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# SAS® Marketing Automation 6.5: User's Guide

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**SAS® Marketing Automation 6.5: User's Guide**

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# Accessibility

## Accessibility Features of SAS Marketing Automation 6.5

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### Overview

SAS Marketing Automation 6.5 has not been tested against U.S. Section 508 standards and W3C Web Content Accessibility Guidelines (WCAG). If you have specific questions about the accessibility of SAS products, send email to [accessibility@sas.com](mailto:accessibility@sas.com) or call SAS Technical Support.

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### Documentation Format

Please contact [accessibility@sas.com](mailto:accessibility@sas.com) if you need this document in an alternative digital format.

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### Landmarks

Landmarks are references to the primary areas of an application's user interface. They provide a quick and easy way for keyboard users to navigate to these areas of the application.

To access the list of landmarks that are available for a specific context, press Ctrl+F6 to open the Landmarks window. Use the arrow keys to select a landmark, and then press Enter to navigate to that area of the application.

---

### User Interface Layout

The application is displayed within SAS Customer Intelligence Studio. SAS Customer Intelligence Studio has the following components.

- The top of the window contains the application name and an application bar that includes a menu bar, a workspace bar, and a **Sign Out** button.

- The left side of the window contains the category pane. You select an item in the category pane to display a category.
- The center of the window contains the workspace that displays the selected item.
- The right side of the window contains the tile pane that lists the items that are open in the workspace.
- The bottom of the window contains a status bar that displays alerts, the current business context, and the current user.

For more information about the layout and features of the application window, see “[The SAS Customer Intelligence Studio User Interface](#)” on page 6.

## Themes

An application’s theme is the collection of colors, graphics, and fonts that appear in the application. The following themes are provided with this application: SAS Corporate (default theme), SAS Blue Steel, SAS Dark, SAS High Contrast, and SAS Light. To change the theme for the application, open the Preferences window, and go to the **Global Preferences** page.

You can use keyboard shortcuts to magnify the contents of the browser window or to invert the application colors.

**Note:** If you have special requirements for your themes, then contact your system administrator or visual designer about using SAS Theme Designer for Flex to build custom themes. SAS Theme Designer for Flex is installed with SAS themes. For more information about this tool, see *SAS Theme Designer for Flex: User’s Guide*.

## Keyboard Shortcuts

The following table contains many of the keyboard shortcuts for the application. In the user interface, some shortcuts are displayed within parentheses in tooltips and menu item labels. Some are also displayed in the Keyboard Shortcuts window.

**Note:** Some application-level keyboard shortcuts do not work when you first open an application. When that happens, press Tab to move the focus to the application, and then try the keyboard shortcut again.

### Keyboard Shortcuts

Action	Keyboard Shortcut
Open the Keyboard Shortcuts window.	F9  <b>Note:</b> The Keyboard Shortcuts window might not contain all of the shortcuts for your application.
Zoom in.	Ctrl+plus sign

Action	Keyboard Shortcut
Zoom out.	Ctrl+minus sign
Maximize view (collapses the category pane and the tile pane, and hides the status bar and the application bar, which includes the menu bar and the workspace bar).  or  Exit maximized view (expands the category pane and the tile pane, and shows the status bar and the application bar).	Ctrl+Alt+Shift+M  <b>Note:</b> This shortcut does not work when the focus is on the workspace bar.
Open the Landmarks window.	Ctrl+F6
Temporarily invert or revert application colors (for the current session only).  <b>Note:</b> You can set the <b>Invert application colors</b> preference in the Preferences window if you want the color change to persist across sessions.	Ctrl+~
Navigate between table headings and table content.	For a two-dimensional table, make sure that the focus is on the table and that you are not in Edit mode. Press Ctrl+F8 to switch the focus between column headings and table cells. Use the arrow keys to navigate from heading to heading.  For a multidimensional table, make sure that the focus is on a table cell and that you are not in Edit mode. Press Ctrl+F8 to switch the focus between column headings, row headings, and table cells. Use the arrow keys to navigate from heading to heading.
Sort columns in a table.	To sort a single column, navigate to its column heading (press Ctrl+F8). Press the spacebar to sort the column.  To sort additional columns, navigate to the column heading of each additional column that you want to sort. Press Ctrl +spacebar.
Change the width of the current column.	Navigate to the column heading (press Ctrl+F8). Then press Ctrl+left arrow or Ctrl+right arrow to change the width of the column.
Move the current column.	Navigate to the column heading (press Ctrl+F8). Then press Shift+left arrow to move one column to the left, and press Shift+right arrow to move one column to the right.
Automatically re-size the current column to fit its contents.	Navigate to the column heading (press Ctrl+F8). Then press Enter.

Action	Keyboard Shortcut
Open a drop-down list or drop-down menu.	Make sure that the focus is on the control, and press Ctrl+down arrow.
Exit a single application in the SAS Visual Analytics Hub.	Tab to the application's button at the top of the browser window, and press Delete.

# 1

## Overview of SAS Marketing Automation

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### What Is SAS Marketing Automation?

With SAS Marketing Automation, you can rapidly create, modify, and manage marketing campaigns. These campaigns can range from simple, single-channel campaigns to sophisticated, multichannel campaigns, and from planned marketing programs to opportunistic communications that are aimed at a precisely defined audience. You can define target segments, prioritize selection rules, select communication channels, schedule and execute campaigns, and perform advanced analyses to predict and evaluate the success of your customer communications. This ability to improve marketing activities can lead to a better return on marketing investment and a healthier bottom line.

SAS Marketing Automation can be used by many people within your marketing organization. Marketers can use it to define communication strategies. Executives can use it to produce reports on marketing effectiveness. Campaign managers can use it to create target segments and execute campaigns. Analysts can use it to model and predict customer behavior.

SAS Marketing Automation is one solution in the SAS Customer Intelligence solution suite.

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### SAS Customer Intelligence

The SAS Customer Intelligence solution suite amplifies the return on your organization's marketing investment by enabling you to execute effective

marketing campaigns; optimize your marketing activities to maximize customer profitability, acquisition, and retention; understand customer behavior; and react to time-critical marketing opportunities.

SAS Customer Intelligence contains these solutions:

**Outbound campaign management**

SAS Campaign Management turns disparate, disorganized customer data into profitable marketing campaigns. This solution includes campaign creation and execution, and recording of contact and response data.

SAS Marketing Automation includes SAS Campaign Management. In addition, SAS Marketing Automation contains the other capabilities that are needed for end-to-end outbound marketing: business intelligence reporting, predictive analysis, and data integration.

**Campaign optimization**

SAS Marketing Optimization optimizes marketing campaign ROI, even when you have limited budgets, channel capacities, and other constraints. This solution applies sophisticated mathematical approaches through an easy-to-use interface.

**Digital marketing**

SAS Digital Marketing provides permission-based digital marketing with large-scale multimedia messaging capabilities, including email and SMS text messages. The digital marketing can be implemented within single-channel or multichannel marketing campaigns.

**Inbound campaign management**

SAS Real-Time Decision Manager helps marketers coordinate interactive marketing across multiple channels. When SAS Real-Time Decision Manager receives a decision request, it combines all available customer data with SAS Analytics and business logic in real time to determine the best response for the customer.

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## SAS Marketing Automation Documentation

The documentation for SAS Marketing Automation consists of the following:

***SAS Marketing Automation User's Guide***

is available from <http://support.sas.com/documentation/solutions/ci/index.html>. You must supply the following user name and password:

User Name: sas

Password: CIadmin123

***SAS Marketing Automation Administrator's Guide***

is available from <http://support.sas.com/documentation/solutions/ci/index.html>. You must supply the following user name and password:

User Name: sas

Password: CIadmin123

---

# What's New in SAS Marketing Automation

## 6.5

### Overview

SAS Marketing Automation 6.5 has the following changes and enhancements:

- Integration with SAS Customer Intelligence 360
- Optimization at treatment level
- Prioritize node rules

### Integration with SAS Customer Intelligence 360

You can make your audience data available to SAS Customer Intelligence 360 for use in creating and updating segments. SAS Marketing Automation audience and treatment data can also used to add targets and messages to tasks in SAS Customer Intelligence 360.

For more information, see “[Connect to SAS Customer Intelligence 360](#)” on page [50](#).

### Optimization at Treatment Level

In previous releases, customer contacts could be optimized only for each marketing cell. Now you can optimize customer contacts for each treatment instead.

For more information, see “[Assign Scores](#)” on page [202](#).

### Prioritize Node Rules

For the Prioritize node, you specify in the business context whether the **Create output cell for remainder** option is disabled or enabled by default.

For more information, see “[Specify Default Settings for Nodes](#)” on page [39](#).



# 2

## Using SAS Customer Intelligence Studio

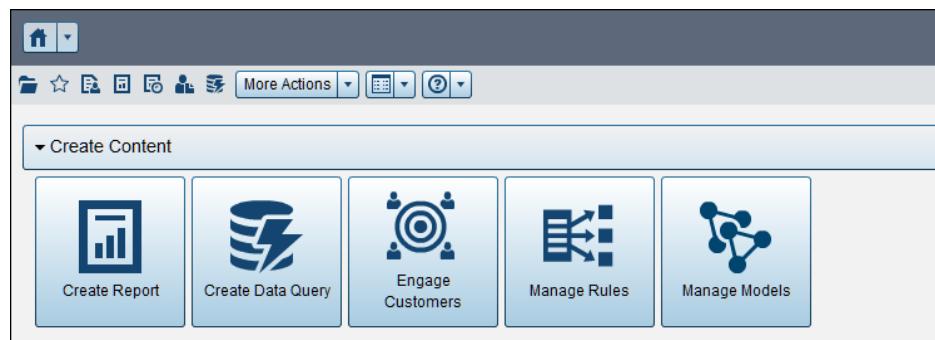
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## The SAS Visual Analytics Home Page

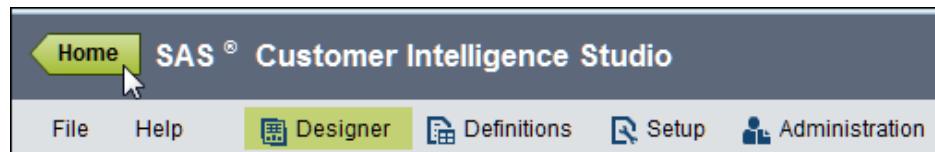
If SAS Visual Analytics is installed at your site, you see the SAS Visual Analytics home page when you first log on. Click **Engage Customers** to open SAS Customer Intelligence Studio.

*Figure 2.1 Engage Customers*



Click **Home** to return to the SAS Visual Analytics home page from SAS Customer Intelligence Studio.

*Figure 2.2 Home*



**CAUTION!** Be sure to save your work before opening SAS Customer Intelligence Studio or returning to the SAS Visual Analytics home page. Unsaved changes might be lost.

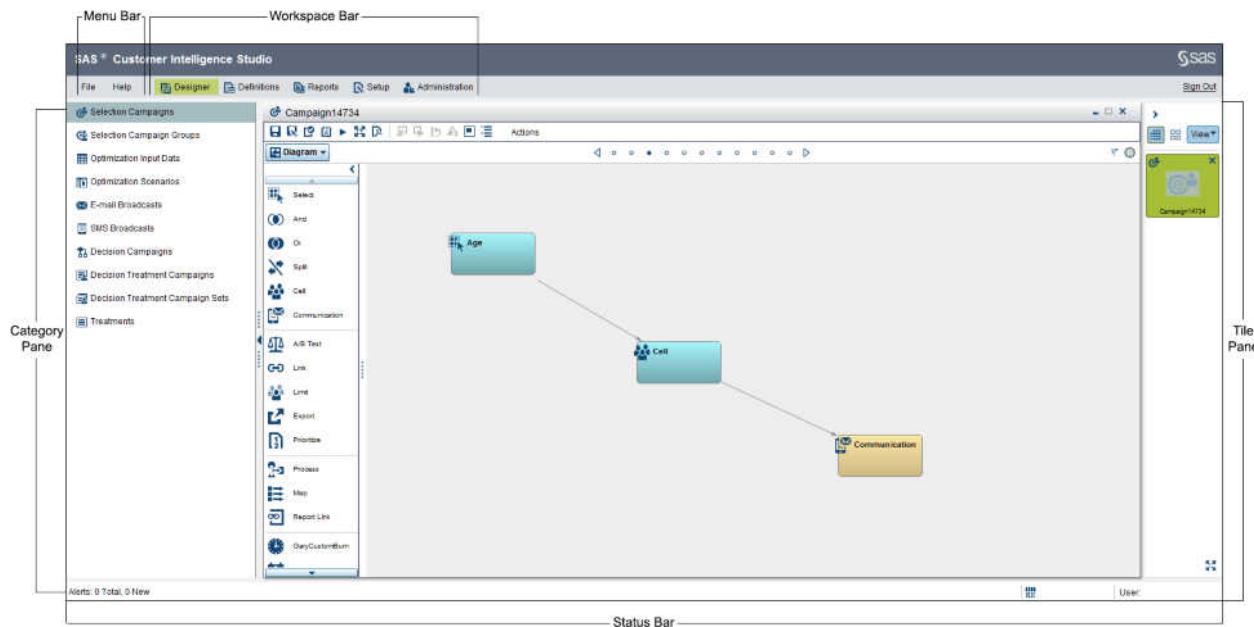
---

## The SAS Customer Intelligence Studio User Interface

### Overview of the User Interface

You use the SAS Customer Intelligence Studio user interface to manage a campaign, definitions, and other items.

**Display 2.1 Components of the SAS Customer Intelligence User Interface**



The user interface has the following components:

- The Menu Bar displays the File and Help menus.
- The Workspace Bar displays the different workspaces that you select.
- The Category Pane lists the categories in each workspace.
- The Tile Pane contains the items that are open in the current workspace.
- The Status Bar displays alerts, the current business context, and the current user.

For information about the version of the Adobe Flash Player that is supported by your operating system and browser, see <https://helpx.adobe.com/flash-player.html>.

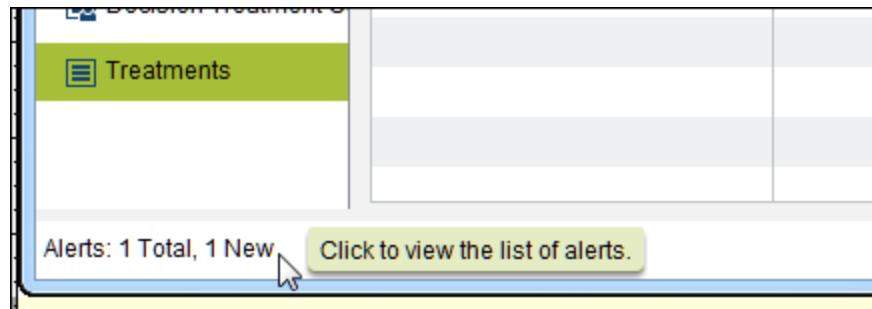
**Note:** The Flex application that provides the web interface for SAS Customer Intelligence Studio is not supported on Windows Server 2008.

## View Alerts

Alerts are displayed when an action such as an execution has failed. For example, a campaign might fail to execute because counts cannot be updated on a particular node. You can view the Alert message for the campaign , open the campaign, and then view the Message window to read the message log and details. Alerts are displayed for the actions that you take. Alerts for actions that are taken by another user are not displayed.

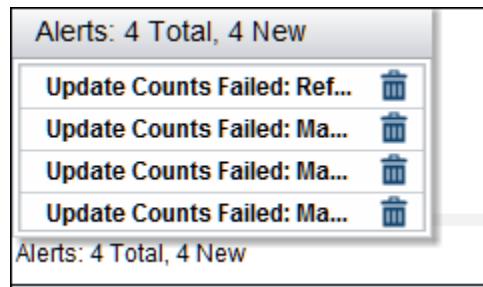
Alerts are listed in the bottom left corner of the interface.

*Display 2.2 Alerts*



Click **Alerts** to view the list of alerts. If more than ten alerts are listed, click **More** to view all of the alerts.

*Display 2.3 View Alerts*



You can then open the campaign and click to view the message log and details.

For more information, see “[View Messages](#)” on page 179.

---

## Menus

### File Menu

From the **File** menu, you can select the following items:

**Save All**

saves the changes to all of the open objects.

**Change Business Context**

opens a new window where you can select a different business context. All unmodified items in the previous business context are automatically closed.

**Recent Work**

lists the most recently opened items. Select **Clear Recent Work** to clear the list.

**Preferences**

displays global preferences and SAS Customer Intelligence Studio preferences.

**Log Off**

closes SAS Customer Intelligence Studio.

## Help Menu

From the **Help** menu, you can select the following items:

### **How To**

displays task help for the open page.

### **User's Guides**

links to the user's guides for the products that are installed in SAS Customer Intelligence Studio.

### **SAS on the Web**

links to documentation, training, and customer support on the SAS website.

## View Menu

From the **View** menu, you can select the following items:

### **Save Layout**

saves the current items in their positions on the screen.

### **Open Layout**

restores a layout that was saved previously.

### **Show Details**

shows the details of a docked item.

### **Show All Items**

displays all open items in the workspace.

### **Close All**

closes all open items.

## Item Menus

When you right-click an item in a workspace, you can select the following menu items:

### **Open**

opens the selected item.

### **Add**

opens the selected item and displays it next to other open items in the workspace.

### **Send to Tile Pane**

opens the selected item and displays its icon in the Tile pane.

### **Open Read-Only**

opens campaigns and treatments in Read-Only mode.

### **Delete**

deletes the selected item.

### **Rename**

renames the selected item. You can rename the following items.

- campaign definitions
- campaign group definitions

- export definitions
- communication definitions
- custom diagram tools
- custom detail groups
- custom detail tags
- treatments

#### **Hide**

hides the selected item from display. For more information, see “[Hide Items from Display](#)” on page 10.

#### **Show Hidden *item name***

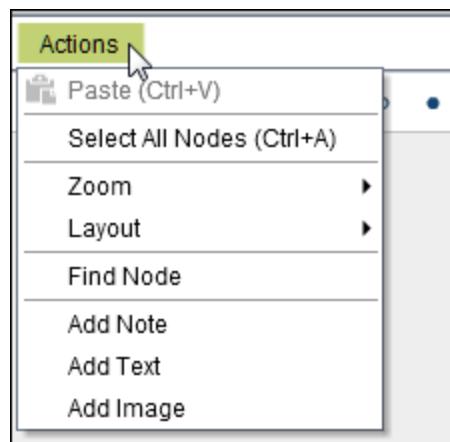
displays hidden items. For more information, see “[Hide Items from Display](#)” on page 10.

#### **Remove Hidden *item name* from View**

removes hidden items from display. For more information, see “[Hide Items from Display](#)” on page 10.

From the **Actions** menu on the toolbar, you can select an action to perform on the diagram or the selected object.

**Figure 2.3** Actions Menu



## **Hide Items from Display**

Performance might be slowed if there are a large number of items within a category. You improve performance by hiding these items from display.

You can hide the following items. Select the row that contains the item and select **Actions** ▶ **Hide**.

- campaign definitions
- selection campaigns
- treatments

An item is also hidden if you select the **Hidden** attribute on the Properties page.

In selection campaigns, hidden items are not visible in new Link nodes and other windows where you select cells in other campaigns. Hiding an item does not

affect existing Link nodes and other windows in which cells have already been selected.

To turn off the **Hidden** attribute and display an item by default, select the row that contains the item and select **Actions** ▶ **Unhide**.

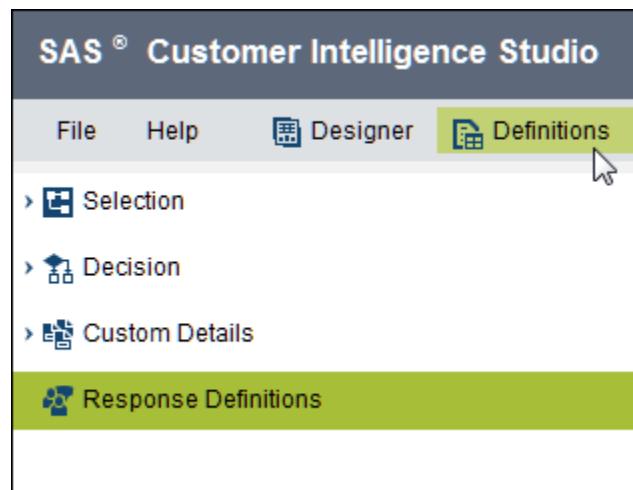
To show hidden items, select **Actions** ▶ **Show Hidden item name**. These items retain their **Hidden** attribute. If hidden items are shown, you can use search options to select hidden or unhidden attributes. For more information, see “[Searching for Items](#)” on page 17.

---

## Workspaces

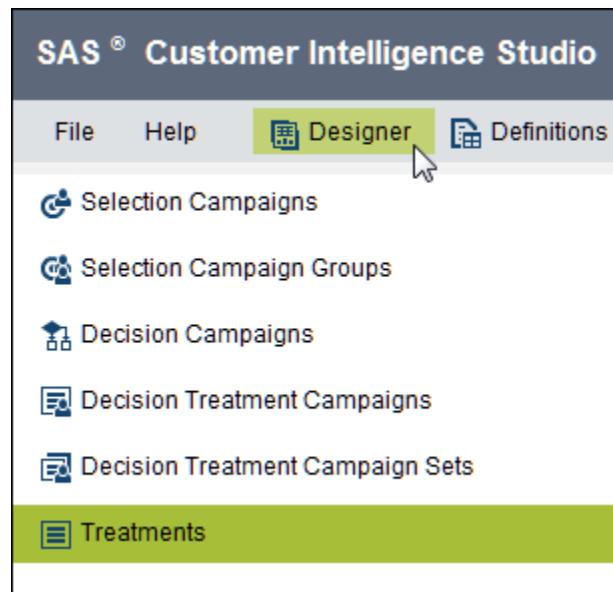
In the Definitions workspace, you create the definitions for your campaign.

*Display 2.4 Definitions Workspace*



In the Designer workspace, you create campaigns that are based on the definitions. You also create treatments in the Designer workspace.

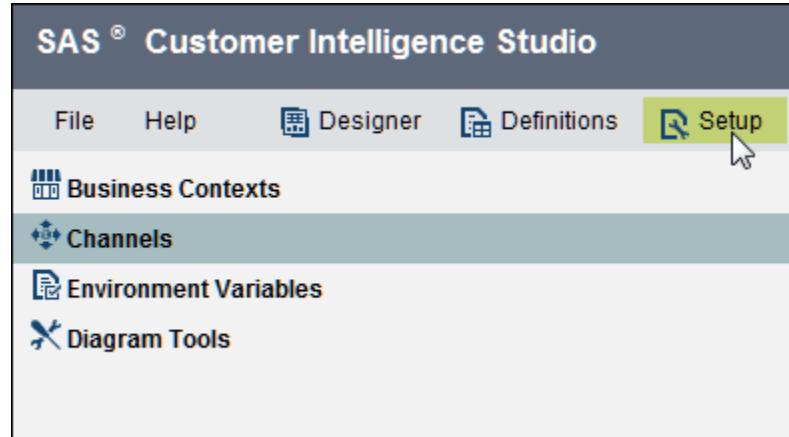
*Figure 2.4 Designer Workspace*



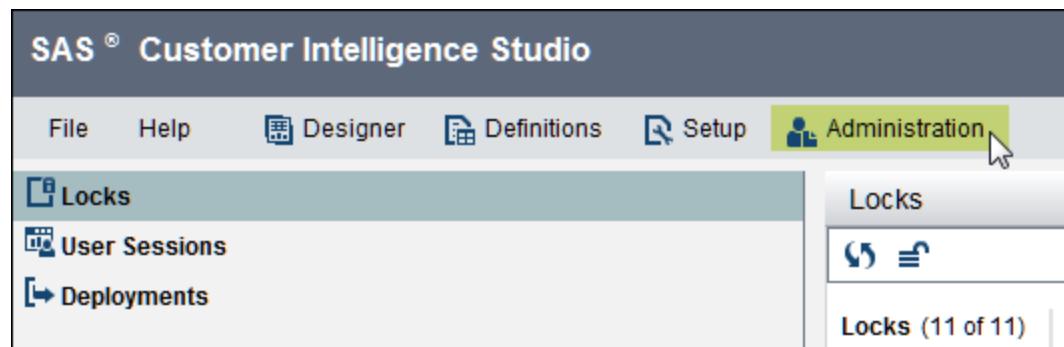
The categories that are listed depend on the products that you have licensed.

In the Setup workspace, you manage business contexts, channels, environment variables, and diagram tools that are provided with the application.

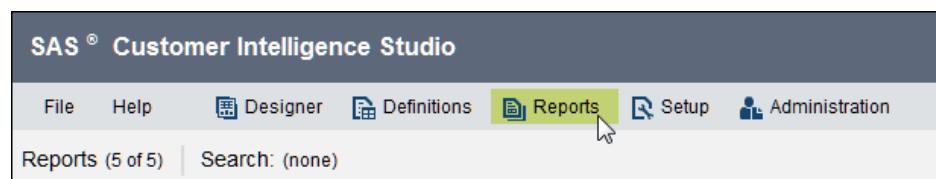
*Display 2.5 Setup Workspace*



In the Administration workspace, you perform tasks such as controlling user sessions.

*Display 2.6 Administration Workspace*

In the Reports workspace, you create and view reports.

*Display 2.7 Reports Workspace*

## The Workspace Toolbar

The following icons are displayed in the workspace toolbars. The icons that are displayed depend on the category that you have selected.

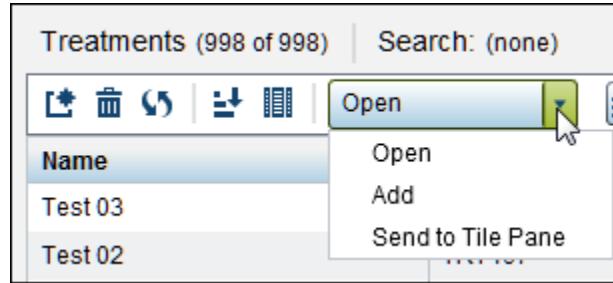
*Table 2.1 Toolbar*

Tool Icon	Tool Icon Name	Description
	Save	Saves changes to environment variables
	New	Creates a new item
	Delete	Deletes the selected item
	Duplicate	Duplicate a business context
	Properties	Display properties of selected objects
	Refresh list	Refresh the list of items

	Edit selected channels	Edit channel visibility
	Release	Release a locked object
	Sort	In the Grid and Detail views, opens a window where you can choose how items are sorted
	Manage columns	In the Grid view, opens a window where you can choose the columns that are displayed

In the Designer and Definitions workspaces, select **Open** to open the selected item.

*Figure 2.5 Open Selected Item*

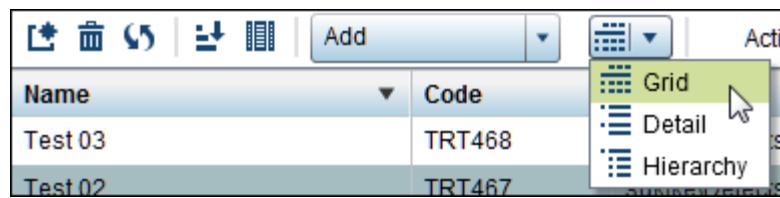


Select **Add** to open the selected item in the workspace and display its icon in the Tile pane.

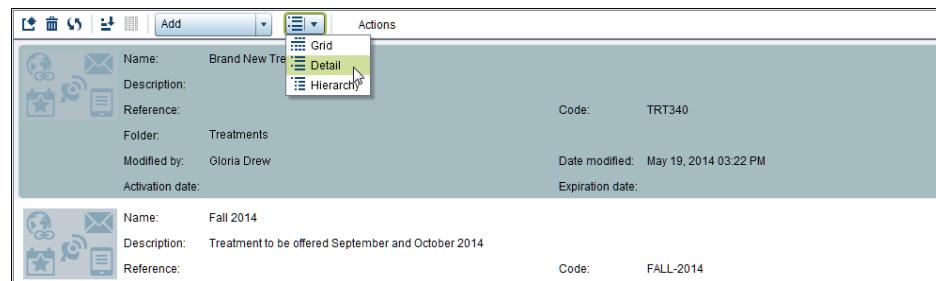
Select **Send to Tile Pane** to display the icon of the selected item in the Tile pane.

Select **Grid** to display the items in rows and columns.

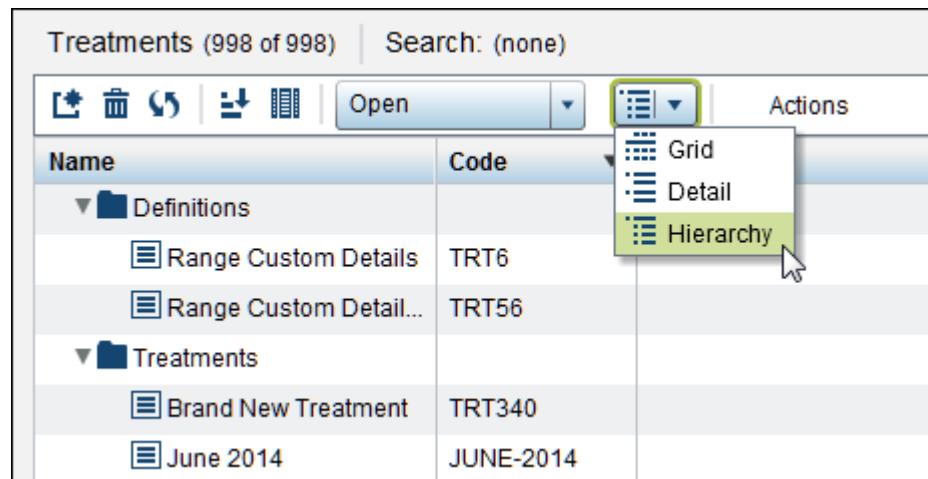
*Figure 2.6 Grid View*



Select **Detail** to display information about each item.

**Figure 2.7** Detail View

Select **Hierarchy** to display the location of items in the folder hierarchy.

**Figure 2.8** Hierarchy View

## The Campaign and Definition Toolbar

When you open a campaign or a definition, the following icons are available in the toolbar. The availability of specific icons depends on which page is active.

**Table 2.2** Toolbar

Tool Icon	Tool Icon Name	Description
	Save	Saves the current item
	Save as	Saves the current item under another name
	Validate campaign	Validates the current campaign

	Message log	Displays the message log
	Execute campaign	Executes the current campaign
	Publish campaign	Publishes campaign reporting data
	Create document	Creates a document of the campaign in PDF file format
	Switch to Process gallery	Displays the Process gallery pages
	Switch to Design gallery	Displays the Design gallery pages
	Flow view	Displays the pages in flow view
	Expanded view	Displays the pages in expanded view
	Execute selected node	Executes the selected node
	Clear counts on all nodes	Clears the counts on all of the nodes in the diagram.
	Clear warnings on all nodes	Clears the warning icons from all the nodes in the diagram
	Overview window	Displays an overview of the diagram
	Node details	Displays information about the selected node
	Refresh page	Refreshes the current page

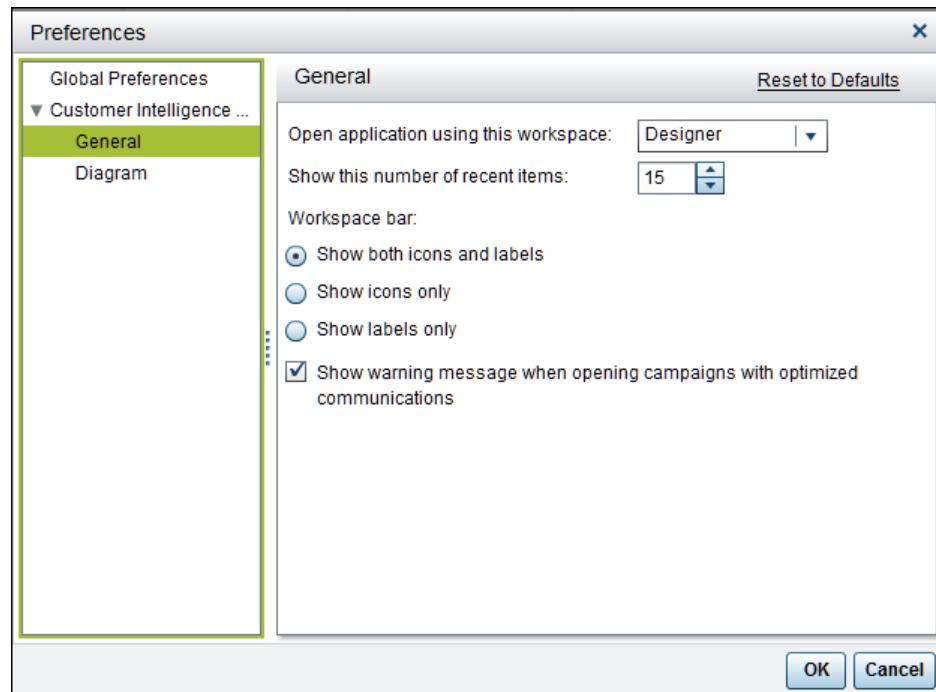
## Setting Preferences

You can set preferences for your SAS Customer Intelligence Studio sessions by selecting **File** ▶ **Preferences**. Click **Global Preferences** to select display preferences for user locales and themes. If you change the theme, log off and log back on to apply the changes.

Click **General** under **SAS Customer Intelligence Studio**.

Click **Diagram** to set display preferences for diagrams.

*Display 2.8 General Preferences*



## Searching for Items

### Search for Text

In SAS Customer Intelligence Studio workspaces and windows, you can enter text in the **Search** field to search for the items that contain that text.

*Figure 2.9 Search Field*



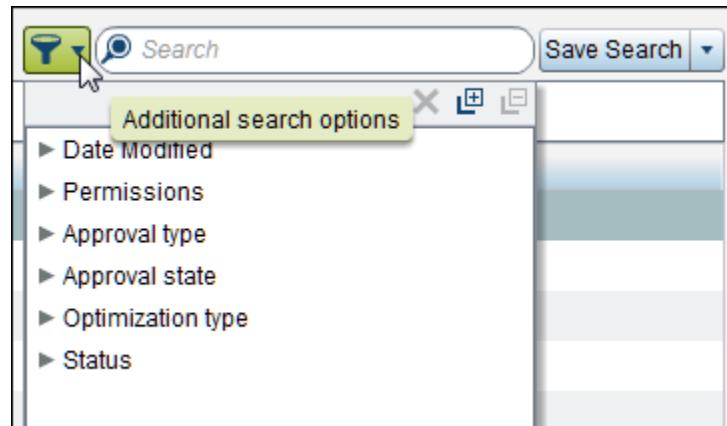
All columns, including the description, are searched for a match. The search is not case-sensitive. AND logic is used to process multiple words. For example, if you enter the words wireless and retention in the search field, items that contain both the word wireless and the word retention are displayed.

Click  to clear the contents of the **Search** field.

## Use Additional Search Options

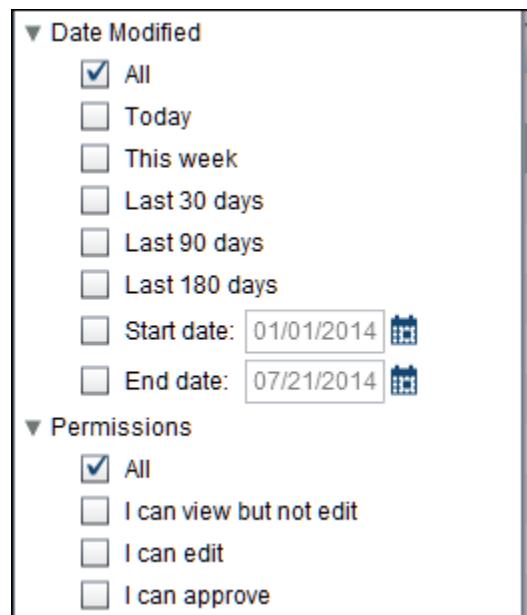
In the Designer and Definitions workspaces, and in some windows, you can select additional search options such as date, ownership, type, and status to filter items. Click  to display the search options.

*Display 2.9 Additional Search Options*



Select the options to include in the search filter. The available options depend on the items that are listed.

*Figure 2.10 Select Search Options*

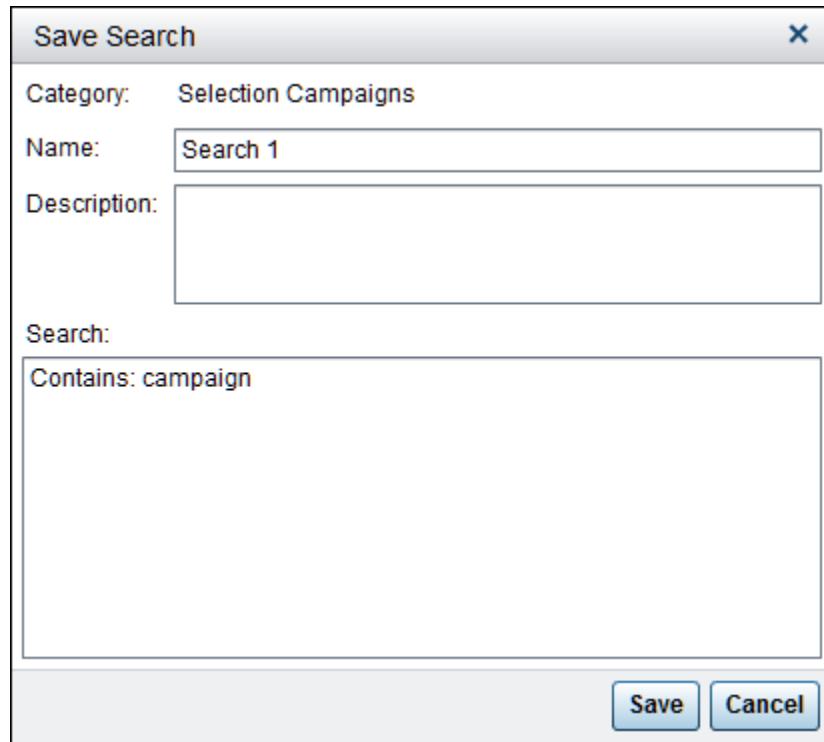


Click to clear your selections. Click to expand the list of options. Click to collapse the list of options.

## Save a Search Filter

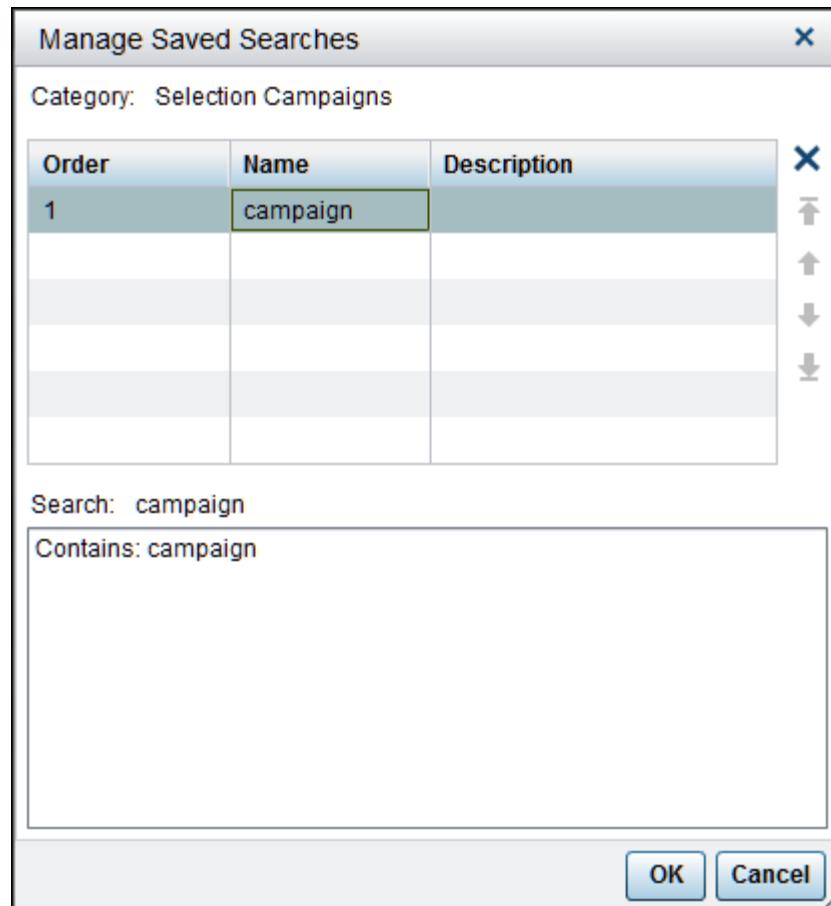
In the Designer and Definitions workspaces, you can save a search filter for later reuse. Click **Save Search** to save your search criteria.

*Display 2.10 Saved Search*



Your saved searches are listed in the **Save Search** menu. To view and manage saved searches, select **Save Search ▶ Manage Saved Searches**.

Display 2.11 Manage Saved Searches

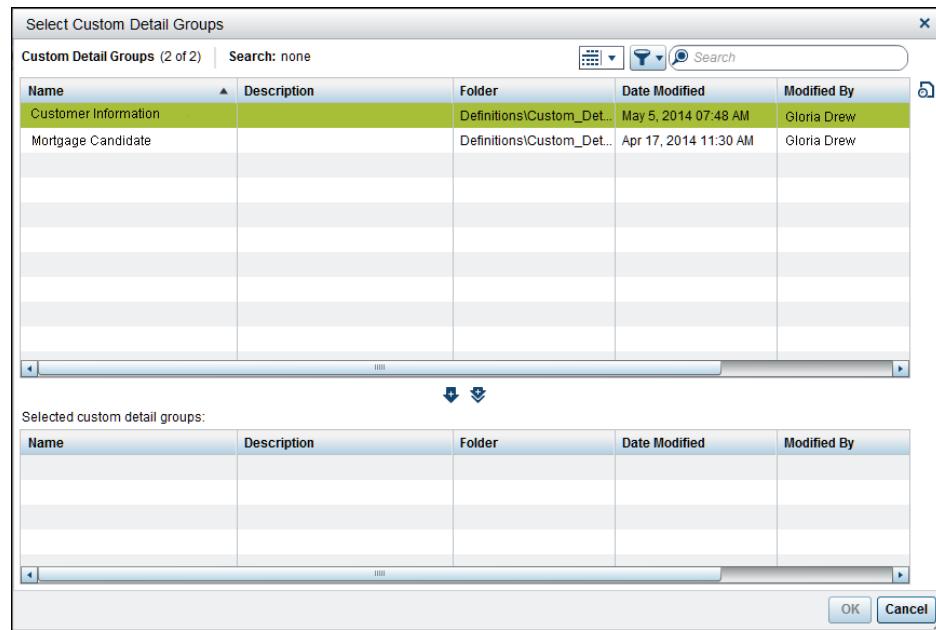


Use the arrows to change the order of the saved searches in the list. Click to remove a saved search from the list.

---

## Select Items

Throughout SAS Customer Intelligence Studio, there are windows where you can select items to add.

**Figure 2.11** Select Items

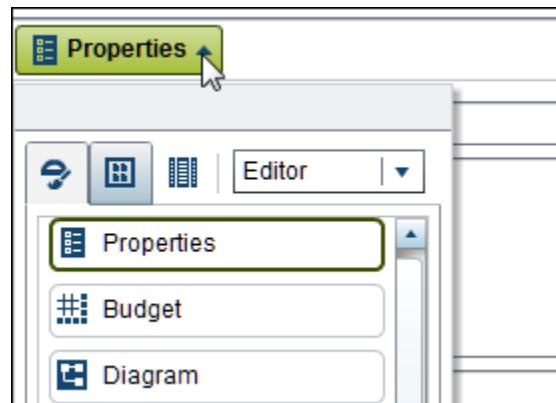
Enter text in the search field to search for the item.

Highlight one or more items and click to add the items to the list of selected items. Click to add all of the items to the list of selected items.

**Note:** Multiple items are separated by semicolons (;). A semicolon that is part of an item name must be preceded by a backslash (\).

## Selecting Pages

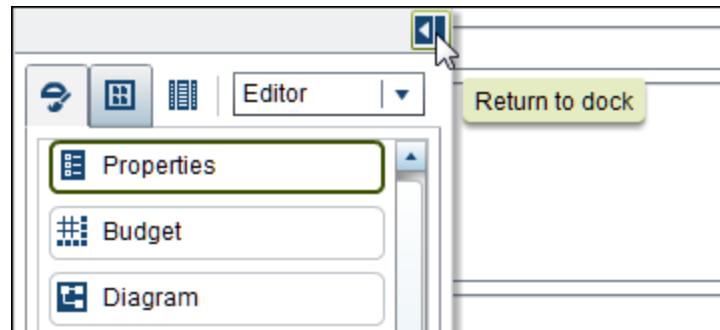
The Page Manager displays the pages that belong to a component. Select the page name to display the Page Manager.

**Figure 2.12** Page Manager

Select the page that you want to view.

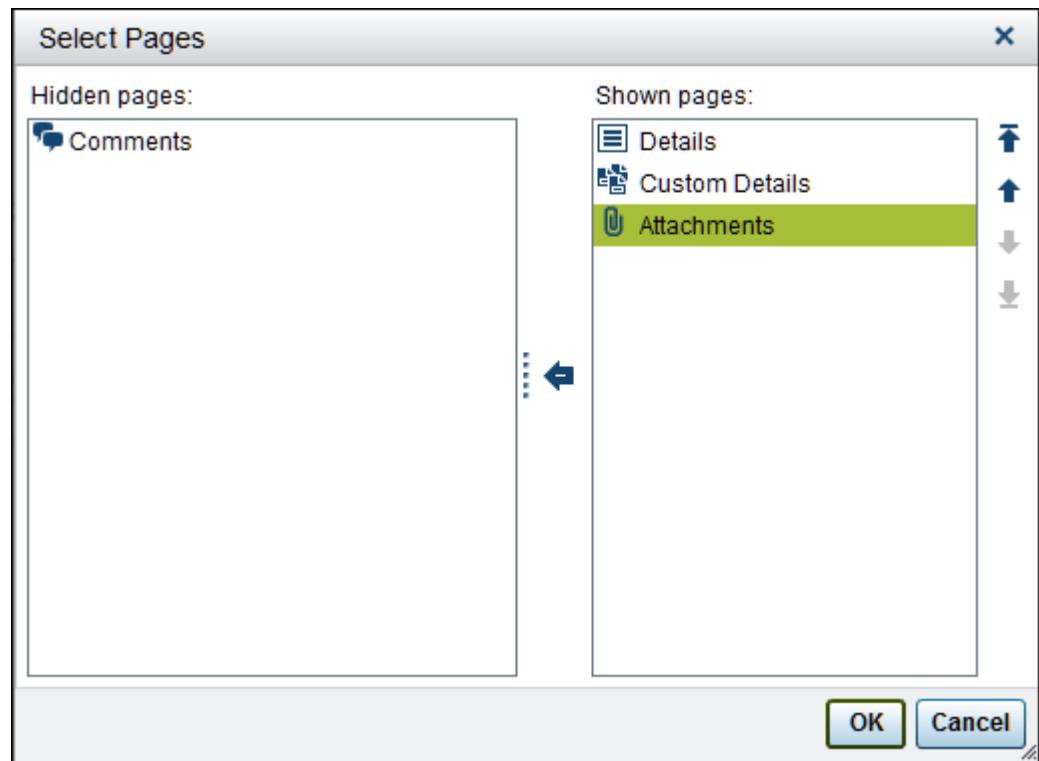
You can drag the Page Manager to any location. Click the arrow in the upper right corner to return the Page Manager to its dock.

Figure 2.13 Return to Dock



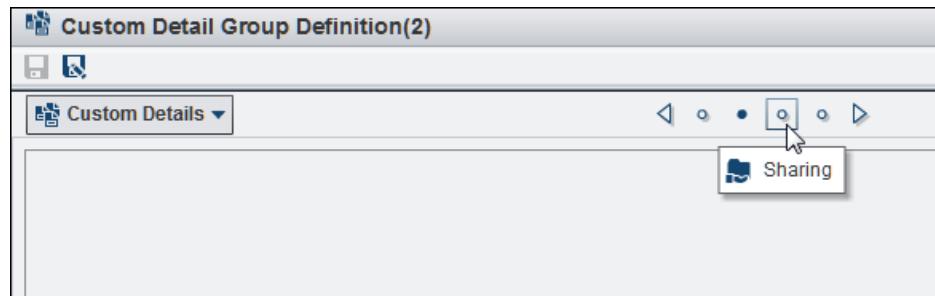
Click . Click the up and down arrows to change the order of the pages. Drag and drop the pages or click the left and right arrows to move pages between the **Hidden pages** and **Shown pages** lists.

Figure 2.14 Select Pages



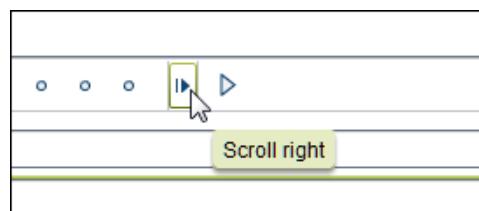
You can also click to display a different page.

*Figure 2.15 Display a Different Page*

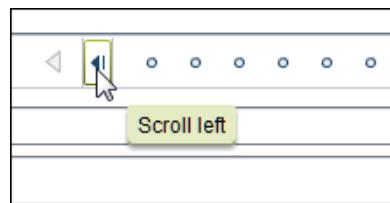


Click the **Scroll right** or **Scroll left** arrows to select from more pages.

*Figure 2.16 Scroll Right*

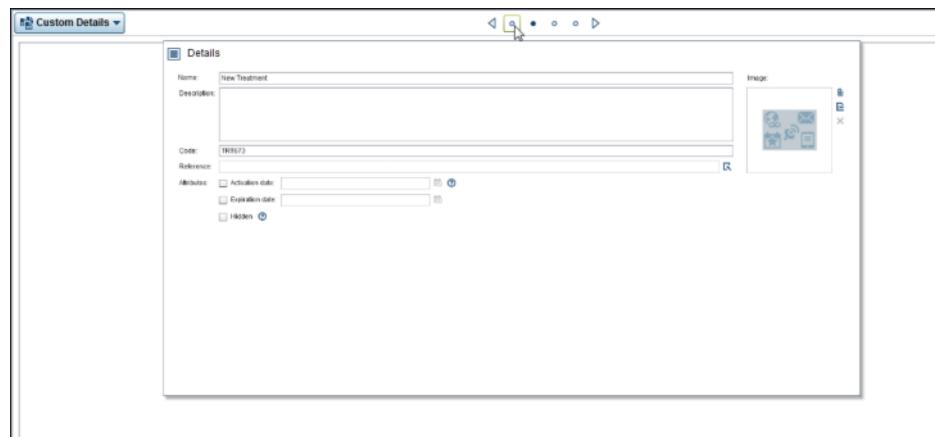


*Figure 2.17 Scroll Left*



If you have made changes to a page, a snapshot of your last visit to the page is displayed when you place the mouse pointer over .

*Figure 2.18 Page Snapshot*



---

## Diagrams

### Diagram Menus

When you right-click the background of the Diagram page, you can select the following menu items:

**Paste (Ctrl + V)**

pastes a copied node onto the diagram.

**Select All Nodes (Ctrl + A)**

selects all of the nodes in the diagram

**Clear All Warnings**

clears warning icons from all nodes.

**Zoom**

changes the magnification of the diagram.

**Layout**

changes the orientation of the nodes.

**Overview Window**

opens a compact schematic view of the diagram. Drag the pointer within the schematic view to change the view area.

**Node Details**

displays information about the selected node.

**Find Node**

displays the node names in a table. Double-click a name to highlight the node.

**Add Note**

adds a note in which you can enter text. When you right-click the note, you can select the following menu items:

**Color**

enables you to change the color of the note.

**Delete**

deletes the note.

**Collapse**

shrinks the note to an icon. Double-click the icon to reopen the note.

**Add Text**

enables you to add text to the background of the diagram. You can move and resize the text box.

**Add Image**

enables you to select an image to add to the background of the diagram.

When you right-click a node or a node group, you can select the following menu items:

**Properties**

displays the Properties window.

**Update Counts**

updates the count.

**Execute**

executes a Communication, Export, Process, or Custom node.

**Clear Warnings**

clears warning icons from the selected nodes.

**Node Details**

displays information about the selected node.

**Copy (Ctrl + C)**

copies the selected node.

**Cut (Ctrl + X)**

cuts the selected node.

**Group**

collects the selected nodes into a group.

**Ungroup**

releases the selected nodes from the group.

**Group Output Cells**

gathers the output cells from a node such as an A/B Test node into a group.

**Expand**

expands the selected group.

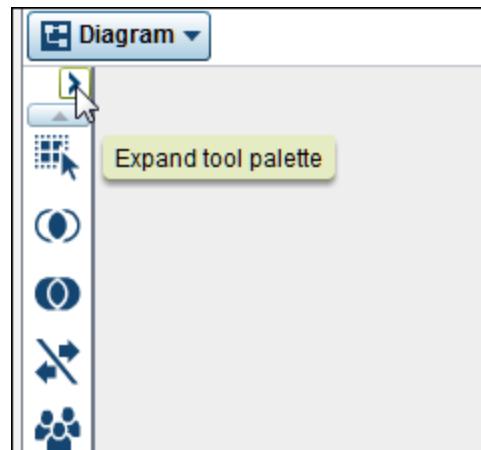
**Collapse**

collapses the selected group.

## The Tool Palette

Diagram nodes are displayed as tools in the tool palette. Click the arrow at the top of the palette to change it to an expanded position.

*Display 2.12 Expand the Tool Palette*



Click the arrow again to collapse the palette.

## Node Status Icons

The status of each node is indicated by one of the following icons:



indicates that the node ran successfully.



indicates that the node is not ready.



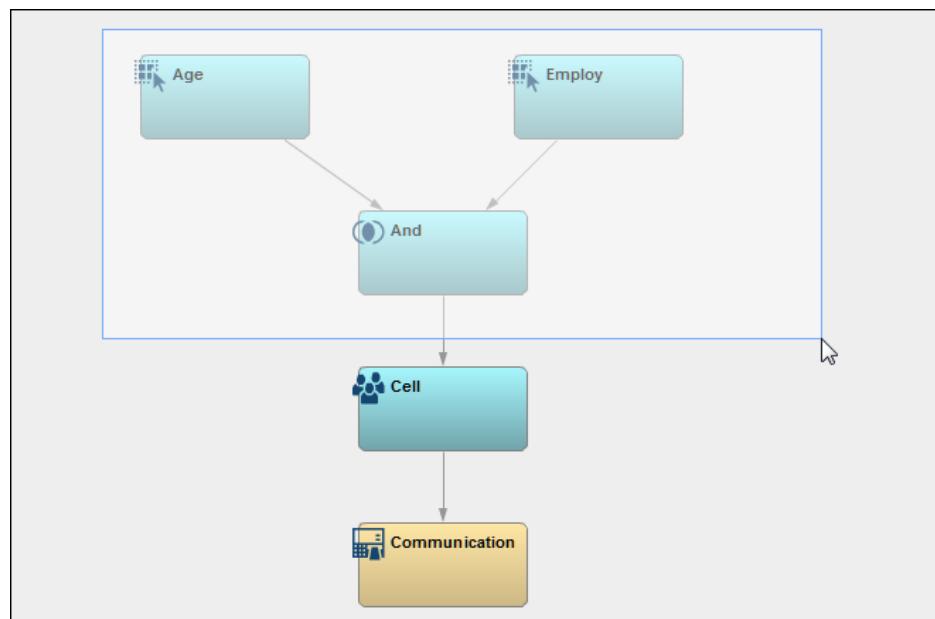
indicates that there are problems that need to be addressed.

## Node Groups

### Create Node Groups

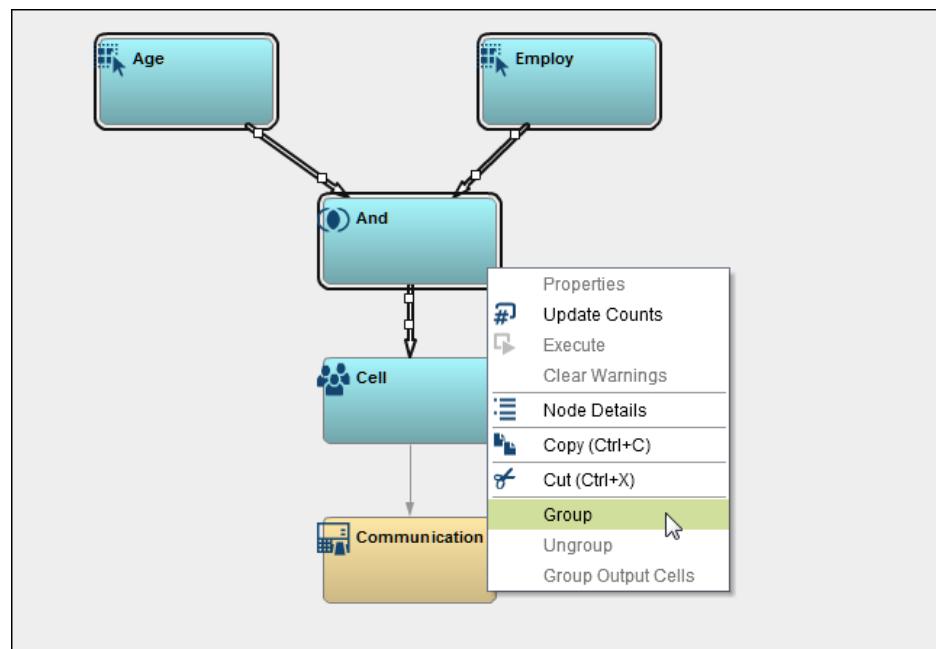
You can simplify the appearance of a diagram and make it easier to manage by gathering nodes into groups. To create a node group, click and drag a selection area around the nodes.

*Display 2.13 Select Nodes*



To add individual nodes to a group, press the Ctrl key while clicking each node. Right-click the selected nodes and select **Group**.

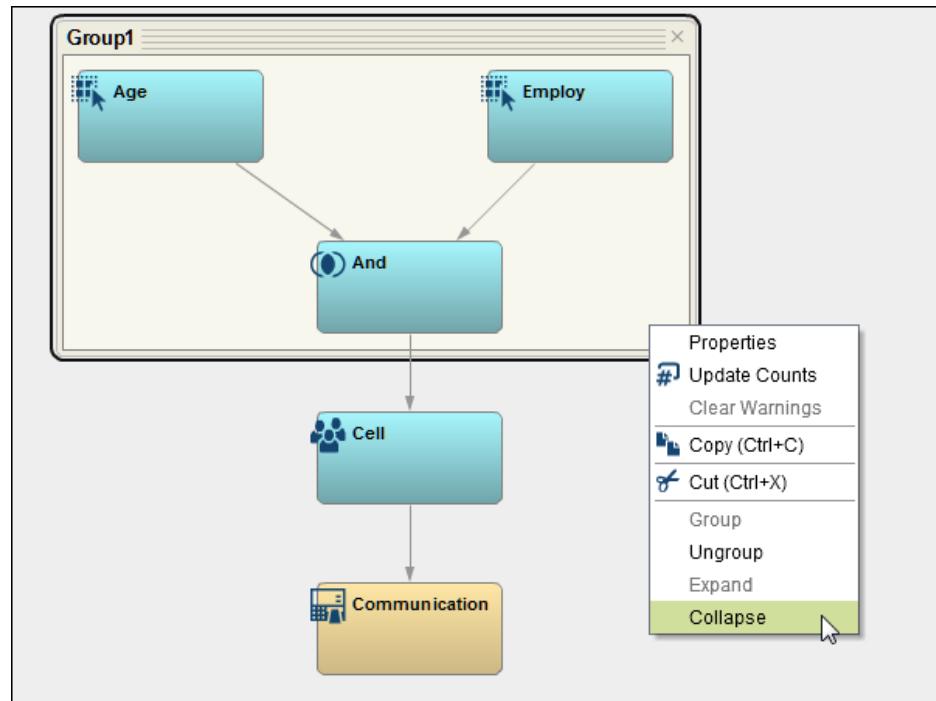
Display 2.14 Create Node Group



### Collapse Node Groups

To collapse the node group, right-click the group and select **Collapse**.

Display 2.15 Collapse Node Group

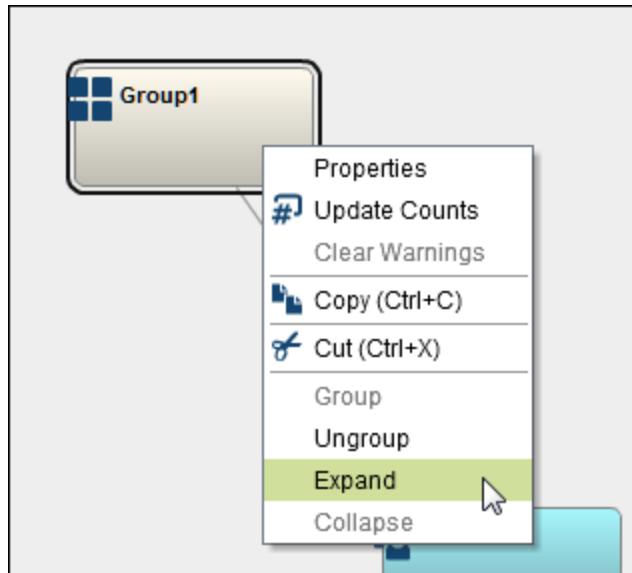


You can also collapse the node group by double-clicking the title bar of the group.

## Expand Node Groups

Expand the node group by right-clicking the group and selecting **Expand**.

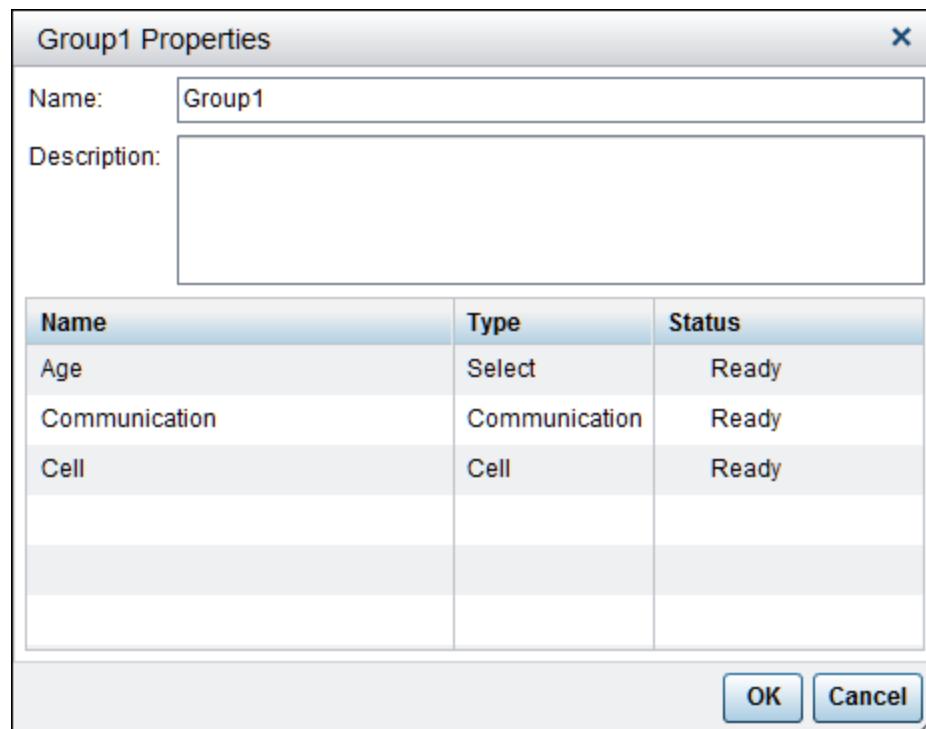
*Display 2.16 Expand Node Group*



You can also expand the node group by double-clicking the collapsed group.

## View the Properties of a Node Group

Right-click any node in the group to see the properties of the node. Click anywhere inside the group area other than a node to see the properties window of the group. Right-click a collapsed node group to see the properties for the group.

**Display 2.17** Node Group Properties

Change the name or add a description for the node group.

---

## Working in a Clustered Environment

SAS Marketing Automation is supported by a cluster of several application servers, or nodes. Each user session is hosted on a single node. If that node becomes unavailable, you must log off and log back on to create a new session on an available node. To determine the node that your user session is logged on to, select the User Sessions category in the Administration workspace.

If you are working in SAS Customer Intelligence Studio and operations start to fail, the node that is hosting your session might be unavailable. Notify your administrator. Log off and log back on to start a new session. You will lose unsaved changes.

For more information, see *SAS Marketing Automation: Administrator's Guide*.



# 3

## Defining the Components of Campaigns

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## Business Contexts

### Overview of Business Contexts

A business context defines the information that an individual user can access. For example, in a large, decentralized environment, multiple groups might access different data. One massive information map for all groups might become too unwieldy. By defining different business contexts for different groups, an administrator can provide smaller, targeted information maps that are more efficient and easier to use. Different, smaller business contexts result in better performance because the smaller information maps are easier to process and update.

Business contexts can enhance information security. A single information map for all groups might violate the information security policies of a large corporation. By defining separate business contexts, the corporation can ensure that individuals and groups have access only to the data that is required to conduct their specific business.

## Business Context Folders

### Create Business Context Folders

The metadata for business context folders is stored within a user-created folder on the **Folders** tab of SAS Management Console. All users should have Write access to this folder.

To create a unique folder for each business context and set the permissions for that folder:

- 1 Create a new folder on the **Folders** tab of SAS Management Console.
- 2 Right-click the new folder and select **Properties**.
- 3 On the **Authorization** tab, click **Add** and assign ReadMetadata, WriteMetadata, WriteMemberMetadata permissions to the groups who should have access to this folder. This folder is the root folder for the business context. SAS Customer Intelligence Studio users are not able to navigate above this folder. You can also edit the permissions later.

Each business context folder contains a separate structure of subfolders. Business contexts cannot share subfolders and cannot have the same root folder. A business context folder cannot be a subfolder of another business context folder.

**Note:** Do not use your private user folder or the **Shared Data** folder as a location for storing business contexts.

### Sample Business Context Data

Sample business context data is included so that you can verify that SAS Customer Intelligence has been installed correctly. On the **Folders** tab of SAS Management Console, the sample data is located in `/Products/SAS Customer Intelligence/Samples/Campaign Data`.

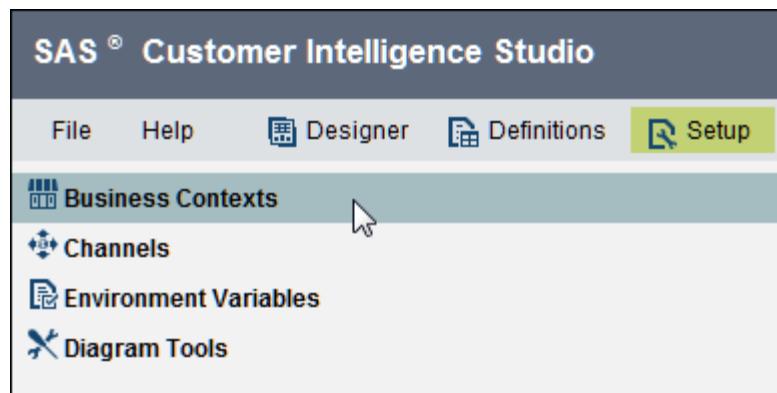
The sample data includes an information map, table metadata, and a library.

For information about using the sample data in creating a business context, see “[Specify Business Context Details](#)” on page 35 and “[Select an Information Map](#)” on page 36.

## Create a Business Context

To create a business context, select the Business Contexts category in the Setup workspace.

