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SAS® Service Parts Optimization 4.3
User's Guide

SAS® Documentation

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SAS® Service Parts Optimization 4.3: User's Guide

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Contents

About This Book

Audience

SAS Service Parts Optimization is designed for persons who are responsible for performing any or all of the following tasks:

- monitoring and analyzing high-level performance of the service parts inventory and making decisions based on the analysis
- maintaining a balance between the inventory stock levels and customer service agreements
- managing the service parts forecasting process
- reviewing inventory levels, inventory turns, and inventory costs
- analyzing the supply chain performance and suggesting optimal service levels and lead times based on budgets and costs
- generating optimal order quantities

You might be assigned to a specific role, which determines the tasks that you can perform. For more information, see "SAS Service Parts Optimization User Roles" on page 9. This documentation focuses on all tasks that you can perform in SAS Service Parts Optimization.

Prerequisites

Here are the prerequisites for using SAS Service Parts Optimization:

- a user ID and password for logging on to SAS Service Parts Optimization.
- a user ID and password for logging on to SAS Forecast Studio. This prerequisite is applicable only if you need to manage forecast modeling.

What's New in SAS Service Parts Optimization 4.3

Overview

SAS Service Parts Optimization 4.3 includes the following changes:

- new features in each workspace
- new features to improve the performance of the user interface
- new business scenarios in the back-end data processes

New Features in Each Workspace

Inventory Analysis Workspace

The new and enhanced features of the Inventory Analysis workspace are as follows:

- The following metrics are displayed in the workspace:
  - actual inventory quantity
  - item price
  - reorder level, order-up-to level, safety stock
  - inventory turns
- Additional attributes (item ID and facility ID) are displayed in the workspace.
- Improvements in the alert settings feature are as follows:
  - You can set alerts for multiple rows at a time.
  - The facility and item pairs inherit alert settings that are specified at the corresponding lowest level of item category or facility and network pair.

Order Suggestions Workspace

The new and enhanced features of the Order Suggestions workspace are as follows:

- Editing the order suggestions is possible. The following editing options are available:
  - modify the order quantities
  - modify the lead times for receipt

    - split the order into two or more staggered receipts from the same source
    - add a vendor for orders that belong to the incomplete replenishment plans
    - modify the transfer cost by changing the transfer mode
- A substitute item can be added to an order.
- Maximum order value constraint is applicable for automatic locking of an order. If the total order quantity for a facility and item pair exceeds the maximum order value, then that order is not auto-locked.
- The following metrics are displayed in the workspace:
    - safety stock
    - total required quantity
    - quantity shortfall
- Additional attributes (item ID and facility ID) are displayed in the workspace.
- Locked orders can be promoted from the user interface.

Scenario Development Workspace

The new and enhanced features of the Scenario Development workspace are as follows:

- Data from a SAS Forecast Studio project can be analyzed by creating an ad hoc scenario.
- The promoted values are displayed on the user interface.

Forecast Management Workspace

The new and enhanced features of the Forecast Management workspace are as follows:

- Enhancements in the integration of SAS Service Parts Optimization with SAS Forecast Studio:
    - Any time series can be selected for creating a project in SAS Forecast Studio. You can build models and add events in SAS Forecast Studio.
    - The selected time series can be reforecasted in SAS Forecast Studio by using the item and facility hierarchies.
- Parameterized control is provided for forecast subgroups and time series. You can reforecast the time series before saving the parameter changes.
- Forecast reconciliation methods include Middle Out as an option.

New Features to Improve the Performance of the User Interface

SAS Service Parts Optimization provides the following improvements that are applicable for all workspaces:

- Pagination is implemented for all data table components in the secondary view and in some dialog boxes. Each page displays up to 1000 records. Four navigation buttons are provided that enable you to view the first, previous, next, and last page of data in the table.

- The filtering feature has the following enhancements:
  - restricted number of rows in the data selection
  - manual intervention for fetching filtered data based on multiple filter criteria

New Business Scenarios in the Back-End Data Processes

The enhancements in the back-end data processes are as follows:

- You can categorize items based on their item attributes into different forecast groups.
- If you have segmented and clustered items based on their demand patterns, then you can use these segments as a forecast subgroup within a business level forecast group. The associated features are as follows:
  - Creating forecast subgroups is optional. You can choose to create subgroups at the configuration stage of SAS Service Parts Optimization.
  - Subgroups inherit the same parameters as the parent forecast groups.
  - There is no reconciliation from the child subgroup to parent forecast group.
- You can get daily forecasts. The forecast process runs on a weekly basis. Weekly forecasts are converted to daily with an equal split or based on weighted split across the workday.
- Lead times for multiple vendors are calculated based on their share of business.
- The optional bill of material (BOM) functionality is configurable and can be turned on or off.
- The data preparation functionality for forecasted demand versus actual demand is configurable and can be turned on or off. The functionality includes the following enhancements:
  - Actual future orders are used instead of forecasted orders if the number of actual orders is greater than the forecasted quantity for the next period.
  - The daily replenishment demand is stored for the next seven days.
- The policy generation process handles multiple vendors for an item and includes transshipment as an optional process.
- Demand from an existing SAS Forecast Studio project can be imported into a scenario.
- Promoted values are stored in a promotion table. You can specify whether the analytical base table (ABT) preparation process for inventory optimization should use these promoted values or not.

Recommended Reading

- *SAS Forecast Studio: User's Guide*
- *SAS High-Performance Forecasting: User's Guide*
- *SAS Inventory Optimization: User's Guide*

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Part 1

Introduction to SAS Service Parts Optimization

Chapter 1

About SAS Service Parts Optimization

Overview of SAS Service Parts Optimization

For service organizations, providing post-sales support for services and parts to customers and creating accurate plans and forecasts for service parts consumption are major challenges. Their main aim is to meet customer requirements (maintain service level) with minimum inventory levels (low holding costs). To achieve this, organizations need to automate the service parts planning processes and shift focus of the service supply chain from just-in-time inventory to just-in-case availability.

SAS Service Parts Optimization is an analysis tool that predicts service parts demand and helps in generating optimal inventory replenishment policies. These policies are based on specific constraints such as target service levels and user-defined inputs such as lead time and demand. Organizations can thereby maintain optimized stock levels over a multi-echelon service network, improve customer-satisfaction, and reduce total costs.

SAS Service Parts Optimization uses the following information to generate optimal inventory replenishment policies:

- node information such as lead time, service level, and associated inventory cost data, which includes the cost of replenishment, holding inventory, and backordering (stock-outs)
- network and inventory information
- forecasted demand data

The optimization is done across the distribution network for any given service part in a multi-echelon mode. The policy calculation algorithm in SAS Service Parts Optimization accounts for variability in demand data and supply.

Some of the tasks that you can perform in SAS Service Parts Optimization are as follows:

- You can view detailed forecasting results and perform further analysis.
- You can view and analyze inventory metrics information.

- You can drill down into the subset of information for specific facility and item pairs to investigate the root cause of inventory issues.
- You can perform what-if analysis for arriving at the optimal service level or lead times to manage the cost or budgets.
- You can ascertain the optimal quantities that need to be ordered to meet the desired service levels.

The analytical features in SAS Service Parts Optimization enable you to calculate optimized inventory and order quantities for parts distribution systems, maintain adequate parts stock levels, and maximize response efficiency; thereby, achieving immediate cost savings, maximum customer satisfaction, greater customer retention, and protected brand image.

The purpose of this document is to explain the key features of SAS Service Parts Optimization.

Benefits of Using SAS Service Parts Optimization

Efficient and effective management of service parts is critically important to the success of organizations that have presence in post-sales operations. Post-sales service and parts have a significant contribution to the revenues and profits for most manufacturing-based companies. However, common problems that such companies confront are as follows:

- lack of visibility into service part demand, it being contingent on break down of the product
- limited or no access to the secondary or tertiary sales data, or resale data
- complex data integration requirements, sales data being stored in multiple and disparate data sources
- obsolete and unbalanced inventory across the supply chain network

These problems lead to loss of opportunities for increasing profitability. SAS Service Parts Optimization provides advanced analytical capabilities to help service organizations resolve these problems. Major uses of SAS Service Parts Optimization include the following:

- provide demand and inventory forecasts
- provide input to set inventory levels
- provide input to plan replenishment activities that includes inventory rebalancing

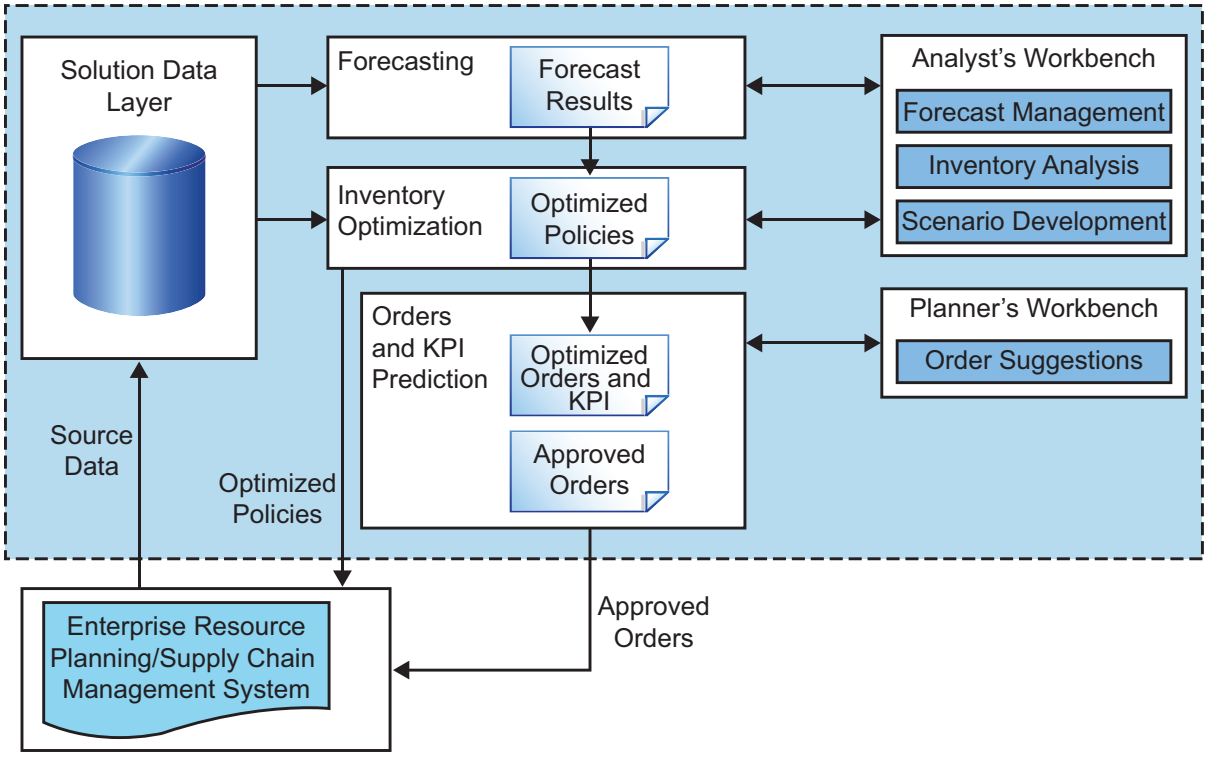
SAS Service Parts Optimization provides automation and analytical sophistication to the forecasting and inventory optimization processes. You can generate millions of forecasts in a turnaround time that is sufficient to run your business. You can uncover previously undetected trends, and you can predict future seasonal fluctuations. The solution enables you to calculate inventory replenishment policies for parts distribution systems and thereby maintain adequate stock levels. These capabilities create ample opportunities for you to reduce costs, increase revenues, and improve customer satisfaction and brand image.

How Does SAS Service Parts Optimization Work?

The SAS Service Parts Optimization solution operates in two modes, batch and interactive.

- The automatic batch mode: Runs the forecasting process for all the identified service part time series, calculates optimal inventory policies, and suggests optimal quantities to be ordered or redistributed across the network.
- The user interactive mode: You can review the results of optimization and conduct a what-if analysis to arrive at an optimal service level or lead time and get the desired results.

Figure 1.1 *Working of SAS Service Parts Optimization*



The functions of the SAS Service Parts Optimization solution can be divided into three logical areas:

- forecasting of service parts
- policy optimization
- generation of suggested order quantities and key performance indicators (KPIs)

The solution uses the demand history of service parts to forecast their demand. You can view the result of the forecasting process in the Forecast Management workspace.

The inventory optimization generates optimal inventory policies every time it runs. You can schedule to run the optimizer on a daily, weekly, monthly, or quarterly basis. SAS Service Parts Optimization optimizes inventory policies to meet target service levels for the specified inputs such as demand, lead time, and so on. You can view and analyze the performance of the supply chain in terms of actual versus target values of service level, lead time, and demand across the items and networks in the Inventory Analysis workspace.

The orders and KPI prediction process suggests order quantities from the primary source of supply. The generator also suggests inventory transshipment or redistribution when there is an inventory imbalance. The generator then saves the recommended order quantities so that they can be sent to the Enterprise Resource Planning (ERP) systems or order management systems. Based on the inventory status, you can view the following item categorizations and replenishment suggestions:

- For items with normal or excess inventory, the order generator suggests no replenishment.
- For items with low inventory:
  - The order generator suggests replenishment from the primary source to fulfill the desired service levels.
  - The order generator suggests replenishment from the primary source and the alternative source to fulfill the desired service levels.
  - Due to cost constraints, the order generator suggests only partial replenishment, and service levels are not met.
  - Due to low stocks in network, the order generator suggests only partial replenishment, and service levels are not met.

You can view these replenishment suggestions in the Order Suggestions workspace.

Forecast management, scenario development, and inventory analysis are primary tasks of the analyst and hence, are part of the analyst's workbench. Order suggestions is primarily a planner's task and is part of planner's workbench.

Accessibility Features of SAS Service Parts Optimization

About the Accessibility Features

SAS Service Parts Optimization includes the following accessibility and compatibility features that improve usability of the product for users with disabilities. These features are related to accessibility standards for electronic information technology adopted by the U.S. Government under Section 508 of the U.S. Rehabilitation Act of 1973, as amended.

If you have questions or concerns about the accessibility of SAS products, send e-mail to **`accessibility@sas.com`**.

SAS Service Parts Optimization conforms to accessibility standards for the Windows platform, with the following exceptions:

- The dialog boxes fail to adjust in size to accommodate any increase in text size.
- There is insufficient support for high contrast and custom color styles in SAS Service Parts Optimization.
- There is insufficient support for column navigation using the keyboard in the tables.
- When a screen reader is used, the following is true:
  - The screen reader cannot read the tables.
  - The screen reader cannot read the toolbar in the Suggested Orders dialog box.
  - The screen reader cannot read a child dialog box that is opened from the New/Edit/Copy Scenario dialog boxes for service level sensitivity analysis scenario type.
  - The screen reader cannot read some labels in the Edit Parameters dialog box.
  - The screen reader reads incorrect mnemonics for the suboptions of the **Open Demand Projection Details** option from **Menu** of the Forecast Results view.

Keyboard Navigation

SAS Service Parts Optimization can be navigated by using the keyboard. The following table includes some guidelines:

Table 1.1 *Standard Keyboard Navigation Controls*

Task	Keyboard Control
Displays the Inventory Analysis workspace	CTRL + 1
Displays the Order Suggestions workspace	CTRL + 2
Displays the Scenario Development workspace	CTRL + 3
Displays the Forecast Management workspace	CTRL + 4
Opens Help	CTRL + F1/F1
Displays a list of the open views and opens the previous view	CTRL + F7
Opens **Menu** for the active view	CTRL + F10
Detaches the view in a new window	ALT + SHIFT + W
Moves forward through controls	TAB
Moves backward through controls	SHIFT+TAB
Performs the action that corresponds to the active control	ENTER

You can access a main menu option by pressing the ALT key and the underlined letter that is shown on the menu. Some menu options in the main menu and in the **Menu** of a view have keyboard shortcut keys assigned to them. If an option has a shortcut key, then the key is listed on the menu next to the option.

Chapter 2

Managing Access to SAS Service Parts Optimization

SAS Service Parts Optimization User Roles

All the users of the SAS Service Parts Optimization solution have specific roles assigned to them. Your access to specific advanced features of a workspace is dependent on the role that is assigned to you.

The following table lists the roles, role descriptions and information about restrictions to the application-specific features, if any.

Table 2.1 *SAS Service Parts Optimization User Roles and Descriptions*

Role Name	Role Description	Application-Specific Feature Restrictions
Buyer	A buyer can handle a limited number of facilities and items.	• In the Inventory Analysis workspace, a buyer can view aggregated values of the inventory metrics for only those facility and item pairs that belong to him or her. • In the Order Suggestions workspace, a buyer can view order details for only those facilities that belong to him or her. • In the Scenario Development workspace, a buyer can select only those items and facilities that belong to him or her. • In the Forecast Management workspace, a buyer cannot specify external forecast values nor can the buyer modify the parameters that control the forecasting process. The buyer can view the details only.

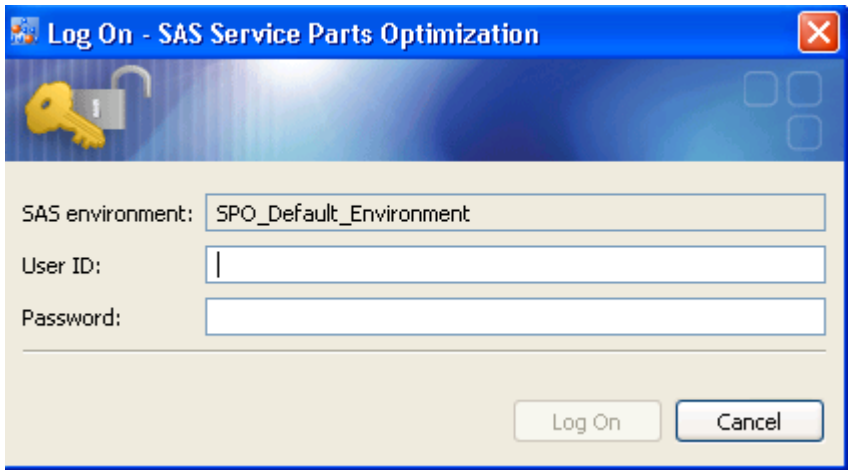
Role Name	Role Description	Application-Specific Feature Restrictions
Forecaster	A forecaster has partial control over the Forecast Management workspace.	• In the Inventory Analysis workspace, a forecaster can view all the details. • In the Order Suggestions workspace, a forecaster can view the details only. The forecaster cannot lock or unlock an order, nor can the forecaster modify the lock settings. • In the Scenario Development workspace, a forecaster can view details only. The forecaster cannot promote a scenario. • In the Forecast Management workspace, a forecaster can specify external forecast values for facility and item pairs with insufficient or no history data. The forecaster cannot modify the parameters that control the forecasting process.
Advance Forecaster	An advance forecaster has complete control over the Forecast Management workspace.	• In the Inventory Analysis workspace, an advance forecaster can view all the details. • In the Order Suggestions workspace, an advance forecaster can view the details only. The advance forecaster cannot lock or unlock an order, nor modify the lock settings. • In the Scenario Development workspace, an advance forecaster can view the details only. The advance forecaster cannot promote a scenario.

Role Name	Role Description	Application-Specific Feature Restrictions
Inventory Analyst	An inventory analyst has complete control over the Inventory Analysis workspace. The analyst has partial control over the Scenario Development workspace.	• In the Order Suggestions workspace, an inventory analyst can view the details only. The analyst cannot lock or unlock an order, nor modify the lock settings. • In the Scenario Development workspace, an inventory analyst cannot promote a scenario. • In the Forecast Management workspace, an inventory analyst can view the details only. The analyst cannot specify external forecast values for facility and item pairs with insufficient or no history data. The inventory analyst also cannot modify the parameters that control the forecasting process.
Advance Inventory Analyst	An advance inventory analyst has complete control over the Scenario Development workspace.	• In the Inventory Analysis workspace, an advance inventory analyst can view all the details. • In the Order Suggestions workspace, an advance inventory analyst can view the details only. The advance analyst cannot lock or unlock an order, nor modify the lock settings. • In the Forecast Management workspace, an advance inventory analyst can view the details only. The advance analyst cannot specify external forecast values for facility and item pairs with insufficient or no history data. The advance analyst cannot modify the parameters that control the forecasting process.

Log On to SAS Service Parts Optimization

Each user who can access SAS Service Parts Optimization is configured in the metadata server and is assigned with an appropriate role or group. You can view and work in a workspace only if you have the correct role assigned to you and the appropriate access permissions. Certain tasks in the SAS Service Parts Optimization application can be performed by users with specific roles only.

Display 2.1 *The Log On Dialog Box for SAS Service Parts Optimization*



To log on to SAS Service Parts Optimization:

1. To display the log on window, browse to the location where the SAS Service Parts Optimization client is installed and double-click the SAS Service Parts Optimization icon.
2. In the log on window, ensure that the **SAS environment** box contains the path to environment file that stores the server information.
3. In the **User ID** box, type a user ID.
4. In the **Password** box, type the password and click **Log On**.

Log Off from SAS Service Parts Optimization

To log off from SAS Service Parts Optimization, from the main menu, select **File** ⇨ **Exit**. Alternatively, you can click ✕ in the top right corner of the application.

Chapter 3

Getting Started with SAS Service Parts Optimization

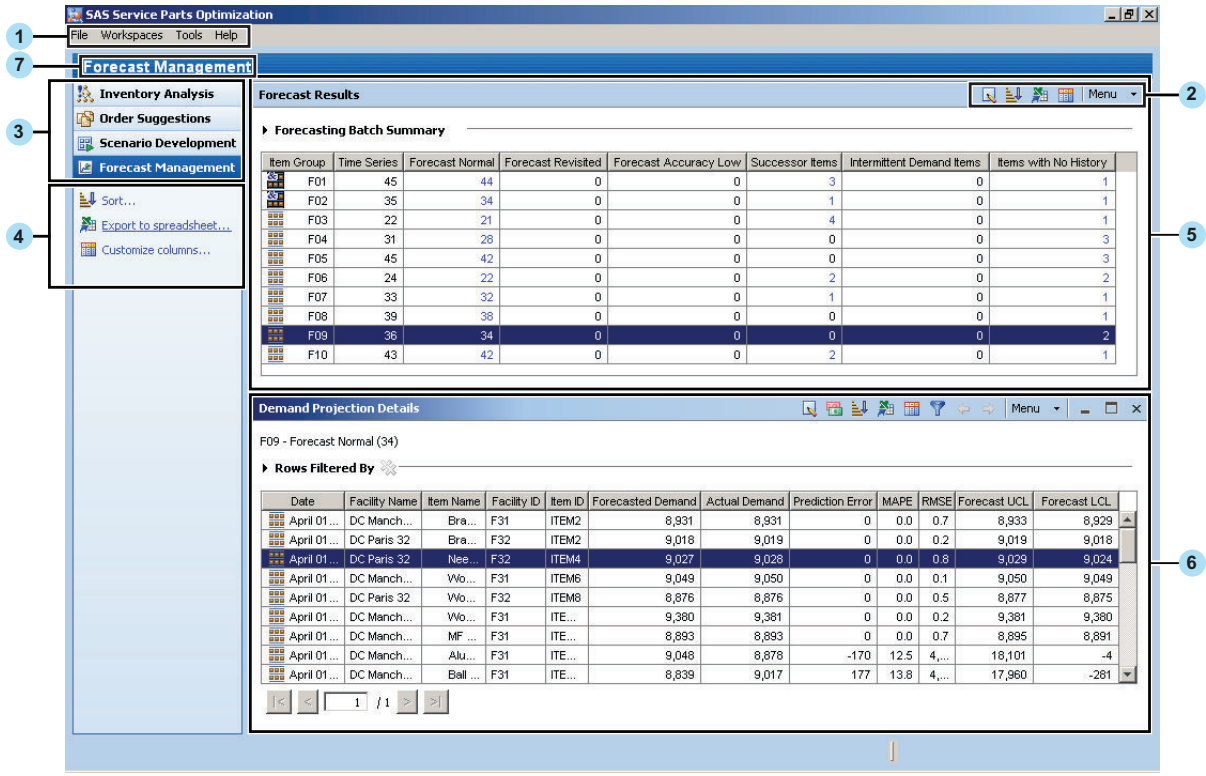
The SAS Service Parts Optimization Interface

After you log on to SAS Service Parts Optimization, the main application window appears. By default, the Inventory Analysis workspace opens. If you switch to a different workspace and close the application, then the workspace that you last opened is displayed the next time you log on to the application.

The SAS Service Parts Optimization application window includes a main menu, a Workspaces pane, a Task pane, and four distinct workspaces.

The following figure shows the major areas of the SAS Service Parts Optimization user interface. Note that the Forecast Management workspace is displayed in the figure.

Display 3.1 *SAS Service Parts Optimization User Interface*



Legend

1	Main Menu
2	Toolbar
3	Workspaces Pane
4	Task Pane
5	Primary View
6	Secondary View
7	Current Workspace Title

Note: The figures and displays in this document contain sample data.

Accessing Help for SAS Service Parts Optimization

You can access Help for SAS Service Parts Optimization in any of the following ways:

F1 key
: is available in any view of a workspace or in a dialog box and provides access to the Help contents that are specific to the active view or dialog box.

Help button
: is available in many views and dialog boxes and enables you to view a Help topic.

Help menu
is available from the main menu and enables you to view the entire Help content for SAS Service Parts Optimization.

Using the Main Menu

SAS Service Parts Optimization provides the following menu options:

File ⇨ Exit
closes SAS Service Parts Optimization.

Workspaces ⇨ Inventory Analysis
displays the Inventory Analysis workspace.

Workspaces ⇨ Order Suggestions
displays the Order Suggestions workspace.

Workspaces ⇨ Scenario Development
displays the Scenario Development workspace.

Workspaces ⇨ Forecast Management
displays the Forecast Management workspace.

Workspaces ⇨ Task Pane ⇨ Full Size
displays the Workspaces pane at 100% of its size.

Workspaces ⇨ Task Pane ⇨ Medium Size
displays the Workspaces pane at 50% of its full size.

Workspaces ⇨ Task Pane ⇨ Small Size
displays the Workspaces pane as icons and hides the Task pane.

Workspaces ⇨ Task Pane ⇨ Hidden
hides the Workspaces pane and Task pane.

Workspaces ⇨ Task Pane ⇨ Size to Fit
enables you to modify the size of the Workspaces pane and Task pane to your desired size.

Workspaces ⇨ Restore Default Layout
returns the currently displayed workspace to the default layout, that is, only the primary view is displayed.

Tools ⇨ Preferences
opens the Preferences dialog box that enables you to set configuration preferences for SAS Service Parts Optimization.

Help ⇨ Help Contents
displays the table of contents for the Help system.

Help ⇨ Dynamic Help
displays the Help contents that are specific to the active view or dialog box.

Help ⇨ SAS on the Web ⇨ Customer Support Center
opens the SAS Customer Support Web site.

Help ⇨ SAS on the Web ⇨ SAS Institute Home Page
opens the SAS corporate home page.

Help ⇨ About SAS Service Parts Optimization
displays copyright and other information about SAS Service Parts Optimization.

Using the Workspaces Pane

Overview

The Workspaces pane provides quick access to the workspace that you want to work with.

The following table displays and describes the icons and corresponding labels that appear on the Workspaces pane:

Table 3.1 *Icons on the Workspaces Pane*

Icon	Action
 Inventory Analysis	Displays the Inventory Analysis workspace.
 Order Suggestions	Displays the Order Suggestions workspace.
 Scenario Development	Displays the Scenario Development workspace.
 Forecast Management	Displays the Forecast Management workspace.

Access to a Workspace

To access the Inventory Analysis workspace, use either of the following methods:

- In the main menu, select **Workspaces** ⇨ **Inventory Analysis**.
- In the Workspaces pane, click  **Inventory Analysis**.

To access the Order Suggestions workspace, use either of the following methods:

- In the main menu, select **Workspaces** ⇨ **Order Suggestions**.
- In the Workspaces pane, click  **Order Suggestions**.

To access the Scenario Development workspace, use either of the following methods:

- In the main menu, select **Workspaces** ⇨ **Scenario Development**.
- In the Workspaces pane, click  **Scenario Development**.

To access the Forecast Management workspace, use either of the following methods:

- In the main menu, select **Workspaces** ⇨ **Forecast Management**.
- In the Workspaces pane, click  **Forecast Management**.

Working in a View

Overview

Each workspace in SAS Service Parts Optimization has two views: a primary view and a secondary view. When you open a workspace, the primary view opens and occupies the major part of the main application window.

You can open the secondary view from the primary view. The primary view is always open and cannot be closed. However, you can close, minimize, maximize, and restore the secondary view.

The following icons are available in the secondary view:

Table 3.2 *Common Icons in the Secondary View*

Shortcut Icon	Action
	Reduces the size of the view.
	Increases the size of the view to fill the workspace display area.
	Returns the view to its default display size.
	Closes the view.

The title bar of a view displays the name of the view. Each view has a toolbar at the top of the view that contains toolbar buttons and a **Menu**.

A view might contain information in tabular (data table) format, graphical (plot) format, or both. You can perform different tasks in a view; some tasks are common across all the workspaces, while some tasks are specific to a view. Detailed information about performing common tasks and view-specific tasks is explained later.

Access to Tasks in a View

You can perform a distinct set of tasks in each workspace. The work area or view within every workspace provides a distinct menu and a Task pane, which you can use to start the workspace-specific tasks.

Each view provides two menus:

- a pop-up menu that you can open by clicking the right mouse button in the view
- a **Menu** option that is available on the toolbar of the view

The following list provides the different ways to start a task. However, not every task can be accessed by every method that is listed herein.

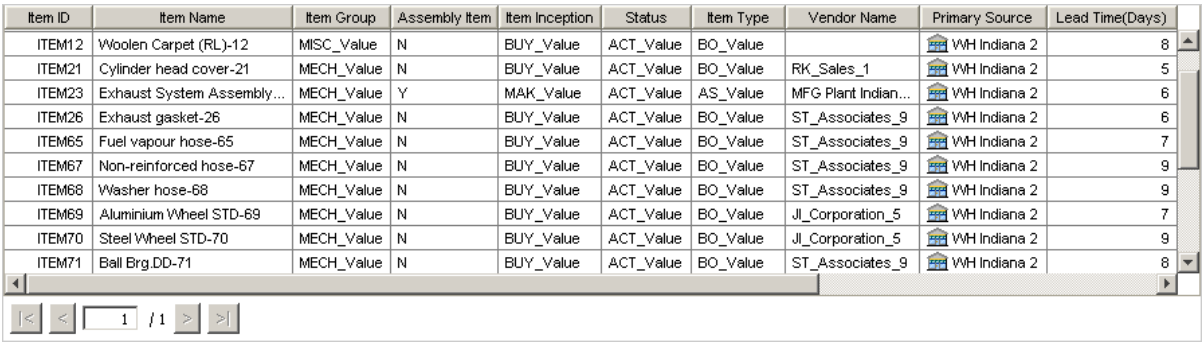
- Select the task from either the pop-up menu or from the **Menu** on the toolbar.
- Click the task-specific icon in the toolbar.

- Click the task in the Task pane.

Using Data Tables

Information in a data table is easy to manage and organize. Most of the views and some dialog boxes that open from a view display information in either one or more data tables.

Display 3.2 *A Data Table with Sample Data*



Item ID	Item Name	Item Group	Assembly Item	Item Inception	Status	Item Type	Vendor Name	Primary Source	Lead Time(Days)
ITEM12	Woolen Carpet (RL)-12	MISC_Value	N	BUY_Value	ACT_Value	BO_Value		WH Indiana 2	8
ITEM21	Cylinder head cover-21	MECH_Value	N	BUY_Value	ACT_Value	BO_Value	RK_Sales_1	WH Indiana 2	5
ITEM23	Exhaust System Assembly...	MECH_Value	Y	MAK_Value	ACT_Value	AS_Value	MFG Plant Indian...	WH Indiana 2	6
ITEM26	Exhaust gasket-26	MECH_Value	N	BUY_Value	ACT_Value	BO_Value	ST_Associates_9	WH Indiana 2	6
ITEM65	Fuel vapour hose-65	MECH_Value	N	BUY_Value	ACT_Value	BO_Value	ST_Associates_9	WH Indiana 2	7
ITEM67	Non-reinforced hose-67	MECH_Value	N	BUY_Value	ACT_Value	BO_Value	ST_Associates_9	WH Indiana 2	9
ITEM68	Washer hose-68	MECH_Value	N	BUY_Value	ACT_Value	BO_Value	ST_Associates_9	WH Indiana 2	9
ITEM69	Aluminium Wheel STD-69	MECH_Value	N	BUY_Value	ACT_Value	BO_Value	JI_Corporation_5	WH Indiana 2	7
ITEM70	Steel Wheel STD-70	MECH_Value	N	BUY_Value	ACT_Value	BO_Value	JI_Corporation_5	WH Indiana 2	9
ITEM71	Ball Brg.DD-71	MECH_Value	N	BUY_Value	ACT_Value	BO_Value	ST_Associates_9	WH Indiana 2	8

You can sort the table rows, customize the columns of a table, and perform other common tasks in a data table. If you sort the rows or customize the columns of the data table before you close a view, switch to a different workspace, log off, or close the application, then the application retains these table settings when you reopen the view or workspace, or when you log on again.

The data table in the secondary view of all workspaces and in some dialog boxes displays information in pages wherein each page shows up to 1000 records. Four navigation buttons are provided that enable you to view the first, previous, next, and last page of data in the table.

Using Graphs

Overview of Graph Types

About Graph Types

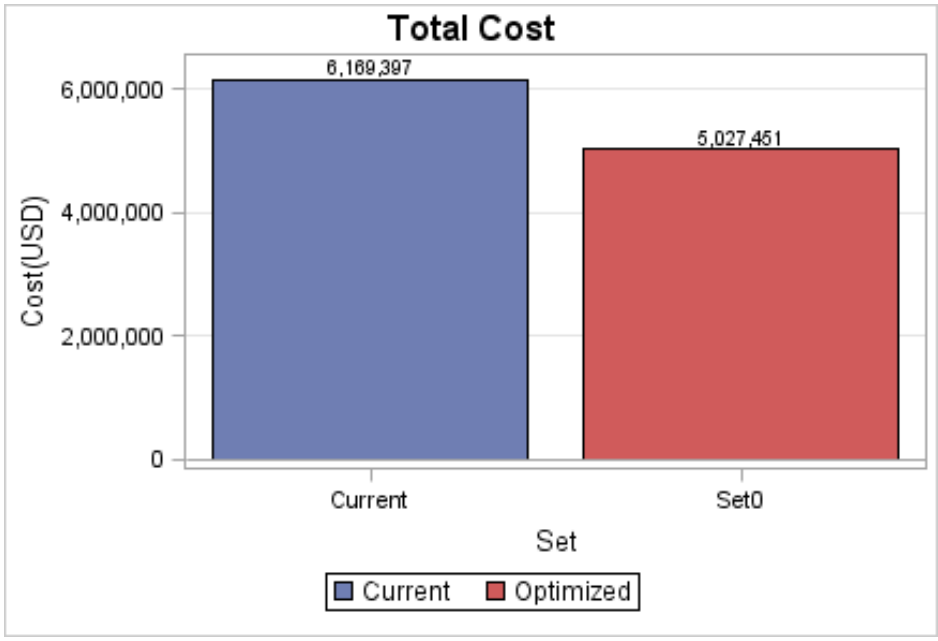
A graph or a plot is a visual representation of data and contains an X-axis, a Y-axis, a title, and a legend.