Display 3.1 Business Contexts



Click to create the business context.

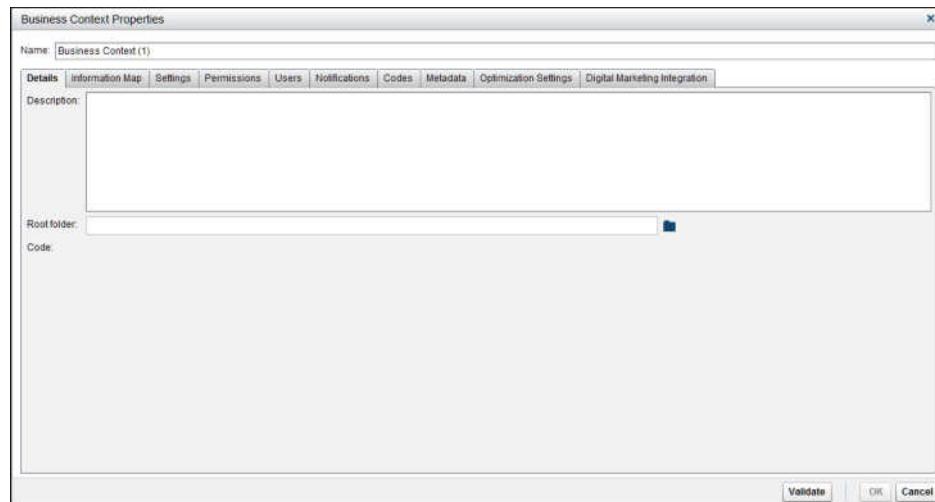
When you log off from SAS Customer Intelligence Studio, all business contexts that have not been modified are automatically saved.

For information about setting user and group permissions for business contexts, see “Administering Groups and Roles” in *SAS Marketing Automation: Administrator’s Guide*.

## Specify Business Context Details

The **Details** tab of the Business Context Properties window displays basic information.

Display 3.2 Details Tab



The business context name must be unique.

Click to select a folder for the business context.

To use the sample data that is provided with SAS Customer Intelligence Studio, select `/Products/SAS Customer Intelligence/Samples/Campaign Data`.

## Select an Information Map

On the **Information Map** tab, select the information map on which the business context is based.

*Display 3.3 Information Map Tab*

The screenshot shows the 'Information Map' tab selected in the top navigation bar. The main content area displays the details of an information map named 'Marketing Automation Sample'. The details pane lists several subject types and their associated metadata:

- InformationMap : Marketing Automation Sample**
  - [Subject\_ID\_C = Customer]
  - [Subject\_ID\_H = Household]
  - [Subject\_Default = Subject\_ID\_C]
  - [From\_Subject\_ID\_C\_To\_Subject\_ID\_H = ManyToOne]
  - [MetadataTable\_Prefix\_Subject\_ID\_C = Cust]
  - [MetadataTable\_Prefix\_Subject\_ID\_H = HH]
  - [Metadata = none]
  - [Subject\_Code\_Subject\_ID\_C = 1]
  - [Subject\_Code\_Subject\_ID\_H = 2]
  - [From\_Subject\_ID\_H\_To\_Subject\_ID\_C = OneToMany]
- Customer**
  - [Metadata = None]
  - [Subject\_ID\_1 = Subject\_ID\_C]
- Age**
  - [Level = Interval]
- Cid**
  - [UseInSubjectID = Subject\_ID\_C]
  - [Level = Id]
- Gender**
  - [Level = Nominal]

Click to select an information map.

To use the sample information map that is provided with SAS Customer Intelligence Studio, select `/Products/SAS Customer Intelligence/Samples/Campaign Data/Marketing Automation Sample`.

## The Settings Tab

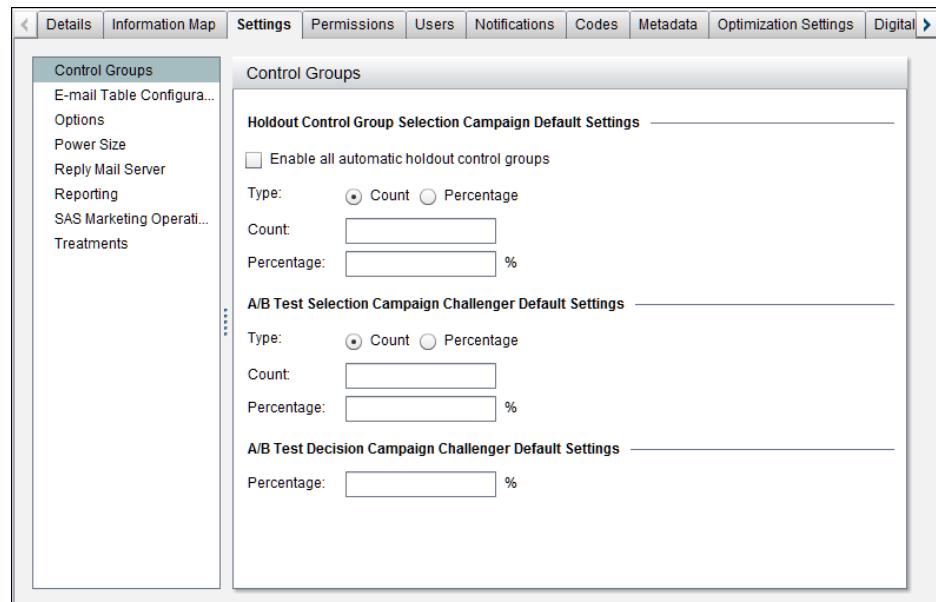
The **Settings** tab displays control group settings and other options that you can modify. The contents of the tab depend on the products that are installed at your site. The following settings apply to SAS Marketing Automation.

## Specify Control Group Settings

### Overview of Control Group Settings

The Control Groups section on the **Settings** tab determines the default settings for automatic holdout and A/B Test control groups. The settings that you specify here are optional and can be overridden in the campaign.

### Display 3.4 Control Groups



The control group settings that are displayed depend on the products that are installed at your site.

### Selection Campaign Control Group Settings

Selection campaign control group settings are displayed if SAS Marketing Automation is installed at your site.

In the Holdout Control Group Selection Campaign Default Settings section, select **Enable all automatic holdout control groups** to enable the automatic population of holdout control groups from a Communication node.

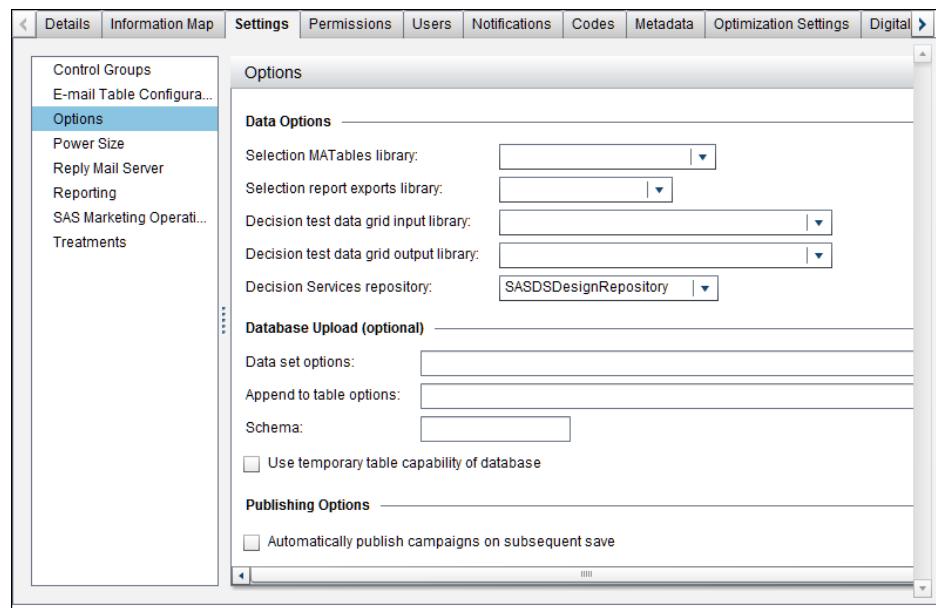
The size of a selection campaign control group can be based on a specific count or on a percentage of the total count. In the A/B Test Selection Campaign Challenger Default Settings section, specify the type of measurement by selecting **Count** or **Percentage**. Specify the numbers for both the **Count** field and the **Percentage** field. The count size must be greater than 0. The percentage must be greater than 0 and less than or equal to 50. You do not have to specify either count or percentage.

## Specify Options

### Overview of Specifying Options

The Options section of the **Settings** tab specifies options for libraries, data sets, and reporting. In order to use the data set settings that are most applicable to your site, you should have a thorough understanding of common data model architecture.

Figure 3.1 Options Section of Settings Tab



The Data options settings that are displayed depend on the products that are installed at your site.

### Data Options Settings for Selection Campaigns

The Data Options section displays selection settings if SAS Marketing Automation is installed at your site.

Select a library from the **Selection MATables library**. The libraries that are listed all have a libref of MATable. For easier maintenance, the best practice is to assign a separate MA tables library to each business context. These table libraries should be stored in a location that ensures fast retrieval of data.

Select an item from the **Selection report exports library** list to designate a storage library for static report links that are generated by SAS Web Report Studio. The libraries that are listed all have a libref of MAStatic.

### Set Database Upload Options

To enable faster uploading of tables and updating of contact history, enter DBSDOPTIONS variable options in the **Data set options** field.

The **Append to table options** field contains options for using the Bulk Load Facility to append an exported table in SAS Marketing Automation. Enter valid options for your database. For more information, see the documentation on the Bulk Load Facility in *SAS Marketing Automation: Administrator's Guide*.

Enter values for the DBTEMPSCHEMA option in the **Schema** field. If the database has native temporary locations, select **Use temporary table capability of database**. However, selecting this option can prevent the updating of contact history. For more information, see the documentation on the Bulk Load Facility in *SAS Marketing Automation: Administrator's Guide*.

**Note:** In order for the database upload options to take effect, you must log off and then log back on to SAS Customer Intelligence Studio.

## Set Publishing Options

Select **Automatically publish campaigns on subsequent save** to publish changes in the campaign to the common data model. Only changes that affect the common data model are published. After a campaign has been published once, a report can be produced every time that the campaign is saved if you select this option.

In cases where a package has been deleted, the campaign is published when it is saved even if **Automatically publish campaigns on subsequent save** is not selected. This feature ensures that the common data model is updated with the deletion.

**Note:** Communication updates are not automatically published to the CI\_COMMUNICATION table unless there has been a manual publish since the last campaign execution.

## Set Approval Options

Select **Open approved campaigns as read-only when user is not an approver** to prevent other users who are not on the list of approvers from editing approved campaigns.

## Specify Default Settings for Nodes

In the Default Node Settings section, you can specify the default rules for diagram nodes. Default rules ensure that you do not have to change the rule every time you create a new node. The rule applies to all of the specified nodes. You can override the default in an individual node.

*Figure 3.2 Default Node Settings*

Default Node Settings	
AND node rule:	Meets all conditions defined by input nodes   ▾
OR node rule:	Meets any conditions defined by input nodes   ▾
Filter Node Remainder Default:	Disabled   ▾
Prioritize Node Remainder Default:	Disabled   ▾

Select a default rule for the And and Or nodes.

For the Prioritize node, specify whether the **Create output cell for remainder** option is disabled or enabled.

## Set Campaign Group Optimization Options

In the Campaign Group Optimization Options section, select **Set default behavior of non-scheduled campaign group optimization to suppress generation of input data** to refrain from generating SAS Marketing Automation input tables during manual optimization. Campaigns in the campaign group are not executed again. Changes, including the Start date, that have been made to the campaign group since the last generation of input data are ignored.

Structural changes to SAS Marketing Optimization input data tables are ignored. This option is displayed only if both SAS Marketing Automation and SAS Marketing Optimization are installed at your site.

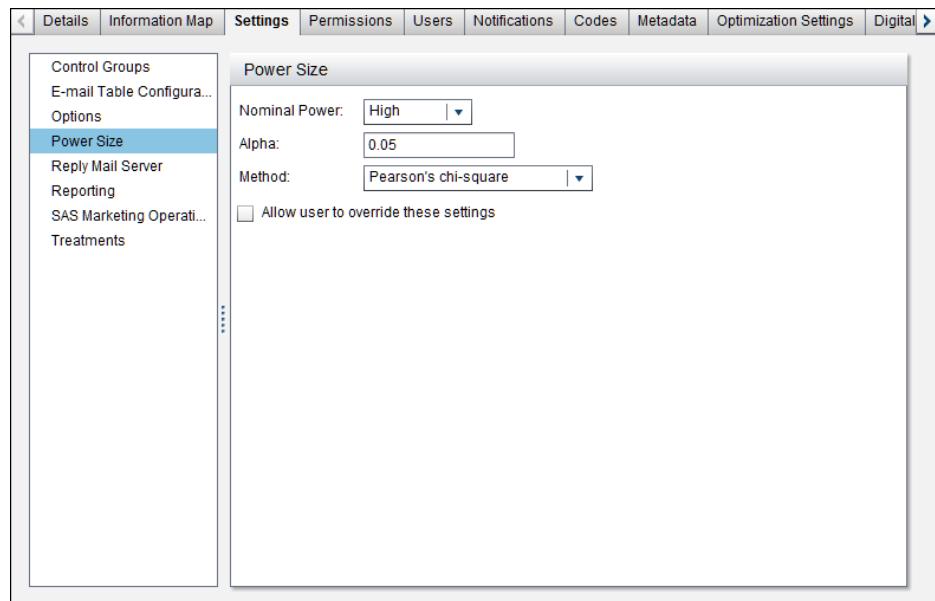
For more information, see “[Optimize Now](#)” on page 346.

**Note:** If you select this option, campaign group input data is still validated during optimization, and error messages are displayed. The errors do not have an effect on the optimization behavior. Generation of input data is suppressed.

## Specify Statistical Power Size

In the Power Size section of the **Settings** tab, you configure the statistical size estimator. The business user can use the estimator to determine the sample size that is required and then analyze response rates for statistically significant differences.

**Figure 3.3** Power Size



**Nominal power** specifies the desired power of the test and is expressed as a probability. Select **High** (0.9), **Medium** (0.75), or **Low** (0.6).

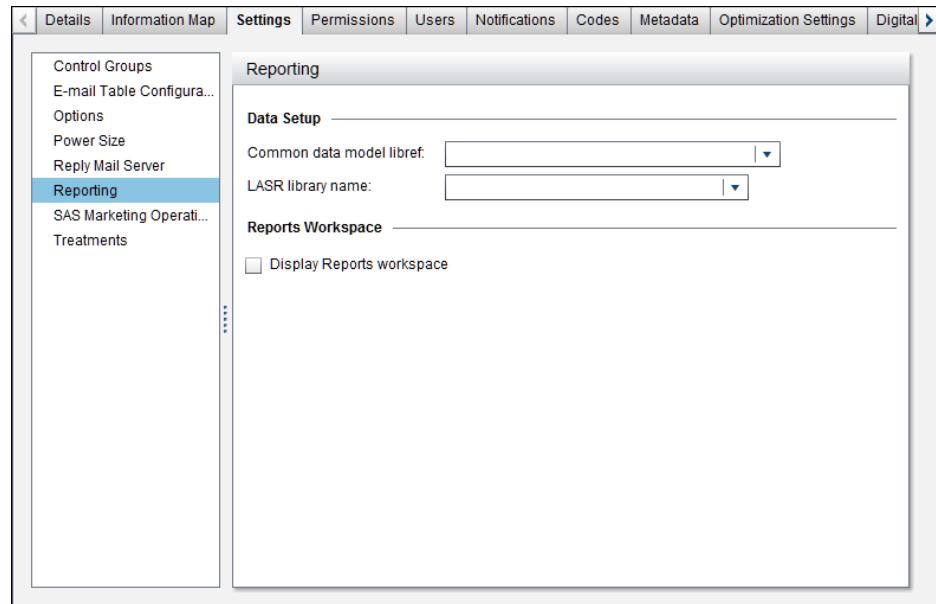
**Alpha** specifies the level of significance of the statistical test. The default value is 0.05, or a 5% level of significance. The value of **Alpha** might need adjustment where there is more than one subgroup. For example, suppose that you divide a champion group into five smaller subgroups that each receive a different treatment. Suppose that you want the probability of making at least one error in five tests to be 5%. Set the probability of making an error in an individual test to 5% divided by 5, or 0.01.

**Method** specifies a modeling technique. Select **Pearson's chi-square**, **Fisher's exact**, or **Likelihood ratio chi-square**.

Select **Allow user to override these settings** to enable the campaign editor to override the settings on the **Advanced** tab of the statistical size estimator.

## Set Reporting Options

In the Reporting section of the **Settings** tab, you specify reporting options.

**Figure 3.4** Reporting

The common data model contains the data from published campaigns. Select a libref for the location of the common data model from the **Common data model libref** list. If you do not select a libref, you cannot publish campaigns.

A LASR library for reporting was created during SAS Customer Intelligence installation. Select the LASR library to use with the **Reports** workspace.

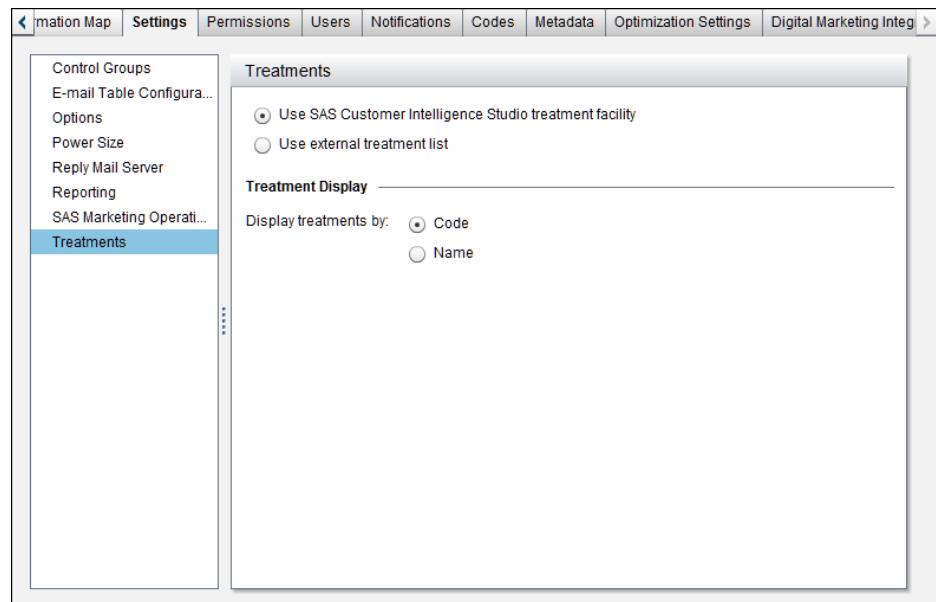
Select **Display Reports workspace** to display the Reports workspace in SAS Customer Intelligence Studio. For more information, see “[Creating Reports](#)” on page 325.

In order for the Reports workspace to be displayed on any device, including mobile devices, SAS Visual Analytics Administration and Reporting must be installed at your site. For more information, see *SAS Visual Analytics: Installation and Configuration Guide* at <http://support.sas.com/documentation/onlinedoc/va/index.html>.

## Specify Location of Treatment Values

In the Treatments section of the **Settings** tab, you specify the location of treatment values. A treatment is a type of marketing communication, such as a coupon for a stay at a hotel. A treatment includes the format, creative content, and offer. Treatments are often used to test the effectiveness of a communication. For example, a test of treatment messages might compare an offer of 30% off the price for six months with an offer of two months free in a six-month contract.

You can select from these treatment values when you associate treatments with marketing cells in a campaign.

**Figure 3.5** Treatments

You can use treatments that you have created in SAS Customer Intelligence Studio, or you can use treatments that were created outside SAS Customer Intelligence Studio. Select **Use SAS Customer Intelligence Studio treatment facility** to create and use treatments that you have created in SAS Customer Intelligence Studio. If you use the SAS Customer Intelligence Studio treatment facility, you cannot use treatments that were created outside SAS Customer Intelligence Studio. SAS Customer Intelligence Studio users can update, edit, and view the contents of treatments that are created by the SAS Customer Intelligence Studio treatment facility.

To use treatments that were created outside SAS Customer Intelligence Studio, select **Use external treatment list**.

**Figure 3.6** External Treatment List

This screenshot shows the 'External Treatment List' configuration dialog box. At the top, there are two radio button options: 'Use SAS Customer Intelligence Studio treatment facility' (unchecked) and 'Use external treatment list' (checked). Below these are seven input fields, each with a 'Browse' button to its right: 'Table', 'Unique key', 'Code', 'Name', 'Description', 'Reference', and 'Image'. At the bottom of the dialog is a 'Treatment Display' section with the instruction 'Display treatments by:' followed by two radio buttons: 'Code' (selected) and 'Name'.

Users can select from this list of values when they add treatments to a campaign. If you use an external treatment list, you cannot use treatments that were created by the SAS Customer Intelligence Studio treatment facility. SAS Customer Intelligence Studio users cannot update, edit, or view the contents of treatments that come from an external list. Treatments that come from an external list cannot contain custom details. Treatments that have duplicate IDs are removed. Treatments with missing numeric values are not displayed in SAS Customer Intelligence Studio.

Click **Browse** to select a table that contains an external treatment list. Associate a unique key, code, and name with the list of treatments. A description is optional. Treatments that are created externally must contain a unique key and a code or name for the treatment. If the table does not have a column that corresponds to the name, the data that is associated with the Code column is used to populate the **Name** field. If the table does not have a column that corresponds to the code, the data that is associated with the Name column is used to populate the **Code** field. If you change the treatment option, treatments that already are assigned to campaigns are not affected.

To control the display of treatment column headings in a campaign, select **Code** or **Name** in the Treatment Display section.

## Share Business Context with Users and Groups

The **Permissions** tab lists the users and groups who can have access to the business context definition in the Setup workspace.

*Display 3.5 Permissions Tab*

Name	Permission

Name	Permission
SAS Administrator	Edit

To add a user to the list, click **+** and select a user. To add a group to the list, click **+** and select a group.

To view the members of a group, select the group and click **⊕**.

To change the permission of a user or user group, click the **Permission** cell and select the permission. By default, all users and groups that you select have Edit permission.

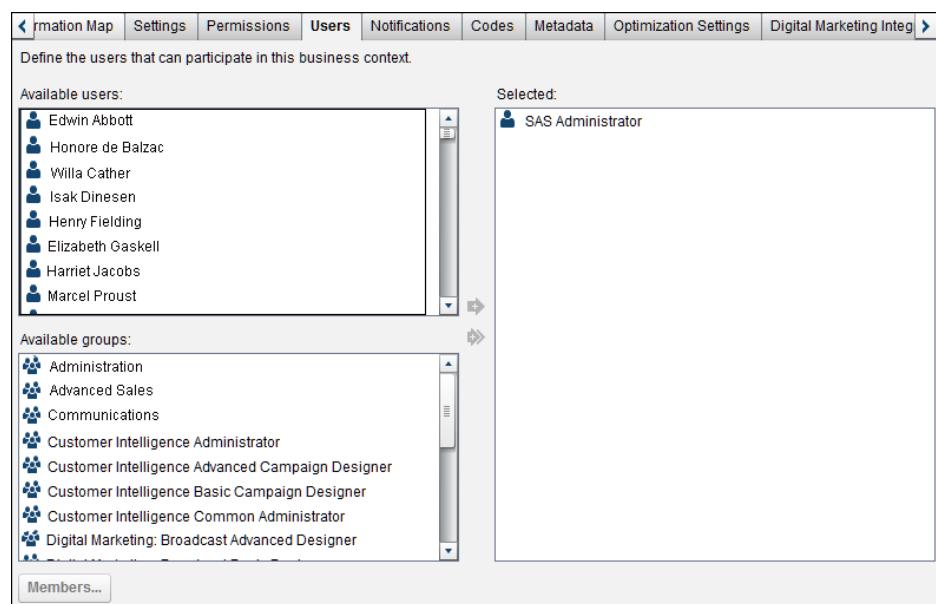
In general, the permission that you set for an individual user overrides the permission that is set for a group that the user is a member of. For more information about the relationship of permissions between users and groups, see *SAS Intelligence Platform: Security Administration Guide* at [SAS Intelligence Platform](#).

If you set a permission to **View**, the user can see the business context in the Setup workspace, but cannot save any changes to the business context. **Edit** permission enables the user to see the business context and to save changes to it.

## Select Users of Business Context Objects

The **Users** tab lists the users and groups who can choose the business context in SAS Customer Intelligence Studio and create and manage assets in the **Definitions** and **Designer** workspaces.

*Display 3.6 Users Tab*



Select the users and groups who should have access to the objects.

## Individual Users and Group Permissions

The **Permissions** and **Users** tabs manage an overlapping set of access permissions that can produce unexpected results. An individual user who has Edit permission to a business context cannot be a user of the business context through a group.

For example, suppose that USER1 is a member of GROUPA. You add individual user USER1 to the **Permissions** tab and give that user Edit access to the business context. Then, you add GROUPA to the **Users** tab, with the expectation that all members of that group, including USER1, will be able to use

the business context. However, the actual result is that USER1 cannot use the business context.

All members of a group that is selected on the **Users** tab can use the business context if one of the following conditions is met.

- An administrative user creates all of the business contexts and adds all users and groups to the **Permissions** and **Users** tabs. This user is not a member of any selected group on the **Users** tab. The administrative user can edit business contexts, but cannot use business contexts unless this user is selected on the **Users** tab.
- A user who is a member of a group creates the business context. Then, the user opens SAS Management Console and selects the business context from the **Folders** tab. The user removes the individual user permission from the **Authorization** tab of the business context properties window. For more information, see “Folders in SAS Management Console” in *SAS Marketing Automation: Administrator’s Guide*.

It is important to remember that individual permissions take precedence over group permissions.

## Enable Email Notifications

On the **Notifications** tab, set the email notifications to send after an event such as a change in checklist status.

**Figure 3.7** Notifications Tab

All	Notification	Event	Recipients
Approval	Approval	Approved	
Campaign Status	Approval	Denied	
Checklist Status	Approval	Request withdrawn	
Deployment	Approval	Requested	
Execution	Campaign Status	Manual	
Optimization	Checklist Status	Attachments	
Schedule	Checklist Status	Batch Simulation	
	Checklist Status	Budget	
	Checklist Status	Comments	
	Checklist Status	Control Groups	
	Checklist Status	Custom Detail Page	
	Checklist Status	Custom Step	
	Checklist Status	Diagram	
	Checklist Status	Members	
	Checklist Status	Notifications	
	Checklist Status	Optimization	

Changes to notification settings are applied to campaigns that are created after the changes are made. The changes are not applied to existing campaigns within the business context.

Notifications are enabled by default. To disable all notifications, select **Turn off notification system**. Notification recipient settings are retained and are applied if you enable notifications.

**CAUTION!** If you turn off the notification system, users of existing campaigns might not be aware that notifications will not be sent. Turning off the notification system affects both existing and future campaigns.

Select a row. Select the events that trigger the notification. Click  to select the recipients of the notification. This setting applies to any notification of the same type that is sent from that business context.

**Note:** In order to receive the notification, the correct email addresses must be assigned to the users in the User Manager plug-in in SAS Management Console. For more information, see *SAS Marketing Automation: Administrator's Guide*.

## **Specify Formats for Codes and Campaign Names**

On the **Codes** tab, specify the format of cell codes, automatic holdout control group codes and names, campaign names, and other items. Valid characters for codes are alphanumeric characters, numerals, underscores, hyphens, and periods. Blank spaces are not allowed in code formats.

### **Display 3.7 Codes**

Enter the name of the automatic holdout control group, campaign group, or campaign in the **Name Format** column. Include the number sign (#) in the name. The # will be replaced by a unique number or, in the case of a control group, the name of the marketing cell that the control group is derived from. The # can occur anywhere in the name. By default, the campaign name format is Campaign#. The campaign group name format is CampaignGroup#. The control group name format is #\_Control, where the # is replaced by the name of the marketing cell. Names can be no longer than 60 characters.

To specify the properties of the code, click a cell in the **Code** column and select either **Automatic - editable**, **Automatic - not editable**, or **Manual - editable**. The **Automatic - not editable** setting for holdout control groups cannot be changed. If the format for a control group name or code is changed in the business context, existing control group cell names and codes are not changed.

to the new format. New control group names and codes comply with the new format. The limit to the length of codes is set in the Code column of the common data model. Codes that exceed the limit are truncated when the campaign is published.

Enter the code format in the **Code Format** column. Include the # that will be replaced by a unique number. The # can occur anywhere in the code name. For control group code formats, the # is replaced by the cell code of the marketing cell. If a cell is linked to more than one Communication node, a unique name is generated for each control group by appending a sequential number to the name.

Here are the default formats:

- GROUP#
- CAMP#
- COMM#
- REPLY#
- CELL#
- CG#
- PKG#
- TRT#

To specify a code that is only numeric, enter # in the **Code Format** cell.

For the **Automatic-editable** and **Automatic-not editable** properties, code formats are required. If automatic holdout control groups are enabled, the PKG# code format is also required for the **Manual-editable** property.

To retain codes, including auto-generated codes, when pasting nodes, select **Retain all code values when pasting**. This setting applies to campaigns within the selected business context.

The following codes are retained:

- campaign codes
- campaign group codes
- cell codes, including marketing cells
- communication codes
- control group codes and names
- package codes

## Generate Information Map Metadata

If there has been a change to an information map, you might need to generate new information map metadata. On the **Metadata** tab, you manage the generation of metadata tables for information maps. Metadata tables are SAS data sets that contain location and summary information about data items.

**Display 3.8 Metadata Tab**

The screenshot shows the SAS Customer Intelligence Information Map interface. The top navigation bar includes links for Information Map, Settings, Permissions, Users, Notifications, Codes, **Metadata** (which is selected and highlighted in blue), Optimization Settings, and Digital Marketing Integration. Below the navigation bar, the title of the information map is displayed as "Information map: Products\SAS Customer Intelligence\Samples\Campaign DataMarketing Automation Sample". A dropdown menu labeled "Metadata library" contains options "Use information map" and "Details".

**Generate Metadata** section:

- Tables:
  - Numeric variable table
  - SQL  SAS SUMMARY procedure
  - Character variable table
  - SQL  SAS SUMMARY procedure
  - Histogram table
  - SQL  SAS SUMMARY procedure
  - Date histogram table
  - SQL  SAS SUMMARY procedure
- Buttons: "Run Selected Now..."

**Manage Metadata** section:

- Buttons: "Create Job for Scheduling", "Send metadata generation job to SAS Schedule Manager. Automatically includes all tables and clears cache.", "Clear Metadata Cache", "Clearing the cache will affect all business contexts that reference the same information map."

The generated metadata is stored in a library with the libref of MAMeta. Select a library from the **Metadata library** list. Click **Details** to display the LIBNAME statement for the library. The **Use information map** item uses the MAMeta LIBNAME statement within the information map. For more information, see *SAS Marketing Automation: Administrator's Guide*.

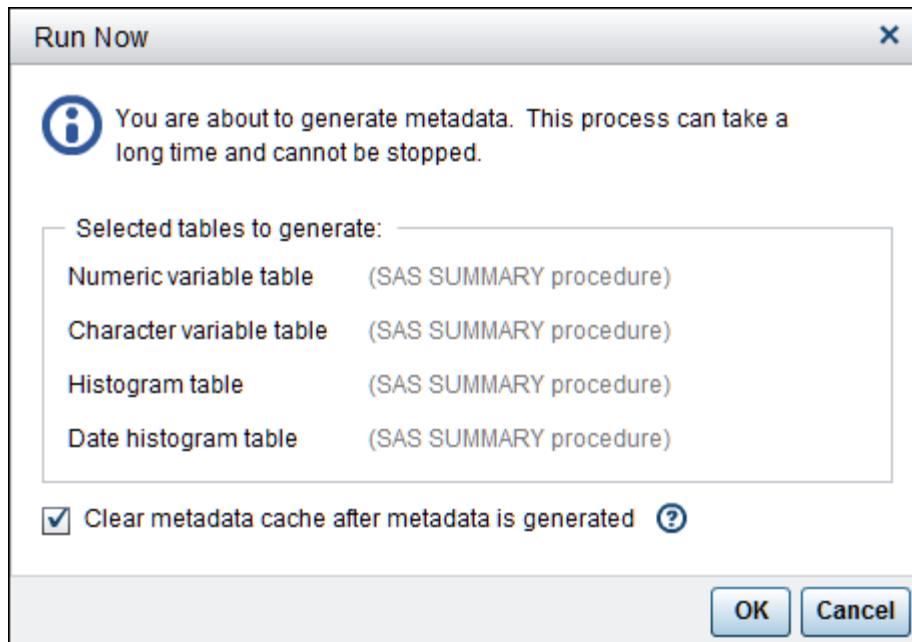
Select **SQL** as a query method if the information map is not complex, but contains a large amount of data. Select **SAS SUMMARY procedure** to specify whether the SUMMARY procedure should be used.

If the metadata counts are in the process of being updated, click **Create Job for Scheduling**. All of the tables are generated and the jobs are sent to the SAS Schedule Manager. The metadata cache is cleared automatically after the metadata has been generated.

To replace the existing metadata counts with new counts, click **Clear Metadata Cache**. The metadata cache is cleared for all business contexts that share the current information map.

If the metadata counts are current and ready for use in a campaign, click **Run Selected Now**.

Figure 3.8 Run Selected Now



To improve performance, previous metadata counts are stored in a cache that is used by SAS Customer Intelligence Studio. To replace the existing metadata counts with new counts, select **Clear metadata cache after metadata is generated**. The metadata cache is cleared for all business contexts that share the current information map.

## Specify Score Columns for Optimization

The **Optimization Settings** tab lists the score columns that can be optimized. The list of score columns is displayed on the Scores page on the Optimization Settings page of the campaign or campaign group that is a candidate for optimization in SAS Marketing Optimization.

Display 3.9 Optimization Settings

**Warning**

Modifications to optimization score columns will affect score assignments for all campaigns and campaign groups using analytical optimization in this business context. Adding columns will create empty score assignments rendering existing optimization campaign groups invalid. Removing columns will delete any associated score assignments in existing analytical optimization campaigns and campaign groups. Associated scenarios might become infeasible.

Click to add a row to the table. Enter the name of the score column.

The column names are limited to 26 characters.

**CAUTION! Changes to the score columns affect the score assignments for all of the campaigns and campaign groups that use the Analytical Scenario method in this business context.** Adding columns creates empty score assignments and makes existing optimization campaign groups invalid. Removing columns deletes any score assignments in existing campaigns and campaign groups. The associated scenarios might become infeasible.

## Connect to SAS Customer Intelligence 360

### SAS Marketing Automation and SAS Customer Intelligence 360

You can make your SAS Marketing Automation audience data available to SAS Customer Intelligence 360 for use in creating and updating segments. SAS Marketing Automation audience and treatment data is also used to add targets and messages to tasks in SAS Customer Intelligence 360.

To provide SAS Marketing Automation data to SAS Customer Intelligence 360:

- 1 Specify tenant information in the business context. For more information, see “[Specify Tenant Information](#)”.
- 2 Make Cell and Link node data available to SAS Customer Intelligence 360. For more information, see “[Specify Cell Node Details](#)” on page 253 and “[Specify Link Node Details](#)” on page 287.
- 3 Select **SAS Customer Intelligence 360** as the output type in the export definition that is used by the Communication nodes in your campaign. For more information, see “[Select an Output Type](#)” on page 105.

The data is uploaded when the campaign is executed.

### Specify Tenant Information

On the **Digital Marketing Integration** tab, specify the information to connect with the tenant that is used by your site.

**Figure 3.9** SAS Customer Intelligence 360 Integration

Connection Details	
User:	<input type="text"/>
Password:	<input type="password"/>
SAS Customer Intelligence 360 Server URL:	<input type="text"/>
Logon Server URL:	<input type="text"/>
Tenant:	currently not known.

The values in the **User** and **Password** fields are the SAS Customer Intelligence 360 credentials for a user who belongs to the tenant that you want to share data

with. For information about adding users to a tenant, see *SAS Customer Intelligence 360: Onboarding Guide*.

The name of the tenant is displayed when the business context is validated.

In the **SAS Customer Intelligence 360 Server URL** and **Logon Server URL** fields, enter the path of the URL. You can also enter only the server segment of the path, and the full path is completed. For example, here is a full SAS Customer Intelligence 360 Server URL path:

```
https://my-ci360-server/my-SAS-midtier/rest/
```

You can enter only the following:

```
https://my-ci360-server
```

The URL resolves to the full path.

## Validate Business Context Settings

Click **Validate** to validate the business context settings.

# Campaigns

## Overview of Campaign Definitions

When you create a new campaign , you select a campaign definition. The details that you specify for a campaign definition determine the information that is available.

## Create a Campaign Definition

To create a new campaign definition, expand the Selection category in the Definitions workspace, and select **Selection Campaign Definitions**.

*Display 3.10 Selection Campaign Definitions*



Click and select **New selection campaign definition** to create the definition.

## Specify Campaign Definition Properties

The Properties page displays information about the campaign definition. You can edit the name when you save the campaign definition.

*Display 3.11 Selection Campaign Definition Properties*

Use the **Code** list to specify the following options:

### Automatic - editable

The code is automatically generated and can be edited. The format is derived from the setting for the current business context.

### Automatic - not editable

The code is automatically generated and cannot be edited. The format is derived from the setting for the current business context.

### Manual - editable

The code is supplied manually by the user.

### Default to business context

The code settings default to the settings for the current business context. The code can be edited on the Properties page of the campaign or campaign group.

Select **Include ‘initiating’ as a campaign status** to specify that **Initiating** and **Initiation complete** are available as statuses in the campaign.

Select **Add ability to submit campaign for approval** if you want to add an approval step to the process. Click **Assign approvers** to select the users and groups who can approve a campaign. Selecting this option adds an Approval page to the Process gallery. Users and groups who have approval permission are listed on the Properties page.

After a campaign has been created based on a campaign definition, further changes to a campaign definition are not reflected in that campaign.

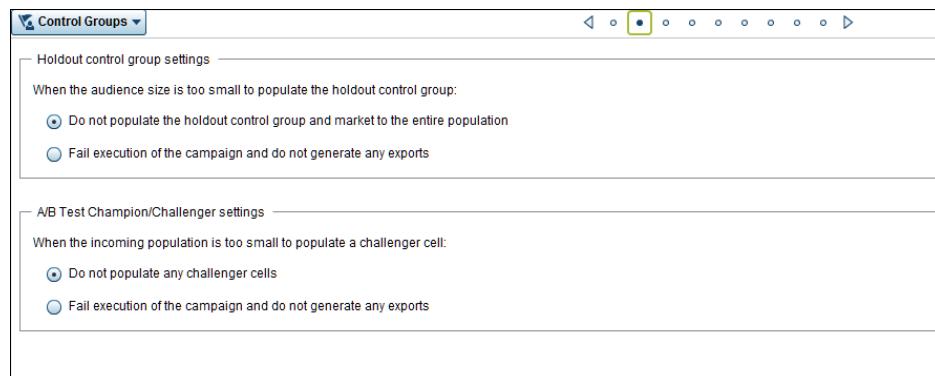
Select **Add ability to include campaign in optimization group** if you want to include the campaign in a group that can be optimized. For more information, see “[Optimizing Campaigns](#)” on page 154.

Campaigns that are based on this definition have an Optimization Settings page. A/B Test nodes cannot be used in campaigns that are members of an optimization campaign group.

## Specify Control Group Settings

The Control Groups page displays the control groups settings for a campaign.

*Display 3.12 Control Groups Page*



The **Holdout control group settings** section specifies the failure options for holdout control groups. The holdout control group population for a cell must not be larger than the population that is not in the holdout control group. When a Communication node is run, the total count in the marketing cell might be less than twice the count that is specified for the cell's control group. In that case, you decide whether to populate the control group and execute the campaign or to cause the campaign to fail and inform the campaign designer of the cause of the failure. Select **Do not populate the holdout control group and market to the entire population** to execute the campaign even if the total count is too small. Select **Fail execution of the campaign and do not generate any exports** to cause campaign execution to fail.

The **A/B Test Champion/Challenger settings** section specifies the failure options for control groups that are generated by the A/B Test node. The champion must be at least as large as the smallest challenger. Select **Do not populate any challenger cells** to execute the campaign even if the total incoming population is too small. Select **Fail execution of the campaign and do not generate any exports** to cause campaign execution to fail. These failure options do not apply to challenger/challenger scenarios.

## Add Custom Detail Pages

### Overview of Custom Detail Pages

On the Custom Detail Pages page, you add new pages that contain user-defined fields. You can select these pages for inclusion in the Design gallery or Process gallery for a campaign.

*Figure 3.10 Custom Detail Pages*

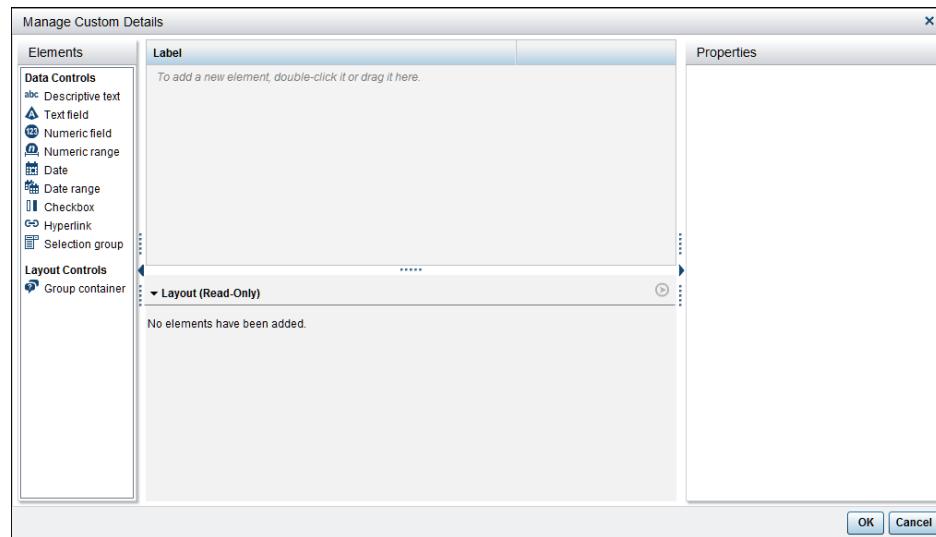


Click **+** to add a new page to the table. Click **Manage custom details** to add custom details to the page. Select **Add custom detail groups** to add custom detail groups to the page.

### Manage Custom Details

In the Manage Custom Details window, you supply information about the custom details.

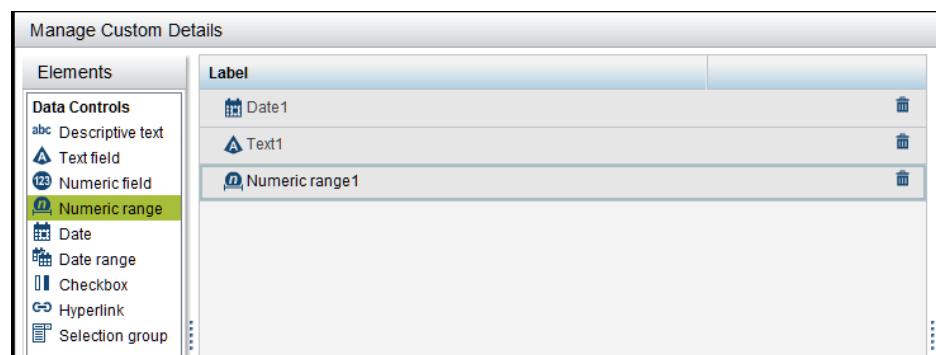
*Display 3.13 Manage Custom Details*



### Select an Element

To select the type of custom detail, double-click it or drag an element from the **Elements** pane to the **Label** pane.

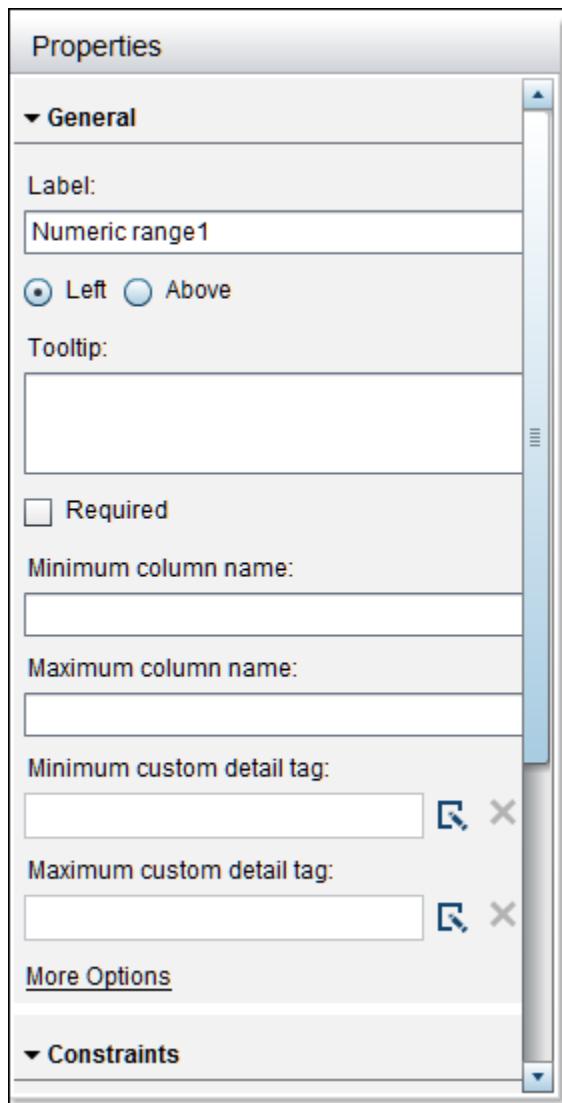
*Display 3.14 Select Element*



### Specify Properties

In the **Properties** pane, specify the details for the selected element. The details vary, depending on the element and the software component. As you set the properties, you can review the results in the **Layout** pane.

Display 3.15 Custom Detail Properties



### Specify General Properties

The following items are the possible properties in the General section. Click **More Options** to display more properties.

#### **Label**

is the name that is displayed with the field. Select **Left** or **Above** to set the location of the label in relation to the custom detail.

**Note:** The names of custom details that are passed to SAS Marketing Optimization must be no longer than 26 characters.

#### **Description**

is the description of the field.

#### **Tooltip**

is the text that is displayed when you rest the mouse pointer on the field.

#### **Required**

indicates that a value is required. Required custom details must be completed before a campaign can be executed.

**Dynamic (editable in campaign)**

indicates that a value is dynamic. Dynamic custom details can be modified. For example, if you have a credit card offer in which you want to give different rates to different customers, you can use a single treatment and specify a different value for the Rate dynamic custom detail for each group of customers. Values that are not dynamic cannot be changed. This option is available only for treatments.

**Column name**

is the name of the column that is displayed in a published report.

**Minimum column name**

is the name of the column that displays the minimum value in a range.

**Maximum column name**

is the name of the column that displays the maximum value in a range.

**Custom detail tag**

is the custom detail tag that is associated with the custom detail. Click  to select a custom detail tag.

**Minimum custom detail tag**

is the custom detail tag that is associated with the minimum value in a range.

Click  to select a custom detail tag.

**Maximum custom detail tag**

is the custom detail tag that is associated with the maximum value in a range. Click  to select a custom detail tag.

**Width**

is the width of a field.

**Hint**

is the text that is displayed beneath the field that indicates the value that should be entered.

**In-field hint**

is the text that is displayed in the field that indicates the value that should be entered.

**Specify Data**

These are the possible properties in the Data section:

**Number of values**

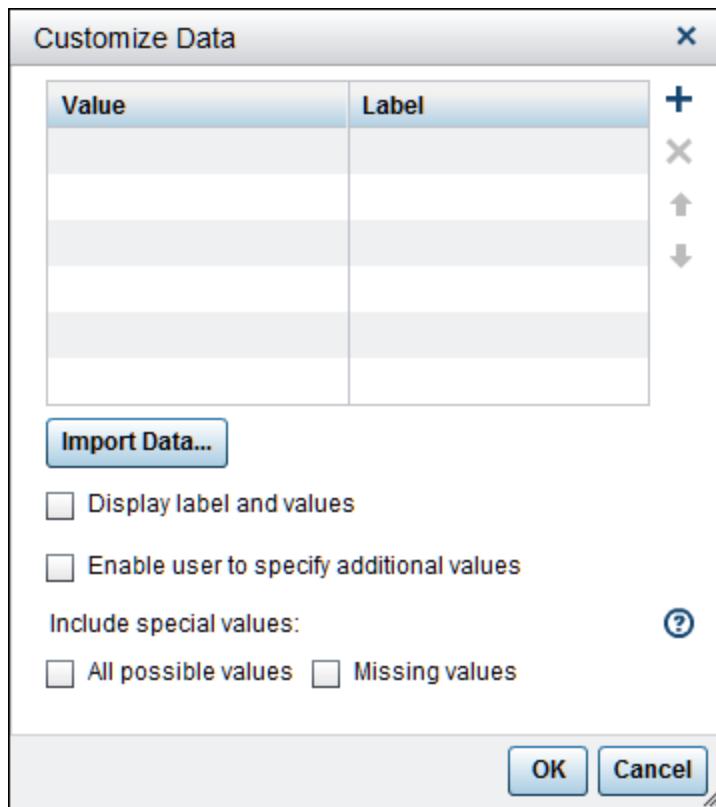
sets the number of text values that can be entered. If you select **Multiple values**, select **Enable user to reorder values** to enable the user to change the order of the values.

**Populated by**

specifies the source of the values that are entered.

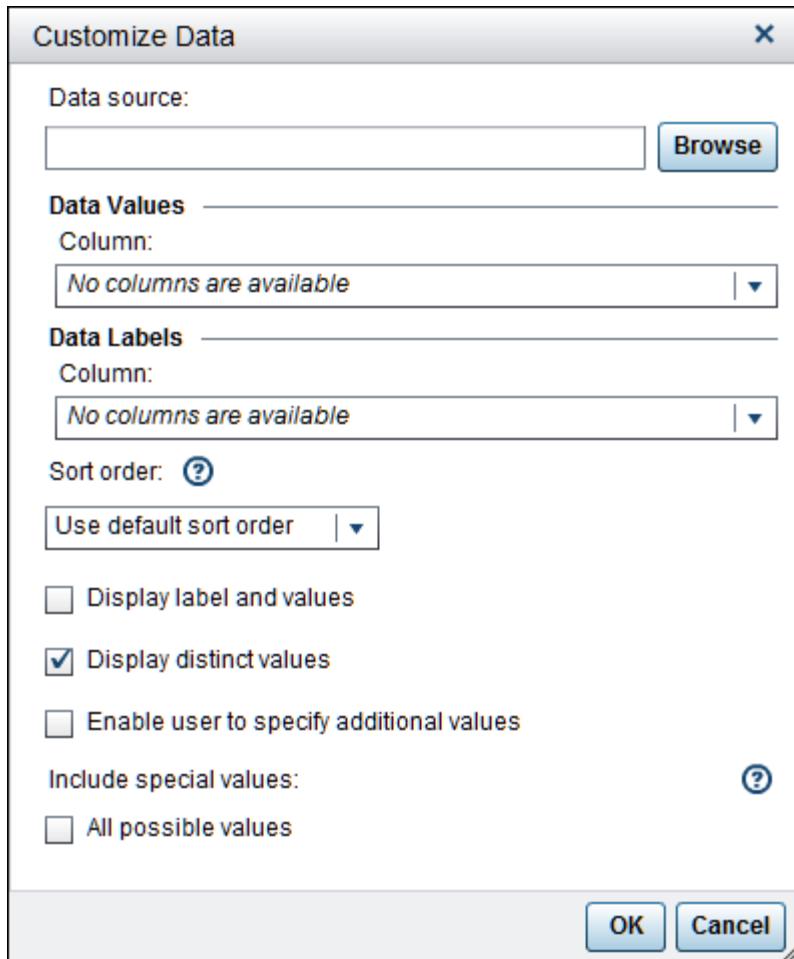
Select **User entry** to indicate that values are entered by the user.

When you select **A predefined list**, the list does not change unless you add or remove values.



To display text other than the name of the list item, enter a value in the Label column. For example, if the list items are products, the Value could be the product number A12345 and the Label could be Child's Desk. When a predefined list is published to the common data model, the published value contains the concatenated display values. Click **Import Data** to import values from a SAS library. Click **Display label and values** to display the label and values with the list item. To enable the user to select values from a list, select **Enable user to specify additional values**. Select **All possible values** and **Missing values** to include those values in the list.

When you select **A dynamic list**, the list displays the contents of the SAS Folders hierarchy on the **Folders** tab of SAS Management Console. Changes in this external list are reflected in the list of values that the user can select.



Click **Browse** to select a data source. Select a column in the Data Values and the Data Labels section to display those columns. Select a sort order. To display a value other than the text in the **Value** field, select **Display label and values** and **Display distinct values**. To enable a user to select more than one value from a list, select **Enable user to specify additional values**. Select **All possible values** and **Missing values** to include those values in the list.

#### Dependencies

If you create at least one element that is populated by a dynamic list, click **Dependencies** to add an element that the first element depends on. For example, if the first element is "Store," and the element that it depends on is "Sales Region," the Store element displays only the stores that are in the

selected sales region.

**Dependencies**

The "Text1" element depends on the following elements:

Element	Description of Dependency

The following elements depend on the "Text1" element:

Element	Description of Dependency

**OK** **Cancel**

Click **+** to add the dependency.

**New Dependency**

The "Text1" element is dependent on the following element:

Numeric range1

Condition

The value of the "Text1" element is displayed when the following condition is met: [?](#)

Data source: /CI Assets/Database Tables/MAALORA/ALLACCT(Table)

Column: ACCTNUM

Operator: Is between (inclusive)

Value: Value selected for the "Numeric range1" element

**OK** **Cancel**

## Specify Constraints

The following items are the possible properties in the Constraints section.

### Allow only integer values

indicates that only integer values can be entered in a numeric or a numeric range custom detail.

### Number of lines

specifies whether to display single or multiple lines. If you select **Multiple lines**, specify the **Maximum line count** and **Number of lines displayed**.

### Minimum length

sets the minimum number of characters that are allowed in the field.

### Maximum length

sets the maximum number of characters that are allowed in the field.

### Maximum line count

is the maximum number of text lines that can be entered in a field.

### Number of lines displayed

is the number of text lines that are displayed in the field.

### Date type

sets the unit to **Day**, **Week**, **Month**, **Quarter**, or **Year**.

In an export file, these custom details contain the following values:

#### Quarter

The first day of the quarter, for example, 1 Oct 2016

#### Week

The date of the Monday of the week, for example, 8 Feb 2016.

#### Year

The first day of the year, for example, 1 Jan 2016.

### Minimum decimal places

sets the minimum number of decimal places that are allowed in the field.

### Maximum decimal places

sets the maximum number of decimal places that are allowed in the field.

### Minimum value allowed

is the minimum value for the field.

### Maximum value allowed

is the maximum value for the field.

### Combined field

is another text field that this field can be combined with.

### Maximum combined length

is the combined length of two combined text fields.

## Specify Appearance

The Appearance section offers a choice of displays for selection groups and group containers. A selection group can be displayed as a drop-down list or a set of radio buttons. A group container can be displayed as a labeled box, a collapsible section, or an unlabeled group.

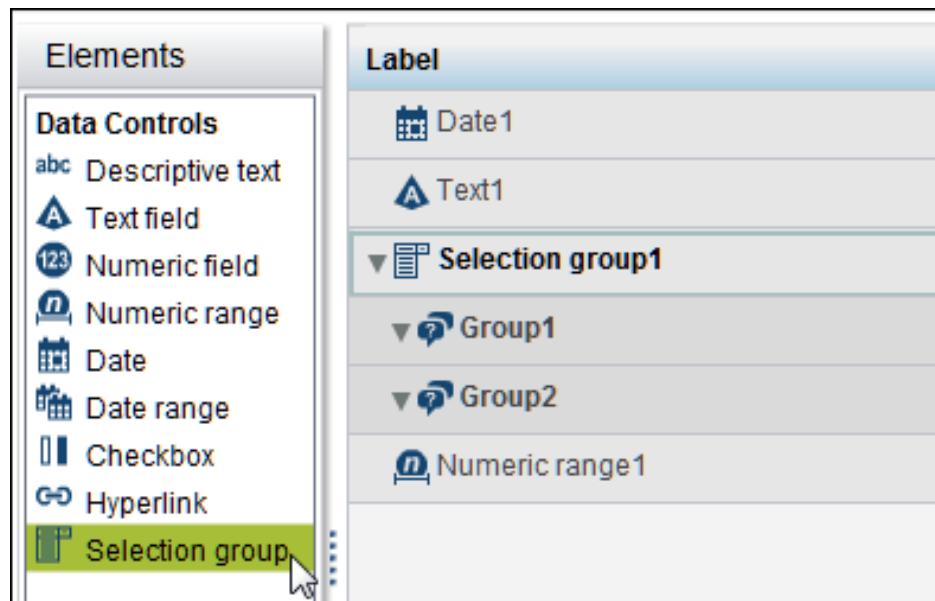
## Specify Default Values

In the Default Values section, you specify a default value for a selection group. Click  to specify which group is displayed first by default.

## Organize Custom Details

A selection group is a collection of other groups that is displayed as a list or a series of radio buttons. Double-click **Selection group** to add it to the **Label** pane.

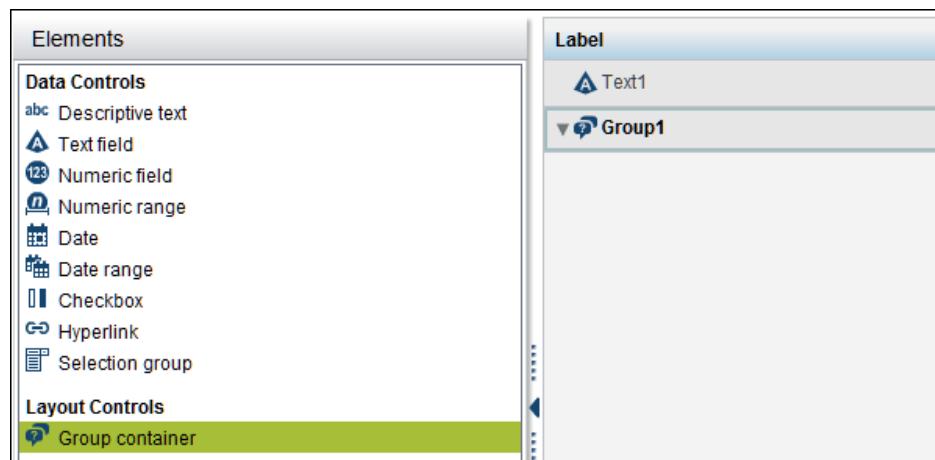
*Display 3.16 Selection Groups*



The selection group is prepopulated with groups that you can modify and add items to. Select items from the **Elements** pane and drag them to a group.

A group container collects custom details into a group. Double-click **Group container** to add it to the **Label** pane.

*Display 3.17 Group Container*

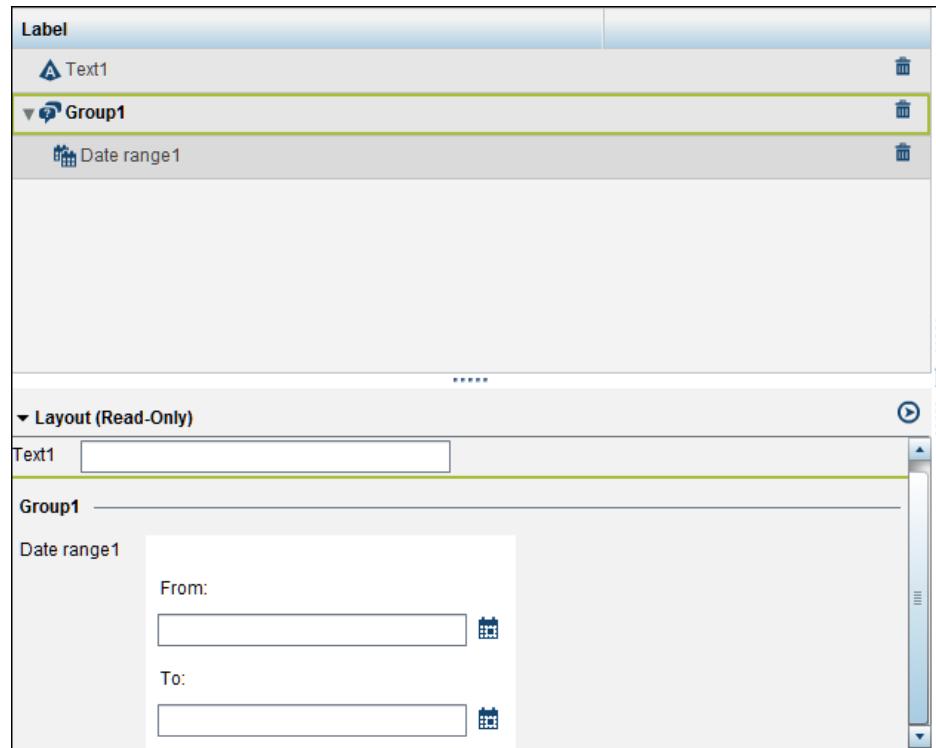


Select items from the **Elements** pane and drag them to a group.

### Preview Custom Details

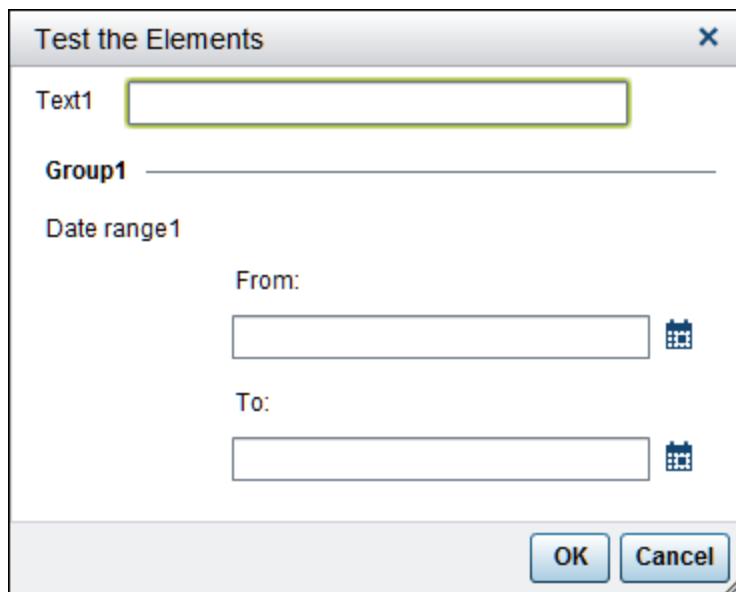
The Layout pane displays the custom details as they will appear on the Custom Details page.

*Display 3.18 Layout*



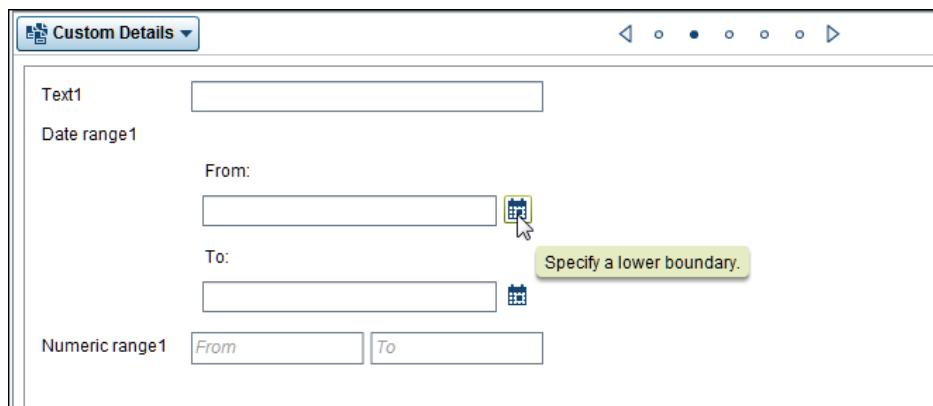
A red asterisk (\*) indicates that a field is required.

Click to open a Test the Elements window where you can test the custom details by interacting with them.

*Display 3.19 Test the Elements*

### **Set Default Values**

On the Custom Details page, you specify default values for the custom details that you have created.

*Display 3.20 Default Values*

Hyperlinks can link to websites or to files on local servers. Specify a link to a local server in one of the following ways:

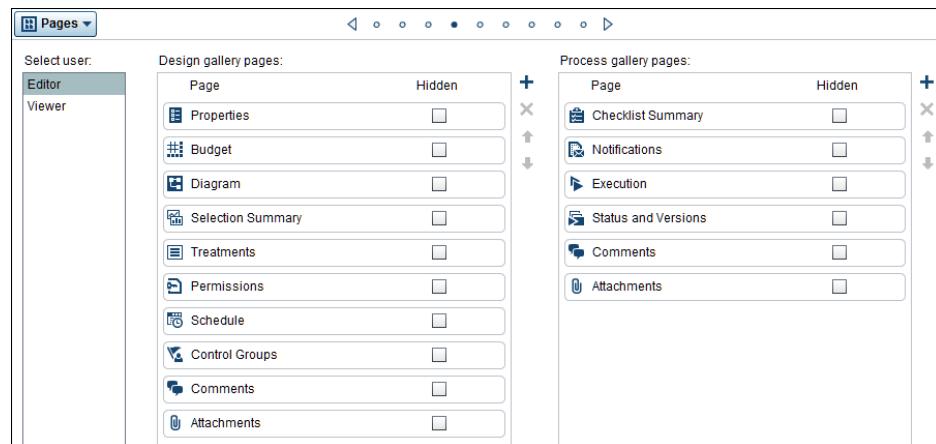
```
\server\path  
file:///server/path
```

**Note:** For security reasons, local links cannot be opened in the Chrome browser. Local links can be opened in the Firefox browser if you change the default configuration. See the Firefox help for more information.

## Select Pages

On the Pages page, you select the pages that are listed in the Page Manager for a campaign.

*Display 3.21 Pages*



Select **Editor**, **Viewer**, or **Approver** and select the pages that each role can have access to.

By default, each role has access to different pages in the Design gallery and Process gallery. Users with **Editor** access can make changes to a campaign. Users with **Viewer** access can view, but not edit a campaign. Users with **Approver** access can edit and approve a campaign. **Approver** is listed if you have selected **Add ability to submit campaign for approval** on the Definition Properties page. If each role should have access to the same pages, select **Same as editor** for **Viewer** and **Approver**.

Select the **Hidden** check box next to each page to add it to the **Hidden pages** list for a campaign . The campaign user can move the page from the **Hidden pages** list to the **Shown pages** list.

Click **+** to select pages to add to the Design gallery or the Process gallery.

The following pages are required for the following roles:

### **Editor** role

- Properties
- Diagram
- Optimization, if **Add ability to include campaign in optimization group** is selected on the Properties page of the definition.
- Approval, if **Add ability to submit campaign for approval** is selected on the Properties page of the definition.
- Execution

### **Viewer** role

- Properties

### **Approver** role

- Properties

- Approval

**Note:** Any changes that you make to page selections apply only to campaigns that are created in the future. Campaigns that currently use this campaign definition are not affected.

## Specify Checklist Items

The Campaign Checklist page displays the pages and custom steps that are in the checklist.

*Display 3.22 Campaign Checklist Page*

The screenshot shows a table titled "Checklist items:" with two columns: "Name" and "Type". The rows are:

Name	Type
Properties	Page
Diagram	Page
Treatments	Page
Schedule	Page

At the top left of the table is a blue plus sign (+) button. At the top right are buttons for adding (+), deleting (X), and reordering (up and down arrows).