Some views enable you to view information of a data table in either a bar chart or a line graph.

About Bar Charts

A bar charts consists of a grid and some vertical columns (bars). Each column describes quantitative data.

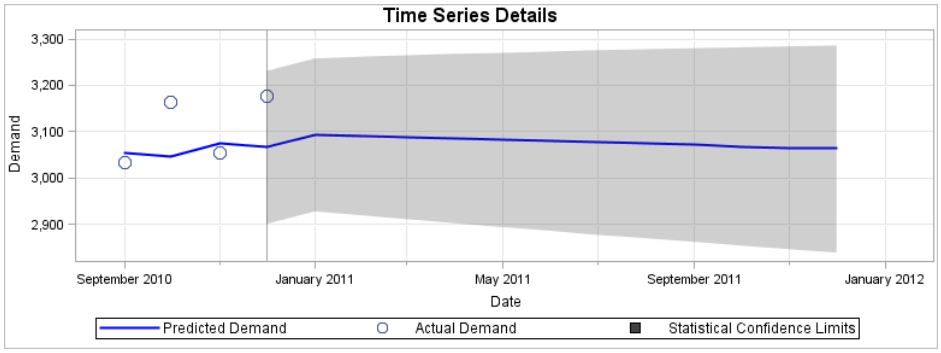
Display 3.3 *A Sample Bar Chart*



About Line Graphs

A line graph shows the relationship of one variable to another, often as movements or trends in the data over a period of time.

Display 3.4 *A Sample Line Graph*



Working in a Graph

By default, the entire contents of a graph are displayed. You can zoom in or out of a graph to view details of a specific area in the graph.

Note: The values that are displayed in the graph and the values that are displayed in the data table might not match exactly. Actual values are used to plot the graph, whereas the data table displays the rounding values.

To zoom in or out of a graph:

1. On the X axis or Y axis of the graph, keep the left mouse button clicked, and drag the mouse pointer in the left or right direction until the graph is magnified to the level that you want.

Note: When you click the left mouse button, an icon of a magnifying glass is displayed that indicates that you can zoom in on the graph.

2. (Optional) To restore the graph to its default view, click  .

Chapter 4

Performing Common Tasks in SAS Service Parts Optimization

Overview of the Common Tasks in SAS Service Parts Optimization

You can perform the following common tasks in a data table:

- Sort the table rows.
- Export the table to a spreadsheet.
- Customize the columns of the table.
- Filter the table rows.
- Modify the width of the table columns.

These are some common tasks that are available only in the secondary view of a workspace:

- Open a copy of the view in a new window.
- Manage a view, that is, minimize, maximize, restore to default size, and close the view.

You can perform a task by clicking the appropriate icon in the toolbar or by selecting a task from **Menu** or the Tasks pane. You can also right-click in the data table to display a pop-up menu that covers the commonly used features of the view.

Tasks that are specific to a view are described in the related topics.

Sorting the Table Rows

About Sorting the Table Rows

You can rearrange the data in a table by sorting the table rows according to the values of the columns. Sorting can be performed in ascending or descending alphanumeric order.

You can specify the order of columns in which you want to sort the table and also apply a sorting direction for each column. By default, the rows are arranged in ascending alphanumeric order.

Sort the Table Rows

You can sort the rows in a table according to the values of the columns by using the Multiple Sort dialog box.

To sort the table rows:

1. In the toolbar, click  . Alternatively, click the header of a column. The Multiple Sort dialog box appears.
2. In the **Select one or more columns to sort** section, select a column or columns and click  to add one or more columns in the **Determine sort order and direction** section. You can select multiple columns by using the SHIFT or CTRL key. To add all columns, click  .
3. (Optional) To deselect a column, in the **Determine sort order and direction** section, select the column and click  . You can deselect multiple columns by using the SHIFT or CTRL key. To deselect all columns, click  .
4. To specify the order of columns, in the **Determine sort order and direction** section, select the column, and then click  or  .
5. To specify the direction of sorting a column, in the **Determine sort order and direction** section, select a column and from the corresponding drop-down list, select **Ascending** or **Descending**. By default, **Ascending** is selected.

   Note: You can specify a different sort order for each column that is displayed in the **Determine sort order and direction** section.
6. Click **OK**. The header of the columns that are selected for sorting display an arrow icon  or  . The direction of the arrow icon is upward if the column sorts the table in ascending order. Otherwise, the arrow direction is downward.

Clear the Sorting of a Table

You can remove the sorting of the table and display the table data in the default order.

To clear the sorting of a table, from the **Menu**, select **Clear Sort**.

Alternatively, in the Multiple Sort dialog box, click  and click **OK**. The table is rearranged and displays data in the default order.

Exporting a Table to a Spreadsheet

About Exporting a Table to a Spreadsheet

Exporting data from a table to a spreadsheet or other formats can be useful for sharing, archiving, or further calculations.

You can export a complete table to a spreadsheet. Even if you have sorted, filtered, or collapsed the table rows in the view, when you export the table, all rows of the table are exported to the spreadsheet.

Export a Table to a Spreadsheet

You can export data from a table to a spreadsheet by using the Export to Spreadsheet dialog box.

Prerequisite:

Ensure that either Microsoft Office 2000, 2007, or XP is installed on your computer.

To export a table to a spreadsheet:

1. In the toolbar, click  . The Export to Spreadsheet dialog box appears.
2. If export options are available, select whether you want to export the table to a file with comma-separated values or to a Microsoft Excel file.

   Note: Not all Export to Spreadsheet dialog boxes provide the option of exporting to a file with comma-separated values. By default, the data is exported to a Microsoft Excel file.
3. To specify a file that stores the exported data, click **Browse** and select a file. The selected file is displayed in the **Name of File** box.
4. Click **OK**. The table is exported to the specified file.

   Note: You cannot export a graph. If you select the **Export to Spreadsheet** option when you are in the **Plot** tab, the corresponding data table is exported.

Customize the Columns of a Table

You can choose the columns to be displayed in a table and customize its view. Some columns cannot be customized and are always displayed in the data table.

To customize the columns of a table:

1. From **Menu**, select **Customize Columns**. The Customize Columns dialog box appears. All columns that are currently displayed in the table are shown in the **Selected columns** frame.
2. In the **Available columns** section, select a column or columns and click  to add one or more columns in the **Selected columns** section. You can select multiple columns by using the SHIFT or CTRL key. To add all columns, click  .
3. (Optional) To deselect a column, in the **Selected columns** section, select the column and click  . You can deselect multiple columns by using the SHIFT or CTRL key. To deselect all columns, click  .
4. To move a column in the table, in the **Selected columns** section, select the column, and then click  or  to move that column to a different location in the table.
5. Click **OK**.

Opening a Copy of a View

About Opening a Copy of a View

You can open multiple copies of a single view in separate windows by using the **Detach in Window** option from **Menu** of a view.

You can perform independent tasks and all navigation tasks in the new detached window without affecting the original view. For example, if you filter some table rows in the detached window, these rows are not filtered in the original view. Also, you can drill down into a row in the detached window, but continue to view the row in the original view.

All features of **Filter Pane** and options under **Menu** for the view are available in its detached window. This window can be moved around in the workspace, thereby providing you the flexibility to compare the contents of the table in the window with that in the original view. However, you cannot perform any data entry tasks in the detached window. For example, you cannot import external forecast information in the detached window of the Demand Projection Details view.

Open a Copy of a View

You can open a copy of a view in a separate independent window. To do so, click **Menu** ⇨ **Detach in Window**.

Filtering the Table Rows

Overview

You can specify filter options to reduce the data rows in a table. These filter options make it easier to work with tables that have a large number of rows.

Applying filters to a table does not change the table. Filters only hide the data rows from the current view of the table corresponding to a specified filter option. You can filter the data in a table in two ways:

Textual search
: enables you to enter search arguments for one of the predefined attributes in the **Rows Filtered By** section.

Multiple filtering
: enables you to specify multiple filter values for a set of predefined options in the **Filter Pane**.

If you want to view the entire data table, you can clear all the filters from the table.

The options in the **Rows Filtered By** section and the **Filter Pane** are based on the data table that is under consideration. A filter trail that shows information about all the filters that are applied to the data table is displayed at the bottom of the **Rows Filtered By** section.

Rows Filtered By Section

Use the **Rows Filtered By** section to filter the data table based on search arguments for one of the predefined attributes.

Display 4.1 *Rows Filtered By Section*

The **Rows Filtered By** section contains the **Text Search** item. This item enables you to specify a search argument in the text box and select an attribute from a predefined list of attributes, based on which you can filter a table. You can specify only alphabetical arguments in the text box.

Click  to search based on the specified criteria.

A reset icon  is displayed next to the section title. Click this icon to reset all the filter options that are applied to the table. The reset option is available only after you search the table based on the specified argument or apply a filter in the **Filter Pane**. Otherwise, the option appears dimmed.

By default, this section is collapsed. Click  to expand the section.

Information about all the filters that are applied to the data table is displayed at the bottom of the section.

Perform Textual Search

You can filter data rows by entering search arguments for one of the predefined attributes in the **Rows Filtered By** section.

To perform textual search:

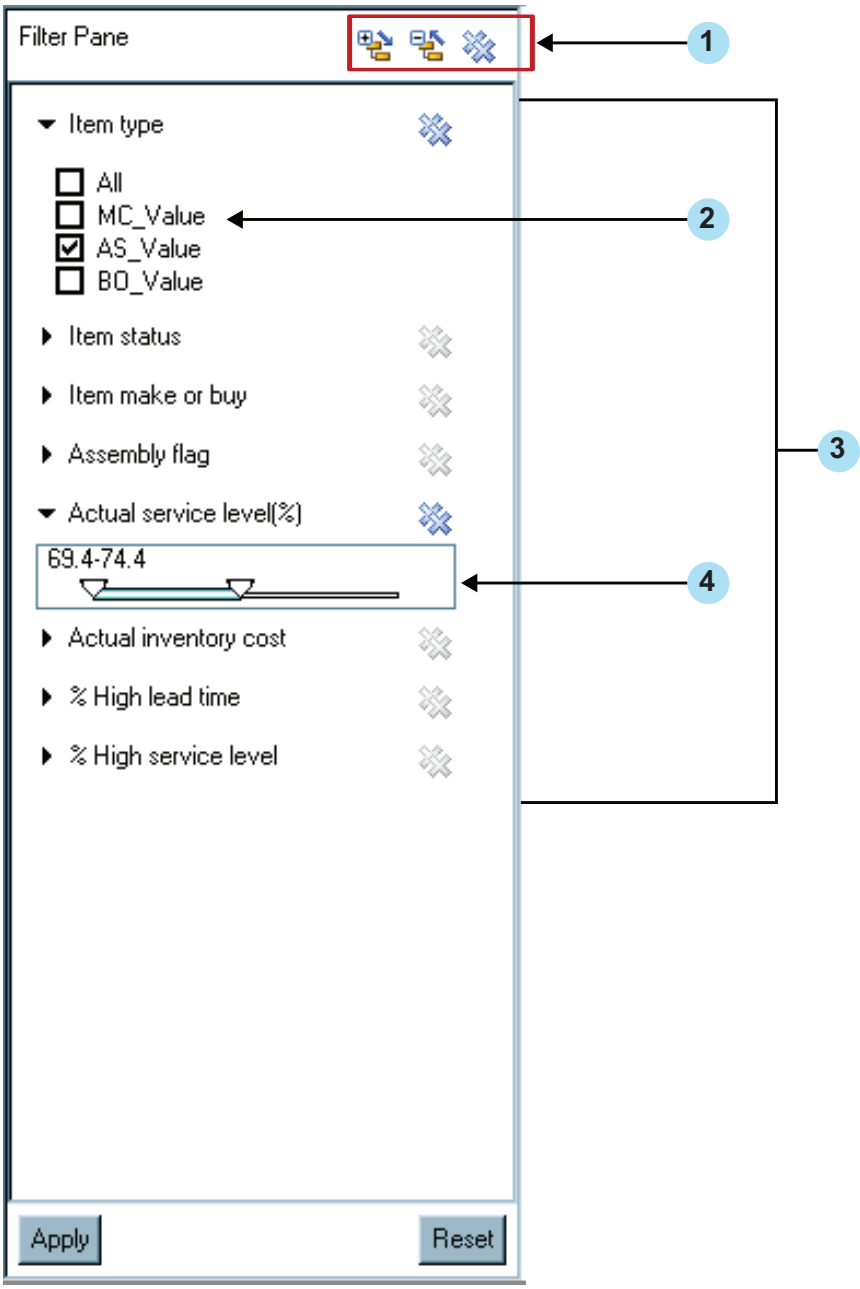
1. If the **Rows Filtered By** section is collapsed, click  . The section expands.
2. In the **Textual Search** box, type the text argument that you want to search.

3. From the **Textual Search** list, select the attribute for which you want to search the data in the table.
4. Click  . The table rows are filtered based on the text argument and the selected attribute.

Filter Pane

Use **Filter Pane** to specify multiple filter values for a set of predefined options.

Display 4.2 *Filter Pane*



Legend

1	Toolbar
2	Check Box Filter Option
3	Filter Sections
4	Slider Bar Filter Option

The filter sections of the **Filter Pane** provide filter options with either check boxes or a slider bar. The appearance and content of the filter sections vary depending on the workspace and view.

The slider bars enable you to change the values of some of the analysis variables. By default, the indicators on a slider bar represent the minimum and maximum values of the corresponding filter section.

A filter section is available for an attribute only when you can apply the filter to reduce the number of rows of the data table. If an attribute has distinct values, then a filter section with check boxes is available for that attribute. If the minimum and maximum values for an attribute are different, then a filter section with a slider bar is available for that attribute.

Each filter section has  displayed next to it. This icon enables you to reset the filter options in the section to the default state by returning the slider bar and the filter options with check boxes to the default state. The reset option is available only if the values in the filter section are modified from their default values. Otherwise, the option appears dimmed.

The following icons are available in the toolbar of the **Filter Pane**:

returns all slider bars to the default value range and returns all filter options with check boxes to the default state only visually in the **Filter Pane**. To reflect the changes in the data table, you must also click **Apply**.

This option is available if the filter options of any filter section have values other than the default values. Otherwise, the option appears dimmed.

collapses or closes all the filter sections.

expands all the filter sections and displays all the options within the sections.

After you change the filter options, you can apply the filter by clicking **Apply**. The data table displays the filtered data. You can reset all filter options by clicking **Reset**.

Perform Multiple Filtering

You can specify multiple filter values for a set of predefined options in the **Filter Pane**.

To perform multiple filtering:

1. In the toolbar, click  . Alternatively, click **Menu** ⇨ **Show Filter Pane**. The **Filter Pane** opens to the left of the data table. The pane displays a collapsed list of filter sections.
2. To expand a filter section, click  or click the filter name. A list of filter options is displayed in the filter section. The filter options can contain a set of check boxes or a slider bar.
3. Select the check box or move the indicators at each end of the slider bar to specify a range of values. The table is displayed with the filtered data.
4. Click **Apply**. The data table displays the filtered data.
5. (Optional) To return the slider bar to the default state or to return the filter option with check boxes to the default state, click the  icon that is placed next to the specific filter section, and then click **Apply** to reflect the change in the data table.

Note: You can click only the **Reset** button to reset all the filter options and also to reflect the changes in the data table.

Remove All Filters from a Table

You can remove all the filters from a table and display the complete table data. To do so, click **Reset**, or click  in the toolbar of the **Filter Pane**, and then click **Apply**.

Modify the Width of the Table Columns

You can modify the width of columns in a table. To do so, place the cursor on the border between the column headings, keep the left mouse button clicked, and drag the border to the left side or to the right side.

Common Toolbar and Menu Options

To perform the common tasks, you can use options from either the toolbar or the menu (that includes the pop-up menu and **Menu** on the toolbar). The following table lists these options and their corresponding actions.

Note: Some actions are available only from the menu. For these actions, "Not available" is displayed in the Toolbar Button column.

Table 4.1 *Common Toolbar and Menu Options*

Toolbar Button	Menu Option	Action
	**Back**	Enables you to view contents of the data table for the previous level. This option appears dimmed when you view the data table at level one.
	**Next**	Enables you to view contents of the data table for the next level. This option is available only if you have navigated to the next level by clicking a link in the data table or double-clicking in a row. This option appears dimmed when you view the data table at its last level.
	**Sort**	Opens the Multiple Sort dialog box that enables you to rearrange the data in the table by sorting the rows according to the values of the columns.

Toolbar Button	Menu Option	Action
Not available	**Clear Sort**	Enables you to remove the sorting that is applied to the table and displays the data in the default order. If the table rows are not sorted, this menu item appears dimmed.
	**Export to Spreadsheet**	Opens the Export to Spreadsheet dialog box that enables you to export data from the table to a spreadsheet.
	**Customize Columns**	Opens the Customize Columns dialog box that enables you to select the columns to be displayed in the table.
Not available	**Help**	Opens the Help window that provides field-level information of this view and enables you to view contents of the entire help for SAS Service Parts Optimization.
	**Show Filter Pane**	Displays the **Filter Pane**. You can view a subset of the table contents by filtering the rows that are not required.
	**Hide Filter Pane**	Hides the **Filter Pane**.
Not available	**Clear All Filters**	Enables you to remove all filters that are applied to the table contents and displays all the rows of the table. This option is available if filters are applied to the table. Otherwise, the option appears dimmed.
Not available	**Detach In Window**	Creates a copy of the view in a separate window. This option is available only from **Menu** on the toolbar.

Part 2

The Inventory Analysis Workspace

Chapter 5

Introduction to Inventory Analysis

About Inventory Analysis

Overview of Inventory Analysis

The Inventory Analysis module enables you to monitor and analyze the performance of the supply chain for service parts. This analysis is based on certain key performance indicators (KPIs) or metrics such as lead time, demand, service level, and inventory cost.

The inventory optimization process optimizes inventory to meet the required service level. Inventory cost and service level serve as the key output performance indicators of the optimization process, while lead time and demand are the main inputs to the inventory optimization process and are considered as the key input performance indicators.

Key Features of Inventory Analysis

Key Performance Indicators

Lead Time
: is the average transportation time measured over the past period between the source and destination facilities. The inventory optimization process uses lead time as one of the constraints. Hence, the less the difference between the actual and target value of lead time and the more accurate the optimization results.

Demand
: is the quantity of an item at a facility that is ordered at that facility. SAS Service Parts Optimization forecasts the demand of items. The forecast results are used by the inventory optimization process to calculate order policies: reorder level and order-up-to level. Further, based on these policies, the inventory optimization process generates replenishment suggestions. Hence, accuracy of the replenishment suggestions depends on the difference between the actual and forecasted demand values that are used for optimization.

Service Level
: is a measure of the fulfillment of customer demand. The inventory optimization process considers the following types of service level for a facility and item pair:

Fill Rate
is the ratio of fulfilled customer demand to the total demand for a given period.

Ready Rate
is the readiness to fulfill total customer demand for a given period.

Service level has two KPIs associated with it: upstream service level and downstream service level. For any facility, upstream service level is a measure of the supplier's performance to fulfill orders from the facility. Downstream service level is a measure of the facility's performance to fulfill orders from its customer.

Inventory Cost
is the cost of the closing inventory for the previous period.

Inventory Quantity
is the quantity of the closing inventory for the previous period.

Safety Stock
is the additional units of inventory that are stored as protection against possible stockouts.

Inventory Turns
is the ratio of the actual demand for a period to the average inventory for that period.

Reviewing the Performance of the Supply Chain for Service Parts

The user interface of the Inventory Analysis module provides an aggregate and granular view of the supply chain for service parts. You can monitor the inventory KPI from an item perspective or from a distribution network perspective. The item perspective enables you to monitor the KPI of service parts at a category or a subcategory level and across all the facilities where the category is defined or stored. The network perspective enables you to track the performance of service parts in a given distribution level.

In both of these perspectives, you can drill down from the aggregate level to an item or a location level. You can also monitor the performance of the service supply chain in a time-phased manner. Both actual and target values of the KPIs (except lead time and service level) are displayed at the aggregate and granular levels, wherein the target values are pre-configured in the underlying solution data layer (SDL). You can compare these actual values with the corresponding target values to review the inventory status and to identify the items or facilities that might be a cause of concern.

The items and facilities that have performance issues in terms of service level, lead time, or demand are highlighted in the user interface, based on certain alert thresholds. You can set and control these alert threshold values for different item categories and facilities.

You can also initiate a what-if scenario analysis for the non-performing facility and item pairs to evaluate the outcomes under different supply chain constraints.

The Inventory Analysis Capabilities

In the user interface of the Inventory Analysis module, you can view the actual and target values for all the KPIs, wherein the target values are preconfigured in the underlying solution data layer (SDL). These KPI values are either aggregated over items or facilities, or are displayed as distinct values at each facility and item level. You can compare the actual values of the KPI with the corresponding target values to review the inventory status and to identify the items or facilities that might be a cause of concern. Aggregation of certain KPIs such as lead time and demand might not be useful. For example, providing the sum of the demand of all items in a location, or providing average lead time of all items in all locations might not serve as a good input for analysis. Hence, the interface does not provide this aggregated information, but displays some relative KPIs such as % high demand, % low demand, % high lead time, % low lead time, and so on.

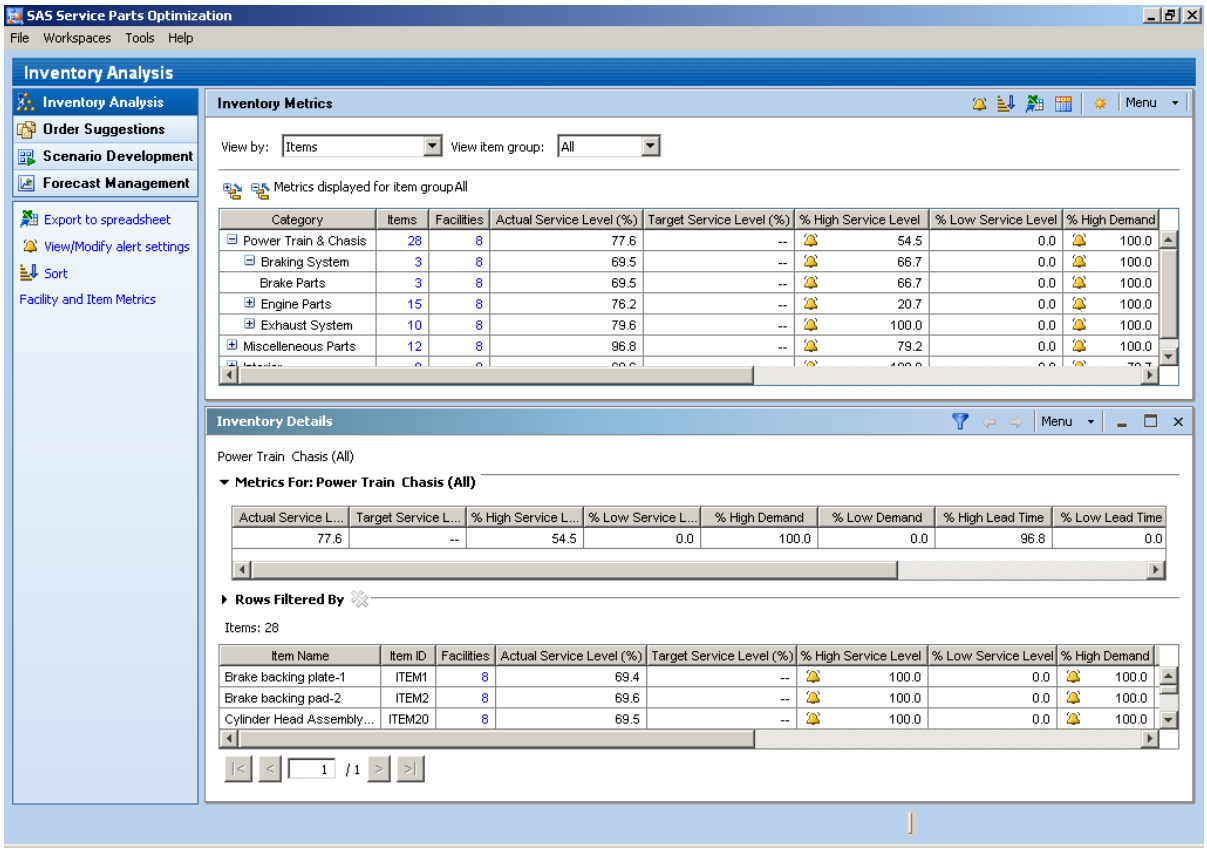
Chapter 6

Getting Started with the Inventory Analysis Workspace

Overview of the Inventory Analysis Workspace

The Inventory Analysis workspace enables you to view aggregated and definite values of metrics such as inventory cost, service level, lead time, inventory turns, inventory quantities, and demand quantities for all combinations of facilities and items in a data table.

Display 6.1 *The Inventory Analysis Workspace*



You can view metric values for all of these facility and item combinations or states for the period under consideration:

- When there are multiple items and multiple facilities, the items and facilities are grouped into categories, and you can view metric values that are aggregated over all facilities and items, per category.
- When there are multiple items and a single facility, for every facility, you can view metric values that are aggregated over all items in that facility.
- When there is a single item and multiple facilities, for every item in a category, you can view metric values that are aggregated over all facilities that store the item.
- When there is a single item and a single facility, for every item and facility pair, you can view the actual and target values of metrics.

By comparing actual metric values with the target metric values, you can review the inventory status and identify the items or facilities that might be a cause of concern.

You can set alert conditions to highlight the item category or facility that might have a considerably higher or lower metric value. You can further analyze and review the exact facility and item pair with considerably higher or lower metric values that caused the alert.

The Inventory Analysis workspace also displays the network view of a facility.

If you log on to the SAS Service Parts Optimization application as a user with the buyer's role, you can view details for only those facilities that belong to you. For all other roles, you can view details for all the facility and item pairs.

In the Inventory Analysis workspace, you can perform the following tasks:

- View the latest actual and target values of the metrics (these values are updated after the inventory optimization batch process runs).
- View the periodic distribution of metric values for a specific facility and item pair.
- Set alert conditions for the metric values. You can set alert conditions at two levels:
  - At a facility and item level, you can set the upper and lower threshold for service level, lead time, and demand. Any facility and item pair that crosses this threshold has breached the threshold condition. For example, you specify the upper threshold value for lead time as 5 days. If the target lead time for a facility and item pair is 6 days, then a positive breach has occurred and an alert is shown.
  - At an aggregate level, you can set the percentage of items in the aggregate that can breach the threshold before an alert is displayed. For example, you specify the upper limit value as 12%. If 10 out of 100 items breach this threshold value, then an alert is not shown. However, if the upper limit is 8%, then an alert is shown.
- Initiate the scenario creation process.

The Inventory Analysis Workspace Components

The Inventory Analysis workspace enables you to view aggregated and distinct metric values for all combinations of facility and item pairs.

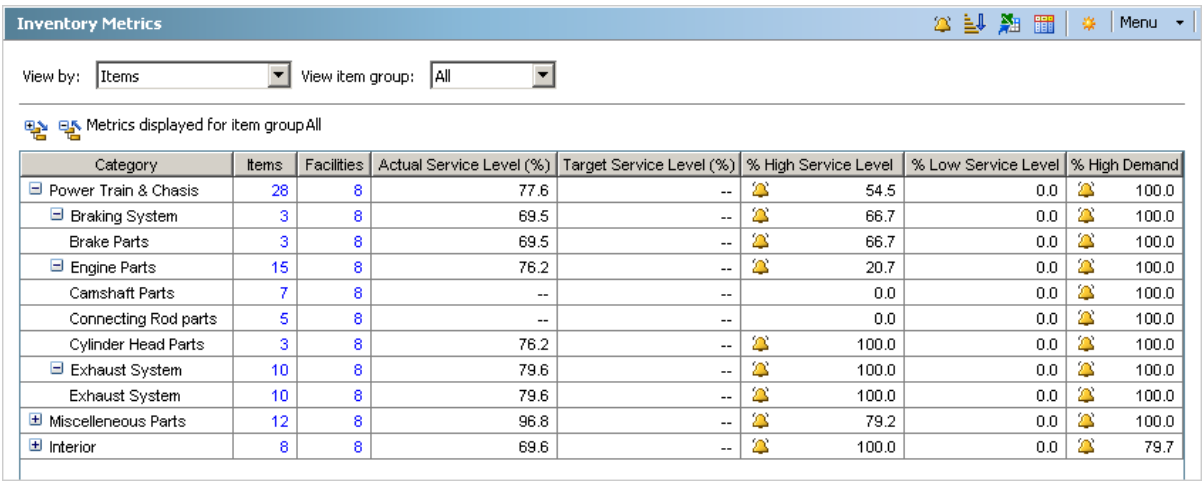
The workspace consists of two views:

- Inventory Metrics view on page 39
- Inventory Details view on page 44

Overview of the Inventory Metrics View

The Inventory Metrics view displays the aggregated actual and target values for service level and inventory cost, and also displays the percentage of items with values that are either too high or too low compared to the actual values.

Display 6.2 *The Inventory Metrics View*



Category	Items	Facilities	Actual Service Level (%)	Target Service Level (%)	% High Service Level	% Low Service Level	% High Demand
Power Train & Chasis	28	8	77.6	--	54.5	0.0	100.0
Braking System	3	8	69.5	--	66.7	0.0	100.0
Brake Parts	3	8	69.5	--	66.7	0.0	100.0
Engine Parts	15	8	76.2	--	20.7	0.0	100.0
Camshaft Parts	7	8	--	--	0.0	0.0	100.0
Connecting Rod parts	5	8	--	--	0.0	0.0	100.0
Cylinder Head Parts	3	8	76.2	--	100.0	0.0	100.0
Exhaust System	10	8	79.6	--	100.0	0.0	100.0
Exhaust System	10	8	79.6	--	100.0	0.0	100.0
Miscelleneous Parts	12	8	96.8	--	79.2	0.0	100.0
Interior	8	8	69.6	--	100.0	0.0	79.7

The Inventory Metrics view is the default or primary view when you open the Inventory Analysis workspace and you cannot close this view. You can open the Inventory Details view from this view.

You can choose to view the data table by items or by facilities and networks.

If you choose to view by items, the data table displays aggregated metric values for all items and facilities grouped by item categories, that is, the data table displays metric values for the multiple items, multiple facilities combination. The contents of this table enable you to analyze which item categories have considerably high or low metric values and need further analysis.

If you choose to view by facilities and networks, the data table displays aggregated metric values for all items grouped by the corresponding facilities, that is, the data table displays metric values for the multiple items, single facility combination. The table also displays the number of networks that contain a facility. This table enables you to analyze which facilities have considerably high or low metric values and need further analysis.

You can check the service level adherence by comparing the actual and target service level values. You can also determine the percentage of items that have breached the lead time or demand threshold. You can set alert conditions to highlight a row that has a considerably higher or lower metric value. You can further drill down into a row to open the Inventory Details view and review the exact facility and item pair that caused the alert.

In the Inventory Metrics view, you can complete the following main tasks:

- view aggregated metric values for all items and facilities in an item category
- view aggregated metric values for all items in a facility
- compare the actual and target service level values at the aggregate level and identify the percentage of items that have breached lead time and demand threshold
- view and modify alert settings for an item category or a facility
- create a new scenario

Apart from these tasks, you can also perform the following tasks that are common across all workspaces:

- sort the table rows
- export the table to a spreadsheet
- customize the columns of the table
- modify the width of the table columns

The Inventory Metrics View Components

Overview

The Inventory Metrics view displays aggregated metric values and enables you to specify alert settings and to create a scenario.

View by List

The **View by** list enables you to specify whether to group the data table by item categories or by facilities and networks.

View Item Group List

The **View item group** list enables you to specify whether to display contents for all item groups or for a specific item group in the table. Information about the selected item group is displayed above the data table.

Data Table in the Inventory Metrics View

The columns in the data table differ based on your selection in the **View by** list. Here is a list of all the columns of information:

Category
: displays the name of the item category. This column is displayed only when you choose **Items** in the **View by** list.

Items
: displays the number of items in the item category or facility, depending on your selection in the **View by** list.

Facilities
: displays the number of facilities in the item category. This column is displayed only when you choose **Items** in the **View by** list.

Facility Name
: displays the name of the facility. This column is displayed only when you choose **Facilities and Networks** in the **View by** list.

Network Count
: displays the number of networks the facility belongs to. This column is displayed only when you choose **Facilities and Networks** in the **View by** list.

Actual Service Level
: displays an average of all the actual service level values.

Target Service Level
: displays an average of all the standard service level values that are preconfigured in the underlying solution data layer (SDL).

% High Service Level
: displays the percentage of items that have the actual service level greater than the upper bound of service level. If  is displayed, then it indicates that this value exceeds the upper limit value for service level that is specified in the Alert Settings dialog box.

% Low Service Level
: displays the percentage of items that have the actual service level less than the lower bound of service level. If  is displayed, then it indicates that this value is less than the lower limit value for service level that is specified in the Alert Settings dialog box.

% High Demand
: displays the percentage of items that have the actual demand greater than the upper bound of demand. If  is displayed, then it indicates that this value exceeds the upper limit value for demand that is specified in the Alert Settings dialog box.

% Low Demand
displays the percentage of items that have the actual demand less than the lower bound of demand. If  is displayed, then it indicates that this value is less than the lower limit value for demand that is specified in the Alert Settings dialog box.

% High Lead Time
displays the percentage of items that have the actual lead time greater than the maximum lead time. If  is displayed, then it indicates that this value exceeds the upper limit value for lead time that is specified in the Alert Settings dialog box.

% Low Lead Time
displays the percentage of items that have the actual lead time less than the minimum lead time. If  is displayed, then it indicates that this value is less than the lower limit value for lead time that is specified in the Alert Settings dialog box.

Actual Inventory Cost
displays the total aggregated cost of the inventory for all facility and item pairs.

Actual Inventory Quantity
displays the total amount of inventory for all facility and item pairs.

Inventory Turns
displays the total inventory turns for all facility and item pairs.

Inventory Metrics View Toolbar and Menu Options

The following table lists the options that are available from the toolbar and menu of the Inventory Metrics view.

Table 6.1 *Toolbar and Menu Options in the Inventory Metrics View*

Toolbar Button	Menu Option	Action
Not available	**Open Inventory Details by Item**	Opens the Inventory Details view. This menu item is available only when you choose **Items** in the **View by** list.

Toolbar Button	Menu Option	Action
Not available	**Open Inventory Details by Facility**	Opens the Inventory Details view that displays aggregated values of metrics for all items in distinct facilities. If you selected **Items** in the **View by** list, then the Inventory Details view displays aggregated values of metrics for all facilities that correspond to distinct items of a category. If you selected **Facilities and Networks** in the **View by** list, then the Inventory Details view displays aggregated values of metrics for all items for distinct facilities within a network.
Not available	**Close Inventory Details**	Closes the Inventory Details view. This menu item is available only when the Inventory Details view is already open.
	**New Scenario**	Opens the New Scenario dialog box that enables you to perform ad hoc analysis of items and facilities.
	**View/Modify Alert Settings**	Opens the Alert Settings dialog box that enables you to view and modify alert conditions for the facility and item combinations in the selected rows.

Apart from these options, the following common options are also available:

- **Sort**
- **Clear Sort**
- **Export to Spreadsheet**
- **Customize Columns**
- **Help**

For details about the common options, see "Common Toolbar and Menu Options" on page 31.

Open the Inventory Details View

The Inventory Details view displays aggregated and definite metric values for different facility and item combinations.

To open the Inventory Details view:

1. In the Inventory Metrics view, in the **View by** list, specify whether you want to group the data table by item categories or by facilities and networks.
2. In the data table, select a row and click **Menu**. Then, select either of the following options:
   - **Open Inventory Details by Item**
   - **Open Inventory Details by Facility**

Alternatively, click the value that is displayed in either the Items column or the Facilities column.

The Inventory Details view opens for the selected facility and item combination.

Close the Inventory Details View

The Inventory Details view enables you to view aggregated and definite metric values for different facility and item combinations.

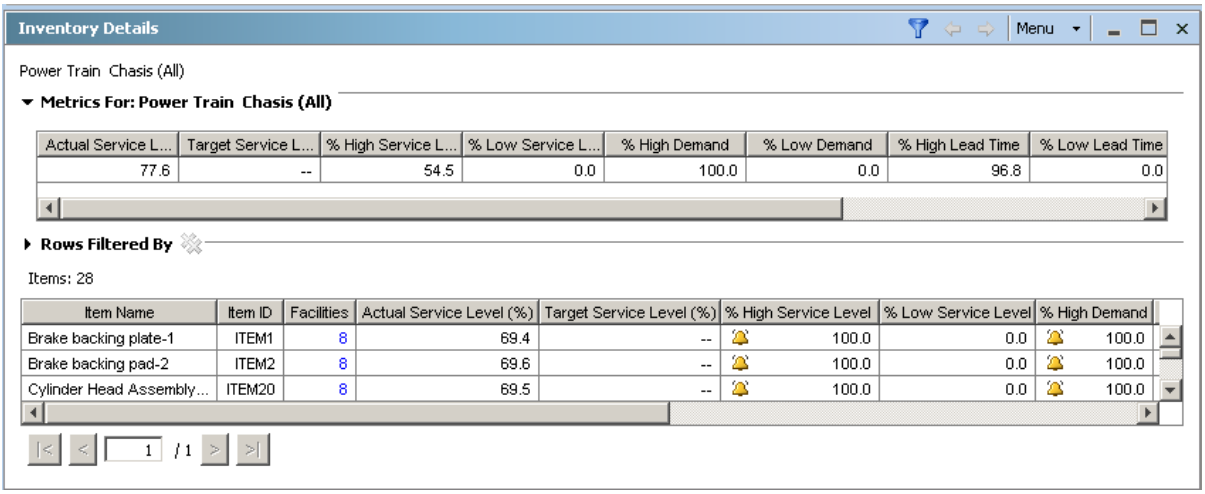
To close the Inventory Details view:

Click  in the Inventory Details view.

Overview of the Inventory Details View

The Inventory Details view displays aggregated and definite metric values for different facility and item combinations in a data table.

Display 6.3 *The Inventory Details View*



The Inventory Details view displays metric values in a data table at three levels:

- Level one is the initial state of the data table. The contents of the table are based on your selection in the Inventory Metrics view. The data table displays aggregated metric values for either of the following facility and item combinations:
  - single item, multiple facilities
  - multiple items, single facility
  - multiple items, single facility, by network

  You can select a row and further drill down into the table to view the data table at level two.
- At level two, the data table displays definite metric values for a facility and item pair for the current period. You can further drill down into the table to view the data table at level three.
- At level three, the data table displays definite distribution of metric values by period, for historical, current, and future periods. You can also view the table information in a graph.

The filter options, alert settings, and attribute options in the Inventory Details view depend on the current level of the data table.

The top left corner of the Inventory Details view displays a breadcrumb trail. When you open the view, the default text or first location in the breadcrumb trail contains the item category name or the facility name that you selected in the Inventory Metrics view. For example:

As you further drill down in the table, at level two of the data table, depending on your selection, the item or facility name are appended to the breadcrumb trail. After you drill down to level three, the breadcrumb trail is further updated. For example, the following figure shows the breadcrumb trail at level three that consists of the item category name, item name, and then facility name:

At any time, you can click a link in the breadcrumb trail to navigate to that level of the data table.

For the first two levels of the data table, the total count of items or facilities in the table is displayed below the **Rows Filtered By** section.

In the Inventory Details view, you can complete the following main tasks:

- view aggregated metric values for either of the following facility and item combinations:
  - single item, multiple facilities
  - multiple items, single facility
  - multiple items, single facility, by network
- view metric values for a specific facility and item pair
- view periodic distribution of metric values for a specific facility and item pair in both tabular and graphical formats
- view and modify alert settings for a facility and item combination
- view attributes of a facility, item, or both
- view inventory details

Apart from these tasks, you can also perform the following tasks that are common across all workspaces:

- sort the table rows
- export the table to a spreadsheet
- customize the columns of the table
- open a copy of the view in a new window
- filter the table rows
- modify the width of the table columns

The Inventory Details View Components

Overview

The Inventory Details view displays aggregated and definite metric values for different facility and item combinations in a data table.

Metrics For Section

The **Metrics For** section displays metric values for the previous level of the data table in the view.

For level one of the data table, the **Metrics For** section displays metric values for the specific item category or facility that you selected in the data table of the Inventory Metrics view. The name of the selected item category or facility is displayed with the title of the section. As you further drill down into the table, either the item name or the facility name is appended to the title at every level of the data table.

Rows Filtered By Section

For details, see "Rows Filtered By Section" on page 27.

Data Table in the Inventory Details View

The data table in the Inventory Details view displays aggregated and definite metric values for different facility and item combinations. The columns of information in the data table differ based on the level that you are currently working in. For more information about the levels in a data table, see "Overview of the Inventory Details View" on page 44.

The data table contains the following columns of information at different levels.

Level one includes the following:

Item Name
: displays the name of the item. This column is displayed only when you open the Inventory Details view by selecting **Menu** ⇨ **Open Inventory Details by Item** on the toolbar of the Inventory Metrics view.

Item ID
: displays the unique identifier for the item. This column is displayed only when you open the Inventory Details view by selecting **Menu** ⇨ **Open Inventory Details by Item** on the toolbar of the Inventory Metrics view.

Facilities
: displays the number of facilities that store the corresponding item. This column is displayed only when you open the Inventory Details view by selecting **Menu** ⇨ **Open Inventory Details by Item** on the toolbar of the Inventory Metrics view.

Facility Name
: displays the name of the facility. This column is displayed only when you open the Inventory Details view by selecting **Menu** ⇨ **Open Inventory Details by Facility** on the toolbar of the Inventory Metrics view.

Facility ID
: displays the unique identifier of the facility. This column is displayed only when you open the Inventory Details view by selecting **Menu** ⇨ **Open Inventory Details by Facility** on the toolbar of the Inventory Metrics view.

Items
: displays the number of items in the corresponding facility. This column is displayed only when you open the Inventory Details view by selecting **Menu** ⇨ **Open Inventory Details by Facility** on the toolbar of the Inventory Metrics view. If you selected **Facilities and Networks** in the **View by** list, then the item count is network-specific.

Actual Service Level (%)
: displays an average of all the actual service level values.

Target Service Level (%)
: displays an average of all the standard service level values that are preconfigured in the underlying data marts.

% High Service Level
: displays the percentage of items that have the actual service level greater than the maximum service level. If  is displayed, then it indicates that this value exceeds the upper limit value for the service level that is specified in the Alert Settings dialog box.

% Low Service Level
displays the percentage of items that have the actual service level less than the minimum service level. If  is displayed, then it indicates that this value is less than the lower limit value for the service level that is specified in the Alert Settings dialog box.

% High Demand
displays the percentage of items that have the actual demand greater than the maximum demand. If  is displayed, then it indicates that this value exceeds the upper limit value for demand that is specified in the Alert Settings dialog box.

% Low Demand
displays the percentage of items that have the actual demand less than the minimum demand. If  is displayed, then it indicates that this value is less than the lower limit value for demand that is specified in the Alert Settings dialog box.

% High Lead Time
displays the percentage of items that have the actual lead time greater than the maximum lead time. If  is displayed, then it indicates that this value exceeds the upper limit value for lead time that is specified in the Alert Settings dialog box.

% Low Lead Time
displays the percentage of items that have the actual lead time less than the minimum lead time. If  is displayed, then it indicates that this value is less than the lower limit value for lead time that is specified in the Alert Settings dialog box.

Actual Inventory Cost
displays the total aggregated cost of the inventory for all facility and item pairs.

Actual Inventory Quantity
displays the total aggregated quantity of the inventory for all facility and item pairs.

Inventory Turns
displays the total inventory turns for all facility and item pairs.

Level two includes the following:

Facility Name
displays the name of the facility.

Facility ID
displays the ID of the facility.

Item Name
displays the name of the item.

Item ID
displays the ID of the item.

Actual Service Level (%)
displays the actual service level.

Target Service Level (%)
displays the standard service level value that is preconfigured in the underlying solution data layer (SDL).

Actual Upstream Service Level (%)
displays ratio of the quantity that is received to the quantity that is ordered on upstream.

Target Upstream Service Level (%)
displays the standard service level value for upstream.

Actual Lead Time
: displays the actual lead time.

Target Lead Time
: displays the lead time value that is preconfigured in the underlying solution data layer (SDL).

Actual Demand
: displays the actual demand.

Target Demand
: displays the forecasted demand value that is obtained from the output of the inventory optimization process.

Actual Inventory Cost
: displays the total cost of the inventory for the facility and item pair.

Buyer
: displays the name of the buyer.

Vendor
: displays the name of the vendor who provides the items.

Safety Stock
: displays the additional units of inventory that are stored as protection against possible stockouts.

Reorder Level
: displays the inventory level at which a replenishment order should be placed.

Order-Up-To Level
: displays the target inventory level.

Item Price
: displays the cost of the item.

Actual Inventory Quantity
: displays the actual quantity of inventory that is available for the facility and item pair.

Inventory Turns
: displays the inventory turns for the facility and item pair.

In level three, the data table contains a column for each period in the history, for the current period, and for each period in the planning horizon except the last period. The number of history periods is customizable. Its initial value is set during the configuration of SAS Service Parts Optimization. The data table displays values for the following metrics:

- Actual Lead Time
- Target Lead Time
- Actual Demand
- Target Demand
- Actual Upstream Service Level (%)
- Target Upstream Service Level (%)
- Actual Service Level (%)
- Target Service Level (%)
- Actual Inventory Cost
- Target Cost
- Actual Inventory Quantity

- Safety Stock
- Reorder Level
- Order-Up-To Level

For the daily base period, the table displays metric values that are aggregated over a week or a month.

Note: For current and future periods, the actual lead time value cannot be calculated because there is no delivery during these periods. Hence, the actual lead time value is missing. Similarly, the actual upstream service level and service level values cannot be calculated because service level is calculated for the past periods. Hence, their values are missing for current and future periods. All missing values are shown as — in the data table.

The  icon is displayed for each metric. When you click this icon, the KPI Graphical View dialog box appears and displays a periodic distribution of values for the metric in a graph.

Filter Pane

For details, see "Filter Pane" on page 28.

Inventory Details View Toolbar and Menu Options

The following table lists the options that are available in the toolbar and menu of the Inventory Details view.

Note: All toolbar and menu options might not be available at all levels of the data table.

Table 6.2 *Toolbar and Menu Options in the Inventory Details View*

Toolbar Button	Menu Option	Action
	**Close Inventory Details**	Closes the Inventory Details view.
Not available	**New Scenario**	Opens the New Scenario dialog box that enables you to perform ad hoc analysis of items and facilities.
Not available	**View Attributes**	Opens the Item and Facility Attributes, or Item Attributes, or Facility Attributes dialog box that enables you to view characteristic details of the item and facility of the selected facility and item pair in the data table.

Toolbar Button	Menu Option	Action
Not available	**View/Modify Alert Settings**	Opens the Alert Settings dialog box that enables you to view and modify threshold conditions for the metrics for the facility and item combinations of the selected rows. *Note:* If you modify the alert settings for a single item, single facility combination, then the settings are considered in the next run of the inventory optimization batch process.

Apart from these options, the following common options are also available:

- **Back**
- **Next**
- **Show/Hide Filter Pane**
- **Clear All Filters**
- **Sort**
- **Clear Sort**
- **Export to Spreadsheet**
- **Customize Columns**
- **Detach in Window**
- **Help**

For details about common options, see "Common Toolbar and Menu Options" on page 31.

Chapter 7

Viewing Inventory Metrics

View Inventory Metric Details

Overview

The Inventory Analysis workspace displays inventory metric details for all the facility and item combinations. By default, this information is grouped by item categories or by facility and network combinations. You can further drill down into this information and view details for a distinct facility and item pair.

You can avoid the drilling down steps and directly view details for a distinct facility and item pair. However, you must know the exact IDs or names of the facility and item.

View Inventory Metric Details for All Facility and Item Combinations

You can view the aggregate and definite metric values for different facility and item combinations in the Inventory Analysis workspace.

To view inventory metric details:

1. In the **View Item Group** list of the Inventory Metrics view, select all or a specific item group.
2. In the **View by** list, specify whether you want to group and analyze inventory metric details in the data table by item categories or by facilities and networks.
3. View the inventory metric details by item categories or by facility and network combinations.
   - To view inventory metrics by item categories:
     1. (Optional) To expand all item categories, click  .
     2. Select a row and click **Menu** ⇨ **Open Inventory Details by Item** or click **Menu** ⇨ **Open Inventory Details by Facility**. The Inventory Details view opens and displays aggregated values of the inventory metrics for the selected

item category in a data table. The data table is grouped by items or facilities, depending on your selection from **Menu** of the Inventory Metrics view.

- To view inventory metrics by facilities and networks:

  In the data table, select a row and click **Menu** ⇨ **Open Inventory Details by Facility**. The Inventory Details view opens and displays aggregated values of the inventory metrics for the selected facility in a data table. The data table is grouped by facilities. The facilities are displayed as a distribution network hierarchy.

4. To view inventory metric details for distinct facility and item pairs, select a row and click the link in either the Items column or the Facilities column. The data table refreshes and displays inventory metric details at level two. At this level, you can view distinct inventory metric values for the facility or item that you selected in the data table at the previous level.
5. To view distribution of metric values for the facility and item pair by period, select a row and click the link in either the Item Name column or the Facility Name column. The data table refreshes and displays inventory metric details at level three. At this level, you can view distinct metric values for the selected facility and item pair for each period in the planning horizon.
6. To view the periodic distribution of the metric values in a graph, click  for that metric. The KPI Graphical View dialog box appears and displays the metric values in a graphical format.

View Inventory Metric Details for a Specific Facility and Item Pair

You can directly view inventory details for a specific facility and item pair by specifying their exact IDs or names.

To view inventory metric details for a specific facility and item pair:

1. In the Task pane, click **Facility and Item Metrics**. The Facility and Item Metrics dialog box appears that enables you to specify the specific facility and item pair.
2. To search for the facility and item pair by their IDs, ensure that **Search by ID** option is selected, and specify the exact facility ID and item ID in the **Facility ID** and **Item ID** boxes respectively.
3. To search for the facility and item pair by their names, select the **Search by name** option, and specify the exact facility name and item name in the **Facility name** and **Item name** boxes respectively.
4. Click **OK**. The Inventory Details dialog box appears and displays distinct metric values for the specified facility and item pair for each period in the planning horizon.
5. To view the periodic distribution of the metric values in a graph, click  for that metric. The KPI Graphical View dialog box appears and displays the metric values in a graphical format.

Chapter 8

Managing Alert Settings

Overview of Alert Settings

Alerts in the Inventory Analysis workspace highlight a row in the data table that has a considerably high or low service level, lead time, or demand value. You can review this row or further drill down into the row to identify whether the problem in the metric value is due to the corresponding item category, facility, or item.

The administrator sets the default upper and lower thresholds for all metrics in the control tables when the SAS Service Parts Optimization application is getting ready for use. Through the user interface, you can modify these values. Alert conditions for distinct facility and item pairs are different from those for facility and item combinations at aggregate levels. The facility and item pairs inherit the alert settings that you specify at the lowest level of the corresponding item category. You can specify the same alert settings for multiple rows at a time. However, this feature is not applicable if you select multiple rows of a single facility, single item combination.

When the actual metric value for a facility and item pair exceeds the upper bound of the threshold or is less than the lower bound of the threshold, an alert is triggered and indicated in the user interface. Also, when the count of alerts at a facility and item pair exceeds the upper limit or is lower than the lower limit at any aggregate level, then an alert is indicated.

The alert enables you to identify the item category, item, or facility that must be further investigated to identify the real cause of alert.

Manage Alert Settings

You can view the current settings for threshold conditions that generate alerts for the metrics. If you want to specify a different condition, you can modify these threshold conditions.

Note: You can view and modify alert settings for facility and item combinations in both the Inventory Metrics view and the Inventory Details view.

To manage alert settings:

1. In the data table of the Inventory Metrics or Inventory Details view, select a row and click **Menu** ⇨ **View/Modify Alert Settings**. The Alert Settings dialog box appears and displays alert setting information for all metrics of the selected facility and item combination, under separate sections.

   Note: You can select multiple rows at a time and change the alert settings. However, this feature is not applicable for a single item, single facility combination.

2. Edit the alert setting values for one or all the metrics and click **OK**.

Note: For single item, single facility combination, the alert settings are not updated immediately in the SAS table. A back-end job updates the setting information about a daily basis. The modified settings are displayed on the interface immediately, but any corresponding alert indicators are displayed after the next run of the inventory optimization process.

Chapter 9

Viewing Attributes of an Item or a Facility

Overview of Item and Facility Attributes

Attributes of items and facilities are the key characteristics that set them apart from other items and facilities, respectively.

Some examples of item attributes: item type, item status, and item ID.

Some examples of facility attributes: facility type, facility ID, and organization ID.

The state of the data table determines whether attributes of the facility, item, or both are displayed in the Attributes dialog box. The following table provides this information.

Table 9.1 *State of the Data Table and Corresponding Attributes*

State of the Data Table	Attributes
Single facility, multiple items	Facility
Single item, multiple facilities	Item
Single item, single facility	Item and Facility

View Item and Facility Attributes

You can view attribute values for an item, a facility, or both depending on your selection in the data table of the Inventory Details view.

To view attributes:

1. Ensure that the Inventory Details view is open and displays the distinct item, facility, or both in the data table for which you want to view the attributes.
2. In the data table, select the row that contains the distinct item, facility, or both.

3. Click **Menu** ⇨ **View Attributes**. The Item and Facility Attributes, or Item Attributes, or Facility Attributes dialog box opens and displays attribute values for the selected facility, item, or both, respectively.

Part 3

The Order Suggestions Workspace

Chapter 10

Introduction to Order Suggestions

About Order Suggestions

Overview of Order Suggestions

The Order Suggestions workspace displays the output of the inventory optimization process and inventory transshipment process for a multi-echelon network. The optimization and transshipment processes run in the back end in a batch mode. The system estimates the quantity that each node (a facility and item pair) within the network would require to meet the target service level. Based on the current inventory position and the projected service levels, items from each facility are categorized as follows:

- normal items:

  The module suggests no orders for these items. Also, no transshipments are suggested. Average projected service level for normal items is higher than or equal to the lower bound of the target service level. Inventory positions are within the range of reorder level and order-up-to-level.

- overstock items:

  The module suggests no orders for these items. Also, no transshipments are suggested. Average projected service level is higher than or equal to the lower bound of the target service level. Inventory positions are higher than the order-up-to level.

- low stock items:

  The module recommends replenishment plans or orders for these items. The replenishment plans can be further divided based on the order source and the ability of the source to fulfill the order under the cost constraints. The following divisions are possible:

  - Primary: Average projected service level is higher than or equal to the lower bound of target service level. Orders are placed from primary suppliers only and no transshipments are received.
  - Primary and Alternative: Average projected service level is higher than or equal to the lower bound of target service level. The inventory pool supplies the necessary transshipments from primary and alternative sources.

- Partial: Average projected service level is lower than the lower bound of target service level. Excess inventories exist in the inventory pool and shipping is possible. However, the transshipment module does not suggest the orders because they are not cost effective. If you are willing to ignore the cost impact, you can receive inventory from the inventory pool to fix the shortage problem.
- Incomplete: Average projected service level is lower than the lower bound of target service level. Either excess inventories are not available or delivery times are not feasible. Thus, even if you are willing to pay a high cost for the inventory, there is insufficient inventory that can be received to fix the shortage problem. To fix the shortage issue, you must order additional inventory from locations that are outside the inventory pool or from external vendors.

Key Features of Order Suggestions

The Order Suggestions workspace provides an overview of orders for a given facility. The system provides replenishment plans for items that are identified to be in a low stock situation. Replenishment plan details for a given item include details about the sources for each order and the cost implications of the optimized plan. If satisfied with a plan, the user interface enables the buyer to lock and promote the order recommendations for a plan.

The buyer can edit order suggestions, if needed. The impact of the edited order on the replenishment plan metrics can be evaluated before saving the changes. Multiple users cannot edit orders for the same item simultaneously.

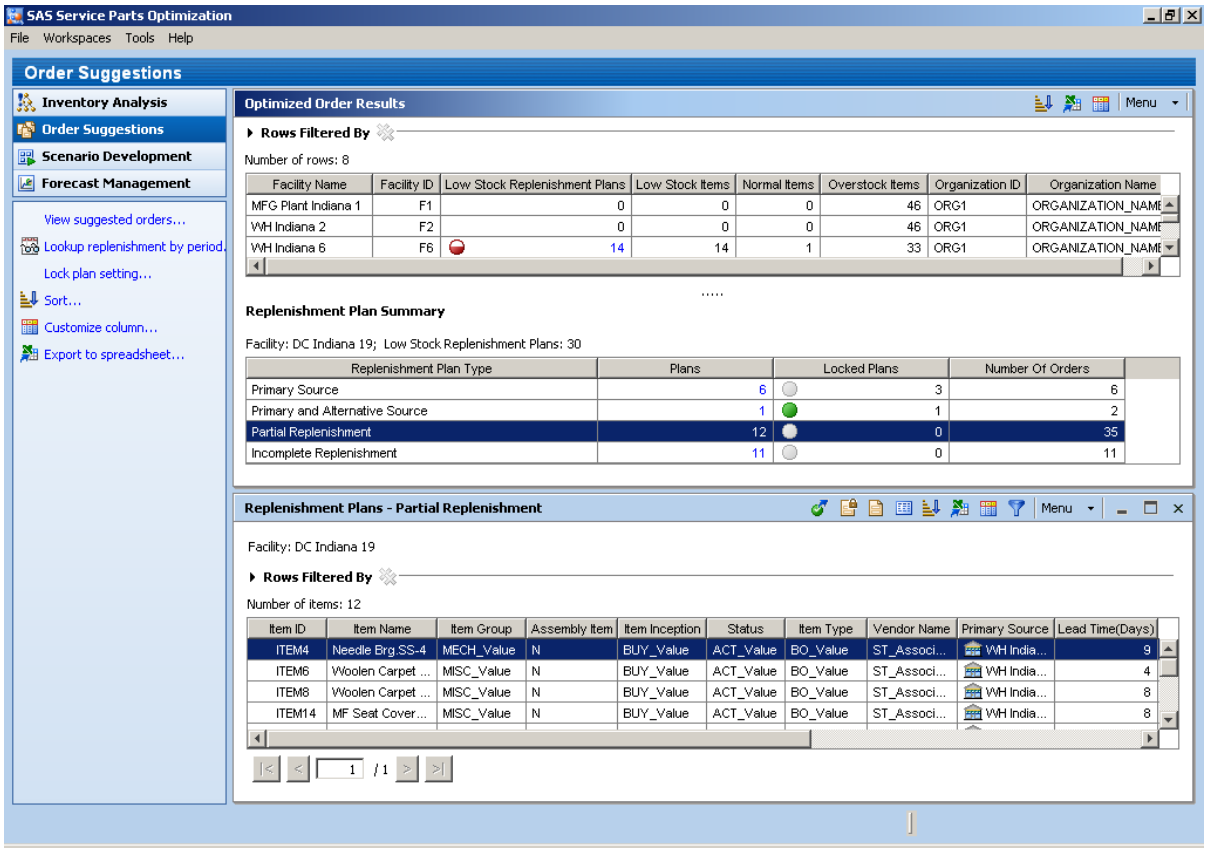
Chapter 11

Getting Started with the Order Suggestions Workspace

Overview of the Order Suggestions Workspace

The Order Suggestions workspace enables you to view the inventory status of all items in each facility. You can view a set of optimized replenishment plans for each period in the planning horizon for all facility and item pairs. However, you can assess the optimized replenishment plans for low stock items only and also address situations in which SAS Service Parts Optimization cannot make any recommendations due to lack of inventory at primary and secondary transfer sources, or if the cost of replenishment is sub-optimal.

Display 11.1 *The Order Suggestions Workspace*



Each replenishment plan for low stock items contains one or more orders. You can review all replenishment plans and submit the order recommendations to the enterprise resource planning (ERP) system. The submitted order suggestions are saved as a SAS table and can be imported in the ERP system.

If you log on to the SAS Service Parts Optimization application as a user with the role of a buyer, then you can view inventory and order details for only those facilities that belong to you. If you are a user with a non-buyer's role, then you can view inventory details and order suggestions for all the facilities and their corresponding buyer names. However, you cannot lock or unlock order recommendations nor specify any lock plan settings.

Note: The orders that are generated by SAS Service Parts Optimization are recommendations and not purchase orders. An order is not automatically transferred to the ERP system. You must perform the actual transfer. If needed, you can choose to ignore the promoted orders too.

In the Order Suggestions workspace, you can perform the following tasks:

- view the inventory status for all items in each facility
- view replenishment by period for all facility and item pairs for each period in the planning horizon
- view replenishment plan details and order suggestions for each facility and item pair that is identified to be in a low stock situation
- lock and promote order recommendations that you want to submit to the external ERP system

- specify lock settings to automatically lock all the orders of replenishment plans that belong to a specific replenishment plan type

The Order Suggestions Workspace Components

The Order Suggestions workspace enables you to view an optimized set of replenishment plans and order suggestions.

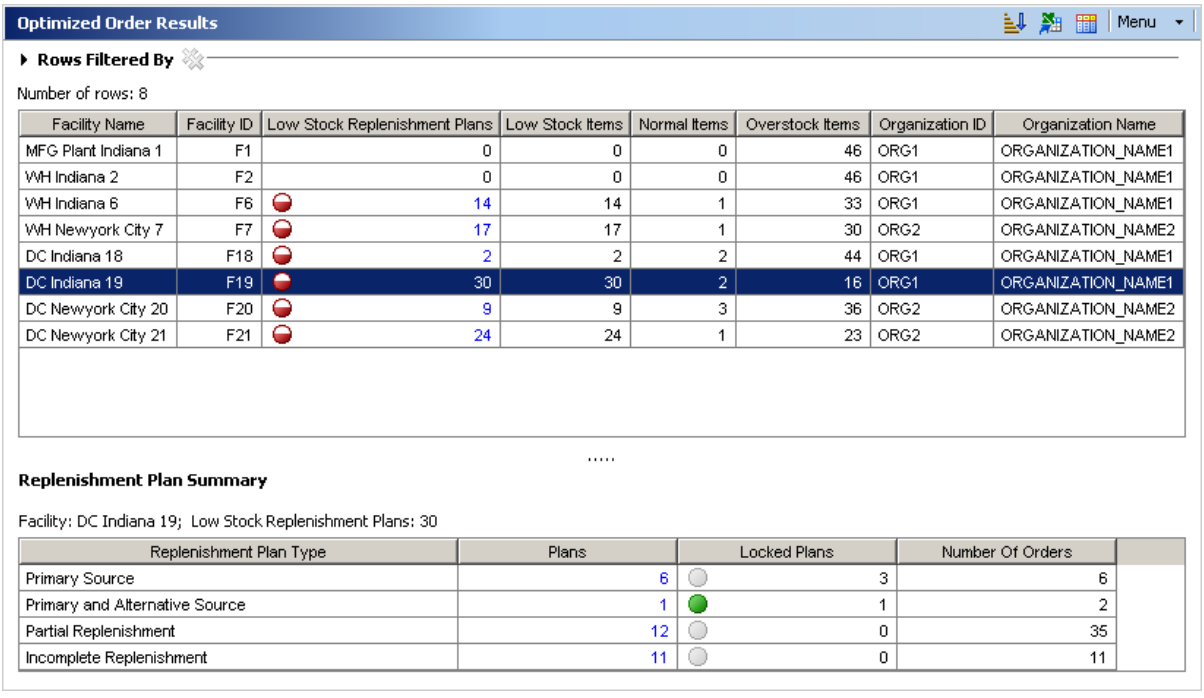
The workspace consists of two views:

- Optimized Order Results view on page 65
- Replenishment Plans view on page 69

Overview of the Optimized Order Results View

The Optimized Order Results view provides a summary of the inventory status for items in each facility and enables you to view their replenishment plans for each period in the planning horizon. You can also view recommended orders for all low stock facility and item pairs.

Display 11.2 *The Optimized Order Results View*



The Optimized Order Results view is the default or primary view of the Order Suggestions workspace.

There are two data tables displayed in the Optimized Order Results view: Optimized Order Results table and Replenishment Plan Summary table.

The Optimized Order Results table displays the inventory status summary for all items per facility. The inventory is divided into the following groups:

- normal items
- overstock items
- low stock items

For details about each group, see "About Order Suggestions" on page 61.

Note: If you log on to the SAS Service Parts Optimization application as a user with the buyer's role, then the Optimized Order Results table displays details for only those facilities that belong to you. For all other roles, the table displays details for all the facility and buyer combinations.

The Replenishment Plan Summary table displays a summary of the replenishment plans for low stock items. The replenishment plans are grouped by the replenishment plan types: primary source, primary and alternative source, partial replenishment, and incomplete replenishment. For details, see "Introduction to Replenishment Plans" on page 75. By default, the Replenishment Plan Summary table displays summary information for the first row in the Optimized Order Results table.

In the Optimized Order Results view, you can complete the following main tasks:

- view the inventory status summary for all items per facility
- view number of replenishment plans, locked orders, and order suggestions that belong to each replenishment plan type
- for all facility and item pairs, view replenishment plan details for each period in the planning horizon
- specify lock settings to automatically lock all the plans in a specific replenishment plan type

Apart from these tasks, in the Optimized Order Results table, you can perform the following tasks that are common for all views:

- sort the table rows.
- export the table to a spreadsheet.
- customize the columns of the table.
- perform textual filter. You can filter the table on facility name, organization name, and organization ID.
- modify the width of the table columns.

The Optimized Order Results View Components

Overview

The Optimized Order Results view provides a summary of the inventory status for items in each facility. The view also displays information about the number of replenishment plans and recommended orders that belong to each replenishment plan type.

Rows Filtered By Section

For details, see "Rows Filtered By Section" on page 27.

Data Tables in the Optimized Order Results View

Optimized Order Results Table

The Optimized Order Results table includes the following columns of information:

Facility Name
: displays the name of the facility.

Facility ID
: displays the unique identifier for the facility.

Buyer Name
: displays the name of the buyer. This column is not displayed if you log on as a user with the role of a buyer.

Low Stock Replenishment Plans
: displays the number of replenishment plans for the low stock items in the facility. The number of replenishment plans is equal to the number of low stock items as given in the Low Stock Items column. Replenishment plans are optimized for all the facilities, across all buyers, and across the multi-echelon networks. If  is displayed, then it indicates that one or more of the replenishment plans belong to the Incomplete replenishment plan type.

Low Stock Items
: displays the number of items in the facility for which the existing inventory is less than the forecasted demand.

Normal Items
: displays the number of items in the facility for which the existing inventory can fulfill the forecasted demand.

Overstock Items
: displays the number of items in the facility for which the existing inventory exceeds the forecasted demand.

Organization ID
: displays the unique identifier for the organization that the facility belongs to.

Organization Name
: displays the name of the organization that the facility belongs to.

Replenishment Plan Summary Table

The Replenishment Plan Summary table includes the following columns of information:

Replenishment Plan Type
: lists the four replenishment plan types: primary source, primary and alternative source, partial replenishment, and incomplete replenishment.

Plans
: displays the total number of low stock items for each replenishment plan type.

Locked Plans
: displays the total number of locked replenishment plans for each replenishment plan type. If  is displayed, then it indicates that all replenishment plans for the corresponding replenishment plan type are locked. If  is displayed, then it indicates that not all the replenishment plans for the corresponding replenishment plan type are locked.

Number of Orders
displays the total number of recommended orders for each replenishment plan type.

Optimized Order Results View Toolbar and Menu Options

The following table lists the options that are available from the toolbar and menu of the Optimized Order Results view.

Table 11.1 *Toolbar and Menu Options in the Optimized Order Results View*

Toolbar Button	Menu Option	Action
Not available	**Open Replenishment Plans**	Opens the Replenishment Plans view that displays replenishment plan details for the facility and replenishment plan type that you select in the Optimized Order Results view. This option is available only from the **Menu**.
Not available	**Close Replenishment Plans**	Closes the Replenishment Plans view. This option is available only from the **Menu** and appears dimmed when the Replenishment Plans view is already closed.
Not available	**View Suggested Orders**	Opens the Suggested Orders dialog box that displays details of the recommended orders for a specific facility or all facilities.
Not available	**Lookup Replenishment By Period**	Opens the Lookup Replenishment By Period dialog box that displays details of the replenishment plans for normal items, overstock items, and low stock items for each period in the planning horizon.
Not available	**Lock Plan Settings**	Opens the Lock Plan Settings dialog box that enables you to lock all the replenishment plans that belong to one or all the replenishment plan types.

Apart from these options, the following common options are also available. All options except **Help** apply only to the Optimized Order Results table in the view:

- **Sort**
- **Clear Sort**
- **Export to Spreadsheet**
- **Customize Columns**

- **Help**

For details about the common options, see "Common Toolbar and Menu Options" on page 31.

Open the Replenishment Plans View

The Replenishment Plans view enables you to view item details of the replenishment plans and recommended orders for a selected replenishment plan type.

To open the Replenishment Plans view, in the Optimized Order Results view, select a row in the Replenishment Plan Summary table for the replenishment plan type of your choice and click **Menu** ⇨ **Open Replenishment Plans**. The Replenishment Plans view opens for the replenishment plan type that you selected.