Click **+** and select **Add page step** to add an existing page to the checklist.

Select **Add custom step** to add a custom step. Edit the name of the custom step to be more descriptive.

## Set Access Permissions for the Campaign

The Campaign Permissions page displays the names of users and groups who automatically have access to the campaigns that are created with this definition. You can set three types of permissions on this page: **Edit**, **View**, and **Approve**.

*Display 3.23 Campaign Permissions*

The screenshot shows two tables: "Groups:" and "Users:". Both tables have columns for "Name" and "Permission".

**Groups:**

Name	Permission
Product Managers	Edit
Design Group	Edit

**Users:**

Name	Permission
Gloria Drew	Edit

A search bar labeled "Search users and groups" is located above the user table.

If no users or groups are added to this page, the creator of a campaign automatically has Edit permission.

If you have selected **Add ability to submit campaign for approval** on the Definition Properties page, at least one user or group must have Approve permission. Both groups and users can have Approve permission. After a campaign has been created, an existing approver can add or remove other approvers on the Permissions page in the campaign.

To add a user to the list, click and select a user. To add a group to the list, click and select a group.

To view the members of a group, select the group and click .

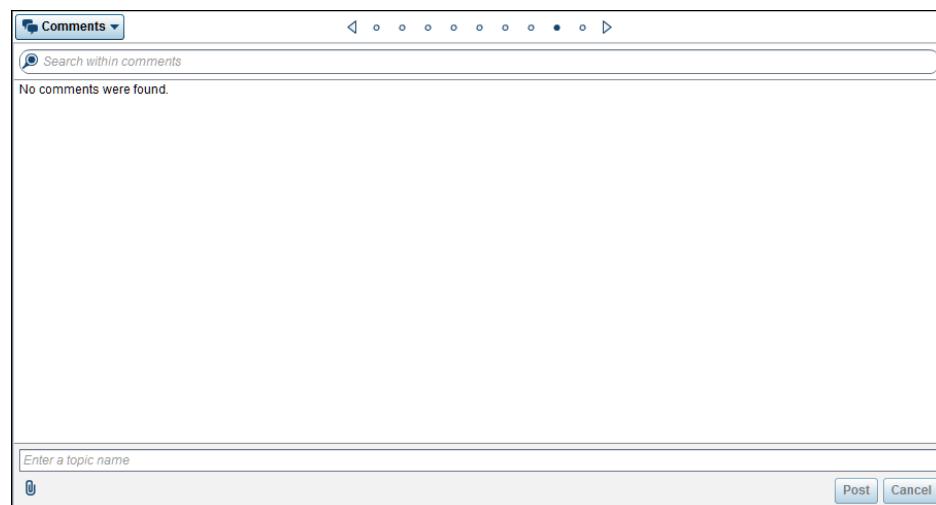
To change the permission of a user or user group, click the **Permission** cell and select the permission. By default, all users and groups that you select have Edit permission.

In general, the permission that you set for an individual user overrides the permission that is set for a group that the user is a member of. For more information about the relationship of permissions between users and groups, see *SAS Intelligence Platform: Security Administration Guide* at [SAS Intelligence Platform](#).

## Add Comments

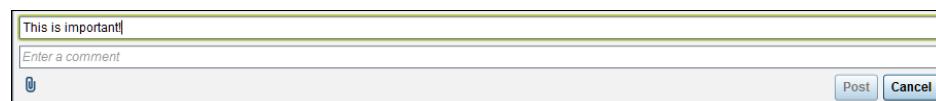
On the Comments page, you view and add comments. You add comments after saving.

**Figure 3.11** Comments



Enter a topic name to add a new comment.

**Figure 3.12** New Topic



Enter the text of the new comment.

Figure 3.13 Comment Text

This screenshot shows a dialog box for entering comment text. It contains two text input fields: the top one has "This is important!" and the bottom one has "Read this before proceeding.". At the bottom right are "Post" and "Cancel" buttons.

Click **Post** to post the comment. Your new comment is displayed on the Comments page. You can add comments even if you do not have Edit permission.

Click to add an attachment such as an image or a document.

To reply to an existing comment, type text in the field below the comment title.

Figure 3.14 Comments List

This screenshot shows a comments list interface. At the top is a header with a "Comments" button and three small icons. Below it is a search bar labeled "Search within comments". The main area displays a single comment card. The card title is "This is important!", followed by the author "Gloria Drew" and the text "Read this before proceeding.". At the bottom of the card are "Edit" and "Delete" links. A cursor arrow points to the "Edit" link.

Type in the search field to find text in comments.

Figure 3.15 Search Comments

This screenshot shows a search interface for comments. It features a header with a "Comments" button and three small icons. Below is a search bar labeled "Search within comments". The search term "This is important!" is typed into the search bar. A cursor arrow points to the search term.

## Add Attachments

On the Attachments page, you view and add attachments such as images or documents.

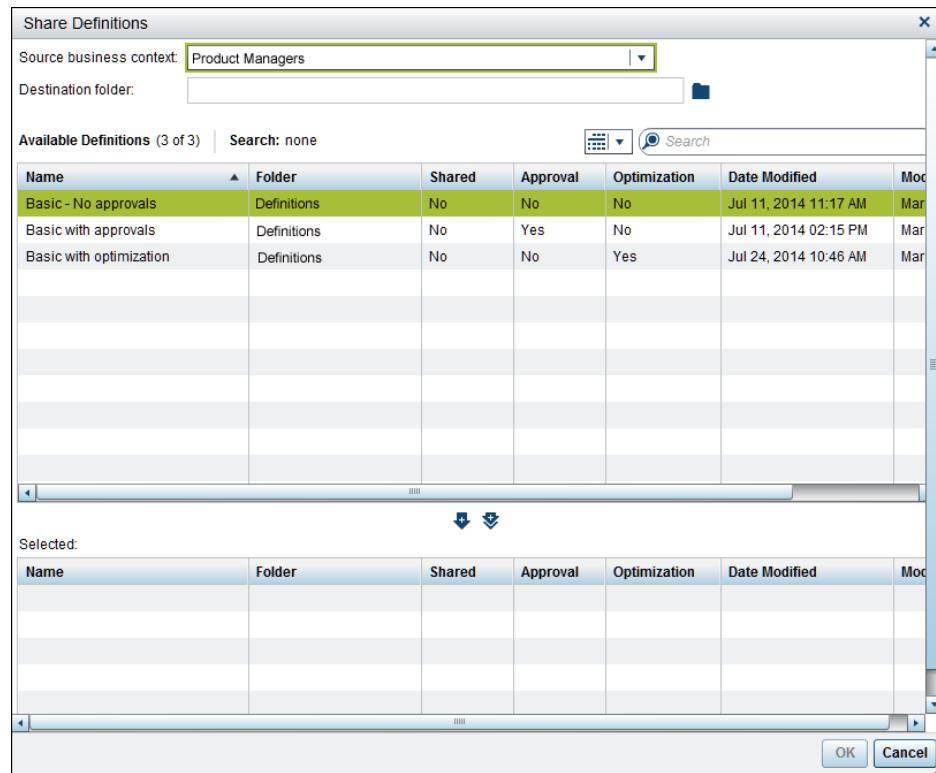
**Figure 3.16** Attachments

Click to select a file to attach.

## Share a Campaign Definition across Business Contexts

A campaign definition can be used in more than one business context. A shared definition is a reference to the initial definition. If you have the appropriate permissions, any changes that you make to the shared definition are saved to the initial definition.

To share a definition that was created in a different business context, click and select **Share selection campaign definition**.

**Display 3.24** Share Definitions

Select the **Source business context** that contains the campaign definitions that you want to share. Click to select the storage location for the shared definition within the current business context. Select the definitions from the Available Definitions table and click the arrows to add them to the list of selected definitions.

If you delete a shared definition, it is deleted only from the current business context.

The Sharing page of the campaign definition lists other business contexts that share the definition.

*Figure 3.17 Sharing Page*

Name	Code	Date Shared	Shared By
Product Managers	17	Jul 11, 2014 11:19 AM	Gloria Drew

A number in a red badge indicates the business contexts that share this definition but that you do not have permission to view.

## Campaign Groups

### Overview of Campaign Group Definitions

A campaign group definition identifies the settings that are applied to a collection of campaigns. You use campaign groups to organize campaigns for scheduling and executing or for optimization.

### Create a Campaign Group Definition

To create a new campaign group definition, expand the Selection category in the Definitions workspace, and select **Campaign Group Definitions**.

*Figure 3.18 Campaign Group Definitions*

Click to create the definition.

## Specify Campaign Group Definition Properties

The Properties page displays information about the campaign group definition.

*Figure 3.19 Campaign Group Definition Properties*



Use the **Code** list to specify the following options:

### Automatic - editable

The code is automatically generated and can be edited. The format is derived from the setting for the current business context.

### Automatic - not editable

The code is automatically generated and cannot be edited. The format is derived from the setting for the current business context.

### Manual - editable

The code is supplied manually by the user.

### Default to business context

The code settings default to the settings for the current business context. The code can be edited on the Properties page of the campaign or campaign group.

Select **Add ability to optimize campaign group** to enable the campaign group to be optimized. If you select this option, you can add an Optimization item on the Checklist page.

By default, optimization campaign groups optimize customer contacts for each marketing cell. When SAS Marketing Optimization is installed, select **Optimize at treatment level** to optimize customer contacts for each treatment instead.

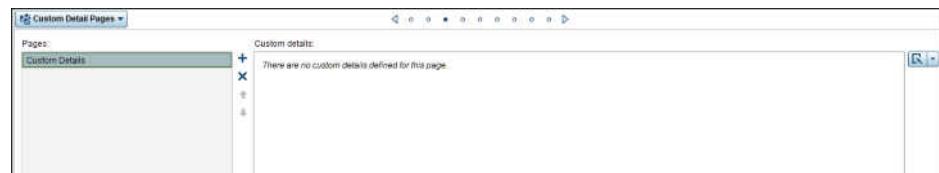
**Note:** Holdout control groups cannot be used in treatment-level optimization.

For more information, see “[Optimizing Campaigns in SAS Marketing Automation and SAS Marketing Optimization](#)” on page 155.

## Add Custom Detail Pages

### Overview of Custom Detail Pages

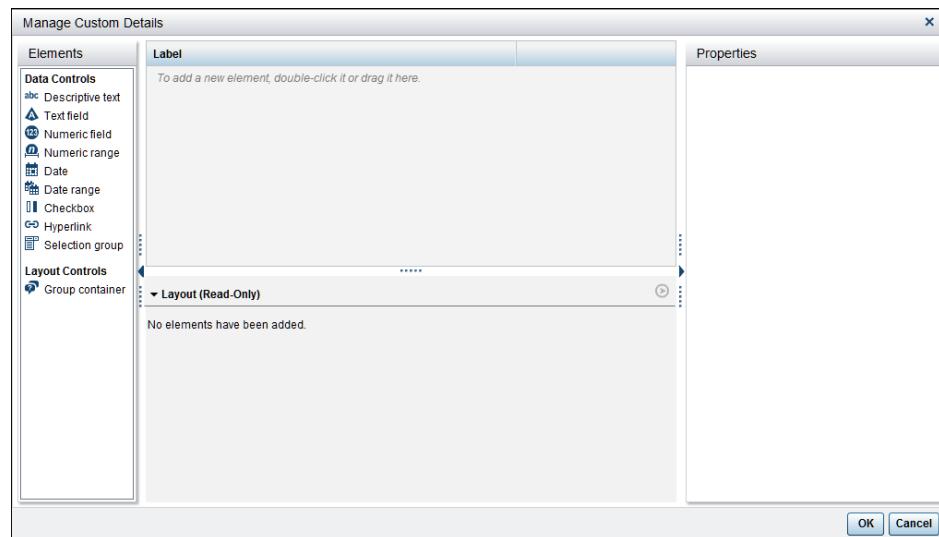
On the Custom Detail Pages page, you add new pages that contain user-defined fields.

**Figure 3.20** Custom Detail Pages

Click **+** to add a new page to the table. Click **🔍** to add custom details to the page.

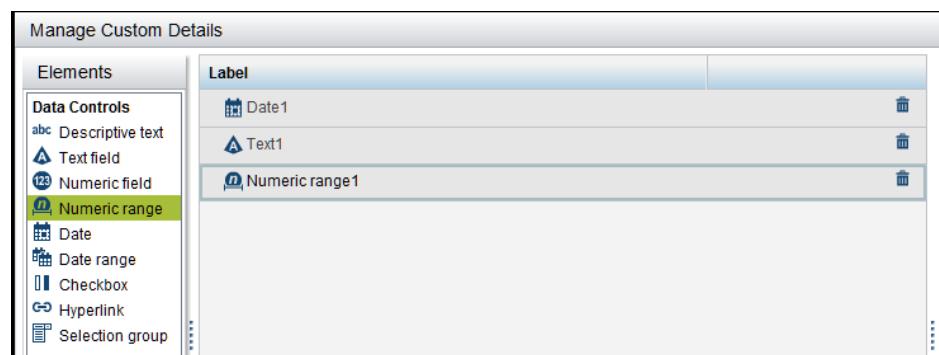
### Manage Custom Details

In the Manage Custom Details window, you supply information about the custom details.

**Display 3.25** Manage Custom Details

### Select an Element

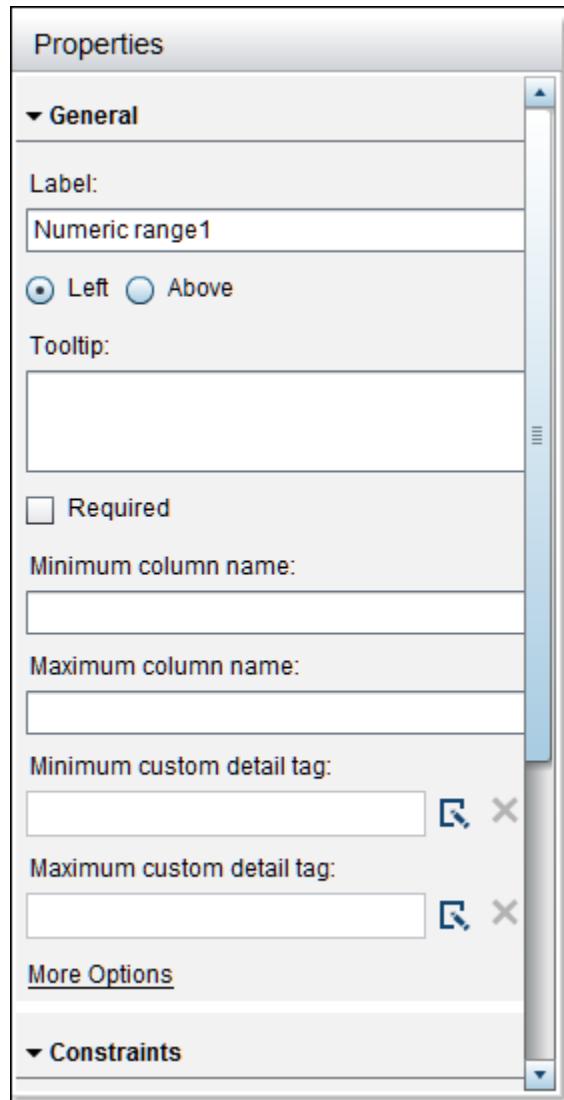
To select the type of custom detail, double-click it or drag an element from the **Elements** pane to the **Label** pane.

**Display 3.26** Select Element

## Specify Properties

In the **Properties** pane, specify the details for the selected element. The details vary, depending on the element and the software component. As you set the properties, you can review the results in the **Layout** pane.

*Display 3.27 Custom Detail Properties*



## Specify General Properties

The following items are the possible properties in the General section. Click **More Options** to display more properties.

### Label

is the name that is displayed with the field. Select **Left** or **Above** to set the location of the label in relation to the custom detail.

**Note:** The names of custom details that are passed to SAS Marketing Optimization must be no longer than 26 characters.

### Description

is the description of the field.

**Tooltip**

is the text that is displayed when you rest the mouse pointer on the field.

**Required**

indicates that a value is required. Required custom details must be completed before a campaign can be executed.

**Dynamic (editable in campaign)**

indicates that a value is dynamic. Dynamic custom details can be modified. For example, if you have a credit card offer in which you want to give different rates to different customers, you can use a single treatment and specify a different value for the Rate dynamic custom detail for each group of customers. Values that are not dynamic cannot be changed. This option is available only for treatments.

**Column name**

is the name of the column that is displayed in a published report.

**Minimum column name**

is the name of the column that displays the minimum value in a range.

**Maximum column name**

is the name of the column that displays the maximum value in a range.

**Custom detail tag**

is the custom detail tag that is associated with the custom detail. Click  to select a custom detail tag.

**Minimum custom detail tag**

is the custom detail tag that is associated with the minimum value in a range.

Click  to select a custom detail tag.

**Maximum custom detail tag**

is the custom detail tag that is associated with the maximum value in a range. Click  to select a custom detail tag.

**Width**

is the width of a field.

**Hint**

is the text that is displayed beneath the field that indicates the value that should be entered.

**In-field hint**

is the text that is displayed in the field that indicates the value that should be entered.

## Specify Data

These are the possible properties in the Data section:

**Number of values**

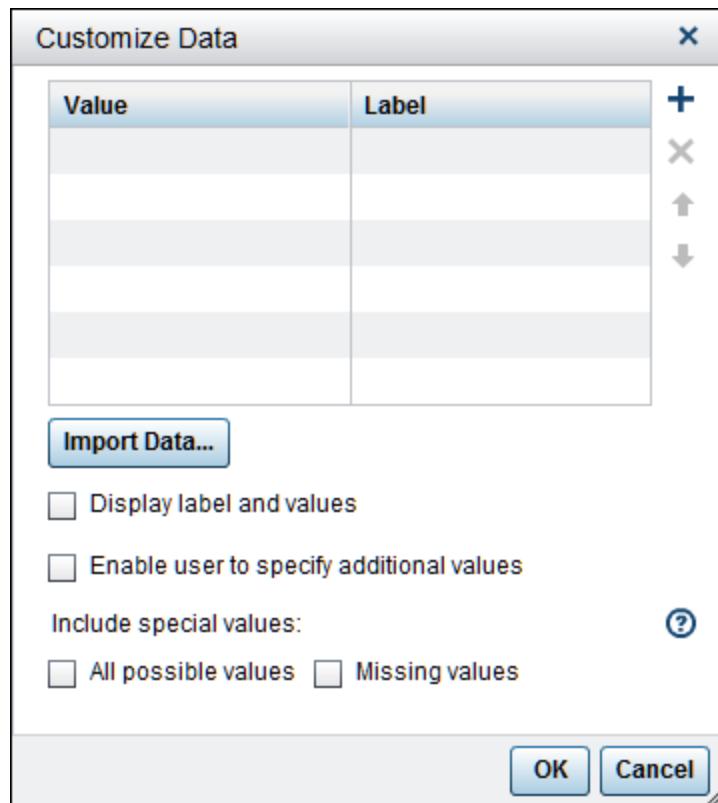
sets the number of text values that can be entered. If you select **Multiple values**, select **Enable user to reorder values** to enable the user to change the order of the values.

**Populated by**

specifies the source of the values that are entered.

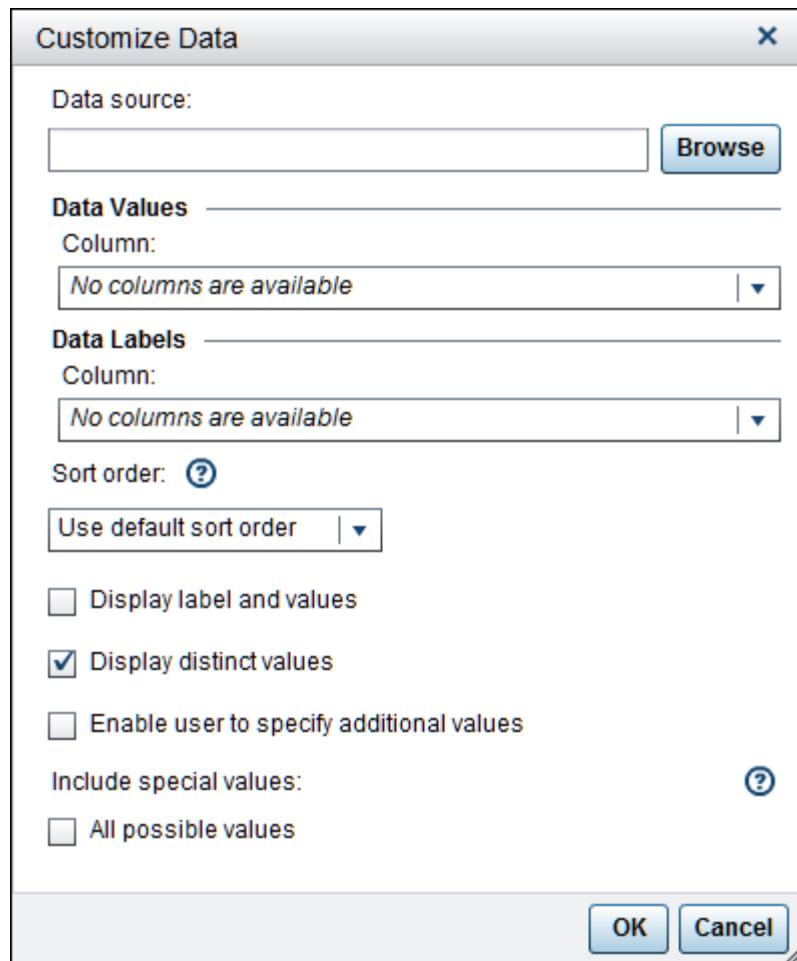
Select **User entry** to indicate that values are entered by the user.

When you select **A predefined list**, the list does not change unless you add or remove values.



To display text other than the name of the list item, enter a value in the Label column. For example, if the list items are products, the Value could be the product number A12345 and the Label could be Child's Desk. When a predefined list is published to the common data model, the published value contains the concatenated display values. Click **Import Data** to import values from a SAS library. Click **Display label and values** to display the label and values with the list item. To enable the user to select values from a list, select **Enable user to specify additional values**. Select **All possible values** and **Missing values** to include those values in the list.

When you select **A dynamic list**, the list displays the contents of the SAS Folders hierarchy on the **Folders** tab of SAS Management Console. Changes in this external list are reflected in the list of values that the user can select.



Click **Browse** to select a data source. Select a column in the Data Values and the Data Labels section to display those columns. Select a sort order. To display a value other than the text in the **Value** field, select **Display label and values** and **Display distinct values**. To enable a user to select more than one value from a list, select **Enable user to specify additional values**. Select **All possible values** and **Missing values** to include those values in the list.

#### Dependencies

If you create at least one element that is populated by a dynamic list, click **Dependencies** to add an element that the first element depends on. For example, if the first element is "Store," and the element that it depends on is "Sales Region," the Store element displays only the stores that are in the

selected sales region.

**Dependencies**

The "Text1" element depends on the following elements:

Element	Description of Dependency

The following elements depend on the "Text1" element:

Element	Description of Dependency

**OK** **Cancel**

Click **+** to add the dependency.

**New Dependency**

The "Text1" element is dependent on the following element:

Numeric range1

Condition

The value of the "Text1" element is displayed when the following condition is met: [?](#)

Data source: /CI Assets/Database Tables/MAALORA/ALLACCT(Table)

Column: ACCTNUM

Operator: Is between (inclusive)

Value: Value selected for the "Numeric range1" element

**OK** **Cancel**

## Specify Constraints

The following items are the possible properties in the Constraints section.

### **Allow only integer values**

indicates that only integer values can be entered in a numeric or a numeric range custom detail.

### **Number of lines**

specifies whether to display single or multiple lines. If you select **Multiple lines**, specify the **Maximum line count** and **Number of lines displayed**.

### **Minimum length**

sets the minimum number of characters that are allowed in the field.

### **Maximum length**

sets the maximum number of characters that are allowed in the field.

### **Maximum line count**

is the maximum number of text lines that can be entered in a field.

### **Number of lines displayed**

is the number of text lines that are displayed in the field.

### **Date type**

sets the unit to **Day**, **Week**, **Month**, **Quarter**, or **Year**.

In an export file, these custom details contain the following values:

#### **Quarter**

The first day of the quarter, for example, 1 Oct 2016

#### **Week**

The date of the Monday of the week, for example, 8 Feb 2016.

#### **Year**

The first day of the year, for example, 1 Jan 2016.

### **Minimum decimal places**

sets the minimum number of decimal places that are allowed in the field.

### **Maximum decimal places**

sets the maximum number of decimal places that are allowed in the field.

### **Minimum value allowed**

is the minimum value for the field.

### **Maximum value allowed**

is the maximum value for the field.

### **Combined field**

is another text field that this field can be combined with.

### **Maximum combined length**

is the combined length of two combined text fields.

## Specify Appearance

The Appearance section offers a choice of displays for selection groups and group containers. A selection group can be displayed as a drop-down list or a set of radio buttons. A group container can be displayed as a labeled box, a collapsible section, or an unlabeled group.

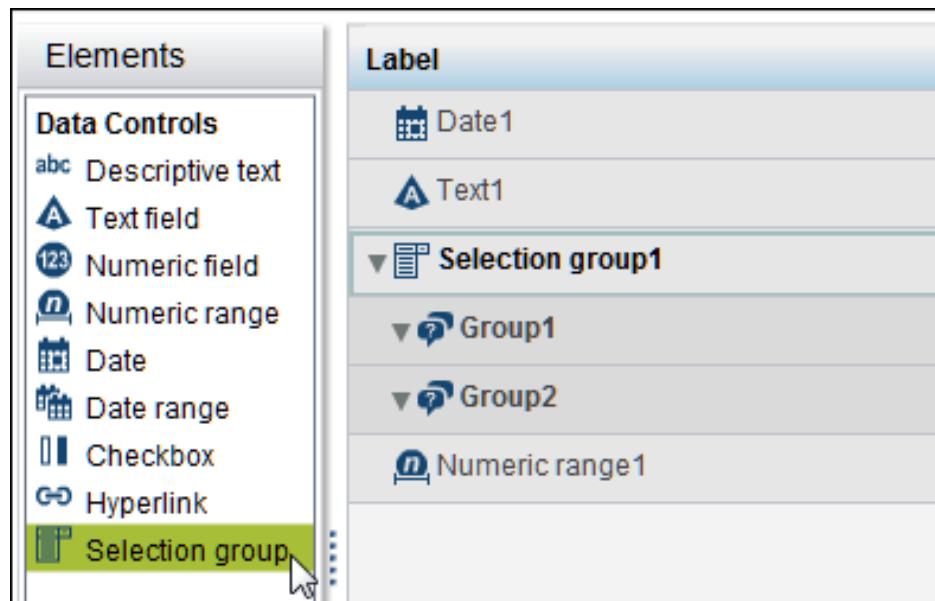
## Specify Default Values

In the Default Values section, you specify a default value for a selection group. Click  to specify which group is displayed first by default.

## Organize Custom Details

A selection group is a collection of other groups that is displayed as a list or a series of radio buttons. Double-click **Selection group** to add it to the **Label** pane.

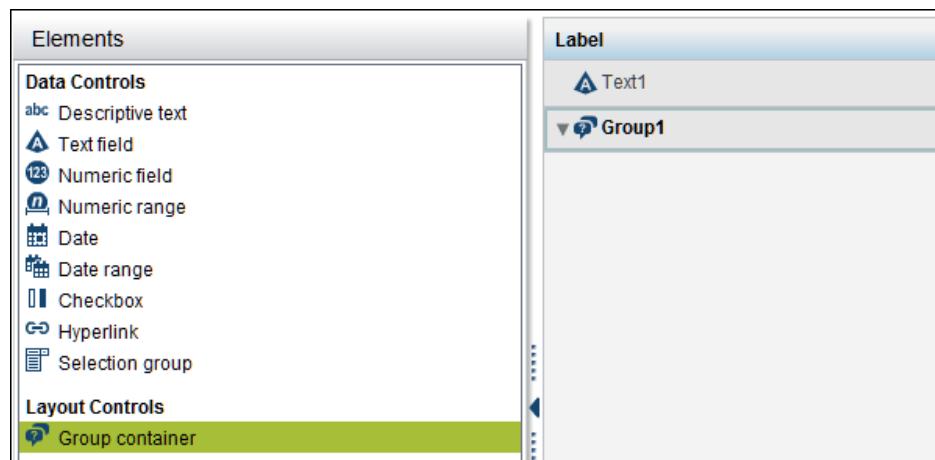
*Display 3.28 Selection Groups*



The selection group is prepopulated with groups that you can modify and add items to. Select items from the **Elements** pane and drag them to a group.

A group container collects custom details into a group. Double-click **Group container** to add it to the **Label** pane.

*Display 3.29 Group Container*

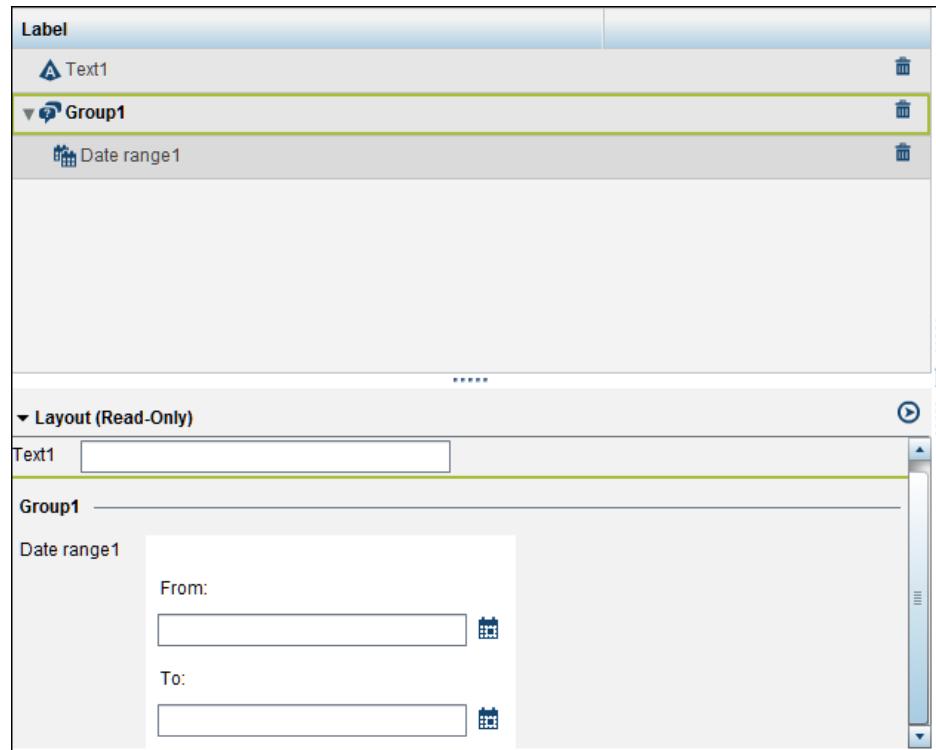


Select items from the **Elements** pane and drag them to a group.

### Preview Custom Details

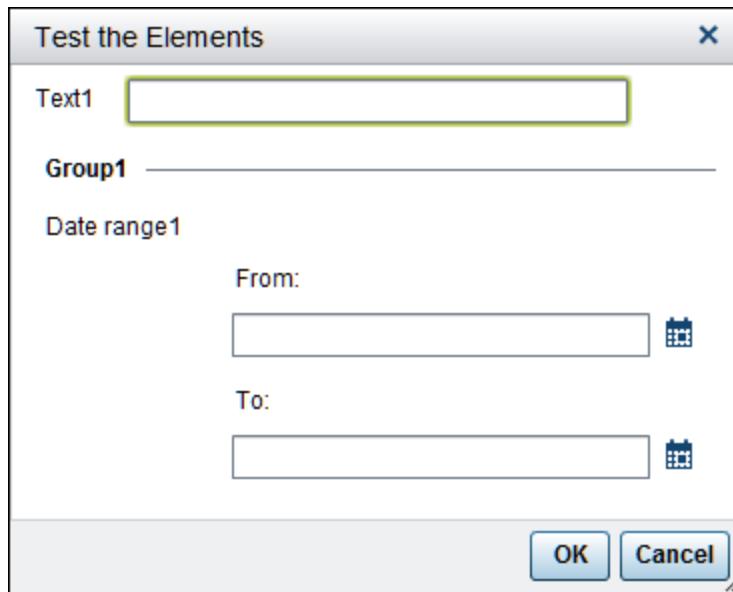
The Layout pane displays the custom details as they will appear on the Custom Details page.

*Display 3.30 Layout*



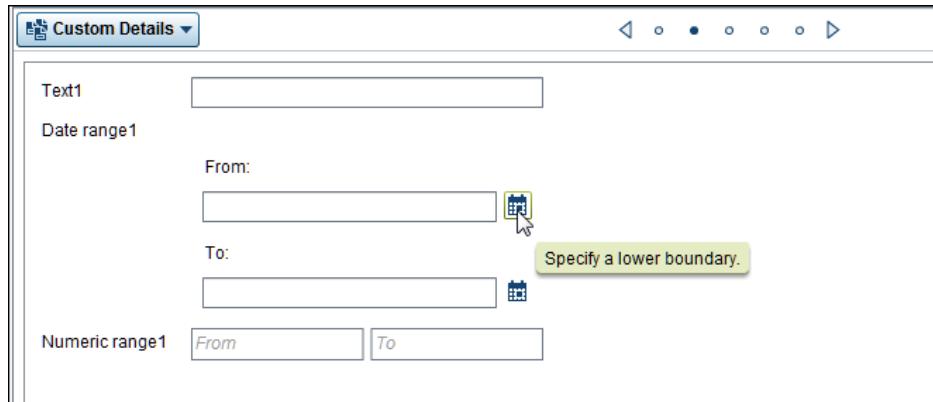
A red asterisk (\*) indicates that a field is required.

Click to open a Test the Elements window where you can test the custom details by interacting with them.

*Display 3.31 Test the Elements*

### **Set Default Values**

On the Custom Details page, you specify default values for the custom details that you have created.

*Display 3.32 Default Values*

Hyperlinks can link to websites or to files on local servers. Specify a link to a local server in one of the following ways:

```
\server\path  
file:///server/path
```

**Note:** For security reasons, local links cannot be opened in the Chrome browser. Local links can be opened in the Firefox browser if you change the default configuration. See the Firefox help for more information.

## Specify Checklist Items

The Campaign Checklist page displays the pages and custom steps that are in the checklist.

*Display 3.33 Campaign Checklist Page*

The screenshot shows a table titled "Checklist items:" with columns for "Name" and "Type". The items listed are Properties (Page), Diagram (Page), Treatments (Page), and Schedule (Page). To the right of the table are buttons for adding (+) and deleting (X) items, along with up and down arrows for reordering.

Name	Type	+ X ↑ ↓
Properties	Page	X
Diagram	Page	↑
Treatments	Page	↓
Schedule	Page	

Click **+** and select **Add page step** to add an existing page to the checklist.

Select **Add custom step** to add a custom step. Edit the name of the custom step to be more descriptive.

## Share a Campaign Group with Users and Groups

The **Campaign Group Permissions** page displays the names of users and groups who have access to the campaign groups that are created with this definition. If no users or groups are added to this page, the creator of a campaign group automatically has Edit permission.

*Figure 3.21 Campaign Group Permissions*

The screenshot shows two tables: "Groups:" and "Users:". Both tables have columns for "Name" and "Permission". There are "+" and "X" buttons to the right of each table. A search bar labeled "Search users and groups" is located at the top right.

Name	Permission

Name	Permission

To add a user to the list, click **+** and select a user. To add a group to the list, click **+** and select a group.

To view the members of a group, select the group and click **⊕**.

To change the permission of a user or user group, click the **Permission** cell and select the permission. By default, all users and groups that you select have Edit permission.

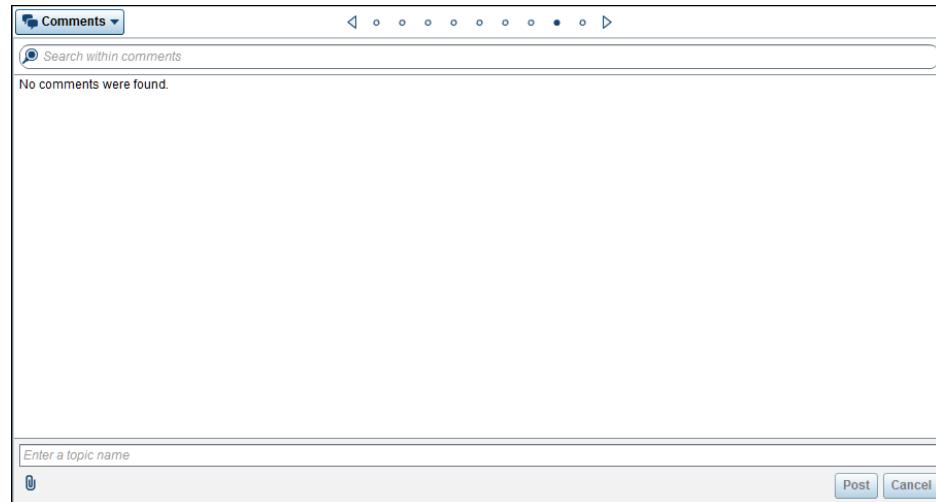
In general, the permission that you set for an individual user overrides the permission that is set for a group that the user is a member of. For more information about the relationship of permissions between users and groups,

see *SAS Intelligence Platform: Security Administration Guide* at [SAS Intelligence Platform](#).

## Add Comments

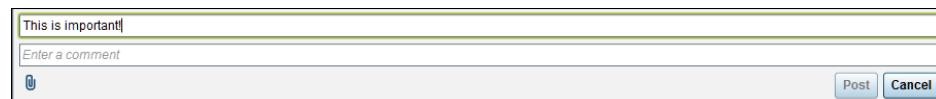
On the Comments page, you view and add comments. You add comments after saving.

**Figure 3.22** Comments



Enter a topic name to add a new comment.

**Figure 3.23** New Topic



Enter the text of the new comment.

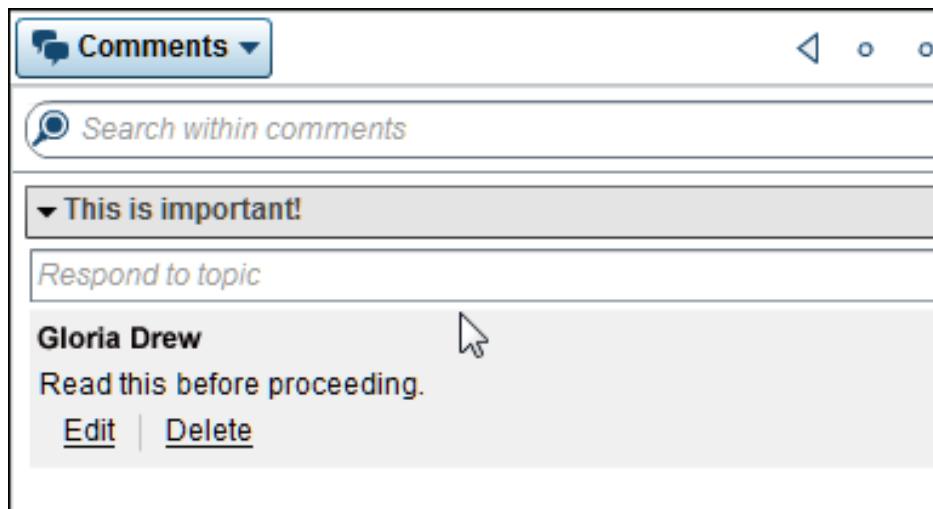
**Figure 3.24** Comment Text



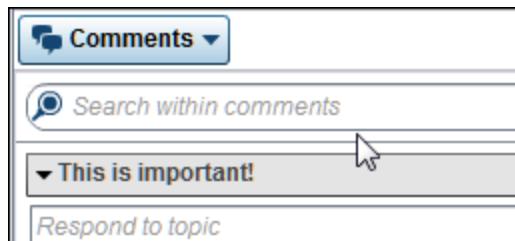
Click **Post** to post the comment. Your new comment is displayed on the Comments page. You can add comments even if you do not have Edit permission.

Click to add an attachment such as an image or a document.

To reply to an existing comment, type text in the field below the comment title.

**Figure 3.25** Comments List

Type in the search field to find text in comments.

**Figure 3.26** Search Comments

## Add Attachments

On the Attachments page, you view and add attachments such as images or documents.

**Figure 3.27** Attachments

Name	Added By	Date Added
Desert.jpg	Gloria Drew	Sep 26, 2014 03:33 PM

Click **+** to select a file to attach.

## Share a Campaign Group Definition across Business Contexts

For information about sharing a campaign group definition that was created in a different business context, see “[Share a Campaign Definition across Business Contexts](#)” on page 68.

## Communications

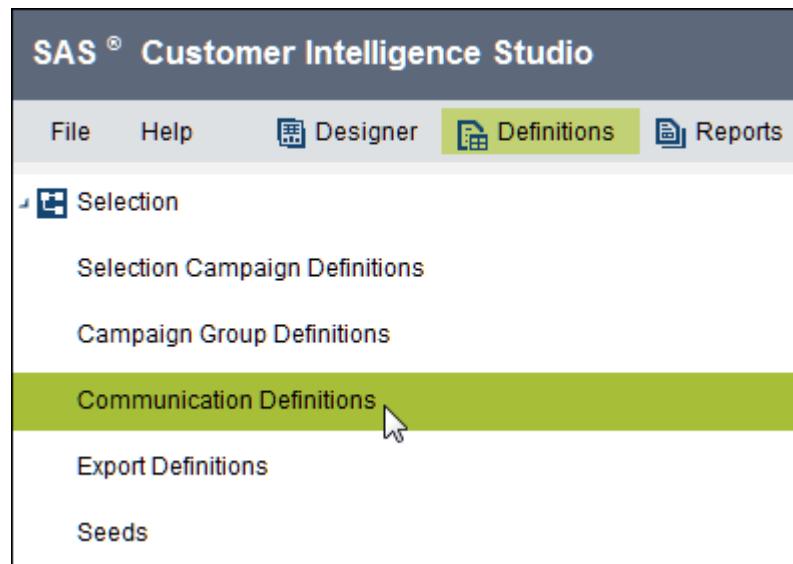
### Overview of Communication Definitions

A communication definition determines the name, custom details, export settings, seeds, audience thresholds, responses, comments, and attachments that are associated with an individual communication.

### Create a Communication Definition

To create a new communication definition, select **Communication Definitions** in the Definitions workspace.

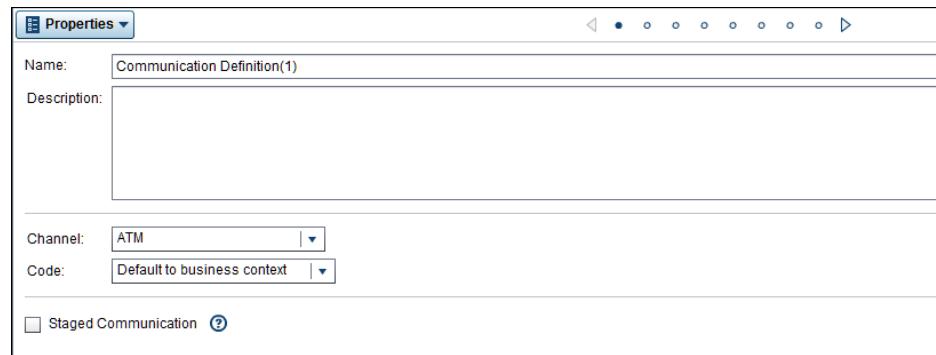
*Figure 3.28 Create Communication Definition*



Click to create the definition.

### Specify Communication Definition Properties

The Properties page displays the name and other information about the communication definition.

**Figure 3.29** Communication Definition Properties Page

Select a communication medium from the **Channel** list. Communications that are based on this communication definition use this channel. After an association has been made with a campaign, further changes to a communication definition are not reflected in the campaign in which the definition is used. Create a new communication and select the communication definition to incorporate the changes in an existing campaign.

Select one of the following settings from the **Code** list.

#### **Default to business context**

The code defaults to the setting for the current business context. Valid characters for code are alphanumeric characters, numerals, underscores, and periods.

#### **Automatic - editable**

The communication code is automatically generated and can be edited. This setting overrides the setting for the business context.

#### **Automatic - not editable**

The communication code is automatically generated and cannot be edited. This setting overrides the setting for the business context.

#### **Manual - Editable**

The communication code is entered by the user and can be edited. This setting overrides the setting for the business context.

Instead of generating an export file from a Communication node, you can store treatments in a staging repository. Select **Staged Communication** to specify that communications that are based on this definition store treatments in a staging repository. In order to use staged communications, both SAS Real-Time Decision Manager and SAS Marketing Automation must be installed at your site, and staging must be configured on your system. For more information about staging treatments, see “[Stage Treatments](#)” on page 168. For more information about configuring staging at your site, see *SAS Real-Time Decision Manager: Administrator’s Guide*.

## Add Custom Details

### Overview of Adding Custom Details

On the Custom Details page, you add user-defined fields.

Display 3.34 Custom Details Page

The screenshot shows a software interface titled 'Custom Details'. It contains four input fields with labels: 'Fixed Cost', 'Revenue Per Response', 'Cost Per Piece', and 'Estimated Response Rate'. Each field has a corresponding text input box. In the top right corner of the window, there is a small icon with a magnifying glass and a plus sign.

To add a custom detail, click and select **Manage custom details**.

To append a custom detail group to the custom detail, select **Add custom detail groups**.

A next to a custom detail displays information about the associated custom detail tag.

### Treatments and Custom Detail Tags

If you add a custom detail tag to a treatment, and that tag is included in the export definition for the campaign, the export file contains a single column for the custom detail tag. The column includes the values for all of the treatments in the package. The values are separated by the separator for treatment values.

If the custom detail tag is not used in all of the treatments in a package, some of the values in the column are empty. For example, a package might contain Treatment 1, Treatment 2, and Treatment 3. Treatment 1 and Treatment 3 use the same custom detail tag. Treatment 2 does not use the custom detail tag. In the export file for the campaign, the value in the column for the custom detail tag might look like the following.

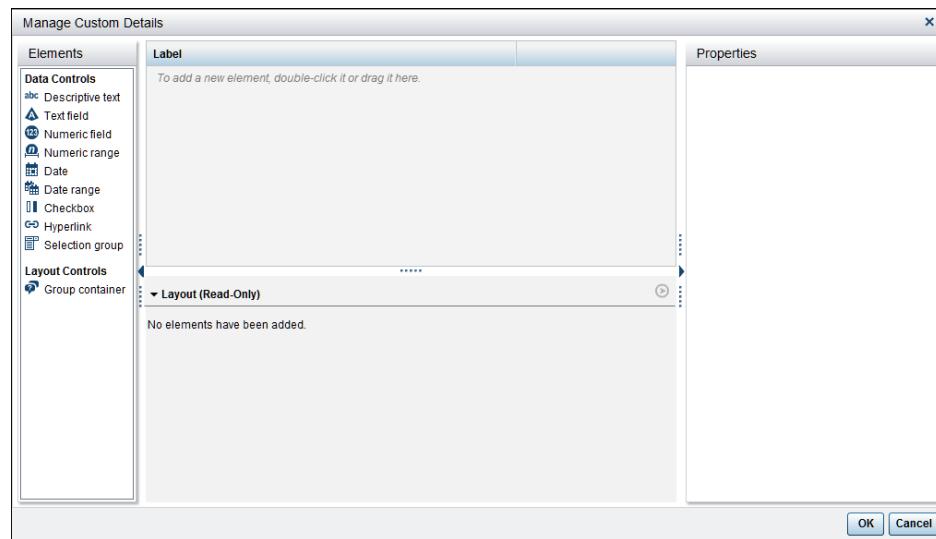
```
Treatment 1 Value,,Treatment 3 Value
```

In this example, a comma (,) is the separator. Separators for treatment values are set in the Environment Variables category in the Setup workspace. For more information, see *SAS Marketing Automation: Administrator's Guide*.

For more information about custom detail tags, see “[Custom Detail Tags](#)” on [page 137](#).

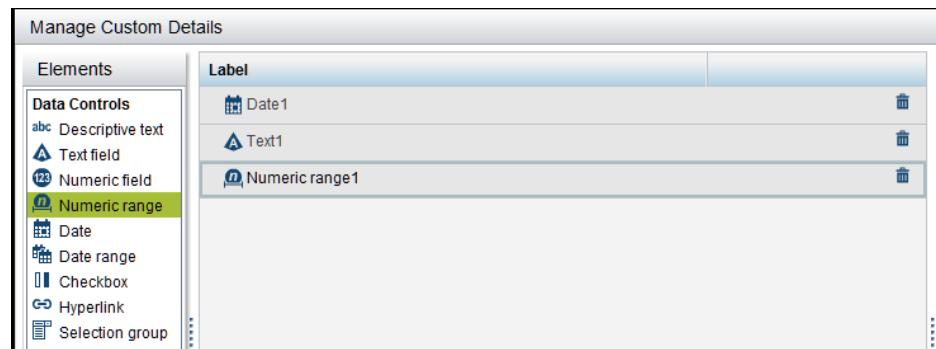
### Manage Custom Details

In the Manage Custom Details window, you supply information about the custom details.

*Display 3.35 Manage Custom Details*

### Select an Element

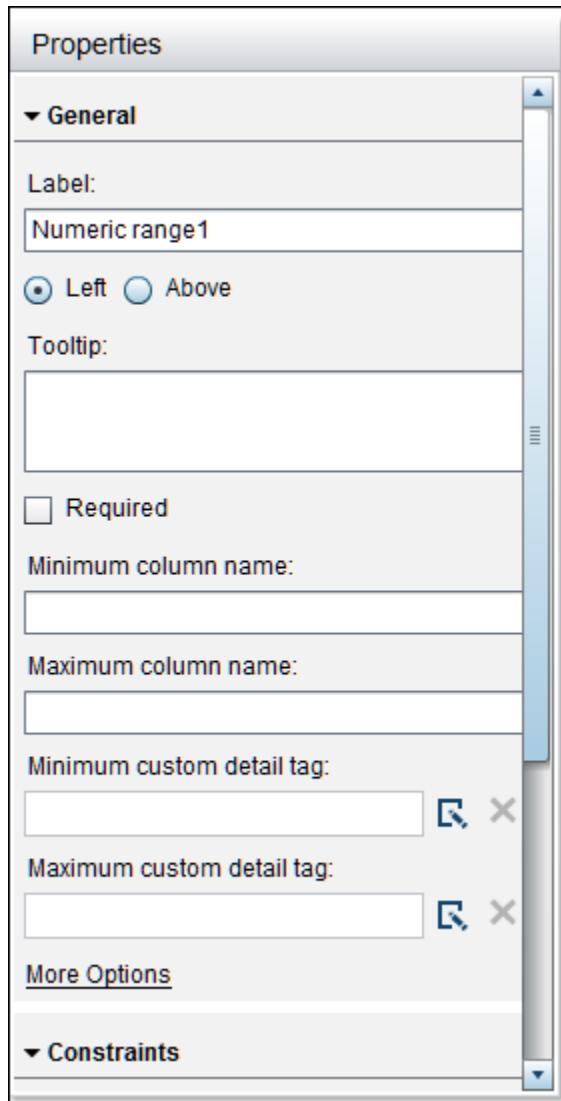
To select the type of custom detail, double-click it or drag an element from the **Elements** pane to the **Label** pane.

*Display 3.36 Select Element*

### Specify Properties

In the **Properties** pane, specify the details for the selected element. The details vary, depending on the element and the software component. As you set the properties, you can review the results in the **Layout** pane.

Display 3.37 Custom Detail Properties



### Specify General Properties

The following items are the possible properties in the General section. Click **More Options** to display more properties.

#### **Label**

is the name that is displayed with the field. Select **Left** or **Above** to set the location of the label in relation to the custom detail.

**Note:** The names of custom details that are passed to SAS Marketing Optimization must be no longer than 26 characters.

#### **Description**

is the description of the field.

#### **Tooltip**

is the text that is displayed when you rest the mouse pointer on the field.

#### **Required**

indicates that a value is required. Required custom details must be completed before a campaign can be executed.

**Dynamic (editable in campaign)**

indicates that a value is dynamic. Dynamic custom details can be modified. For example, if you have a credit card offer in which you want to give different rates to different customers, you can use a single treatment and specify a different value for the Rate dynamic custom detail for each group of customers. Values that are not dynamic cannot be changed. This option is available only for treatments.

**Column name**

is the name of the column that is displayed in a published report.

**Minimum column name**

is the name of the column that displays the minimum value in a range.

**Maximum column name**

is the name of the column that displays the maximum value in a range.

**Custom detail tag**

is the custom detail tag that is associated with the custom detail. Click  to select a custom detail tag.

**Minimum custom detail tag**

is the custom detail tag that is associated with the minimum value in a range.

Click  to select a custom detail tag.

**Maximum custom detail tag**

is the custom detail tag that is associated with the maximum value in a range. Click  to select a custom detail tag.

**Width**

is the width of a field.

**Hint**

is the text that is displayed beneath the field that indicates the value that should be entered.

**In-field hint**

is the text that is displayed in the field that indicates the value that should be entered.

**Specify Data**

These are the possible properties in the Data section:

**Number of values**

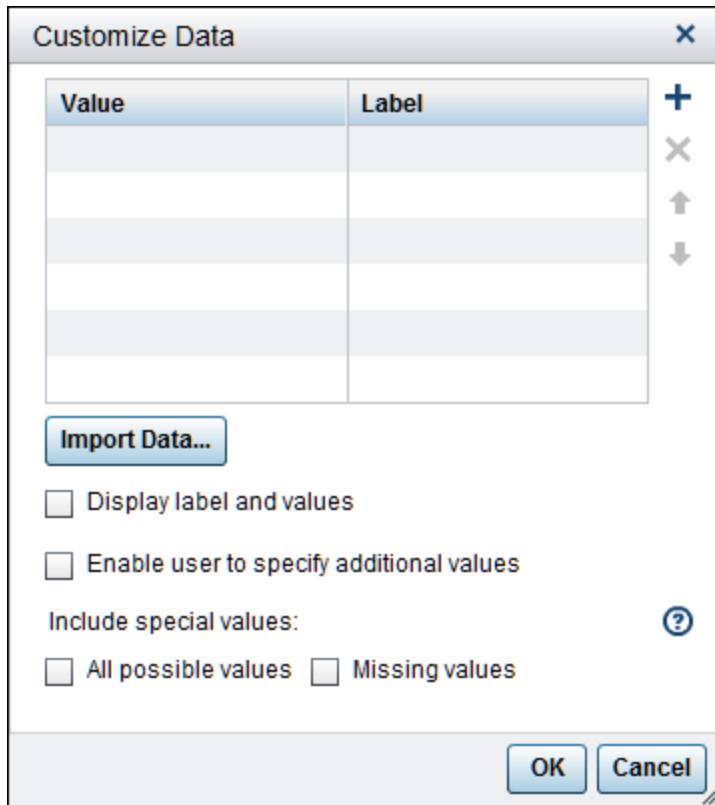
sets the number of text values that can be entered. If you select **Multiple values**, select **Enable user to reorder values** to enable the user to change the order of the values.

**Populated by**

specifies the source of the values that are entered.

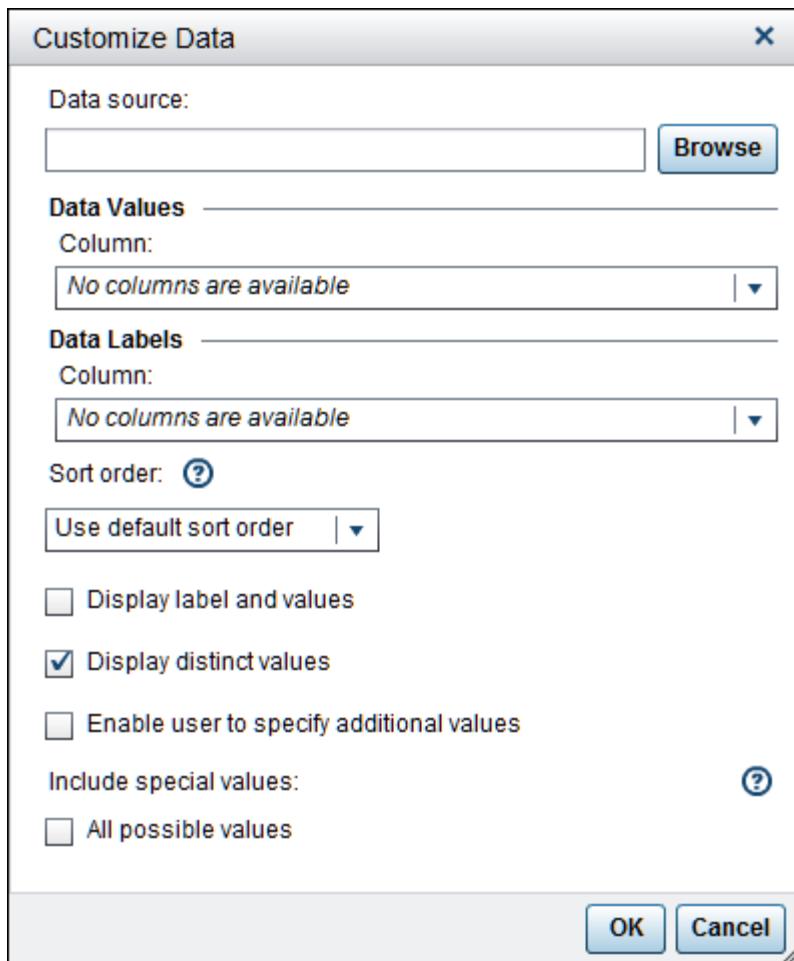
Select **User entry** to indicate that values are entered by the user.

When you select **A predefined list**, the list does not change unless you add or remove values.



To display text other than the name of the list item, enter a value in the Label column. For example, if the list items are products, the Value could be the product number A12345 and the Label could be Child's Desk. When a predefined list is published to the common data model, the published value contains the concatenated display values. Click **Import Data** to import values from a SAS library. Click **Display label and values** to display the label and values with the list item. To enable the user to select values from a list, select **Enable user to specify additional values**. Select **All possible values** and **Missing values** to include those values in the list.

When you select **A dynamic list**, the list displays the contents of the SAS Folders hierarchy on the **Folders** tab of SAS Management Console. Changes in this external list are reflected in the list of values that the user can select.



Click **Browse** to select a data source. Select a column in the Data Values and the Data Labels section to display those columns. Select a sort order. To display a value other than the text in the **Value** field, select **Display label and values** and **Display distinct values**. To enable a user to select more than one value from a list, select **Enable user to specify additional values**. Select **All possible values** and **Missing values** to include those values in the list.

#### Dependencies

If you create at least one element that is populated by a dynamic list, click **Dependencies** to add an element that the first element depends on. For example, if the first element is "Store," and the element that it depends on is "Sales Region," the Store element displays only the stores that are in the

selected sales region.

**Dependencies**

The "Text1" element depends on the following elements:

Element	Description of Dependency

The following elements depend on the "Text1" element:

Element	Description of Dependency

**OK** **Cancel**

Click **+** to add the dependency.

**New Dependency**

The "Text1" element is dependent on the following element:

Numeric range1

Condition

The value of the "Text1" element is displayed when the following condition is met: [?](#)

Data source: /CI Assets/Database Tables/MAALORA/ALLACCT(Table)

Column: ACCTNUM

Operator: Is between (inclusive)

Value: Value selected for the "Numeric range1" element

**OK** **Cancel**

## Specify Constraints

The following items are the possible properties in the Constraints section.

### **Allow only integer values**

indicates that only integer values can be entered in a numeric or a numeric range custom detail.

### **Number of lines**

specifies whether to display single or multiple lines. If you select **Multiple lines**, specify the **Maximum line count** and **Number of lines displayed**.

### **Minimum length**

sets the minimum number of characters that are allowed in the field.

### **Maximum length**

sets the maximum number of characters that are allowed in the field.

### **Maximum line count**

is the maximum number of text lines that can be entered in a field.

### **Number of lines displayed**

is the number of text lines that are displayed in the field.

### **Date type**

sets the unit to **Day**, **Week**, **Month**, **Quarter**, or **Year**.

In an export file, these custom details contain the following values:

#### **Quarter**

The first day of the quarter, for example, 1 Oct 2016

#### **Week**

The date of the Monday of the week, for example, 8 Feb 2016.

#### **Year**

The first day of the year, for example, 1 Jan 2016.

### **Minimum decimal places**

sets the minimum number of decimal places that are allowed in the field.

### **Maximum decimal places**

sets the maximum number of decimal places that are allowed in the field.

### **Minimum value allowed**

is the minimum value for the field.

### **Maximum value allowed**

is the maximum value for the field.

### **Combined field**

is another text field that this field can be combined with.

### **Maximum combined length**

is the combined length of two combined text fields.

## Specify Appearance

The Appearance section offers a choice of displays for selection groups and group containers. A selection group can be displayed as a drop-down list or a set of radio buttons. A group container can be displayed as a labeled box, a collapsible section, or an unlabeled group.

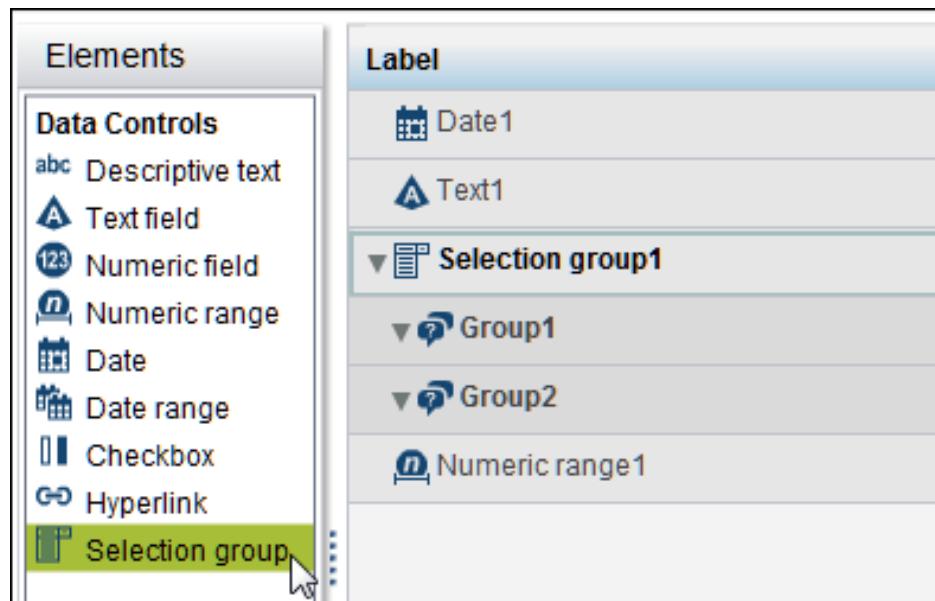
## Specify Default Values

In the Default Values section, you specify a default value for a selection group. Click  to specify which group is displayed first by default.

## Organize Custom Details

A selection group is a collection of other groups that is displayed as a list or a series of radio buttons. Double-click **Selection group** to add it to the **Label** pane.

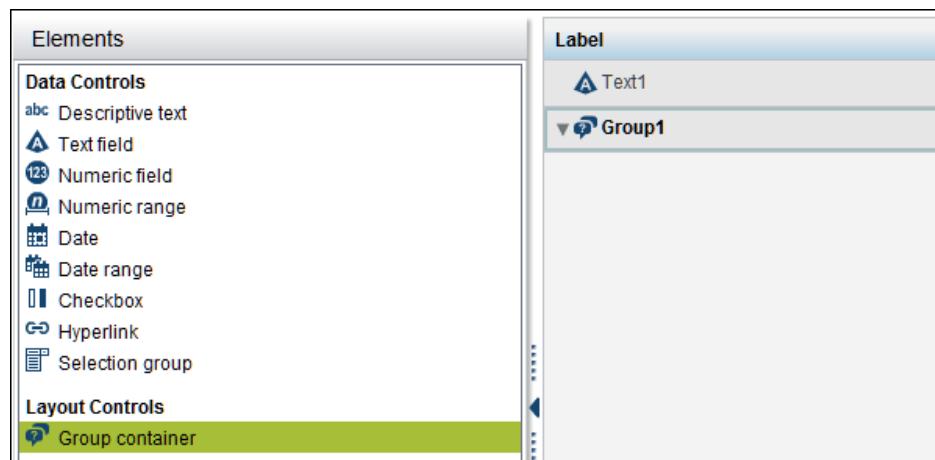
*Display 3.38 Selection Groups*



The selection group is prepopulated with groups that you can modify and add items to. Select items from the **Elements** pane and drag them to a group.

A group container collects custom details into a group. Double-click **Group container** to add it to the **Label** pane.

*Display 3.39 Group Container*

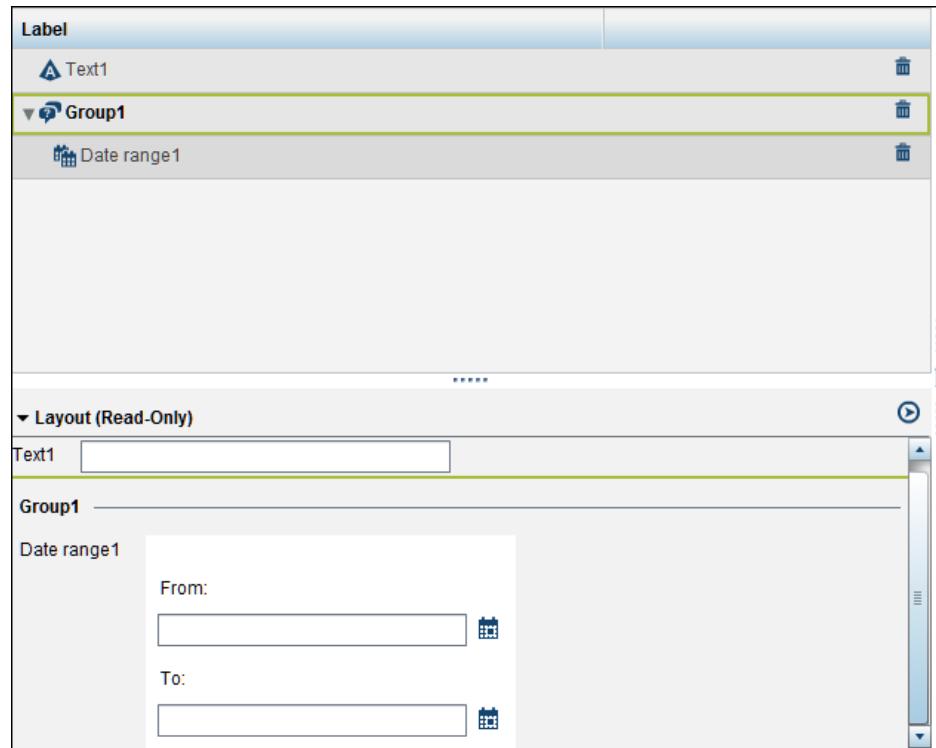


Select items from the **Elements** pane and drag them to a group.