You can also open the Replenishment Plans view by clicking a link in the Plans column of the Replenishment Plan Summary table.

Close the Replenishment Plans View

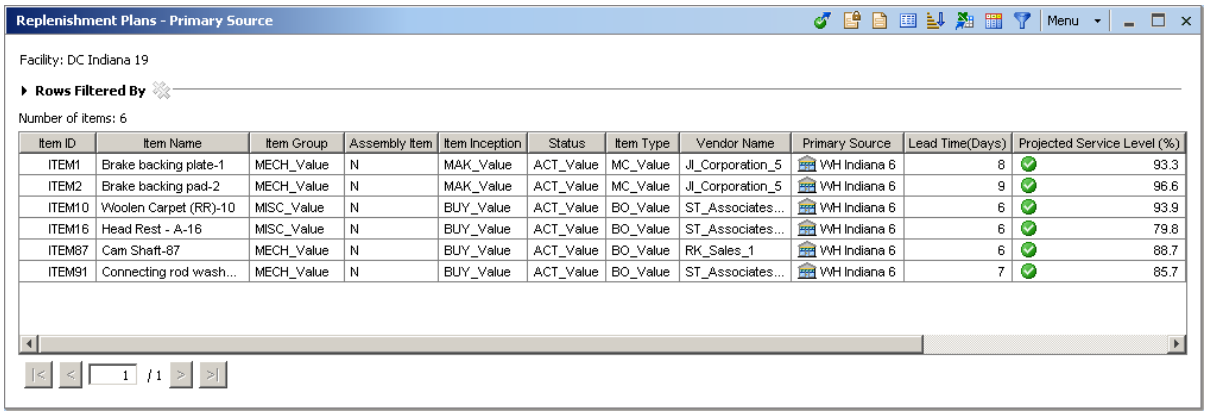
The Replenishment Plans view enables you to view item details of the replenishment plans and recommended orders for a selected replenishment plan type.

To close the Replenishment Plans view, click  in the Replenishment Plans view. Alternatively, in the Optimized Order Results view, click **Menu** ⇨ **Close Replenishment Plans**.

Overview of the Replenishment Plans View

The Replenishment Plans view enables you to view details of replenishment plans and recommended orders for a facility with low stock items that you select in the Optimized Order Results view.

Display 11.3 *The Replenishment Plans View*



You can open the Replenishment Plans view for the following replenishment plan types:

- primary source
- primary and alternative source
- partial replenishment
- incomplete replenishment

The title bar of the view displays the name of the replenishment plan type that is selected. The top left corner of the Replenishment Plans view shows the name of the facility for which the replenishment plan details are currently displayed in the data table.

In the Replenishment Plans view, you can complete the following main tasks:

- view replenishment plan details for all low stock items in a facility
- lock and unlock order recommendations
- promote the locked order recommendations
- view details of the recommended orders for all low stock items in a facility
- view attribute information of an item and a facility
- export the suggested order details to a spreadsheet

Apart from these tasks, in the data table, you can also perform the following tasks that are common across all workspaces:

- sort the table rows.
- export the table to a spreadsheet.
- customize the columns of the table.
- filter the table rows. You can perform textual search on item name, primary source, and vendor name.
- modify the width of the table columns.

The Replenishment Plans View Components

Overview

The Replenishment Plans view provides details of replenishment plans and recommended orders for the selected replenishment plan type.

Rows Filtered By Section

For details, see "Rows Filtered By Section" on page 27.

Data Table in the Replenishment Plans View

The data table in the Replenishment Plans view displays replenishment plan details for all the items of the facility and replenishment plan type that you select in the Optimized Order Results view. The table displays details for the date when the inventory optimization batch process was last run.

For all the replenishment plan type, the data table includes the following columns of information, except as mentioned:

Item ID
displays the item ID.

Item Name
displays the item name.

Item Group
displays the name of the item group.

Assembly Item
displays whether the item is assembled or not.

Item Inception
displays whether the item is manufactured (made) or bought.

Status
displays the item status.

Item Type
displays the type of the item.

Vendor Name
displays the name of the vendor who provides the item.

Primary Source
displays the name of the immediate supplier of the item. If  is displayed, then it indicates that the primary source is a vendor. If  is displayed, then it indicates that the primary source is a facility.

Lead Time (Days)
displays the transportation time (in days) that is required to transport the item from the primary source to the facility by the primary channel.

Projected Service Level (%)
displays the average of the forecasted service level values for the future periods. If there is no projected demand from downstream facilities at this facility, then no value is specified here. One of the following icons is also displayed:

indicates that the projected service level is higher than the lower bound value of the service level for the facility and item pair. This icon is displayed if you are viewing replenishment plan details for Primary Source or Primary and Alternative Source replenishment plan types.

indicates that the projected service level is lower than the lower bound value of the service level for the facility and item pair. However, excess inventory is available to fulfill the necessary demand. This icon is displayed if you are viewing replenishment plan details for Partial replenishment plan type.

indicates that projected service level is lower than the lower bound value of the service level for the facility and item pair and excess inventory is unavailable to fulfill the necessary demand. This icon is displayed if you are viewing replenishment plan details for Incomplete replenishment plan type.

Primary Source Amount
displays the quantity of items that are ordered from the primary source.

Alternative Source Amount
: displays the quantity of items that are ordered from the alternative source. The number that is displayed in brackets () is the number of alternative sources that supply this item. This column is not displayed if you are viewing replenishment plan details for the Primary Source replenishment plan type.

Total Order Amount
: displays the total order quantity for the item that is calculated as the sum of primary and alternative source amounts. For Primary Source replenishment type, this value is the same as the number in the Primary Source Amount column.

  If this value exceeds the maximum order quantity that is specified in the back-end table, then  is displayed and the replenishment plan is not auto-locked.

Plan ID
: displays a system-generated identifier (composed of seven characters) for the replenishment plan type, followed by an eight-digit number. If  is displayed, then it indicates that the replenishment plan is locked, else  is displayed to indicate that the order is not locked.

Filter Pane

For details, see "Filter Pane" on page 28.

Replenishment Plans View Toolbar and Menu Options

The following table lists the options that are available from the toolbar and menu of the Replenishment Plans view.

Table 11.2 *Toolbar and Menu Options in the Replenishment Plans View*

Toolbar Button	Menu Option	Action
	**Close Replenishment Plans**	Closes the Replenishment Plans view.
	**View Replenishment Plan Details**	Opens the Replenishment Plan Details dialog box that displays item details, primary source order details, planned order receipts, and replenishment plan metric details for the selected item, and enables you to export these details to a spreadsheet.
Not available	**View Item and Facility Attributes**	Opens the Item and Facility Attributes dialog box that displays the attribute values for the selected item and facility.

Toolbar Button	Menu Option	Action
Not available	**View Suggested Orders**	Opens the Suggested Orders dialog box that displays details of all the recommended orders for a specific facility or for all facilities.
	**Promote Order**	Promotes the order for the selected item and facility. *Note:* Ensure that the order is locked.
Not available	**Promotes All Orders**	Promotes orders for all items of the selected facility.
	**Lock Order**	Locks the order for the selected item and facility.
Not available	**Lock All Orders**	Locks orders for all items of the selected facility.
	**Unlock Order**	Unlocks the order for the selected item.
Not available	**Unlock All Orders**	Unlocks orders for all items of the selected facility.
Not available	**Export Replenishment Plans to Spreadsheet**	Opens the Export to Spreadsheet dialog box that enables you to export the replenishment plan details for a selected item to a Microsoft Excel file. Without opening the Replenishment Plan Details dialog box for an item, you can export the plan details to the Excel file. Also, you can select multiple items and export their plan details in the same Excel file. This Excel file contains a separate worksheet for each plan order.

Apart from these options, the following common options are also available:

- **Show/Hide Filter Pane**
- **Clear All Filters**
- **Sort**
- **Clear Sort**
- **Export to Spreadsheet**
- **Customize Columns**
- **Help**

For details about the common options, see "Common Toolbar and Menu Options" on page 31.

Chapter 12

Viewing Replenishment Plan Details

Introduction to Replenishment Plans

Replenishment plans are generated by the back-end batch process. As part of a replenishment plan, the batch process also generates order suggestions for each facility-item pair that is identified to be in a low stock situation. The optimized replenishment plans include primary source (normal) and alternative internal transfer (transshipment) orders.

There are four types of replenishment plans:

- In the primary source replenishment plan, the low stock items can be replenished entirely from the primary source.
- In the primary and alternative source replenishment plan, the low stock items can be partially replenished from the primary source. The remaining items are transferred from one or many alternative sources.
- In the partial replenishment plan, the low stock items are optimally replenished from primary and alternative sources. However, this optimal solution (lowest cost solution) only partially replenishes the low stock items. Inventory might be available at alternative sources, but transferring the inventory from those sources is more costly than not making an order.
- In the incomplete replenishment plan, SAS Service Parts Optimization cannot generate replenishment plans for some low stock items because of insufficient excess inventory in the primary or alternative sources that are required to achieve the necessary amounts.

Replenishment plans and the corresponding orders for primary source, and for primary and alternative source replenishment types are locked by default. The plans and orders for partial and incomplete replenishment plan types are not locked by default.

The Optimization Order Results view displays the number of replenishment plans that belong to each of the replenishment plan types. You can view details of each replenishment plan type in the Replenishment Plans view.

View Replenishment Plan Details

View Replenishment Plan By Period for All Items in a Facility

You can view replenishment plan details by period for all items in a facility irrespective of their inventory status, that is, for normal items, overstock items, and low stock items.

To view replenishment plan details for all items:

1. In the data table of the Optimized Order Results view, select a facility.
2. Click **Menu** ⇨ **Lookup Replenishment By Period**. The Lookup Replenishment By Period dialog box appears and displays a data table that contains replenishment plan details for all items that belong to the selected facility.

   Note: You can perform tasks such as filter or sort the table rows, customize the columns, or export the table in the Lookup Replenishment By Period dialog box by using the **Rows Filtered By** section or clicking the appropriate option in the toolbar.
3. If you want to view the projected inventory details for every period in the planning horizon for an item, select an item and click **View Replenishment By Period**. The Replenishment By Period dialog box appears and displays attribute information for the selected facility and item pair and period details of the projected inventory.

   Note: You can export the information in the Replenishment By Period dialog box to a Microsoft Excel file by clicking  in the toolbar.

View Replenishment Plans for Low Stock Items in a Facility

You can view a summary of the replenishment plans for low stock items such as the number of items that belong to each replenishment plan type, number of orders per plan type, and so on. You can further drill down into the summary information to view details of all plans in each replenishment plan type, for every item.

To view replenishment plans for low stock items in a facility:

1. In the data table of the Optimized Order Results view, for a facility, click the link in the Low Stock Replenishment Plans column. The Replenishment Plan Summary table displays a summary of the replenishment plans for the selected facility. The table displays the following information:
   - number of plans in each replenishment plan type
   - number of plans that are locked
   - number of recommended orders in each replenishment plan type
2. If you want to view details of the replenishment plans in a specific replenishment plan type, in the Replenishment Plan Summary table, click the link in the Plans column. The Replenishment Plans view opens and displays replenishment plan details for each item that belongs to the selected facility and plan type.
3. If you want to view further details of the recommended orders and replenishment metrics for an item, select the item and click **Menu** ⇨ **Replenishment Plan Details**. The Replenishment Plan Details dialog box appears and displays attribute information

for the selected item, primary and alternative source order details, planned order receipts details by period, and replenishment plan metric information.

Note: You can export the information in the Replenishment Plan Details dialog box to a Microsoft Excel file by clicking  in the toolbar.

Chapter 13

Managing Replenishment Plan Locks

Overview of Replenishment Plan Locks

You can lock a replenishment plan to prepare the order recommendations in that plan for automatic submission to the external enterprise resource planning (ERP) system.

Locking a replenishment plan is useful when you are unable to monitor orders on a periodic basis but want to automatically promote the plans of a certain replenishment type to the ERP system. In such a scenario, you can simply lock the replenishment plans of the specific replenishment type. The modified lock settings are applied in the next run of the inventory optimization batch process. You can specify the plan types that you want to automatically lock. By default, the Primary and the Primary and Alternative Replenishment Plan types are auto-locked.

You can specify the maximum order quantity for a facility and item pair in a back-end table. If the total order quantity for a facility and item pair exceeds this quantity, then the replenishment plan is not auto-locked. However, you can manually lock these plans.

Note: You must be a user with the role of a buyer to be able to modify the lock settings, and to lock or unlock a replenishment plan.

Managing Replenishment Plan Locks

Manage the Lock Settings for a Facility

You can lock all the recommended orders in replenishment plans that belong to one or all the replenishment plan types by modifying the lock settings. The locked recommended orders are then ready to be submitted to the external system and can be used to generate purchase orders.

To manage lock settings for a facility:

1. In the data table of the Optimized Order Results view, select a facility.
2. Click **Menu** ⇨ **Lock Plan Setting**. The Lock Plan Setting dialog box appears. A list of the four replenishment plan types is displayed. If the check box for a replenishment plan type is selected, then it indicates that all orders for replenishment plans in that plan type are automatically locked.
3. To modify the lock settings, select or clear the check box for a replenishment plan type and click **OK**. The modified lock settings are applied in the next run of the inventory optimization batch process.

   Note: The auto-lock settings are not applied to an order if the total order quantity for the corresponding facility and item pair exceeds the maximum order quantity value.

Lock an Order in a Replenishment Plan

You can lock all recommended orders in a replenishment plan to submit the orders to the external system.

To lock an order in a replenishment plan:

1. Ensure that the Replenishment Plans view is open and displays the plan that you want to lock.
2. In the data table, select the replenishment plan and click **Menu** ⇨ **Lock Order**.

   Alternatively, you can select the plan and click the locked icon  . All orders in the plan are locked. The Plan ID column for the selected replenishment plan displays the locked icon  to indicate that the plan is locked. Also, in the Replenishment Plan Summary table of the Optimized Order Results view, the value in the Locked Plans column for the corresponding replenishment plan type is updated.

   TIP You can select multiple replenishment plans and select **Lock Order** or click **Menu** ⇨ **Lock All Orders** to lock all the plans at once.

Note: You must promote the locked plans that you want to submit to the ERP system. The promoted order recommendations are copied to a back-end table. You can use this table to submit order recommendations to the ERP system.

Unlock an Order in a Replenishment Plan

You can unlock all recommended orders in a replenishment plan if you do not want to submit the orders to the external system.

To unlock an order in a replenishment plan:

1. Ensure that the Replenishment Plans view is open and displays the plan that you want to unlock.
2. In the data table, select the replenishment plan and click **Menu** ⇨ **Unlock Order**.

   Alternatively, you can select the plan and click the unlocked icon  . All orders in the plan are unlocked. The Plan ID column for the selected replenishment plan displays the unlocked icon  to indicate that the plan is unlocked. Also, in the Replenishment Plan Summary table of the Optimized Order Results view, the value in the Locked Plans column for the corresponding replenishment plan type is updated.

TIP You can select multiple replenishment plans and select **Unlock Order** or click **Menu** ⇨ **Unlock All Orders** to unlock all the plans at once.

Chapter 14

Managing Order Suggestions

View Order Suggestions

You can view suggested or recommended order details for all low stock items that belong to a specific facility or all facilities.

To view order suggestions:

1. In the data table of the Optimized Order Results view, select a facility.
2. Click **Menu** ⇨ **View Suggested Orders**. The Suggested Orders dialog box appears and displays a data table that contains the recommended order details for all items that belong to the selected facility.

   Alternatively, you can open the Suggested Orders dialog box in the Replenishment Plans view.
3. To view order suggestions for all facilities, in the **View orders for facility** list, select **All**. The data table refreshes and displays details of order suggestions for all items.

   Note: You can use the toolbar and menu options to perform tasks in the data table such as filter the table rows, sort the table rows, customize the columns, and export the table contents to a spreadsheet.

Editing Order Suggestions

Overview

If you are not satisfied with any of the system-generated order suggestions, you can manually change its values through the user interface. You can modify the order amount of an order, split an order, modify the transfer mode, and assign a vendor to an order. You cannot edit locked orders, promoted orders, or orders of an assembled item.

You can delay or advance the delivery of a part of a specific order by splitting the order and then specifying different transfer modes for the new orders. The transfer cost and total order quantity are split equally if their values are divisible by the split number. If not, the values are split such that the first order includes the remainder values. You can reset the split orders to obtain the original order.

Orders of the incomplete replenishment plans are not fulfilled due to insufficient items in the network. You can fulfill these orders by ordering items from the external vendors. After you assign a vendor to the order, you must specify the custom transfer mode, cost of transfer, lead time, and the transfer amount.

You can re-edit an order. If you are editing an order again, the original order details are available for comparison. For orders of incomplete replenishment plans, you can add vendors to the alternative source orders.

Edit an Order Suggestion

To edit an order:

1. Open the Edit Order dialog box.
   a. In the data table of the Optimized Order Results view, select a facility.
   b. Click **Menu** ⇨ **View Suggested Orders**. The Suggested Orders dialog box appears and displays a data table that contains the recommended order details for all items that belong to the selected facility.

      Alternatively, you can open the Suggested Orders dialog box in the Replenishment Plans view.
   c. Right-click the order to be edited and from the pop-up menu, select **Edit Order**. The Edit Order dialog box appears.
2. To edit the order amount of an order, click in the Order Amount column and type the new amount.

   Note: The order amount must be greater than zero and less than or equal to the value in the Excess Units column.
3. To split an order, see "Split an Order" on page 85.
4. To modify the transfer mode for an order, see "Modify the Transfer Mode for an Order" on page 85.
5. To add a vendor to an order, see "Add a Vendor to an Order" on page 85.
6. To view the impact of the changes on the replenishment plan metrics, click **Evaluate**. The optimization process runs in the back end for the selected item and the impacted

networks to calculate new metric values. The **Replenishment Plan Metrics** section displays the new metric values along with the original values.

7. If you want to modify the order again, click **Back**. The **Primary Source Orders** and **Alternate Source Orders** sections are displayed and you can perform any of the edit tasks.
8. If you want to save the modified values, click **Save**. A confirmation message is displayed.
9. Click **OK**. The changed values are updated in the Suggested Orders dialog box.  is displayed in the Item ID column of the tables in the Suggested Orders dialog box and the Replenishment Plans view. This icon is also displayed for all the orders that are impacted by the edited order.

Split an Order

If you want to delay or advance the delivery of a part of an order, then you can split the order and specify different transfer modes for the new orders. In effect, the lead times for the new orders change. You can reset the split orders to obtain the original order.

To split an order:

1. In the Edit Order dialog box, select the row that contains the order to be split and click  . The Split Order dialog box appears.

   Note: For details about how to open the Edit Order dialog box, see Open the Edit Order Dialog Box on page 84.
2. Specify the number of orders into which you want to split the order and click **OK**. The order is split into the number of orders that you specified and the transfer cost and order quantity are split too.
3. In the Transfer Mode column, select an option from the list.

Modify the Transfer Mode for an Order

You can change the transfer mode for an order and specify the lead time and transfer cost for the changed mode of transfer.

To modify the transfer mode for an order:

1. Ensure that the Edit Order dialog box is open. For details about how to open the Edit Order dialog box, see Open the Edit Order Dialog Box on page 84.
2. In the Transfer Mode column, select an option from the list. The lead time and transfer cost for the selected order is automatically recalculated.
3. If you select Custom as the transfer mode, specify the lead time and transfer cost values in the Lead Time and Transfer Cost columns.

Add a Vendor to an Order

You can specify external vendors to fulfill orders of the incomplete replenishment plans. You must then specify the order amount, lead time, and transfer cost for the order.

To add a vendor to an order:

1. Ensure that the Edit Order dialog box is open. For details about how to open the Edit Order dialog box, see Open the Edit Order Dialog Box on page 84.
2. In the **Alternative Source Orders** section, click  . The Vendor Details dialog box appears and displays the vendor name and whether it is primary or not.
3. From the list of vendors, select a vendor and click **Add**. The vendor details are added. The lead time, order amount, and transfer cost values are set to a default 0.
4. Specify the lead time, order amount, and transfer cost values.

Add a Substitute Item to an Order

For partial and incomplete replenishment plan orders, if a substitute item is available, then you can specify the substitute item to fulfill the order. The substitute item details are included in the promoted order.

To add a substitute item:

1. Open the Suggested Orders dialog box. For detailed steps, see "View Order Suggestions" on page 83.
2. Select the order to be edited.
3. Ensure that  is displayed in the Substitute Item column for the order to be edited. This icon indicates that at least one substitute item is available for the item in the order.
4. Click  . The Substitute Item Details dialog box appears. A list of all the available substitute items is displayed.
5. Select a substitute item and click **Add**. The Substitute Item Details dialog box closes and the selected item name is displayed in the Substitute Item column along with  . This icon indicates that a substitute item is added for the order.

Chapter 15

Promoting Orders

Overview of Promoting Orders

You must lock and then promote the orders that you want to submit to the external ERP system. By promoting orders, order details are copied to the back-end tables. You can promote only locked orders. Promoted orders cannot be modified.

Promote Orders

Promote orders that you want to submit to the external ERP system. When you promote an order, its details are saved in a back-end table. You can promote only locked orders.

To promote orders:

1. In the Replenishment Plans view, select the order to be promoted and click  . Alternatively, click **Menu** ⇨ **Promote Order**. The selected order is promoted.
2. To promote all orders that are locked, click **Menu** ⇨ **Promote All Orders**.

Part 4

The Scenario Development Workspace

Chapter 16

Introduction to Scenario Development

About Scenario Development

Overview of Scenario Development

The Scenario Development module enables you to study the impact of change in metrics such as service level, lead time, demand, and part cost on the overall network cost. Using this functionality, you can find the optimum service level to operate within the budgeted inventory costs. You can also simulate the impact on the network cost for varying percentage of the service level.

SAS Service Parts Optimization supports four types of analysis.

- The service level sensitivity analysis enables you to discover how network cost varies with varying service level.
- The customer-facing facility analysis enables you to ascertain the optimum service level for a group of items to meet the specified budget constraints. This analysis is also helpful when the inventory cost of your network is within the budget, but the service levels of items are suboptimal at the customer-facing facilities. With this analysis, you can set the optimum service level to minimize the stock-outs and cost penalties that are associated with them.
- The internal facility service level analysis is aimed at the primary distribution network. The warehouses or facilities that supply items for customer-facing warehouses and depots need to maintain downstream service level. This service level in turn depends on the downstream service level of the customer-facing facilities. This analysis enables you to ascertain service levels so as to meet the service level of downstream customer-facing depots or facilities.
- The ad hoc analysis is a free form analysis to simulate the impact of input parameters like service level, lead time, demand, and item cost on the overall network cost. Using this analysis, you can compare scenarios with different input parameters.

Key Features of Scenario Development

The Scenario Development module enables you to create different scenarios for different business problems. Most of the results are available in graphical form to help you take decisions. You can optimize and re-optimize the system. You can compare current network results with the optimal values.

You can create new scenarios, edit them, and also create scenarios from existing scenarios. You can use data from an existing SAS Forecast Studio project and perform an ad hoc analysis.

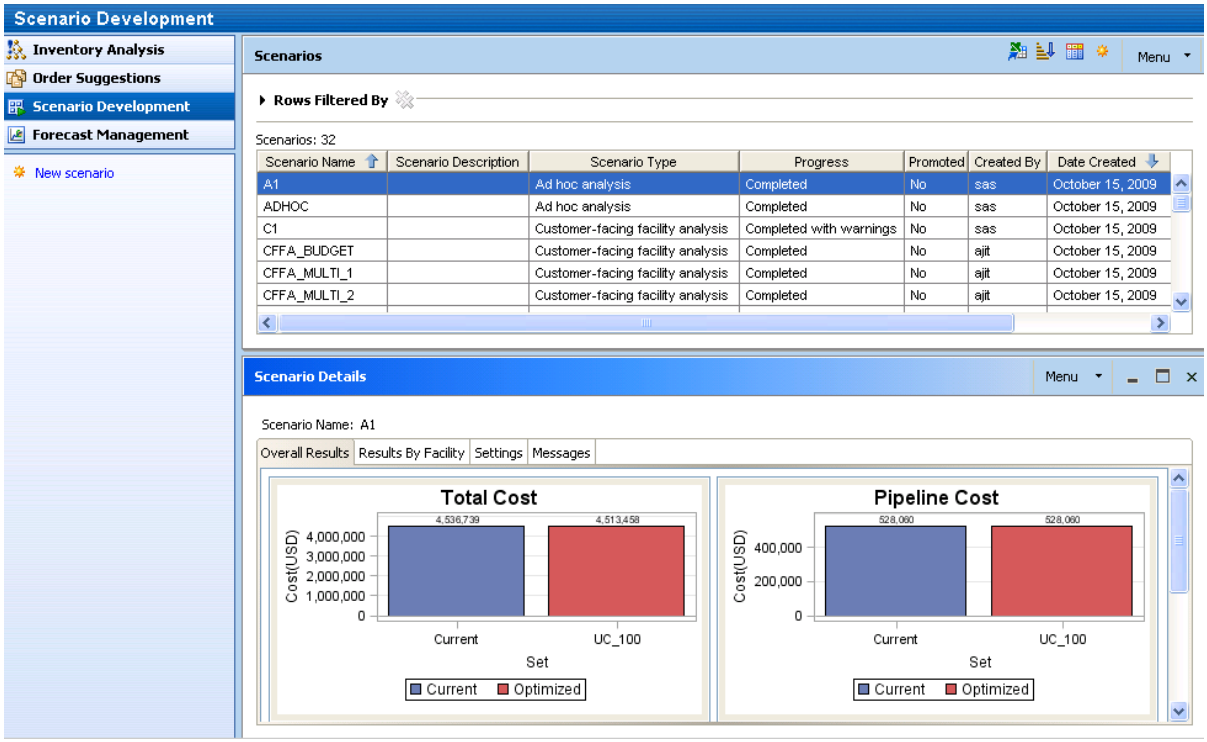
Chapter 17

Getting Started with the Scenario Development Workspace

Overview of the Scenario Development Workspace

The Scenario Development workspace enables you to perform what-if analysis by creating scenarios. You can view a summary of all the scenarios and then choose to view details of a scenario. You can edit, create a copy of, or delete an existing scenario.

Display 17.1 *The Scenario Development Workspace*



You can modify certain metrics such as service level, lead time, demand, and unit cost of an item in a scenario and view the impact of this change on other metrics such as total inventory cost, on-hand cost, and so on. After you are satisfied with results of the scenario, you can promote these values, that is, submit them for updating the underlying tables.

In the Scenario Development workspace, you can perform the following tasks:

- view a summary of all the existing scenarios
- create a new scenario
- manage an existing scenario by performing activities such as edit, delete, and copy
- view scenario results in a tabular format, graphical format, or both
- promote scenario settings
- view details of the warnings or errors that occurred during scenario processing, in case they exist

The Scenario Development Workspace Components

The Scenario Development workspace enables you to view and analyze the impact of change in inputs on various output parameters. You can perform four types of analyses: service level sensitivity, customer-facing facility, internal facility service level, and ad hoc.

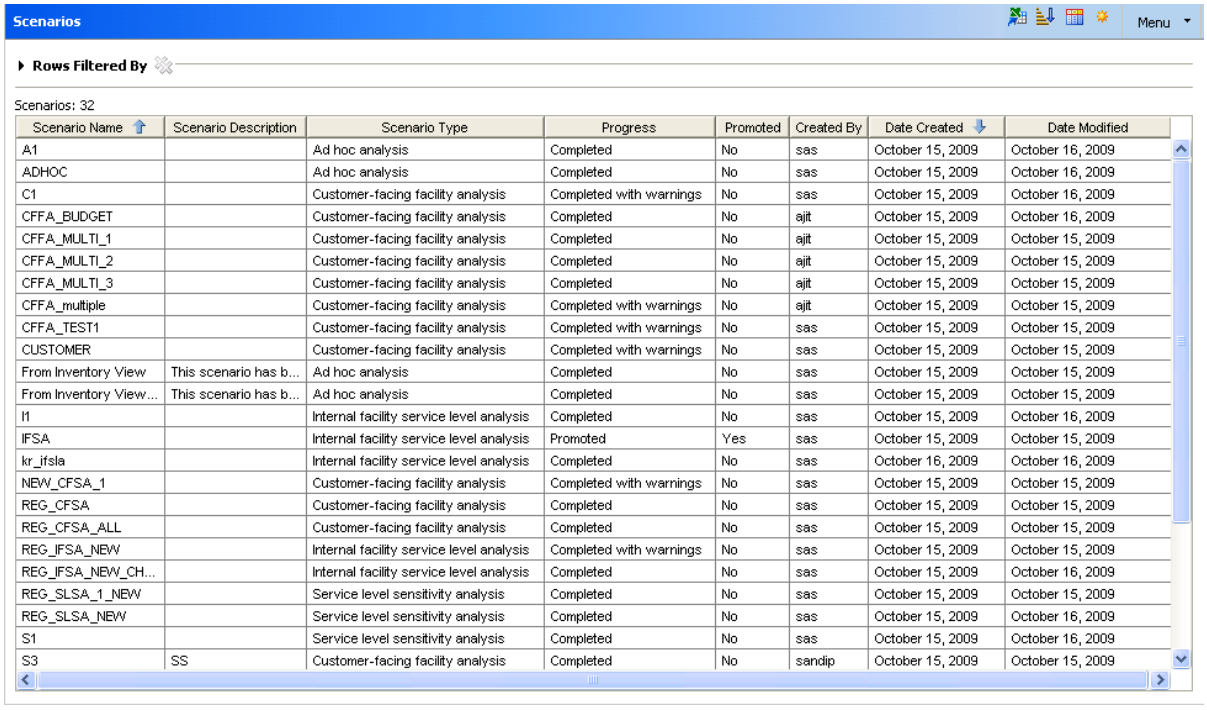
The workspace consists of two views:

- Scenarios view on page 95
- Scenario Details view on page 100

Overview of the Scenarios View

The Scenarios view displays a data table that contains a summary of all the scenarios that you created. In this view, you can create a new scenario, and view, copy, edit, and delete an existing scenario.

Display 17.2 *The Scenarios View*



Scenario Name	Scenario Description	Scenario Type	Progress	Promoted	Created By	Date Created	Date Modified
A1		Ad hoc analysis	Completed	No	sas	October 15, 2009	October 16, 2009
ADHOC		Ad hoc analysis	Completed	No	sas	October 15, 2009	October 16, 2009
C1		Customer-facing facility analysis	Completed with warnings	No	sas	October 15, 2009	October 16, 2009
CFFA_BUDGET		Customer-facing facility analysis	Completed	No	ajit	October 15, 2009	October 16, 2009
CFFA_MULTI_1		Customer-facing facility analysis	Completed	No	ajit	October 15, 2009	October 16, 2009
CFFA_MULTI_2		Customer-facing facility analysis	Completed	No	ajit	October 15, 2009	October 15, 2009
CFFA_MULTI_3		Customer-facing facility analysis	Completed	No	ajit	October 15, 2009	October 15, 2009
CFFA_multiple		Customer-facing facility analysis	Completed with warnings	No	ajit	October 15, 2009	October 15, 2009
CFFA_TEST1		Customer-facing facility analysis	Completed with warnings	No	sas	October 15, 2009	October 15, 2009
CUSTOMER		Customer-facing facility analysis	Completed with warnings	No	sas	October 15, 2009	October 15, 2009
From Inventory View	This scenario has b...	Ad hoc analysis	Completed	No	sas	October 15, 2009	October 15, 2009
From Inventory View...	This scenario has b...	Ad hoc analysis	Completed	No	sas	October 15, 2009	October 15, 2009
I1		Internal facility service level analysis	Completed	No	sas	October 15, 2009	October 16, 2009
IFSA		Internal facility service level analysis	Promoted	Yes	sas	October 15, 2009	October 15, 2009
kr_ifsla		Internal facility service level analysis	Completed	No	sas	October 16, 2009	October 16, 2009
NEW_CFSA_1		Customer-facing facility analysis	Completed with warnings	No	sas	October 15, 2009	October 15, 2009
REG_CFSA		Customer-facing facility analysis	Completed	No	sas	October 15, 2009	October 15, 2009
REG_CFSA_ALL		Customer-facing facility analysis	Completed	No	sas	October 15, 2009	October 15, 2009
REG_IFSA_NEW		Internal facility service level analysis	Completed with warnings	No	sas	October 15, 2009	October 15, 2009
REG_IFSA_NEW_CH...		Internal facility service level analysis	Completed	No	sas	October 15, 2009	October 16, 2009
REG_SLSA_1_NEW		Service level sensitivity analysis	Completed	No	sas	October 15, 2009	October 15, 2009
REG_SLSA_NEW		Service level sensitivity analysis	Completed	No	sas	October 15, 2009	October 16, 2009
S1		Service level sensitivity analysis	Completed	No	sas	October 15, 2009	October 16, 2009
S3	SS	Customer-facing facility analysis	Completed	No	sandip	October 15, 2009	October 15, 2009

The Scenarios view is the default or primary view when you open the Scenario Development workspace and you cannot close this view. You can open the Scenario Details view from this view.

The scenarios in the data table can belong to either of the following analyses: service level sensitivity analysis, customer-facing facility analysis, internal facility service level analysis, and ad hoc analysis. Each scenario can be in either of the following states:

- scheduled
- processing
- completed
- completed with warnings
- completed with errors
- errors
- failure
- promoted

In the Scenarios view, you can complete the following main tasks:

- view a summary of all the existing scenarios
- create a new scenario
- edit an existing scenario
- delete an existing scenario
- create a copy of an existing scenario

Apart from these tasks, in the data table, you can perform the following tasks that are common across all workspaces:

- sort the table rows.
- export the table to a spreadsheet.
- customize the columns of the table.
- perform textual filter. You can filter the table based on scenario name, scenario description, scenario type, progress status of the scenario, and logon ID of the creator.
- modify the width of the table columns.

The Scenarios View Components

Overview

The Scenarios view displays a summary of all the scenarios that you created in a data table and provides options to enable you to create a new scenario, and view, edit, or delete an existing scenario.

Rows Filtered By Section

For details, see "Rows Filtered By Section" on page 27.

Data Table in the Scenarios View

The data table includes the following columns of information:

Scenario Name
displays the name that you specified while creating the scenario.

Scenario Description
displays the additional information that you provided while creating the scenario.

Scenario Type
displays the type of analysis that you specified while creating the scenario.

Progress
displays the current status of the scenario. The possible statuses and their descriptions are as follows:

- The **Scheduled** status indicates that the scenario is scheduled for processing.
- The **Processing** status indicates that the scenario is under processing.
- The **Completed** status indicates that the scenario processing completed without any errors.
- The **Completed with warnings** status indicates that the scenario processing completes with one or more warnings. The cause of the warnings differs based on the scenario type.
  - This status is not applicable for the service level sensitivity analysis.
  - For the customer-facing facility analysis, the warning is caused because the re-optimization process fails for one or all of the selected facility and item pairs. You can promote only optimized values of the facility and item pairs.
  - For the internal facility service level analysis, the warning is caused because the re-optimization process fails for one or all the selected networks. You can promote the optimized values of the networks.
  - For the ad hoc analysis, the warning is caused because the optimization process fails for any of the sets. However, at least one set must be processed without any errors. You can promote the set that is processed without errors.
- The **Completed with errors** status indicates that the scenario processing completes with one or more errors. The cause of the errors differs based on the scenario type.
  - For the service level sensitivity analysis, the error is caused because the optimization process fails for any of the selected networks. However, at least one network must be processed without any errors. The Scenario Details view displays partial output. Only the optimized values for the networks that are processed without any errors are displayed.
  - This status is not applicable for the customer-facing facility analysis.
  - For the internal facility service level analysis, the error is caused because the optimization process fails for any of the selected networks. However, at least one network must be processed without any errors. The Scenario Details view displays partial output. Only optimized values are displayed.
  - For the ad hoc analysis, the error is caused because the optimization process partially succeeds for the sets. The Scenario Details view displays partial output. Only optimized values for the networks that are processed without any errors are displayed.

  Note: You cannot promote the scenario with this status.
- The **Error** status indicates that the scenario processing fails. The scenario encounters errors due to failure in the optimization process or any data-related problems. The exact cause of error differs based on the scenario type.
  - For the service level sensitivity analysis, the error is caused because the optimization process fails for all the selected networks.

- For the customer-facing facility analysis, the error is caused because calculation of current values or optimized values for all the selected facility and item pairs fails.
- For the internal facility service level analysis, the error is caused because calculation of current values or optimized values for any of the selected networks fails.
- For the ad hoc analysis, the error is caused because calculation of current values or optimized values for all the sets fails.

Note: You cannot promote the scenario with this status and the Scenario Details view shows no output.

- The **Failure** status indicates that the scenario processing could not complete because of some database-related issues such as table does not exist or library cannot be accessed due to permission issues.

  Note: You cannot promote the scenario with this status and the Scenario Details view shows no output.

- The **Promoted** status indicates that the scenario settings are submitted in the system.

Promoted
: displays Yes or No depending on whether the scenario is promoted or not.

Created By
: displays the logon ID of the user who created the scenario.

Date Created
: displays the date of creation of the scenario.

Date Modified
: displays the date of modification, if any, to the scenario.

Scenarios View Toolbar and Menu Options

The following table lists all the options that are available in the toolbar and menu of the Scenarios view.

Table 17.1 *Toolbar and Menu Options in the Scenarios View*

Toolbar Button	Menu Option	Action
Not available	**Open Scenario Details**	Opens the Scenario Details view that displays details of the selected scenario and enables you to further modify the parameters and promote the scenario settings.
Not available	**Close Scenario Details**	Closes the Scenario Details view. This option appears dimmed when the Scenario Details view is closed.

Toolbar Button	Menu Option	Action
	**New Scenario**	Opens the New Scenario Type dialog box that enables you to choose the type of scenario that you want to create.
Not available	**Edit Scenario**	Opens the Edit Scenario dialog box that displays the scenario that you select in the data table and enables you to modify the scenario settings.
Not available	**Copy Scenario**	Opens the Copy Scenario dialog box that enables you to create a copy of the selected scenario.
Not available	**Delete Scenario**	Enables you to delete the scenario that you select in the data table.

Apart from these options, the following common options are also available:

- **Sort**
- **Clear Sort**
- **Export to Spreadsheet**
- **Customize Columns**
- **Help**

For details about the common options, see "Common Toolbar and Menu Options" on page 31.

Open the Scenario Details View

The Scenario Details view enables you to view details of a scenario that you select in the Scenarios view.

To open the Scenario Details view, in the Scenarios view, double-click a row in the data table. The Scenario Details view opens details for the scenario that you selected.

Close the Scenario Details View

The Scenario Details view enables you to view details of a scenario.

To close the Scenario Details view, click  in the Scenario Details view.

Overview of the Scenario Details View

The Scenario Details view displays details of the scenario that you select in the Scenarios view. In this view, you can modify the scenario parameters and promote the scenario settings. You can open the Scenario Details view for the following analysis types:

- service level sensitivity analysis
- customer-facing facility analysis
- internal facility service level analysis
- ad hoc analysis

Display 17.3 *Scenario Details View for a Scenario of the Service Level Sensitivity Analysis Type*

The top left corner of the view displays the name of the scenario that is selected. The scenario details are displayed under different tabs:

Overall Results
displays aggregated values for metrics across all items in the network, in graphical format.

Note: This tab is displayed only for the service level sensitivity analysis, internal facility service level analysis, and ad hoc analysis types.

Results by Facility
displays results of the scenario, grouped by facilities. The scenario results are displayed in tabular format, graphical format, or both.

Settings
displays details of the information that is used to create the scenario. For example, date of scenario creation, names of the selected items, names of the selected facilities, and so on.

Messages
displays information about any warnings or errors that a scenario encountered during its processing.

The number of tabs and the information that you can view in a tab depend on the scenario type and the progress status of the scenario.

In the Scenario Details view, you can complete the following main tasks:

- view scenario results in a tabular format, graphical format, or both
- promote scenario settings
- view input selection details for the scenario
- view details of the warnings or errors that occurred during scenario processing, in case they exist

Apart from these tasks, you can also perform the following tasks in the data table:

- export the table to a spreadsheet
- customize the columns of the table
- filter the table rows based on facility and item attributes
- modify the width of the table columns

The Scenario Details View Components

The Scenario Details view displays details of the selected scenario and enables you to further modify the parameters and promote the scenario settings. The content and appearance of the Scenario Details view differs based on the type of analysis that you choose to view. To view components of the Scenario Details view for an analysis type, click the analysis type link from the following list:

- Service Level Sensitivity Analysis on page 101
- Customer-Facing Facility Analysis on page 103
- Internal Facility Service Level Analysis on page 107
- Ad Hoc Analysis on page 112

Service Level Sensitivity Analysis: Scenario Details View

Overall Results Tab

The **Overall Results** tab displays a line graph that shows the variation in the total inventory cost for the selected range of service levels across all selected items in the selected facility.

The following options are available in the toolbar and from the menu of this tab:

- **Promote Scenario Settings**
- **Close Scenario Details**
- **Help**

For details about these options, see "Scenario Details View Toolbar and Menu Options" on page 116.

Results By Facility Tab

The **Results By Facility** tab displays a data table and a set of graphs.

You can view the scenario results grouped by facility either in a tabular format, graphical format, or both. By default, you can view the results in tabular format. You can choose to view a graph for a facility, by selecting the check box that is provided with the facility.

The data table shows the total inventory cost at each facility at each service level increment, starting with the minimum service level up to the maximum service level. The data table contains the following columns of information:

Facility
: lists all the facilities in a distribution network tree structure.

Items
: displays the number of items in a facility for a network.

Facility ID
: displays the ID of the facility.

(Minimum service level value) to (Maximum service level value)
: displays the inventory cost for the minimum service level, for each increment in the service level from the minimum value to the maximum value, and for the maximum service level.

If you choose to view details for a facility in graphical format, then the graph is displayed below the data table. You can choose to view graphs for all the facilities. The graphs are opened next to each other. Each graph displays the total inventory cost for a facility.

The following options are available in the toolbar and from the menu of this tab:

- **Close Scenario Details**
- **View Graph and Table**
- **View Graphs Only**
- **View Table Only**
- **Promote Scenario Settings**
- **Export to Spreadsheet**
- **Help**

For details about these options, see "Scenario Details View Toolbar and Menu Options" on page 116.

Settings Tab

The **Settings** tab displays all the input selection details that you specified for the scenario. If the scenario is promoted, then the promoted values are also displayed. You can view the following information:

- **Scenario name**

- **Scenario description**
- **Date created**
- **Date modified**
- **Owner**
- **Service level maximum (%)**
- **Service level minimum (%)**
- **Service level steps (%)**
- **Selected items**
- **Selected facilities**
- **Promoted values**

The following options are available in the toolbar and from the menu of this tab:

- **Close Scenario Details**
- **Promote Scenario Settings**
- **Export Settings**
- **Help**

For details about these options, see "Scenario Details View Toolbar and Menu Options" on page 116.

Messages Tab

If the scenario results in a warning or an error, then a data table that contains error and warning details is displayed in this tab. Otherwise, the tab is blank.

The following options are available in the toolbar and from the menu of this tab:

- **Close Scenario Details**
- **Promote Scenario Settings**
- **Help**

For details about these options, see "Scenario Details View Toolbar and Menu Options" on page 116.

Customer-Facing Facility Analysis: Scenario Details View

Results By Facility Tab

Summary Section

Use the **Summary** section to view the aggregated results of the scenario. You can specify a value for inventory budget and minimum service level. These values are used for re-optimizing the scenario.

You can view the following aggregated results for all the facilities that you included in the scenario:

- **Current Inventory Cost**
- **Set Inventory Budget**: You can specify a new value for the inventory budget in the text box.
- **Optimized Inventory Cost**
- **New Inventory Cost**: By default, this value is the same as the optimized inventory cost. However, if you specify a new service level value and re-optimize the scenario, then this value is calculated by the re-optimization process.
- **Current Service Level (%)**
- **Set Service Level Minimum (%)**: You can specify a new value for the service level in the text box.
- **Optimized Service Level (%)**
- **New Service Level (%)**: This value is calculated based on the changes in the new service level values. If you have not modified any service level value, then this value is the same as the optimized service level.

If you are viewing the data table at level two, that is, at facility and item level, then the following results are also displayed for the selected facility:

- **Current Inventory Cost**
- **Current Service Level (%)**
- **Optimized Inventory Cost**
- **Optimized Service Level (%)**
- **New Inventory Cost**
- **New Service Level (%)**

Rows Filtered By Section

For details, see "Rows Filtered By Section" on page 27.

Data Table in the Results By Facility Tab

The data table in the tab displays information at two levels.

- At level one, the data table displays aggregated values of scenario results per facility. A column in the table displays the total number of items in each facility. To view the data table at level two, click the link in this column.
- At level two, the data table displays detailed scenario results for each item in the selected facility.

The top left corner of the **Results By Facility** tab displays a breadcrumb trail. When you open the tab, the default text in the breadcrumb trail displays **All Facilities**. After you choose to move to the next level in the data table, the name of the selected facility is appended to the breadcrumb trail.

The data table contains the following columns of information at level one:

Facility
: lists the names of the facilities that you selected to create the scenario.

Items
: displays the number of items in a facility for a network.

Facility ID
: displays the ID of the facility.

Current Inventory Cost
: displays the current inventory cost for all items in the facility.

Current Service Level (%)
: displays the current average service level (in percentage) for all items in the facility.

Optimized Inventory Cost
: displays the optimized average inventory cost for all items in the facility.

Optimized Service Level (%)
: displays the optimized average service level (in percentage) for all items in the facility.

New Inventory Cost
: displays the new inventory cost that is calculated based on the changes in the new service level values at level two of the data table. If you have not modified any service level value, then this value is the same as the optimized inventory cost.

New Service Level (%)
: displays the new service level (in percentage) that is calculated based on the changes in the new service level values at level two of the data table. If you have not modified any service level value, then this value is the same as the optimized service level.

The data table contains the following columns of information at level two:

Facility
: displays the name of the facility that you selected in the data table at level one.

Facility ID
: displays the ID of the facility.

Item
: displays the name of the item.

Item ID
: displays the ID of the item.

Current Inventory Cost
: displays the current inventory cost for the item.

Current Service Level (%)
: displays the current service level (in percentage) for the item.

Optimized Inventory Cost
: displays the optimized inventory cost for the item.

Optimized Service Level (%)
: displays the optimized service level (in percentage) for the item.

New Inventory Cost
: displays the new inventory cost for the item that is calculated based on the changes in the new service level values. If you have not modified any service level value, then this value is the same as the optimized inventory cost.

New Service Level (%)
: enables you to specify the new service level (in percentage) for the item. By default, this value is the same as the optimized service level value.

The following columns are not displayed by default in the data table. You can choose to view them in the data table by using the customize columns feature.

Current Inventory Units
: displays the number of items that are currently available in the inventory.

Optimal Inventory Units
displays the optimized number of items that must exist in the inventory. This value is a result of the scenario process.

Lead Time (Days)
displays the number of days that are required to transport the item from its primary source.

Service Type
displays **FR** for fill rate or **RR** for ready rate, depending on the service type of the item.

Predicted Demand (Units)
displays the forecasted demand value (in units) for the item.

Unit Cost
displays the cost per item.

MAPE
displays the mean average percent error in the forecasted demand for the item.

Buyer
displays the name of the buyer of the item.

Vendor
displays the name of the vendor of the item.

Results By Facility Tab Toolbar and Menu Options

The following options are available in the toolbar and from the menu of this tab:

Note: Some of the options are available only at level one of the data table or only at level two of the data table.

- **Close Scenario Details**
- **Show/Hide Filter Pane**
- **Promote Scenario Settings**
- **Set Service Level**
- **Sort**
- **Clear Sort**
- **Export to Spreadsheet**
- **Customize Columns**
- **Help**

For details about these options, see "Scenario Details View Toolbar and Menu Options" on page 116.

Settings Tab

The **Settings** tab displays all the input selection details that you specified for the scenario. You can view the following information:

- **Scenario name**
- **Scenario description**
- **Date created**
- **Date modified**

- **Owner**
- **Selected items**
- **Selected facilities**

If you specified a budget constraint, a minimum service level value, or both, then information about **Budget constraint**, **Minimum service level (%)**, or both are also displayed.

The following options are available in the toolbar and from the menu of this tab:

- **Close Scenario Details**
- **Promote Scenario Settings**
- **Export Settings**
- **Help**

For details about these options, see "Scenario Details View Toolbar and Menu Options" on page 116.

Messages Tab

If the scenario results in a warning or an error, then a data table that contains error and warning details is displayed in this tab. Otherwise, the tab is blank.

The following options are available in the toolbar and from the menu of this tab:

- **Close Scenario Details**
- **Promote Scenario Settings**
- **Help**

For details about these options, see "Scenario Details View Toolbar and Menu Options" on page 116.

Internal Facility Service Level Analysis: Scenario Details View

Overall Results Tab

The **Overall Results** tab displays bar charts for all the sets for each of the following metrics:

- inventory cost
- on-hand cost
- on-hand holding cost
- average service level (%)

The bar charts show the aggregated values for the metrics across all items in the network.

The following options are available in the toolbar and from the menu of this tab:

- **Close Scenario Details**
- **Promote Scenario Settings**
- **Help**

For details about these options, see "Scenario Details View Toolbar and Menu Options" on page 116.

Results By Facility Tab

Overview

The **Results By Facility** tab displays scenario results at two levels. Level one is the aggregated level, and level two is the individual facility level. The components of the **Results By Facility** tab differ based on the level that you are currently working in.

Level one is the default level that is displayed when you open the tab. The tab enables you to select whether you want to view the optimized settings, current settings, or new settings. The tab displays a data table with values of metrics aggregated over items per facility in the network. You can view metric information in graphical format too. A column in the table displays the total number of items in each facility. To view the scenario results at the next level, click the link in this column. For more information about this level, see "Components of the Results By Facility Tab at Level One" on page 108.

At level two, you can view a data table that contains metric values for individual items in a selected facility. You can also view a summary of the scenario results for the selected facility. For more information about this level, see "Components of the Results By Facility Tab at Level Two" on page 109.

The top left corner of the **Results By Facility** tab displays a breadcrumb trail. When you open the tab, the default text in the breadcrumb trail displays **All Facilities**. After you choose to move to the next level in the data table, the name of the selected facility is appended to the breadcrumb trail.

Components of the Results By Facility Tab at Level One

View results for list

The **View results for** list enables you to select **Optimized Settings**, **Current Settings**, or **New Settings** at level one of the data table. At level two of the table, the list appears dimmed and displays the selection that you made at level one.

Data table

The data table displays information for the settings that you select in the **View results for** list. The data table contains the following columns of information:

Facility
: lists the facilities in the distribution hierarchy for networks that are valid for the selected facility and item pairs.

Items
: displays the number of items in a facility for a network.

Facility ID
: displays the ID of the facility.

Inventory Cost
: displays the inventory cost for all items in the facility.

On-Hand Cost
: displays the on-hand cost for all items in the facility.

Holding Cost
: displays the holding cost for all items in the facility.

Service Level (%)
: displays the average service level (in percentage) for all items in the facility.

Bar charts

You can view bar charts that show metric values for all the settings for the selected facility. To view the graphs for a facility, double-click the row that contains the facility. Graphs are displayed for the following metrics:

- inventory cost
- on-hand cost
- on-hand holding cost
- average service level (%)

Components of the Results By Facility Tab at Level Two

Summary section

Use the **Summary** section to view the aggregated scenario results for the selected facility. You can view the following aggregated results for the selected facility:

- **Current Inventory Cost**
- **Current Service Level (%)**
- **Optimized Inventory Cost**
- **Optimized Service Level (%)**
- **New Inventory Cost**: This value is calculated based on the changes in the new service level values. If you have not modified any service level value, then this value is the same as the optimized inventory cost.
- **New Service Level (%)**: This value is calculated based on the changes in the new service level values. If you have not modified any service level value, then this value is the same as the optimized service level.

Rows Filtered By section

For details, see "Rows Filtered By Section" on page 27.

Data table

The data table displays information for all settings for the selected facility. The data table contains the following columns of information:

Facility
: displays the name of the facility that you selected in the data table at level one.

Facility ID
: displays the ID of the facility.

Item
: lists the items that belong to the selected facility.

Item ID
: displays the ID of the item.

Current Inventory Cost
: displays the current inventory cost for the item.

Current Service Level (%)
: displays the current service level (in percentage) for the item.

Optimized Inventory Cost
: displays the optimized inventory cost for the item.

Optimized Service Level (%)
: displays the optimized service level (in percentage) for the item.

New Inventory Cost
displays the new inventory cost for the item that is calculated based on the changes in the new service level values. If you have not modified any service level value, then this value is the same as the optimized inventory cost.

New Service Level (%)
enables you to specify the new service level (in percentage) for the item. By default, this value is the same as the optimized service level value.

The following columns are not displayed by default in the data table. You can choose to view them in the data table by using the customize columns feature.

Current Inventory Units
displays the number of items that are currently available in the inventory.

Optimal Inventory Units
displays the optimized number of items that must exist in the inventory. This value is a result of the scenario process.

Lead Time (Days)
displays the number of days that are required to transport the item from its primary source.

Service Type
displays **FR** for fill rate or **RR** for ready rate, depending on the service type of the item.

Predicted Demand (Units)
displays the forecasted demand value (in units) for the item.

Unit Cost
displays the cost per item.

Buyer
displays the name of the buyer of the item.

Vendor
displays the name of the vendor of the item.

Results By Facility Tab Toolbar and Menu Options

The following options are available in the toolbar and from the menu of this tab:

Note: Some of the options are available only at level one of the data table or only at level two of the data table.

- **Close Scenario Details**
- **View Graph and Table**
- **View Graphs Only**
- **View Table Only**
- **Show/ Hide Filter Pane**
- **Promote Scenario Settings**
- **Set Service Level**
- **View Graph**
- **Back**

  Note: This action is available only as a toolbar button.

- **Next**

Note: This action is available only as a toolbar button.

- **Sort**
- **Clear Sort**
- **Export to Spreadsheet**
- **Customize Columns**
- **Help**

For details about these options, see "Scenario Details View Toolbar and Menu Options" on page 116.

Settings Tab

The **Settings** tab displays all the input selection details that you specified for the scenario. You can view the following information:

- **Scenario name**
- **Scenario description**
- **Date created**
- **Date modified**
- **Owner**
- **Selected items**
- **Selected facilities**

If you selected a network, then information about the **# of Networks** is also displayed.

The following options are available in the toolbar and from the menu of this tab:

- **Close Scenario Details**
- **Promote Scenario Settings**
- **Export Settings**
- **Help**

For details about these options, see "Scenario Details View Toolbar and Menu Options" on page 116.

Messages Tab

If the scenario results in a warning or an error, then a data table that contains error and warning details is displayed in this tab. Otherwise, the tab is blank.

The following options are available in the toolbar and from the menu of this tab:

- **Close Scenario Details**
- **Promote Scenario Settings**
- **Help**

For details about these options, see "Scenario Details View Toolbar and Menu Options" on page 116.

Ad Hoc Analysis: Scenario Details View

Overall Results Tab

The **Overall Results** tab displays bar charts for all the sets for each of the following metrics:

- inventory cost
- pipeline cost
- on-hand cost
- on-hand holding cost

The bar charts show the aggregated values for the metrics across all items in the network.

The following options are available in the toolbar and from the menu of this tab:

- **Close Scenario Details**
- **Promote Scenario Settings**
- **Help**

For details about these options, see "Scenario Details View Toolbar and Menu Options" on page 116.

Results By Facility Tab

Overview

The **Results By Facility** tab displays scenario results at two levels — aggregated level and individual facility level. The components of the **Results By Facility** tab differ based on the level that you are currently working in.

Level one is the default level that is displayed when you open the tab. The tab enables you to select a set. You can view a data table that contains values of metrics that are aggregated over items per facility in the network. You can view metric information in graphical format too. A column in the table displays the total number of items in each facility. To view the scenario results at the next level, click the link in this column. For more information about this level, see "Components of the Results By Facility Tab at Level One" on page 112.

At level two, you can view a data table that contains metric values for individual items in a selected facility. You can also view a summary of the scenario results for the selected facility. For more information about this level, see "Components of the Results By Facility Tab at Level Two" on page 113.

The top left corner of the **Results By Facility** tab displays a breadcrumb trail. When you open the tab, the default text in the breadcrumb trail displays **All Facilities**. After you choose to move to the next level in the data table, the name of the selected facility is appended to the breadcrumb trail.

Components of the Results By Facility Tab at Level One

View results for list

The **View results for** list enables you to select current settings or a set. The data table at both levels display scenario results based on the selection.

Data table
The data table displays information for current settings or for a set, based on your selection in the **View results for** list. The data table contains the following columns of information:

Facility
lists the facilities that you selected to create the scenario.

Items
displays the number of items in a facility for a network.

Facility ID
displays the ID of the facility.

Inventory Cost
displays the average inventory cost for all items in the facility.

On-Hand Cost
displays the average on-hand cost for all items in the facility.

Holding Cost
displays the average holding cost for all items in the facility.

Pipeline Cost
displays the average pipeline cost for all items in the facility.

Service Level (%)
displays the average service level (in percentage) for all items in the facility.

Bar charts
You can view bar charts that show metric values for the current settings and for all the sets in the scenario. You can choose to view the graphical format for a facility, by double-clicking the row that contains the facility. Graphs are displayed for the following metrics:

- inventory cost
- pipeline cost
- on-hand cost
- on-hand holding cost

Components of the Results By Facility Tab at Level Two

Summary section
Use the **Summary** section to view the metric values that are aggregated over all items in the selected facility. You can view values for the following metrics:

- **Current Inventory Cost**
- **Current Service Level (%)**

If you selected a set in the **View results for** list, then the following additional metric values are displayed:

- **Optimized Inventory Cost**
- **Optimized Service Level (%)**

Rows Filtered By section
For details, see "Rows Filtered By Section" on page 27.

Data table
The data table contains the following columns of information:

Facility
displays the facility that you selected from the data table at level one.

Facility ID
displays the ID of the facility.

Item
displays the name of the item that belongs to the facility.

Item ID
displays the ID of the item.

Inventory Cost
displays the inventory cost for the item.

On-Hand Cost
displays the on-hand cost for the item.

Holding Cost
displays the holding cost for the item.

Pipeline Cost
displays the pipeline cost for the item.

Service Level (%)
displays the service level (in percentage) for the item.

Inventory Units
displays the total units of the item in the inventory.

The following columns are not displayed by default in the data table. You can choose to view them in the data table by using the customize columns feature.

Lead Time (Days)
displays the number of days that are required to transport the item from its primary source.

Service Type
displays **FR** for fill rate or **RR** for ready rate, depending on the service type of the item.

Unit Cost
displays the cost per item.

Predicted Demand (Units)
displays the forecasted demand value (in units) for the item.

Buyer
displays the name of the buyer of the item.

Vendor
displays the name of the vendor of the item.

Results By Facility Tab Toolbar and Menu Options

The following options are available in the toolbar and from the menu of this tab:

Note: Some of the options are available only at level one of the data table or only at level two of the data table.

- **Close Scenario Details**
- **View Graph and Table**
- **View Graphs Only**
- **View Table Only**

- **Promote Scenario Settings**
- **View Graph**
- **Back**

  Note: This action is available only as a toolbar button.
- **Next**

  Note: This action is available only as a toolbar button.
- **Show/ Hide Filter Pane**
- **Sort**
- **Clear Sort**
- **Export to Spreadsheet**
- **Customize Columns**
- **Help**

For details about these options, see "Scenario Details View Toolbar and Menu Options" on page 116.

Settings Tab

The **Settings** tab displays all the input selection details that you specified for the scenario. If the scenario is promoted, the promoted values are also displayed. You can view the following information:

- **Scenario name**
- **Scenario description**
- **Date created**
- **Date modified**
- **Owner**
- **View results for**: enables you to select a set from the list and view the service level settings for that set.
- **Selected items**
- **Selected facilities**
- **Promoted values**

If you selected a network, then information about the **# of Networks** is also displayed. You can also view details about the settings for lead time, service level, demand, and unit cost, based on your selection.

The following options are available in the toolbar and from the menu of this tab:

- **Close Scenario Details**
- **Promote Scenario Settings**
- **Export Settings**
- **Help**

For details about these options, see "Scenario Details View Toolbar and Menu Options" on page 116.

Messages Tab

If the scenario results in a warning or an error, then a data table that contains error and warning details is displayed in this tab. Otherwise, the tab is blank. If there are multiple sets in your scenario, then you can select a specific set from the **View results for** list and view the messages for that set.

The following options are available in the toolbar and from the menu of this tab:

- **Close Scenario Details**
- **Promote Scenario Settings**
- **Help**

For details about these options, see "Scenario Details View Toolbar and Menu Options" on page 116.

Scenario Details View Toolbar and Menu Options

Most of the toolbar and menu options in the Scenario Details view are common for all the scenario types. The following table lists these options and their corresponding actions.

Table 17.2 *Toolbar and Menu Options in the Scenario Details View*

Toolbar Button	Menu Option	Action
	**Close Scenario Details**	Closes the Scenario Details view.

Toolbar Button	Menu Option	Action
	**Promote Scenario Settings**	For Service Level Sensitivity Analysis Opens the Promote Settings dialog box that enables you to promote the settings for any one service level of the scenario. For Customer-Facing Facility Analysis Opens the Promote Settings dialog box that enables you to promote the settings for all items at all facilities in the scenario. For Internal Facility Service Level Analysis Opens the Promote Settings dialog box that enables you to promote the service level for all items at all facilities in the scenario. For Ad Hoc Analysis Opens the Promote Settings dialog box that enables you to promote the settings for any one set of the scenario.
	**View Graph and Table**	Refreshes contents of the **Results By Facility** tab to display the data table and the opened graphs. You can view only the graphs that you opened by clicking the check boxes for the corresponding facilities. This option is available only when you view the data table at level one.
	**View Graphs Only**	Refreshes contents of the **Results By Facility** tab to display the opened graphs. You can view only the graphs that you opened by clicking the check boxes for the corresponding facilities. This option is available only when you view the data table at level one.
	**View Table Only**	Refreshes contents of the **Results By Facility** tab to display only the data table. This option is available only when you view the data table at level one.

Toolbar Button	Menu Option	Action
Not available	**Set Service Level**	Opens the Enter New Service Level dialog box that enables you to specify a new service level value for the selected rows. This option is available only in the pop-up menu.
Not available	**View Graph**	Displays graphs for the selected facility. This option is available only in the pop-up menu at level one for the internal facility service level analysis and ad hoc analysis scenario types.
	**Export Settings**	Opens the Export to Spreadsheet dialog box that enables you to export the scenario settings to a Microsoft Excel file. Information about the selected items and facilities is copied in separate sheets of the Excel file.

For the remaining options that are common across workspaces, see "Common Toolbar and Menu Options" on page 31.

Chapter 18

Working with Scenarios

Types of Scenarios

Overview

A scenario enables you to view the impact of change in inputs on certain output parameters. The input metrics that can be promoted differ based the scenario type.

SAS Service Parts Optimization support four types of scenarios, that is, you can perform the following four types of analysis:

- service level sensitivity analysis
- customer-facing facility analysis
- internal facility service level analysis
- ad hoc analysis

Service Level Sensitivity Analysis

This analysis enables you to determine the service level sensitivity for a facility. The analysis can be performed on a single item or a group of items in a single facility. SAS Service Parts Optimization automatically identifies the network based on the selected items and the reference facility.

To perform this analysis, you only need to provide the upper limit (maximum) and lower limit (minimum) values for the service level and an increment step value. The analysis results display the total inventory cost for every facility upstream and downstream from the reference facility in the scenario, for each service level increment at the reference facility.

You can submit or promote one service level value that is applied to all the items that you selected in the reference facility. The promoted service level value is used by the system for the next run of the inventory optimization process.

Customer-Facing Facility Analysis

This analysis enables you to maximize the service level values for a group of items and a group of customer-facing facilities that are subject to an inventory investment constraint.

To perform this analysis, you can provide either a minimum service level constraint, or a total budget constraint for all the customer-facing facilities in the scenario, or both. You can choose to specify no constraint too.

If you specify only the service level constraint, then the analysis would not produce service levels less than the constraint value. If you specify a total budget constraint, then the analysis produces optimal service levels at the customer-facing facilities that meet the budget constraint. If you specify both the constraint, then the analysis produces optimal service levels that are not lower than the service level constraint and that meet the budget constraint too. In case the analysis cannot meet both the constraints, then the analysis only suffices the budget constraint.

In situations where you have not specified any constraint, the analysis uses the current total cost across the selected customer-facing facilities as the constraint. and generates the optimal service level values for the facilities.

You can specify a threshold value for the total inventory cost to trigger alert indicators on the results when the total inventory cost exceeds the threshold value. You can modify or override the optimal service level value that is recommended by the system at each facility and item level and re-optimize the scenario. Re-optimization considers the new overridden service level values to calculate the new inventory cost and the new service levels for all the facility and item pairs.

You can submit or promote the optimal service level values that are recommended by the system or that you supplied for the facility and item pairs. The promoted service level values are used by the system for the next run of the inventory optimization process.

Internal Facility Service Level Analysis

This analysis enables you to optimize the service level values for non-customer-facing or internal facilities for a given network to service the service level of customer-facing facilities for the network. The internal service level values are optimized such that they are achieved at the lowest possible inventory cost.

To perform this analysis, you only need to select items, facilities and networks. You do not specify any constraint. The service level values for customer-facing facilities are used to calculate service levels for the internal facilities. You can specify a threshold value for the total inventory cost to trigger alert indicators on the results when the total inventory cost exceeds the threshold value.

The analysis generates values for the following metrics at aggregated level and for each facility and item pair:

- inventory cost
- on-hand cost
- on-hand holding cost
- optimal service level

You can modify or override the optimal service level value that is recommended by the system at each facility and item level and re-optimize the scenario. Re-optimization considers the new overridden service level values, new budget, and new minimum service level values to calculate the new metric values at aggregated level and for each facility and item pair.

You can view metric values for the current settings of the system, for the optimized settings that you obtain after the scenario is run, and also for the new settings (overridden values). To view the metric values for new settings, you need to re-optimize the scenario.

You can submit or promote the optimal service level values that are recommended by the system or that you supplied for the facility and item pairs. The promoted service level values are used by the system for the next run of the inventory optimization process.

Ad Hoc Analysis

This analysis enables you to evaluate the impact of network variables on policy parameters and costs. To perform this analysis, you can specify new values for either one or all of the following inputs:

- service level
- lead time
- demand
- unit cost

You can analyze not only the source system data but also data from a specific SAS Forecast Studio project. The project contains reforecasted data for a selected set of time series. The Forecast Management workspace enables you to select the time series that you want to reforecast and later analyze.

You can create multiple sets, each with different input values. However, if you create a set without any input settings, then that set is not saved and would not be used for analysis.

Note: In ad hoc analysis, any change in the demand value applies only to the customer-facing facilities.

You can specify a threshold value for the total inventory cost to trigger alert indicators on the results when the total inventory cost exceeds the threshold value. The analysis generates values for the following metrics for each set:

- inventory cost
- on-hand cost
- pipeline cost
- on-hand holding cost

You can view metric values for the current settings in the system too.

You can submit or promote any one set. The promoted values are used by the system for the next run of the inventory optimization process.

Create a Service Level Sensitivity Analysis Scenario

Overview

To create a new scenario:

1. In the Scenarios view, click **Menu** ⇨ **New Scenario**. The New Scenario Type dialog box appears. A list of the scenario types is displayed.
2. From the list of scenario types, select **Service level sensitivity analysis** and click **OK**. The New Scenario dialog box appears.

Specify Basic Scenario Details

1. In the **Scenario name** box, type a name for the scenario.
2. (Optional) In the **Description** box, type a description of maximum 255 characters for the scenario.

Select Items for the Scenario

1. In the **Scenario Items and Locations** section, click **Change selected items**. The Item Selection dialog box appears.

   Note: If you log on to the SAS Service Parts Optimization application as a user with the role of a buyer, then ensure that you select only those items that belong to you.

2. To search for items based on their attributes or dimensions, in the **Selection dimensions** section, select a dimension. The **Selection settings** section either displays the values for the dimension with check boxes or enables you to further search for the item.

   Note: If you select the facility before selecting the items, then the system displays only those items that belong to the facility.

3. For every dimension that you want to search the item on, select item dimension values:

   - If the **Selection settings** section displays dimension values, select the check box for the required values.

     Note: The dimension values might be displayed in a hierarchical manner. To view all dimension values, expand the dimension value.

   - If the **Selection settings** section provides a search functionality, in the **Search** list, select a dimension type. In the box, type a description for the dimension type and click  . The data table below the **Search** options displays the results of the search

     In the first column of the data table, select the check boxes for the item attribute values.

4. Click **Add Items to Selected List**. The **Selected List** section displays details for all the selected items.

   Note: The data table that contains the search results continues to display the items that you added to the **Selected List**. If you perform a new search and if the already selected items are a part of the search results, then the data table will display the items for reselection. However, if you reselect these items, then they are not duplicated in the **Selected List** section.

5. To delete any item from the **Selected List** data table, select the check box in the first column for that item and click  .

   TIP If there are many rows in the table of the **Selected List** section, you can use the **Filter Pane** to filter out specific items and then delete them from the table.

6. Click **Done**. The Item Selection dialog box closes and the **Selected items** option in the New Scenario dialog box displays the number of items that you selected.

   Note: By clicking **Done** or  , you only close the dialog box. All the items that are displayed in the **Selected List** table are already selected for the scenario.

   Note: If you select an assembled item, then its child items are also selected for analysis.

Select Facilities for the Scenario

1. In the **Scenario Items and Locations** section, click the link to select the facility. The Facility Selection dialog box appears.