### Preview Custom Details

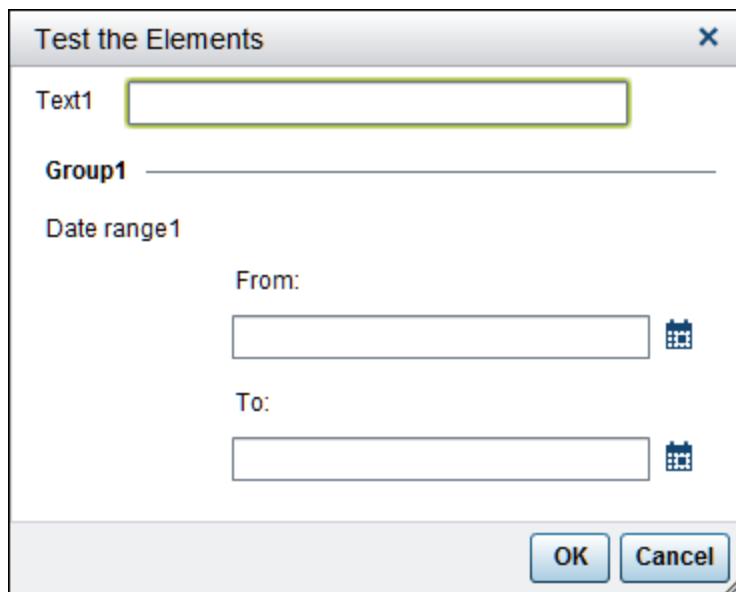
The Layout pane displays the custom details as they will appear on the Custom Details page.

*Display 3.40 Layout*



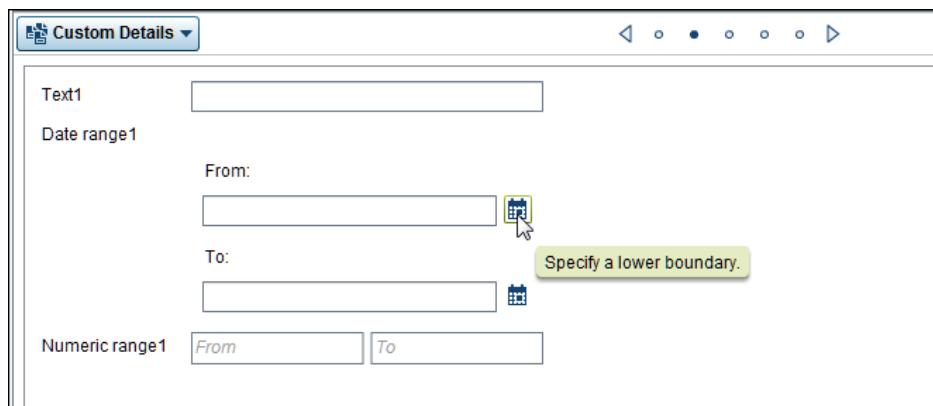
A red asterisk (\*) indicates that a field is required.

Click to open a Test the Elements window where you can test the custom details by interacting with them.

*Display 3.41 Test the Elements*

### **Set Default Values**

On the Custom Details page, you specify default values for the custom details that you have created.

*Display 3.42 Default Values*

Hyperlinks can link to websites or to files on local servers. Specify a link to a local server in one of the following ways:

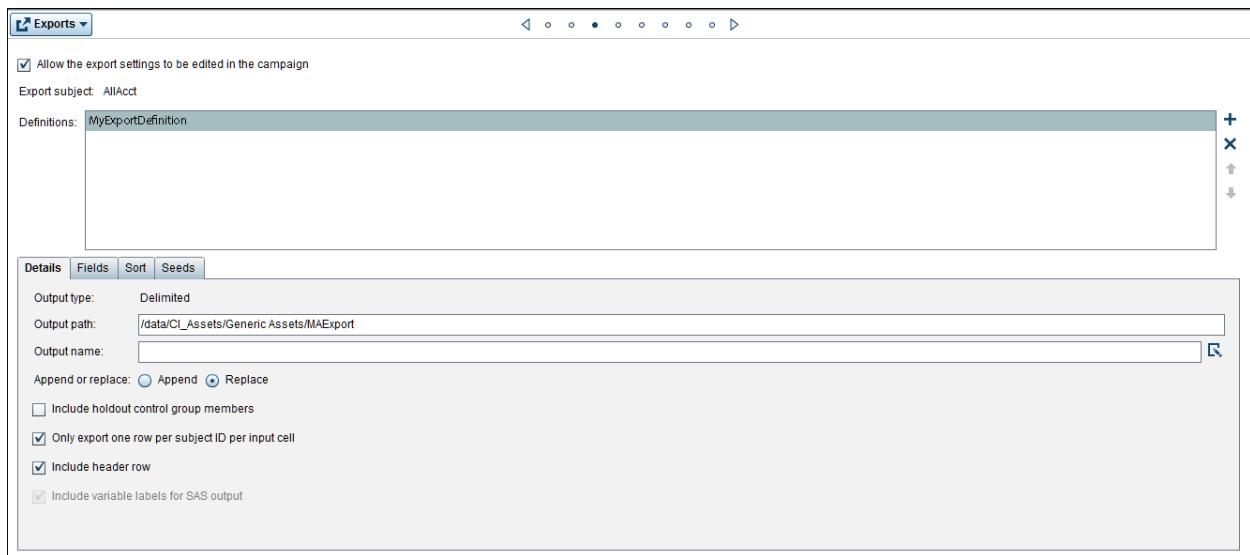
```
\server\path  
file:///server/path
```

**Note:** For security reasons, local links cannot be opened in the Chrome browser. Local links can be opened in the Firefox browser if you change the default configuration. See the Firefox help for more information.

## Set Export Values

The Exports page displays the export settings for the communication definition. These settings are the default values for communications that use this communication definition.

**Figure 3.30** Exports Page



In staged communication definitions, the Exports page is blank.

The **Details** tab displays the output type and other information.

After you have selected an export definition, the **Output path** field displays the location for the exported data that is specified in the export definition. You can edit the output path.

In the **Output name** field, enter a filename for the exported data. If the export definition is for SAS Digital Marketing, click to select a broadcast. The file or table name must be a valid name for the type of file or table. The name must also be valid for the operating system under which the file or table is created. You can use variables to generate filenames. For more information, see “[Use Variables to Create Export Filenames](#)” on page 264.

Select **Append** or **Replace** to specify whether you want to append or replace the existing file or table. If multiple exports within a campaign are written to the same export file or table, a header row can be inserted at the beginning automatically. All subsequent exports append data without inserting another header row. To insert only one header row at the beginning, select **Replace** for one communication, and select **Append** for all other communications. The communication that is marked **Replace** writes to the export file first, followed by the communications that are marked **Append**. If the output type is SAS Customer Intelligence 360, **Replace** is the only option that is available.

Select **Include holdout control group members** to include holdout control groups in the export. This option is not available if the output type is SAS Customer Intelligence 360.

To exclude duplicate rows or subjects from the export file, select **Only export one row per subject ID per input cell**. For more information, see “[Export One Row per Subject ID](#)” on page 266.

To use your own column headings as part of the export file, select **Include header row**. This check box is unavailable if the export type is TABLE, SAS DATASET, EXCEL, XML, or SAS Customer Intelligence 360.

To use the variable labels in a SAS format file, select **Include variable labels for SAS output**. This check box is enabled only when the export type is SAS DATASET.

**Note:** If a SAS data set is replaced and **Include variable labels for SAS output** is selected, the specified value for the label is used when replacing a SAS data set. If a SAS data set is replaced and **Include variable labels for SAS output** is not selected, the **Output name** is used as the label. If the data is appended to a SAS data set and **Include variable labels for SAS output** is selected, the SAS label is displayed as the first section of the cell in the Field column. If the data is appended to a SAS data set and **Include variable labels for SAS output** is not selected, the labels in the existing data set are not changed.

## Select Columns for Export

Click the **Fields** tab to add and delete columns in the export file. If the output type is SAS Customer Intelligence 360, the fields are already selected.

*Display 3.43 Fields Tab*

Field	Output Name	Format	Type	Sort
Randbin - Customer	RANDBIN		Numeric	
Income - Customer	INCOME	COMMA10.2	Numeric	
Client Id - Customer	CLIENTID	F10.0	Numeric	
Employ - Customer	EMPLOY	\$EMPSTAT.	Character	
City - Contact Information - Cust...	CITY	\$35.	Character	
Customer Since - Customer	ACQDATE	DATETIME16.0	Date	
External Opt Out - Customer	OPTOUTEXTERNAL	NOYES.	Numeric	

The **Available** list contains these folders:

- The **Data Items** folder displays items in a hierarchy that is determined by the information map that is associated with the selected export definition. In addition, any calculated data items that you have created are displayed in the **Data Items** folder.
- The **Campaign** and **Optimization** folders contain the set of standard fields that are associated with campaign and communication definitions and with SAS Marketing Optimization, if that product is installed at your site. Also displayed are custom detail tags, links, and custom details that are associated with individual campaign and communication definitions.
- The **Marketing Cell** folder contains standard fields for cells, including cell codes. This folder also contains tracking codes.
- The **Package** folder contains standard fields for package codes and treatment details, and folders that contain fields for custom details and custom detail tags.

- The **Text** item adds a text row with the default name of Textn, where n is a number and the series of numbers starts with 1. You can replace the default name and the default output name with meaningful names.
- The **Today's Date** item adds a text column with the default name of Today's Date to the export file. The default output name is Export\_Date\_Today. The value for Today's Date is the date that the export file is created.

Use the arrows to move items between the Available hierarchy and the Selected table.

You can modify all of the fields in a **Text** item. For other items, except for the cells in the Field column, you can modify the content of the cells in the Selected table.

The Output Name column headings are automatically populated. You can replace these headings with a unique valid column heading. Output names can contain only alphanumeric characters and the underscore (\_) character.

## Change Sort Order

To specify a different sort order, click the **Sort** tab. This tab is not available if the output type is SAS Customer Intelligence 360.

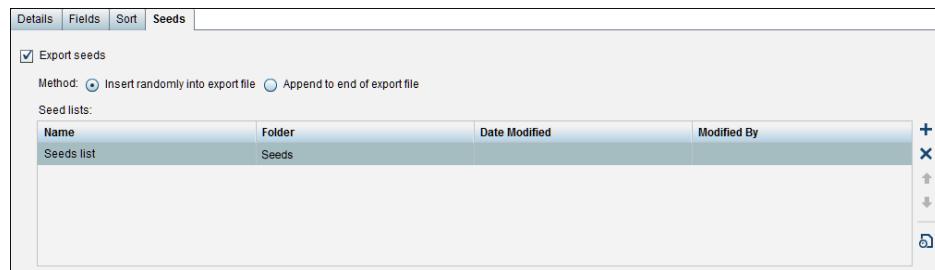
*Display 3.44 Sort*

Sort export by:		
Direction	Field	Output Name
	Randbin - Customer	RANDBIN
	Income - Customer	INCOME
	Client Id - Customer	CLIENTID
	Employ - Customer	EMPLOY
	City - Contact Information - Customer	CITY
	Customer Since - Customer	ACQDATE

Click to select the fields by which to sort. Use the arrows to change the position of the fields.

## Select Seed Lists

On the **Seeds** tab, select **Export seeds** to specify the seeds that are exported when the communication executes and the data is exported. This tab is not available if the output type is SAS Customer Intelligence 360.

**Figure 3.31** Seeds

Select a method to determine how the seeds are exported. You can choose to insert the list items randomly into the export file or to append the list to the end of the export file. For example, when you select the former and you are exporting 1000 customers with 10 random seeds, the seeds are scattered randomly among the customer names.

Click to select a seed list.

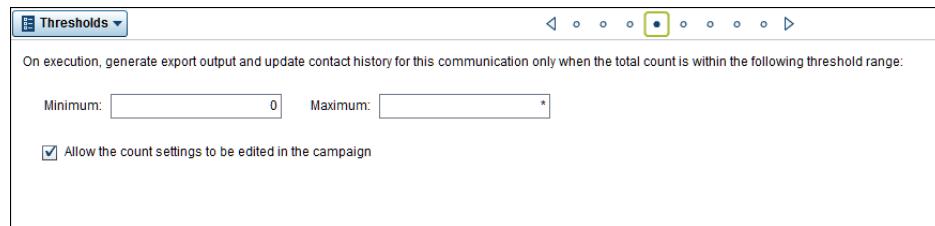
Click to view members of the selected seed list.

If the fields of the seed list do not match the fields of the export definition that is assigned to the Communication node, the following rules apply:

- If the field is in the seed list, but is not in the export definition, the field is dropped from the export file.
- In some cases, the field might be in the export definition, but does not have a value in the seed list or is not in the seed list. The field inherits the value of the previous record in the export file.

## Set Audience Threshold

The Thresholds page displays the audience threshold settings for communications.

**Figure 3.32** Thresholds Page

Select **Allow the count settings to be edited in the campaign** to enable users to change count settings in a campaign.

Specify a minimum and maximum threshold value. A communication runs if the count meets the criteria that you specify. If the count does not meet the threshold criteria, the communication executes without generating an export file. If you do not specify a threshold value, the minimum value is **0** and the maximum value is **\***.

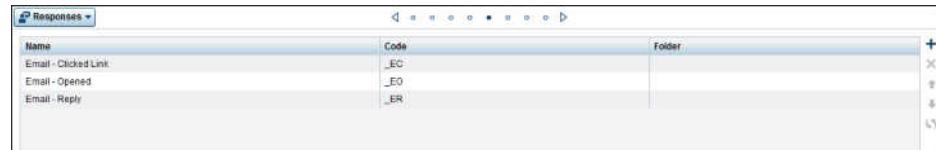
If there is an export associated with the communication that contains no data items, the Communication node always has a count of 1. For example, an export

might contain a cell code and a communication code, but no items from the Data Items folder. In this case, you might not want to set a threshold.

## Select Responses

The Responses page displays a list of responses that are associated with a communication.

*Figure 3.33 Responses Page*



A screenshot of a software interface titled "Responses". It shows a table with three columns: "Name", "Code", and "Folder". There are three rows of data:

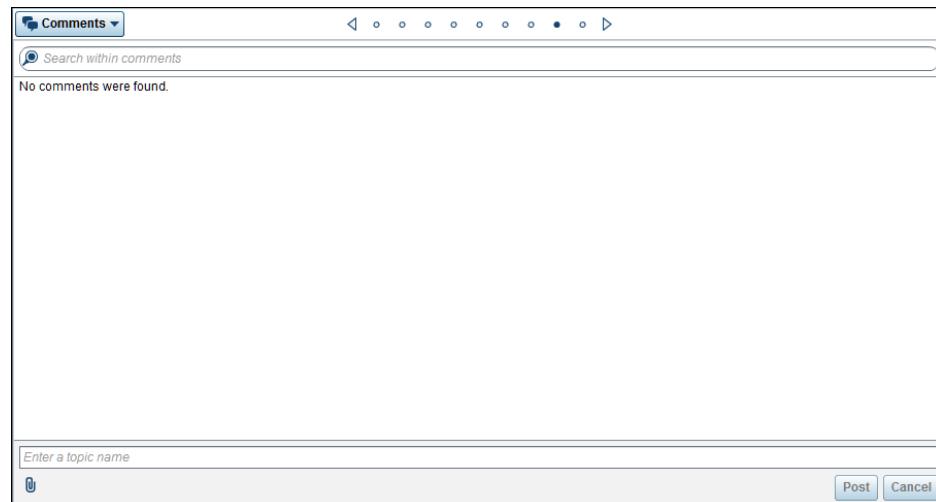
Name	Code	Folder
Email - Clicked Link	_EC	
Email - Opened	_EO	
Email - Reply	_ER	

Click  to add a response from a list of defined responses. For information about defining responses, see “[Responses](#)” on page 141.

## Add Comments

On the Comments page, you view and add comments. You add comments after saving.

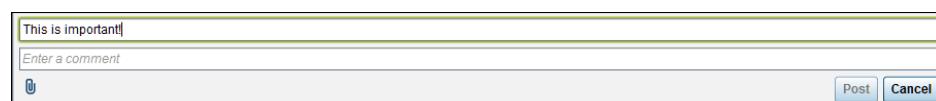
*Figure 3.34 Comments*



A screenshot of a software interface titled "Comments". At the top, there is a search bar with the placeholder text "Search within comments". Below the search bar, a message says "No comments were found." At the bottom, there is a form for adding a new comment, consisting of a text input field labeled "Enter a topic name" and two buttons: "Post" and "Cancel".

Enter a topic name to add a new comment.

*Figure 3.35 New Topic*



A screenshot of a "New Topic" dialog box. It contains a single text input field with the placeholder text "Enter a comment". At the bottom right, there are two buttons: "Post" and "Cancel".

Enter the text of the new comment.

**Figure 3.36** Comment Text

This screenshot shows a dialog box for entering comment text. At the top, there are two text input fields: the first contains "This is important!" and the second contains "Read this before proceeding.". Below these fields is a small icon of a document with a plus sign. In the bottom right corner of the dialog are two buttons: "Post" and "Cancel".

Click **Post** to post the comment. Your new comment is displayed on the Comments page. You can add comments even if you do not have Edit permission.

Click to add an attachment such as an image or a document.

To reply to an existing comment, type text in the field below the comment title.

**Figure 3.37** Comments List

This screenshot shows a comments list interface. At the top left is a button labeled "Comments" with a dropdown arrow. To its right are three small circular icons. Below this is a search bar with the placeholder text "Search within comments". The main area displays a single comment card. The card has a header with a minus sign and the text "This is important!". Below the header is a "Respond to topic" link. The comment body contains the name "Gloria Drew" and the text "Read this before proceeding.". At the bottom of the card are "Edit" and "Delete" links. A cursor arrow points towards the "Edit" link.

Type in the search field to find text in comments.

**Figure 3.38** Search Comments

This screenshot shows a search interface for comments. It features a search bar with the placeholder text "Search within comments". Below the search bar is a list of comments. The first comment in the list has a minus sign and the text "This is important!". A cursor arrow points towards the minus sign. The rest of the comment card is identical to the one in Figure 3.37.

## Add Attachments

On the Attachments page, you view and add attachments such as images or documents.

**Figure 3.39** Attachments

Name	Added By	Date Added
Desert.jpg	Gloria Drew	Sep 26, 2014 03:33 PM

Click  to select a file to attach.

## Share a Communication Definition across Business Contexts

A communication definition can be used in more than one business context. For example, if you work in several business contexts, you might want to create one communication definition that you can use in any business context that you have access to.

A shared definition is a reference to the initial definition. If you have the appropriate permissions, any changes that you make to the shared definition are saved to the initial definition. You can share any communication definition that does not have an export definition that is assigned to it. You cannot assign export definitions to a shared communication definition.

To share a definition that was created in a different business context, click  and select **Share communication definition**.

**Figure 3.40** Share Definitions

Share Definitions						
Source business context:		Destination folder:				
Available Definitions (6 of 6)   Search: none						  
Name	Channel	Staged	Folder	Shared	Date Modified	
ATM Staged	ATM	Yes	Definitions	No	Jul 16, 2014 12:57 PM	
Call center inbound contact staged	Call Center	Yes	Definitions	No	Sep 8, 2014 05:18 PM	
Catalog	Catalog	No	Definitions	No	Jul 24, 2014 10:51 AM	
Direct Mail - non staged	Mail	No	Definitions	No	Jul 11, 2014 11:18 AM	
Direct Mail -Staged	Mail	Yes	Definitions	No	Jul 11, 2014 11:19 AM	
Staged Social Media	Social Media	Yes	Definitions	No	Sep 4, 2014 04:02 PM	
Selected:						
Name	Channel	Staged	Folder	Shared	Date Modified	
						 

Select the **Source business context** that contains the communication definitions that you want to share. Click  to select the storage location for the shared definition within the current business context. Select the definitions from

the Available Definitions table and click the arrows to add them to the list of selected definitions.

If you delete a shared definition, it is deleted only from the current business context.

The Sharing page of the communication definition lists other business contexts that share the definition.

**Figure 3.41** Sharing Page

Name	Code	Date Shared	Shared By
Worldwide Business Context	17	Jul 24, 2014 10:51 AM	Gloria Drew

A number in a red badge indicates the business contexts that share this definition but that you do not have permission to view.

## Exports

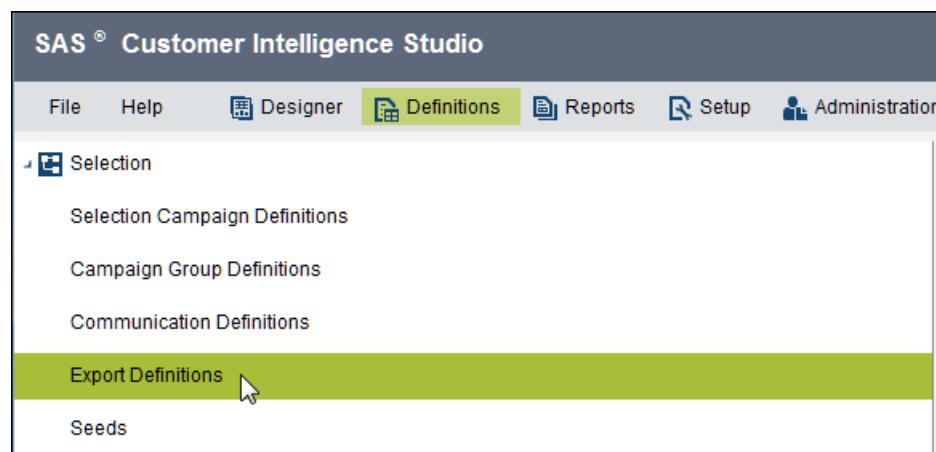
### Overview of Export Definitions

An export definition determines the subject, output type, contents, and other properties of an export file.

### Create an Export Definition

To create a new export definition, expand the Selection category and select **Export Definitions** in the Definitions workspace.

**Figure 3.42** Create Export Definition



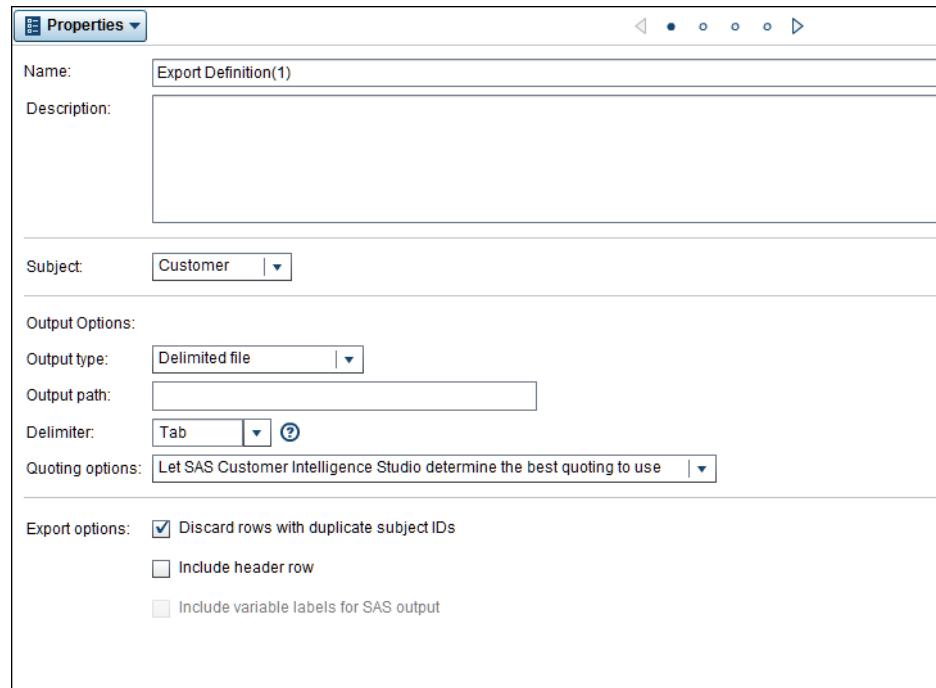
Click to create the definition.

## Specify Export Definition Properties

### Overview of the Export Definition Properties Page

On the Properties page, you supply the output options and other information.

*Figure 3.43 Export Definition Properties Page*



### Select a Subject

Select a **Subject** to specify the type of record to export. The items that you can select are the subjects that are defined in the information map.

### Select an Output Type

Select an **Output type** to specify the type of files that are created and exported. You can select one of the following output types:

- Delimited file. When you select this output type, you specify a delimiter. For more information, see “[Select Delimited File and Quoting Options](#)” on page [106](#).
- Microsoft Excel
- Positional file
- SAS data set
- SAS Digital Marketing
- Table
- XML file

- SAS Customer Intelligence 360. Selecting this output type creates an export file that contains information about audiences and treatments. The file is sent to SAS Customer Intelligence 360 for use in adding targets and messages to tasks. This output type can be used by any Communication node, regardless of which channel is selected. This output type cannot be used in an Export node. Commas are used as separators.

For information about output types and export files, see “[Output Type Requirements](#)” on page 108.

### Select an Output Path or Library

Specify an **Output path or Library** for the output location. If you select **Table** or **SAS Data Set** from the **Output type** list, you specify a library.

If you select **SAS Digital Marketing** as the output type, select a library from the list.

### Select Delimited File and Quoting Options

If you select **Delimited file** from the **Output type** list, select an item from the **Delimiter** list. You can also enter a delimiter in the **Delimiter** field; you cannot enter a double quotation mark or a tab character. Do not use a colon or a single quotation mark as a delimiter.

If you select **Delimited file** as your output type, select an item from the **Quoting options** list.

You can select one of the following options:

**Let SAS Customer Intelligence determine the best quoting to use**

specifies that SAS Customer Intelligence apply quotation marks as specified by the values in the export file. This option is recommended.

**Always quote values in the export file**

specifies that SAS Marketing apply quotation marks to all of the values in the export file.

**Never quote values in the export file**

specifies that SAS Marketing Automation not apply quotation marks to the values in the export file. Do not select this option if you have selected a delimiter that occurs in the data that is being exported.

### Specify Export Options

To exclude duplicate rows from the export file, select **Discard rows with duplicate subject IDs**.

To use the Output Name as the column heading in the export file, select **Include header row**. This check box is available only if the output type is **Delimited file** or **Positional file**.

To use the variable labels in a SAS format file, select **Include variable labels for SAS output**. This check box is available only when the output type is **SAS data set** or **SAS Digital Marketing**.

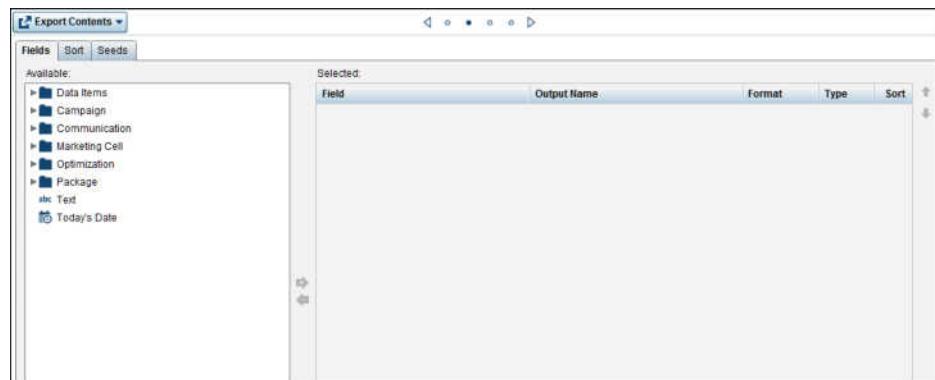
## Specify Export Contents

### Select Fields for Export

On **Fields** tab of the Export Contents page, select the contents of the export file.

If **SAS Customer Intelligence 360** is the output type, the fields are already selected. The SAS Customer Intelligence 360 export file contains subject IDs and their associated treatments from the Communication node. When the campaign is executed, the file is stored on the server tier. A copy of the file is sent to SAS Customer Intelligence 360.

*Figure 3.44 Fields Tab*



On the **Fields** tab, the **Available** list displays the items that can be added to the export file. The contents of the list depend on the information map. The list contains these folders and items:

- **Data Items** are displayed in a hierarchy. The hierarchy is determined by the information map that is associated with the selected export definition. Items are removed from the **Selected** table if the names, variable IDs, or subject IDs differ from those in the underlying information map.
- The **Campaign** and **Communication** folders contain the set of standard fields that are associated with campaign and communication definitions. Also displayed are custom detail tags that have been associated with campaigns and communications.
- The **Marketing Cell** folder contains fields for cell properties, such as Code, Description, Name, and Tracking Code.
- The **Optimization** folder contains fields that are associated with SAS Marketing Optimization.
- The **Package** folder contains fields that are associated with packages and treatments, such as Code, Treatment Code, Treatment Description, Treatment Name, and Treatment Reference. This folder also contains links and custom detail tags that have been associated with treatments. For information about the export files that result from treatments that contain custom detail tags, see “[Treatments and Custom Detail Tags](#)” on page 123.
- The **Text** item adds a text column that has the default name of `Textn`. You can replace the default name with a meaningful name.

- The **Today's Date** item adds a column that has the default name of Today's Date. The date is the date that the export file is created.
- Select an item and click  to add the item to the **Selected** table. Each row in that table defines a column in the export file. To delete an item from the selected table, select the item and click .

## Output Type Requirements

If the output type is SAS Digital Marketing, the following output column names are required:

### SUBJECT\_IDn

the unique identifier of each recipient. Additional identifiers can be included in the export definition. Each subject identifier must include a unique integer and be kept in sequence (for example, SUBJECT\_ID1, SUBJECT\_2, SUBJECT\_ID3). If multiple fields are used to make up a subject, the fields must be defined in the order in which they appear in the information map. If the subject contains only two fields, the `UseInSubjectIdTop=Subject_ID_xxxx` information map custom property can be used to specify which field is processed first.

### RESPTRACKING\_CD

a code that associates the particular cell with a communication occurrence. Select the **TrackingCode** data item from the **Cell** folder to include this column name.

**Note:** If you use the RESPTRACKING\_CD code to export other data item, the exported column exports the actual RESPTRACKING\_CD instead of specified data item.

### EMAIL or SMS

the email address or telephone number of the recipient.

You can modify all the cells of text items that appear in the **Selected** table. For other items, except for the cells in the **Field** column, you can modify the content of the cells in the **Selected** table. You can also add and delete rows as well as change the order of the rows.

You can enter the contents of the **Position** column of export files that are the Positional File output type. Every row must have a position, the position must be numeric, and there can be no duplicate positions. You can also add and delete rows as well as change the order of the rows.

If an output type of Table, SAS data set, XML, or Microsoft Excel is selected, the output name must follow these rules:

- The name must be 32 characters or fewer in length, if the format specifies fewer than 32 characters. If you use macro variables to generate SAS data set output names, make sure that the name does not exceed the limit.
- The name must start with a letter.
- The name must contain only letters, numbers, and underscores.
- The name must be unique.

For information about making SAS data sets and tables available to export definitions, see *SAS Marketing Automation: Administrator's Guide*.

If the output type is SAS Customer Intelligence 360, tables that have a one-to-many or many-to-one relationships to other tables will cause the export to fail.

## Specify Sort Order of Fields

On the **Sort** tab, specify the sort order of fields in the export file. This tab is not available for the **SAS Customer Intelligence 360** output type.

*Figure 3.45 Sort Tab*

Direction	Field	Output Name
↑	Total Household Deposits - Household	TOTALDEP_1
↑	Credit - Model Scores - Customer	CREDIT
↑	Approval Date - Campaign	CAMPAIGN_DATE_APPROVE

Click to select the sort criteria.

To change the order in which an item appears, select the item and click or . To specify the order of values within fields, select a field, and select or .

## Select Seed Lists

On the **Seeds** tab, select **Export seeds in communications** to specify the seeds that are included in the export. This tab is not available for the **SAS Customer Intelligence 360** output type.

*Figure 3.46 Seeds*

Name	Folder	Date Modified	Modified By
Seeds list	Seeds		

Specify how the seeds are exported by selecting a method. You can choose to insert the list items randomly into the export file or append the list to the end of the export file. For example, if you select the former and if you are exporting 1000 customers with 10 random seeds, the seeds are scattered randomly among the customer names.

Click to select a seed list. You can add a seed list only once.

Click to view members of the selected seed list.

If a seed list does not have a value for a field that is being exported, the value for that field is the value of the row that is directly before it.

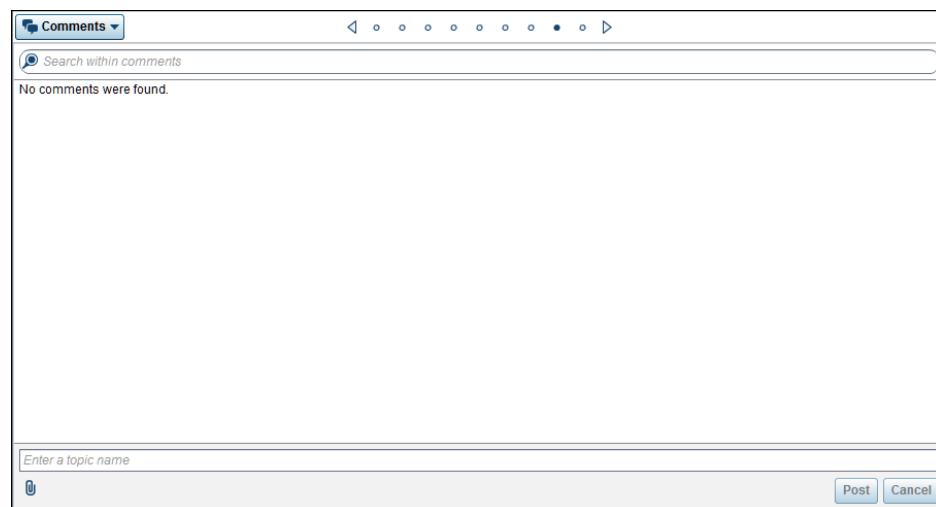
Only Communication nodes use seeds in their exports. If you use an Export node that is based on an export definition that includes seeds, the seeds are not in the export file that is created.

The seed lists apply only to the selected export definition. If you have more than one export definition that you want to use in Communication nodes, you must select a seed list for each export definition.

## Add Comments

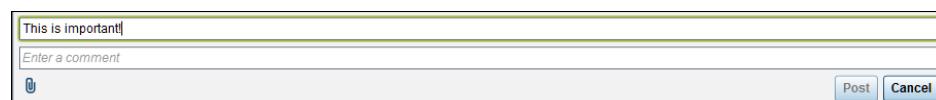
On the Comments page, you view and add comments. You add comments after saving.

*Figure 3.47 Comments*



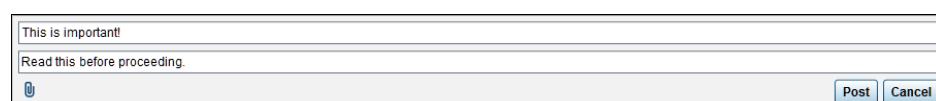
Enter a topic name to add a new comment.

*Figure 3.48 New Topic*



Enter the text of the new comment.

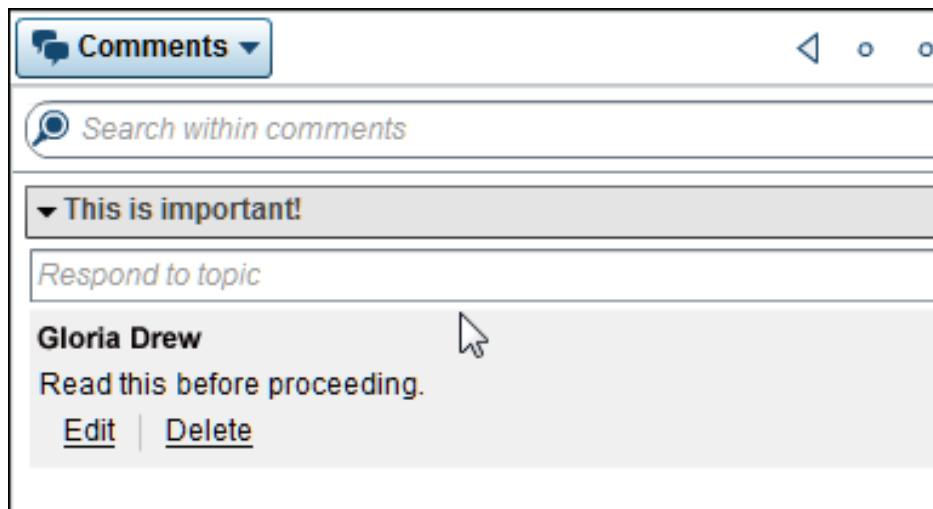
*Figure 3.49 Comment Text*



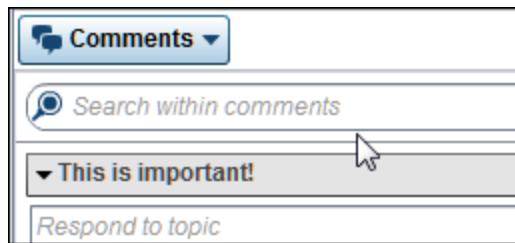
Click **Post** to post the comment. Your new comment is displayed on the Comments page. You can add comments even if you do not have Edit permission.

Click to add an attachment such as an image or a document.

To reply to an existing comment, type text in the field below the comment title.

*Figure 3.50 Comments List*

Type in the search field to find text in comments.

*Figure 3.51 Search Comments*

## Add Attachments

On the Attachments page, you view and add attachments such as images or documents.

*Figure 3.52 Attachments*

Name	Added By	Date Added	Actions
Desert.jpg	Gloria Drew	Sep 26, 2014 03:33 PM	

Click to select a file to attach.

## Seeds

### Overview of Seeds

A seed is an individual or organization to whom you send a communication to verify that a communication has been processed correctly. Typically, seeds are

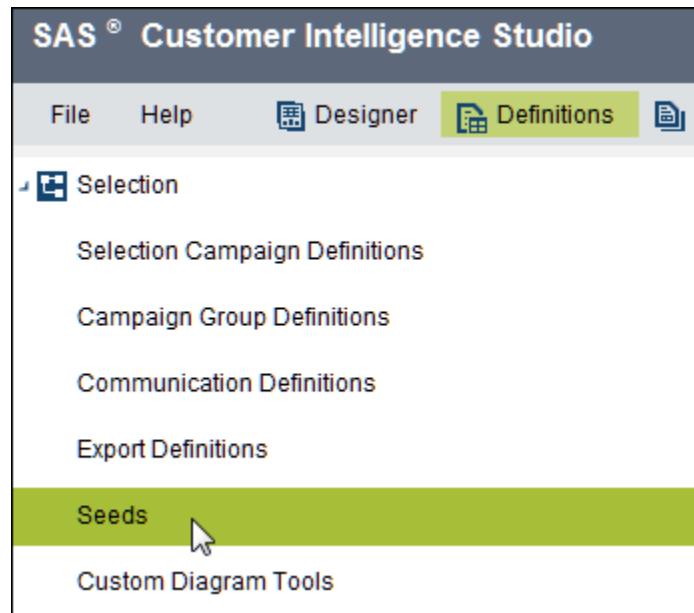
company employees who would not have been selected for the specific communication.

You can create seed lists which you can then use in campaigns. You select seed lists in Communication nodes.

## Create a Seed List

To create a seed list, select **Seeds** in the Definitions workspace.

*Figure 3.53 Seeds*



Click to create a seed list definition.

## Specify Seed List Definition Properties

The Properties page displays information about the seed list definition.

*Figure 3.54 Seed List Definition Properties*



## Add Members to a Seed List

On the Seed Members page, you add columns and members to a seed list.

**Figure 3.55** Seed Members

The screenshot shows a table titled "Seed Members". The table has three columns: "Age", "Credit", and "Lastname". A single row is present, containing the values "44", "22", and "Jones". The "Age" cell is highlighted with a green background. The table includes standard navigation icons at the top and right side.

Age	Credit	Lastname
44	22	Jones

You select all of the columns that become part of the table. Click to add columns from the information map to the table. Seed lists cannot contain date type data items.

Click to add a row to the table. Enter member information in the row. Any changes in the contents of a seed list are reflected everywhere that the seed list is used.

## Display Seed List Usage

The Usage page lists the campaigns and export definitions that are using the seed list.

**Figure 3.56** Usage

The screenshot shows a table titled "Usage". It displays one row of data under the heading "Used in the following:". The table has columns: "Name", "Type", "Folder", "Date Modified", and "Modified By". The data row shows "Exports" as the Name, "Export Definition" as the Type, "Exports" as the Folder, "Aug 12, 2014 02:00 PM" as the Date Modified, and no specific user name for the Modified By field.

Name	Type	Folder	Date Modified	Modified By
Exports	Export Definition	Exports	Aug 12, 2014 02:00 PM	

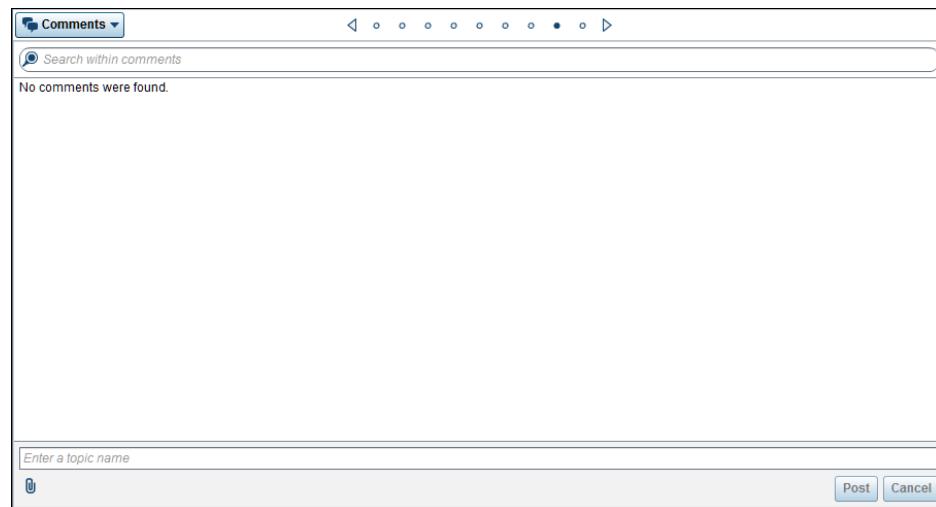
Select a row and click to open the campaign.

An information icon is displayed if there are items that you do not have permission to view.

## Add Comments

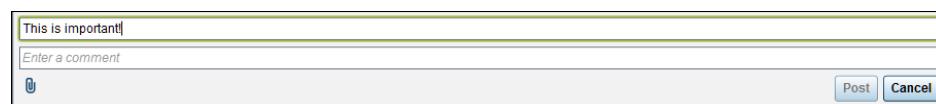
On the Comments page, you view and add comments. You add comments after saving.

**Figure 3.57** Comments



Enter a topic name to add a new comment.

**Figure 3.58** New Topic



Enter the text of the new comment.

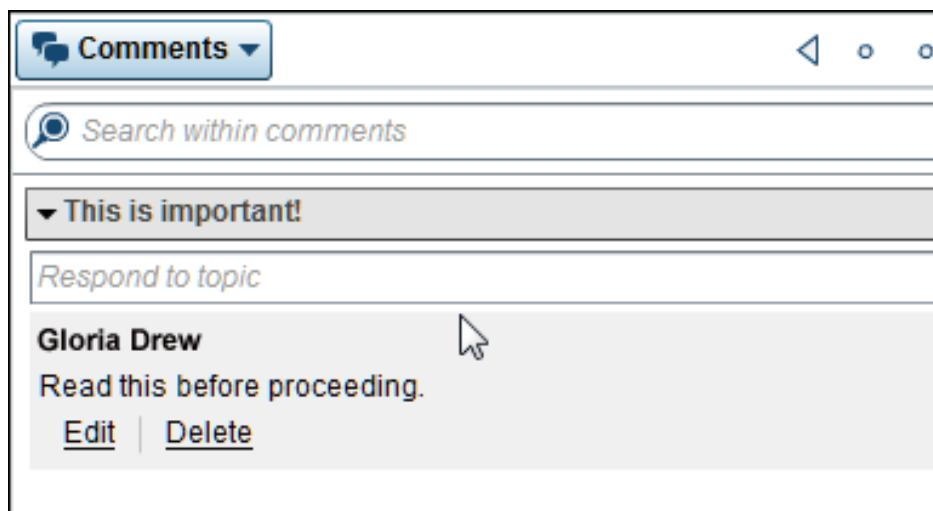
**Figure 3.59** Comment Text



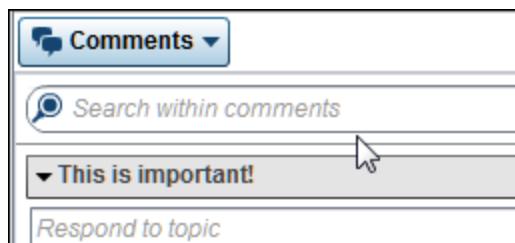
Click **Post** to post the comment. Your new comment is displayed on the Comments page. You can add comments even if you do not have Edit permission.

Click to add an attachment such as an image or a document.

To reply to an existing comment, type text in the field below the comment title.

**Figure 3.60** Comments List

Type in the search field to find text in comments.

**Figure 3.61** Search Comments

## Add Attachments

On the Attachments page, you view and add attachments such as images or documents.

**Figure 3.62** Attachments

Name	Added By	Date Added
Desert.jpg	Gloria Drew	Sep 26, 2014 03:33 PM

Click **+** to select a file to attach.

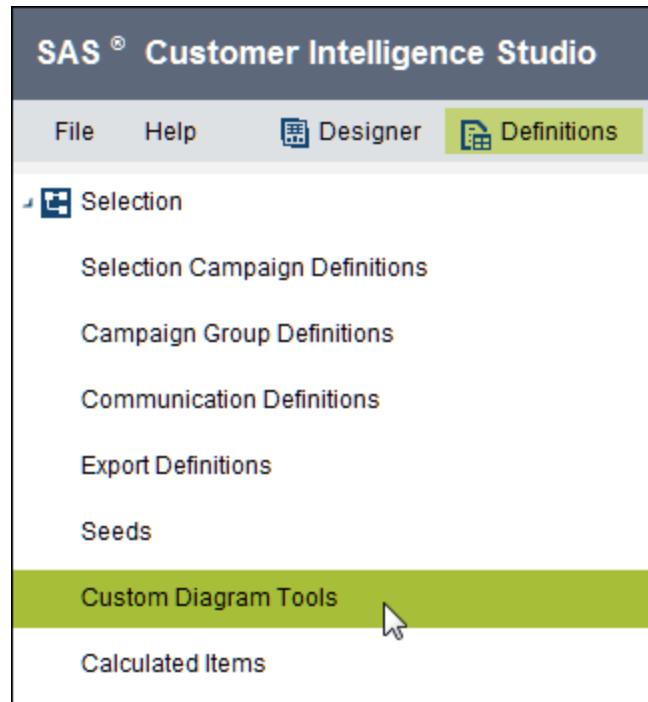
## Custom Diagram Tools

### Overview of Custom Diagram Tools

You can create a custom diagram tool from a stored process. The custom tool can then be used in campaign diagrams.

To create a custom diagram tool, expand the **Selection** category in the Definitions workspace, and select **Custom Diagram Tools**.

*Display 3.45 Custom Diagram Tools*



Click to create a new tool.

## Specify Custom Diagram Tool Properties

The Properties page displays information about the tool.

*Display 3.46 Custom Tool Properties*

Properties	
Name:	Selection Custom Tool(1)
Tooltip:	(empty text area)
Icon:	
Permissions:	<input type="radio"/> None (hidden) <input checked="" type="radio"/> All users <input type="radio"/> Advanced users
Process:	<input type="text"/>
Description:	
Input subject:	<input type="text"/> Any
Output subject:	<input type="text"/> AllAcct

Click the image next to **Icon** to select an icon.

Select one of the following permission settings from the **Permissions** list:

**None**

specifies that the tool is not displayed on the Diagram page of a campaign

**Advanced users**

specifies that only advanced users can view the tool.

**All users**

specifies that all users can view the tool. This is the default setting.

Click  to select the process that executes when the tool is run.

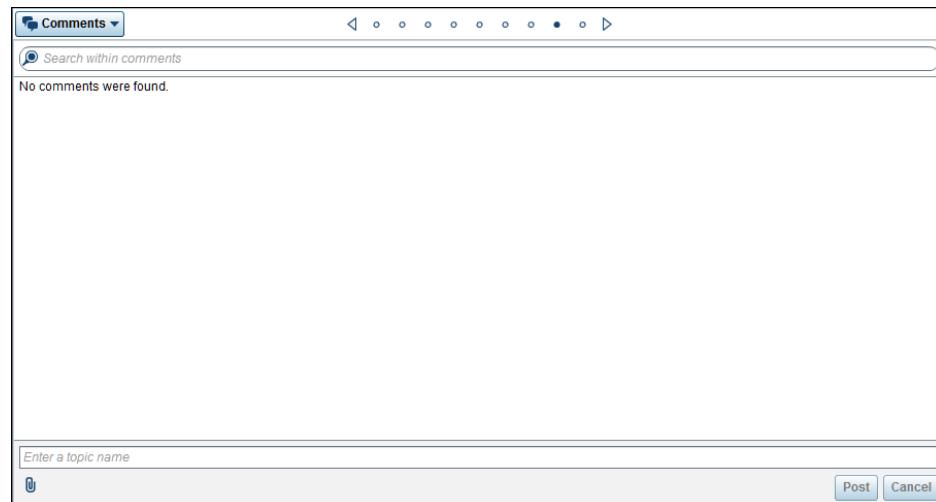
Select an **Input subject** and an **Output subject** for the stored process. The items in these lists are determined by that stored process that you have selected.

**Note:** Changes to custom diagram tools are not displayed in the Tool Palette of other users until those users have logged off and logged back on.

## Add Comments

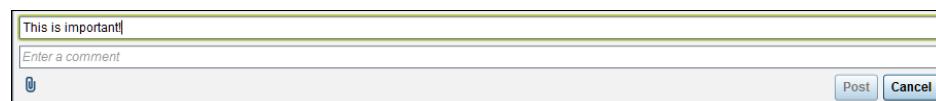
On the Comments page, you view and add comments. You add comments after saving.

*Figure 3.63 Comments*



Enter a topic name to add a new comment.

*Figure 3.64 New Topic*



Enter the text of the new comment.

**Figure 3.65** Comment Text

This is important  
Read this before proceeding.  
[Attachment icon]  
Post Cancel

A screenshot of a comment text input dialog box. It contains two text input fields: the first with placeholder text "This is important" and the second with "Read this before proceeding.". Below the fields is an attachment icon. At the bottom right are "Post" and "Cancel" buttons.

Click **Post** to post the comment. Your new comment is displayed on the Comments page. You can add comments even if you do not have Edit permission.

Click to add an attachment such as an image or a document.

To reply to an existing comment, type text in the field below the comment title.

**Figure 3.66** Comments List

Comments ▾  
Search within comments  
▼ This is important!  
Respond to topic  
Gloria Drew   
Read this before proceeding.  
Edit | Delete

A screenshot of a comments list interface. It shows a single comment from "Gloria Drew" with the text "Read this before proceeding.". Below the comment are "Edit" and "Delete" links. A cursor arrow points to the "Edit" link.

Type in the search field to find text in comments.

**Figure 3.67** Search Comments

Comments ▾  
Search within comments  
▼ This is important!   
Respond to topic

A screenshot of a comments list interface. A cursor arrow points to the "Search within comments" field.

## Add Attachments

On the Attachments page, you view and add attachments such as images or documents.

*Figure 3.68 Attachments*

Name	Added By	Date Added
Desert.jpg	Gloria Drew	Sep 26, 2014 03:33 PM

Click to select a file to attach.

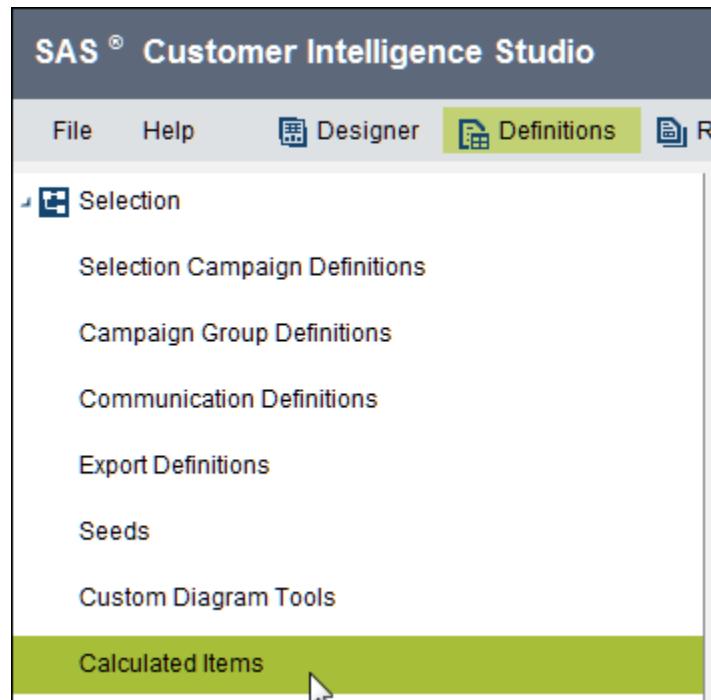
## Calculated Items

### Overview of Calculated Items

You can create calculated items that can be used by any campaign in the same business context.

### Create a Calculated Item

To create a calculated item, select **Calculated Items** in the Definitions workspace.

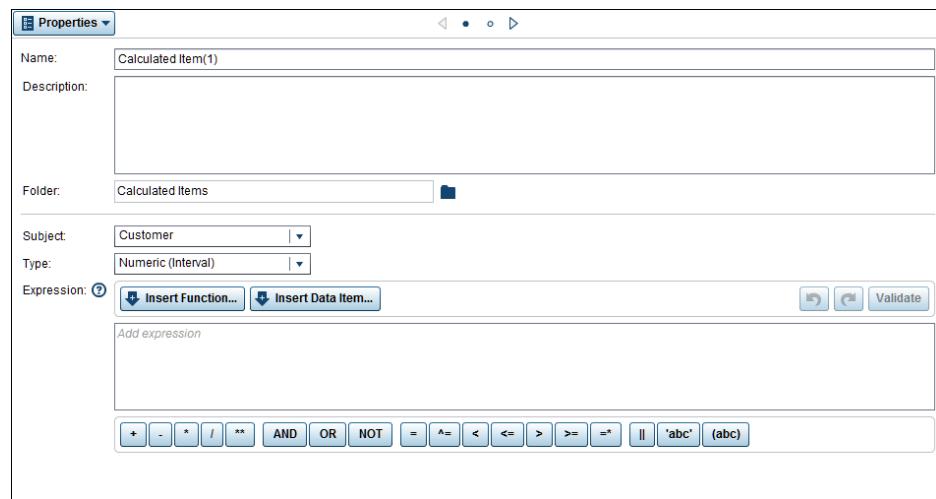
*Figure 3.69 Calculated Items*

Click to create the calculated item.

### Specify Calculated Item Properties

The Properties page displays information about the calculated item.

Figure 3.70 Calculated Item Properties Page



Click to select a folder for the calculated item.

Select a subject from the **Subject** list.

Select a type from the **Type** list.

To enter an expression, type directly in the field or click the operator buttons and the **Insert Function** and **Insert Data Item** buttons.

**Note:** In the expression editor, the names of data items are not translated for the current locale.

For a list of available SAS functions, see [Appendix 4, “Using SAS Language Elements in Expressions,” on page 369](#). For examples and a complete description of each function, see *SAS Language Elements by Name, Product, and Category* at <http://support.sas.com/documentation/onlinedoc/base/index.html>.

For faster performance when defining a TRUE or FALSE expression such as `(Age < 20)`, enclose the expression in an SQL construct as follows:

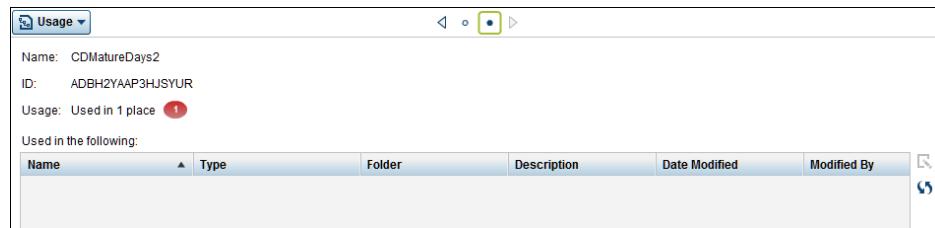
`"case when (Age < 20) then 1 else 0 end"`

Click to undo any changes that you have made. Click to re-create the changes.

Click **Validate** to verify whether the current expression text is valid.

## Display Calculated Item Usage

The Usage page displays the campaigns and definitions that are using a calculated item. This page also lists campaign groups that are using the calculated item as scores, and any other calculated item that is using the current calculated item.

**Figure 3.71** Usage Page

If there are multiple references to a calculated item within the same campaign, the usage is counted only one time.

A red badge is displayed if there are items that you do not have permission to view.

Click to open a selected item in the list

To refresh the list of calculated items, click .

**Note:** Calculated items that are imported or migrated from a previous release, are de-duplicated according to the expression, rather than the name. A calculated item is not imported if it uses the same expression as a calculated item in the target location.

## Custom Detail Groups

### Overview of Custom Details

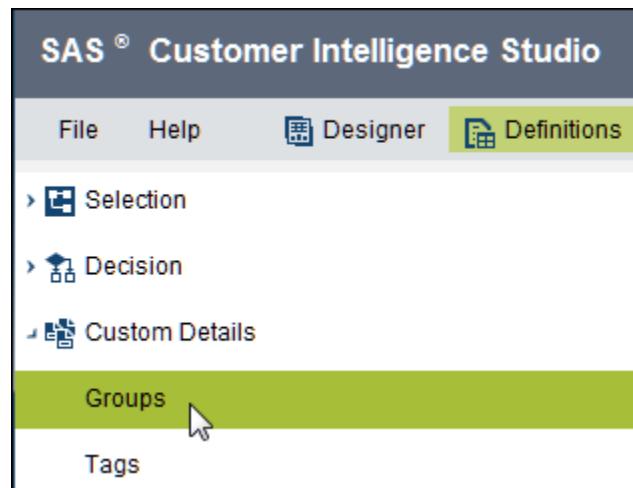
Custom details are user-defined fields that you can create for use in campaigns.

A custom detail group is a collection of custom details that can be reused wherever custom details can be added. You can assign the entire group without having to assign each custom detail. For example, you can create a custom detail group that contains budgetary data. Individual custom details could be Total Costs, Expected Revenue, Cost per Item, and Shipping Cost.

A custom detail tag is a placeholder for a custom detail. You create a tag and then you assign the tag to a custom detail. You can select the tag for inclusion in the export file for selection campaigns. If the tag is selected in an export definition, a custom detail value that is referenced by that tag will be written to the export file.

### Create a Custom Detail Group

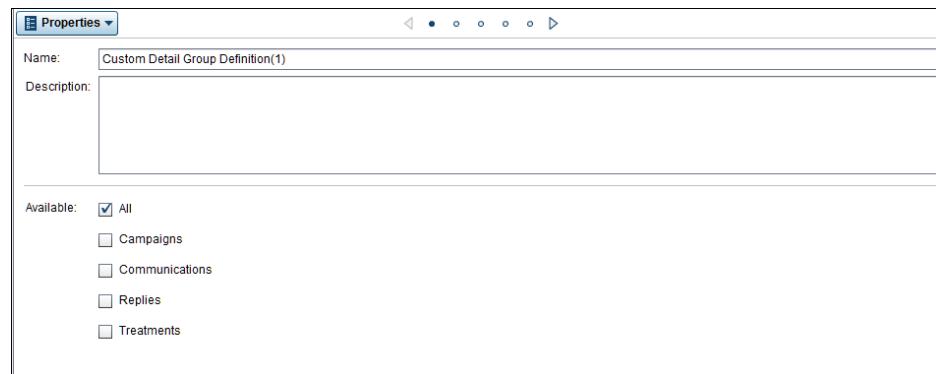
To create a custom detail group, select the Custom Details category in the Definitions workspace. Select **Groups**.

*Display 3.47 Custom Detail Groups*

Click to create the custom detail group.

## Specify Custom Detail Group Properties

The Properties page displays information about the custom detail group.

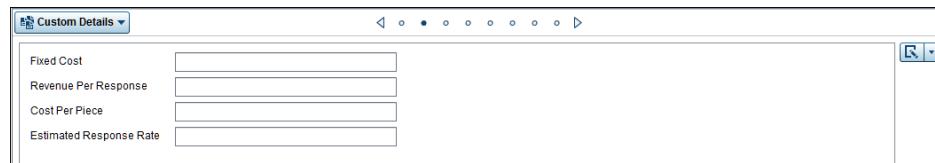
*Display 3.48 Custom Detail Group Properties*

In the Available section, select the components that have access to the custom detail group.

## Add Custom Details

### Overview of Adding Custom Details

On the Custom Details page, you add user-defined fields.

**Display 3.49** Custom Details Page

To add a custom detail, click  and select **Manage custom details**.

To append a custom detail group to the custom detail, select **Add custom detail groups**.

A  next to a custom detail displays information about the associated custom detail tag.

### Treatments and Custom Detail Tags

If you add a custom detail tag to a treatment, and that tag is included in the export definition for the campaign, the export file contains a single column for the custom detail tag. The column includes the values for all of the treatments in the package. The values are separated by the separator for treatment values.

If the custom detail tag is not used in all of the treatments in a package, some of the values in the column are empty. For example, a package might contain Treatment 1, Treatment 2, and Treatment 3. Treatment 1 and Treatment 3 use the same custom detail tag. Treatment 2 does not use the custom detail tag. In the export file for the campaign, the value in the column for the custom detail tag might look like the following.

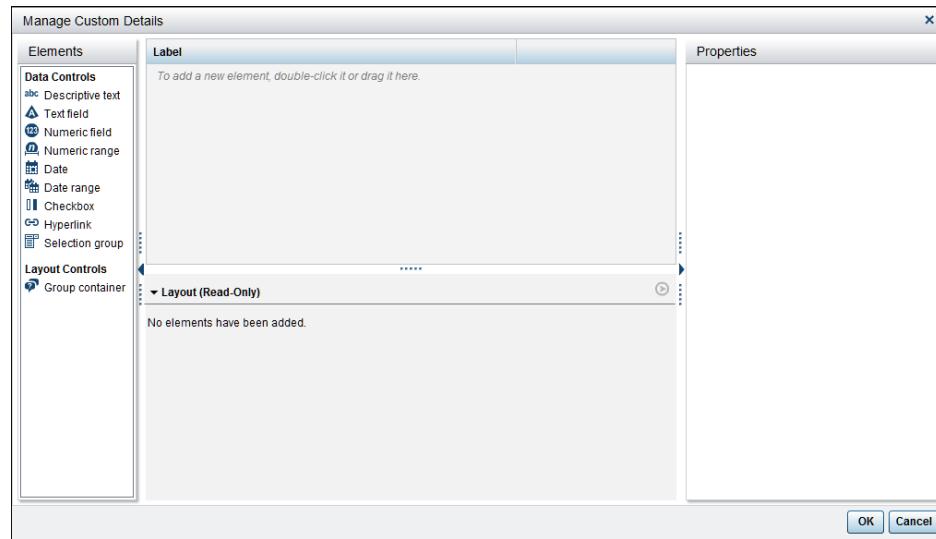
```
Treatment 1 Value,,Treatment 3 Value
```

In this example, a comma (,) is the separator. Separators for treatment values are set in the Environment Variables category in the Setup workspace. For more information, see *SAS Marketing Automation: Administrator's Guide*.

For more information about custom detail tags, see “[Custom Detail Tags](#)” on [page 137](#).

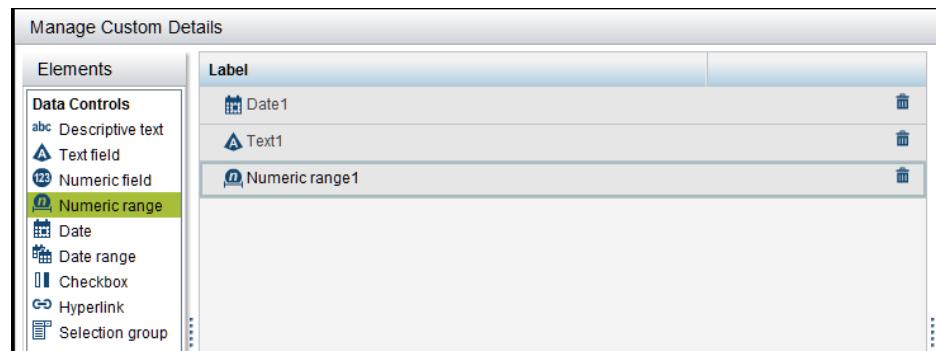
### Manage Custom Details

In the Manage Custom Details window, you supply information about the custom details.

*Display 3.50 Manage Custom Details*

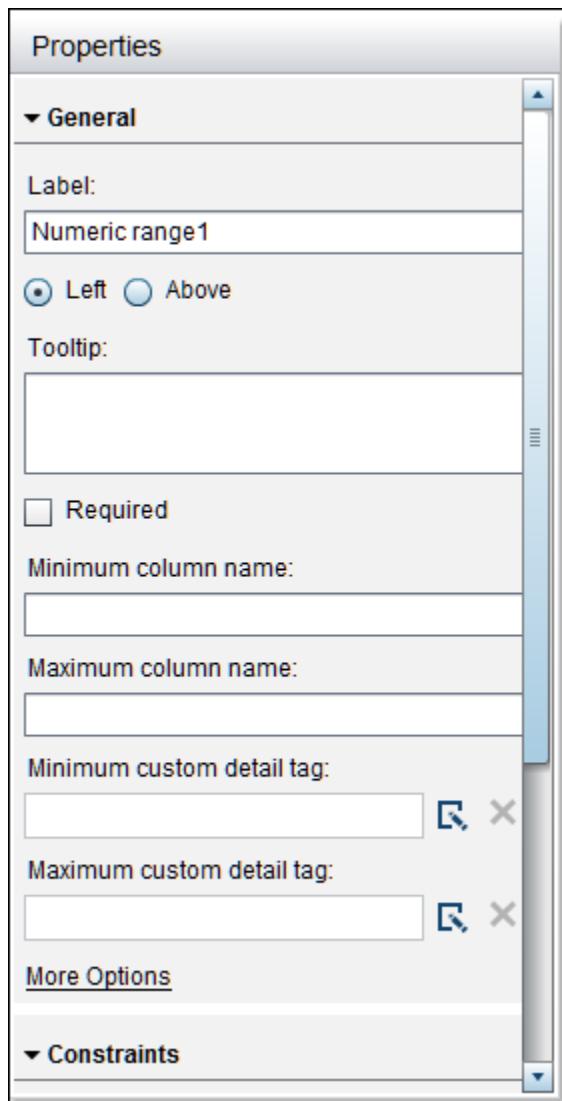
### Select an Element

To select the type of custom detail, double-click it or drag an element from the **Elements** pane to the **Label** pane.

*Display 3.51 Select Element*

### Specify Properties

In the **Properties** pane, specify the details for the selected element. The details vary, depending on the element and the software component. As you set the properties, you can review the results in the **Layout** pane.

**Display 3.52** Custom Detail Properties

### Specify General Properties

The following items are the possible properties in the General section. Click **More Options** to display more properties.

#### **Label**

is the name that is displayed with the field. Select **Left** or **Above** to set the location of the label in relation to the custom detail.

**Note:** The names of custom details that are passed to SAS Marketing Optimization must be no longer than 26 characters.

#### **Description**

is the description of the field.

#### **Tooltip**

is the text that is displayed when you rest the mouse pointer on the field.

#### **Required**

indicates that a value is required. Required custom details must be completed before a campaign can be executed.

**Dynamic (editable in campaign)**

indicates that a value is dynamic. Dynamic custom details can be modified. For example, if you have a credit card offer in which you want to give different rates to different customers, you can use a single treatment and specify a different value for the Rate dynamic custom detail for each group of customers. Values that are not dynamic cannot be changed. This option is available only for treatments.

**Column name**

is the name of the column that is displayed in a published report.

**Minimum column name**

is the name of the column that displays the minimum value in a range.

**Maximum column name**

is the name of the column that displays the maximum value in a range.

**Custom detail tag**

is the custom detail tag that is associated with the custom detail. Click  to select a custom detail tag.

**Minimum custom detail tag**

is the custom detail tag that is associated with the minimum value in a range.

Click  to select a custom detail tag.

**Maximum custom detail tag**

is the custom detail tag that is associated with the maximum value in a range. Click  to select a custom detail tag.

**Width**

is the width of a field.

**Hint**

is the text that is displayed beneath the field that indicates the value that should be entered.

**In-field hint**

is the text that is displayed in the field that indicates the value that should be entered.

**Specify Data**

These are the possible properties in the Data section:

**Number of values**

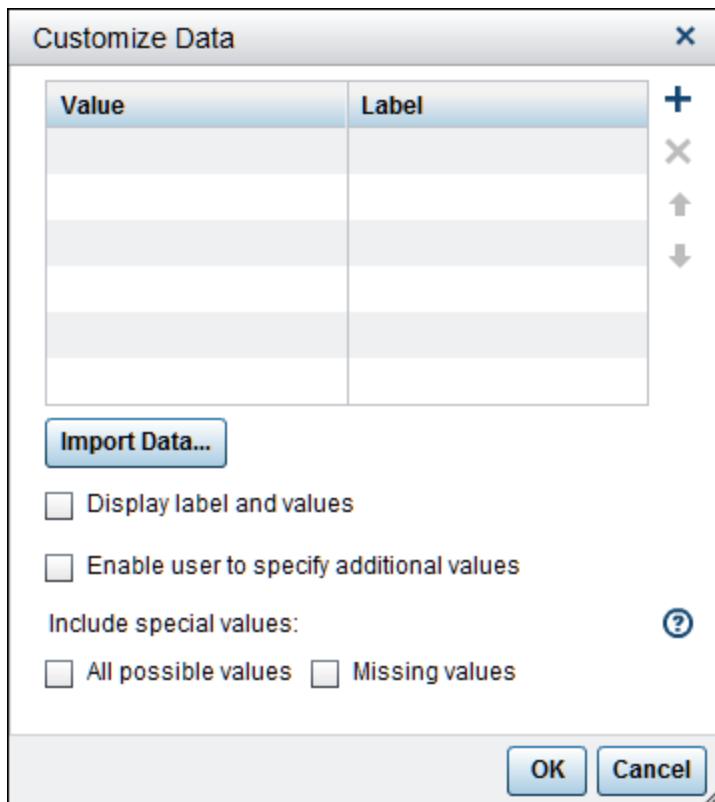
sets the number of text values that can be entered. If you select **Multiple values**, select **Enable user to reorder values** to enable the user to change the order of the values.

**Populated by**

specifies the source of the values that are entered.

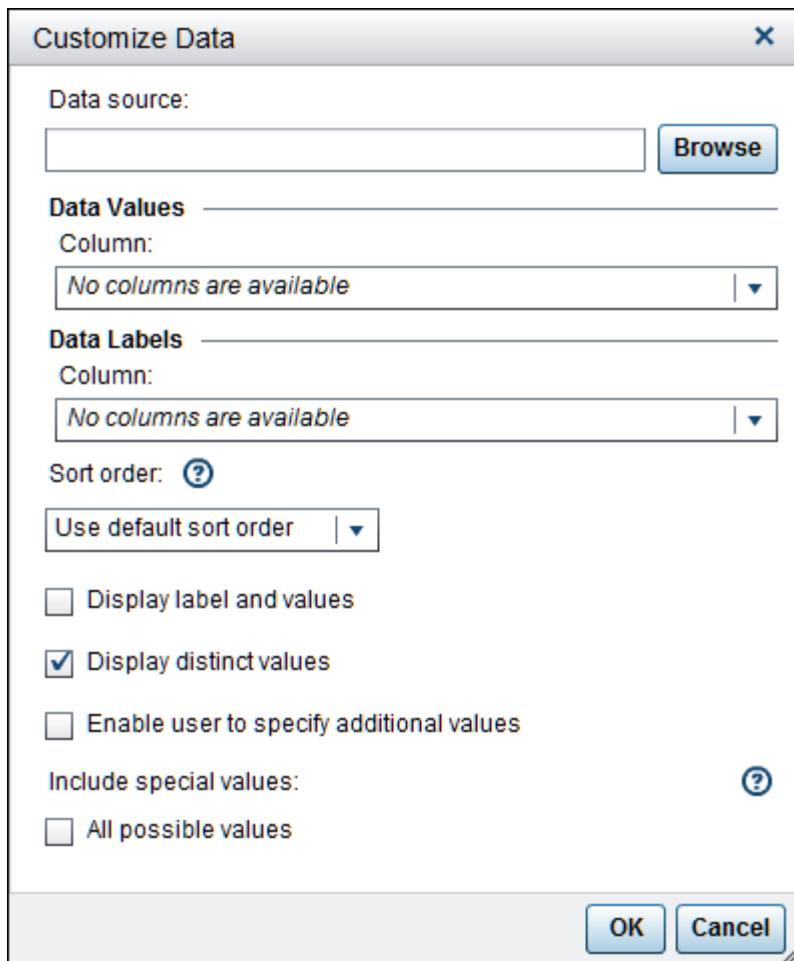
Select **User entry** to indicate that values are entered by the user.

When you select **A predefined list**, the list does not change unless you add or remove values.



To display text other than the name of the list item, enter a value in the Label column. For example, if the list items are products, the Value could be the product number A12345 and the Label could be Child's Desk. When a predefined list is published to the common data model, the published value contains the concatenated display values. Click **Import Data** to import values from a SAS library. Click **Display label and values** to display the label and values with the list item. To enable the user to select values from a list, select **Enable user to specify additional values**. Select **All possible values** and **Missing values** to include those values in the list.

When you select **A dynamic list**, the list displays the contents of the SAS Folders hierarchy on the **Folders** tab of SAS Management Console. Changes in this external list are reflected in the list of values that the user can select.



Click **Browse** to select a data source. Select a column in the Data Values and the Data Labels section to display those columns. Select a sort order. To display a value other than the text in the **Value** field, select **Display label and values** and **Display distinct values**. To enable a user to select more than one value from a list, select **Enable user to specify additional values**. Select **All possible values** and **Missing values** to include those values in the list.

#### Dependencies

If you create at least one element that is populated by a dynamic list, click **Dependencies** to add an element that the first element depends on. For example, if the first element is "Store," and the element that it depends on is "Sales Region," the Store element displays only the stores that are in the

selected sales region.

**Dependencies**

The "Text1" element depends on the following elements:

Element	Description of Dependency

The following elements depend on the "Text1" element:

Element	Description of Dependency

**OK** **Cancel**

Click **+** to add the dependency.

**New Dependency**

The "Text1" element is dependent on the following element:

Numeric range1

Condition

The value of the "Text1" element is displayed when the following condition is met: [?](#)

Data source: /CI Assets/Database Tables/MAALORA/ALLACCT(Table)

Column: ACCTNUM

Operator: Is between (inclusive)

Value: Value selected for the "Numeric range1" element

**OK** **Cancel**

## Specify Constraints

The following items are the possible properties in the Constraints section.

### Allow only integer values

indicates that only integer values can be entered in a numeric or a numeric range custom detail.

### Number of lines

specifies whether to display single or multiple lines. If you select **Multiple lines**, specify the **Maximum line count** and **Number of lines displayed**.

### Minimum length

sets the minimum number of characters that are allowed in the field.

### Maximum length

sets the maximum number of characters that are allowed in the field.

### Maximum line count

is the maximum number of text lines that can be entered in a field.

### Number of lines displayed

is the number of text lines that are displayed in the field.

### Date type

sets the unit to **Day**, **Week**, **Month**, **Quarter**, or **Year**.

In an export file, these custom details contain the following values:

#### Quarter

The first day of the quarter, for example, 1 Oct 2016

#### Week

The date of the Monday of the week, for example, 8 Feb 2016.

#### Year

The first day of the year, for example, 1 Jan 2016.

### Minimum decimal places

sets the minimum number of decimal places that are allowed in the field.

### Maximum decimal places

sets the maximum number of decimal places that are allowed in the field.

### Minimum value allowed

is the minimum value for the field.

### Maximum value allowed

is the maximum value for the field.

### Combined field

is another text field that this field can be combined with.

### Maximum combined length

is the combined length of two combined text fields.

## Specify Appearance

The Appearance section offers a choice of displays for selection groups and group containers. A selection group can be displayed as a drop-down list or a set of radio buttons. A group container can be displayed as a labeled box, a collapsible section, or an unlabeled group.

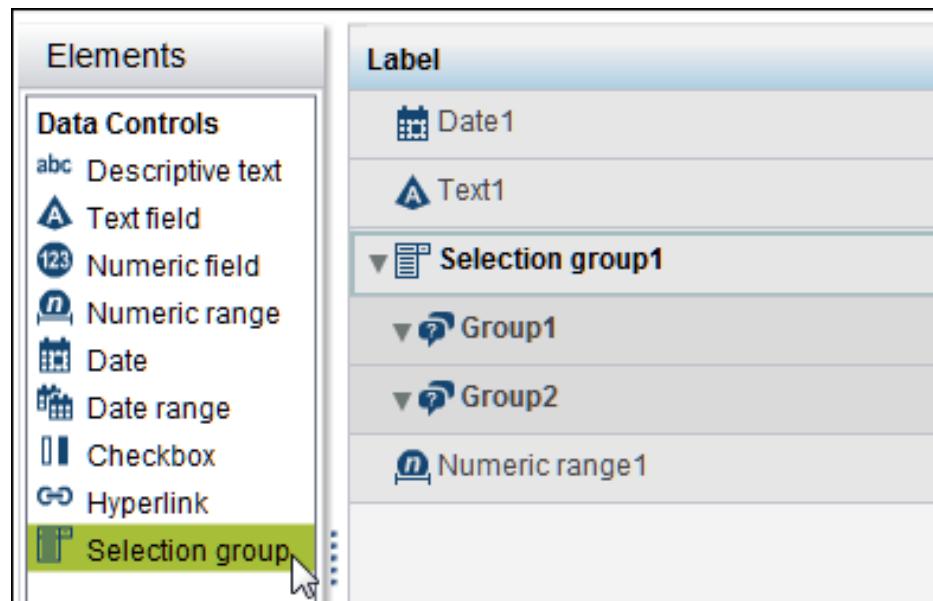
## Specify Default Values

In the Default Values section, you specify a default value for a selection group. Click  to specify which group is displayed first by default.

## Organize Custom Details

A selection group is a collection of other groups that is displayed as a list or a series of radio buttons. Double-click **Selection group** to add it to the **Label** pane.

*Display 3.53 Selection Groups*

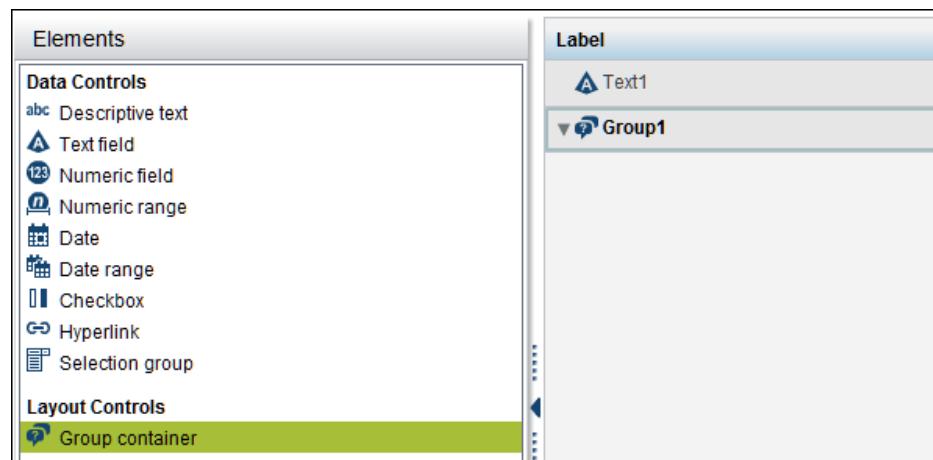


The screenshot shows the 'Selection Groups' interface. On the left, the 'Elements' pane lists various controls under 'Data Controls': Descriptive text, Text field, Numeric field, Numeric range, Date, Date range, Checkbox, Hyperlink, and Selection group. The 'Selection group' item is highlighted with a green background. On the right, the 'Label' pane shows a list of items: Date1, Text1, Selection group1, Group1, Group2, and Numeric range1. The 'Selection group1' item is expanded, revealing its contents: Group1 and Group2.

The selection group is prepopulated with groups that you can modify and add items to. Select items from the **Elements** pane and drag them to a group.

A group container collects custom details into a group. Double-click **Group container** to add it to the **Label** pane.

*Display 3.54 Group Container*



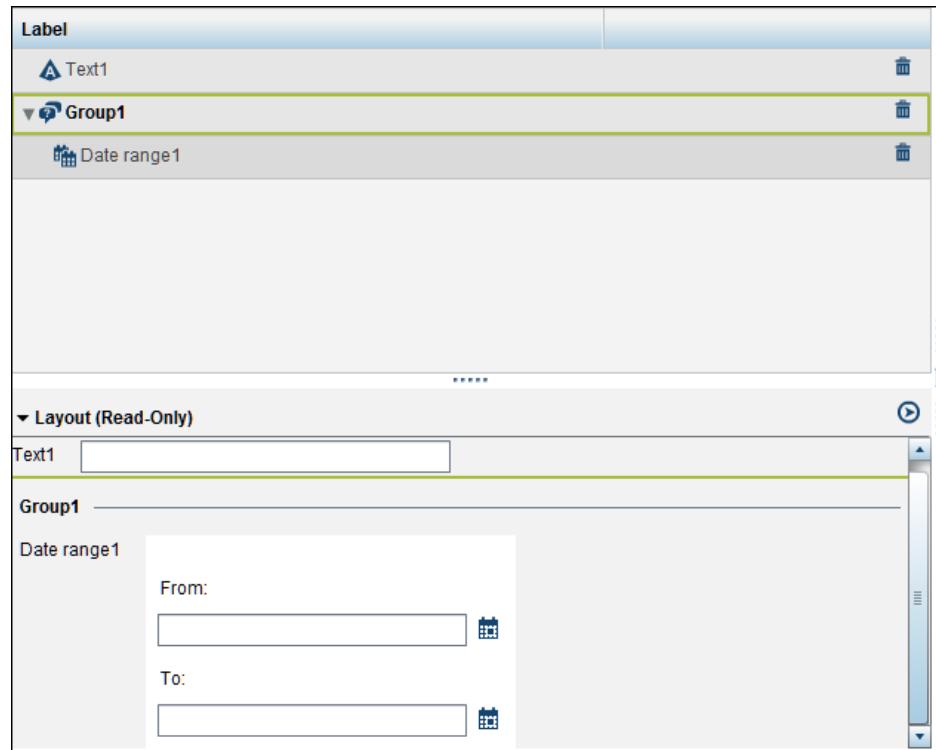
The screenshot shows the 'Group Container' interface. On the left, the 'Elements' pane lists controls under 'Data Controls' and 'Layout Controls'. The 'Group container' item is highlighted with a green background. On the right, the 'Label' pane shows a list of items: Text1 and Group1. The 'Group1' item is expanded, showing an empty list.

Select items from the **Elements** pane and drag them to a group.

### Preview Custom Details

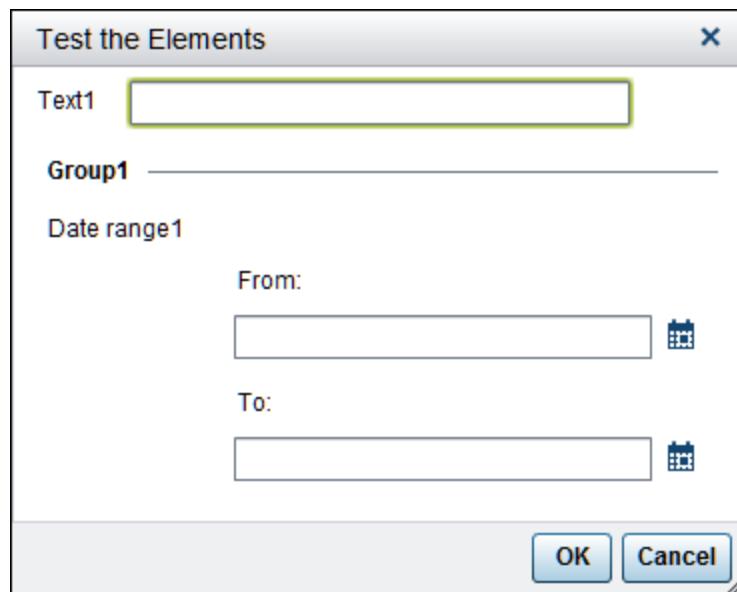
The Layout pane displays the custom details as they will appear on the Custom Details page.

*Display 3.55 Layout*



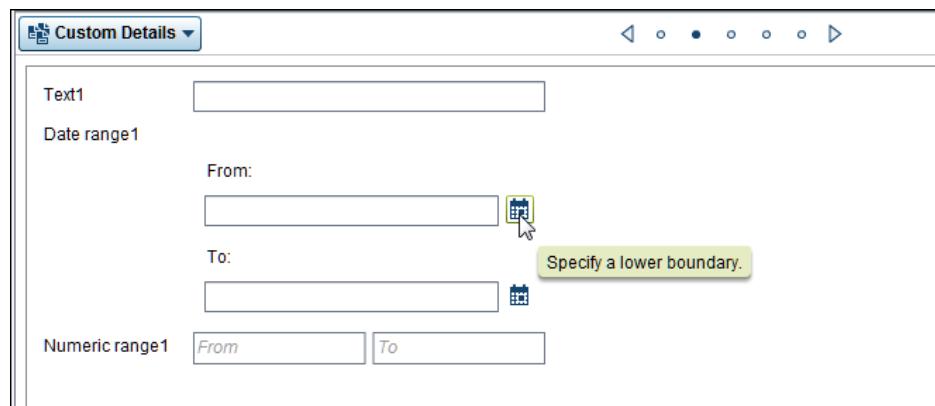
A red asterisk (\*) indicates that a field is required.

Click to open a Test the Elements window where you can test the custom details by interacting with them.

*Display 3.56 Test the Elements*

### **Set Default Values**

On the Custom Details page, you specify default values for the custom details that you have created.

*Display 3.57 Default Values*

Hyperlinks can link to websites or to files on local servers. Specify a link to a local server in one of the following ways:

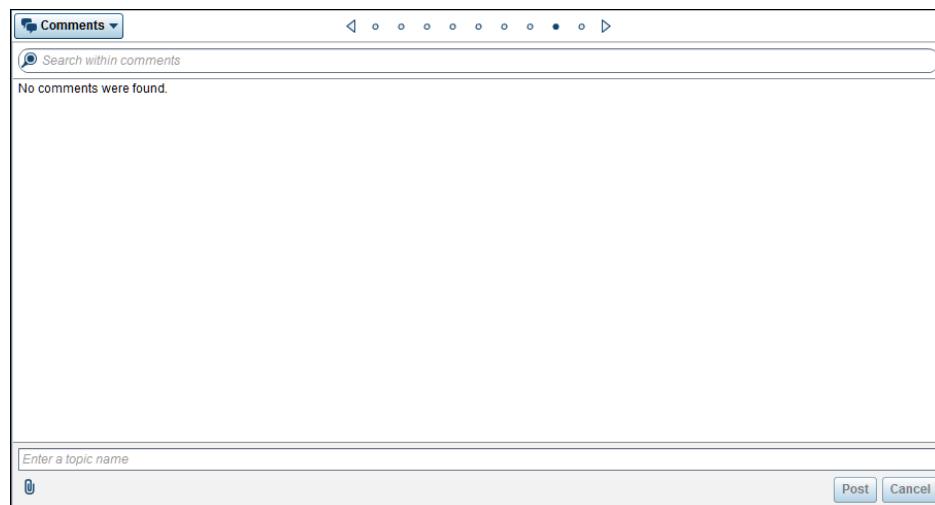
```
\server\path  
file:///server/path
```

**Note:** For security reasons, local links cannot be opened in the Chrome browser. Local links can be opened in the Firefox browser if you change the default configuration. See the Firefox help for more information.

## Add Comments

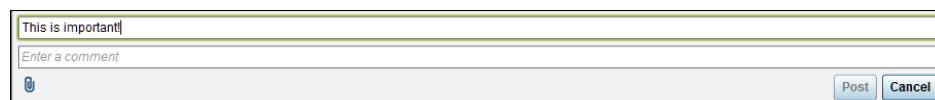
On the Comments page, you view and add comments. You add comments after saving.

**Figure 3.72** Comments



Enter a topic name to add a new comment.

**Figure 3.73** New Topic



Enter the text of the new comment.

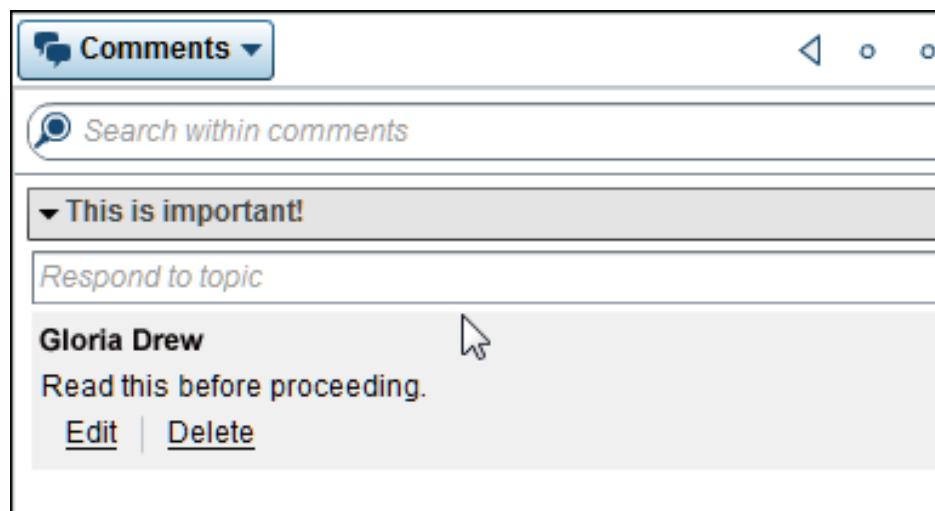
**Figure 3.74** Comment Text



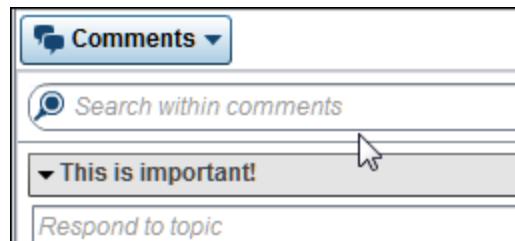
Click **Post** to post the comment. Your new comment is displayed on the Comments page. You can add comments even if you do not have Edit permission.

Click to add an attachment such as an image or a document.

To reply to an existing comment, type text in the field below the comment title.

**Figure 3.75** Comments List

Type in the search field to find text in comments.

**Figure 3.76** Search Comments

## Add Attachments

On the Attachments page, you view and add attachments such as images or documents.

**Figure 3.77** Attachments

Name	Added By	Date Added
Desert.jpg	Gloria Drew	Sep 26, 2014 03:33 PM

Click **+** to select a file to attach.

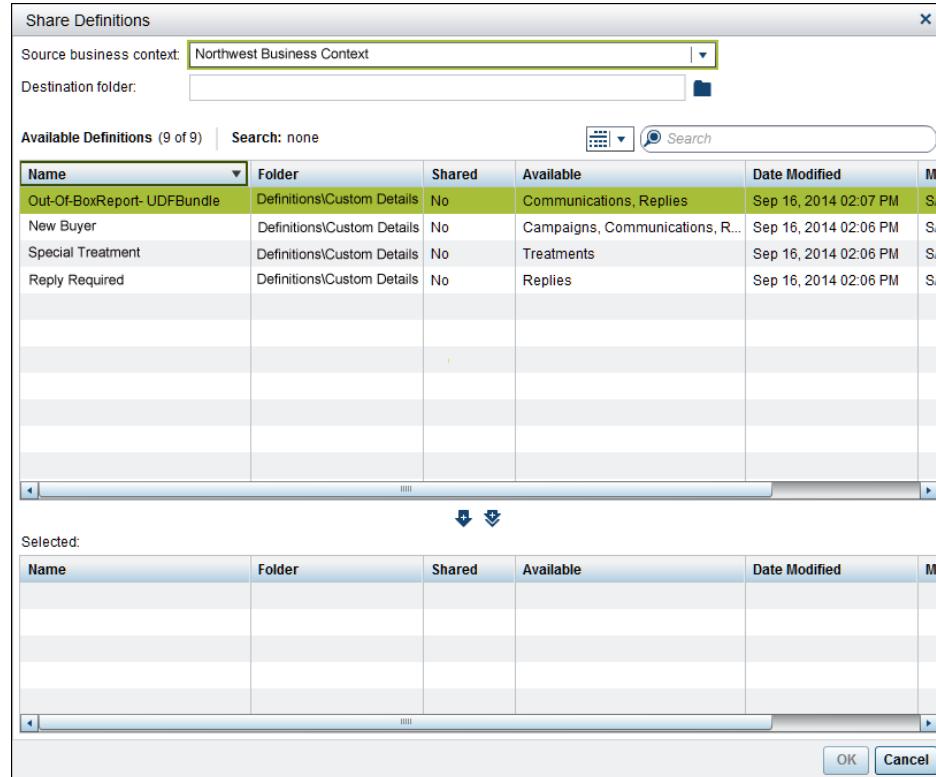
## Share a Custom Detail Group Definition across Business Contexts

A custom detail group definition can be used in more than one business context. For example, you might work in several business contexts. In this case, you could create one custom detail group definition that you can use in any business context that you have access to.

A shared definition is a reference to the initial definition. If you have the appropriate permissions, any changes that you make to the shared definition are saved to the initial definition.

To share a definition that was created in a different business context, click  and select **Share custom detail group definition**.

*Display 3.58 Share Definitions*

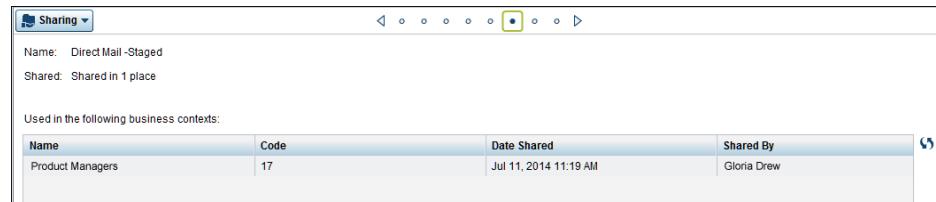


Select the **Source business context** that contains the custom detail group definitions that you want to share. Click  to select the storage location for the shared definition within the current business context. Select the definitions from the Available Definitions table and click the arrows to add them to the list of selected definitions.

If you delete a shared definition, it is deleted only from the current business context.

The Sharing page of the custom detail group definition lists other business contexts that share the definition.

*Figure 3.78 Sharing Page*



A number in a red badge indicates the business contexts that share this definition but that you do not have permission to view.

---

## Custom Detail Tags

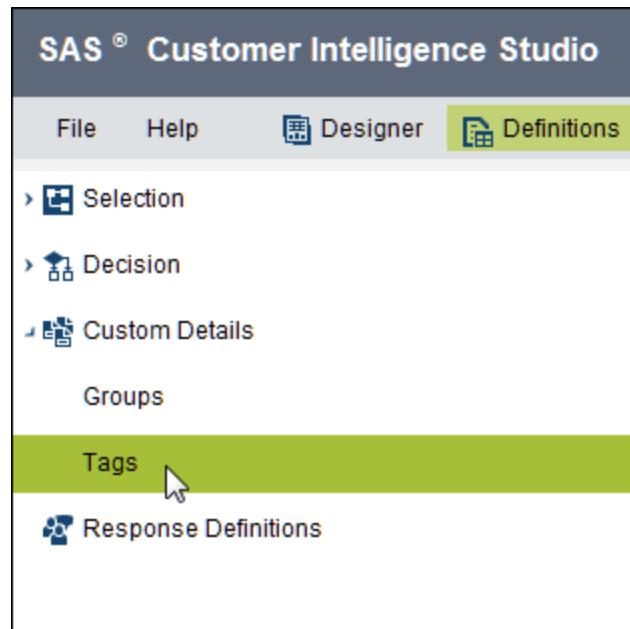
### Overview of Custom Detail Tags

A custom detail tag is a placeholder for a custom detail. You can select the tag for inclusion in the export file for a campaign. If the tag is selected in an export definition, a custom detail value that is referenced by that tag is written to the export file.

### Create a Custom Detail Tag

To create a custom detail tag, select **Tags** in the Definitions workspace.

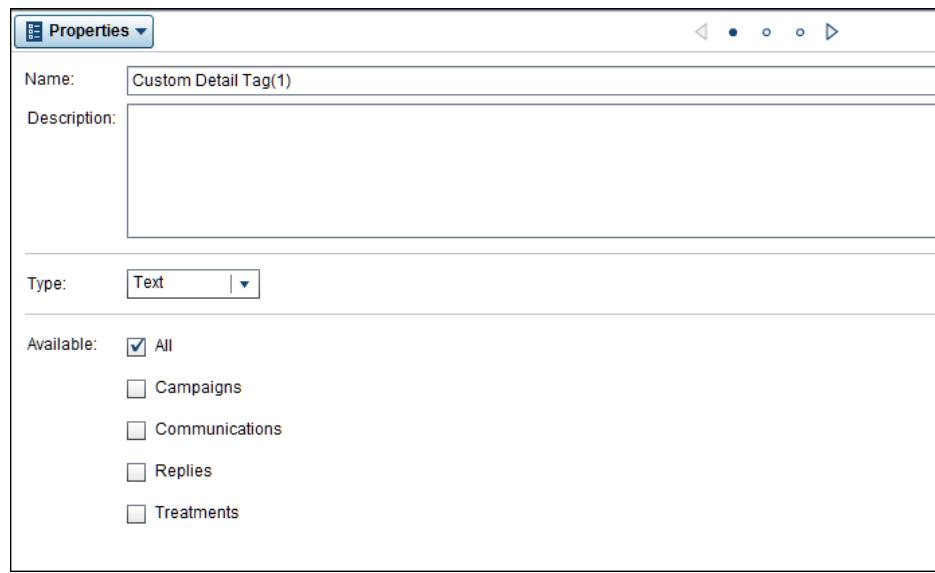
*Display 3.59 Tags*



Click to create the tag.

### Specify Custom Detail Tag Properties

The Properties page displays the name and other information about the custom detail tag.

**Display 3.60** Custom Detail Tag Properties

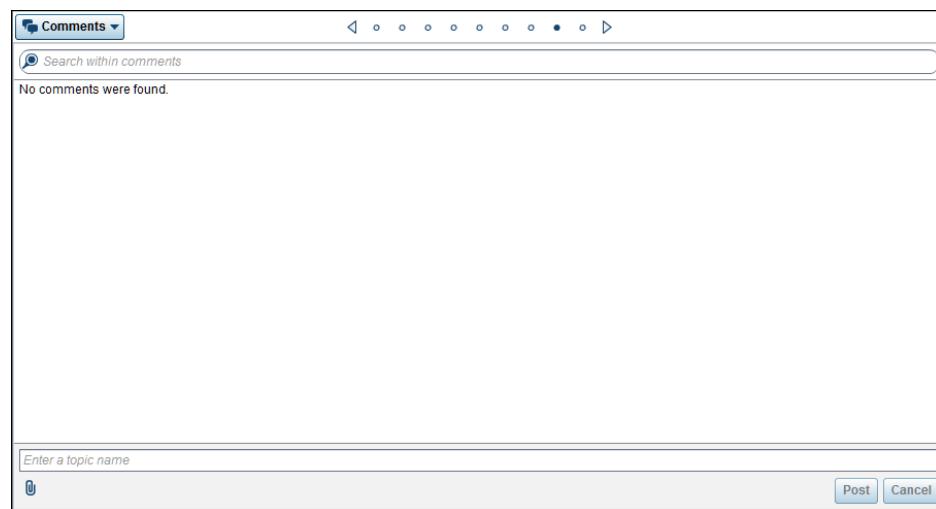
Select the type of tag from the **Type** list. You can select one of the following types:

- Text
- Numeric
- Date
- Boolean
- Hyperlink.

In the Available section, select the check boxes to make the tag available to campaigns, communications, or treatments. You must select at least one check box.

## Add Comments

On the Comments page, you view and add comments. You add comments after saving.

**Figure 3.79** Comments

Enter a topic name to add a new comment.

**Figure 3.80** New Topic

Enter the text of the new comment.

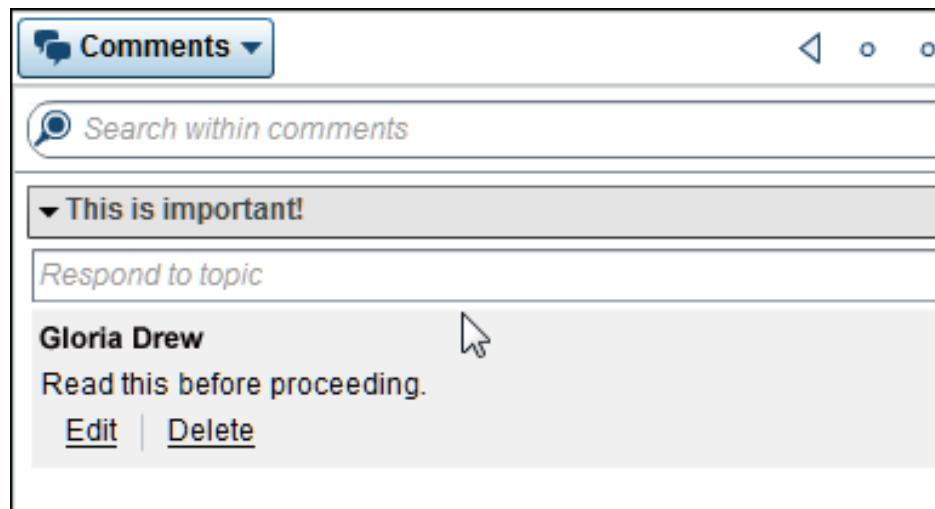
**Figure 3.81** Comment Text

Click **Post** to post the comment. Your new comment is displayed on the Comments page. You can add comments even if you do not have Edit permission.

Click to add an attachment such as an image or a document.

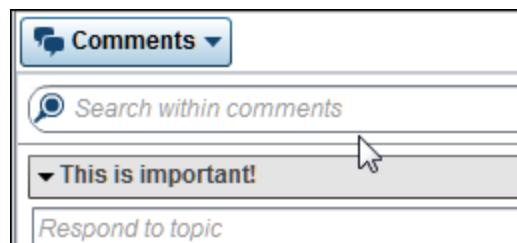
To reply to an existing comment, type text in the field below the comment title.

**Figure 3.82** Comments List



Type in the search field to find text in comments.

**Figure 3.83** Search Comments



## Add Attachments

On the Attachments page, you view and add attachments such as images or documents.

**Figure 3.84** Attachments

Name	Added By	Date Added	Actions
Desert.jpg	Gloria Drew	Sep 26, 2014 03:33 PM	

Click to select a file to attach.

---

## Responses

### Overview of Response Definitions

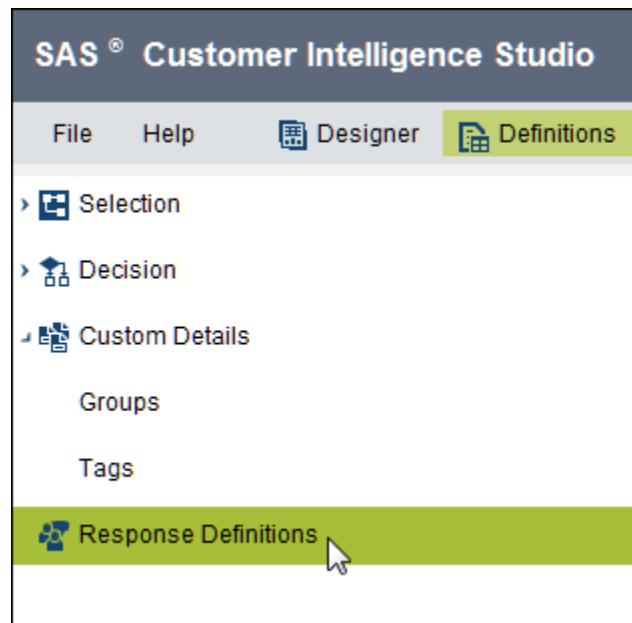
A response is the reaction that an individual has to a campaign, such as requesting a quote, making an inquiry, opening an email message, or buying the product.

Response nodes display the details for the responses that are associated with a communication. You specify the content of the Response nodes by creating response definitions.

### Create a Response Definition

To create a response definition, select the Response Definitions category in the Definitions workspace.

*Display 3.61 Response Definitions*

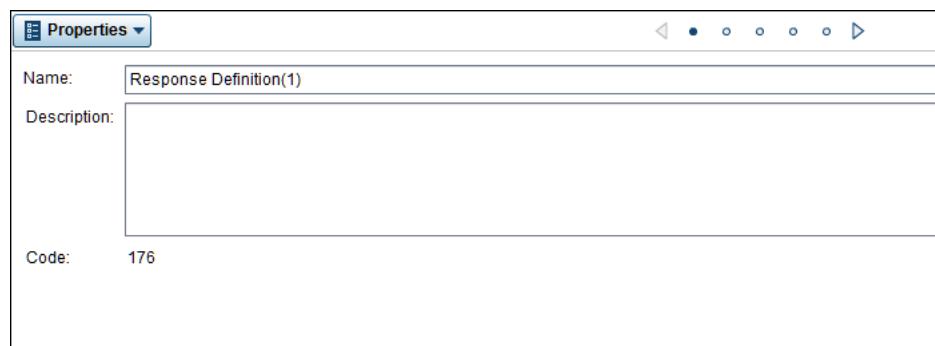


Click to create a response definition.

### Specify Response Definition Properties

The Properties page displays the name and description of the response definition.

Figure 3.85 Response Definition Properties



The response code is generated automatically and cannot be edited.

## Assign Communication Definitions to a Response

On the Assign to Definitions page, you assign the response to communication definitions. Then you are able to select from the assigned response definitions on the Responses page of the Communication node in a campaign.

Figure 3.86 Assign to Definitions

The screenshot shows a software interface titled 'Assign to Definitions'. It displays a table of communication definitions assigned to a response. A tooltip 'This response definition is being used in 84 definitions that are not in the current business contexts.' is shown over the table. The table has columns for Name, Folder, Date Modified, and Modified By. The data includes:

Name	Folder	Date Modified	Modified By
Account	Definitions	Jul 3, 2014 12:53 PM	Gloria Drew
Custom Communications	Definitions	Jul 3, 2014 12:53 PM	Henri LeBleu
Customer	Definitions	Jul 3, 2014 12:54 PM	Henri LeBleu
Household	Definitions	Jul 3, 2014 12:54 PM	Henri LeBleu
Insurance Client	Definitions	Jul 7, 2014 04:21 PM	Gloria Drew
Municipal	Definitions	Sep 22, 2014 08:28 AM	Gloria Drew

Click **+** to select one or more definitions to associate with the response.

## Assign Channels to a Response

On the Response Channel Codes page, you map channels to channel response codes. Response codes are used in reporting to track responses.

Figure 3.87 Response Channel Codes

The screenshot shows a software interface titled 'Response Channel Codes'. It displays a table for mapping response channels to channel response codes. The table has columns for 'Response Channel' and 'Channel Response Code'. The data includes:

Response Channel	Channel Response Code
Email	EO
Agent	
ATM	
Batch	
Calendar	
Call Center	

To map a channel to a channel response code:

- Click **+** to add a row to the table.
- Click the **Response Channel** cell and select a channel from the list.

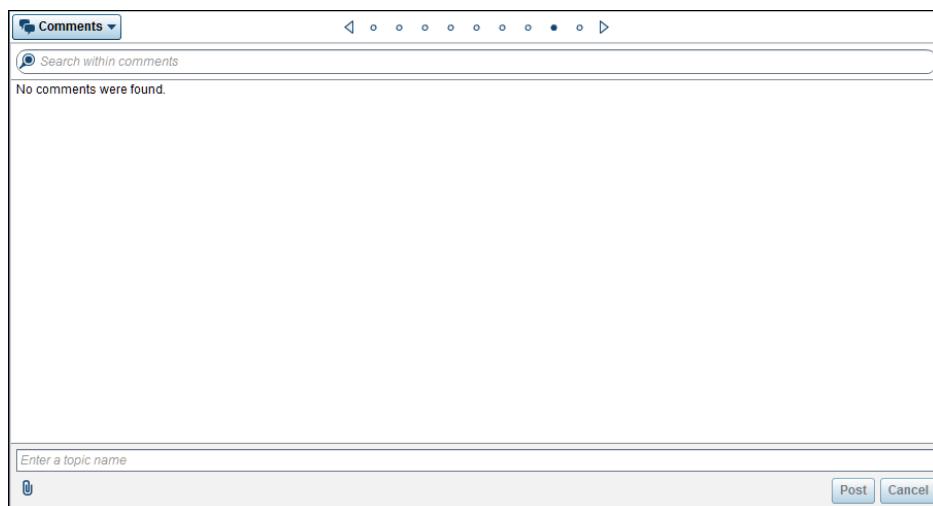
- Enter a code in the **Channel Response Code** cell. The code should be recognizable by the channel.

**Note:** Different channels cannot have the same response code. Each channel response code must be unique.

## Add Comments

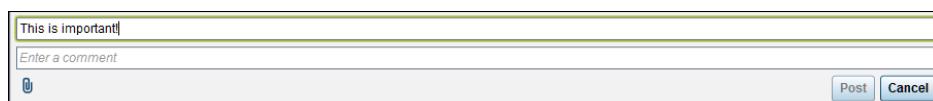
On the Comments page, you view and add comments. You add comments after saving.

*Figure 3.88 Comments*



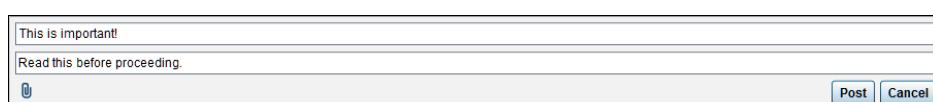
Enter a topic name to add a new comment.

*Figure 3.89 New Topic*



Enter the text of the new comment.

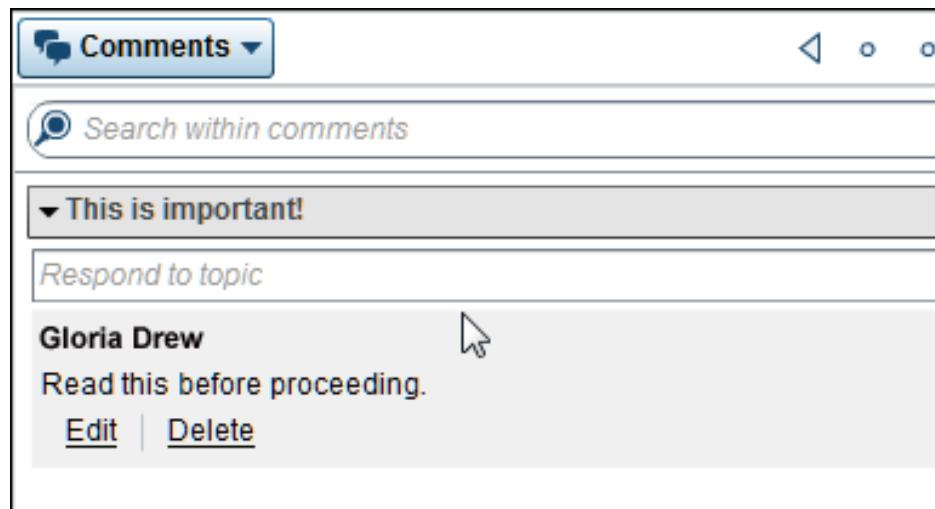
*Figure 3.90 Comment Text*



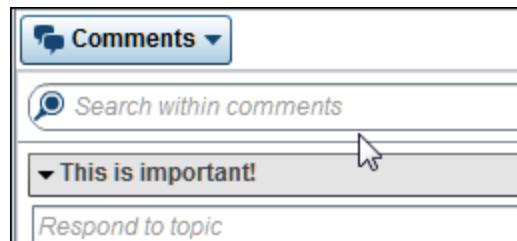
Click **Post** to post the comment. Your new comment is displayed on the Comments page. You can add comments even if you do not have Edit permission.

Click to add an attachment such as an image or a document.

To reply to an existing comment, type text in the field below the comment title.

**Figure 3.91** Comments List

Type in the search field to find text in comments.

**Figure 3.92** Search Comments

## Add Attachments

On the Attachments page, you view and add attachments such as images or documents.

**Figure 3.93** Attachments

Name	Added By	Date Added
Desert.jpg	Gloria Drew	Sep 26, 2014 03:33 PM

Click **+** to select a file to attach.

## Date and Time Values

Valid date and time values are dependent on the locale that has been set for your system.

Here are some examples of valid date values for the US locale:

- 1/22/16

- 1/22/2016
- 01/22/16
- January 22, 2016
- jan 22, 2016

Here are some examples of valid time values for the US locale:

- 9:30 am
- 9:30 AM
- 6:00 pm

To enter a date and time value, combine a date with a time. Here are some examples of combined date and time values:

- 1/22/16 9:30 am
- jan 22, 2016 9:30 AM

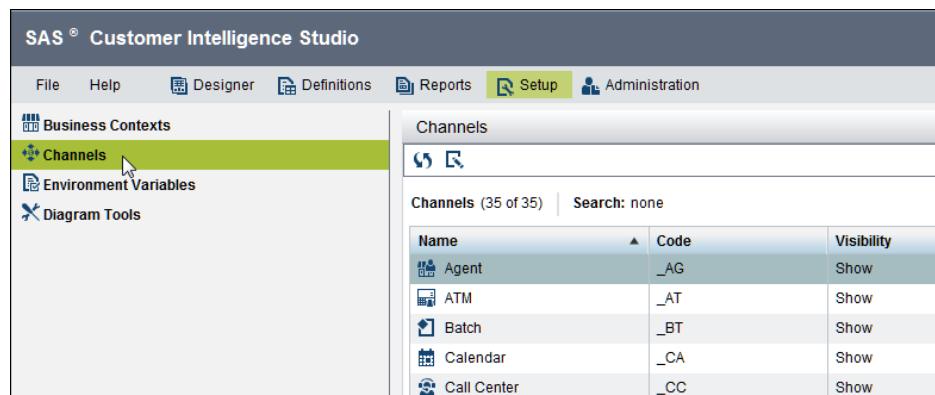
Military time values are not supported.

You cannot associate a particular time or time zone with a user-defined field of type Date. The Date value is automatically associated with midnight in the time zone of the PC where the date value is entered. For example, if you are in Chicago and you select February 15, 2016, then the datetime value that is stored is February 15, 2016 12:00 CST. This datetime is equivalent to February 15, 2016 6:00 GMT. If you are in Sydney and you select February 15, 2016, then the datetime value that is stored is February 15, 2016 12:00 EDT. This datetime is equivalent to February 14, 2016 13:00 GMT. The server's time zone during run time has no effect on the value that is assigned. This behavior might cause unexpected results when comparing date values from different time zones during run time.

## Show or Hide Channels

The available communication channels are listed in the Channels category of the Setup workspace.

*Display 3.62 Channels*



The screenshot shows the SAS® Customer Intelligence Studio interface. The top navigation bar includes File, Help, Designer, Definitions, Reports, Setup, and Administration. The left sidebar features Business Contexts, Channels (which is highlighted with a green background), Environment Variables, and Diagram Tools. The main content area is titled 'Channels' and displays a list of 35 channels. The table columns are Name, Code, and Visibility. The data is as follows:

Name	Code	Visibility
Agent	_AG	Show
ATM	_AT	Show
Batch	_BT	Show
Calendar	_CA	Show
Call Center	_CC	Show

All channels are visible by default. Right-click a channel row and select **Hide Channel** to hide a channel from view. Hidden channels cannot be selected in definitions.

## Diagram Tools

Diagram nodes are listed in the Diagram Tools category of the Setup workspace.

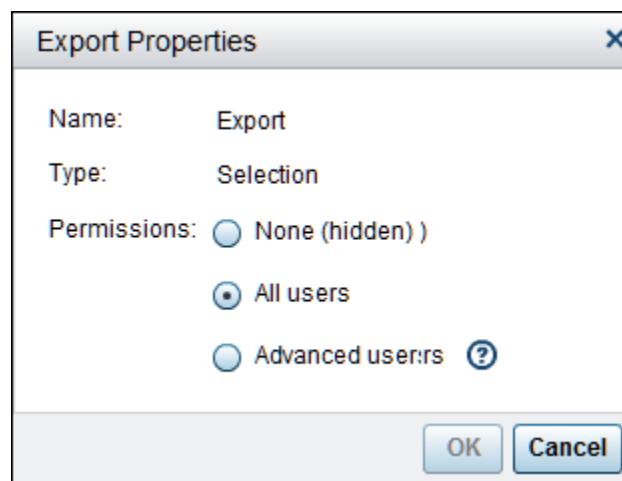
*Display 3.63 Diagram Tools*

The screenshot shows the SAS Customer Intelligence Studio interface. The top menu bar includes File, Help, Designer, Definitions, Reports, Setup, and Administration. The left sidebar has categories: Business Contexts, Channels, Environment Variables, and Diagram Tools, with Diagram Tools currently selected. The main pane displays a table titled "Diagram Tools (29 of 29) | Search: none". The table has columns for Name, Type, and Permissions. The data rows include:

Name	Type	Permissions
Export	Selection	All users
Prioritize	Selection	All users
And	Selection	All users
Link	Selection	All users
Or	Selection	All users
Report Link	Selection	All users
Split	Selection	All users
Cell	Selection	All users

Select a tool and click to display the properties of the tool.

*Display 3.64 Tool Properties*



### None

specifies that the tool is not displayed on the Diagram page of a campaign

### Advanced users

specifies that only advanced users can view the tool.

### All users

specifies that all users can view the tool. This is the default setting.

---

## Stored Processes

### Overview of Stored Processes

You can create SAS Marketing Automation stored processes in SAS Management Console and then use the processes in a Process node or a Custom node in SAS Customer Intelligence Studio.

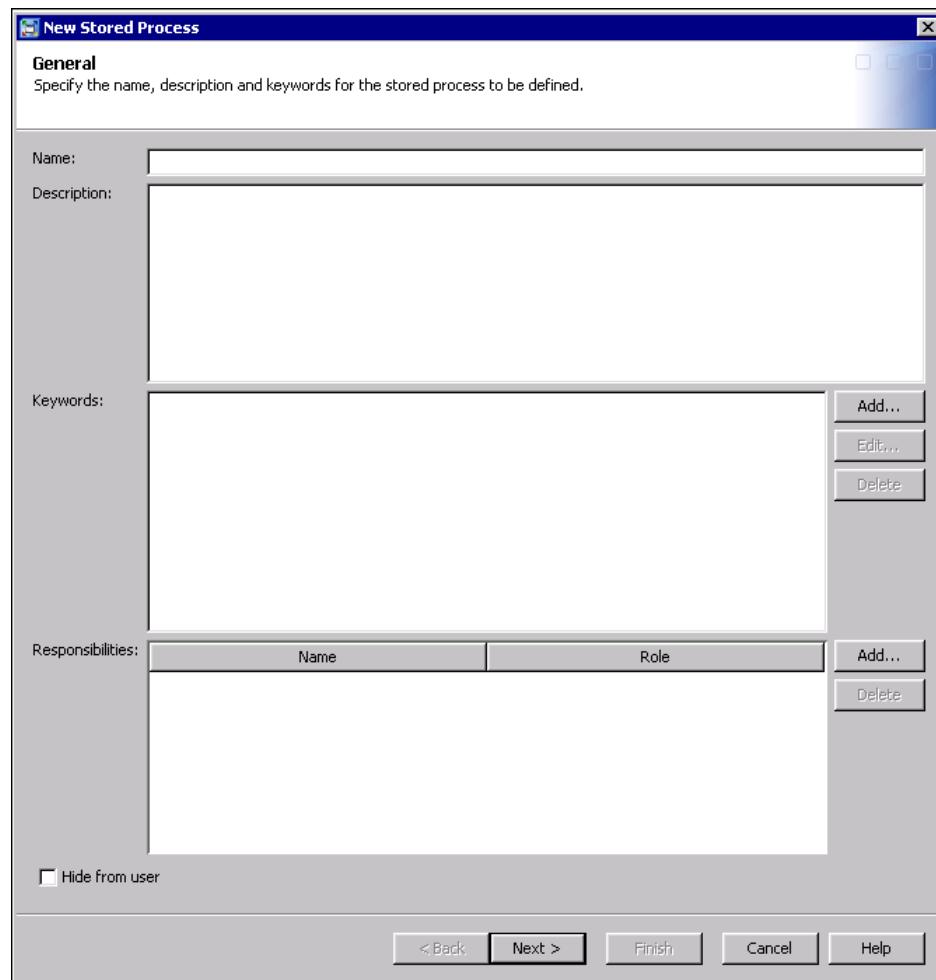
To create a stored process, select the **Folders** tab in SAS Management Console. Right-click the folder that contains the stored processes and select **New ▶ Stored Process**.

The following topics contain information that is specific to SAS Marketing Automation stored processes. For complete information about creating stored processes, click **Help** in the New Stored Process wizard.

### Specify Name and Keywords

On the General page of the New Stored Process wizard, specify the name and the keyword that makes the stored process available to SAS Customer Intelligence Studio.

Figure 3.94 New Stored Process Wizard



In order for the stored process to be selectable in SAS Customer Intelligence Studio, you must provide a keyword of MAUser. Click **Add** and enter **MAUser** in the Add Keyword dialog box.

**Note:** All stored processes that are created for use by SAS Customer Intelligence are stored in `/System/Applications/SAS Customer Intelligence/Customer Intelligence6.5/Stored Processes`. If you write your own stored processes, you should store them in a different folder (for example, `/Shared Data/My Stored Processes`). Any user-written stored processes that are in the `/System/Applications/SAS Customer Intelligence/Customer Intelligence6.5/Stored Processes` folder are lost when SAS Customer Intelligence studio is upgraded to the next version.

You can also use the following keywords to specify input subjects, output subjects, and the number of output cells that are generated from the stored process. The input and output subjects can be selected from the node properties window in SAS Customer Intelligence Studio. Keywords are not case-sensitive.

#### InSubjectID=<subject>

specifies the input subject that the stored process is available for. A separate InSubjectID keyword must be specified for every input subject that is supported by the process. If a stored process should be available for all input subjects, you do not need to specify the InSubjectID keyword.

**OutSubjectID=<subject>**

specifies the output subject that the stored process produces data for. A separate OutSubjectID keyword must be specified for every output subject that is supported by the process. If a stored process is to be available for all output subjects, you do not need to specify the OutSubjectID keyword.

Here is an example of creating a stored process with InSubjectID and OutSubjectID keywords:

```
MAUser
InSubjectID=Customer
OutSubjectID=Household
OutSubjectID=Customer
```

**MaxCells=<number>**

specifies the maximum number of output cells that are generated when the stored process is run. If the **MaxCells** value is specified, and **MinCells** and **NumberofCells** values are not specified, the minimum number of rows is 1.

**MinCells=<number>**

specifies the minimum number of output cells that are generated when the stored process is run. If only the **MinCells** value is specified, the maximum number of rows is unlimited.

**NumberOfCells=<number>**

specifies the default number of output cells that are generated when the stored process is run. If more than one **NumberOfCells** keyword is specified, the last value is used.

Click **Add** to specify the owner or the administrator of the keyword. Click **Next** to continue.

## Examples: Input Subjects and Output Subjects

Your selection of input subjects and output subjects for a stored process affects how the Process node can be used in SAS Customer Intelligence Studio. It is important to keep these implications in mind when you create a stored process. The following examples of Process node behavior illustrate the effects of specifying input and output subjects.

### Upstream Connections

When an upstream node that has a defined subject is linked to a newly created Process node, the input subject is the same as the subject of the upstream node.

If a stored process is chosen, and the input subject for the stored process is a subject other than that of the upstream node, the link breaks. The link does not break if the input subject is the same as the input subject for the upstream node, or if the input subject is defined as **Any**, or if the input subject is defined as **Many** and one of these subjects is same as the subject of the upstream node.

If the stored process contains a list of subjects, then the subject of the upstream node is selected by default. Only nodes that have same subject as the selected subject can be connected to or from the Process node.

### InSubjectID=None, OutSubjectID=None

When **InSubjectID=None** and **OutSubjectID=None** are specified for a stored process, the **From subject** list for the Process node contains all

possible input subjects for the current business context. The **To subject** field is synchronized with the selected input subject.

Only nodes that have same subject as the selected subject can be connected to or from the Process node.

**InSubjectID=None, OutSubjectID=One/List**

This is not a valid combination. When **InSubjectID=None** and **OutSubjectID=One** or **OutSubjectID>List** are specified for a stored process, SAS Customer Intelligence Studio corrects the specification and allocates the output subjects to the list of input subjects.

Only nodes that have same subject as the selected subject can be connected to or from the Process node.

**InSubjectID=One, OutSubjectID=None**

When **InSubjectID=One** and **OutSubjectID=None** are specified for a stored process, the **From subject** field in the Process node displays the selected subject. The **To subject** field is synchronized with the selected input subject.

Only nodes that have same subject as the selected subject can be connected to or from the Process node.

**InSubjectID=One, OutSubjectID=One**

When **InSubjectID=One** and **OutSubjectID=One** are specified for a stored process, the **From subject** and **To subject** fields in the Process node display the selected input and output subjects.

Only nodes that have the same subject as the subject that is specified by **InSubjectID** can be connected upstream from the Process node. Only nodes that have the same subject as the subject that is specified by **OutSubjectID** can be connected downstream from the Process node.

**InSubjectID=One, OutSubjectID=List**

When **InSubjectID=One** and **OutSubjectID=List** are specified for a stored process, the **From subject** field in the Process node contains the subject that is specified by **InSubjectID**. The **To subject** field displays a drop-down list.

Only nodes that have the same subject as the subject that is specified by **InSubjectID** can be connected upstream from the Process node. Only nodes that have the subject that is selected from the **To subject** list can be connected downstream from the Process node.

**InSubjectID=List, OutSubjectID=None**

When **InSubjectID=List** and **OutSubjectID=None** are specified for a stored process, the **From subject** field in the Process node displays a drop-down list of the subjects that are specified by **InSubjectID**. The **To subject** field is synchronized with the selected input subject.

Only nodes that have same subject as the selected subject can be connected to or from the Process node.

**InSubjectID=List, OutSubjectID=One**

When **InSubjectID=List** and **OutSubjectID=One** are specified for a stored process, the **From subject** field in the Process node displays a drop-down list of the subjects that are specified by **InSubjectID**. The **To subject** field displays the subject that is specified by **OutSubjectID**.

Only nodes that have the same subject as the subject that is selected from the **From subject** list can be connected upstream from the Process node.

Only nodes that have the subject that is displayed in the **To subject** field can be connected downstream from the Process node.

**InSubjectID=List, OutSubjectID=List**

When **InSubjectID=List** and **OutSubjectID=List** are specified for a stored process, the **From subject** field in the Process node displays a drop-down list of the subjects that are specified by **InSubjectID**. The **To subject** field displays a drop-down list of the subjects that are specified by **OutSubjectID**.

Only nodes that have the same subject as the subject that is selected from the **From subject** list can be connected upstream from the Process node.

Only nodes that have the same subject as the subject that is selected from the **To subject** list can be connected downstream from the Process node.

## Specify Prompts and Parameters

On the Parameters page of the New Stored Process wizard, you can specify the parameters and prompts, including cascading prompts, that the new stored process requires. Cascading prompts present the user with a choice, and then display another prompt that depends on the choice that the user has made. For example, the user might select a state and then a city within that state. The prompts are displayed in SAS Customer Intelligence Studio.

The following prompt types are not supported by SAS Marketing Automation:

- Data source
- Data source item
- File or directory
- OLAP member
- Data library

You can provide a parameter that is a list of possible values. Users can make multiple selections from the list. If the parameter list is configured to allow only one option, then that option is presented to the stored process in a macro variable. The macro variable is defined when you register the stored process. If there is a macro variable that is named `&tablenames`, and only one selection is allowed, `&tablenames` contains the selection. If users can make more than one selection from the parameter list, each selection is available to the stored process macro using the defined macro variable name that is appended with an ascending number (for example, `&tablenames1`, `&tablenames2`, and `&tablenames3`). `&tablenames` holds only the first selection.

## Define Streams

You can gather additional information in a stored process by defining streams on the **Data** tab of the stored process Properties window. You refer to the stream by using the following code in the stored process:

```
%maspinits(xmlstream=(streamname streamname));
```

`streamname` is the name of the stream that you have defined on the **Data** tab. All streams must be defined as rewritable.

You can define the following stream names:

**MacroVar**

creates a table that is named MACROVAR that contains the data that is generated by the MATableForMacro macro variable. For more information, see [Appendix 3, “The MACROVAR Table,” on page 365](#).

**Neighbor**

creates tables that are named INPUTNODES and OUTPUTNODES. These tables contain data about the nodes that are adjacent to the Process node.

For more information about defining streams, see [SAS Stored Process Developer’s Guide](#).

---

## Rules for Names

The names for campaigns, treatments, and other items in SAS Customer Intelligence Studio must follow certain rules. The length of a name must be between 1 and 60 characters. Names cannot include leading or trailing blank spaces, forward slash (/) characters, backslash (\) characters, or any control characters.

Node names cannot exceed 255 characters.

There are no restrictions on the names for calculated items.

# 4

## Designing Campaigns

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## Optimizing Campaigns

### Optimizing Campaigns in SAS Marketing Automation

In SAS Marketing Automation, you can optimize campaigns based on priorities and customer rankings.

You optimize campaigns with SAS Marketing Automation in the following sequence.

- 1 In SAS Marketing Automation, a campaign group is created from a campaign group definition in which **Add ability to optimize campaign group** is selected. For more information, see “[Specify Campaign Group Definition Properties](#)” on page 70.
- 2 Campaigns are created from a campaign definition in which **Add ability to include campaign in optimization group** is selected. For more information, see “[Specify Campaign Definition Properties](#)” on page 52.
- 3 Optimization settings are specified for the campaigns. For more information, see “[Specify Optimization Settings](#)” on page 185.
- 4 The campaigns are added to the campaign group. For more information, see “[Add Campaigns to a Campaign Group](#)” on page 194.
- 5 Optimization settings are specified for the campaign group. Optimization settings for member campaigns can be edited. For more information, see “[Specify Optimization Settings](#)” on page 200.
- 6 The campaign group is optimized. For more information, see “[Set the Schedule for an Optimization Campaign Group](#)” on page 334.

## Optimizing Campaigns in SAS Marketing Automation and SAS Marketing Optimization

If SAS Marketing Optimization is installed at your site, you can use SAS Marketing Optimization to optimize campaigns. In SAS Marketing Automation, you can set the scores and other values in an individual campaign and then collect campaigns into a campaign group. When you have designated a campaign group for optimization in SAS Marketing Automation, you can generate optimization data and optimize scenarios in SAS Marketing Optimization. You can set a preferred scenario whose results are promoted to SAS Marketing Automation and then published.

You optimize campaigns with SAS Marketing Automation and SAS Marketing Optimization in the following sequence.

- 1 In SAS Marketing Automation, a campaign group is created from a campaign group definition in which **Add ability to optimize campaign group** is selected. For more information, see “[Specify Campaign Group Definition Properties](#)” on page 70.
- 2 Selection campaigns are created from a campaign definition in which **Add ability to include campaign in optimization group** is selected. For more information, see “[Specify Campaign Definition Properties](#)” on page 52.
- 3 Optimization settings are specified for the campaigns. For more information, see “[Specify Optimization Settings](#)” on page 185.
- 4 The campaigns are added to the campaign group. For more information, see “[Add Campaigns to a Campaign Group](#)” on page 194.
- 5 Optimization settings are specified for the campaign group. Optimization settings for member campaigns can be edited. For more information, see “[Specify Optimization Settings](#)” on page 200.
- 6 Optimization data is generated from SAS Marketing Automation.
- 7 In SAS Marketing Optimization, a scenario or several scenarios are created, using optimization data. The creation of a scenario can be launched from SAS Marketing Automation.
- 8 After optimizing several test scenarios in SAS Marketing Optimization, and determining the best scenario to be used for optimization, a scenario is assigned to the optimization group as the preferred scenario. The scenario is marked as preferred in the campaign group in SAS Marketing Automation.
- 9 In SAS Marketing Automation, the campaign group is either optimized or executed. The group is optimized by clicking **Optimize Now** if the user wants to test the integration without exporting or publishing. The group can be executed in order to produce export files.
- 10 When optimization begins, SAS Marketing Automation creates new input data tables from the data in the current campaigns and campaign group. SAS Marketing Optimization validates the generated optimization data. Next, in SAS Marketing Optimization, the preferred scenario is optimized and promoted to SAS Marketing Automation. During promotion, the optimized counts are sent to SAS Marketing Automation.

**11** In SAS Marketing Automation, the campaign group is executed with the optimized result. For more information, see “[Set the Schedule for an Optimization Campaign Group](#)” on page 334.

**Note:** Do not include household-level subjects when you optimize campaigns with SAS Marketing Optimization. Subjects with more than one row per subject ID cannot be processed.

---

## Creating Campaigns

### Overview of Creating Campaigns

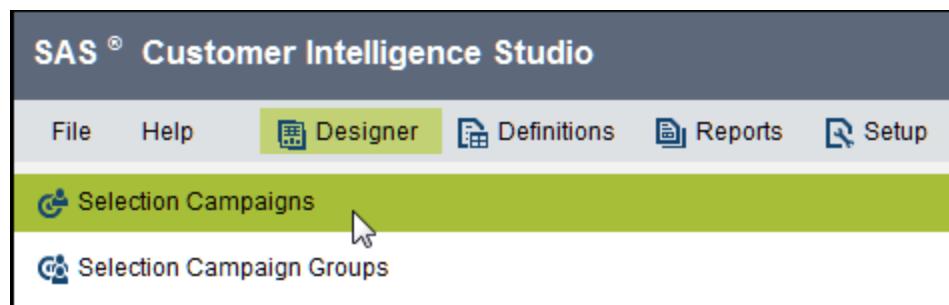
You use SAS Customer Intelligence Studio to create campaigns that direct communications to a selected group of customers.

After you create a campaign, you use the diagram and nodes to select groups of customers to target and to define communication channels.

### Create a Campaign

To create a campaign, select **Selection Campaigns** in the Designer workspace.