   Note: The name of the link that enables you to open the Facility Selection dialog box varies depending on the type of scenario that you want to create.

   - For service level sensitivity analysis, the link name is **Select/Change facility**.
   - For customer-facing facility analysis, the link name is **Change selected customer-facing facilities**.
   - For internal facility service level analysis, the link name is **Change selected internal facilities**.

- For ad hoc analysis, the link name is **Change selected facilities**.

2. To search for facilities based on their attributes or dimensions, in the **Selection dimensions** section, select a dimension. The **Selection settings** section either displays the values for the dimension with check boxes or enables you to further search for the facility.

   Note: If you select items before selecting the facility, then the system displays only those facilities that the items belong to.

   Perform the following steps for every dimension that you want to search the facility on:

3. To select facility dimension values:

   - If the **Selection settings** section displays dimension values, select one or more values.

     Note: The dimension values can be given in a hierarchical manner. To view all dimension values, expand the dimension value.

   - If the **Selection settings** section provides a search functionality, in the **Search** list, select a dimension type. In the **Search** box, type a description for the dimension type and click  . The data table below the **Search** options displays the results of the search.

     In the first column of the data table, select the check boxes for the item attribute values.

4. Click **Add Facilities to Selected List**. The **Selected List** section displays details for all the selected facilities in a data table.

   Note: If you are performing service level sensitivity analysis, then you must select only one facility.

   Note: The data table that contains the search results continues to display the facilities that you added to the **Selected List**. If you perform a new search and if the already selected facilities are a part of the search results, then the data table will display the facilities for reselection. However, if you reselect these facilities, then they are not duplicated in the **Selected List** section.

5. To delete any facility from the **Selected List** data table, in the first column of the data table, select the check box for that facility and click  .

   TIP If there are many rows in the **Selected List** table, you can use the **Filter Pane** to filter out specific facilities and then delete them from the table.

6. Click **Done**. The Facility Selection dialog box closes and the number of facilities that you selected are displayed in the New Scenario dialog box.

   Note: By clicking **Done** or  , you only close the dialog box. All the facilities that are displayed in the **Selected List** table are already selected for the scenario.

Specify Scenario Settings

1. In the **Service level maximum** box of the **Scenario Settings** section, type a value between 0.01%–99.99%.

2. In the **Service level steps** box, type the incremental step value.

Complete Scenario Creation

1. To specify alert settings, in the **Enter threshold to trigger alert indicator in scenario results** box, type a threshold value.

   Note: This step is not applicable for the service level sensitivity analysis scenario type.

2. (Optional) Select **Send an e-mail when the scenario processing completes**.
3. Click **OK**.

A confirmation message box that contains the following message is displayed:

```
The scenario is created and is queued for processing. You can
view the progress of the scenario in the Scenarios view.
```

To close the message box, click **OK**.

Create a Customer-Facing Facility Analysis Scenario

Overview

To create a new scenario:

1. In the Scenarios view, click **Menu** ⇨ **New Scenario**. The New Scenario Type dialog box appears. A list of the scenario types is displayed.
2. From the list of scenario types, select **Customer-facing facility analysis** and click **OK**. The New Scenario dialog box appears.

Specify Basic Scenario Details

1. In the **Scenario name** box, type a name for the scenario.
2. (Optional) In the **Description** box, type a description of maximum 255 characters for the scenario.

Select Items for the Scenario

1. In the **Scenario Items and Locations** section, click **Change selected items**. The Item Selection dialog box appears.

   Note: If you log on to the SAS Service Parts Optimization application as a user with the role of a buyer, then ensure that you select only those items that belong to you.

2. To search for items based on their attributes or dimensions, in the **Selection dimensions** section, select a dimension. The **Selection settings** section either displays the values for the dimension with check boxes or enables you to further search for the item.

   Note: If you select the facility before selecting the items, then the system displays only those items that belong to the facility.

3. For every dimension that you want to search the item on, select item dimension values:
   - If the **Selection settings** section displays dimension values, select the check box for the required values.

     Note: The dimension values might be displayed in a hierarchical manner. To view all dimension values, expand the dimension value.
   - If the **Selection settings** section provides a search functionality, in the **Search** list, select a dimension type. In the box, type a description for the dimension type and click  . The data table below the **Search** options displays the results of the search

     In the first column of the data table, select the check boxes for the item attribute values.
4. Click **Add Items to Selected List**. The **Selected List** section displays details for all the selected items.

   Note: The data table that contains the search results continues to display the items that you added to the **Selected List**. If you perform a new search and if the already selected items are a part of the search results, then the data table will display the items for reselection. However, if you reselect these items, then they are not duplicated in the **Selected List** section.
5. To delete any item from the **Selected List** data table, select the check box in the first column for that item and click  .

   TIP If there are many rows in the table of the **Selected List** section, you can use the **Filter Pane** to filter out specific items and then delete them from the table.
6. Click **Done**. The Item Selection dialog box closes and the **Selected items** option in the New Scenario dialog box displays the number of items that you selected.

   Note: By clicking **Done** or  , you only close the dialog box. All the items that are displayed in the **Selected List** table are already selected for the scenario.

   Note: If you select an assembled item, then its child items are also selected for analysis.

Select Facilities for the Scenario

1. In the **Scenario Items and Locations** section, click the link to select the facility. The Facility Selection dialog box appears.

   Note: The name of the link that enables you to open the Facility Selection dialog box varies depending on the type of scenario that you want to create.
   - For service level sensitivity analysis, the link name is **Select/Change facility**.
   - For customer-facing facility analysis, the link name is **Change selected customer-facing facilities**.
   - For internal facility service level analysis, the link name is **Change selected internal facilities**.
   - For ad hoc analysis, the link name is **Change selected facilities**.
2. To search for facilities based on their attributes or dimensions, in the **Selection dimensions** section, select a dimension. The **Selection settings** section either displays the values for the dimension with check boxes or enables you to further search for the facility.

Note: If you select items before selecting the facility, then the system displays only those facilities that the items belong to.

Perform the following steps for every dimension that you want to search the facility on:

3. To select facility dimension values:

   - If the **Selection settings** section displays dimension values, select one or more values.

     Note: The dimension values can be given in a hierarchical manner. To view all dimension values, expand the dimension value.

   - If the **Selection settings** section provides a search functionality, in the **Search** list, select a dimension type. In the **Search** box, type a description for the dimension type and click  . The data table below the **Search** options displays the results of the search.

     In the first column of the data table, select the check boxes for the item attribute values.

4. Click **Add Facilities to Selected List**. The **Selected List** section displays details for all the selected facilities in a data table.

   Note: If you are performing service level sensitivity analysis, then you must select only one facility.

   Note: The data table that contains the search results continues to display the facilities that you added to the **Selected List**. If you perform a new search and if the already selected facilities are a part of the search results, then the data table will display the facilities for reselection. However, if you reselect these facilities, then they are not duplicated in the **Selected List** section.

5. To delete any facility from the **Selected List** data table, in the first column of the data table, select the check box for that facility and click  .

   TIP If there are many rows in the **Selected List** table, you can use the **Filter Pane** to filter out specific facilities and then delete them from the table.

6. Click **Done**. The Facility Selection dialog box closes and the number of facilities that you selected are displayed in the New Scenario dialog box.

   Note: By clicking **Done** or  , you only close the dialog box. All the facilities that are displayed in the **Selected List** table are already selected for the scenario.

Specify Scenario Settings

1. If you want to specify a budget constraint for the facilities, select **Set a total budget constraint for all customer-facing facilities in the scenario** and in the box, type a budget value.

2. (Optional) Select the **Set minimum service level scenario can suggest** check box and in the box, type a value between 0.01%–99.99%. If you do not specify a value, then the value is considered as a missing value.

Complete Scenario Creation

1. To specify alert settings, in the **Enter threshold to trigger alert indicator in scenario results** box, type a threshold value.

   Note: This step is not applicable for the service level sensitivity analysis scenario type.

2. (Optional) Select **Send an e-mail when the scenario processing completes**.
3. Click **OK**.

A confirmation message box that contains the following message is displayed:

```
The scenario is created and is queued for processing. You can
view the progress of the scenario in the Scenarios view.
```

To close the message box, click **OK**.

Create an Internal Facility Analysis Scenario

Overview

To create a new scenario:

1. In the Scenarios view, click **Menu** ⇨ **New Scenario**. The New Scenario Type dialog box appears. A list of the scenario types is displayed.
2. From the list of scenario types, select **Internal facility analysis** and click **OK**. The New Scenario dialog box appears.

Specify Basic Scenario Details

1. In the **Scenario name** box, type a name for the scenario.
2. (Optional) In the **Description** box, type a description of maximum 255 characters for the scenario.

Select Items for the Scenario

1. In the **Scenario Items and Locations** section, click **Change selected items**. The Item Selection dialog box appears.

   Note: If you log on to the SAS Service Parts Optimization application as a user with the role of a buyer, then ensure that you select only those items that belong to you.

2. To search for items based on their attributes or dimensions, in the **Selection dimensions** section, select a dimension. The **Selection settings** section either displays the values for the dimension with check boxes or enables you to further search for the item.

   Note: If you select the facility before selecting the items, then the system displays only those items that belong to the facility.

3. For every dimension that you want to search the item on, select item dimension values:

- If the **Selection settings** section displays dimension values, select the check box for the required values.

  Note: The dimension values might be displayed in a hierarchical manner. To view all dimension values, expand the dimension value.

- If the **Selection settings** section provides a search functionality, in the **Search** list, select a dimension type. In the box, type a description for the dimension type and click  . The data table below the **Search** options displays the results of the search

  In the first column of the data table, select the check boxes for the item attribute values.

4. Click **Add Items to Selected List**. The **Selected List** section displays details for all the selected items.

   Note: The data table that contains the search results continues to display the items that you added to the **Selected List**. If you perform a new search and if the already selected items are a part of the search results, then the data table will display the items for reselection. However, if you reselect these items, then they are not duplicated in the **Selected List** section.

5. To delete any item from the **Selected List** data table, select the check box in the first column for that item and click  .

   TIP If there are many rows in the table of the **Selected List** section, you can use the **Filter Pane** to filter out specific items and then delete them from the table.

6. Click **Done**. The Item Selection dialog box closes and the **Selected items** option in the New Scenario dialog box displays the number of items that you selected.

   Note: By clicking **Done** or  , you only close the dialog box. All the items that are displayed in the **Selected List** table are already selected for the scenario.

   Note: If you select an assembled item, then its child items are also selected for analysis.

Select Facilities for the Scenario

1. In the **Scenario Items and Locations** section, click the link to select the facility. The Facility Selection dialog box appears.

   Note: The name of the link that enables you to open the Facility Selection dialog box varies depending on the type of scenario that you want to create.

   - For service level sensitivity analysis, the link name is **Select/Change facility**.
   - For customer-facing facility analysis, the link name is **Change selected customer-facing facilities**.
   - For internal facility service level analysis, the link name is **Change selected internal facilities**.
   - For ad hoc analysis, the link name is **Change selected facilities**.

2. To search for facilities based on their attributes or dimensions, in the **Selection dimensions** section, select a dimension. The **Selection settings** section either displays the values for the dimension with check boxes or enables you to further search for the facility.

   Note: If you select items before selecting the facility, then the system displays only those facilities that the items belong to.

Perform the following steps for every dimension that you want to search the facility on:

3. To select facility dimension values:

   - If the **Selection settings** section displays dimension values, select one or more values.

     Note: The dimension values can be given in a hierarchical manner. To view all dimension values, expand the dimension value.

   - If the **Selection settings** section provides a search functionality, in the **Search** list, select a dimension type. In the **Search** box, type a description for the dimension type and click  . The data table below the **Search** options displays the results of the search.

     In the first column of the data table, select the check boxes for the item attribute values.

4. Click **Add Facilities to Selected List**. The **Selected List** section displays details for all the selected facilities in a data table.

   Note: If you are performing service level sensitivity analysis, then you must select only one facility.

   Note: The data table that contains the search results continues to display the facilities that you added to the **Selected List**. If you perform a new search and if the already selected facilities are a part of the search results, then the data table will display the facilities for reselection. However, if you reselect these facilities, then they are not duplicated in the **Selected List** section.

5. To delete any facility from the **Selected List** data table, in the first column of the data table, select the check box for that facility and click  .

   TIP If there are many rows in the **Selected List** table, you can use the **Filter Pane** to filter out specific facilities and then delete them from the table.

6. Click **Done**. The Facility Selection dialog box closes and the number of facilities that you selected are displayed in the New Scenario dialog box.

   Note: By clicking **Done** or  , you only close the dialog box. All the facilities that are displayed in the **Selected List** table are already selected for the scenario.

Select Networks for the Scenario

1. In the **Select Items and Locations** section, click **Change selected networks**. The Network Selection dialog box appears and displays the distribution networks of facilities.

2. To select a network, select the check box against the top or root or source facility of that network and click **OK**. The Network Selection dialog box closes and the **Selected networks** option in the New Scenario dialog box displays the count of selected networks.

   Note: The count of networks that is displayed does not change automatically if you remove any item or facility after selecting the networks.

Specify Scenario Settings

To specify alert settings, in the **Enter threshold to trigger alert indicator in scenario results** box, type a threshold value.

Note: You do not need to specify any special settings for performing internal facility service level analysis. The scenario results are based on the service level settings of the customer-facing facilities.

Complete Scenario Creation

1. To specify alert settings, in the **Enter threshold to trigger alert indicator in scenario results** box, type a threshold value.

   Note: This step is not applicable for the service level sensitivity analysis scenario type.
2. (Optional) Select **Send an e-mail when the scenario processing completes**.
3. Click **OK**.

A confirmation message box that contains the following message is displayed:

```
The scenario is created and is queued for processing. You can
view the progress of the scenario in the Scenarios view.
```

To close the message box, click **OK**.

Create an Ad Hoc Analysis Scenario

Overview

You can create an ad hoc scenario to analyze the source system data or to analyze data from a SAS Forecast Studio project.

To create a new scenario:

1. In the Scenarios view, click **Menu** ⇨ **New Scenario**. The New Scenario Type dialog box appears. A list of the scenario types is displayed.
2. From the list of scenario types, select **Ad hoc analysis** and click **OK**. The New Scenario dialog box appears.
3. To analyze, source system data, see "Analyze Source System Data" on page 131.
4. To analyze data from a SAS Forecast Studio project, see "Analyze SAS Forecast Studio Demand Data" on page 135.

   Note: This option is not available if the administrator has hidden the Forecast Management workspace.

Analyze Source System Data

Specify Basic Scenario Details

1. In the **Scenario name** box, type a name for the scenario.

2. (Optional) In the **Description** box, type a description of maximum 255 characters for the scenario.

Select Items for the Scenario

1. In the **Scenario Items and Locations** section, click **Change selected items**. The Item Selection dialog box appears.

   Note: If you log on to the SAS Service Parts Optimization application as a user with the role of a buyer, then ensure that you select only those items that belong to you.

2. To search for items based on their attributes or dimensions, in the **Selection dimensions** section, select a dimension. The **Selection settings** section either displays the values for the dimension with check boxes or enables you to further search for the item.

   Note: If you select the facility before selecting the items, then the system displays only those items that belong to the facility.

3. For every dimension that you want to search the item on, select item dimension values:

   - If the **Selection settings** section displays dimension values, select the check box for the required values.

     Note: The dimension values might be displayed in a hierarchical manner. To view all dimension values, expand the dimension value.

   - If the **Selection settings** section provides a search functionality, in the **Search** list, select a dimension type. In the box, type a description for the dimension type and click  . The data table below the **Search** options displays the results of the search

     In the first column of the data table, select the check boxes for the item attribute values.

4. Click **Add Items to Selected List**. The **Selected List** section displays details for all the selected items.

   Note: The data table that contains the search results continues to display the items that you added to the **Selected List**. If you perform a new search and if the already selected items are a part of the search results, then the data table will display the items for reselection. However, if you reselect these items, then they are not duplicated in the **Selected List** section.

5. To delete any item from the **Selected List** data table, select the check box in the first column for that item and click  .

   TIP If there are many rows in the table of the **Selected List** section, you can use the **Filter Pane** to filter out specific items and then delete them from the table.

6. Click **Done**. The Item Selection dialog box closes and the **Selected items** option in the New Scenario dialog box displays the number of items that you selected.

   Note: By clicking **Done** or  , you only close the dialog box. All the items that are displayed in the **Selected List** table are already selected for the scenario.

   Note: If you select an assembled item, then its child items are also selected for analysis.

Select Facilities for the Scenario

1. In the **Scenario Items and Locations** section, click the link to select the facility. The Facility Selection dialog box appears.

Note: The name of the link that enables you to open the Facility Selection dialog box varies depending on the type of scenario that you want to create.

- For service level sensitivity analysis, the link name is **Select/Change facility**.
- For customer-facing facility analysis, the link name is **Change selected customer-facing facilities**.
- For internal facility service level analysis, the link name is **Change selected internal facilities**.
- For ad hoc analysis, the link name is **Change selected facilities**.

2. To search for facilities based on their attributes or dimensions, in the **Selection dimensions** section, select a dimension. The **Selection settings** section either displays the values for the dimension with check boxes or enables you to further search for the facility.

   Note: If you select items before selecting the facility, then the system displays only those facilities that the items belong to.

   Perform the following steps for every dimension that you want to search the facility on:

3. To select facility dimension values:

   - If the **Selection settings** section displays dimension values, select one or more values.

     Note: The dimension values can be given in a hierarchical manner. To view all dimension values, expand the dimension value.

   - If the **Selection settings** section provides a search functionality, in the **Search** list, select a dimension type. In the **Search** box, type a description for the dimension type and click  . The data table below the **Search** options displays the results of the search.

     In the first column of the data table, select the check boxes for the item attribute values.

4. Click **Add Facilities to Selected List**. The **Selected List** section displays details for all the selected facilities in a data table.

   Note: If you are performing service level sensitivity analysis, then you must select only one facility.

   Note: The data table that contains the search results continues to display the facilities that you added to the **Selected List**. If you perform a new search and if the already selected facilities are a part of the search results, then the data table will display the facilities for reselection. However, if you reselect these facilities, then they are not duplicated in the **Selected List** section.

5. To delete any facility from the **Selected List** data table, in the first column of the data table, select the check box for that facility and click  .

   TIP If there are many rows in the **Selected List** table, you can use the **Filter Pane** to filter out specific facilities and then delete them from the table.

6. Click **Done**. The Facility Selection dialog box closes and the number of facilities that you selected are displayed in the New Scenario dialog box.

   Note: By clicking **Done** or  , you only close the dialog box. All the facilities that are displayed in the **Selected List** table are already selected for the scenario.

Select Networks for the Scenario

1. In the **Select Items and Locations** section, click **Change selected networks**. The Network Selection dialog box appears and displays the distribution networks of facilities.
2. To select a network, select the check box against the top or root or source facility of that network and click **OK**. The Network Selection dialog box closes and the **Selected networks** option in the New Scenario dialog box displays the count of selected networks.

   Note: The count of networks that is displayed does not change automatically if you remove any item or facility after selecting the networks.

Scenario Settings: Manage Sets

1. To add a new set, click  . The new set is added to the **Selected scenario sets** section.

   Note: A default set is available. If you need only one set, you can work with this default set and create the scenario.
2. To delete a set, click  . The selected set is deleted.
3. To rename a set, click  . The Rename Set dialog box appears. Specify a new name for the set and click **OK**. The Rename Set dialog box closes and the set is saved with a new name.
4. To create a copy of a set, click  . A copy of the selected set is created. You can specify settings for the target metrics for this set.

Note: If you do not specify any settings for a new set, then that set is not saved and is not considered during analysis.

Scenario Settings: Specify Target Metric Values

For the selected set:

1. If you want service level as a target metric, expand the **Service Level** subsection and specify the service level value for all the selected facility and item pairs in either of the following ways:
   - Set all service levels to a percentage value. The value must be between 0.01%–99.99%.
   - Increase all service level values by a percentage value.
   - Decrease all service level values by a percentage value.

   Note: To expand a subsection, click the subsection title.
2. You can specify settings for target metrics for the new set.
   a. If you want lead time as a target metric, expand the **Lead Time** subsection and specify the lead time value for all the selected facility and item pairs to a fixed number of days.
   b. If you want demand as a target metric, expand the **Demand** subsection and specify the demand for all facility and item pairs in either of the following ways:
      - Set the demand to a fixed value.
      - Increase all demand values by a percentage value.

- Decrease all demand values by a percentage value.

Note: The change in demand values affects only the customer-facing facilities. Hence, to view the impact of change in demand in the scenario results, you must select at least one customer-facing facility.

c. If you want unit cost as a target metric, expand the **Unit Cost** subsection and specify the unit cost value for all facility and item pairs in either of the following ways:

- Set all unit cost values to a fixed value.
- Increase all unit cost values by a value.
- Decrease all unit cost values by a value.

Complete Scenario Creation

1. To specify alert settings, in the **Enter threshold to trigger alert indicator in scenario results** box, type a threshold value.

   Note: This step is not applicable for the service level sensitivity analysis scenario type.

2. (Optional) Select **Send an e-mail when the scenario processing completes**.
3. Click **OK**.

A confirmation message box that contains the following message is displayed:

```
The scenario is created and is queued for processing. You can
view the progress of the scenario in the Scenarios view.
```

To close the message box, click **OK**.

Analyze SAS Forecast Studio Demand Data

Specify Basic Scenario Details

1. In the **Scenario name** box, type a name for the scenario.
2. (Optional) In the **Description** box, type a description of maximum 255 characters for the scenario.

Select a SAS Forecast Studio Project

To select a SAS Forecast Studio project:

1. Select the **Analyze Forecast Studio Project Data**. The Forecast Project Selection dialog box appears.
2. Select a project and click **OK**. The ad hoc scenario is prepopulated with the item, facility, and network selection details from the SAS Forecast Studio project.

Select Items for the Scenario

Items that exist in the SAS Forecast Studio project data are assigned to the scenario. You cannot add more items to this list. However, you can remove any item.

To select items for the scenario:

1. In the **Scenario Items and Locations** section, click **Change selected items**. The Item Selection dialog box appears. The **Selected List** section displays the list of selected items. The **Find Items** section is disabled.

2. To delete any item from the **Selected List** data table, in the first column of the data table, select the check box for that item and click  .

   TIP If there are many rows in the table of the **Selected List** section, you can use the **Filter Pane** to filter out specific items and then delete them from the table.

3. Click **Done**. The Item Selection dialog box closes and the **Selected items** option in the New Scenario dialog box displays the number of items that you selected.

   Note: By clicking **Done** or  , you only close the dialog box. All the items that are displayed in the **Selected List** table are already selected for the scenario.

Select Facilities for the Scenario

Facilities that exist in the SAS Forecast Studio project data are assigned to the scenario. You cannot add more facilities to this list. However, you can remove any facility.

1. In the **Scenario Items and Locations** section, click **Change selected facilities**. The Facility Selection dialog box appears.

2. To delete any facility from the **Selected List** data table, in the first column of the data table, select the check box for that facility and click  .

   TIP If there are many rows in the **Selected List** table, you can use the **Filter Pane** to filter out specific items and then delete them from the table.

3. Click **Done**. The Facility Selection dialog box closes and the number of facilities that you selected are displayed in the New Scenario dialog box.

   Note: By clicking **Done** or  , you only close the dialog box. All the facilities that are displayed in the **Selected List** table are already selected for the scenario.

Select Networks for the Scenario

Networks that exist in the SAS Forecast Studio project data are assigned to the scenario. You cannot add more networks to this list. However, you can remove any network.

1. In the **Select Items and Locations** section, click **Change selected networks**. The Network Selection dialog box appears and displays the distribution networks of facilities.

2. To remove a network, clear the check box against the top or source facility of that network and click **OK**. The Network Selection dialog box closes and the selected network is removed.

   Note: The count of networks that is displayed does not change automatically if you remove any item or facility after selecting the networks.

Scenario Settings: Manage Sets

A default set is available that contains metric values based on data from the selected SAS Forecast Studio project. You cannot modify or update the metric values from the default set.

1. To add a new set, click  . The new set is added to the **Selected scenario sets** section.

2. To delete a set, click  . The selected set is deleted.

3. To rename a set, click  . The Rename Set dialog box appears. Specify a new name for the set and click **OK**. The Rename Set dialog box closes and the set is saved with a new name.

4. To create a copy of a set, click  . A copy of the selected set is created. You can specify settings for the target metrics for this set.

Note: If you do not specify any settings for a new set, then that set is not saved and is not considered during analysis.

Scenario Settings: Specify Target Metric Values

For the selected set:

1. If you want service level as a target metric, expand the **Service Level** subsection and specify the service level value for all the selected facility and item pairs in either of the following ways:

   - Set all service levels to a percentage value. The value must be between 0.01%–99.99%.
   - Increase all service level values by a percentage value.
   - Decrease all service level values by a percentage value.

   Note: To expand a subsection, click the subsection title.

2. You can specify settings for target metrics for the new set.

   a. If you want lead time as a target metric, expand the **Lead Time** subsection and specify the lead time value for all the selected facility and item pairs to a fixed number of days.

   b. If you want demand as a target metric, expand the **Demand** subsection and specify the demand for all facility and item pairs in either of the following ways:

      - Set the demand to a fixed value.
      - Increase all demand values by a percentage value.
      - Decrease all demand values by a percentage value.

      Note: The change in demand values affects only the customer-facing facilities. Hence, to view the impact of change in demand in the scenario results, you must select at least one customer-facing facility.

   c. If you want unit cost as a target metric, expand the **Unit Cost** subsection and specify the unit cost value for all facility and item pairs in either of the following ways:

      - Set all unit cost values to a fixed value.
      - Increase all unit cost values by a value.
      - Decrease all unit cost values by a value.

Complete Scenario Creation

1. To specify alert settings, in the **Enter threshold to trigger alert indicator in scenario results** box, type a threshold value.

   Note: This step is not applicable for the service level sensitivity analysis scenario type.

2. (Optional) Select **Send an e-mail when the scenario processing completes**.

3. Click **OK**.

A confirmation message box that contains the following message is displayed:

The scenario is created and is queued for processing. You can view the progress of the scenario in the Scenarios view.

To close the message box, click **OK**.

Edit a Scenario

If you are not satisfied with the results of an existing scenario or you want to specify custom metric values for more facility and item pairs in a scenario, then you can modify the settings of that scenario and save the new values. The scenario is processed again with the new values.

Note: You can edit a scenario that has completed processing. However, you cannot edit a scenario that is in a scheduled state or that has been promoted.

To edit a scenario:

1. In the Scenarios view, select the scenario to be modified and click **Menu** ⇨ **Edit Scenario**. Depending on the type of the scenario that you select, the Edit Scenario dialog box appears and displays the current settings of the scenario.
2. Edit the scenario options that you want to change and click **OK**. The dialog box closes. The scenario changes are saved and the scenario is submitted for processing.

Create a Copy of a Scenario

You can create a copy of any existing scenario. A new scenario is created that consists of the same settings as the original scenario. You can then modify or retain the existing scenario settings. If you want to modify the settings of a scenario that is already promoted, you can create its copy and then make the necessary changes in the copied scenario.

To create a copy of a scenario:

1. In the Scenarios view, right-click the scenario to be copied and click **Menu** ⇨ **Copy Scenario**. The Copy Scenario dialog box appears and displays the current settings of the scenario.
2. Edit the scenario name and other scenario options and click **OK**. The dialog box closes. The scenario is saved with the new name and changes and the scenario is submitted for processing.

Delete a Scenario

If you do not want to use a scenario or its results, you can delete the scenario.

To delete a scenario, in the Scenarios view, right-click the scenario to be deleted and click **Menu** ⇨ **Delete Scenario**. The Confirm dialog box appears that displays the following message:

Are you sure you want to delete the scenario(s)?

Click **OK**. The scenario is deleted.

Chapter 19

Working with Results of a Scenario

Working with Results of a Service Level Sensitivity Analysis Scenario

Service level sensitivity analysis enables you to determine the service level sensitivity for an item in a network.

In the Scenarios view, double-click the service level sensitivity analysis type scenario whose results you want to view. The Scenario Details view opens and displays results of the scenario. The information and tasks that you can perform in the Scenario Details view differ based on the current status of the scenario. The following table provides a list of the different statuses of a scenario and the corresponding tasks that you can perform.

Note: You can view the current status of the scenario in the Progress column of the Scenarios view.

Table 19.1 *Scenario Statuses and Corresponding Tasks for Service Level Sensitivity Analysis*

Scenario Status	Available Tasks
Scheduled	• View input settings on page 146 • View system messages on page 147
Processing	• View input settings on page 146 • View system messages on page 147

Scenario Status	Available Tasks
Completed	• View input settings on page 146 • View summarized scenario results on page 147 • View scenario results per facility on page 147 • Promote scenario settings on page 155 • View system messages on page 147
Completed with errors	• View input settings on page 146 • View summarized scenario results on page 147 • View scenario results per facility on page 147 • View system messages on page 147
Errors	• View input settings on page 146 • View system messages on page 147
Failure	• View input settings on page 146 • View system messages on page 147
Promoted	• View input settings and promoted values on page 146 • View summarized scenario results on page 147 • View scenario results per facility on page 147 • View system messages on page 147

Working with Results of a Customer-Facing Facility Analysis Scenario

Customer-facing facility analysis enables you to analyze how to maximize the service levels for a group of items in customer-facing facilities.

In the Scenarios view, double-click the customer-facing analysis type of scenario whose results you want to view. The Scenario Details view opens and displays results of the scenario. The information and tasks that you can perform in the Scenario Details view differ based on the current status of the scenario. The following table provides a list of the different statuses of a scenario and the corresponding tasks that you can perform.

Note: You can view the current status of the scenario in the Progress column of the Scenarios view.

Table 19.2 *Scenario Statuses and Corresponding Tasks for Customer-Facing Facility Analysis*

Scenario Status	Available Tasks
Scheduled	• View input settings on page 146 • View system messages on page 147
Processing	• View input settings on page 146 • View system messages on page 147
Completed	• View input settings on page 146 • View summarized scenario results on page 148 • View scenario results per facility on page 149 • Specify a service level value for multiple facility and item pairs on page 154 • Promote scenario settings on page 156 • Re-optimize the scenario on page 152 • View system messages on page 147
Completed with warnings	• View input settings on page 146 • View summarized scenario results on page 148 • View scenario results per facility on page 149 • Specify a service level value for multiple facility and item pairs on page 154 • Promote scenario settings on page 156 • Re-optimize the scenario on page 152 • View system messages on page 147
Errors	• View input settings on page 146 • View system messages on page 147
Failure	• View input settings on page 146 • View system messages on page 147
Promoted	• View input settings on page 146 • View summarized scenario results on page 148 • View scenario results per facility on page 149 • View system messages on page 147

Working with Results of an Internal Facility Service Level Analysis Scenario

Internal facility service level analysis enables you to analyze the optimized service levels of the internal facilities for given service levels at customer-facing facilities.

In the Scenarios view, double-click the internal facility service level analysis type of scenario whose results you want to view. The Scenario Details view opens and displays results of the scenario. The information and tasks that you can perform in the Scenario Details view differ based on the current status of the scenario. The following table provides a list of the different statuses of a scenario and the corresponding tasks that you can perform.

Note: You can view the current status of the scenario in the Progress column of the Scenarios view.

Table 19.3 *Scenario Statuses and Corresponding Tasks for Internal Facility Service Level Analysis*

Scenario Status	Available Tasks
Scheduled	• View input settings on page 146 • View system messages on page 147
Processing	• View input settings on page 146 • View system messages on page 147
Completed	• View input settings on page 146 • View summarized scenario results on page 149 • View scenario results per facility on page 150 • Specify a service level value for multiple facility and item pairs on page 154 • Promote scenario settings on page 156 • Re-optimize the scenario on page 153 • View system messages on page 147
Completed with warnings	• View input settings on page 146 • View summarized scenario results on page 149 • View scenario results per facility on page 150 • Specify a service level value for multiple facility and item pairs on page 154 • Promote scenario settings on page 156 • Re-optimize the scenario on page 153 • View system messages on page 147

Scenario Status	Available Tasks
Completed with errors	• View input settings on page 146 • View summarized scenario results on page 149 • View scenario results per facility on page 150 • View system messages on page 147
Errors	• View input settings on page 146 • View system messages on page 147
Failure	• View input settings on page 146 • View system messages on page 147
Promoted	• View input settings on page 146 • View summarized scenario results on page 149 • View scenario results per facility on page 150 • View system messages on page 147

Working with Results of an Ad Hoc Analysis Scenario

Ad hoc analysis enables you to analyze how change in certain metric values for a group of items and facilities impacts their policy parameters and costs.

In the Scenarios view, double-click the ad hoc analysis type of scenario whose results you want to view. The Scenario Details view opens and displays results of the scenario. The information and tasks that you can perform in the Scenario Details view differ based on the current status of the scenario. The following table provides a list of the different statuses of a scenario and the corresponding tasks that you can perform.

Note: You can view the current status of the scenario in the Progress column of the Scenarios view.

Table 19.4 *Scenario Statuses and Corresponding Tasks for Ad Hoc Analysis*

Scenario Status	Available Tasks
Scheduled	• View input settings on page 146 • View system messages on page 147
Processing	• View input settings on page 146 • View system messages on page 147

Scenario Status	Available Tasks
Completed	• View input settings on page 146 • View summarized scenario results on page 150 • View scenario results per facility on page 151 • Promote scenario settings on page 156 • View system messages on page 147
Completed with warnings	• View input settings on page 146 • View summarized scenario results on page 150 • View scenario results per facility on page 151 • Promote scenario settings on page 156 • View system messages on page 147
Completed with errors	• View input settings on page 146 • View summarized scenario results on page 150 • View scenario results per facility on page 151 • View system messages on page 147
Errors	• View input settings on page 146 • View system messages on page 147
Failure	• View input settings on page 146 • View system messages on page 147
Promoted	• View input settings and promoted values on page 146 • View summarized scenario results on page 150 • View scenario results per facility on page 151 • View system messages on page 147

View Input Selection Settings

You can view the selection settings that you specified for creating the scenario at anytime in the Scenario Details view.

To view the input selection settings for the scenario, in the Scenario Details view, click the **Settings** tab.

Note: For promoted scenarios of the service level sensitivity analysis and ad hoc analysis scenario types, the **Settings** tab also displays the promoted values.

If the list of the selected items, facilities, or networks (whichever is applicable for the scenario) is long, then all of them are not listed in the tab. You can click the link that is provided at the end of the list to view the entire list.

View System Messages

If the scenario processing contains warning or error messages, you can view details of these messages in the Scenario Details view.

To view system messages, in the Scenario Details view, click the **Messages** tab. A data table is displayed that lists the warning or error messages and the affected item and facility names.

You can use the system messages to resolve the problems in your scenario and again analyze it.

View Summarized Results for Service Level Sensitivity Analysis Scenario

You can view a summary of the scenario results in a graphical format in the Scenario Details view.

To view the summarized results for the scenario, in the Scenario Details view, ensure that the **Overall Results** tab is displayed. The tab displays a line graph that shows the variation in the total inventory cost for the different service levels within the specified range across all items in the network.