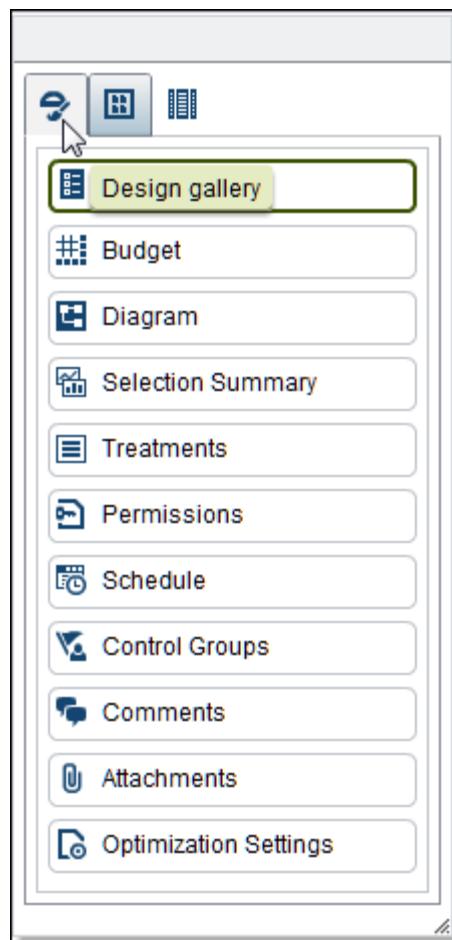
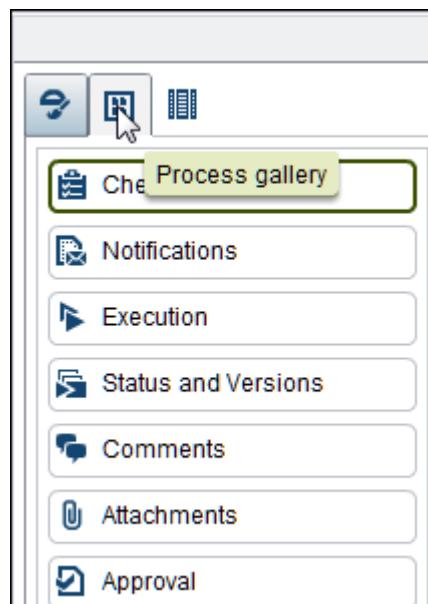
*Display 4.1 Selection Campaigns*



Click and select a campaign definition.

### Campaign Galleries

Depending on the campaign definition, a campaign might have a Design gallery and a Process gallery. The campaign definition settings determine the pages that are displayed with each gallery.

*Display 4.2 Example of Design Gallery Pages**Display 4.3 Example of Process Gallery Pages*

Click  to edit the display order of the pages, and to show or hide pages from view.

If you are an approver of the campaign, you can view both the Editor and Approver galleries. Select **Editor** to edit the campaign. Select **Approver** to approve the campaign.

For more information on the Page Manager, see “[Selecting Pages](#)” on page 21.

## Specify Campaign Properties

### Overview of Campaign Properties

The Properties page displays information about the campaign.

*Display 4.4 Properties Page*



### Campaign Code

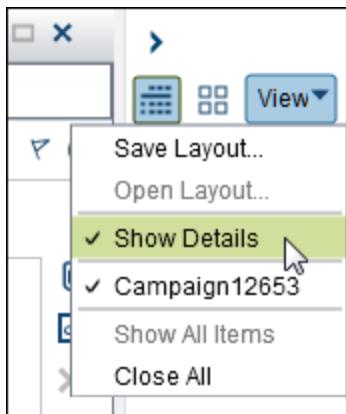
The campaign code is created either automatically or manually, and the code is editable, depending on the campaign definition. The campaign code cannot be longer than 30 characters.

### Select a Campaign Image

Click  and select an image from your system to identify the campaign. To use an image that has a URL, click  and provide the URL for the image. Click  to restore the default image.

To display the image in the minimized view of the campaign, select **View ▶ Show details**.

Display 4.5 Show Details



### Hide Campaign from Display

Select **Hidden** to hide the campaign from display in the category list. For more information, see “[Hide Items from Display](#)” on page 10. If you use **Save as** to save a copy of the campaign, the **Hidden** attribute is turned off in the saved copy.

### Specify Diagram Properties

In the Diagram Properties section, select **Use the most current data when referenced by a link** to display the most recent data. This applies to a campaign that contains a source cell that is referenced by a Link node. The data is refreshed when the campaign is executed. The data for static report links is not refreshed. The counts might vary between the current campaign and the campaign that contains the Link node. The campaign that contains the Link node is updated only when that campaign is opened.

**Note:** The counts are not updated again if the campaign is executed more than one time in the same user session, even if the underlying data has changed.

Select **Use the most current data when executing communications** to clear the counts for all of the upstream nodes before the execution of a single communication.

Select **Produce counts for all nodes when executing** to control whether to improve execution performance by combining the SQL queries for multiple nodes into one query, when possible. This option does not apply to optimization.

In some cases you want to display the most current data when you execute a campaign. In other cases, it is not necessary to have the most current data. You can save processor time by clearing the check box for an option. For example, you might have a target campaign whose cell node is linked to by Link nodes in several separate campaigns. The underlying data is updated once per night. All of the campaigns are executed on the same nightly schedule. You would need to execute the campaign only once per night, rather than every time a related campaign is executed. In this case, you would clear the **Use the most current data when referenced by a link** option. You would then schedule one execution of the campaigns, clearing all of the counts, followed by executions of the related campaigns.

**Note:** In a campaign group that contains campaigns that are related by Link nodes, counts might vary after execution. For example, suppose that campaign

that is a link target does not have **Use the most current data when referenced by a link selected**. If a campaign containing the Link node that links to the target campaign is executed before the target campaign, the Link node uses the existing tables from the target campaign. When the target campaign is executed, new counts might be produced that are different from the counts in the campaign that contains the Link node.

If you are in the process of designing a campaign and experimenting with different scenarios, you probably do not require the most current data. Clear the **Use the most current data when executing communications** option. This action minimizes interruptions that are the result of the recomputation of tables that already exist. This option applies only to the execution of a single communication or to an occurrence of a communication. In multi-stage campaigns, this option re-executes only the nodes that are as far upstream as the closest ancestor Communication node.

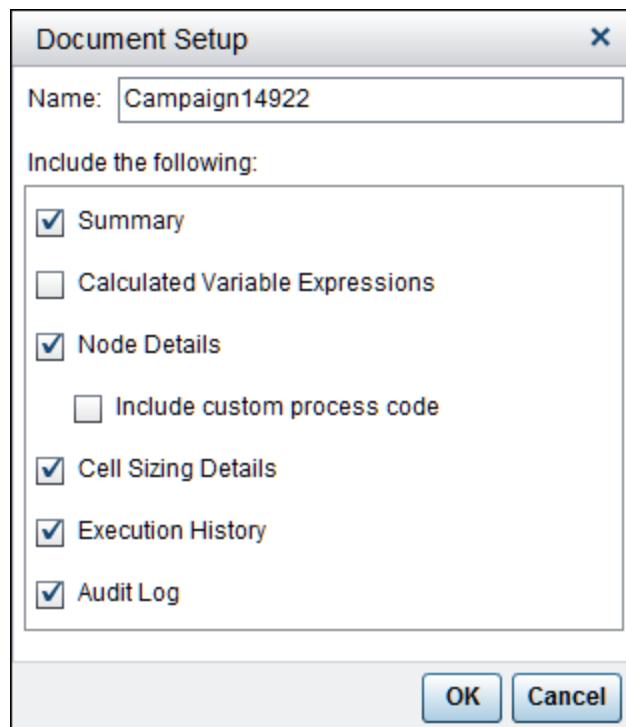
If the **Produce counts for all nodes when executing** check box is selected, more SQL statements are executed. There is a longer run time. If your campaign has valid data, you can use counts that have already been generated. You might have finished designing a campaign that has valid counts for all of the nodes that are upstream from a Communication node. If you execute the communication in production mode, you can achieve faster results by clearing the **Produce counts for all nodes when executing** option. You can then use the counts that have already been computed. For example, there might be two Select nodes that are connected to an And node. The **Produce counts for all nodes when executing** check box is cleared. In this case, a single SQL statement is issued, and the count is displayed only for the And node. This setting does not apply to optimization campaigns.

Select **Do not publish this campaign if it does not contain a Communication node** to prevent the campaign from being published if there are no Communication nodes in the diagram. If the campaign has been published before, previously published data is not removed from the common data model.

### Generate a Diagram Document for Each Execution

You might want to verify the content of a campaign that has executed successfully. You might also want to maintain an audit trail of campaign execution documentation.

You can generate a diagram document every time the campaign is executed. Select **Create and attach a summary document with each execution**. Click **Document setup** to select the items to be included in the diagram document.

*Display 4.6 Create Diagram Document*

A diagram document is generated only if the campaign executes successfully. The generated documents are listed on the Attachments page of the campaign. Images are not included in the diagram document. All cells are included in cell sizing details. The attachment has the same name each time it is generated. A timestamp indicates when each generated document was attached to the campaign.

## Set the Budget

On the Budget page, you set budget values.

*Display 4.7 Budget*

### Offers

enables you to specify the minimum and maximum number of offers that can be made for a campaign.

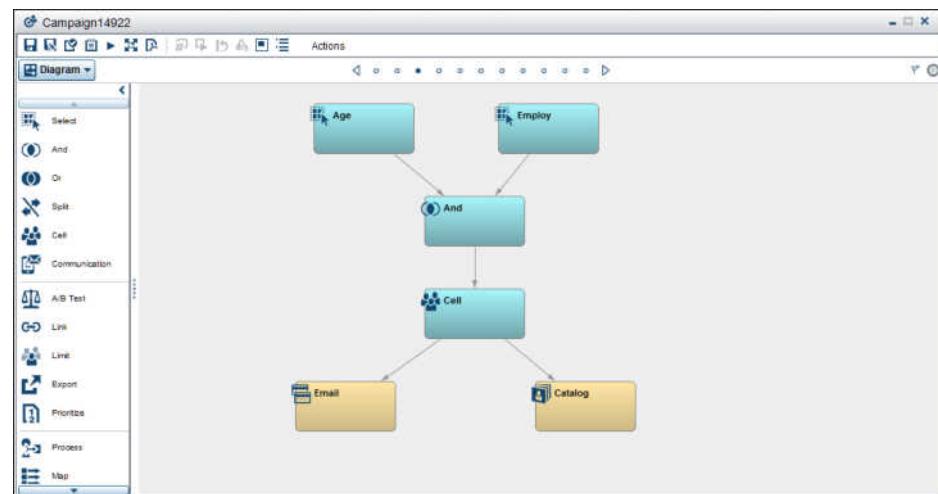
### Budget

enables you to specify the minimum and maximum budget for all of the offers in this campaign.

## Create a Diagram

A diagram consists of linked nodes that you use to create groups of customers for inclusion in campaigns and for planning the communications that are sent during a campaign. Select the Diagram page to create a diagram.

*Display 4.8 Diagram*



To add a node to the diagram, click the node, or drag the node onto the diagram.

Follow these steps to connect a node to another node or to a node group.

- 1 Position the pointer over the outer section of the first node. The pointer changes to a pencil.

*Display 4.9 Connect a Node*



- 2 Select and hold down the left mouse button. Then, drag the pointer to the second node.

To move a node, follow these steps:

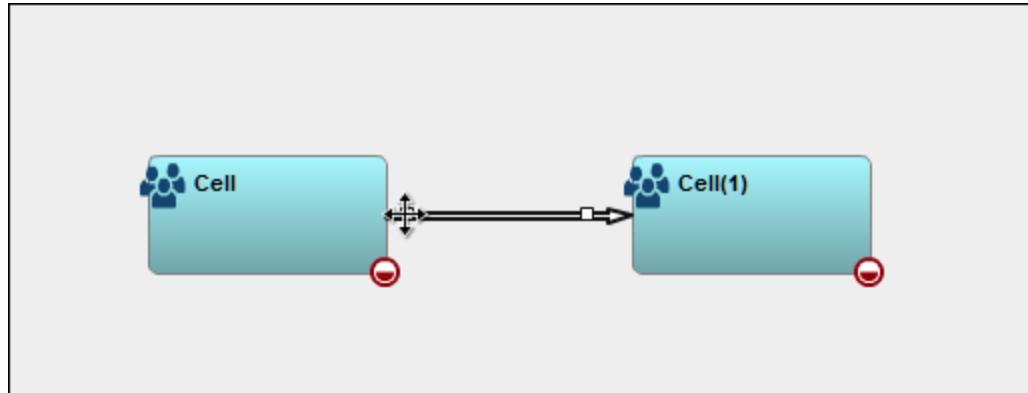
- 1 Place the pointer over the inner section of a node, wait until the pointer becomes a cross, and hold the left mouse button down to select the node.

*Display 4.10 Move a Node*



- 2** Drag the node icon to a new location.

**Figure 4.1** Move a Link



Note: You cannot move a link to or from a collapsed node group.

To move a link from one node to another, follow these steps:

- 1 Select the link to highlight it.
  - 2 Place the pointer over the end of a link and wait until the pointer becomes a cross.
  - 3 Drag the link to the new location.

For information on the nodes, see [Chapter 5, “Creating Nodes,”](#) on page 237.

## **View Summary Information about Cells, Packages, and Channels**

The Selection Summary page displays information about marketing cells, packages, and channels. The **Cell Summary** tab lists counts for marketing cells.

#### **Display 4.11 Selection Summary, Non-optimization Campaign**

**Display 4.12 Selection Summary, Cell- Level Optimization Campaign**

The screenshot shows the 'Selection Summary' window with the 'Cell Summary' tab selected. It displays three marketing cells: 'challenger1', 'challenger2', and 'Champion'. The 'challenger1' row has 'challenger1' in the Name column, 'challenger1' in the Cell Code column, '222' in the Unoptimized Cell Count column, and 'Sep 4, 2015 03:54 PM Print Ad.' in the Last Run Date and Channels columns. The 'challenger2' row has 'challenger2' in the Name column, 'challenger2' in the Cell Code column, '44' in the Unoptimized Cell Count column, and 'Sep 4, 2015 03:54 PM Print Ad.' in the Last Run Date and Channels columns. The 'Champion' row has 'Champion' in the Name column, 'champion' in the Cell Code column, '22' in the Unoptimized Cell Count column, and 'Sep 4, 2015 03:54 PM Print Ad.' in the Last Run Date and Channels columns. Below the table, the 'Cell Details' tab is selected, showing details for 'challenger1': Name: challenger1, Description: Challenger, Subject: Customer, Communications: Communication.

If a campaign is a member of a campaign group that optimizes treatments, the **Treatment Summary** tab displays the counts for each treatment. This tab cannot be edited. For more information, see “[Specify Campaign Group Definition Properties](#)” on page 70.

**Figure 4.2 Treatment Summary Tab**

The screenshot shows the 'Treatment Summary' window with the 'Cell Summary' tab selected. It displays one treatment: 'Optimization Campaign One'. The 'Optimization Campaign One' row has 'Optimization Campaign One' in the Name column, 'CAMP14652' in the Code column, and 'Unoptimized Count' and 'Optimized Count' both empty. To the right of the table, there is a 'Percentage Dropped' column header and a set of icons for filtering and sorting.

On the **Cell Summary** tab, the **Cell Details** tab displays information about the selected cell.

The **Linked Cells** tab displays information about cells that are linked to a Link node that acts as a marketing cell.

**Display 4.13 Linked Cells**

The screenshot shows the 'Cell Details' tab with the 'Linked Cells' tab selected. It displays one link: 'Link to Female(9)'. The 'Link to Female(9)' row has 'Link to Female(9)' in the Link Name column, 'Female(9)' in the Source Cell column, 'Split1010ToSplit1019' in the Source Campaign column, and 'Included' in the Included/Excluded column.

The **Linked Reports** tab displays information about reports that are linked to Report Link node that acts as a marketing cell.

**Display 4.14 Linked Reports**

The screenshot shows the 'Cell Details' tab with the 'Linked Reports' tab selected. It displays one report link: 'Link to RLSCMC002\_DynamicReportExport'. The 'Link to RLSCMC002\_DynamicReportExport' row has 'Link to RLSCMC002\_DynamicReportExport' in the Report Link Name column, 'RLSCMC002\_DynamicReportExport' in the Report Export column, and 'Included' in the Included/Excluded column.

The **Package Summary** tab displays a hierarchical view of communications and cells.

*Display 4.15 Package Summary Tab, Non-optimization Campaign*

Campaign14973					
Name	Code	Package Code	Initial Count	Final Count	Holdouts
Campaign14973	CAMP14973	COMM25480			
Communication					
Cell	CELL38728	PKG20790			
Link to Fema...	CELL38727	PKG20792			
Link to RLSM...	CELL38726	PKG20794			

The Initial Count column contains the count before the holdout control group population is subtracted. The Final Count column contains the count after the holdout control group population is subtracted. The Holdouts column lists the holdout control group population for each cell.

If the campaign has been optimized, the unoptimized and optimized package counts are listed.

*Display 4.16 Package Summary Tab, Optimization Campaign*

Campaign14922					
Name	Code	Package Code	Unoptimized Count	Optimized Count	Percentage Dropped
Campaign14922	CAMP14922	COMM25330			
Communication					
Cell	CELL38620	PKG20690			
Link to Fema...	CELL38720	PKG20786			
Link to RLSM...	CELL38721	PKG20788			

The Unoptimized Count column contains the pre-optimization count for the cell. The Optimized Count column contains the final count after the holdout control group population has been subtracted and optimization has occurred. The Percentage Dropped column includes both the holdout control group population and the counts that are dropped after optimization.

The **Channel Summary** tab displays a summary of package counts based on channel.

*Display 4.17 Channel Summary Tab, Non-optimization Campaign*

Catalog					
Name	Code	Initial Packages	Final Packages	Holdouts	
Communication	COMM25480				

The Initial Packages column contains the count for the channel or communication before the holdout control group population is subtracted. The Final Packages column contains the count after the holdout control group population is subtracted. The Holdouts column lists the holdout control group population for each channel or communication. The communication row counts are summations of the holdout control group population for each cell that feeds into a communication. The channel row counts are summations of the communication counts for that channel.

If the campaign group has been optimized, the unoptimized and optimized package counts are listed.

**Display 4.18** Channel Summary Tab, Optimization Campaign

Name	Code	Unoptimized Packages	Optimized Packages	Percentage Dropped
▼ Catalog	_CT			
Communication	COMM25330			

The Unoptimized Packages column contains the unoptimized count for the channel or the communication. The Optimized Packages column contains the final count after the holdout control group population has been subtracted and optimization has occurred. The Percentage Dropped column includes both the holdout control group population and the counts that are dropped after optimization.

## Add Treatments to a Campaign

### List Treatments

The Treatments page displays the treatments that are associated with the Communication nodes in a campaign.

Select **List** to add a treatment to the list.

**Display 4.19** List of Treatments

To select a treatment and make it available to the campaign, click **+**.

For information about treatments, see “Creating Treatments” on page 220.

### Assign Treatments

Select **Assignment** to associate packages and treatments with communications. A Communication node must be connected to a marketing cell in order for you to assign a treatment. The Communication node must be an Export type Communication node. For more information, see “[Types of Communication Nodes](#)” on page 263.

The Assignment page has two views, the Summary table view and the Matrix view.

Click to display a table view and the summary of treatments that are assigned to each marketing cell.

Display 4.20 Summary Table View

Treatments				
Packages (1 of 1)	Search: none			
Communication	Marketing Cell	Cell Code	Package Code	Treatments
Communication	Cell	Generic_CELL44411	Generic_PKG16	Gold <span style="color: yellow;">!</span>

A ! indicates that no treatments have been selected for that row.

Click in the **Treatments** cell to select the treatments to associate with a communication.

Display 4.21 Assign Treatments

The dialog box displays the following information:

- Communication name: Communication
- Cell name: Cell
- Channel: Catalog
- Subject: Customer
- Selected treatments:

Priority	Name	Code
1	Back to School discount	TRT15
2	Beach Flyer	TRT89

You can select more than one instance of a dynamic treatment. This is useful if you want to provide different values for the custom details in different instances of the same treatment. Each package can contain 0 or more treatments. If no changes are made to any of the custom details in the different instances, the instances are not published to the common data model.

Use the up and down arrows to change the priority. Click to select a new treatment

To display the Matrix view of the Assignment page, click .

Display 4.22 Matrix View

Treatment		Cell	
Gold		1 <input checked="" type="checkbox"/>	
CC1		<input type="checkbox"/>	
LOAN1			
GNumStatic			

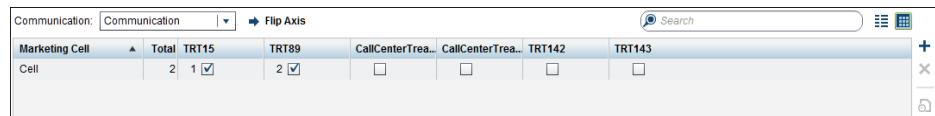
Treatment name: G\_CreditCard  
Treatment code: CC1

In the Matrix view, select a Communication node from the **Communication** list. Select the check box for a treatment to add the treatment to the package. Priorities for treatments are assigned in the order in which they are selected. Treatments are sent in order of priority. Press the Shift key to select multiple treatments in order.

Click  to view the contents of a treatment.

Click **Flip Axis** to change the orientation of the Matrix view.

*Display 4.23 Flip Axis*



Marketing Cell	Total	TRT15	TRT89	CallCenterTrea...	CallCenterTrea...	TRT142	TRT143
Cell	2	1 <input checked="" type="checkbox"/>	2 <input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Stage Treatments

Instead of generating an export file from a Communication node, you can store treatments in a staging repository for use in a SAS Real-Time Decision Manager decision campaign. Staged treatments ensure that the right offer is delivered in the right channel at the right time.

Staged treatments might be used in the following circumstances:

- An offer does not need to be made immediately after the segmentation and eligibility rules are executed.
- An offer might not be appropriate for the channel in which a campaign is executed.
- Delivery of the offer should be delayed to reduce the perception of spam.

In order to use staged treatments, both SAS Real-Time Decision Manager and SAS Marketing Automation must be installed at your site and staging must be configured on your system. For more information about configuring staging at your site, see *SAS Real-Time Decision Manager: Administrator's Guide*.

If the diagram contains a Staged type Communication node, you use the Stage page to stage treatments. For more information, see “[Types of Communication Nodes](#)” on page 263. The Stage page is blank for Export type Communication nodes.

Select **Stage** to manage staged treatments.

Display 4.24 Stage Page

The screenshot shows a software interface titled "Treatments". On the left, there's a sidebar with options like "List", "Assignment", "Stage", "Remove Staged", "Custom Details", and "Updates". The main area has a header "Packages (1 of 1) Search: none". Below it is a table with columns: Communication, Marketing Cell, Channel, and Treatments. The "Treatments" column contains "TRT15; TRT89". A "Treatment Options" panel is open at the bottom, showing "TRT15" selected. It includes sections for "Treatment activation date: No restriction", "Treatment expiration date: No restriction", and "Presentation window: ?". Under "Presentation window", there are two dropdown menus: "Start: Specific date/time" and "End: Specific date/time", each with a calendar icon.

Click in the Treatments cell to select treatments to stage.

After you have staged a treatment, specify the treatment options.

Display 4.25 Treatment Options

This is a screenshot of the "Treatment Options" dialog box. On the left, a list of treatments is shown: TRT89, TRT147, TRT148, and TRT81. The TRT89 entry is highlighted. To the right, there are sections for "Treatment activation date: No restriction", "Treatment expiration date: No restriction", and "Presentation window: ?". Under "Presentation window", there are two dropdown menus: "Start: Specific date/time" and "End: Specific date/time", each with a calendar icon.

The presentation window sets the date range during which the treatment can be presented. You can specify a specific date and time, or a date and time relative to when the treatment is staged.

Display 4.26 Presentation Start Date

This screenshot shows the "Presentation window: ?" dialog box. It has a "Start" checkbox followed by a dropdown menu with "Specific date/time" selected. Below it is an "End" checkbox followed by a dropdown menu. The dropdown menu for "End" is open, showing three options: "Specific date/time", "Hours after staging", and "Days after staging". The "Hours after staging" option is highlighted with a green background and a cursor is hovering over it.

To set the beginning and end of the date range, select the treatment and select **Start** and **End**. For the start and end dates, select **Specific date/time**, **Hours after staging**, or **Days after staging**. Enter a value or click and select a

date. A treatment cannot be presented before the start date, even if an earlier activation date is specified in the treatment definition.

### Remove Staged Treatments

If the diagram contains a Staged type Communication node, use the Remove Staged page to remove staged treatments from the repository. For more information, see “[Types of Communication Nodes](#)” on page 263.

*Display 4.27 Remove Staged Treatments*

Communication	Marketing Cell	Channel	Removal Method	Treatments
Communication	Cell	ATM	Specific treatments	2 Back to School discount; Beach Flyer

Click to select the treatments that you want to remove.

*Display 4.28 Specify Removal Method*

Name	Code	Description	Reference
Back to School discount	TRT15		
Beach Flyer	TRT89		

Select **None** to remove no treatments from the staging repository.

Select **All treatments** to remove all treatments that are staged for the set of subjects in the marketing cell for the current channel.

Select **Specific treatments** to remove selected treatments from the staging repository. These treatments are selected from the list of treatments for the current business context.

## Specify Custom Details

Select **Custom Details** to display the custom details for each treatment.

*Display 4.29 Custom Details*

Name	Code
Back to School discount	TRT15
Beach Flyer	TRT45
Beach Flyer	TRT89

Custom details:

Costs	4
Mail cost	0.75

Enter a value for the custom detail or click to select a variable.

The next to a custom detail displays information about the associated custom detail tag.

For information about the export files that result from treatments that contain custom detail tags, see “[Treatments and Custom Detail Tags](#)” on page 223.

## View Updated Treatments

Treatments that have been modified because they were assigned to the campaign are displayed on the Updates page.

*Display 4.30 Updates*

Name	Code	Status	Modified By	Date Modified
Beach Flyer	TRT89	updated		Oct 8, 2014

Campaign treatment:

Details	Custom Details
Name:	Beach Flyer
Description:	
Code:	TRT89
Activation date:	No restriction
Expiration date:	No restriction
Attributes:	
Reference:	
Staged:	False
Image:	

Treatment:

Details	Custom Details
Name:	Beach Flyer
Description:	Use this for our winter vacation promotion.
Code:	TRT89
Activation date:	Dec 5, 2014 04:34 PM
Expiration date:	No restriction
Attributes:	
Reference:	
Staged:	False
Image:	

The Updates page is not displayed if **Use external treatment list** has been selected for the current business context.

The number in the red disc indicates the number of treatments that have been changed. Select **Updates** or **Rejections** to display changed treatments or treatments whose changes have been rejected. Click in the toolbar to refresh the contents of the Treatments page.

Select a treatment to compare the campaign version of the treatment with the changed version. **Campaign Treatment** is the version of the treatment that is associated with the campaign. **Treatment** is the changed version.

Click to accept the changes. Click to reject the changes.

**Note:** Changed values in dynamic custom details are not updated. To include the changed values in the treatment, remove the dynamic custom detail and then add it again to the treatment.

## Monitor Campaign Status

The Checklist Summary page displays the status of the campaign and of pages on the checklist. You can use the checklist to keep track of your progress while working on a campaign.

*Display 4.31 Checklist Summary Page*

Name	Type	Date Updated	Updated By
Properties	Page		
Budget	Page		
Diagram	Page		
Schedule	Page		
Optimization Settings	Page		

Click to select a new status for the campaign.

Checkmarks can indicate completion of a portion of a campaign. Click next to a page name to change the status. The icon changes to when you click it.

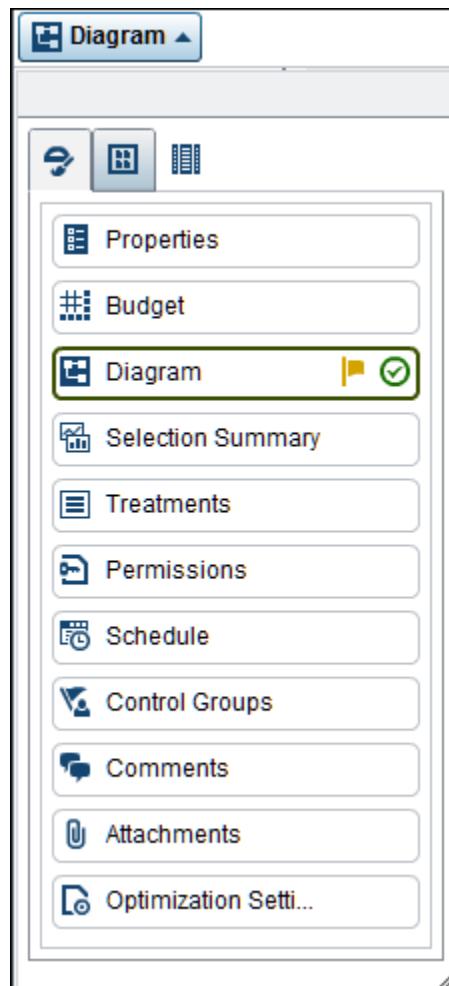
Status flags can indicate levels of completion or areas that need work. Select a status flag next to the page name.

*Display 4.32 Status Flag*

Name	Type
Properties	Page
Budget	Page
Diagram	Page
Schedule	Page
Optimization Settings	Page

Click a page name to display the page.

The checkmark and status flag are displayed in the Page Manager.

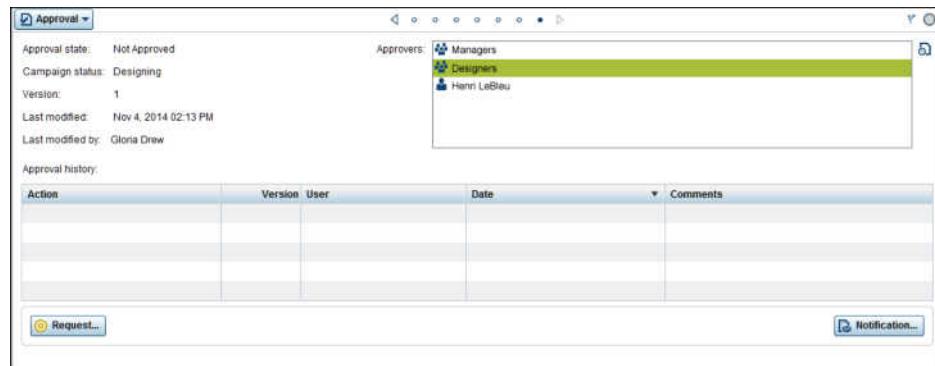
*Display 4.33 Page Status and Follow-up Flag*

Click the icons to change the checkmark and status flag on the page.

*Figure 4.3 Change Page Status*

## Approve a Campaign

A campaign can require approval by a member of a designated list of users who have approval permissions. If the required approval is not granted, the campaign cannot be executed. The approval status of the campaign is reflected on the Approvals page.

**Display 4.34** Approvals

The Approvals page lists only those approvers who have access to the current business context.

The selections on the Approvals page depend on your access permissions. If you have the appropriate permissions, you can change the approval status of a campaign by clicking one of the following buttons:

**Approve**

approves the campaign for execution.

**Deny**

denies approval and prevents the campaign from being executed.

**Request**

requests approval of the campaign.

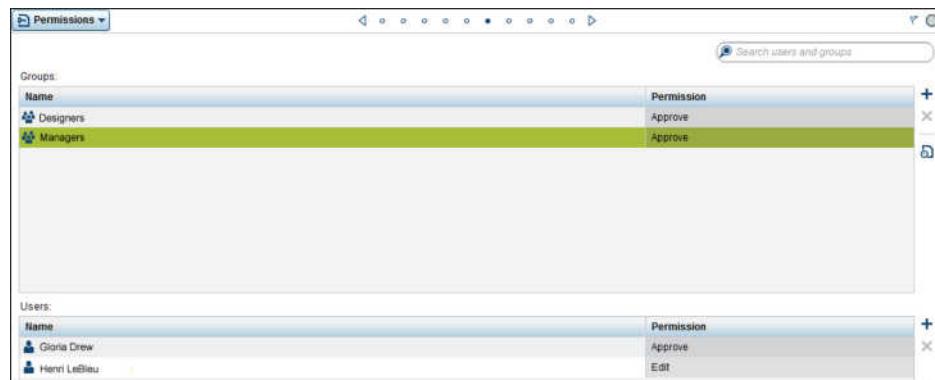
**Withdraw Request**

withdraws the request for approval. The option is available if you do not have approval permission.

Click **Notification** to set up email notifications for events that are related to approvals. For more information, see “[Email Notifications](#)” on page 177.

## Set Access Permissions for the Campaign

The Permissions page displays the names of users and groups who have access.

**Figure 4.4** Permissions Page

To add a user to the list, click  and select a user. To add a group to the list, click  and select a group.

To view the members of a group, select the group and click .

To change the permission of a user or user group, click the **Permission** cell and select the permission. By default, all users and groups that you select have Edit permission.

In general, the permission that you set for an individual user overrides the permission that is set for a group that the user is a member of. For more information about the relationship of permissions between users and groups, see *SAS Intelligence Platform: Security Administration Guide* at [SAS Intelligence Platform](#).

## Set the Schedule

For information about scheduling campaigns and communications for execution, see “[Create a Schedule](#)” on page 329.

## Control Groups

### Overview of Control Groups

Control groups are used to evaluate the effectiveness of a communication by comparing the responses of an audience that receives the communication with the responses of an audience that does not receive a communication or that receives a different communication.

Automatic holdout control groups are holdout control groups that are created when a cell that does not have the **Cell represents a control group** option selected is connected to a Communication node. Members of a holdout control group do not receive a communication. After a communication has been sent, the responses of the holdout control group can be compared with the responses of groups that received a communication. These control groups are enabled, and their default values are specified in the properties for the current business context. The settings can be overridden in the campaign properties and in the Communication node.

**Note:** Holdout control groups cannot be used in treatment-level optimization.

A/B Test type control groups are created by the A/B Test node, and can be champion/challenger or challenger/challenger configurations. Members of a champion/challenger test receive either a champion communication or one of a set of one or more challenger communications that is measured against the champion. In a champion/challenger test, the champion is the control group that the challengers are compared against. Members of a challenger/challenger test receive one of two or more communications that are compared against each in order to determine the best communication. In a challenger/challenger test, each challenger serves as a control group for all the other challengers. There is not a pre-defined champion. All challengers are treated equally. Champion/challenger and challenger/challenger testing might or might not be combined with holdout control groups. All A/B Test groups, except for holdout control groups, receive treatments, and responses from each group can be compared to determine which treatment performed best. (Optional) Holdout control groups can receive treatments.

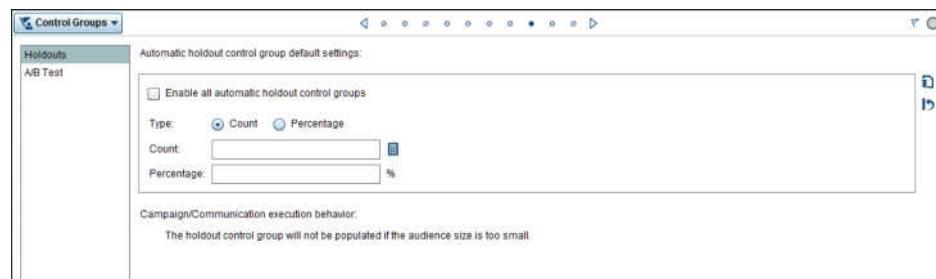
Manual control groups are created by checking the **Cell represents a control group** option in a cell. Manual control groups can receive treatments, or they can be designated as holdout control groups that do not receive treatments. Manual control groups can be used to simulate either automatic holdout control groups or A/B Test control groups. Manual control groups do not have all of the features of the automatic holdout and A/B Test control groups. In order for this control group information to be published to the common data model, the cell must be connected to a Communication node.

### Manage Control Group Settings for a Campaign

On the Control Groups page, you can override the default values for automatic holdout and A/B Test control groups that were set in the business context. For example, you might want to add more population to the default value for a control group.

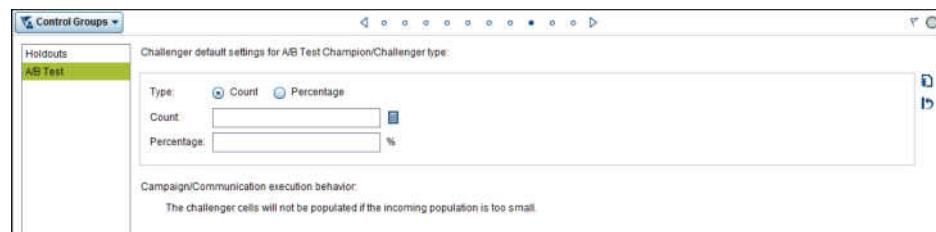
Select **Enable all automatic holdout control groups** on the Holdouts page to specify whether automatic holdout control groups are enabled or disabled by default for Communication nodes and A/B Test nodes in this campaign.

*Display 4.35 Settings for Holdouts*



The **A/B Test** page settings affect the A/B Test node in Champion/Challenger mode. These settings do not apply to Challenger/Challenger mode. The **A/B Test** settings are not displayed in campaigns that have an optimization step.

*Display 4.36 Settings for A/B Test Control Groups*



Specify the size for the **Count** field or the **Percentage** field. The count size must be greater than 0. The percentage must be greater than 0 and less than or equal to 50. Percentages are limited to three decimal places. Click to use the statistical size estimator to specify the count. For more information, see "Determine Sample Size" on page 248.

The holdout control group population must not be larger than the population that is not in the holdout control group. When a Communication node is executed, if total count in the marketing cell is less than twice the count specified for a control group, the resulting action is specified in the communication definition or

on the Thresholds page of the communication. Either the holdout control group is not populated, or the campaign execution fails.

When you click , you take the following actions:

- apply the settings to all of the existing automatic holdout control groups in the campaign. This action replaces any settings in the automatic holdout control groups that are in the Communication nodes. The counts are cleared in the affected nodes and in any nodes that are downstream.
- apply the challenger settings to the A/B Test nodes in Champion/Challenger mode. This action replaces any settings that are in the nodes with the new settings. The counts are cleared in the A/B Test nodes and in any nodes that are downstream. This setting does not affect A/B Test nodes that are in Challenger/Challenger mode.

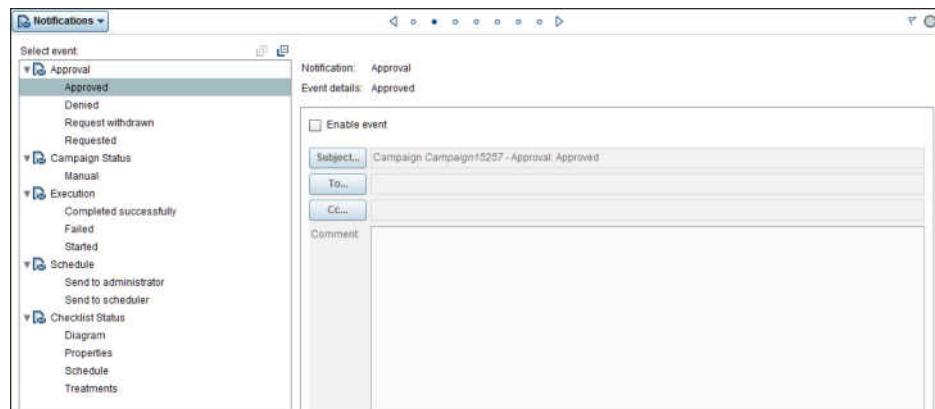
Click  to reset the values to the default values that were set in the business context.

## Email Notifications

### Set an Email Notification

You can use the Notifications page to notify users of an event such as a change in checklist status.

*Display 4.37 Notifications*



Click  to expand the list of events. Click  to collapse the list.

Select the type of notification and the event for which the email message will be sent.

Select **Enable event** to modify the subject line and to select addressees. In order to receive the notification, the correct email addresses must be assigned to the users in the User Manager plug-in in SAS Management Console. For more information, see *SAS Marketing Automation: Administrator's Guide*.

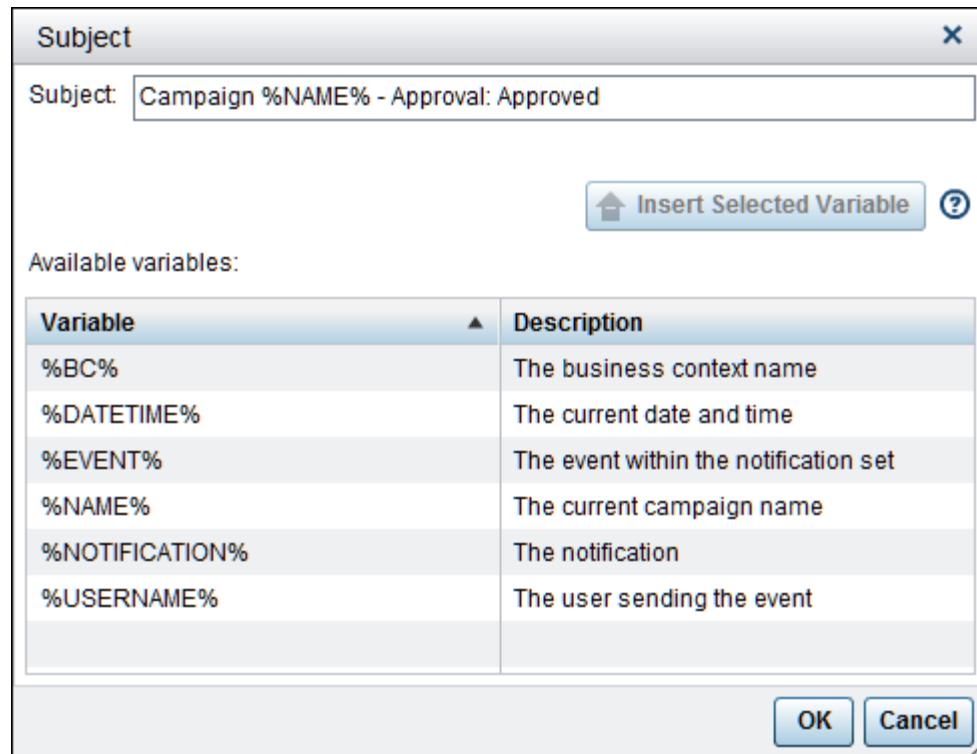
Click **To** and **Cc** to designate the recipients of the message. For more information, see “[Select Users and Groups](#)” on page 178.

Enter any additional information in the **Comment** field.

### Change the Subject

Click **Subject** to change the subject line of the email message.

*Display 4.38 Subject Window*

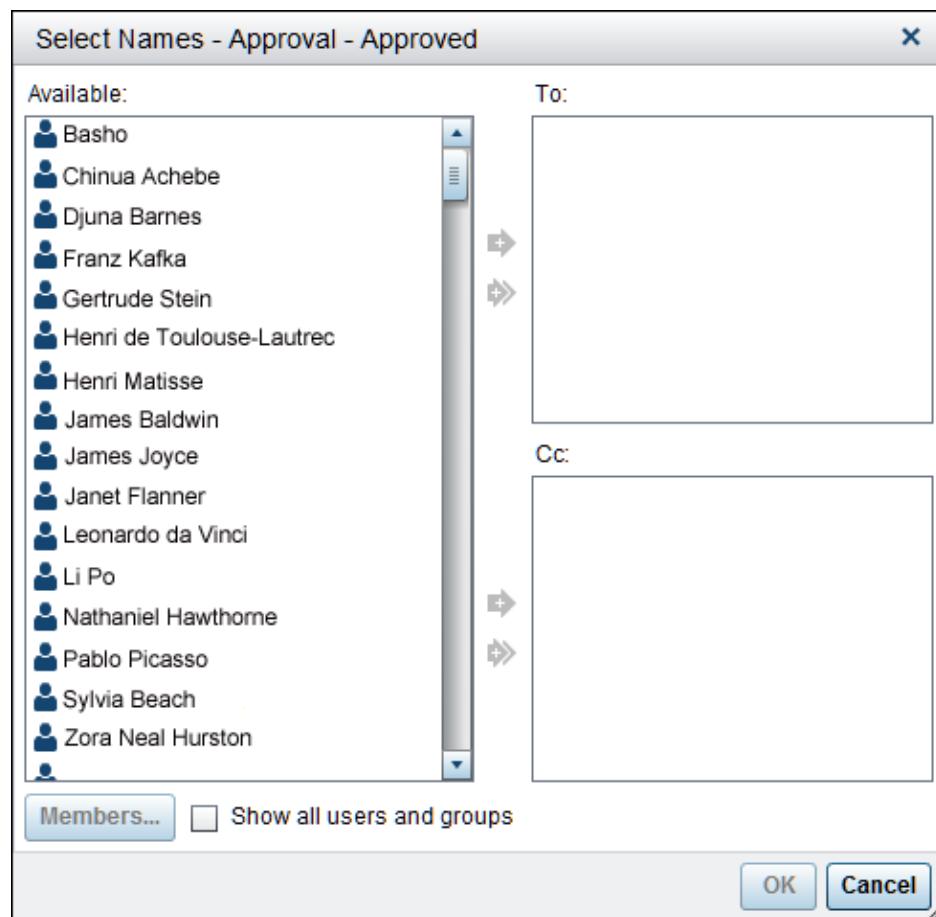


Place the pointer at the location in the **Subject** field where you want to insert the variable. Select a variable and click **Insert Selected Variable**. In the email message, the variable is replaced by the text that is indicated in the **Description** column. For example, in Campaign21476, if the **Subject** field contains **Campaign %NAME% - Execution: Failed**, the subject of the email message would be **Campaign Campaign21476 - Execution: Failed**.

### Select Users and Groups

Select names and use the arrows to add users and groups to the **To** and **Cc** lists.

Figure 4.5 Select Names for Email Notification



The **Available** list displays SAS Customer Intelligence users. Select **Show all users and groups** to display all users and groups.

Select a group and click **Members** to display the members of the group.

## Execute a Campaign

To execute a campaign, see “Execute a Campaign or Campaign Group” on page 338.

## View Messages

The message log records events such as failed campaign executions or the inability to update counts on particular nodes. Click to view any messages.

Display 4.39 Message Log

**Message log:**

Name	Date	User
Update Counts Failed	Oct 29, 2014 01:25 PM	Gloria Drew

\*\*\*\*\*

**Message details:**

Refine Output Campaign/Communication Node A: Error in the stored process or a called macro - vendor code: 1012, message: Macro[MACHKERR] There was an error in the called macro [maexp]. Check the log for details..

**Close**

Up to 100 messages can be displayed in the log. Select a message and click to clear an individual message.

## Status and Versions

### Set Status and Version

The Status and Versions page displays a history of changes in the campaign status and of the different versions of the campaign.

Display 4.40 Status and Versions

Version: 2

Campaign status: Design Complete

Last published date:

Last published by:

History: (4 of 4) Search: none

Action	Version	Campaign Status	User	Date	Comments
Create Version	2	Design Complete	Gloria Drew	Nov 4, 2014 03:10 PM	
Manual Change Status	1	Designing	Gloria Drew	Nov 4, 2014 03:10 PM	
Manual Change Status	1	Design Complete	Gloria Drew	Nov 4, 2014 03:10 PM	
Create Campaign	1	Designing	Gloria Drew	Nov 4, 2014 02:16 PM	Initial Version

You might want to record different versions of the campaign. Click to create a new version. Click to manually change the campaign status. Versions and changes in campaign status are listed in the History table.

**CAUTION!** When a new version is created, any scheduled executions are deleted for the campaign. Creating a new version deletes the approval status for the campaign.

## The Life Cycle of a Campaign

A campaign progresses through three phases. Each phase contains one or more statuses.

- 1 The Design phase contains the following statuses.

### Initiating

This status is set when a campaign is created. Some information must be supplied before beginning the design of the campaign. **Use “initiating” as a campaign status** must be enabled in the campaign definition.

### Initiation Complete

The necessary information has been supplied. The campaign is ready for the designer.

### Designing

The campaign is being designed.

### Design Complete

No further work is required on the campaign.

- 2 The Approval phase contains the following statuses.

### Requested

Approval has been requested.

### Denied

Approval has been denied.

### Approved

The campaign has been approved.

- 3 The Execution stage contains the following statuses.

### Ready to Execute

The campaign is ready to execute, but it has not been executed or sent to the scheduler for execution.

### Scheduled

The campaign has been sent to the scheduler, but all of the scheduled communications have not executed.

### Active

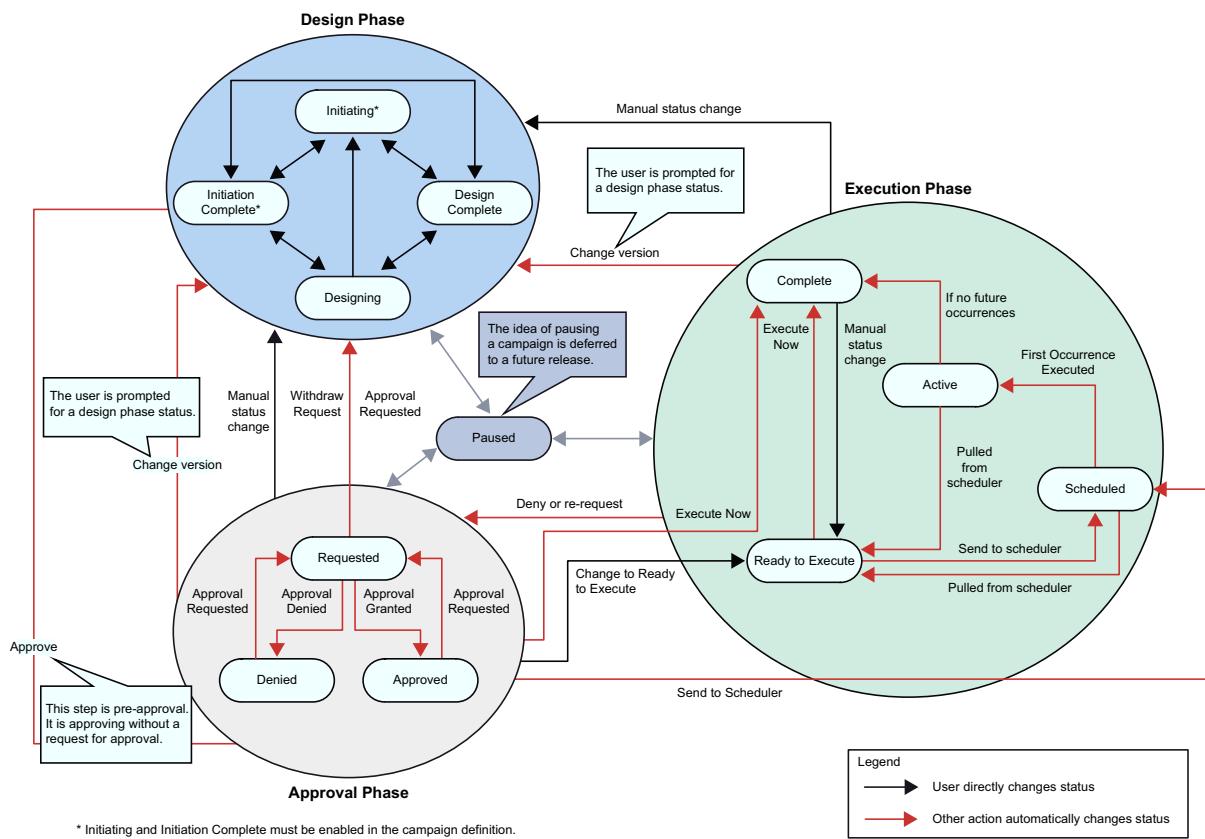
The campaign has been sent to the scheduler. A scheduled communication has executed at least once, and there are future occurrences.

### Complete

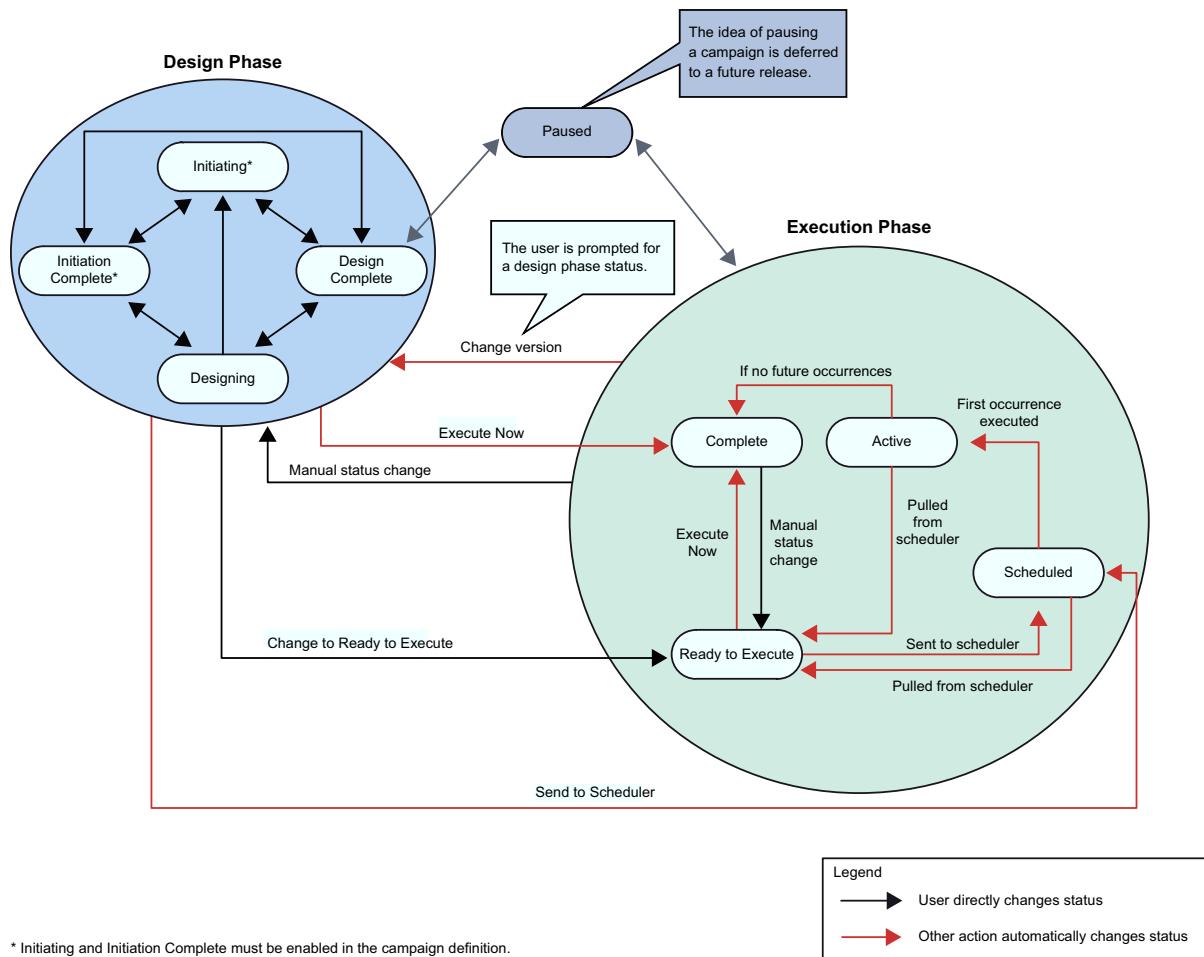
All scheduled occurrences have been executed.

The following figure shows the flow between the statuses of a campaign with an Approval phase.

**Display 4.41** Design Phase, Approval Phase, and Execution Phase



The following figure shows the flow between the statuses of a campaign without an Approval phase.

**Display 4.42** Design Phase and Execution Phase

## Add Attachments

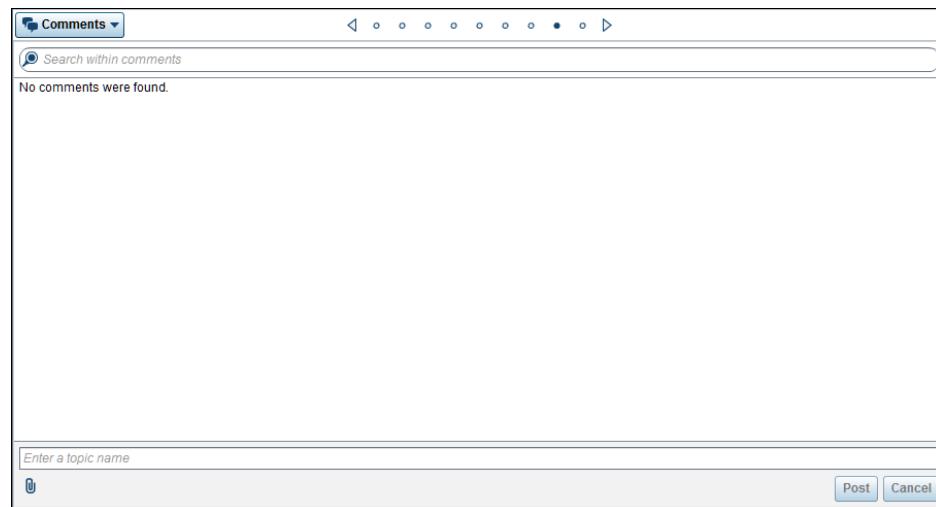
On the Attachments page, you view and add attachments such as images or documents.

**Figure 4.6** Attachments

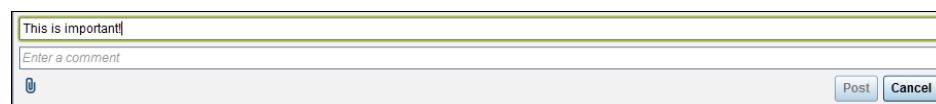
Click **+** to select a file to attach.

## Add Comments

On the Comments page, you view and add comments. You add comments after saving.

**Figure 4.7** Comments

Enter a topic name to add a new comment.

**Figure 4.8** New Topic

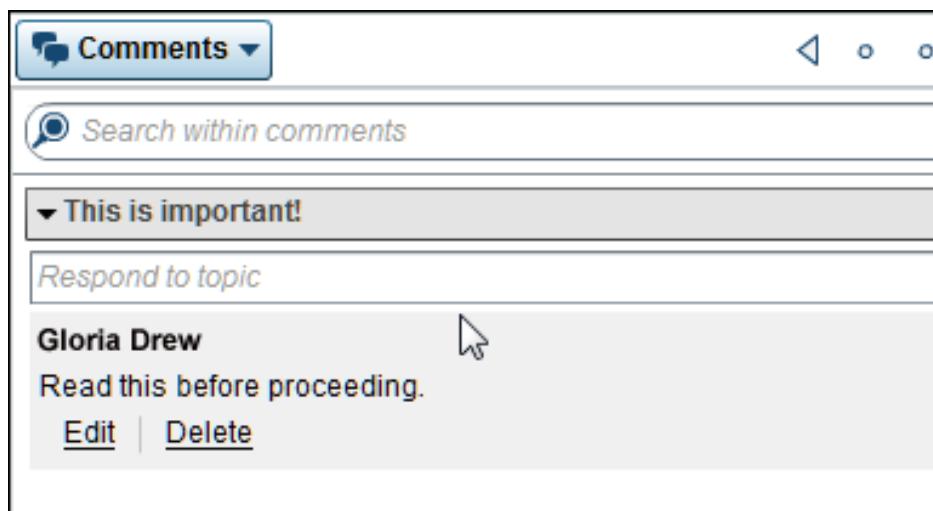
Enter the text of the new comment.

**Figure 4.9** Comment Text

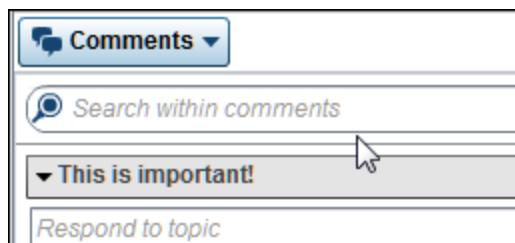
Click **Post** to post the comment. Your new comment is displayed on the Comments page. You can add comments even if you do not have Edit permission.

Click to add an attachment such as an image or a document.

To reply to an existing comment, type text in the field below the comment title.

**Figure 4.10** Comments List

Type in the search field to find text in comments.

**Figure 4.11** Search Comments

## Specify Optimization Settings

### Overview of Specifying Optimization Settings

If the campaign can be optimized, the Optimization Settings page displays the criteria for optimization. For more information about optimization, see “Optimizing Campaigns” on page 154.

When a member campaign is removed from a campaign group, the campaign retains the optimization settings for the group.

### Optimization with SAS Marketing Automation Only

If you are optimizing campaigns and SAS Marketing Optimization is not installed at your site, you can use the following optimization method and settings.

#### Priority-based method

For more information, see “Select an Optimization Method” on page 186.

#### Priorities

For more information, see “Set Priorities” on page 187.

#### Budgets

For more information, see “Specify Budget Information” on page 188.

**Inclusions**

For more information, see “[Specify Mandatory Inclusions for Optimization](#)” on page 188.

**Contacts**

For more information, see “[Set Maximum Number of Contacts](#)” on page 188.

## **Optimization with SAS Marketing Automation and SAS Marketing Optimization**

If SAS Marketing Optimization is installed at your site, the following methods and settings use SAS Marketing Optimization to optimize SAS Marketing Automation campaigns.

**Analytical scenario and Priority-based scenario** methods

For more information, see “[Select an Optimization Method](#)” on page 186.

**Scores**

For more information, see “[Assign Scores](#)” on page 187.

**Priorities**

For more information, see “[Set Priorities](#)” on page 187.

**Budgets**

For more information, see “[Specify Budget Information](#)” on page 188.

**Inclusions**

For more information, see “[Specify Mandatory Inclusions for Optimization](#)” on page 188.

**Contacts**

For more information, see “[Set Maximum Number of Contacts](#)” on page 188.

## **Select an Optimization Method**

Click  to select one of the following methods:

**Analytical scenario**

If you select **Analytical scenario**, you can set the score for each communication cell. A full optimization finds the best possible solution, based on an analytical objective measure. The campaign group that contains the campaign is assigned a preferred optimization scenario in SAS Marketing Optimization. This is the default method if SAS Marketing Optimization is installed at your site.

**Priority-based scenario**

If you select **Priority-based scenario**, you can specify priorities as input into the optimization process. The optimization is based first on campaign priorities and then on customer rankings. With the priority-based scenario method, you can also add more constraints and contact policies. The campaign group that contains the campaign is assigned a preferred optimization scenario in SAS Marketing Optimization. The priority-based scenario method is available if SAS Marketing Optimization is installed at your site.

**Priority-based**

If you select **Priority-based**, you can specify priorities as input into the optimization process. No scenario is assigned in SAS Marketing Optimization. The optimization is based first on campaign priorities and then on customer rankings. With the priority-based method, you can use only the constraints and contact policies that you create in the campaign group. This

is the default method if SAS Marketing Optimization is not installed at your site.

You can change methods from the Priority-based scenario method to the Analytical scenario method without deleting optimization data or scenarios. You can also change methods from the Priority-based to the Priority-based scenario or the Analytical scenario method without deleting optimization data or scenarios. If you change from the Analytical scenario method to any other method, or from the Priority-based scenario method to the Priority-based method, you must delete all scenarios. The optimization data is deleted.

## Assign Scores

If you have selected **Analytical scenario**, you assign score values to communication cells on the Scores page. The scores are included in the optimization process.

*Display 4.43 Scores*

The screenshot shows a table titled "Cell Scores (3 of 3)" with a search bar "Search: none". The table has columns: Name, Code, exp\_val, and discount123. There are three rows corresponding to Communication Node A, B, and C, each with three child nodes: Age Cell Node, Gender Cell Node, and Distance Cell Node. The "exp\_val" column contains values like CELL35202, CELL35204, and CELL3472. The "discount123" column is empty.

Cell Scores (3 of 3)   Search: none			
	Name	Code	exp_val
	Communication Node A	COMM21341	
	Age Cell Node	CELL35202	
	Communication Node B	COMM21339	
	Gender Cell Node	CELL35204	
	Distance Cell Node	CELL3472	

If the campaign is a member of a treatment-level optimization group, the treatment settings are displayed. These settings cannot be edited.

## Set Priorities

If you selected the **Priority-based scenario** or the **Priority-based** method, you set the priority for each cell on the Priorities page.

*Display 4.44 Priorities*

The screenshot shows a table titled "Cell Priorities (3 of 3)" with a search bar "Search: none". The table has columns: Communication, Cell, and Priority. There are three rows corresponding to Communication Node A, B, and C, each with three child nodes: Age Cell Node, Gender Cell Node, and Distance Cell Node. The "Priority" column contains values like 1, 2, and 3. The "Communication" column lists the node names.

Cell Priorities (3 of 3)   Search: none		
	Communication	Cell
	Communication N...	Age Cell Node
	Communication N...	Gender Cell No...
	Communication N...	Distance Cell N...

Select a cell and click to assign a priority. You can assign a priority to multiple cells by selecting multiple rows and clicking . Priority values do not have to be sequential or unique. For example, if there are two cells, you can assign one cell a priority of 5 and another cell a priority of 2. Lower values indicate higher priorities. Cells without priority values are assigned the lowest priority.

In the **Grid** view, click and select **Names**, **Codes**, or **Names and Codes** to display for the campaign, communication, and cells. In the **Hierarchy** view, select to display all of the rows.

## Specify Budget Information

The Budgets page displays the budget values for optimization. The page displays the values for the communication cells. You can edit these values.

*Display 4.45 Budgets*

Priorities	Budget	Search: none				
Budgets	Name	Code	Maximum Offers	Maximum Budget	Unit Cost	Unit Usage
	Refine Output Campaign	CAMP12652				1
	Communication Node	COMM21341				1
	Communication Node	COMM21339				1

In the **Minimum Budget** and **Maximum Budget** columns, specify the minimum and maximum budget for all of the offers.

In the **Unit Cost** and **Unit Usage** columns, specify the unit cost and usage for communication cells.

Click to set values for the selected rows.

Click to clear the values from selected rows.

## Specify Mandatory Inclusions for Optimization

On the Inclusions page, you specify mandatory inclusions at the cell level in an optimization.

*Display 4.46 Inclusions*

Priorities	Cells (3 of 3)	Search: none			
Inclusions	Name	Code	Mandatory	Exclude from Constraints	Exclude from Contact Policies
	Communication Node A	COMM21341			
	Ape Cell Node	CELL35202	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Communication Node B	COMM21339			
	Gender Cell Node	CELL35204	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Distance Cell Node	CELL36472	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Select **Mandatory** to require that an offer be included in the optimization. Select the **Exclude from** check boxes if you do not want the mandatory inclusions to apply to constraints or contact policies.

Click to set inclusions for the selected rows.

## Set Maximum Number of Contacts

On the Contacts page, you specify the maximum number of contacts per subject.

#### Display 4.47 Contacts

Name	Code
Finance Campaign	CAMP17615
Communication	COMM29464

Select **Display maximum number of contacts for each communication** to display the maximum number of contacts for each communication cell, if that value has been set. If the data contains values for communications, this view is expanded by default to display the names of the communication cells.

To enter values for communication cells, select **Maximum number of contacts per subject**.

Click to set maximum contacts for the selected rows.

Click to clear the values from selected rows.

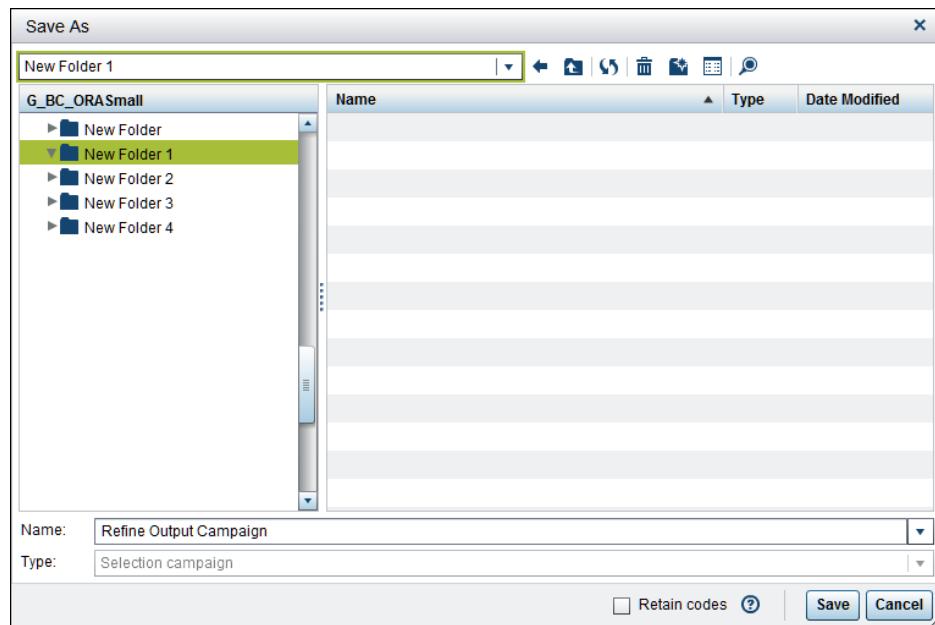
This maximum number is the upper limit. A lower limit can be specified in SAS Marketing Optimization.

## Save a Campaign

To save a campaign, click in the toolbar. The campaign is saved under the name that is specified in the **Name** field.

To save a campaign under a different name, click in the toolbar.

Display 4.48 Save As



Select a folder and supply a new name for the campaign . To save the campaign to a new folder, click  and open the new folder.

Select **Retain codes** to retain codes that are created manually or generated automatically. Codes are retained according to the setting for the business context. The following codes are retained:

- campaign code
- campaign group code
- cell code
- control group code and name
- communication code
- package code

**Note:** You have Edit permission for a campaign that you have saved under a different name. If you have Approve permission for the original campaign, the permission is changed to Edit for the campaign that you saved under a different name. The pages that are displayed might be different from the pages that are displayed for View or Approve permission.

## Creating Campaign Groups

### Overview of Campaign Groups

You can organize campaigns into a group for scheduling and executing or for optimization. You can coordinate the optimization schedule and execution schedules for a campaign group so that the execution schedules of individual campaigns occur automatically at specified intervals after optimization.

The following criteria apply to campaigns in a campaign group:

- All the campaigns within a campaign group must be at the same subject level.
- A campaign can be the member of only one campaign group.
- When a campaign has been added to a group, and the group has not yet been saved, the campaign cannot be opened for edit or added to another campaign group.
- In order to view and edit the campaigns in a campaign group, you must have the appropriate permissions to view or edit the contents of individual campaigns.
- Campaigns that have already been scheduled for execution cannot be added to a campaign group.
- Open campaigns cannot be added to a campaign group.
- The campaign and the campaign group must have the same optimization status. For example, a campaign that can be optimized cannot be added to a campaign group that cannot be optimized.

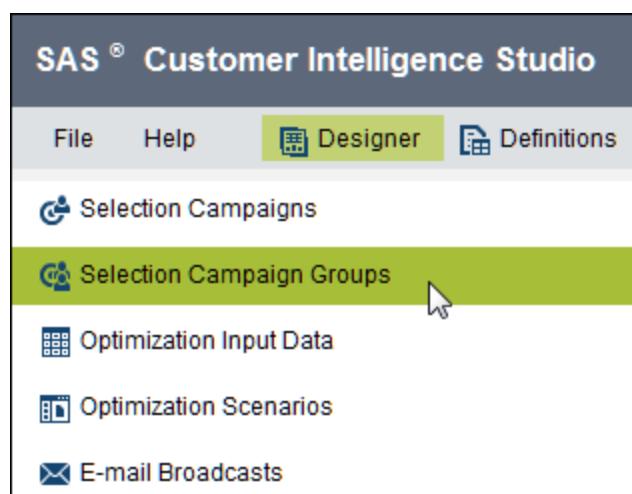
If you use SAS Marketing Optimization to optimize the campaign group and there are changes in the campaign group in SAS Marketing Automation, refresh the optimization group in SAS Marketing Optimization to synchronize the changes.

For information about optimizing campaigns, see “[Optimizing Campaigns](#)” on page 154.

## Create a Campaign Group

To create a campaign group, select **Selection Campaign Groups** in the Designer workspace.

*Figure 4.12 Selection Campaign Groups*



Click and select a campaign group definition.

## Specify Campaign Group Properties

The Properties page displays information about the campaign group.

*Figure 4.13 Campaign Group Properties*

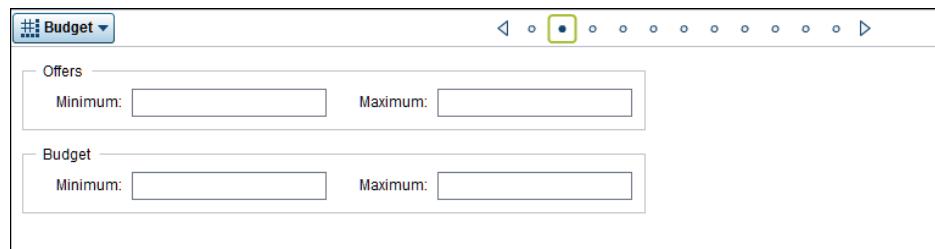


The campaign group code is created either automatically or manually, and the code is editable depending on the campaign group definition.

## Set the Budget

On the Budget page, you set budget values.

*Figure 4.14 Budget*



### Offers

enables you to specify the minimum and maximum number of offers that can be made for a campaign group.

### Budget

enables you to specify the minimum and maximum budget for all of the offers in this campaign group.

## Monitor Campaign Group Status

The Checklist Summary page displays the status of the campaign group and of pages on the checklist. You can use the checklist to keep track of your progress while working on a campaign group.

**Figure 4.15** Checklist Summary Page

Name	Type	Date Updated	Updated By
Properties	Page		
Budget	Page		
Members	Page		
Schedule	Custom Step		
Optimization Settings	Page		
Execution	Custom Step		
Generic Camp Group	Custom Step		

Checkmarks can indicate completion of a portion of a campaign group. Click  next to a page name to change the status. The icon changes to  when you click it.

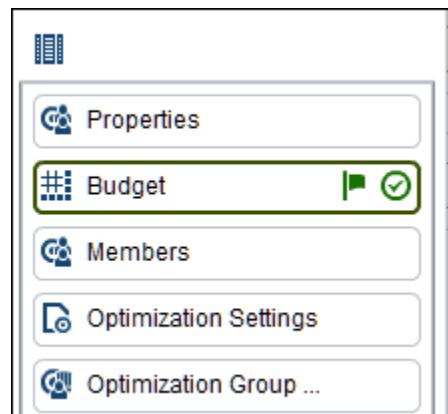
Status flags can indicate levels of completion or areas that need work. Select a status flag next to the page name.

**Figure 4.16** Status Flag

Name	Type
Properties	Page
Budget	Page
Members	Page
Schedule	Custom Step
Optimization Settings	Page
Execution	Custom Step
Generic Camp Group	Custom Step

Click a page name to display the page.

The check mark is displayed in the Page Manager.

**Figure 4.17** Page Status and Follow-up Flag

## Schedule and Execute

For information about scheduling and executing a campaign group, see Chapter 7, “Scheduling Campaigns and Communications for Execution,” on page 329.

## Add Campaigns to a Campaign Group

If you have permission to edit a campaign, you can add the campaign to the campaign group on the Members page.

*Figure 4.18 Members Page*

Name	Code	Folder	Status	Start	End	Last Executed	Date Published	Delete
Campaign14922	CAMP14922	Campaigns	Designing					
Staged Campaigns	CAMP10305	Campaigns	Designing					

Click to add a campaign to the list of members. To view the contents of one or more campaigns, select the campaign names and click .

After a campaign is added to a campaign group, some components in the campaign are disabled. The following restrictions are in effect when you open a member campaign:

- The Budget page, Schedule page, and Optimization Settings page are Read-only.
- On the Execution page, you cannot make changes to schedules. You cannot synchronize schedules.
- Changes that are made to control group settings result in unoptimized counts. Campaigns that have unoptimized counts cannot be executed.
- Individual communications can be executed if they are within a non-optimization campaign group.

If you use **Save as** to save a member campaign, the restrictions do not affect the saved copy of the campaign.

## Set Access Permissions for the Campaign Group

The Permissions page displays the names of users and groups who have access.

*Figure 4.19 Permissions*

Groups:		
Name	Permission	
Designers	Approve	
Managers	Approve	

Users:		
Name	Permission	
Gloria Drew	Approve	
Henri LeBleu	Edit	

To add a user to the list, click and select a user. To add a group to the list, click and select a group.

To view the members of a group, select the group and click .

To change the permission of a user or user group, click the **Permission** cell and select the permission. By default, all users and groups that you select have Edit permission.

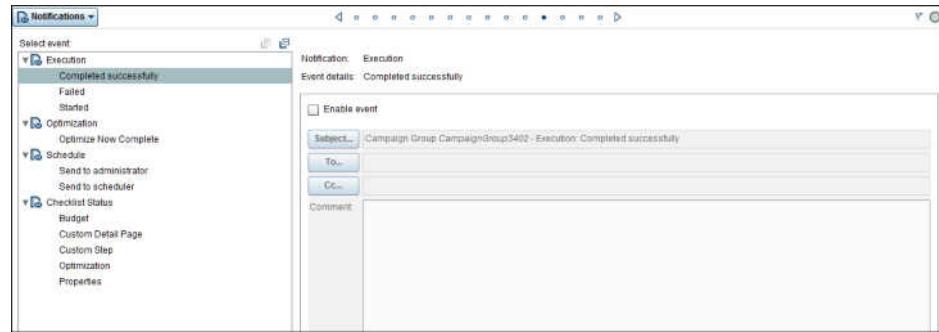
In general, the permission that you set for an individual user overrides the permission that is set for a group that the user is a member of. For more information about the relationship of permissions between users and groups, see *SAS Intelligence Platform: Security Administration Guide* at [SAS Intelligence Platform](#).

## Email Notifications

### Set an Email Notification

If notifications are enabled for the current business context, you can use the Notifications page to notify users of an event such as a change in checklist status. You can override the notification details that were defined in the business context.

*Figure 4.20 Notifications*



Click to expand the list of events. Click to collapse the list.

Select the type of notification and the event for which the email message is sent.

Select **Enable event** in order to be able to modify the subject line and to select addressees. In order to receive the notification, the correct email addresses must be assigned to the users in the User Manager plug-in in SAS Management Console.

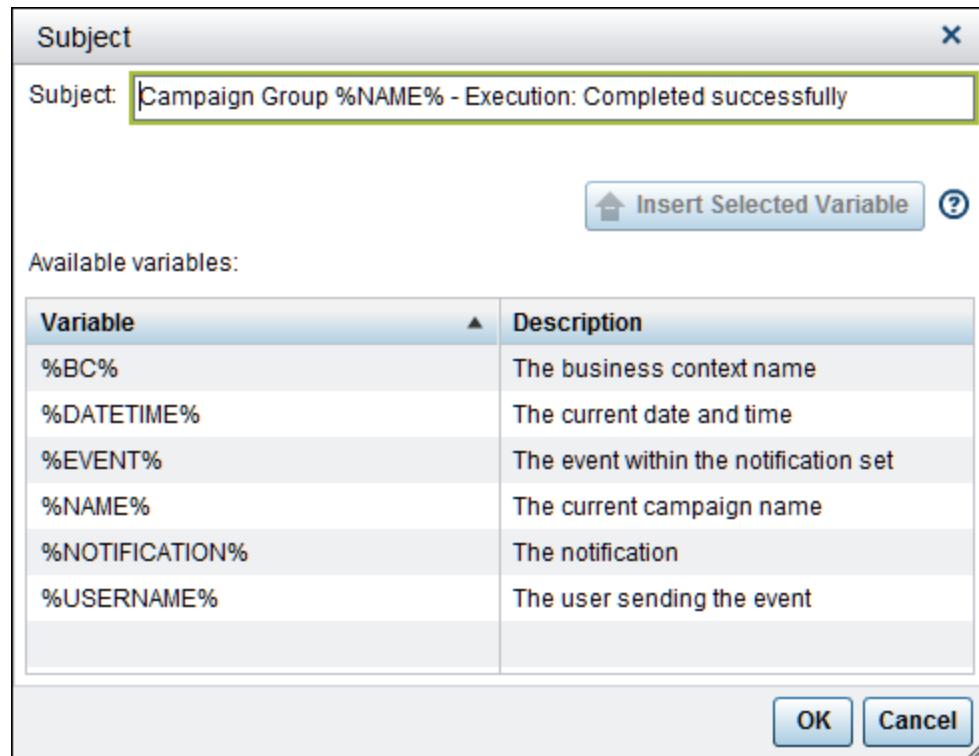
Click **To** and **Cc** to designate the recipients of the message.

Enter any additional information in the **Comment** field.

### Change the Subject

Click **Subject** to change the subject line of the email message.

Figure 4.21 Subject Window

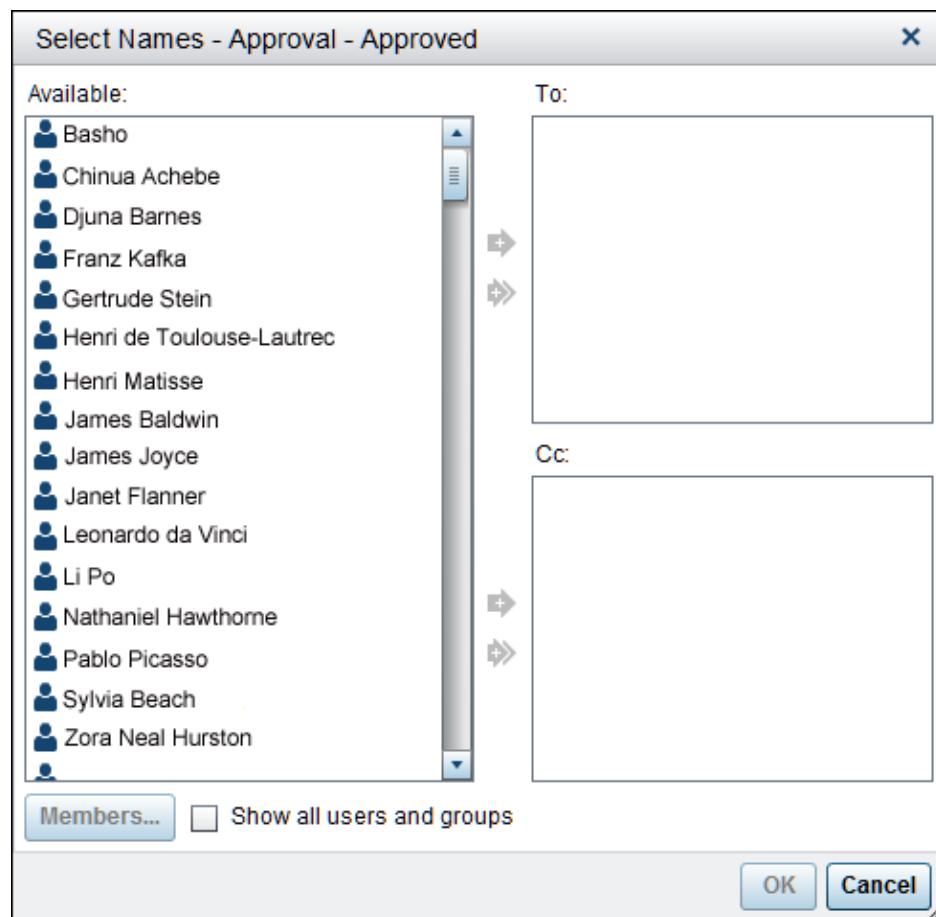


You can edit the subject field.

To insert a variable in the subject line, place the pointer at the location in the **Subject** field where you want to insert the variable. Select a variable and click **Insert Selected Variable**. In the email message, the variable is replaced by the text that is indicated in the Description column. For example, in Campaign21476, if the **Subject** field contains **Campaign %NAME% - Execution: Failed**, the subject of the email message would be **Campaign Campaign21476 - Execution: Failed**.

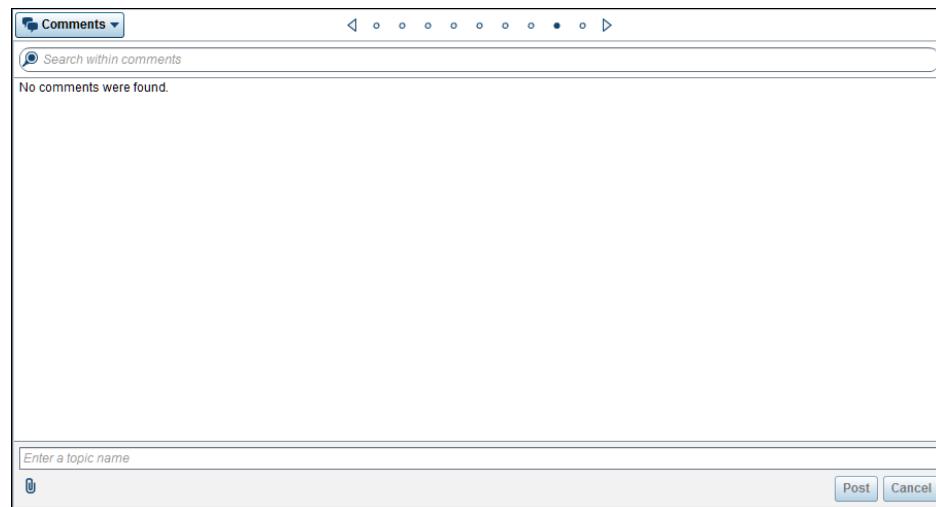
### Select Users and Groups

Select names and use the arrows to add users and groups to the **To** and **Cc** lists.

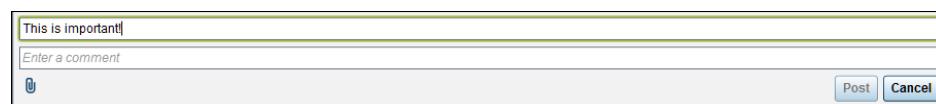
**Figure 4.22** Select Names for Email Notification

## Add Comments

On the Comments page, you view and add comments. You add comments after saving.

**Figure 4.23** Comments

Enter a topic name to add a new comment.

**Figure 4.24** New Topic

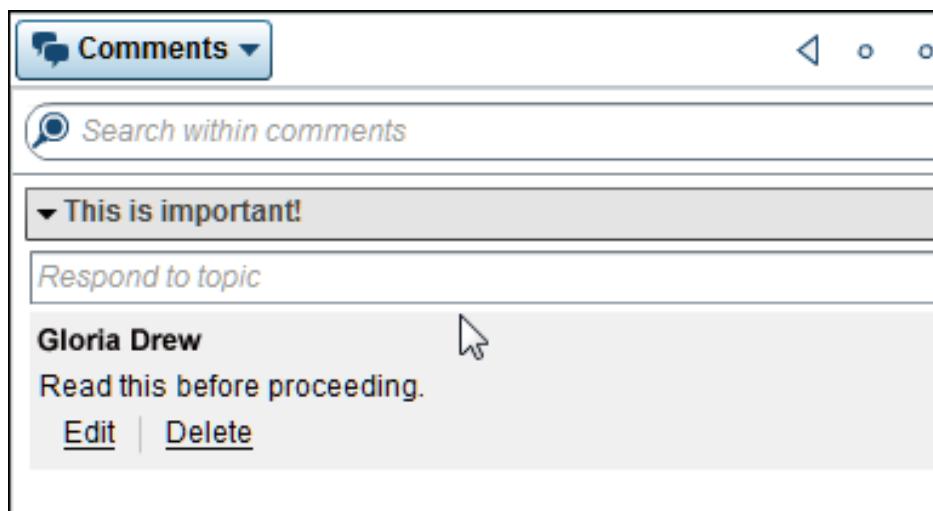
Enter the text of the new comment.

**Figure 4.25** Comment Text

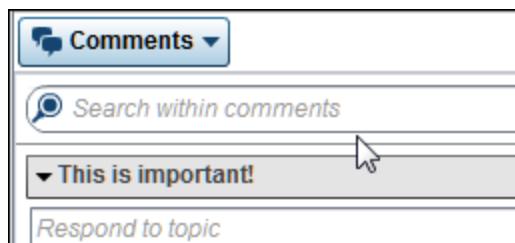
Click **Post** to post the comment. Your new comment is displayed on the Comments page. You can add comments even if you do not have Edit permission.

Click to add an attachment such as an image or a document.

To reply to an existing comment, type text in the field below the comment title.

**Figure 4.26** Comments List

Type in the search field to find text in comments.

**Figure 4.27** Search Comments

## Add Attachments

On the Attachments page, you view and add attachments such as images or documents.

**Figure 4.28** Attachments

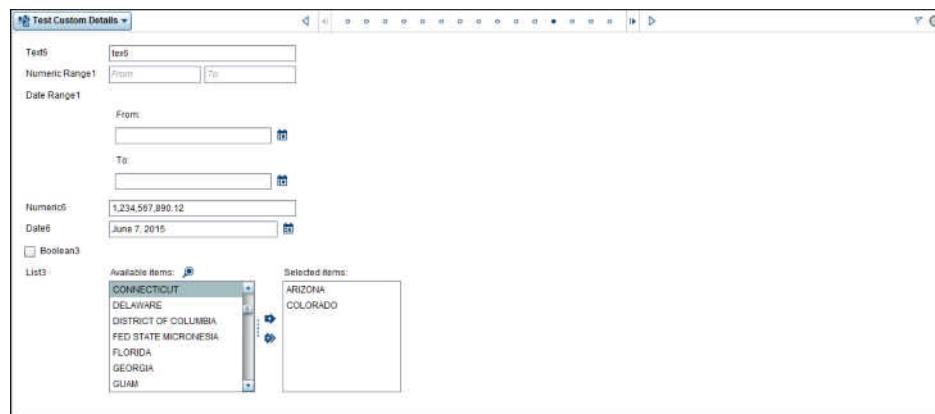
Name	Added By	Date Added
Desert.jpg	Gloria Drew	Sep 26, 2014 03:33 PM

Click **+** to select a file to attach.

## View Custom Details

Depending on the campaign group definition, there might be one or more pages where you enter values for custom details.

Figure 4.29 Custom Details



The title of the page is set in the campaign group definition.

The next to a custom detail displays information about the associated custom detail tag.

## Specify Optimization Settings

### Overview of Specifying Optimization Settings

If the campaign group can be optimized, the Optimization Settings page displays the criteria for optimization. For more information, see “[Optimizing Campaigns](#)” on page 154.

When a member campaign is removed from a campaign group, the campaign retains the optimization settings for the group. The campaign group retains its optimization method when campaigns are added, regardless of the optimization method of the member campaigns.

For information about dynamic treatments and optimization settings, see “[Treatment Summary Count](#)” on page 219.

### Optimization with SAS Marketing Automation Only

If you are optimizing campaign groups and SAS Marketing Optimization is not installed at your site, you can use the following optimization method and settings.

#### Priority-based method

For more information, see “[Select an Optimization Method](#)” on page 201.

#### Priorities

For more information, see “[Set Priorities](#)” on page 203.

#### Budgets

For more information, see “[Specify Budget Information](#)” on page 204.

#### Channels

For more information, see “[Specify Channel Usage](#)” on page 204.

#### Inclusions

For more information, see “[Specify Mandatory Inclusions for Optimization](#)” on page 205.

## Contacts

For more information, see “[Set Maximum Number of Contacts](#)” on page 205.

## **Optimization with SAS Marketing Automation and SAS Marketing Optimization**

If SAS Marketing Optimization is installed at your site, the following methods and settings use SAS Marketing Optimization to optimize SAS Marketing Automation campaign groups.

### **Analytical scenario and Priority-based scenario** methods

The **Analytical scenario** and **Priority-based scenario** methods are available for cell-level optimizations. **Analytical scenario - treatment optimization** is the only optimization method that is available for treatment-level optimization.

## Scores

For more information, see “[Assign Scores](#)” on page 202.

## Priorities

For more information, see “[Set Priorities](#)” on page 203.

## Budgets

For more information, see “[Specify Budget Information](#)” on page 204.

## Channels

For more information, see “[Specify Channel Usage](#)” on page 204.

## Inclusions

For more information, see “[Specify Mandatory Inclusions for Optimization](#)” on page 205.

## Contacts

For more information, see “[Set Maximum Number of Contacts](#)” on page 205.

## Custom Details

For more information, see “[Specify Custom Details](#)” on page 206.

The following pages use SAS Marketing Optimization to optimize SAS Marketing Automation campaign groups.

## Optimization Group Data

For more information, see “[Manage Optimization Group Data](#)” on page 212.

## Optimization Scenarios

For more information, see “[Display Optimization Scenarios](#)” on page 216.

## **Select an Optimization Method**

Click  to select one of the following methods:

### **Analytical scenario**

If you select **Analytical scenario**, you can set the score for each communication cell or treatment. A full optimization finds the best possible solution, based on an analytical objective measure. The campaign group that contains the campaign is assigned a preferred optimization scenario in SAS Marketing Optimization. This is the default method if SAS Marketing Optimization is installed at your site. **Analytical scenario - treatment optimization** is the only optimization method that is available for treatment-level optimization.

### Priority-based scenario

If you select **Priority-based scenario**, you can specify priorities as input into the optimization process. The optimization is based first on campaign priorities and then on customer rankings. With the priority-based scenario method, you can also add more constraints and contact policies. The campaign group that contains the campaign is assigned a preferred optimization scenario in SAS Marketing Optimization. The priority-based scenario method is available if SAS Marketing Optimization is installed at your site.

### Priority-based

If you select **Priority-based**, you can specify priorities as input into the optimization process. No scenario is assigned in SAS Marketing Optimization. The optimization is based first on campaign priorities and then on customer rankings. With the priority-based method, you can use only the constraints and contact policies that you create in the campaign group. This is the default method if SAS Marketing Optimization is not installed at your site.

You can change methods from the Priority-based scenario method to the Analytical scenario method without deleting optimization data or scenarios. You can also change methods from the Priority-based to the Priority-based scenario or the Analytical scenario method without deleting optimization data or scenarios. If you change from the Analytical scenario method to any other method, or from the Priority-based scenario method to the Priority-based method, you must delete all scenarios. The optimization data is deleted.

## Assign Scores

If you have selected **Analytical scenario**, you assign score values to communication cells and treatments on the Scores page. The scores are included in the optimization process. Score columns are set in the current business context.

**Figure 4.30 Scores in Cell-Level Optimization**

The screenshot shows a table titled "Cell Scores (33 of 33)" under the "Analytical scenario" method. The table has columns for Name, Code, and exp\_val. The data includes:

Name	Code	exp_val
Campaign14922	CAMP14922	discount123
Communication	COMM25330	
Cell	CELL38620	
Refine Output Campaign	CAMP12952	
Communication Nod...	COMM21341	
Age Cell Node	CELL35202	
Communication Nod...	COMM21339	
Gender Cell Node	CELL35204	
Distance Cell Nod...	CELL38472	
Split191010Split1919		
Split1015	Split1015	
Cluster 1	GenericCell	
Cluster 2	GenericCell	
Cluster 3	GenericCell	
Outliers	GenericCell	
Split1012	Split1012	
	GenericCell	

**Figure 4.31 Scores in Treatment-Level Optimization**

Treatment Scores (12 of 12)		Search: none				
	Name	Code	Exp_Val	Discount123	Score1	Score2
▼ Optimization Campaign...	CAMP14652					
▼ Communication	COMM25296					
▼ Cell	CELL61317					
ABC	TRT1267					
Beach Flyer	TRT45					
Citi Advantage P...	CAPS					
Citi Diamond Pre...	CDP					
▼ Optimization Campaign...	CAMP14654					
▼ Communication	COMM25298					
▼ Cell	CELL61319					
ABC	TRT1267					

To enter a value, select a cell and enter the value or click to select a score.

Alternatively, select one or more cells and click to select a score to apply to the selected cells.

You can select the same score data item for more than one cell. The resulting score values in SAS Marketing Optimization are assigned to the customer, based on the specific cell or offer.

All cells must have a score value for the same score. For example, if one communication cell has a value for Exp\_Value, the communication cells in the campaign group must have a value for Exp\_Value. Scores that are set for a campaign group overwrite any existing scores that have been set for the individual campaigns in the group.

## Set Priorities

If you selected the **Priority-based scenario** or the **Priority-based** method, you set the priority for each cell on the Priorities page.

**Figure 4.32 Priorities**

Cell Priorities (33 of 33)   Search: none			
Priorities	Campaign	Communication	Cell
Budgets	Campaign 14922	Communication	Cell
Channels			
Inclusions			
Contacts	Refine Output Cam.	Communication N.	Age Cell Node
Custom Details			
	Refine Output Cam.	Communication N.	Gender Cell No.
	Refine Output Cam.	Communication N.	Distance Cell N.

Select a cell and click to assign a priority. You can assign a priority to multiple cells by selecting multiple rows and clicking . Priority values do not have to be sequential or unique. For example, if there are two cells, you can assign one cell a priority of 5 and another cell a priority of 2. Lower values indicate higher priorities. Cells without priority values are assigned the lowest priority.

The ranking of subjects within any individual communication is controlled by the sort order that has been defined for the first export file within that communication. Although it is possible to have different sort orders on subsequent export files within the communication, these will not influence the optimization process.

In the **Grid** view, click and select **Names**, **Codes**, or **Names and Codes** to display for the campaign, communication, and cells. In the **Hierarchy** view, select to display all of the rows.

## Specify Budget Information

The Budgets page displays the budget constraints to use in the optimization. The page displays the values for the cells or treatments in each member campaign. You can edit these values, and you can set values for each campaign and communication cell or treatment, as well as for the campaign group.

**Figure 4.33** Budgets

Scores	Budget	Search: none					
Budgets	Name	Code	Minimum Offers	Maximum Offers	Minimum Budget	Maximum Budget	Unit Cost
Channels	Group	CAMP11473				8	
Inclusions	opt 3	COMM17813				8	
Contacts	new	CELL49923					
Custom Details	Cell	TRT73				9	
	Beach Discount	CAMP11471					
	Opt2	COMM17814					
	new2	CELL49921					
	Cell	TRT45				8	
	Beach Flyer						

In the **Minimum Offers** and **Maximum Offers** columns, specify the minimum and maximum number of offers that can be made.

In the **Minimum Budget** and **Maximum Budget** columns, specify the minimum and maximum budget for all of the offers. The minimum budget and minimum offer can be specified only with analytical scenarios.

In the **Unit Cost** and **Unit Usage** columns, specify the unit cost and usage for communication cells.

Click to set values for the selected rows.

Click to clear the values from selected rows.

## Specify Channel Usage

On the Channels page, you specify the minimum and maximum usage limits for channels that are used by the campaign group.

**Figure 4.34** Channels

Priorities	Channels (3 of 3)	Search: none	Search
Budgets	Channel	Maximum Usage	
Channels	Agent		
Inclusions	Catalog		
Contacts	Mail		
Custom Details			

Show only channels used in member campaigns

Enter values in the **Minimum Usage** and **Maximum Usage** cells for the channels that you want to use.

The list of channels is all of the channels that are available in SAS Marketing Automation. Click **Show only channels used in member campaigns** to limit the list.

When an optimization group is created, only data for channels that are used within communications in the member campaigns are passed to SAS Marketing Optimization. Supplying values for channels that are not used in member campaigns does not affect optimization. However, if a campaign that does include an unused channel is added later, the specified channel values are included in the optimization.

### Specify Mandatory Inclusions for Optimization

On the Inclusions page, you specify mandatory inclusions at the cell or treatment level in an optimization.

*Figure 4.35 Inclusions*

Cells (2 of 2) Search: none			
	Name	Code	Mandatory
	opt 3	CAMP11473	<input type="checkbox"/>
	new	COMM17813	<input type="checkbox"/>
	Cell	CELL49923	<input type="checkbox"/>
	Beach Discoun	TRT77	<input checked="" type="checkbox"/>
	Opt2	CAMP11471	<input type="checkbox"/>
	new2	COMM17814	<input type="checkbox"/>
	Cell	CELL49921	<input type="checkbox"/>
	Beach Flyer	TRT46	<input type="checkbox"/>

Select **Mandatory** to require that an offer be included in the optimization. Select the **Exclude from** check boxes if you do not want the mandatory inclusions to apply to constraints or contact policies.

Click to set inclusions for the selected rows.

### Set Maximum Number of Contacts

On the Contacts page, you specify the maximum number of contacts per subject.

*Figure 4.36 Contacts*

Specify maximum number of contacts per subject (optional) <a href="#">?</a>		
Maximum Contacts Search: none		
	Name	Code
	Group	
	opt 3	CAMP11473
	new	COMM17813
	Cell	CELL49923
	Opt2	CAMP11471
	new2	COMM17814
	Cell	CELL49921

Select **Display maximum number of contacts for each communication** to display the maximum number of contacts for each communication cell, if that value has been set. If the data contains values for communications, this view is expanded by default to display the names of the communication cells.

Click to set maximum contacts for the selected rows.

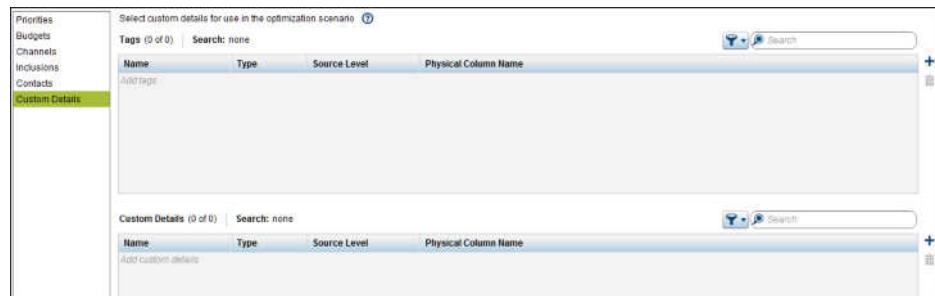
Click  to clear the values from selected rows.

This maximum number is the upper limit. A lower limit can be specified in SAS Marketing Optimization.

### Specify Custom Details

On the Custom Details page, you select custom details to use in the optimization scenario. These custom details are passed to SAS Marketing Optimization when the campaign group is optimized. In SAS Marketing Optimization, custom details are used in filters for constraints and contact policies. Custom details are not available with the Priority-based method.

*Figure 4.37 Custom Details*



Click  to select a custom detail or custom detail tag. You can select custom detail tags and custom details that are associated with campaigns or with communications. Only text and numeric custom details are available to be selected.

Select a cell in the **Physical Column Name** column to edit the column name that is supplied to SAS Marketing Optimization.

### Example: Use Custom Details to Derive Analytical Scores for Specific Campaigns

Analytical scores might be available in SAS Marketing Optimization for the type of campaign, but not for a specific campaign. For example, the campaign types might be **Internet Services**, **Phone Services**, and **Wireless Services**. You can use custom details to specify the service type for each specific campaign in SAS Marketing Automation and then derive the corresponding analytical score in SAS Marketing Optimization.

To use custom details to set the service type for specific campaigns:

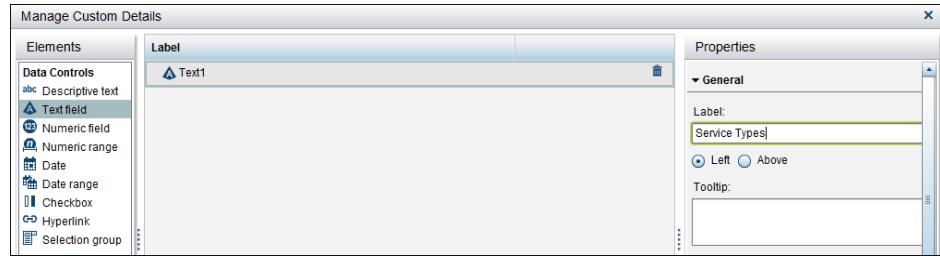
- 1 In the Definitions workspace in SAS Customer Intelligence Studio, create a custom detail group definition.
  - a On the Custom Details page, select **Manage custom details**.

*Figure 4.38 Manage Custom Details*



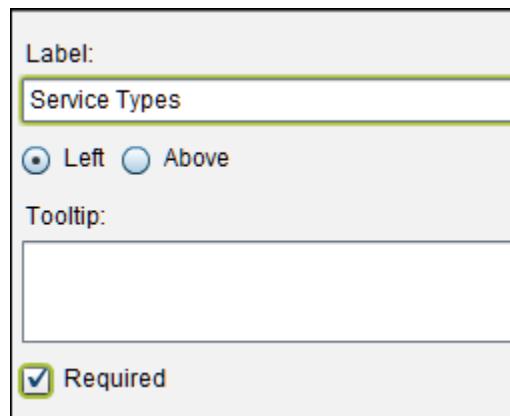
- b In the Manage Custom Details window, select **Text field** and edit the label.

*Figure 4.39 Service Types Label*



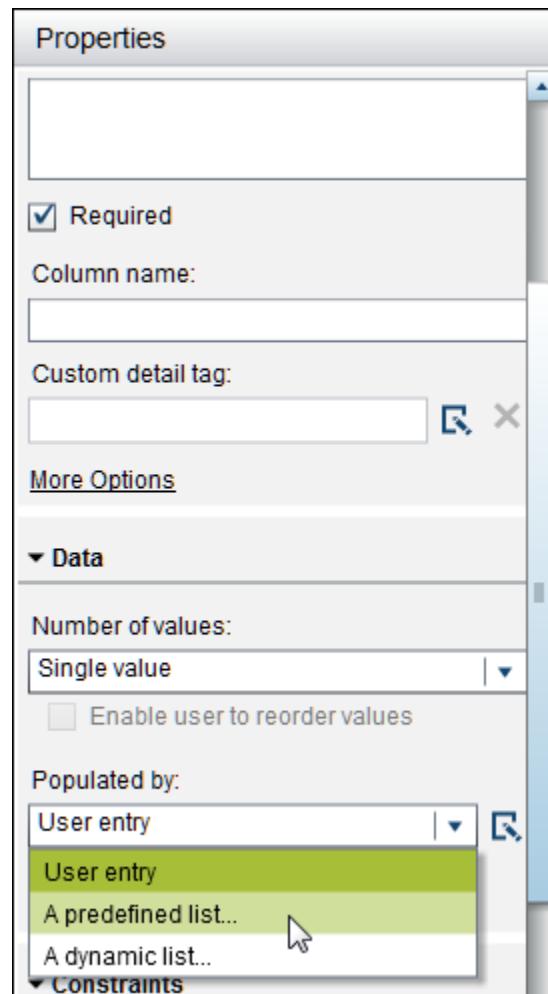
- c The service type is a required value. Select **Required**.

*Figure 4.40 Required Value*

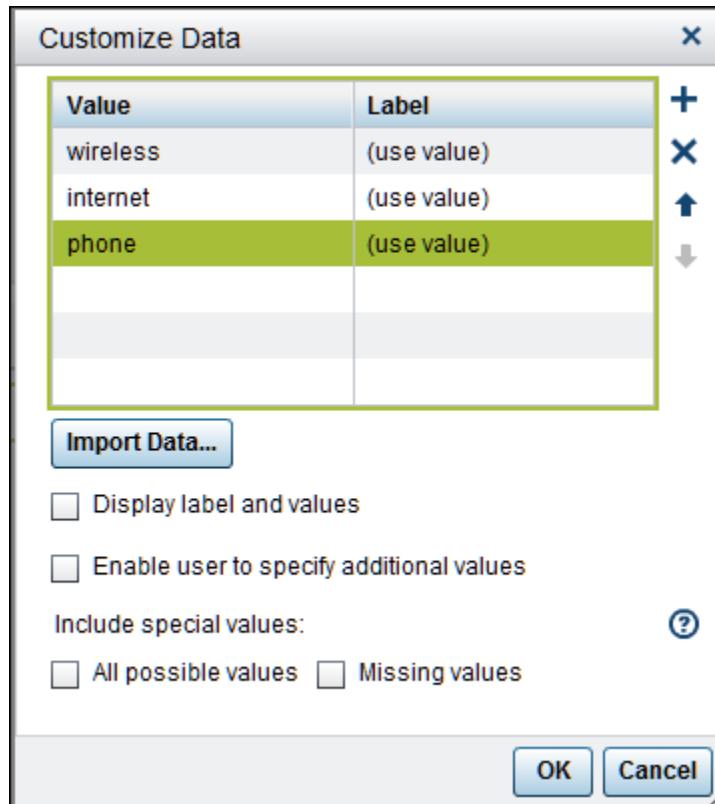


- d Select **A predefined list** from the **Populated by** field.

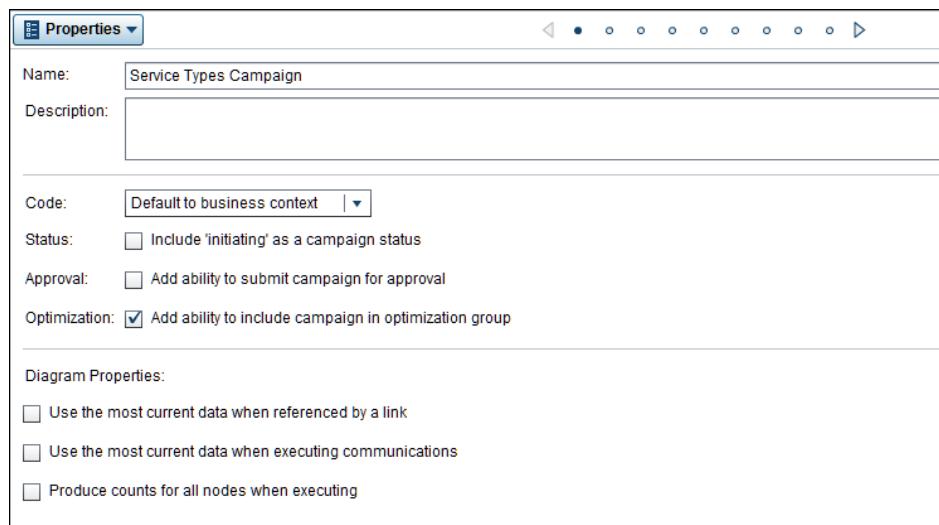
Figure 4.41 Predefined List



- e Enter the service types as items in the predefined list.

*Figure 4.42 Predefined List Items*

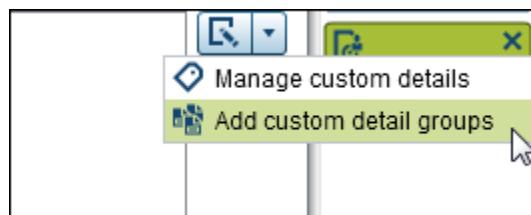
- 2 Create a selection campaign definition that includes the Service Types custom detail group.
  - a On the Properties page, select **Add ability to include campaign in optimization group**.

*Figure 4.43 Create Optimization Campaign*

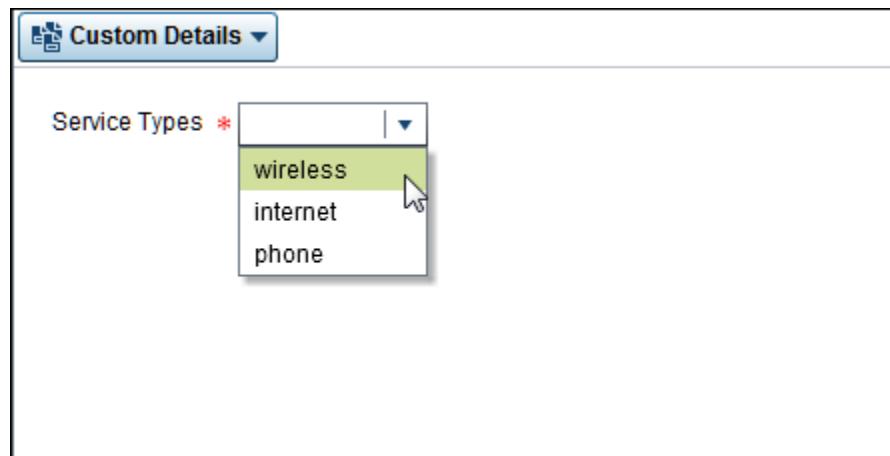
- b On the Custom Detail Pages page, click **+** to add a custom details page.

**Figure 4.44** Add Custom Details Page

- c Add the custom detail group that you created.

**Figure 4.45** Add Custom Detail Group**Figure 4.46** Service Types Custom Detail Group

- 3 Create a campaign that uses the campaign definition that you created. Select a service type on the Custom Details page.

**Figure 4.47** Select a Service Type

- 4 Create a campaign group that includes the custom details for the new campaign.

- a Add the campaign as a member.

**Figure 4.48** Add Member Campaign

Name	Code	Folder	Status	Start	End	Last Executed	Date Published	Date Modified
Wireless Campaign	CAMP15493	Campaigns	Designing					Nov 7, 2014 04:00 PM

- b Add the custom detail to the Optimization Settings page.

**Figure 4.49** Add Custom Details to Optimization Settings

The screenshot shows the 'Custom Details' section of the SAS Marketing Optimization interface. On the left, there is a sidebar with links: Scores, Budgets, Channels, Inclusions, Contacts, and Custom Details, which is currently selected. The main area has two tables.

The top table is titled 'Select custom details for use in the optimization scenario'. It has columns: Name, Type, Source Level, and Physical Column Name. There is one row with the following values:

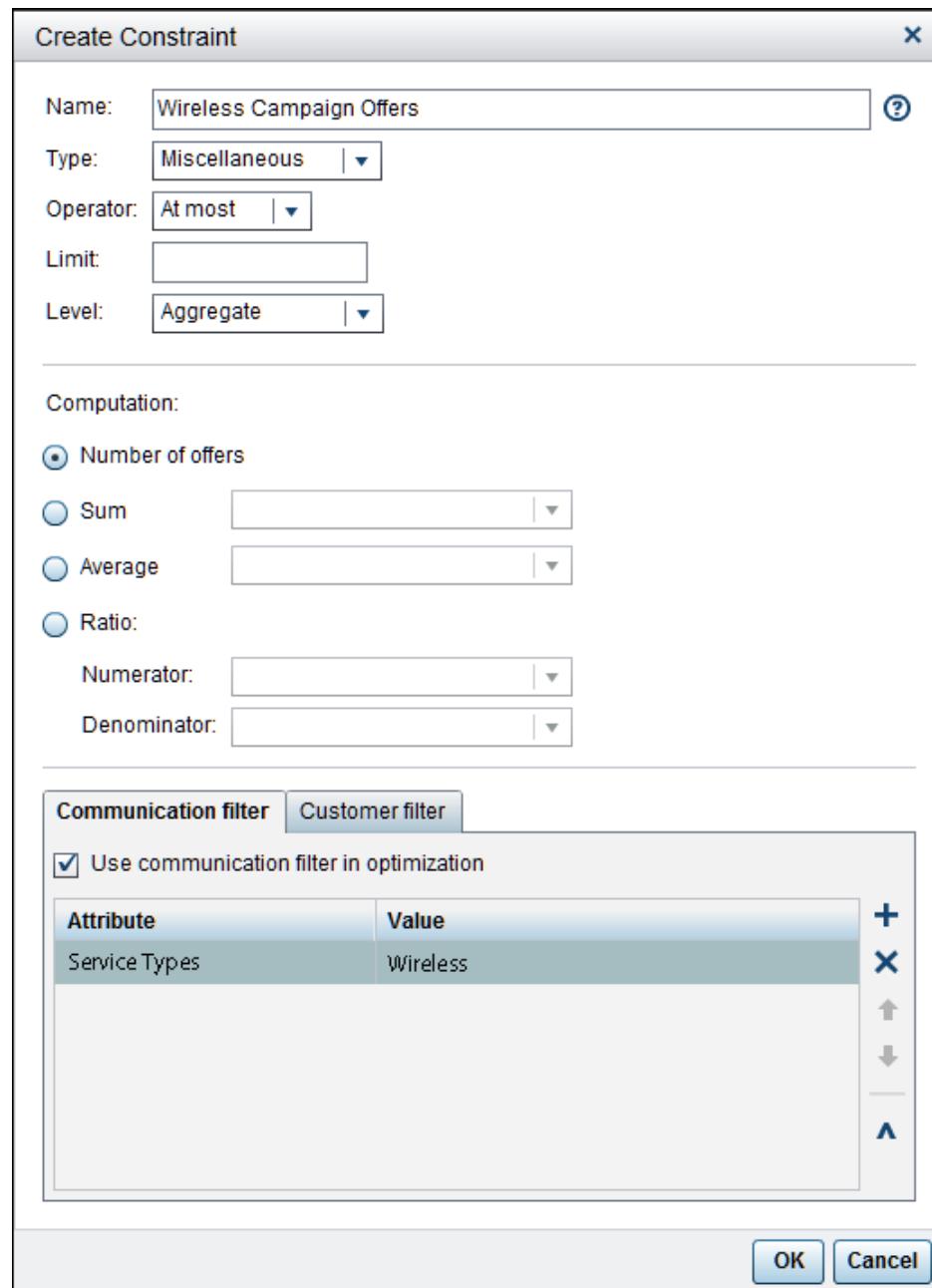
Name	Type	Source Level	Physical Column Name
Add tags			

The bottom table is titled 'Custom Details (1 of 1)'. It also has columns: Name, Type, Source Level, and Physical Column Name. There is one row with the following values:

Name	Type	Source Level	Physical Column Name
Service Types	Text	Page: Custom Details	service_types

- 5 When you create a new scenario in SAS Marketing Optimization, create a constraint that uses the custom detail in its communication filter.

Figure 4.50 Use Custom Detail in Constraint



These campaign custom details can apply wherever communication filters are used (for example, in contact policy limits and in blocking policies).

## Manage Optimization Group Data

### Overview of Managing Optimization Group Data

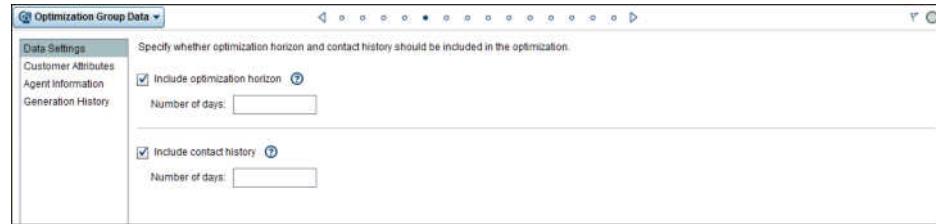
If you have selected the Analytical scenario or Priority-based scenario method on the Optimization Settings page, you can define the settings for the data that is used by an optimization campaign group. The settings include the optimization horizon and contact history, the customer attributes to be included in the data

generated for optimization, and agent information. A history of data generation status is maintained.

## Specify Data Settings

On the Data Settings page, you set the optimization horizon and contact history.

*Figure 4.51 Optimization Group Data*



The optimization horizon is a forward-looking time period that is used by the optimization. Only campaigns that are scheduled to execute within the horizon are included in the optimization. Setting the optimization horizon enables the optimization to evaluate campaigns that are outside the optimization window.

For example, optimization can occur daily, but the optimization horizon is 14 days. Suppose that there is a contact policy that limits customer contact to once every 14 days. In that case, the optimization that occurs today could include a campaign with a better offer that is scheduled to execute in 12 days.

The optimization horizon is used to expand the number of campaigns that are included in an optimization.

Select **Include optimization horizon** and enter the number of days. If you do not select **Include optimization horizon**, all campaigns that are scheduled to execute are included in the optimization.

The contact history is a record of contacts that have been made with customers. You can specify the number of days in the past, so that any record of contacts within that range is included in the optimization. If a contact has occurred before the value is specified, the record of that contact is not included in the optimization.

A contact policy can prescribe the number of contacts that can occur within the optimization. For example, the contact policy can limit communications to one contact per customer every 30 days. If the contact history value is 30 days, and a specific customer was contacted 31 days previously, there would be no contact history for that customer in the optimization data. If the contact policy is once every 30 days, and a special offer is made every 90 days, you might want to set the contact history value to 90 to make sure that customers do not receive the same offer twice within a 90-day period.

The contact history value should be set to cover the longest contact policy range. For example, you might have some contact policies that cover 7 days, some that cover 23 days, and some that cover 45 days. The contact history should contain at least 45 days. Do not set the contact history value to be larger than necessary. Processing contact history can take a long time.

Select **Include contact history** and enter the number of days.

## Select Customer Attributes

Customer attributes are used by SAS Marketing Optimization in customer filters, calculated measures, objective measures, and other areas.

On the Customer Attributes page, you select the customer attributes to associate with the optimization group.

**Figure 4.52** Customer Attributes



The attributes are data items that are tagged as customer attributes in the information map for the current business context.

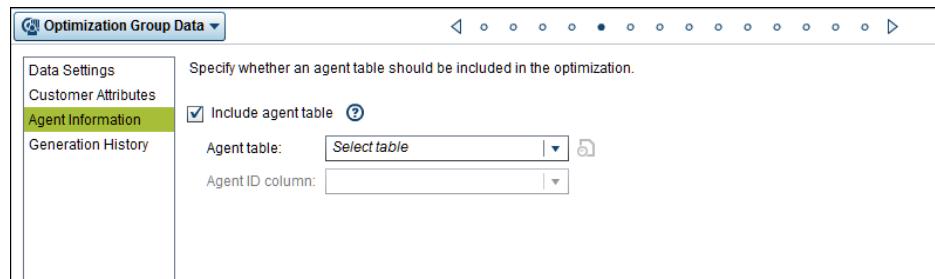
## Include Agent Information

In SAS Marketing Optimization, you can designate communications using an agent contact as the outbound channel (for example, a personal banker relationship with the customer). In this case, each customer must be assigned to an agent, and only the assigned agent can contact the customer for the particular communications that use the agent. The agent table contains information about the capacity of each agent in each time period.

You can include information from an agent table if the information map for the current business context has agent information that is mapped to the customer table. The agent table must be registered to an agent library in SAS Management Console.

You select an agent table on the Agent Information page.

**Figure 4.53** Agent Information



Include the agent table only if any of the communications require a specific agent to contact a given customer. To include agent information in the

optimization, select **Include agent table** and select a table and an Agent ID column.

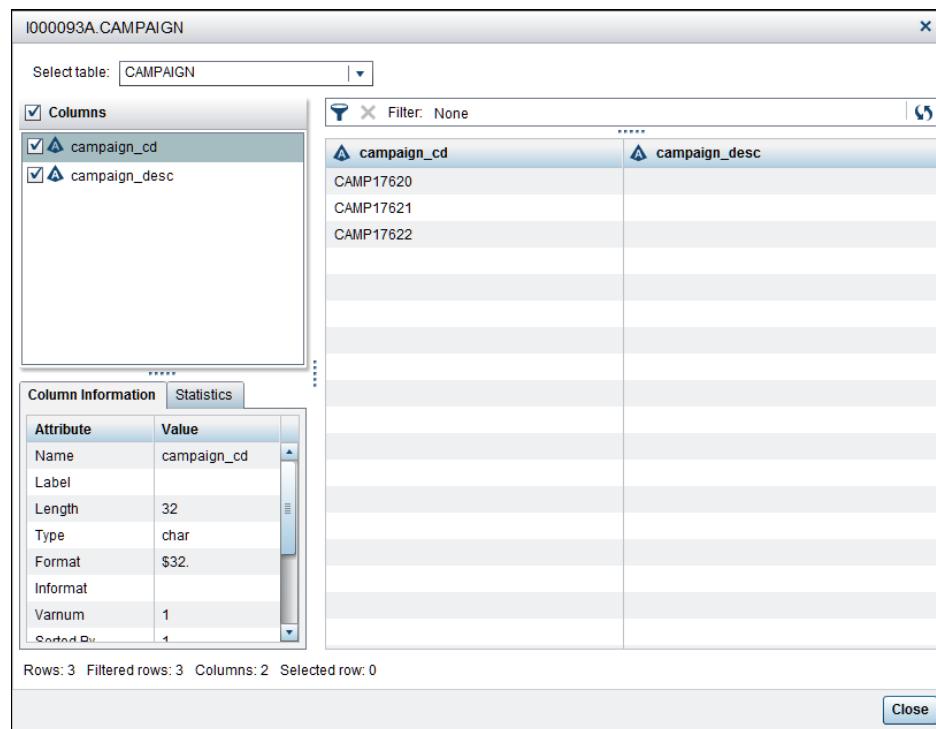
Click  to view the contents of the table.

### Generate Optimization Group Data

You create your optimization group data by clicking **Generate Optimization Data** to generate optimization data tables. To include any changes to the optimization data, click **Refresh Optimization Data** to refresh the data in the tables that are inside the optimization horizon.

When the tables have been generated, click  in the toolbar to view the contents.

*Figure 4.54 Contents of Generated Table*



The screenshot shows a software interface for viewing table contents. The title bar says "1000093A.CAMPAIGN". On the left, there's a sidebar with a "Select table:" dropdown set to "CAMPAIGN" and a "Columns" section containing two checked items: "campaign\_cd" and "campaign\_desc". Below this is a "Column Information" table with the following data:

Attribute	Value
Name	campaign_cd
Label	
Length	32
Type	char
Format	\$32.
Informat	
Varnum	1
Sorted By	1

The main area displays the table data with two columns: "campaign\_cd" and "campaign\_desc". The data rows are:

campaign_cd	campaign_desc
CAMP17620	
CAMP17621	
CAMP17622	

At the bottom, status information is shown: "Rows: 3 Filtered rows: 3 Columns: 2 Selected row: 0". A "Close" button is at the bottom right.

Select a table to view its contents.

**Note:** Optimization data generation fails if a communication code is longer than 32 characters.

### View Generation History

After you have generated optimization data, you view the history on the Generation History page.

**Figure 4.55** Generation History

Missing values are displayed for cells with the **Mandatory** and **Exclude from Constraints** check boxes selected on the Inclusions page of the Optimization Settings page.

# Display Optimization Scenarios

A scenario in SAS Marketing Optimization is used to define an optimization problem in business terms. For example, within a scenario, you can apply suppression rules to the customer database, create new numerical measures to use in calculations, define the objective and constraints for the optimization, and assign various contact policy restrictions.

If you have selected the Analytical scenario or the Priority-based scenario method, the Optimization Scenarios page displays the scenarios that are associated with the campaign group.

### **Figure 4.56 Optimization Scenarios**

The page lists the scenarios for which you have View or Edit permission.

Click **Create New Scenario** to create another scenario. A new scenario cannot be created until optimization group data has been generated. For more information, see [“Generate Optimization Group Data” on page 215](#).

For information about creating scenarios, see *SAS Marketing Optimization User's Guide*.

## **View Summary Counts**

The Selection Summary page displays counts for optimization and non-optimization campaign groups. In an optimization campaign group, you can compare the pre-optimization and post-optimization counts at the campaign, cell,

package, and channel level. Counts are not updated after the campaign group is opened. To view the most current counts, close and reopen the campaign group.

## Cell Summary Count

The **Cell Summary** tab displays the counts for all of the marketing cells in the member campaigns.

*Figure 4.57 Cell Summary Tab, Non-optimization Campaign Group*

Name	Cell Code	Cell Count	Last Run Date	Channels
Cell	CELL46186			Catalog
Cell	CELL45187			Catalog
Cell	CELL46188			Mail

*Figure 4.58 Cell Summary Tab, Cell-Level Optimization Campaign Group*

Name	Cell Code	Unoptimized Cell Count	Last Run Date	Channels
Cell(14)	CELL79012	87,283		Print Ad
Cell(4)	CELL79014			Print Ad

The **Cell Summary** tab for a treatment-level optimization campaign group displays further optimization information.

*Figure 4.59 Cell Summary Tab, Treatment-Level Optimization Campaign Group*

Name	Cell Code	Unoptimized Cell Count	Dropped by Optimization	Optimized Count	Last Run Date	Channels
Cell	CELL61317					Agent
Cell	CELL61318					Agent
Cell	CELL61319					Agent

The cell summary count specifies the number of subjects that received at least one offer for a particular cell.

## Package Summary Count

The **Package Summary** tab displays a hierarchical view of campaigns, communications, and cells.

*Figure 4.60 Package Summary Tab, Non-optimization Campaign Group*

Name	Code	Package Code	Initial Count	Final Count	Holdouts
Banking Campaign	CAMP17231				
Communication	COMM29098				
Cell	CELL46186	PKG23750			
Insurance Campaign	CAMP17230				
Communication	COMM29099				
Cell	CELL46187	PKG23752			
Vacation Campaign	CAMP17232				
Communication	COMM29100				
Cell	CELL46188	PKG23754			

The Initial Count column contains the package count before the holdout control group population is subtracted. The Final Count column contains the count after the holdout control group population is subtracted. The Holdouts column lists the holdout control group population for each cell.

If the campaign group has been optimized, the unoptimized and optimized counts are listed.

**Figure 4.61** Package Summary Tab, Cell-Level Optimization Campaign Group

Name	Code	Package Code	Unoptimized Count	Optimized Count	Percentage Dropped
OptBanking	CAMP17820				
Communication	COMM29468				
Cell	CELL46637	PKG24021			
OptFinance	CAMP17622				
Communication	COMM29470				
Cell	CELL46639	PKG24025			
OptInsurance	CAMP17821				
Communication	COMM29469				
Cell	CELL46638	PKG24023			

The Unoptimized Count column contains the pre-optimization count for the cell. The Optimized Count column contains the final count after the holdout control group population has been subtracted and optimization has occurred. The Percentage Dropped column includes both the holdout control group population and the counts that are dropped after optimization.

**Note:** Holdout control groups cannot be used in treatment-level optimization.

## Channel Summary Count

The **Channel Summary** tab displays the communication package counts, based on channels.

**Figure 4.62** Channel Summary Tab, Non-optimization Campaign Group

Name	Code	Initial Packages	Final Packages	Holdouts
Catalog	_CT			
Communication	COMM29088			
Communication	COMM29099			
Mail	_ML			
Communication	COMM29100			

The counts reflect that each customer within each input cell receives a package. There might be duplicates within the package counts. This tab does not display the de-duplicated counts.

In a non-optimization campaign group, the Initial Packages column contains the count for the channel or communication before the holdout control group population is subtracted. The Final Packages column contains the count after the holdout control group population is subtracted. The Holdouts column lists the holdout control group population for each channel or communication. The communication row counts are summations of the holdout control group population for each cell that feeds into a communication. The channel row counts are summations of the communication counts for that channel.

**Figure 4.63** Channel Summary Tab, Cell-Level Optimization Campaign Group

Name	Code	Unoptimized Packages	Optimized Packages	Percentage Dropped
Catalog	_CT			
Communication	COMM29468			
Communication	COMM29470			
Communication	COMM29469			

In a cell-level optimization campaign group, the Unoptimized Packages column contains the unoptimized count for the channel or the communication. The Optimized Packages column contains the final count after the holdout control group population has been subtracted and optimization has occurred. The Percentage Dropped column includes both the holdout control group population and the counts that are dropped after optimization.

### Treatment Summary Count

The **Treatment Summary** tab displays the counts for each treatment in a treatment-level optimization campaign group.

**Figure 4.64** Treatment Summary Tab

Name	Code	Unoptimized Count	Optimized Count	Percentage Dropped
Optimization Camp...	CAMP14652			
Communication	COMM25296			
Cell	CELL61317			
ABC	TRT1267			
Beach Flyer	TRT45			

The treatment counts displays the number of times that a specific treatment is offered in a communication.

If you change the dynamic treatment assignments in a campaign that is a member of a treatment-level optimization campaign group, the changes might not appear when the campaign group is opened. If a dynamic treatment is removed and another instance of the same dynamic treatment is added, the previously deleted treatment code and name might be used for the new treatment. When the campaign group is opened, the treatment optimization settings might not be updated for the new dynamic treatment. In this case, you must manually update the optimization settings for the new treatment.

## Validate Campaigns

You can validate campaigns to determine whether the campaign is ready to be executed. Validation is not enabled while nodes are running.

To validate a campaign, click in the toolbar.

The Validate window displays the results. If the validation fails, a message that describes the errors is displayed on the **Problems** tab.

*Display 4.49 Problems*



The **Warnings** tab displays warnings about the nodes in the diagram. Press Ctrl-A to copy all of the text in the **Warnings** tab.

If there are errors, address the errors, and click **Refresh Validation** to run the validation again.

---

## Creating Treatments

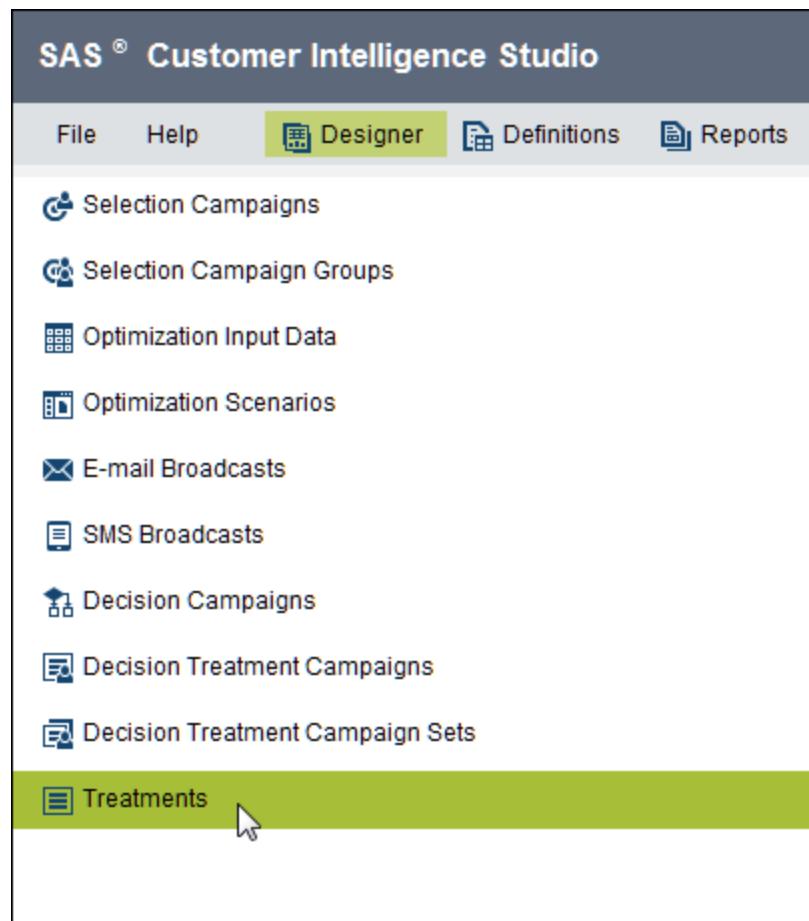
### Overview of Treatments

A treatment is a type of marketing communication, such as a coupon for a stay at a hotel. A treatment includes the format, creative content, and offer.

Treatments are often used to test the efficacy of a communication. For example, a test of treatment messages might compare an offer of 30% off the price for six months with an offer of two months free in a six-month contract.

### Create a Treatment

To create a treatment, select the Treatments category in the Designer workspace.

*Display 4.50 Treatments Category*

Click .

## Specify Treatment Details

The Properties page displays information about the treatment.

*Figure 4.65 Properties Page*

The code depends on the campaign definition. The code can be generated automatically or manually, and can be editable.

Click next to the **Reference** field to select a reference for the treatment.

You can specify the date range during which treatments are available. Treatments that are past the expiration date are not available for selection in a campaign.

Select **Activation date** and **Expiration date**. Click  to select a date and time. You can set one or both dates. The time zone is based on the locale for the client.

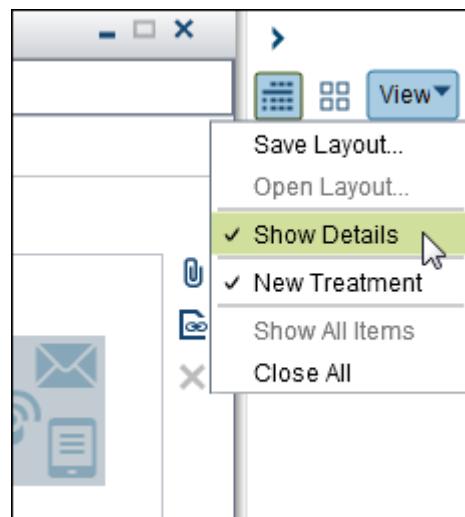
Select **Hidden** to hide the treatment from display in the category list. For more information, see “[Hide Items from Display](#)” on page 10. If you use **Save as** to save a copy of the treatment, the **Hidden** attribute is turned off in the saved copy.