Note: By default, when you open the Scenario Results view, the **Overall Results** tab is displayed.

View Service Level Sensitivity Analysis Scenario Results Per Facility

You can view the total inventory cost for every upstream facility and downstream facility from the reference selected facility in the scenario, for each service level value within the specified range, in the Scenario Details view.

To view the scenario results per facility:

1. In the Scenario Details view, click the **Results By Facility** tab. A data table is displayed that lists the upstream and downstream facilities in a network tree structure and displays the total inventory cost for every service level increment value.

2. To view scenario results for a facility in a graphical format, click the check box for the facility name. A graph is displayed below the data table. The graph title shows the name of the facility for which the graph is displayed.

   Note: You can view graphs for all the facilities. The graphs open next to each other.

3. (Optional) To view only the table, only the graph, or both table and graph, click **Menu** ⇨ **View Table Only**, **Menu** ⇨ **View Graphs Only**, or **Menu** ⇨ **View Graph And Table** respectively.

   Note: Not all graphs are displayed. You can view only those graphs that you opened earlier.

View Summarized Results for Customer-Facing Facility Analysis Scenario

You can view the current, optimized, and re-optimized values for inventory cost and service level for all facilities in the Scenario Details view. You can also specify new values for minimum service level and specify a new inventory budget for the scenario.

To view metric summary for the scenario:

In the **Results By Facility** tab of the Scenario Details view, expand the **Summary** section.

Note: You can expand a section by clicking  for that section or the name of the section.

Values for the following metrics are displayed:

- Current inventory cost
- Set inventory budget

  Note: An empty text box is displayed for this metric.

- Optimized inventory cost
- New inventory cost

  Note: The value of this metric is same as the optimized inventory cost value, unless you specify a new service level and re-optimize the scenario.

- Current service level
- Set service level

  Note: An empty text box is displayed for this metric.

- Optimized service level
- New service level

  Note: The value of this metric is same as the optimized service level value, unless you specify a new minimum service level and re-optimize the scenario.

View Customer-Facing Facility Analysis Scenario Results Per Facility

You can view the total inventory cost and service level values at two levels, aggregated over all items per facility and for each facility and item pair.

To view the scenario results per facility:

1. In the Scenario Details view, ensure that the **Results By Facility** tab is displayed. The tab displays a data table that provides the total inventory cost and service level values for all items per facility.

   The metric values are aggregated over all items in the facility. The table displays the current metric values as they exist in the system, the optimized metric values after the scenario run completed, and also the new values of the metrics.

   Note: The new metric values contain the same values as the optimized values, unless you have specified a new service level value and re-optimized the scenario.

2. To view a summary of the metric values for all facilities, click the **Summary** section.
3. To view scenario results for every item in a facility, for the specific facility, click the link in the Items column. The metric values are displayed for all the items in the selected facility. The **Summary** section displays a new subsection that contains metric values for the selected facility.

Note: If the Optimized Inventory Cost column, New Inventory Cost column, or both display an alert icon  , then it indicates that the inventory cost values exceed the threshold value that you specified during scenario creation.

View Summarized Results for Internal Facility Service Level Analysis Scenario

You can view and compare the current, optimized, and re-optimized values for certain metrics in the Scenario Details view.

To view the summarized results for the scenario, in the Scenario Details view, ensure that the **Overall Results** tab is displayed. The tab displays bar charts for each of the following metrics:

- Inventory Cost
- On-Hand Cost
- On-Hand Holding Cost
- Average Service Level (%)

Each bar chart contains a separate bar for the current value, optimized value, and re-optimized or new value of the metric. By default, the new value is same as the optimized metric value, unless you specify a new service level value and re-optimize the scenario.

View Internal Facility Service Level Analysis Scenario Results Per Facility

You can view and compare the current, optimized, and re-optimized values for certain metrics such as total inventory cost and service level at two levels, aggregated over all items per facility, and for each facility and item pair in the Scenario Details view.

To view the scenario results per facility:

1. In the Scenario Details view, click the **Results By Facility** tab. The tab displays a data table that provides the current, optimized, and new values for the following metrics for all items per facility:
   - Inventory Cost
   - On-Hand Cost
   - Holding Cost
   - Service Level

   Note: The new setting values are the same as the optimized setting values, unless you have re-optimized the scenario.
2. To view the metric values for a facility in graphical format, double-click in the row that contains the facility name. Four graphs are displayed below the data table. Each graph contains a bar for current value, optimized value, and new or re-optimized value. The graph title shows the name of the metric for which the graph is displayed.
3. (Optional) To view only the table, only the graph, or both table and graph, click **Menu** ⇨ **View Table Only**, **Menu** ⇨ **View Graphs Only**, or **Menu** ⇨ **View Graph And Table** respectively.

   Note: You can view graphs for the facility that you opened earlier.
4. To view scenario results for every item in a facility, for the specific facility, click the link in the Items column. The contents of the data table refresh and the metric values are displayed for all the items in the selected facility.

Note: If the Inventory Cost column displays an alert icon  , then it indicates that the inventory cost value exceeds the threshold value that you specified during scenario creation. This icon can be displayed at both levels of the data table.

View Summarized Results for Ad Hoc Analysis Scenario

You can view and compare the current and optimized values in each set for certain metrics in the Scenario Details view.

To view the summarized results for the scenario:

In the Scenario Details view, ensure that the **Overall Results** tab is displayed. The tab displays bar charts for each of the following metrics:

- Inventory Cost
- Pipeline Cost
- On-Hand Cost
- On-Hand Holding Cost

Each bar chart contains a separate bar for the current value and for each set in the scenario.

View Ad Hoc Analysis Scenario Results Per Facility

You can view and compare the current values and the optimized values in each set for certain metrics such as inventory cost and on-hand cost at two levels, aggregated over all items per facility and for each facility and item pair, in the Scenario Details view.

To view the scenario results per facility:

1. In the Scenario Details view, click the **Results By Facility** tab. The tab displays a data table that provides the current values for the following metrics for all items per facility:
   - Inventory Cost
   - On-Hand Cost
   - Holding Cost
   - Pipeline Cost
   - Service Level
2. To view optimized metric values for a set, in the **View results for** list, select the set name. The contents of the data table refresh and the optimized values for the metrics are displayed.
3. To view the metric values in graphical format, double-click in the row that contains the facility name. Four graphs are displayed below the data table. The graph title shows the name of the metric for which the graph is displayed.

   Note: You can view graphs for current settings and for settings of another set of the scenario too.
4. (Optional) To view only the table, only the graph, or both table and graph, click **Menu** ⇨ **View Table Only**, **Menu** ⇨ **View Graphs Only**, or **Menu** ⇨ **View Graph And Table** respectively.

   Note: You can view graphs for the facility that you opened earlier.
5. To view scenario results for every item in a facility, for the specific facility, click the link in the Items column. The metric values for all the items in the selected facility are displayed in the data table.
6. If you want to view a summary of the current and optimized inventory cost and service level values for the selected facility, click the **Summary** section to expand it.
7. To navigate to the previous level of the data table, in the toolbar, click  .

Note: If the Inventory Cost column displays an alert icon  , then it indicates that the inventory cost value exceeds the threshold value that you specified during scenario creation. This icon can be displayed at both levels of the data table.

Re-Optimize the Customer-Facing Facility Analysis Scenario

The Scenario Details view enables you to specify new scenario settings and re-optimize the scenario to view the impact on the other metric values.

To re-optimize the scenario:

1. In the Scenario Details view, ensure that the **Results By Facility** tab is displayed.
2. To specify a new inventory budget for the scenario, click the **Summary** section to expand it, and in the **Set inventory budget** box, type the new budget value. The **Re-Optimize Scenario** link is activated.
3. To specify a new minimum service level value for all the facility and item pairs in the scenario, in the **Summary** section, in the **Set service level minimum** box, type the new service level. The **Re-Optimize Scenario** link is activated, if not already active.
4. To specify a new service level value for a facility and item pair:
   a. Select a facility: For a specific facility, click the link in the Items column. The metric values for all the items in the selected facility are displayed in the data table. The **Summary** section displays a new subsection that contains metric values for the selected facility.
   b. Specify a new service level value: For a specific item, in the New Service Level column of the data table, double-click the currently displayed value. The value is selected.
   c. Press DELETE and in the empty box, type the new service level value and press ENTER. The **Re-Optimize Scenario** link is activated, if not already active.

   Note: You can perform steps a–c for other items too.
5. If you want to specify a common service level value for multiple facility and item pairs, see "Specify a Service Level Value for Multiple Facility and Item Pairs" on page 154.
6. To re-optimize the scenario, click **Re-Optimize Scenario**. A message box is displayed that contains the following message:

   `The scenario is scheduled for re-optimization. To view the completion status of the scenario, see the Progress column in the Scenarios view.`

   The Scenario Details view closes. For this scenario, the Progress column in the Scenarios view displays **Scheduled**.
7. To view the re-optimized metric values, wait until the Progress column displays **Completed**, or **Completed with warnings** status and then double-click the scenario to open the Scenario Details view.

   You can view results of the re-optimization process in the **Results By Facility** tab. Based on the scenario settings that you modified, the re-optimization results are displayed under different columns:

   - If you modified the inventory budget, minimum service level value, and also updated any new service level values, then the scenario recalculates optimized values for inventory cost and service level based on the specified inventory budget and minimum service level. You can view the re-optimized inventory costs for all

the facility and item pairs are displayed under the Optimized Inventory Cost column, the re-optimized service level values are displayed under the Optimized Service Level column. The scenario also calculates new values for inventory cost and service level as per the specified new service level value. You can view the new values for inventory cost and service level under the New Inventory Cost and New Service Level columns.

- If you modified the inventory budget, or the minimum service level value, or both, then the re-optimized inventory costs for all the facility and item pairs are displayed under the Optimized Inventory Cost column and the re-optimized service level values are displayed under the Optimized Service Level column.
- If you specified any new service level value for the scenario, then the re-optimized values are displayed under the New Inventory Cost and the New Service Level columns.

Re-Optimize the Internal Facility Service Level Analysis Scenario

The Scenario Details view enables you to input new service level values for facility and item pairs and re-optimize the scenario to view the impact on the other metric values.

To re-optimize the scenario:

1. In the Scenario Details view, ensure that the **Results By Facility** tab is displayed.
2. To specify a new service level value for a facility and item pair:
   a. Select a facility: For a specific facility, click the link in the Items column. The metric values for all the items in the selected facility are displayed in the data table.
   b. Select the item: For a specific item, in the New Service Level column of the data table, double-click the currently displayed value. The value is selected.
   c. Press DELETE and in the empty box, type the new service level value and press ENTER. The **Re-Optimize Scenario** link is activated.

   Note: You can perform steps a–c for other items too.
3. If you want to specify a common service level value for multiple facility and item pairs, see "Specify a Service Level Value for Multiple Facility and Item Pairs" on page 154.
4. To re-optimize the scenario, click **Re-Optimize Scenario**. A message box is displayed that contains the following message:

   `The scenario is scheduled for re-optimization. To view the completion status of the scenario, see the Progress column in the Scenarios view.`

   The Scenario Details view closes. For this scenario, the Progress column in the Scenarios view displays **Scheduled**.
5. To view the re-optimized metric values, wait until the Progress column displays **Completed**, or **Completed with warnings** status and then double-click the scenario to open the Scenario Details view.

Specify a Service Level Value for Multiple Facility and Item Pairs

You can specify a common service level value for multiple facility and item pairs in the Scenario Details view. You can perform this task only for customer-facing facility analysis and internal facility service level analysis.

To specify a service level value for multiple facility and item pairs:

1. In the Scenario Details view, ensure that you are viewing the data table in the **Results By Facility** tab at level two.
2. To select multiple facility and item pairs: In the data table, select a row. Then, press CTRL and select the other rows.
3. Right-click in the data table and from the pop-up menu, select **Set Service Level**. The Enter New Service Level dialog box appears.
4. In the **New Service Level** box, type the service level value in percentage and click **OK**. The new service level value is set for all the selected facility and item pairs.

Chapter 20

Promoting Scenario Settings

Overview of Promoting Scenario Settings

A scenario enables you to view the impact of change in inputs on certain output parameters. After you analyze the scenario results, you can submit or promote values of input metrics such as service level, lead time, demand, and unit cost in the system. The promoted values are saved in a table. You need to manually update the promoted values in the underlying tables so that the values can be used in the next run of the inventory optimization process.

The input metrics that can be promoted differ based the scenario type. For customer-facing facility analysis, service level sensitivity analysis, and ad hoc analysis, the promoted settings are applied to all the facility and item pairs that you selected for the scenario. For internal facility service level analysis, the promoted settings are applied to the entire network.

You can promote settings for a scenario only once. You can view the promoted scenario, but cannot make any changes to it. If you want to promote a scenario again, create a copy of the scenario, modify the settings, and then promote the settings.

Promote Scenario Settings

Promote Settings for Service Level Sensitivity Analysis Scenario

After you review the scenario results, you can promote a service level value. This service level value is applied to all the items and the facility that you selected for the scenario. You cannot promote the settings of a scenario that has been promoted earlier.

To promote scenario settings:

1. In the toolbar of the Scenario Details view, click  . Alternatively, click **Menu** ⇨ **Promote Scenario Settings**. The Promote Settings dialog box appears.
2. Review the values in the settings and in the **Service Level to Promote** box, type the value of the service level that you want to promote for all the items in the facility, and click **OK**. The service level value is promoted and in the Scenarios view, the value in the Progress column of the data table changes to **Promoted**. The promoted values are displayed in the **Settings** tab.

Note: When you open the Scenario Details view for a promoted scenario, you can view the scenario details only. You cannot specify any new values.

Promote Settings for Customer-Facing Facility and Internal Facility Service Level Analysis Scenarios

After you review the scenario results, you can promote the scenario settings. The scenario settings are applied to all the facility and item pairs that are included in the scenario. You cannot promote the settings of a scenario that has been promoted earlier.

Note: If you want to promote scenario settings based on the new service level values that you modified, then you must ensure that you re-optimized the scenario for the new values.

To promote scenario settings:

1. In the toolbar of the Scenario Details view, click  . The Promote Settings dialog box appears and displays the following warning message:

   The settings being promoted will apply to all the items at all facilities contained in the scenario. Once these settings have been promoted, the scenario cannot be modified. It can only be viewed. You can make a copy of the scenario in order to make changes and promote them.
2. (Optional) Select **Do not show this message again**.
3. Click **OK**. The scenario settings are promoted and the Progress column in the Scenarios view displays **Promoted** for the scenario.

Note: When you open the Scenario Details view for a promoted scenario, you can view the scenario details only. You cannot specify any new values.

Promote Settings for Ad Hoc Analysis Scenario

After you review the scenario results, you can promote the scenario settings. The scenario settings are applied to all the facility and item pairs that you selected for the scenario. You cannot promote the settings of a scenario that has been promoted earlier.

To promote scenario settings:

1. In the toolbar of the Scenario Details view, click  . The Promote Settings dialog box appears.
2. In the **Selected scenarios sets** section, select the set that you want to promote and click **Promote Settings**. The scenario settings are promoted and the Progress column in the

Scenarios view displays **Promoted** for the scenario. The promoted values are displayed in the **Settings** tab.

Note: When you open the Scenario Details view for a promoted scenario, you can view the scenario details only. You cannot specify any new values.

Part 5

The Forecast Management Workspace

Chapter 21

Introduction to Forecast Management

About Forecast Management

Overview of Forecast Management

The Forecast Management module forecasts the service parts demand and enables you to view the demand forecasts. Through the user interface of the Forecast Management module, you can specify external demand for the time series that lack historical demand data and hence, cannot be forecasted. The Forecast Management module also enables you to view the estimates of long-term forecasts (one-time buy) of items. The forecasting process runs in batch mode with no manual intervention. However, you can edit the batch process parameters and thereby control the batch process. The Forecast Management module uses SAS Forecast Studio as the analytical workbench for business administrators or analysts. The demand forecast results are used by the Inventory Optimization module.

Key Features of Forecast Management

Time Series Forecasting

The Forecast Management module is based on time series forecasting. Time series forecasting assumes that there exists enough historical demand data that can be used for estimating the future demand of an item and that the behavior or trend of the future demand is similar to the historical demand. The historical demand data is derived from the historical sales information of the particular item or item group. The past demand of the item is instrumental in identifying the innate characteristics of its future demand. These characteristics include factors such as seasonality, business cycle, past trends, and external factors or events that might influence the demand. Time series forecasting uses a set of forecasting models that are fundamental to this process.

Automated Forecasting Process

In a practical scenario, there can be thousands of items in hundreds of facilities (leading to a forecast volume of about a million facility and item pairs) that need to be forecasted, say every week. To improve the efficiency of the forecasting process, the Forecast Management module is designed to run these forecasts in an automated mode. The automated forecasting

process needs minimal manual intervention and performs self-correction so that the forecasting process automatically adapts to the latest changes in the demand pattern. Hence, if the existing forecasting model generates inaccurate forecasts, the underlying logic of the forecasting process identifies a new forecasting model for that item. The forecasting process is controlled by batch process parameters. You can control the batch process by managing these batch process parameters. In case of item succession, where a new item replaces an existing item, the forecasting process uses the history of existing item to generate forecasts for the successor items.

Managing the Forecasting Results

After the periodic forecasting process completes, you can view the summarized results of the process. You can also view details of the forecasts for each facility and item pair. You can input or import external future demand for items with insufficient or no demand history. Demand forecast information can be divided into two components: demand by external customers at the customer-facing facilities and demand by non-customer-facing (internal) facilities to customer-facing facilities. The Forecast Management workspace displays the demand information for the customer-facing facilities. The second component (that is, the internal stock order information) is used for inventory optimization and can be viewed in the Inventory Analysis workspace.

Revising the Forecast Results

You can use your analytical expertise to rectify the inaccurate results of the forecasting batch process or to modify any of the forecast results. You can use SAS Forecast Studio, the analytical workbench of the Forecast Management module, to create new forecasting models or to customize the existing models. You can then use the updated forecasting models and reforecast the forecast results. The revised forecast results can be updated in the source system or can be further analyzed in the Scenario Development workspace.

Seamless Integration with Downstream Systems

Demand projection details of service parts are used for estimating optimal inventory replenishment policies, namely reorder level and order-up-to level. The inventory optimization module uses information of these policies and of the current inventory availability to determine optimal replenishment quantities and periodicity to service the projected demand.

Chapter 22

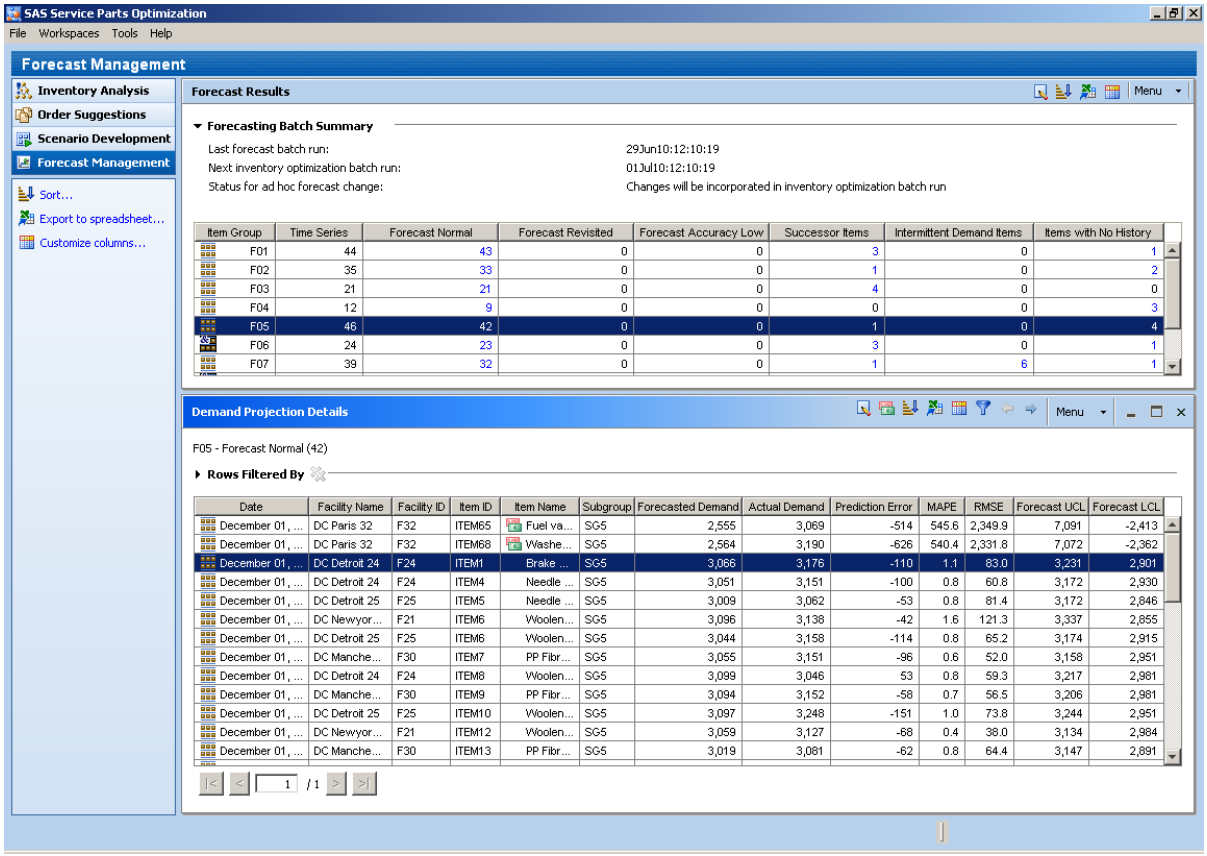
Getting Started with the Forecast Management Workspace

Overview of the Forecast Management Workspace

The Forecast Management workspace enables you to view and manage results of the forecasting process.

In the workspace, you can control the forecast results by modifying parameters that control the forecasting batch process. For forecast results with no or insufficient history, you can specify external forecast values.

Display 22.1 *The Forecast Management Workspace*



If you log on to the SAS Service Parts Optimization application as a user with the role of a buyer, then you can view all the details in the workspace. You cannot specify external forecast values, nor can you modify the forecasting process parameters. However, if you are assigned the forecaster's role, then you can also specify external forecast values. Users with an advance forecaster role can edit the forecasting parameters and perform all these tasks.

In the Forecast Management workspace, you can perform the following tasks:

- view information of the forecasting and inventory optimization batch processes
- view results of the forecasting process for the different result types
- edit forecasting process parameters
- specify forecast values for items with no history
- view end-of-life forecast results for a time series
- create forecast input data to be used by SAS Forecast Studio for forecasting

The Forecast Management Workspace Components

The Forecast Management workspace enables you to view results of the forecasting batch process.

The workspace consists of two views:

- Forecast Results view on page 165
- Demand Projection Details view on page 170

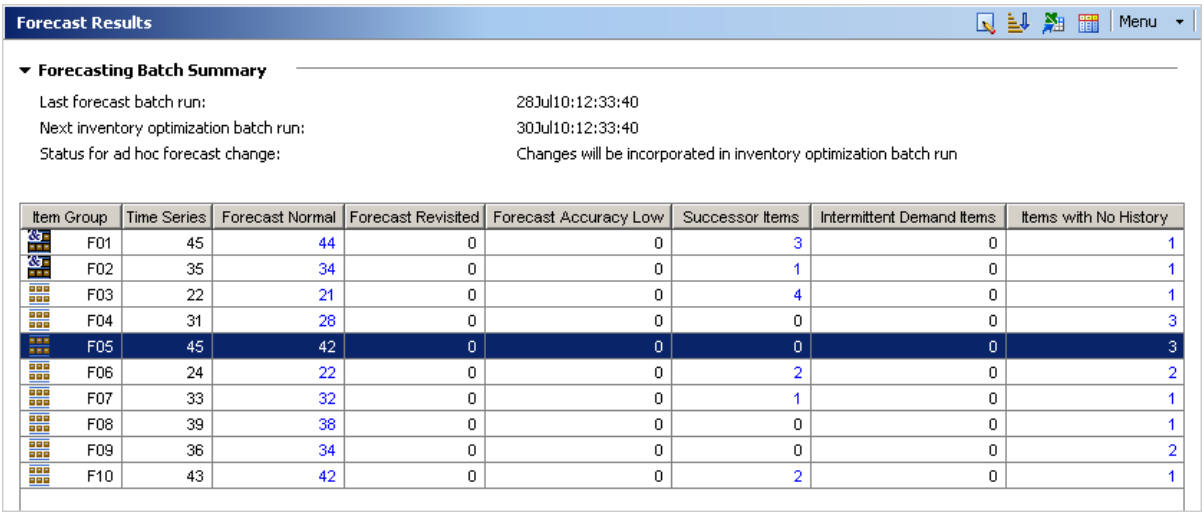
Overview of the Forecast Results View

The Forecast Results view provides information about the forecasting and inventory optimization batch processes, and enables you to view and analyze results of the forecasting batch process.

The forecast results are categorized into six result types:

- normal forecast results
- revisited forecast results
- forecast results with low accuracy
- forecast results for successor items
- forecast results for items with no or insufficient history
- forecast results for items with intermittent demand

Display 22.2 *The Forecast Results View*



Item Group	Time Series	Forecast Normal	Forecast Revisited	Forecast Accuracy Low	Successor Items	Intermittent Demand Items	Items with No History
F01	45	44	0	0	3	0	1
F02	35	34	0	0	1	0	1
F03	22	21	0	0	4	0	1
F04	31	28	0	0	0	0	3
F05	45	42	0	0	0	0	3
F06	24	22	0	0	2	0	2
F07	33	32	0	0	1	0	1
F08	39	38	0	0	0	0	1
F09	36	34	0	0	0	0	2
F10	43	42	0	0	2	0	1

The Forecast Results view is the default or primary view when you open the Forecast Management workspace and you cannot close this view. You can open the Demand Projection Details view from this view.

In the Forecast Results view, you can complete the following main tasks:

- view information of the forecasting and inventory optimization batch processes
- view results of the forecasting process for the different result types
- edit forecasting process parameters

Apart from these tasks, you can also perform the following tasks that are common across all workspaces:

- sort the table rows

- export the table to a spreadsheet
- customize the columns of the table
- modify the width of the table columns

The Forecast Results View Components

Overview

The Forecast Results view provides information of the forecasting and inventory optimization batch processes, and enables you to view and analyze results of the forecasting batch process.

Forecasting Batch Summary Section

Use the **Forecasting Batch Summary** section to view information about the forecasting and inventory optimization batch processes.

The **Forecasting Batch Summary** section displays the following information:

- date and time when the forecast batch process was last run.
- date and time when the next inventory optimization batch process is scheduled to run.
- status of whether the ad hoc changes will be incorporated in the next scheduled inventory optimization batch process or in the next forecasting batch process. This information is dynamic and changes as per the status of the batch processes.

Note: Information about the inventory optimization batch process is not displayed if the administrator has hidden the Inventory Analysis workspace.

By default, this section is collapsed. To view the **Forecasting Batch Summary** section, click  .

Data Table in the Forecast Results View

The data table in the Forecast Results view includes the following columns of information:

Item Group
displays the name of the item group.

Either of the following icons are displayed along with the column name:

indicates that the forecasting process parameters for the item group are set to the default values.

indicates that the forecasting process parameters for the item group are modified.

Time Series
displays the number of time series in the item group. This value is equal to the sum of the values in the Forecast Normal, Forecast Accuracy Low, and Items with No History columns.

Forecast Normal
: displays the number of time series in the item group that have forecast results with high accuracy. This number indicates the number of time series that are processed by the default models of the forecasting batch process.

Forecast Revisited
: displays the number of time series in the item group for which forecast model selection process is revisited.

Forecast Accuracy Low
: displays the number of time series in the item group that have forecast results with low accuracy. This number indicates the number of time series in the item group for which the forecasting batch process could not generate accurate results.

Successor Items
: displays the number of successor items in the item group.

Intermittent Demand Items
: displays the number of items in the item group that have intermittent demand.

Items with No History
: displays the number of items in the item group that have insufficient or no historical demand data. Due to insufficient history, the forecasting batch process is unable to generate forecast results for these items.

Forecast Results View Toolbar and Menu Options

The following table lists the options that are available from the toolbar and menu of the Forecast Results view.

Table 22.1 *Toolbar and Menu Options in the Forecast Results View*

Toolbar Button	Menu Option	Action
Not available	**Open Demand Projection Details**	You can further select either of the following options from the menu: **Forecast Normal** opens the Demand Projection Details view that displays demand projections for time series that have normal forecast results. **Forecast Revisited** opens the Demand Projection Details view that displays demand projections for time series that have revisited forecast results. **Forecast Accuracy Low** opens the Demand Projection Details view that displays demand projections for time series that have forecast results with low accuracy. **Successor Items** opens the Demand Projection Details view that displays demand projections for time series that have successor items. **Intermittent Demand Items** opens the Demand Projection Details view that displays the demand projections for time series that have items with intermittent demand. **Items with No History** opens the Demand Projection Details view that displays demand projections for time series that have items with insufficient or no history.
Not available	**Close Demand Projection Details**	Closes the Demand Projection Details view. This menu item is available only when the Demand Projection Details view is already open.

Toolbar Button	Menu Option	Action
	**Edit Parameters**	Opens the Edit Forecast Group Parameters dialog box that enables you to modify values of the parameters that control the forecast results for facility and item pairs of the selected item group. This option is available only if you log on as a user with the role of an advance forecaster.

Apart from these options, the following common options are also available:

- **Sort**
- **Clear Sort**
- **Export to Spreadsheet**
- **Customize Columns**
- **Help**

For details about the common options, see "Common Toolbar and Menu Options" on page 31.

Open the Demand Projection Details View

You can view the detailed results of the forecasting process for a selected item group and for a chosen result type in the Demand Projection Details view.

To open the Demand Projection Details view:

1. In the Forecast Results view, select an item group or a row in the data table.
2. In the view menu, select either of the following menu items:
   - **Open Demand Projection Details ⇨ Forecast Normal**
   - **Open Demand Projection Details ⇨ Forecast Revisited**
   - **Open Demand Projection Details ⇨ Forecast Accuracy Low**
   - **Open Demand Projection Details ⇨ Successor Items**
   - **Open Demand Projection Details ⇨ Intermittent Demand Items**
   - **Open Demand Projection Details ⇨ Items with No History**

Alternatively, click the value that is displayed in either of the following columns:

- Forecast Normal
- Forecast Revisited
- Forecast Accuracy Low
- Successor Items
- Intermittent Demand Items

- Items with No History

The Demand Projection Details view opens for the selected item group and result type.

Close the Demand Projection Details View

The Demand Projection Details view displays detailed results of the forecasting process for a selected item group and for a chosen result type.

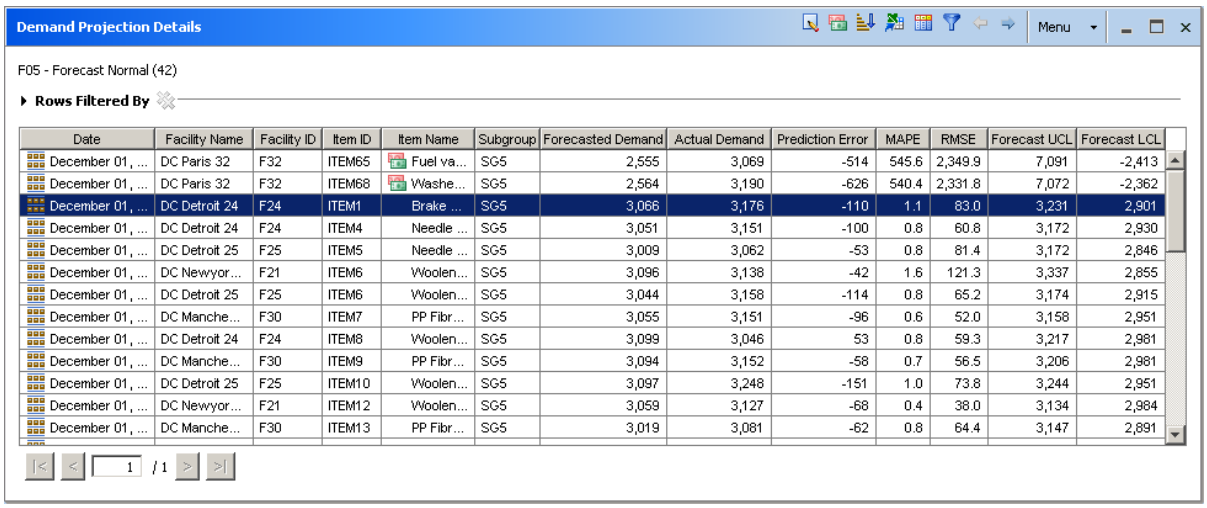
To close the Demand Projection Details view, click  in the Demand Projection Details view. Alternatively, in the view menu of the Forecast Results view, select **Close Demand Projection Details**.

Overview of the Demand Projection Details View

The Demand Projection Details view displays demand projections for time series that belong to the result type that you selected in the Forecast Results view. You can open the Demand Projection Details view for either of the six result types.

For details about the result types, see "Overview of the Forecasting Process Results" on page 179.

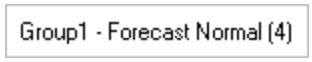
Display 22.3 *The Demand Projection Details View*



The Demand Projection Details view displays demand projection information at two levels.

At level one, you can view demand projection details for all facility and item pairs for the date when the forecasting batch process was last run.

At level two, you can select a facility and item pair and view details for all its time series in both tabular and graphical formats. The top left corner of the Demand Projection Details view displays a breadcrumb trail. When you open the view, the default text or first location in the breadcrumb trail shows information about the item group, the result type, and the number of rows. For example:



When you further drill down into the table at level one to view projection details at time series level (level two), the selected facility and item pair is appended to the breadcrumb trail. For example:

The breadcrumb trail also includes the subgroup name, if the administrator has turned on the visibility of subgroups.

In the Demand Projection Details view, you can complete the following main tasks:

- view demand projections for each result type
- specify forecast values for items with no history
- view end-of-life forecast results for a time series
- copy data for the selected time series to a back-end table that can be used by SAS Forecast Studio for reforecasting
- view subgroup properties
- edit forecasting process parameters for a time series

Apart from these tasks, you can also perform the following tasks that are common across all workspaces:

- sort the table rows
- export the table to a spreadsheet
- customize the columns of the table

The Demand Projection Details View Components

Overview

The Demand Projection Details view displays demand projections for time series from the item group and result type that you selected in the Forecast Results view.

Rows Filtered By Section

For details, see "Rows Filtered By Section" on page 27.

Data Table in the Demand Projection Details View

The data table in the Demand Projection Details view displays detailed results from the forecasting batch process for only one time series of all facility and item pairs. The time series belongs to the item group and result type that you selected in the Forecast Results view. The table displays details for the date when the forecasting batch process was last run for the facility and item pairs.

If you choose to view demand projection details for normal forecasts, revisited forecasts, forecast results with low accuracy, successor items, or intermittent demand items, then the data table includes the following columns of information:

Date
displays the date when the forecasting batch process was last run for the facility and item pair.

Either of the following icons are displayed along with the date:

indicates that the forecasting process parameters for the time series are set to the default values.

indicates that the forecasting process parameters for the time series are modified.

Facility Name
displays the name of the facility.

Item Name

displays the name of the item. If  is displayed, then it indicates that end-of-life forecasting values are available for the time series.

Facility ID
displays the ID of the facility.

Item ID
displays the ID of the item.

Subgroup
displays the name of the subgroup.

Note: This column is available only if the administrator creates subgroups in the back end and turns their visibility on.

Forecasted Demand
displays the predicted demand for the time series.

Actual Demand
displays the actual demand for the time series.

Prediction Error
displays the error in the forecasted demand for the time series. This value is the difference in the forecasted demand and actual demand.

MAPE
displays the mean absolute percent error in the forecasted demand for a time series.

RMSE
displays the root mean square error in the forecasted demand for a time series.

Forecast UCL
displays the upper control limit for forecasts for a time series.

Forecast LCL
displays the lower control limit for forecasts for a time series.

If you choose to view demand projection details for items with no history, then the data table contains the following columns of information:

Date
displays the date when the forecasting batch process was last run for the facility and item pair.

Facility Name
displays the name of the facility.

Item Name
displays the name of the item.

Facility ID
displays the ID of the facility.

Item ID
displays the ID of the item.

Subgroup
displays the name of the subgroup.

Note: This column is displayed only if the administrator creates subgroups in the back end and turns their visibility on.

External Demand
displays the demand data that you have entered for a time series.

Actual Demand
displays the actual demand for the time series.

Demand Error
displays the error in the forecasted demand for the time series. This value is the difference in the external demand and actual demand.

External Demand Variance
displays the variance in the external demand values.

Table Tab

The **Table** tab displays a table that contains demand projection details for all time series of the selected facility and item pair.

Values for MAPE and RMSE are displayed above the data table.

The data table for all result types, except items with no history contains the following columns of information:

- Date
- Facility Name
- Item Name
- Forecasted Demand
- Actual Demand
- Prediction Error
- Forecast UCL
- Forecast LCL

The data table for items with no history result type contains the following columns of information:

- Date
- Facility Name
- Item Name
- External Demand

- Actual Demand
- Demand Error
- External Demand Variance

These details are displayed in graphical format in the **Plot** tab.

Plot Tab

The graph in the **Plot** tab displays demand projection details for all time series of a facility and item pair that you select in the data table of the Demand Projection Details view. These details are displayed in tabular format in the **Table** tab.

The **Plot** tab shows line graphs for actual and predicted demand, and a band for the statistical confidence limits.

The components of the graph are as follows:

X-axis
displays all the dates when the forecasting batch process was run and also when the batch process is scheduled to run. The number of dates to be displayed on the graph depend on the base period and the planning horizon.

Y-axis
displays demand values.

Filter Pane

For details, see "Filter Pane" on page 28.

Demand Projection Details View Toolbar and Menu Options

The following table lists the options that are available from the toolbar and menu of the Demand Projection Details view.

Table 22.2 *Toolbar and Menu Options in the Demand Projection Details View*

Toolbar Button	Menu Option	Action
	**Close Demand Projection Details**	Closes the Demand Projection Details view.
Not available	**View Time Series Details**	Replaces the data table with contents of the **Table** tab. The tab displays a data table that shows demand projections for all time series of the selected facility and item pair. This option is available only when you view the demand projection details for one time series of all the facility and item pairs.

Toolbar Button	Menu Option	Action
	**Edit Parameters**	Opens the Edit Time Series Parameters dialog box that enables you to modify values of the parameters that control the forecast results for time series of the selected facility and item pair. This option appears dimmed if you are viewing demand projection details for items with no history. This option is available only if you log on as a user with the role of an advance forecaster.
Not available	**View Subgroup Properties**	Opens the View Subgroup Properties dialog box that displays the properties for the subgroup of the selected row. This option is available only if the administrator turns on the visibility for subgroups.
	**Import External Forecasts**	Opens the Import External Forecasts dialog box that enables you to enter forecast values or import the values from an external source file. This option is available if you choose to view demand projection details for the items with no history result type.
	**Estimate One-Time Buy**	Opens the Estimate One-Time Buy dialog box that enables you to view the end-of-life forecast results for a specific time series.
Not available	**Create Forecast Input Data**	Creates a table in the back end that stores the time series details for the selected facility and item pair. You can use these details to create a SAS Forecast Studio project.

Apart from these options, the following common options are also available:

- **Next**

  Note: This option is available only when you view the demand projection details for all the facility and item pairs in a data table. Otherwise, the option appears dimmed.

- **Back**

Note: This option is available only when you view the demand projection details for all the time series of the selected facility and item pair in the **Table** tab or **Plot** tab. Otherwise, the option appears dimmed.

- **Show/ Hide Filter**

  Note: This option is available only when you view the demand projection details for all the facility and item pairs.

- **Clear All Filters**

  Note: This option is available only when you view the demand projection details for all the facility and item pairs.

- **Sort**
- **Clear Sort**
- **Export to Spreadsheet**
- **Customize Columns**
- **Detach in Window**
- **Help**

For details about common options, see "Common Toolbar and Menu Options" on page 31.

Chapter 23

Managing Forecasting Process Parameters

Overview of the Forecasting Process Parameters

The results of the forecasting batch process are controlled by certain parameters. The administrator sets these parameters in the control tables during the pre-initial data load tasks for SAS Service Parts Optimization.

The forecasting process parameters can be categorized as follows:

- data preparation
- model generation
- model selection
- forecast
- quality

The Forecast Management workspace enables you to modify these parameters and thereby control the forecasting batch process. The modified values for the parameters are considered when the next forecasting batch process runs. If you are not satisfied with the impact of the changes on the forecasting batch process results, you can restore the earlier values.

You can modify the forecasting parameters at three levels:

- Forecast group level: The parameters for all time series that belong to the forecast group are modified.
- Subgroup level: The parameters for all time series that belong to the subgroup are modified.

  Note: You can use this feature only if subgroups are visible in the user interface. The administrator creates subgroups and turns their visibility on.
- Time series level: The parameters for a specific time series are modified.

Note: Parameter settings at time series level have the highest priority, followed by the settings at subgroup level, and then the settings at forecast group level. For example, any changes to the parameters at time series level override the parameter settings at the subgroup level and forecast group level for that time series.

Edit Forecasting Process Parameters

You can modify parameter values that control the forecasting batch process results.

To edit the forecasting batch process parameters:

1. Specify whether you want to edit parameters at item-group level, subgroup-level, or time series level.
   - To edit parameters for an item group or a subgroup:
     1. In the Forecast Results view, select the row that contains the item group for which you want to modify the parameter values.
     2. Click **Menu** ⇨ **Edit Forecast Group Parameters**. The Edit Forecast Group Parameters dialog box appears.
     3. To modify parameters for a specific subgroup, in the **Subgroup** list, select a subgroup.

   Note: The **Subgroup** list is available only if the administrator turns on the visibility of subgroups.
   - To edit parameters for a time series:
     1. In the Demand Projection Details view, select the row that contains the time series for which you want to modify the parameter values.
     2. Click **Menu** ⇨ **Edit Time Series Parameters**. The Edit Time Series Parameters dialog box appears.
2. Use the tabs in the dialog box to modify values of the parameters.
3. If you are editing parameters at time series level, perform the following steps:
   a. Click **Evaluate**. The page of the dialog box refreshes and displays the original and new values for RMSE, MAPE, forecasted demand, UCL, and LCL. The new values are calculated based on the modified forecasting process parameters.
   b. If you want to re-edit the parameters, click **Back**.
4. Click **Save**. The Edit Parameters dialog box closes. You will see  next to the parameters that are changed from their default values. If you modified the parameters for an item group or subgroup, then  is displayed in the relevant Item Group column in the Forecast Results view to indicate that the default parameters have changed. If you modified the parameters for a time series, then this icon is displayed in the Date column of the Demand Projection Details view. The updated parameters are considered in the next forecasting batch process run.

   Note: The indicative icons are displayed only when the parameters have values other than their default values. Otherwise, the icons are not displayed.

Chapter 24

Working with Forecasting Process Results

Overview of the Forecasting Process Results

The forecasting process runs as a batch job. The results of the process are categorized into the following result types:

- normal forecast results on page 180
- revisited forecast results on page 180
- forecast results for items with low accuracy on page 181
- forecast results for successor items on page 183
- forecast results for items with no or insufficient history on page 184
- forecast results for items with intermittent demand on page 183

The Forecast Results view displays the number of time series that belong to each of the result types. You can view details of the exact facility and item pair within a result type in the Demand Projection Details view.

View Results of the Forecasting Process

You can view the number of facility and item pairs that belong to a result type in the Forecast Results view. You can further analyze a result type to view demand projections for its facility and item pairs in the Demand Projection Details view.

To view results of the forecasting process:

1. In the Forecast Results view, for an item group, click the link in the result type column. The Demand Projection Details view opens and displays projection details for all facility and item pairs of the selected item group.

   Note: The view displays one row per facility and item pair. These rows contain the projection results for the date when the forecasting batch process was last run.

2. To view details for all the time series for a specific facility and item pair, double-click the row that contains the facility and item pair. The **Table** tab opens. This tab displays demand projections for time series for the selected facility and item pair.

3. (Optional) To view demand projections in a graphical format, click the **Plot** tab. The graph in the **Plot** tab displays actual and predicted demand quantities, upper and lower control limits for forecasts, and the statistical confidence limit value.

Overview of the Normal Forecast Results

The forecasting batch process generates a set of forecast results that have high accuracy, that is, low and acceptable error values. These results are called as the normal forecast results.

The list of facility and item pairs that have normal forecast results is obtained as a result of the forecasting batch process run. The forecasting process generates forecasts without rechecking the model repository and without selecting or fitting the forecasting model again. The inventory optimization process can directly use the values of the forecasted demand quantity and demand variance for the normal forecast results.

The number of facility and item pairs that have normal forecast results is displayed under the Forecast Normal column in the data table of the Forecast Results view. If you want to view demand projections for these facility and item pairs, you can open the Demand Projection Details view. You can also view time series details for each pair in this view, in both tabular and graphical formats.

Overview of the Revisited Forecast Results

The forecasting batch process generates a set of forecast results that is not as accurate as normal forecast results, but error values of this set is within the tolerance limits. Forecast results of this set are called revisited forecast results.

The list of facility and item pairs that have revisited forecast results is obtained as a result of the forecasting batch process run. For revisited forecasts, the forecasting process rechecks the forecasting models to verify if the previously selected forecasting model is

the best one available or whether another model can be selected. If another model is selected, the forecast process runs again with the newly selected model. The inventory optimization process can use the values of the forecasted demand quantity and demand variance only after rechecking model selection process and subsequent forecasting.

The number of facility and item pairs that have revisited forecast results is displayed under the Forecast Revisited column in the Forecast Results table. To view demand projection details for these facility and item pairs, you can open the Demand Projection Details view. You can also view time series details for each pair in this view, in both tabular and graphical formats.

Working with Forecast Results with Low Accuracy

Overview

The forecasting batch process might generate a set of forecast results that are not accurate enough for performing further analysis by the inventory optimization batch process. These are the forecast results with low accuracy.

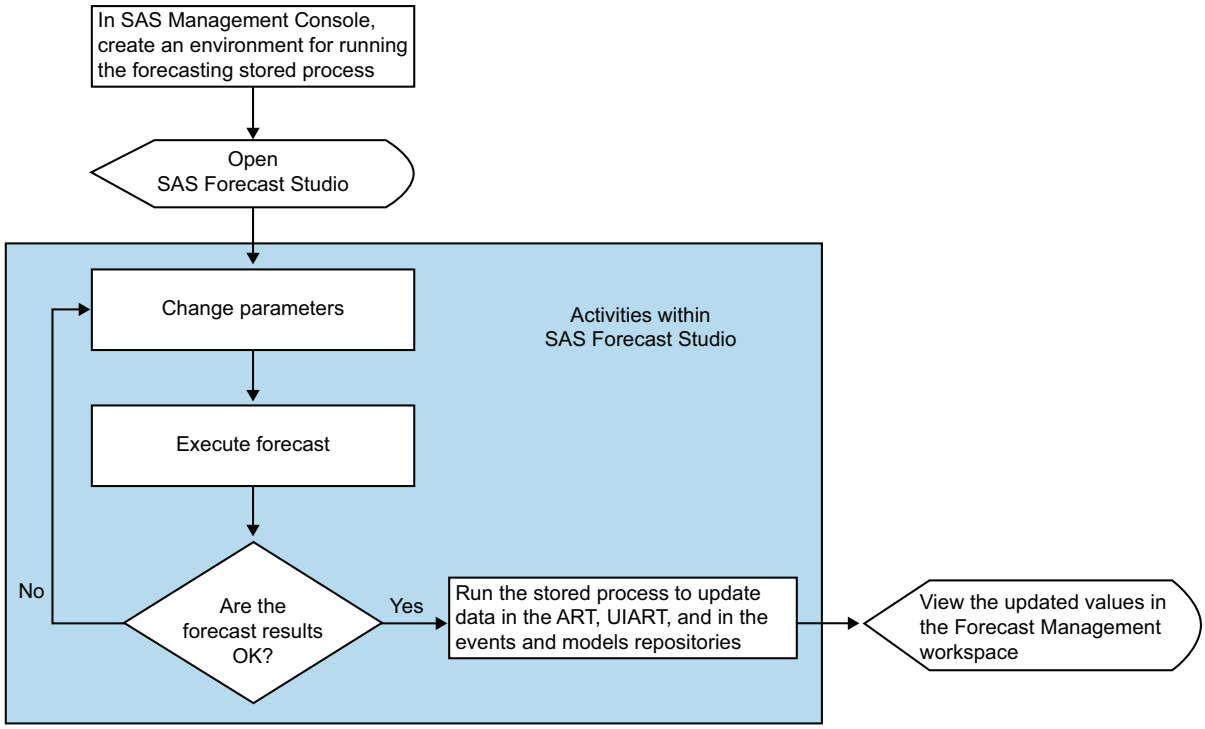
One or more of the error values for forecast results with low accuracy cross the tolerance limits. You can use features of SAS Forecast Studio to rediagnose and reselect the model parameters that impact the forecasting batch process. SAS Forecast Studio is a client application that is designed to automate and speed up the forecasting process. Through the interactive user interface, the application facilitates selection of forecasting variables, and defines events and forecasting models for future estimates of time-stamped data.

You can perform the following activities in SAS Forecast Studio:

- Generate forecast results by using the existing models of SAS Forecast Studio.
- Define your own forecasting models (custom models).
- Generate events that have a direct impact on the demand of items. The events can cause sudden and sustained rise or fall in demand.

SAS Service Parts Optimization is integrated with SAS Forecast Studio to enable you to modify the inaccurate forecast results and run forecast for time series that belong to any facility and item pair. This is done by using the forecasting models in the model repository of the SAS Forecast Studio.

Figure 24.1 *Correcting Low Accuracy Forecast Results*



Abbreviations

ART	Analytical result table
UIART	User interface analytical result table

After you complete correcting the forecast results in SAS Forecast Studio, the updated predicted demand quantity and predicted demand variance is now available for the inventory optimization batch process. By integrating SAS Forecast Studio with SAS Service Parts Optimization, you can intercede the automated process flow and thus have greater control over the accuracy of the forecast results.

The number of time series that have forecast results with low accuracy is displayed under the Forecast Accuracy Low column in the data table of the Forecast Results view. You can view demand projection details for these time series in the Demand Projection Details view, in both tabular and graphical formats. The forecast results that you update in the SAS Forecast Studio are immediately reflected in the user interface.

Correct Forecast Results with Low Accuracy

The forecast results with low accuracy cannot be used for further analysis because of the high error percentage. You can modify and correct these results in the SAS Forecast Studio to be able to use them for further analysis.

To correct forecast results with low accuracy:

1. Reforecast the forecast results with low accuracy in SAS Forecast Studio. Perform reforecast for every forecast group that contains low accuracy forecast results. For details, see "Reforecast the Time Series in SAS Forecast Studio" on page 187.
2. Run the stored process that copies the reforecasted results to the analytical result tables of SAS Service Parts Optimization. If you created any events or models in SAS Forecast Studio, then those are also copied to the events and models repositories of SAS Service Parts Optimization. Run the stored process for every forecast group that contains low accuracy forecast results. For details, see "Run the Stored Process" on page 188.
3. Open the Forecast Results view in the Forecast Management workspace. For all the forecast groups that you worked with in SAS Forecast Studio, if the accuracy of the resultant forecasts for all the time series is improved, then the values in the Forecast Accuracy Low column are changed to `0`.

Overview of Items with Intermittent Demand

Some items have discontinuous or intermittent demand. SAS Service Parts Optimization enables you to view and analyze the forecast results for all facility and item pairs with intermittent demand.

The list of facility and item pairs that have intermittent demand is obtained as a result of the forecasting batch process run. Intermittent demand models (IDMs) forecast the average demand per period. IDMs are useful for forecasting data of hierarchical time series. The time series with intermittent demand do not undergo quality analysis process.

From all the sets of forecast results, the forecasting batch process identifies the facility and item pairs that have intermittent demand. Forecast results for these pairs are displayed under the Intermittent Demand Items column in the data table of the Forecast Results view. To view demand projection details for these facility and item pairs, you can open the Demand Projection Details view. You can also view time series details for each pair in this view, in both tabular and graphical formats.

Overview of the Forecast Results for Successor Items

Some items are failure-prone or have low sales. Such items need to be replaced by more durable items that have a higher probability of getting sold. The replacing items are called successor items, and the replaced items are the predecessor items.

If the historical demand data of a successor item is less than the predetermined minimum value (data sufficiency value) that is needed to forecast demand for the item, then the forecasting batch process considers historical demand data of the predecessor item. If their combined historical demand data is also less than the data sufficiency value, then the successor item is treated as item with insufficient history. For more information about items with no or insufficient history, see "Overview of the Forecast Results for Items with No History" on page 184.

However, if the available demand history of the successor item is sufficient, then the demand history of the predecessor item is not considered. Note that you can set the value for the definition of sufficiency in the control table.

The number of facility and item pairs that contain successor items is displayed under the Successor Items column in the data table of the Forecast Results view. To view demand projection details for these facility and item pairs, you can open the Demand Projection Details view. You can also view time series details for each pair in this view, in both tabular and graphical formats. By using this information, you can review whether the demand of the successor items is the same or has changed with respect to their predecessor items.

Overview of the Forecast Results for Items with No History

The forecasting process cannot provide statistical forecast results for facility and item pairs that have no historical demand data or for pairs whose history data is less than a predetermined minimum demand value. The Forecast Management workspace enables you to input the forecast values for these facility and item pairs.

The minimum demand value (data sufficiency value) is specified in the control table. You can modify the default value as per your requirements. For example, if you consider that demand history of 175 days is sufficient for statistical estimations, you can assign 175 as the value for the global macro variable.

The forecasting batch process identifies the facility and item pairs with insufficient history as new parts. The batch process cannot provide any statistical forecast for these pairs. However, the inventory optimization process needs an average forecasted demand for all facility and item pairs. The Forecast Management workspace enables you to enter the forecast values or import a file that contains the demand data.

The number of facility and item pairs with no or insufficient history is displayed under the Items with No History column in the data table of the Forecast Results view. You can view demand projection details for these facility and item pairs and input the forecast values for these facility and item pairs in the Demand Projection Details view. You can also view time series details for each pair in this view, in both tabular and graphical formats.

Specify Forecast Values for Items with No History

For facility and item pairs with no or insufficient history data, the forecasting batch process cannot generate forecast results. You can manually enter the forecast values for these facility and item pairs or import the values from an external source file.

Prerequisites: Ensure that the Demand Projection Details view is open and displays details for the items with no history result type.

To specify forecast values:

1. In the Demand Projection Details view, select a row.

   Note: You can specify forecast values at both levels of the demand projection details.

2. Click **Menu** ⇨ **Import External Forecasts**. The Import External Forecasts dialog box appears.

3. Specify whether you want to enter forecast data for current time period or next time period. The dates in the Date column of the table change based on your selection.

4. Specify values:

- To manually enter forecast results for a facility and item pair, enter the external demand and external demand variance values.

  Note: The dates are generated based on the base period and the parameter settings.

- To import forecast results from an external source file:

  1. Click **Import from file**. The Open dialog box appears.
  2. Browse to the file from which you want to import the forecast results and click **OK**. The Open dialog box closes, and the External Demand and External Demand Variance columns in the table of the Import External Forecasts dialog box are updated with the values from the external file.

5. In the Import External Forecasts dialog box, click **OK**. The forecast values are assigned to the facility and item pair for the specified period.

Revising Forecast Results for a Selected Time Series

You can leverage the features of SAS Forecast Studio to reforecast the forecast results for a selected time series. The Forecast Management workspace enables you to copy details of the time series to a back-end table. You can use data from this table in SAS Forecast Studio to create a project and run forecasts. The revised forecast results can then be copied to the analytical result tables of SAS Service Parts Optimization and viewed from the user interface. You can also use the data from the SAS Forecast Studio project to create an ad hoc scenario and analyze the project data.

To revise forecast results for a selected time series:

1. Create a table that contains the time series data. For details, see "Prepare Input Data for Reforecasting" on page 186.
2. Reforecast the forecast results for the selected time series in SAS Forecast Studio. For details, see "Reforecast the Time Series in SAS Forecast Studio" on page 187.
3. Run the stored process that copies the forecast results for the selected time series to the analytical result tables of SAS Service Parts Optimization. If you created any events or models in SAS Forecast Studio, then those are also copied to the events and models repositories of SAS Service Parts Optimization. For details, see "Run the Stored Process" on page 188.
4. Open the Demand Projection Details view in the Forecast Management workspace. The updated forecast results are displayed for the facility and item pair that you worked with in SAS Forecast Studio.

Preparing Data for Ad Hoc Analysis Scenario Creation

SAS Service Parts Optimization enables you to perform an ad hoc analysis on the reforecasted data of any time series. Using this feature, you can evaluate the impact of network variables on policy parameters and costs for the selected time series.

The Forecast Management workspace enables you to copy the time series data to a table that can be used by SAS Forecast Studio for reforecasting. You can then use the Scenario Development workspace to perform an ad hoc analysis on this data.

To prepare data for ad hoc analysis scenario creation:

1. Create a table that contains the time series data. For details, see "Prepare Input Data for Reforecasting" on page 186.
2. Reforecast the forecast results for the selected time series in SAS Forecast Studio. For details, see "Reforecast the Time Series in SAS Forecast Studio" on page 187.
3. Run the stored process that copies the project data to a back-end table. This table is available to the ad hoc analysis scenario creation process. For details, see "Run the Stored Process" on page 188.

You can now create an ad hoc analysis scenario from the Scenario Development workspace.

View Batch Process Details

You can view information about the forecasting and inventory optimization batch processes in the **Forecasting Batch Summary** section of the Forecast Results view.

To view batch process details:

1. Ensure that the Forecast Results view is open.
2. If the **Forecasting Batch Summary** section is collapsed, click  . The section displays the following information:
   - date and time when the last forecast batch process was run
   - date and time when the next inventory optimization batch process is scheduled to run
   - status information of whether the ad hoc changes that you perform in the workspace are incorporated in the next inventory optimization batch process or in the next forecasting batch process

Prepare Input Data for Reforecasting

You can store details of all the time series of a facility and item pair in a back-end table to be used for creating a project in SAS Forecast Studio. You can reforecast the forecast results for this facility and item pair and use the results for creating an ad hoc scenario or write back the results in the source system.

To prepare input data for reforecasting:

1. In the data table of the Demand Projection Details view, select the row that contains the facility and item pair, details of which you want to store in the back-end table.

   Note: You can select a row at both levels of the data table.
2. Click **Menu** and select **Create Forecast Input Data**. A confirmation box appears.
3. Click **OK**. The time series data for the selected facility and item pair is copied to a table in the back end.

Reforecast the Time Series in SAS Forecast Studio

You can leverage the analytical features of SAS Forecast Studio to modify the forecast results of SAS Service Parts Optimization.

Prerequisites:

- Ensure that SAS Forecast Studio 3.1 (or later) is installed on your computer or on the Web server.
- Ensure that SAS Management Console 9.2 is installed on your computer and that the metadata profile is configured on your computer.
- If you want to copy the reforecasted results to the analytical base tables of SAS Service Parts Optimization, then ensure that the source file for the SPO_FS_Integration stored process exists in the sasstp folder of the SAS Service Parts Optimization installation folder. For example, C:\Program Files\SAS\SASFoundation\9.2\spo\sasstp.
- If you want to further analyze the reforecasted results in the Scenario Development workspace, then ensure that the source file for the Add_Project_For_Ad_Hoc_Analysis stored process exists in the sasstp folder of the SAS Service Parts Optimization installation folder.
- Ensure that the environment that enables you to work with the stored processes in SAS Forecast Studio is available.

To reforecast the time series in SAS Forecast Studio:

1. Open SAS Forecast Studio: Click **Start** ⇨ **All Programs** ⇨ **SAS** ⇨ **SAS Forecast Studio 3.1**. The SAS Forecast Studio window appears. The Projects dialog box also appears.
2. In the **Environment** list, select the environment that you created in the previous step.
3. Click **New**. The New Project wizard opens.
4. In the **Name** box, type a name for the project and click **Next**.
5. From the list of libraries, expand **FORECAST**. Two categories of tables are displayed.
   - Tables that are specific to the forecast groups with less accurate results. These tables contain historic demand data that is to be used for forecasting. The table names have the following naming convention: <base period>_nok_forecast_studio_data. For example, wk_nok_forecast_studio_data.
   - Tables that contain copied data for the selected time series. The table names have the following naming convention: <userID>_<base period><forecast group number>_<timestamp>. For example, **`sas_w12_165915`**. This table is created by a SAS user. The table contains data for the 12th forecast group of the week base period. The table was created at 16 hours 59 minutes and 15 seconds.
6. Select a table and click **Next**.
7. Select variables in the following order:
   1. FORECAST_GROUP_CD
   2. FACILITY_RK
   3. FACILITY_ID or FACILITY_NM
   4. ITEM_RK

5. ITEM_ID or ITEM_NM

   and click  .

   Note: The order of variable selection should be as specified in this step.

8. To specify that hierarchical forecasting is not to be performed, clear the **Forecast a hierarchy using the above classification (BY) variables** check box and click **Next**.
9. In the **Time ID variable** list, select **START_DT**. Values for the remaining property boxes on the page are automatically updated.
10. (Optional) If you want to modify the values for any of the properties, edit the values.
11. Click **Next**. A list of all the variables in your data are displayed.
12. To specify a role for the **DEMAND_QTY** variable, click in the **Role** column for the variable and select **Dependent** from the list. Only the **DEMAND_QTY** variable is to be chosen as the dependent variable.
13. For each of the remaining variables in the list, click in the **Role** column and select **Independent** from the list, and click **Next**.
14. If you want to modify the values for preparing the data for forecast, edit the values, and click **Next**.
15. If you want to modify the number of periods to forecast, any other forecast settings, and create and import events, edit the values, and click **Next**.
16. Ensure that **Perform forecasts and display in SAS Forecast Studio.** is selected and click **Finish**. The forecasting process is triggered. The process takes some time to complete.

    The Forecast Summary dialog box appears that displays forecast results.
17. Click **Close**. Forecast results for the selected time series are displayed on the screen.

Run the Stored Process

You are provided with two stored processes to work with. You must run one or both of the stored processes to complete the integration with SAS Forecast Studio.

To run the stored process:

1. To open the stored process, in SAS Forecast Studio, click **Tools** ⇨ **Reports and Stored Processes**. The Reports and Stored Processes dialog box appears.
2. In the left pane, expand **Reports** ⇨ **Samples**.
3. If you want to copy the reforecasted results to the analytical result tables of SAS Service Parts Optimization, select the **SPO_FS_Integration** stored process and click **Run**. A dialog box stating that the stored process run is in progress appears. The stored process run can take some time to complete.

   After the stored process run completes, the dialog box closes. The forecast results for the forecast group are copied to the analytical result tables of SAS Service Parts Optimization. If you created any events or models in SAS Forecast Studio, then those are also copied to the events and models repositories of SAS Service Parts Optimization.
4. If you want to make the SAS Forecast Studio project available to the Scenario Development workspace, select the **Add_Project_For_AdHoc_Analysis** stored

process and click **Run**. A dialog box stating that the stored process run is in progress appears.

After the stored process run completes, the dialog box closes. The SAS Forecast Studio project data is copied to a back-end table. You can analyze the data from this table by creating an ad hoc scenario in the Scenario Development workspace.

5. In the Reports and Stored Processes dialog box, click **Close**.

Chapter 25

Working with End-of-Life Forecast Results

Overview of End-Of-Life Forecasting

End-of-life forecasting is the estimation of the total number of items that would be necessary at a facility at a specific time to support any future demand. End-of-life forecasting is also termed as one-time-buy estimation or long-term forecasting.

Due to various reasons, companies might discontinue production of certain products. However, such discontinued products might be still in use by the customers, and companies need to fulfill the future service requirement for these products. Therefore, companies must produce and store the right quantities of parts (items) of the discontinued products.

The forecasting batch process calculates end-of-life forecasting only if the time series has a historical demand data of at least 40% of the product lifetime value. For example, if the planning horizon is ten years, then to calculate end-of-life forecast results, the forecasting process requires historical demand data for at least four years.

For estimating end-of-life forecasting results, forecasting batch process uses clustering and regression techniques. Here are the high-level steps that the batch process follows:

1. Clustering process: Generates cluster means based on the historical demand data for all time series whose items have completed their life cycle. The items that are still in demand at facilities are not considered for clustering.
2. Data sufficiency test: Checks for time series that fulfill the data sufficiency test, that is, checks which time series have historical demand data equal to at least 40% of the product's lifetime value.
3. Regression technique: Performs regression of the historical demand data on cluster means for time series with minimum root mean square error (RMSE) value. The estimated regression parameters are used for calculating the future demand.

These estimated values are divided annually.

You can view the estimated end-of-life forecast results for a time series in the One-Time Buy dialog box. You can open this dialog box from the Demand Projection Details view for any result type except for the items with no history result type. You can view a graphical and tabular representation of the estimated annual demand quantities.

View End-Of-Life Forecast Results for a Time Series

The One-Time Buy dialog box enables you to view the end-of-life forecast results for a specific time series. The results display the total number of items that a facility can store so as to support the forecasted demand quantity. These results are displayed for a yearly grain in both tabular and graphical formats.

Prerequisites:

- Ensure that the Demand Projection Details view is open.
- Ensure that the icon  is displayed for the specific facility and item pair for which you want to view details. This icon indicates that end-of-life forecast results are available for this facility and item pair.

To view end-of-life forecast results for a time series:

1. In the Demand Projection Details view, select the row that displays the facility and item pair that you want to view details of.
2. In the view toolbar, click  . The One-Time Buy dialog box appears. The dialog box displays the end-of-life forecast details in both graphical and tabular format. The details include facility name, item name, MRP controller name, model name, forecast year, demand quantity, forecasted quantity, forecast upper limit, and forecast lower limit.

Glossary

actual demand
the number of orders that are received over the period under consideration for a facility and item pair.

base period
the interval of time in which one inventory replenishment order is allowed.

clustering
the process of dividing a data set into mutually exclusive groups such that the observations for each group are as close as possible to one another, and different groups are as far as possible from one another.

control table
a table containing parameter values that are used for the forecast and inventory optimization analyses. These values are customizable.

data sufficiency value
a threshold value that is used to decide whether a time series is to be considered as a part of new part forecasting or short-term forecasting. This value is customizable.

dimension
an aspect or perspective by which data can be accessed, selected, sequenced, grouped, filtered, and presented. Dimensions offer an intuitive way of organizing and selecting data for retrieval, exploration, and analysis.

end-of-life forecast
an estimation of the total number of items that would be necessary at a facility at a specific time to support any future demand.

facility and item pair
a combination of facility and item that is used as a unit to view demand details.

fill rate
a service measure that indicates the fraction of demand that is satisfied from on-hand inventory.

finished good
a product or an item that is completely manufactured but is not yet sold or distributed to the customers.

fixed ordering cost
the predetermined cost that is incurred each time a replenishment order is placed. This cost includes the expense that is associated with processing an order and is usually independent of the size of the order.

forecast group
a group of items and the facilities where these items are stored. Forecast groups are created by placing items of the same hierarchy together. In some cases, forecast groups also refer to item segments based on their sales pattern. Unless otherwise stated, a forecast group is the same as an item group.

holding cost
the cost of keeping items in inventory, which includes the expense that is incurred in running a warehouse, handling inventory, and counting inventory. Holding costs might also include the cost of special storage requirements, deterioration of stock, damage, theft, obsolescence, insurance, taxes, or the opportunity cost of money invested. Also called carrying cost.

holdout sample
the number of periods of the most recent data that should be excluded from the parameter estimation. The holdout sample can be used to evaluate the forecasting performance of a candidate model.

internal transfer order
the order or demand that is placed by the facilities. Demand from the end customers is not considered.

inventory turns
the ratio of the total cost of items that are sold to the average inventory units of the items, over a given period.

inventory units
the quantity of items in the inventory.

item group
group of items based on their sales pattern.

item inception
a value that indicates whether the item is in-house or bought out.

long-term forecast
See end-of-life forecast.

low accuracy forecast
a forecast whose forecast model is rediagnosed for better accuracy.

MAPE
See mean absolute percent error.

mean absolute percent error
the average of the absolute percentage errors. Short form: MAPE.

multi-echelon network
the distribution network that has at least one facility and item pair with more than one echelon level. The echelon level of a facility and item pair represents its relative position in a network. The echelon level of a pair is equal to the maximum echelon level of all

its successor facility and item pairs plus one. If a facility and item pair does not have successors, its echelon level is one.

one-time buy estimation
See end-of-life forecast.

order-up-to level
the target inventory level.

pipeline cost
the per unit per period cost of transportation of an item.

planning horizon
the number of periods into the future for which predictions are made.

policy type
the type of replenishment policy that is used to manage inventory. Policies help in determining when and in what quantities, orders should be placed to restock inventory. SAS Service Parts Optimization supports two policy types¬Base-stock policy (BS) and Min-max policy (SS).

ready rate
the probability that the on-hand inventory level at the end of a review time period is positive.

regression variable
an independent variable that is used in regression analysis for prediction of dependent variables.

reorder level
the inventory level at which a replenishment order should be placed.

revisited forecast
a forecast whose forecast model is changed for better accuracy.

RMSE
See root mean square error.

root mean square error
the square root of the mean square error. It is used as an estimate of the standard deviation of the response variable. Short form: RMSE.

service level
a measure of the fulfillment of customer demand.

solution data layer
an intermediate layer of tables provided by the solution to save the customer source data in the required manner.

successor item
an item that succeeds another item in the network.

transshipment
transfer of goods or items between facilities.

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Your Turn

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