Click  and select an image from your system to identify the treatment. To use an image that has a URL, click  and provide the URL for the image. Click  to restore the default image.

**Note:** If you delete a treatment that has an attached image, the image is deleted from the system and is no longer available to be used in campaigns.

To display the image in the minimized view of the treatment, select **View ▶ Show details**.

*Figure 4.66 Show Details*



## Custom Details

### Overview of Adding Custom Details

On the Custom Details page, you add user-defined fields.

*Display 4.51 Custom Details Page*

Fixed Cost	<input type="text"/>
Revenue Per Response	<input type="text"/>
Cost Per Piece	<input type="text"/>
Estimated Response Rate	<input type="text"/>

To add a custom detail, click  and select **Manage custom details**.

To append a custom detail group to the custom detail, select **Add custom detail groups**.

A  next to a custom detail displays information about the associated custom detail tag.

## Treatments and Custom Detail Tags

If you add a custom detail tag to a treatment, and that tag is included in the export definition for the campaign, the export file contains a single column for the custom detail tag. The column includes the values for all of the treatments in the package. The values are separated by the separator for treatment values.

If the custom detail tag is not used in all of the treatments in a package, some of the values in the column are empty. For example, a package might contain Treatment 1, Treatment 2, and Treatment 3. Treatment 1 and Treatment 3 use the same custom detail tag. Treatment 2 does not use the custom detail tag. In the export file for the campaign, the value in the column for the custom detail tag might look like the following.

Treatment 1 Value,,Treatment 3 Value

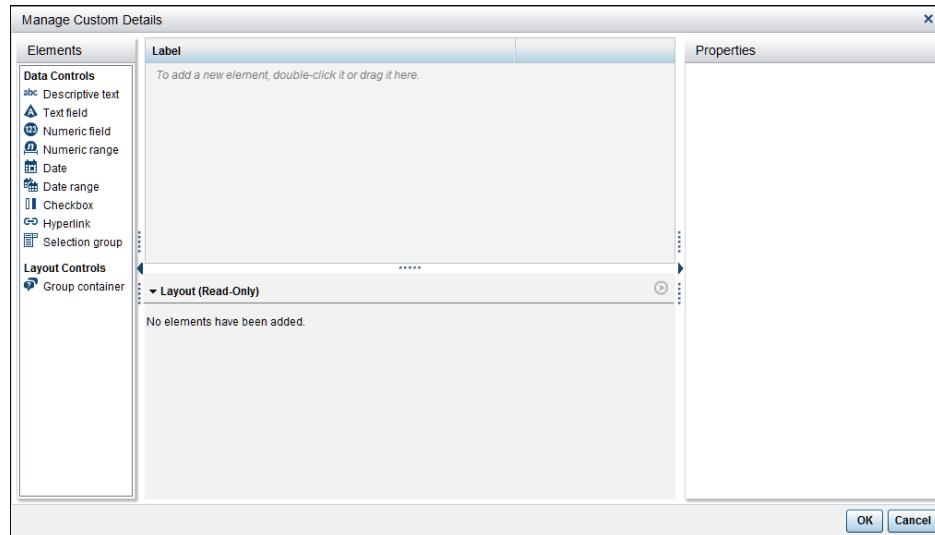
In this example, a comma (,) is the separator. Separators for treatment values are set in the Environment Variables category in the Setup workspace. For more information, see *SAS Marketing Automation: Administrator's Guide*.

For more information about custom detail tags, see “[Custom Detail Tags](#)” on [page 137](#).

## Manage Custom Details

In the Manage Custom Details window, you supply information about the custom details.

*Display 4.52 Manage Custom Details*



## Select an Element

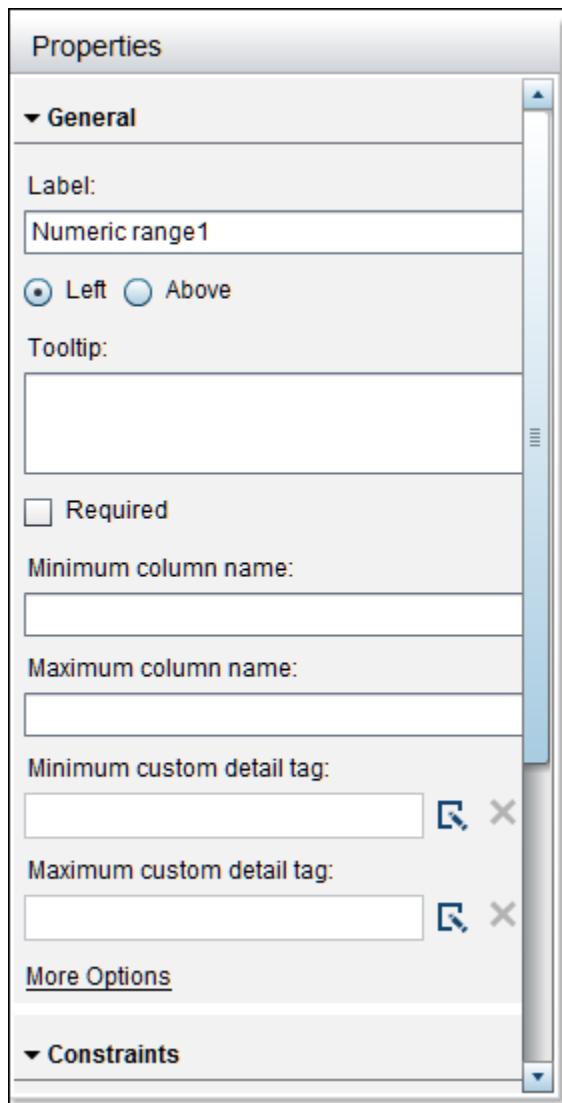
To select the type of custom detail, double-click it or drag an element from the Elements pane to the Label pane.

Display 4.53 Select Element

Manage Custom Details		
Elements	Label	
Data Controls		
abc Descriptive text	Date1	trash
▲ Text field	Text1	trash
123 Numeric field		
■■■ Numeric range	Numeric range1	trash
Date		
Date range		
checkbox		
Hyperlink		
Selection group		
...		

### Specify Properties

In the **Properties** pane, specify the details for the selected element. The details vary, depending on the element and the software component. As you set the properties, you can review the results in the **Layout** pane.

**Display 4.54** Custom Detail Properties

### Specify General Properties

The following items are the possible properties in the General section. Click **More Options** to display more properties.

#### **Label**

is the name that is displayed with the field. Select **Left** or **Above** to set the location of the label in relation to the custom detail.

**Note:** The names of custom details that are passed to SAS Marketing Optimization must be no longer than 26 characters.

#### **Description**

is the description of the field.

#### **Tooltip**

is the text that is displayed when you rest the mouse pointer on the field.

#### **Required**

indicates that a value is required. Required custom details must be completed before a campaign can be executed.

**Dynamic (editable in campaign)**

indicates that a value is dynamic. Dynamic custom details can be modified. For example, if you have a credit card offer in which you want to give different rates to different customers, you can use a single treatment and specify a different value for the Rate dynamic custom detail for each group of customers. Values that are not dynamic cannot be changed. This option is available only for treatments.

**Column name**

is the name of the column that is displayed in a published report.

**Minimum column name**

is the name of the column that displays the minimum value in a range.

**Maximum column name**

is the name of the column that displays the maximum value in a range.

**Custom detail tag**

is the custom detail tag that is associated with the custom detail. Click  to select a custom detail tag.

**Minimum custom detail tag**

is the custom detail tag that is associated with the minimum value in a range.

Click  to select a custom detail tag.

**Maximum custom detail tag**

is the custom detail tag that is associated with the maximum value in a range. Click  to select a custom detail tag.

**Width**

is the width of a field.

**Hint**

is the text that is displayed beneath the field that indicates the value that should be entered.

**In-field hint**

is the text that is displayed in the field that indicates the value that should be entered.

**Specify Data**

These are the possible properties in the Data section:

**Number of values**

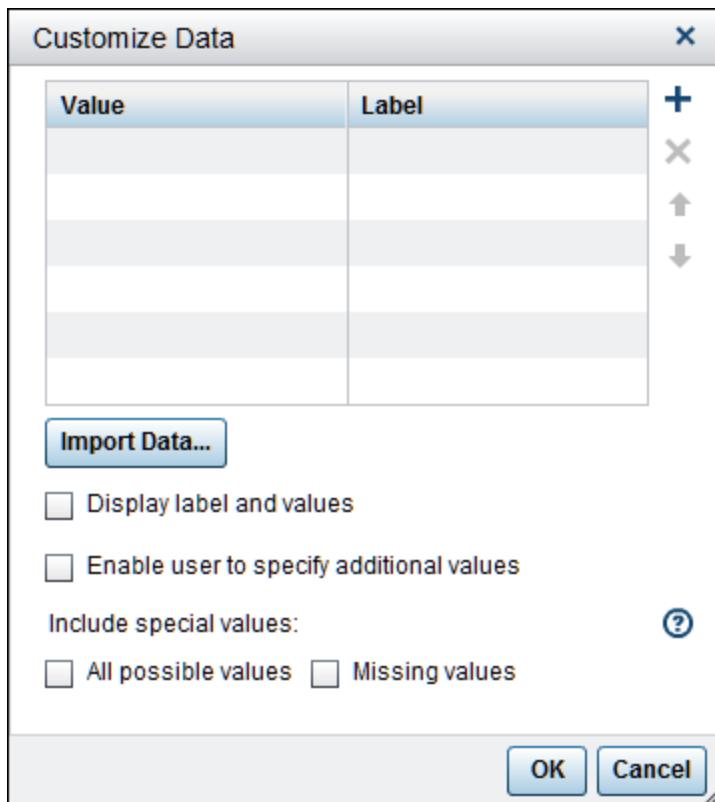
sets the number of text values that can be entered. If you select **Multiple values**, select **Enable user to reorder values** to enable the user to change the order of the values.

**Populated by**

specifies the source of the values that are entered.

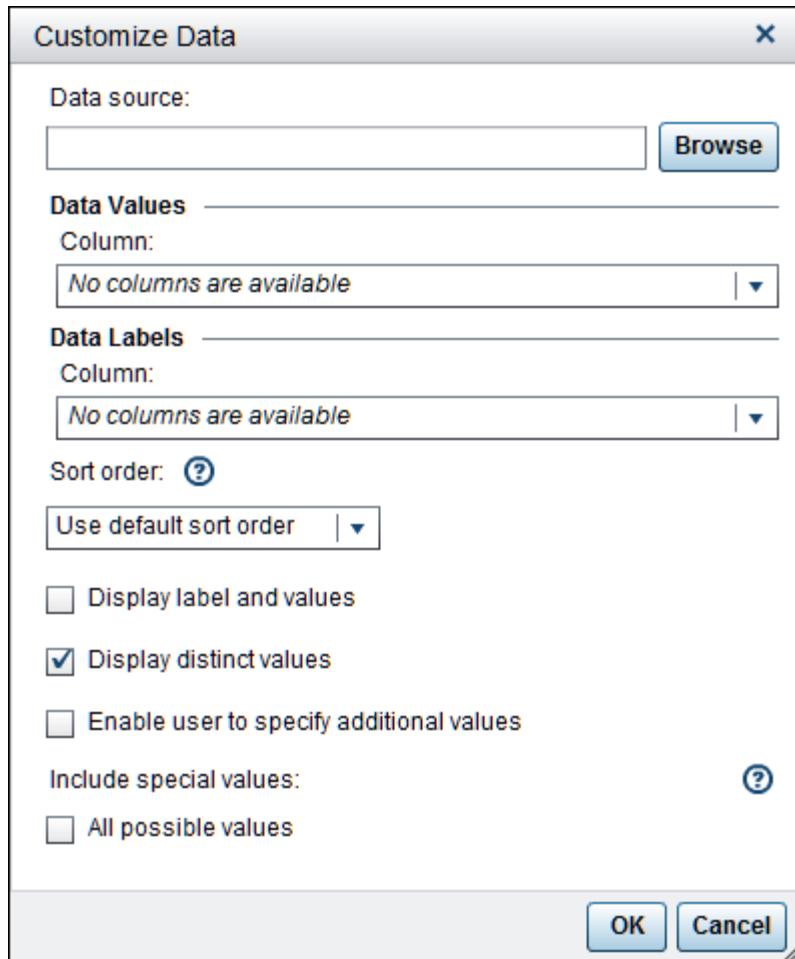
Select **User entry** to indicate that values are entered by the user.

When you select **A predefined list**, the list does not change unless you add or remove values.



To display text other than the name of the list item, enter a value in the Label column. For example, if the list items are products, the Value could be the product number A12345 and the Label could be `Child's Desk`. When a predefined list is published to the common data model, the published value contains the concatenated display values. Click **Import Data** to import values from a SAS library. Click **Display label and values** to display the label and values with the list item. To enable the user to select values from a list, select **Enable user to specify additional values**. Select **All possible values** and **Missing values** to include those values in the list.

When you select **A dynamic list**, the list displays the contents of the SAS Folders hierarchy on the **Folders** tab of SAS Management Console. Changes in this external list are reflected in the list of values that the user can select.



Click **Browse** to select a data source. Select a column in the Data Values and the Data Labels section to display those columns. Select a sort order. To display a value other than the text in the **Value** field, select **Display label and values** and **Display distinct values**. To enable a user to select more than one value from a list, select **Enable user to specify additional values**. Select **All possible values** and **Missing values** to include those values in the list.

#### Dependencies

If you create at least one element that is populated by a dynamic list, click **Dependencies** to add an element that the first element depends on. For example, if the first element is "Store," and the element that it depends on is "Sales Region," the Store element displays only the stores that are in the

selected sales region.

**Dependencies**

The "Text1" element depends on the following elements:

Element	Description of Dependency

The following elements depend on the "Text1" element:

Element	Description of Dependency

**OK**   **Cancel**

Click **+** to add the dependency.

**New Dependency**

The "Text1" element is dependent on the following element:

Numeric range1

Condition

The value of the "Text1" element is displayed when the following condition is met: [?](#)

Data source: /CI Assets/Database Tables/MAALORA/ALLACCT(Table)

Column: ACCTNUM

Operator: Is between (inclusive)

Value: Value selected for the "Numeric range1" element

**OK**   **Cancel**

## Specify Constraints

The following items are the possible properties in the Constraints section.

### Allow only integer values

indicates that only integer values can be entered in a numeric or a numeric range custom detail.

### Number of lines

specifies whether to display single or multiple lines. If you select **Multiple lines**, specify the **Maximum line count** and **Number of lines displayed**.

### Minimum length

sets the minimum number of characters that are allowed in the field.

### Maximum length

sets the maximum number of characters that are allowed in the field.

### Maximum line count

is the maximum number of text lines that can be entered in a field.

### Number of lines displayed

is the number of text lines that are displayed in the field.

### Date type

sets the unit to **Day**, **Week**, **Month**, **Quarter**, or **Year**.

In an export file, these custom details contain the following values:

#### Quarter

The first day of the quarter, for example, 1 Oct 2016

#### Week

The date of the Monday of the week, for example, 8 Feb 2016.

#### Year

The first day of the year, for example, 1 Jan 2016.

### Minimum decimal places

sets the minimum number of decimal places that are allowed in the field.

### Maximum decimal places

sets the maximum number of decimal places that are allowed in the field.

### Minimum value allowed

is the minimum value for the field.

### Maximum value allowed

is the maximum value for the field.

### Combined field

is another text field that this field can be combined with.

### Maximum combined length

is the combined length of two combined text fields.

## Specify Appearance

The Appearance section offers a choice of displays for selection groups and group containers. A selection group can be displayed as a drop-down list or a set of radio buttons. A group container can be displayed as a labeled box, a collapsible section, or an unlabeled group.

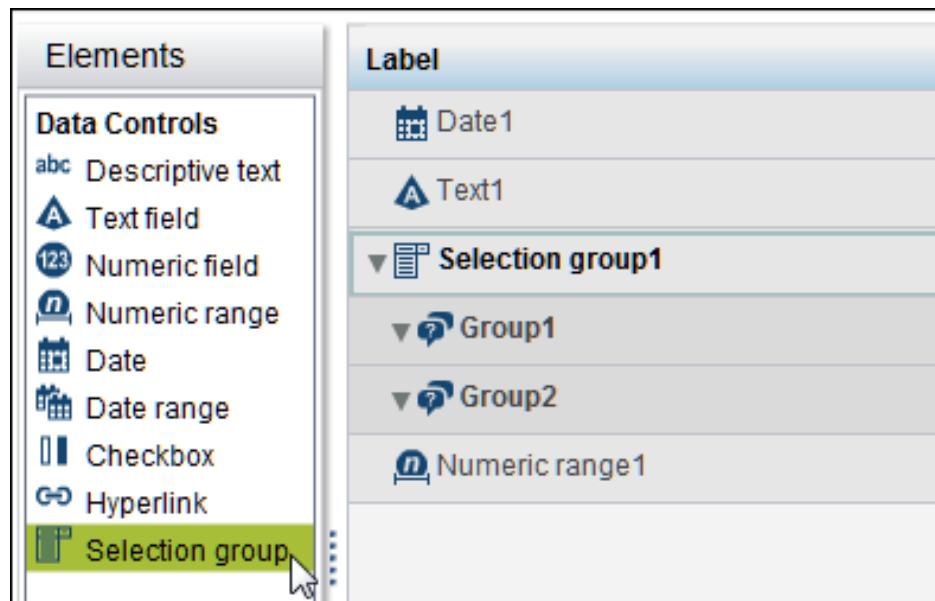
## Specify Default Values

In the Default Values section, you specify a default value for a selection group. Click  to specify which group is displayed first by default.

## Organize Custom Details

A selection group is a collection of other groups that is displayed as a list or a series of radio buttons. Double-click **Selection group** to add it to the **Label** pane.

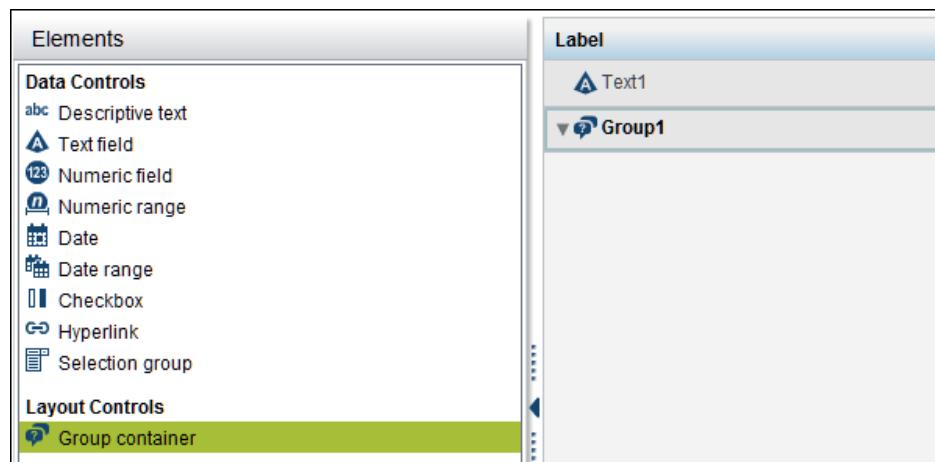
*Display 4.55 Selection Groups*



The selection group is prepopulated with groups that you can modify and add items to. Select items from the **Elements** pane and drag them to a group.

A group container collects custom details into a group. Double-click **Group container** to add it to the **Label** pane.

*Display 4.56 Group Container*

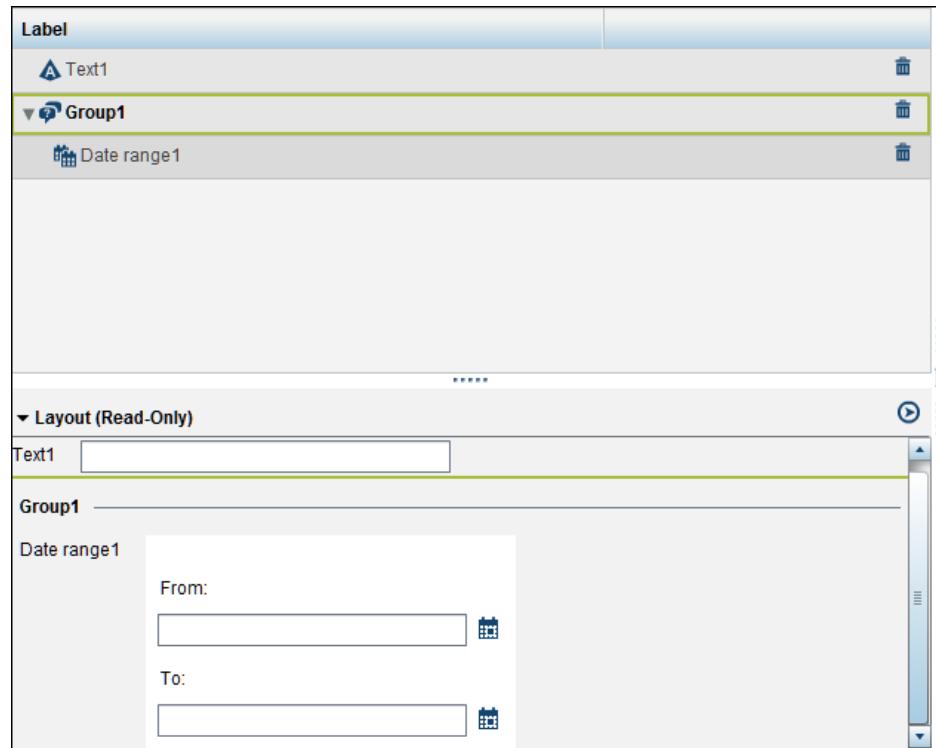


Select items from the **Elements** pane and drag them to a group.

### Preview Custom Details

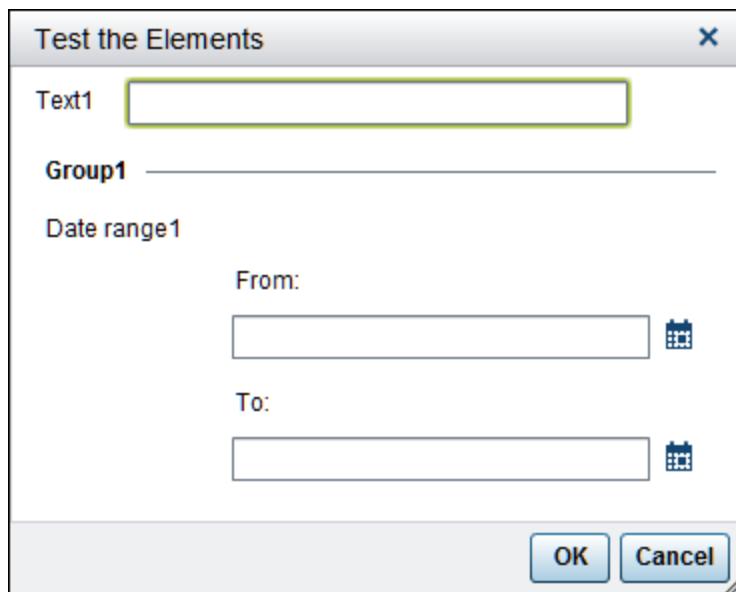
The Layout pane displays the custom details as they will appear on the Custom Details page.

*Display 4.57 Layout*



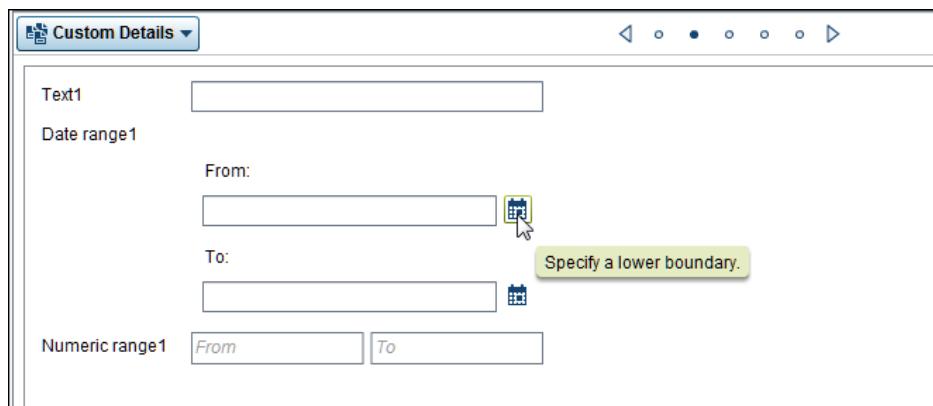
A red asterisk (\*) indicates that a field is required.

Click to open a Test the Elements window where you can test the custom details by interacting with them.

*Display 4.58 Test the Elements*

### **Set Default Values**

On the Custom Details page, you specify default values for the custom details that you have created.

*Display 4.59 Default Values*

Hyperlinks can link to websites or to files on local servers. Specify a link to a local server in one of the following ways:

```
\server\path  
file:///server/path
```

**Note:** For security reasons, local links cannot be opened in the Chrome browser. Local links can be opened in the Firefox browser if you change the default configuration. See the Firefox help for more information.

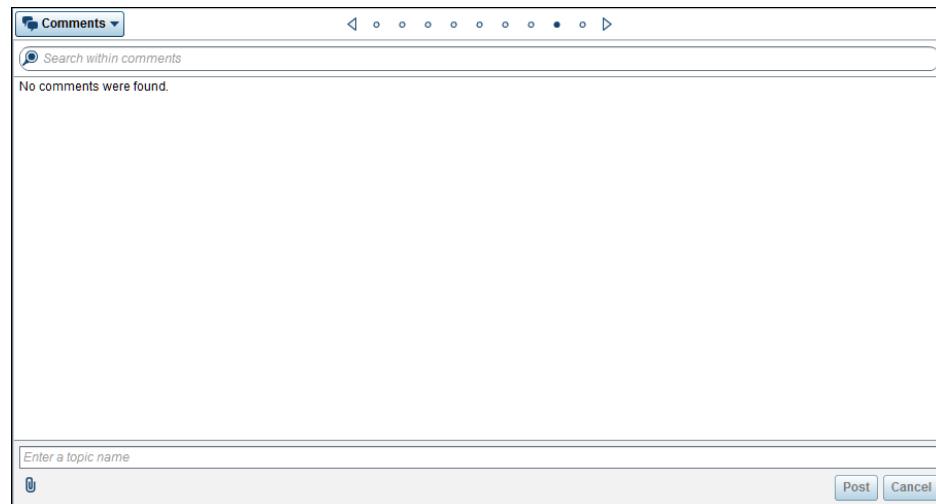
## Inbound Contact Rules

Inbound contact rules are used in SAS Real-Time Decision Manager campaigns. For more information, see *SAS Real-Time Decision Manager: User's Guide*.

## Add Comments

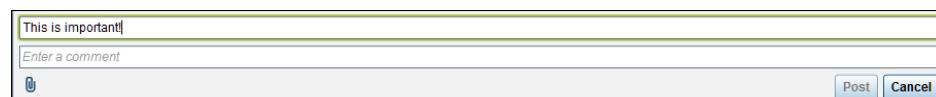
On the Comments page, you view and add comments. You add comments after saving.

**Figure 4.67** Comments



Enter a topic name to add a new comment.

**Figure 4.68** New Topic



Enter the text of the new comment.

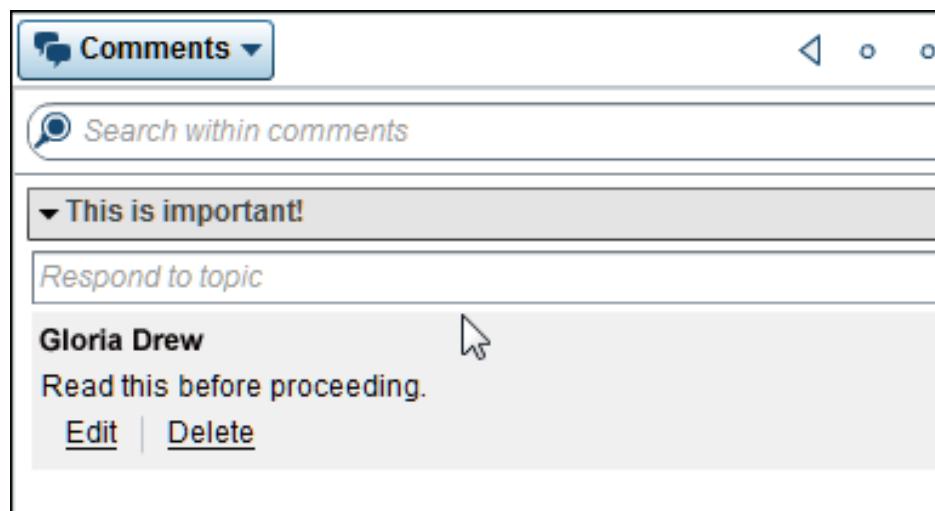
**Figure 4.69** Comment Text



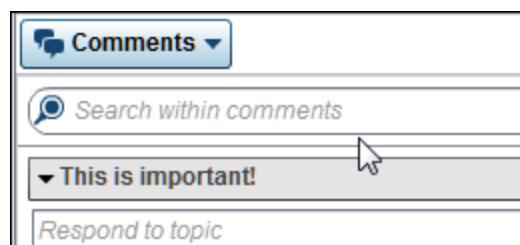
Click **Post** to post the comment. Your new comment is displayed on the Comments page. You can add comments even if you do not have Edit permission.

Click to add an attachment such as an image or a document.

To reply to an existing comment, type text in the field below the comment title.

**Figure 4.70** Comments List

Type in the search field to find text in comments.

**Figure 4.71** Search Comments

## Add Attachments

On the Attachments page, you view and add attachments such as images or documents.

**Figure 4.72** Attachments

Name	Added By	Date Added
Desert.jpg	Gloria Drew	Sep 26, 2014 03:33 PM

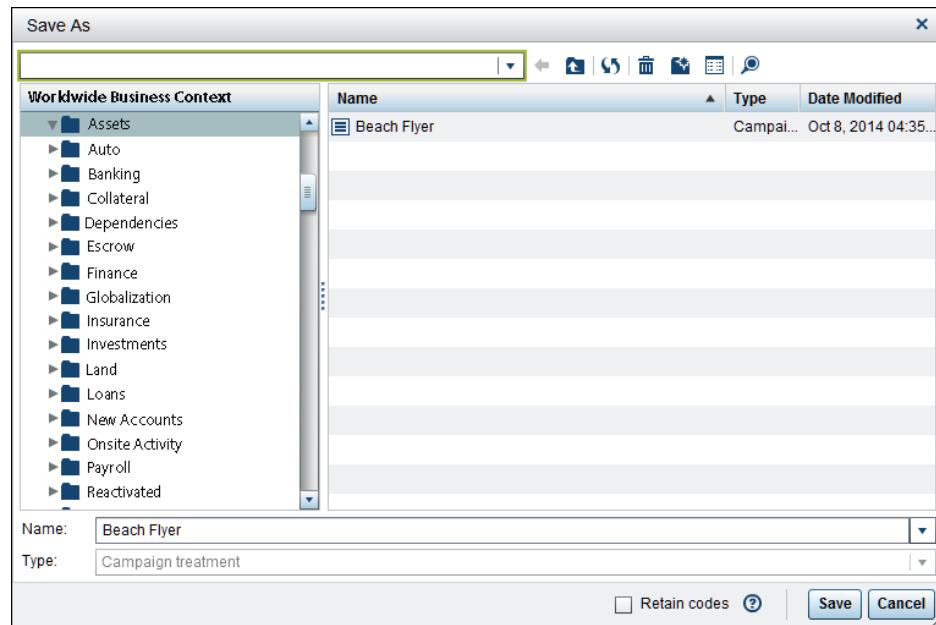
Click **+** to select a file to attach.

## Save a Treatment

To save a treatment, click in the toolbar. The treatment is saved under the name that is specified in the **Name** field.

To save a treatment under a different name, click in the toolbar.

Figure 4.73 Save As



Select a folder and supply a new name for the treatment. To save the treatment to a new folder, click  and open the new folder.

Select **Retain codes** to retain codes that are created manually or generated automatically. Codes are retained according to the setting for the business context. The following codes are retained:

- campaign code
- campaign group code
- cell code
- control group code and name
- communication code
- package code

# 5

## Creating Nodes

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## Copying and Pasting Nodes

### Overview of Copying and Pasting Nodes

You can copy nodes by selecting a node or a group of nodes, right-clicking, and selecting **Copy**. Press Ctrl - A to select all of the nodes in a diagram. To paste the copied nodes, right-click and select **Paste**.

To cut a node or a group of nodes, select the nodes, right-click, and select **Cut**. You can also cut nodes by selecting the nodes and pressing the Delete key. To paste the cut nodes, right-click and select **Paste**.

You can copy and paste nodes into the same diagram or a different diagram. You cannot copy and paste between selection and decision diagrams, or between diagrams that are in different business contexts.

The pasted node is named *nodename (n)*, where *n* is an incremented number. The description is retained with the pasted node. If the node contains a code, such as a cell code, it is pasted according to the rules of the current business context. If the code is generated automatically, a new code is generated. If the code is set manually, the **Code** field in the pasted node is blank. In the pasted node, the **Total** and **Last run on** fields are blank. Counts and percentages are cleared in the pasted node.

The pasted node group is named *nodegroupname (n)*, where *n* is an incremented number. Incremented numbers begin with the (2) for node groups.

### Copy and Paste Nodes in Selection Campaigns

The following considerations apply when you copy and paste nodes in selection campaigns.

#### All nodes

When a pasted node references a variable and the source of the variable is not copied, the node is marked **Not Ready**.

#### A/B Test node

- An A/B Test node cannot be pasted into a campaign that is a member of an optimization campaign group.
- Champion/Challenger and Challenger/Challenger settings are preserved. When the node is pasted into a different campaign with a different default setting on the Control Group Settings page, the settings of the original A/B Test node are preserved.
- Whether code settings are preserved depends on the setting in the business context.
- The contents of Actual fields are not included in the pasted node.
- Generated cells cannot be copied by themselves; they are included in a copy of the node.
- Generated cells are pasted in the same relative position as the original output cells.

- All of the generated cells of an A/B Test node are automatically included with the node when the node is pasted into the same diagram.

#### And node

If an And node is copied and the upstream nodes are not included, the Input Nodes section is cleared in the pasted node.

#### Cell node

- Generated cells cannot be copied by themselves, but can be included in a copy of the parent node.

#### Communication node

- If the communication has been optimized, the reference to the associated optimized MATable is cleared.
- If the Communication node is copied within the same campaign, package and treatment assignments are retained only if the cells are copied with the communication.
- If the Communication node is copied across campaigns, selected treatments that are not already included in the universe of treatments in the target campaign are dropped. The target campaign's version of a treatment does not change. Any values that have been entered for custom details that do not exist in the target campaign's version of the treatment are discarded. If the target campaign's treatment has custom details that are not in the treatments from the source campaign, those custom detail values are set to their defaults
- You cannot change export definitions or the contents of the export file until an upstream node is connected. Export output names are pasted with the node. Any export items that do not exist in the target campaign, such as custom details, are removed. The refine output details are cleared under the following conditions. the Communication node is copied within the same campaign and the node that is referenced in the refine output setting is not a terminal node or is not copied in the same action. If the Communication node is copied and pasted across campaigns, the nodes that are selected for refinement must be copied at the same time as the Communication node. Otherwise, the refine output details are cleared.
- All Response nodes are copied with the Communication node. The Response nodes are added to the diagram if the **Add to Diagram** option is checked on the **Responses** page of the Communication node.
- If a Communication node and its associated marketing cells are copied and then pasted into a campaign, the control groups settings of the pasted Communication node are retained. The retained settings include any overridden values that are different from the values in the campaign properties. When a single Communication node is copied and pasted within a campaign or to a different campaign, the control group information is cleared.
- The pasted node does not retain values that are a result of updating counts.

#### Export node

- You cannot change the export definition or the contents of the export file in an Export node that is pasted by itself. This restriction does not apply to an Export node that is pasted with upstream nodes.

- Any export items that do not exist in the target campaign, such as custom details, are removed from the pasted Export node.
- Refine output specifications are retained. If you are pasting the Export node into a different campaign, the node reference is retained only if the Export node, refine output references, and all of the intervening nodes necessary to make the refine output reference valid are copied and pasted at the same time. If the Export node is pasted into the same campaign and the node that is the source for refine output is a terminal node and is included in the copy, then the refine output reference is to the pasted node. If the terminal refine output node is not part of the copied set of nodes, the reference is to the original refine output node.

#### Limit node

- The **Total** and **Actual %** fields are blank in the pasted node.
- The **Sort** field is disabled in the pasted node until it is linked to an upstream node.

#### Link node

If a cell is assigned to a Link node and the Link node is pasted into the diagram from which the cell originates, the Link node is cleared. The Link node is set to a **Not ready** state.

#### Map node

If the Map node is pasted without a connecting node upstream, the **From** subject is set to **Unknown**. Only a node with a subject that is compatible with the **To** subject can be connected to the Map node as an input node.

#### node groups

- All the rules for individual nodes within the group apply as if being copied and pasted outside a group.
- If only one node can be pasted, the group is not created; the single node is pasted.
- The positions of the nodes within the pasted group do not change, even if some nodes are not pasted.
- If the group is collapsed when it is copied, it is collapsed when it is pasted.
- If the group is expanded when it is copied, it is expanded when it is pasted.

#### Or node

If an Or node is copied and the upstream nodes are not included, the Input Nodes section is cleared in the pasted node.

#### Prioritize Node

- Generated cells are pasted only if the relevant input nodes are included in the copy.
- Output cells cannot be copied by themselves; they must be included in a copy of the node.
- Output cells are pasted in the same relative position as the original output cells.
- When generated cells have been grouped and the group is not selected in the copy, the pasted generated cells are not grouped.
- The remainder node is pasted with the Prioritize node.

- The **Sort** field is disabled in the pasted node until it is linked to an upstream node.

#### Process and Custom node

Code is copied with the node.

If a process has been selected, the following considerations apply:

- All parameters are copied with their values if the values are set.
- Output cells cannot be copied by themselves; they must be included in a copy of the node.
- Output cells are pasted in the same relative position as the original output cells.
- All of the generated cells of a Process node are automatically included with the node when the node is pasted into the same diagram.
- If a Process node's generated cells have been grouped and the node is pasted, the individual cells are pasted, but the group is not pasted.

#### Report Link node

There are no special considerations for the Report Link node.

#### Response node

Response nodes cannot be copied on their own. They are included in a copy of the Communication node.

#### Select node

User-entered nominal values are copied.

#### Split node

- All parameters are copied with their values if the values are set.
- Output cells cannot be copied by themselves; they must be included in a copy of the node.
- Output cells are pasted in the same relative position as the original output cells.
- All of the generated cells of a Split node are automatically included with the node when the node is pasted into the same diagram. The exception is when the split is made using values from a previous node and the previous node was not copied. In this case an empty Split node is pasted.
- If a Split node's generated cells have been grouped and the node is pasted, the individual cells are pasted, but the group is not pasted.
- When the Split node is pasted into a different diagram, all of the generated cells of a Split node are included with the node. An exception is when the split is made using values from a previous node and the previous node was not copied. In this case, an empty Split node is pasted.
- When a Split node uses values from a previous node and is pasted into the same diagram without pasting the previous node and all of the nodes between the previous node and the Split node, the Split node remains in a **Not ready** state. The state is **Not ready** until you reconnect the previous node to the Split node or you change the **Split method** setting in the Split node.

## A/B Test Node

### Overview of the A/B Test Node

The A/B Test node enables you to partition an audience into champion and challenger groups for testing. The node generates output marketing cells, which can then be linked to Communication nodes. Each cell can be linked to only one Communication node. The A/B Test node cannot be used in campaigns that are in optimization campaign groups.

*Figure 5.1 A/B Test Node Properties*

The screenshot shows the 'A/B Test Properties' dialog box. At the top, there are fields for 'Name' (set to 'A/B Test') and 'Description'. Below these, the 'Type' is set to 'Champion/Challenger'. Under 'Sort criteria', it says 'none (random)'. There is a checkbox for 'Enable the holdout control group' which is unchecked. The 'Size' field contains a value of '1'. To the right of the size field are buttons for 'Actual' and a magnifying glass icon. Below this section, there is a note about creating challengers using 'Counts' or 'Percentages'. The 'Output cells' section contains a table with columns: Type, Cell Name, Cell Code, Size, Limit, and Actual. A single row is present with 'Champion' in the Type column. To the right of the table are several icons: a grid, a list, a delete, a plus sign, a minus sign, an up arrow, a down arrow, a calculator, and a magnifying glass. At the bottom of the dialog, there are two checkboxes: 'Create output cell for remainder' and 'Make output cells available for linking'. Below these checkboxes is a 'Count' section with fields for 'Subject' (set to 'Unknown'), 'Total' (set to '1'), 'Dropped' (empty), and 'Last run on' (empty). There is also an 'Update' button. At the very bottom are 'OK' and 'Cancel' buttons.

Select one of the following values:

#### Champion/Challenger

generates marketing cells that reflect the audiences for a champion offer and one or more challenger offers that are being tested against the champion.

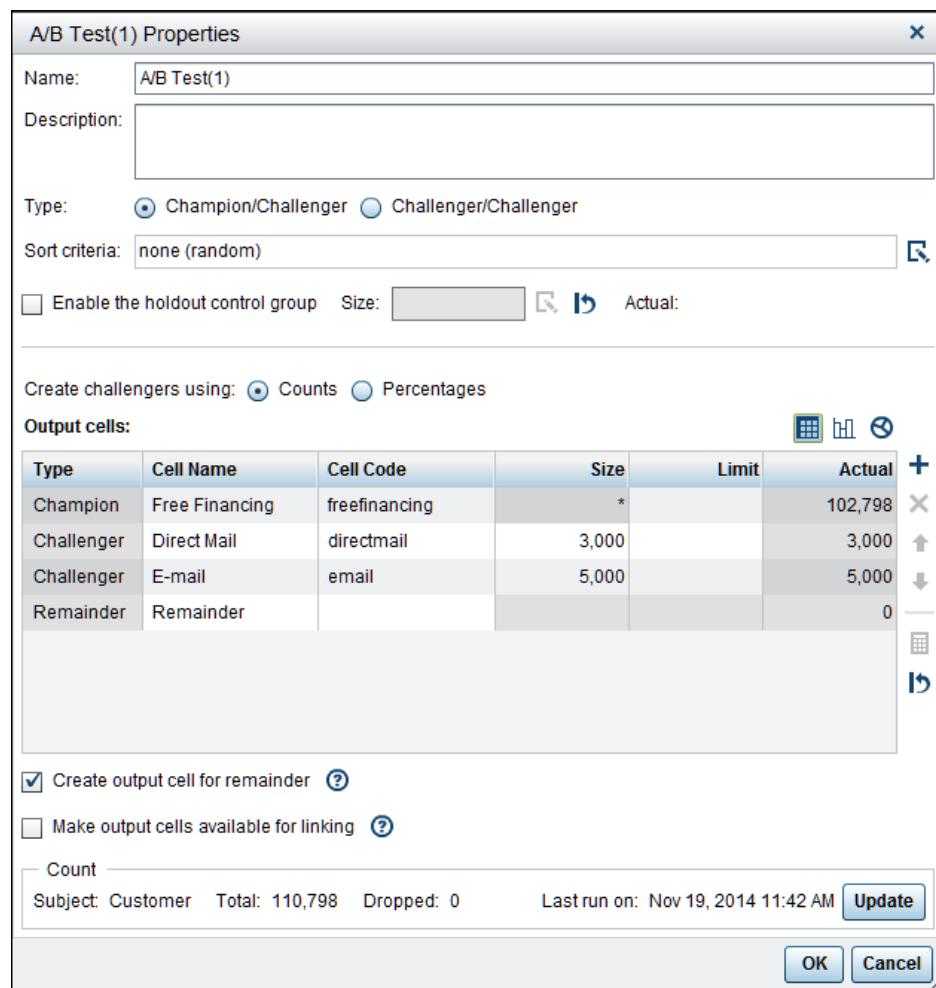
**Challenger/Challenger**

generates marketing cells that reflect the audiences for two or more challenger communications that are compared against each other in order to determine the best communication.

**Champion/Challenger**

In the **Champion/Challenger** type, the champion is the control group that the challengers are compared against to determine whether they outperform the champion. The champion group contains most of the population, minus the size of any challenger groups. The challenger group contains enough of the population to be statistically significant. This group is as small as possible because the campaign designer does not know whether the challenger outperform the champion.

For example, the marketing department might want to create a campaign that compares a new challenger's offer against the champion offer that has been used in previous campaigns. The champion offer is a direct mail piece that offers free financing on a car for 60 months. The first challenger uses direct mail to offer 5% below invoice price for the same car. The second challenger uses email to offer 5% below invoice and free service for the first 100,000 miles. The campaign designer wants to allocate an audience of 3000 to the first challenger and 5000 to the second challenger because the second offer costs less to send.

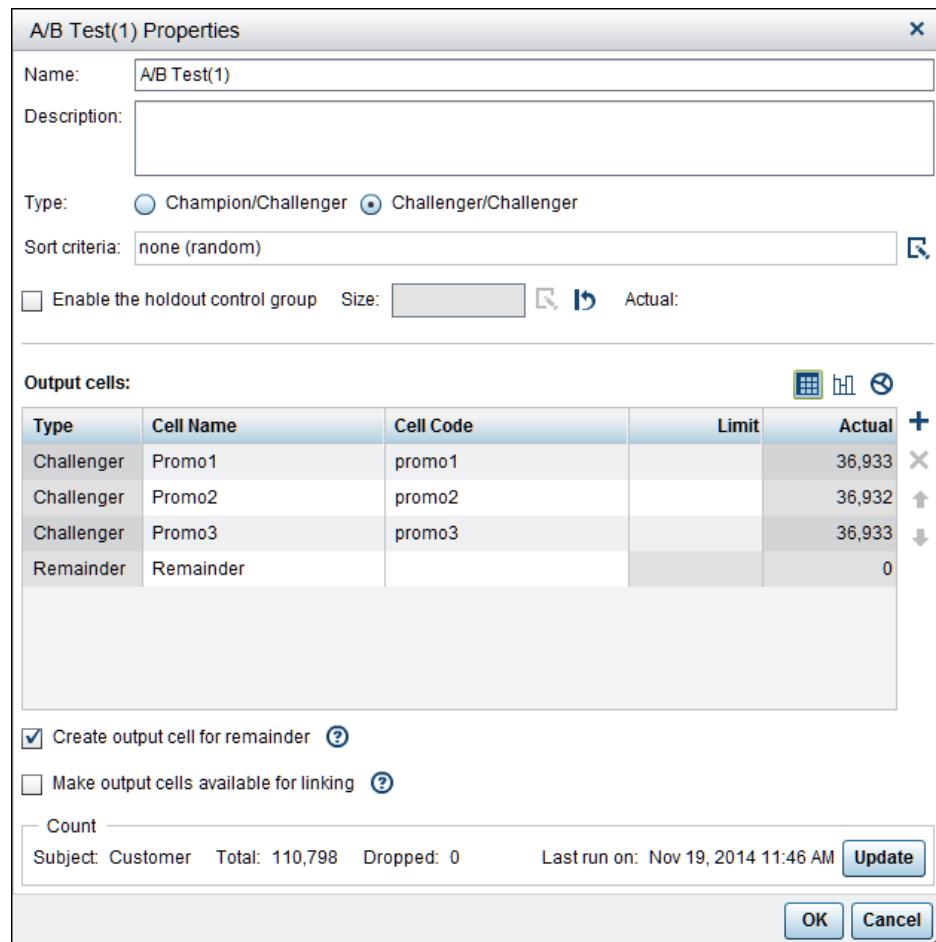
**Figure 5.2** A/B Test Node Properties Window with Champion/Challenger Type Selected

## Challenger/Challenger

The **Challenger/Challenger** type sets up two or more control groups. Each challenger is a control group for all of the other challengers. Any two challengers can be compared to each other.

For example, an organization might have three very similar promotional materials that are all targeted toward young men whose income is greater than 50,000. The marketing department would like to test these promotional materials against each other. By using the **Challenger/Challenger** type, the target population can be split evenly between three test groups.

**Figure 5.3 A/B Test Node Properties Window with Challenger/Challenger Type Selected**



If a challenger has a limit, the population above that limit is evenly redistributed among the other challengers that do not have a limit or that have not yet reached their limit. If the excluded population cannot be equally distributed among the remaining challengers, then the distribution of the extra member is determined randomly.

## Specify A/B Test Node Properties

### Specify Criteria for Sorting

Click next to **Sort criteria** to specify the criteria for sorting. In the A/B Test node, sorting determines which subjects are dropped or placed in the remainder cell when limits are used. Sorting does not determine how to populate champion, challenger, or holdout control groups. If limits are used, the populations of the champion, challenger, and holdout control groups are selected randomly after the sort criteria are applied. In some cases, no sort criteria exist and limits require that a portion of the population be dropped or placed in a remainder cell. In those cases, the dropped population is determined randomly.

## Enable Holdout Control Group

Select **Enable the holdout control group** to generate an automatic holdout control group that does not receive any treatment. The performance of the holdout control group can be compared against all of the champions and challengers that are created in the A/B Test node. Enter a size, or click  to specify a count or a percentage. If you enter a number, the size type is set to **counts**. If you enter a number followed by a percent sign (%), the size type is set to **percentages**. You can also use the statistical size estimator to specify a size. For more information, see “[Determine Sample Size](#)” on page 248.

You can track the number of holdouts in the nodes that are generated from the A/B Test node. For the **Champion/Challenger** type, the number of holdouts is displayed in the champion node and in the Communication node that is linked to the champion node. For the **Challenger/Challenger** type, the number of holdouts is displayed in the first node in the list of challenger nodes in the Properties window and in the Communication node that is linked to the challenger node.

The dropped count in the A/B Test node includes both the number of holdouts and customers who have not been assigned to an output node because of limits within the A/B Test. The dropped count can be greater than the holdout count. There can be a dropped count even if a holdout control group is not enabled. The dropped count is not displayed in the nodes that are generated from the A/B Test node.

## Specify Counts or Percentages

If you have selected **Champion/Challenger** as the type, select **counts** or **percentages** from the **Create challengers using** list. The default value is set in the campaign properties. If the audience size is too small to create a holdout control group, the challengers are not populated and the campaign does not execute.

## Add Challengers

Click  to add one or more challengers whose default size is set in the campaign properties. Specify a cell name and cell code for all of the rows. The Limit column enables you to set the upper limits on the size of each cell. The Champion limit must be greater than 0.

For the **Challenger/Challenger** type, each challenger receives an equal proportion of the population after any holdout control groups are subtracted. There must be least one challenger. If a limit is set, the size of the challenger is limited after it receives its portion of the population. The dropped population is allocated to the remainder cell if **Create output cell for remainder** is selected.

For the **Champion/Challenger** type, enter a size for the challengers, or click  to use the Statistical Size Estimator to help you calculate the size for the **counts** type. For more information, see “[Determine Sample Size](#)” on page 248. The champion receives the remainder of the population after the sizes of all of the challengers have been met. The size of the champion must be at least as large as the smallest challenger. If the population is not large enough to assign to the champion at least as many members as the smallest challenger, then the options that are specified for the campaign definition take effect. Either the challenger cells are not populated, or the campaign does not execute.

## Apply Default Control Group Values

Click  to apply the control group values that are set in the campaign properties to the challenger and holdout control groups and to clear the counts in the A/B Test node and in downstream nodes. The campaign defaults overwrite any existing settings in the A/B Test node.

## Create Output Cell for Remainder

**Create output cell for remainder** creates an output cell that is populated with the population that does not belong to the champion, challenger, or holdout control groups. Treatments can be assigned to a remainder cell. For example, you might want to send a standard communication to the remaining customers. If no limits have been set on the champion in a champion/challenger setting, or on the challengers in a challenger/challenger setting, the count of the remainder cell is 0. There can be a remainder cell if all challengers have a limit in a challenger/challenger setting.

## Make Output Cells Available for Linking

**Make output cells available for linking** enables you to use the Link node to link to the champion, challenger, and remainder cells from another campaign or diagram. Each cell must have a name and the diagram must be saved. The Link node cannot link to an automatic holdout control group. This option affects cells that are generated after the option is selected. **Make output cells available for linking** can be manually selected or cleared in the generated cells without affecting whether the option is selected in the A/B Test node.

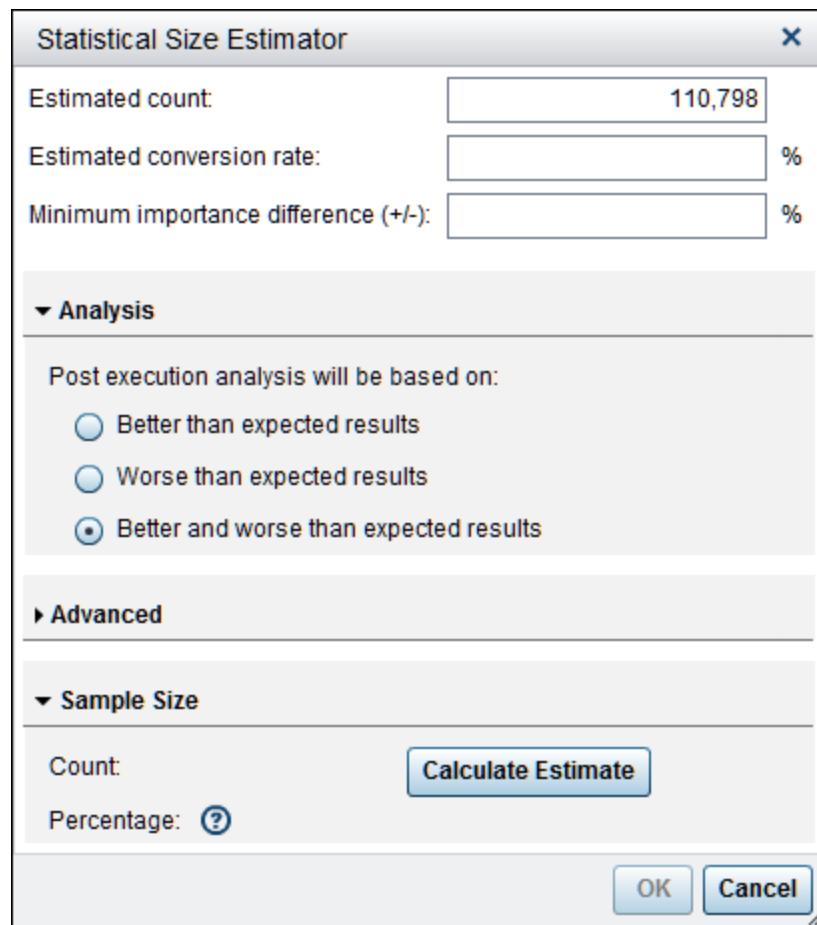
## Display Counts

The **Total** field displays the total population, minus the number in the holdout control group.

The **Dropped** field displays the population that is not included in the champion or challenger control groups. When **Create output cell for remainder** is selected, the **Dropped** field displays the number in the holdout control group. The dropped count is displayed only when the value is greater than 0.

## Determine Sample Size

With the statistical size estimator, you can determine a sample size, and then analyze response rates for statistically significant differences. The settings for the statistical size estimator are set in the business context. Depending on the setting, you might be able to edit the setting within a campaign.

*Display 5.1 Statistical Size Estimator*

**Estimated count** is the total number of subjects that are entering the node. This value is used to determine what percentage the computed group represents in comparison to the total number of individuals.

**Estimated conversion rate** reflects the estimated conversion rate of offers to responses, including both positive and negative responses, that you predict that this interaction will generate. For example, experience might show that a certain style of campaign typically produces a 3% conversion rate. You can specify this historic rate, or you can assume that the rate will be higher with this group in this campaign and raise that estimated conversion rate.

**Minimum importance difference** represents the level of granularity that the analytical reports can identify. If this number is very small, there will be a very fine level of granularity. The size of the group will be larger. This will potentially keep more customers from receiving an offer if they are being held out. If this number is very large, it will be difficult to identify improvements unless the improvements are extremely large. For example, a choice of 0.1% would allow the analytical reports to determine the difference between 3.1% and 3.2% conversion rates. A choice of 0.5% would allow the analytical reports to make decisions based only on the difference between 3.1% and 3.6%.

The Analysis section determines the basis for post-execution analysis. Do you expect to base your post-execution analysis on better-than-expected results, or on both better-than-expected results and worse-than-expected results? For example, if a communication provides a better offer, then the expectation is that

a control group should perform better than the remainder of the target audience. In this case a single-sided test is needed, and you should select **Better than expected results**. If a control group is held out and given no treatment at all, or if the treatment that is given to a control group compares equally with the treatment that is given to the remainder of the target audience, then the control group could perform worse than expected. In this case, a two-sided test is needed, and you should select **Better and worse than expected results**.

In the Advanced section, **Nominal power** specifies the desired power of the test and is expressed as a probability. You can select **High** (0.9), **Medium** (0.75), or **Low** (0.6).

**Alpha** specifies the level of significance of the statistical test. The default value is 0.05, or a 5% level of significance. The value of **Alpha** might need adjustment where there is more than one subgroup. For example, you might have divided a champion group into five smaller subgroups that each receive a different treatment. If you want the probability of making at least one error in five tests to be 5%, you should set the probability of making an error in an individual test to 5% divided by 5, or 0.01.

**Method** specifies a modeling technique. You can select **Pearson's chi-square**, **Fisher's exact**, or **Likelihood ratio chi-square**.

Click **Restore Defaults** to return to the values that were set for the current business context.

In the Sample Size section, click **Calculate Estimate** to execute the statistical size calculations. The **Percentage** value is rounded to three decimal places.

**Note:** If possible, the count, rather than the percentage, should be used. If percentage is used, and the size of the input population changes, the estimated size of the group might be statistically incorrect.

## Display Charts

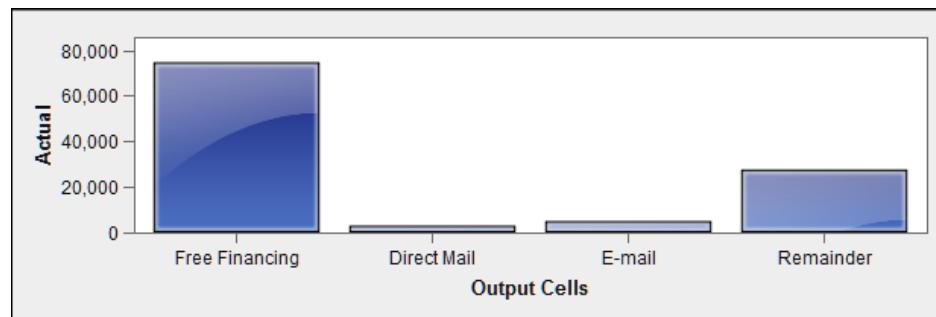
Click  to display a grid of values.

*Figure 5.4 Grid of Values*

Type	Cell Name	Cell Code	Size	Limit	Actual
Champion	Free Financing	freefinancing	*	75,000	75,000
Challenger	Direct Mail	directmail	3,000		3,000
Challenger	E-mail	email	5,000		5,000
Remainder	Remainder	CELL39842			27,798

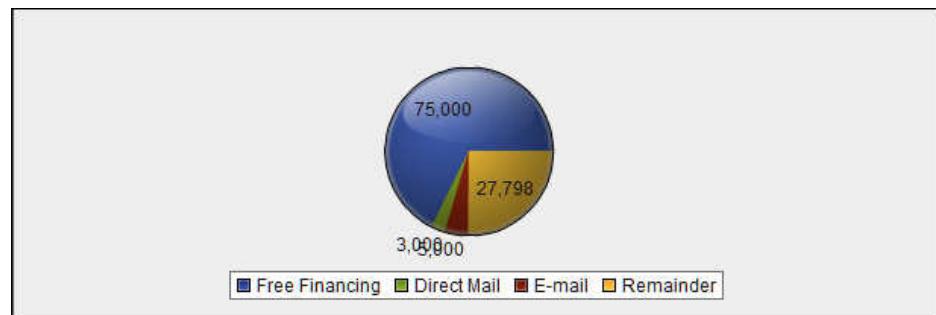
Click  to display a bar chart of values.

**Figure 5.5 Bar Chart of Values**



Click to display a pie chart of values.

**Figure 5.6 Pie Chart of Values**



---

## And and Or Nodes

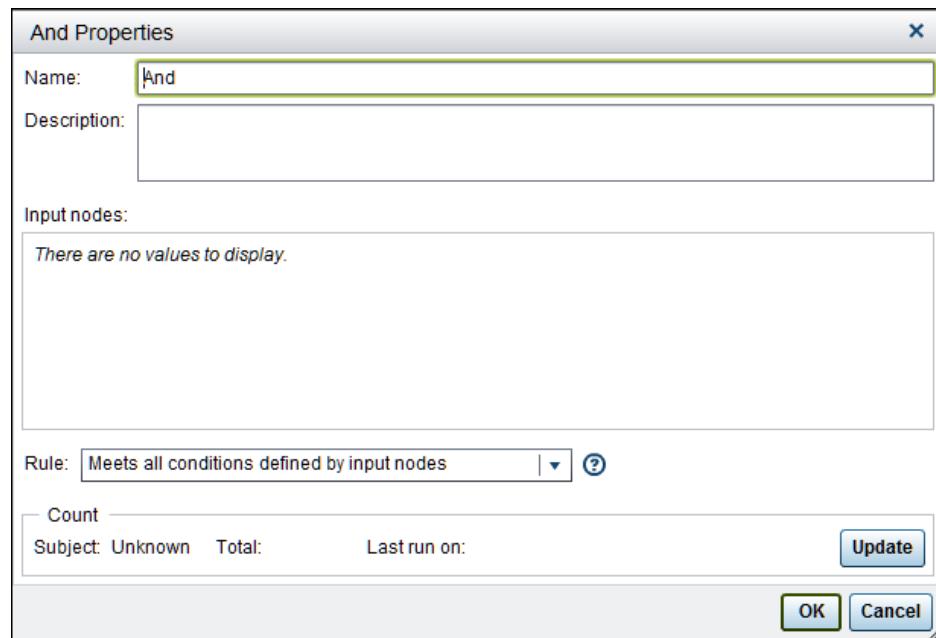
### Overview of And and Or Nodes

The And and Or nodes enable you to logically combine the criteria from two or more nodes.

### Specify And Node Details

The And Properties window displays information about the And node.

Figure 5.7 And Properties



Select one of the following rules from the **Rule** list:

**Meets all conditions defined by input nodes**

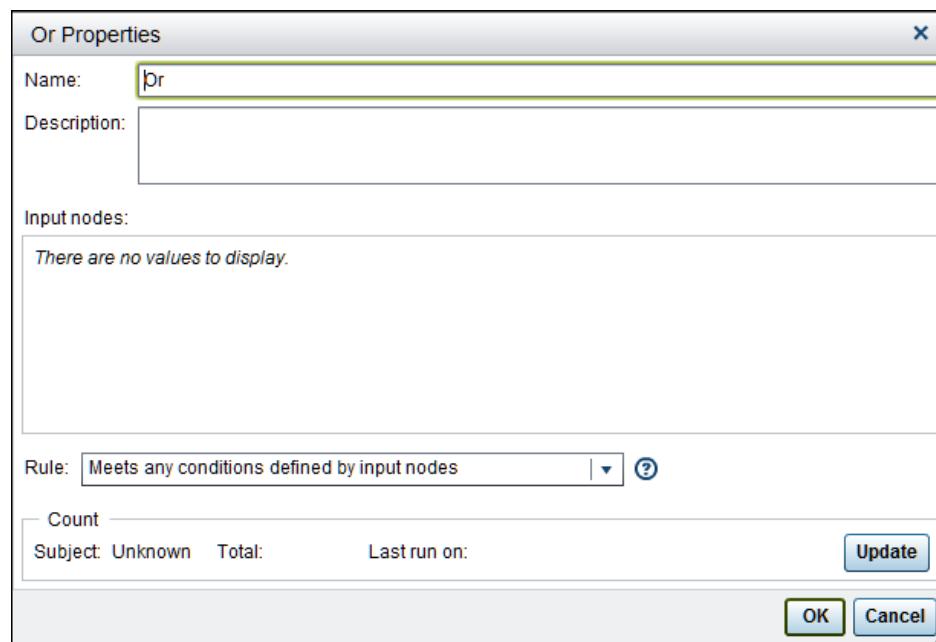
This means that a logical AND operation should be applied under all circumstances to the conditions regarding the input nodes. This is the default rule.

**Is a member of each group defined by input nodes**

This indicates that an Intersect operation should be used to query the database.

## Specify Or Node Details

The Or Properties window displays information about the Or node.

**Figure 5.8** Or Properties

Select one of the following rules from the **Rule** list:

**Meets any conditions defined by input nodes**

This means that a logical OR operation should be applied under all circumstances to the conditions regarding the input nodes. This is the default rule.

**Is a member of any of the groups defined by input nodes**

This indicates that a Union operation should be used to query the database.

## Cell Node

### Overview of the Cell Node

The Cell node combines the data items from the preceding nodes and displays the number of unique subjects.

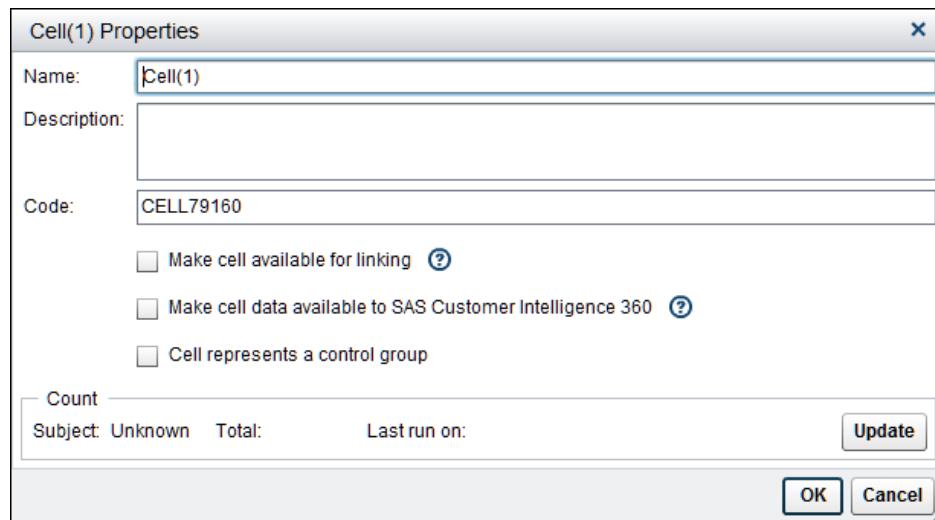
A marketing cell is a Cell, Link, or Report node that directly precedes the Communication node. The **Act as a marketing cell** option must be selected in order for a Link node or a Report node to act as a marketing cell. You assign treatments to the marketing cell on the Treatments page. Execution of the communication combines all of the marketing cell counts and returns the number of unique subjects from that combination.

The Cell node is the only node that can be used as a target for diagrams that you want to link to the current diagram.

### Specify Cell Node Details

The Cell Properties window displays information about the cell.

Display 5.2 Cell Properties



The **Code** field displays the cell code. Cell codes are required and can be either specified manually or generated automatically, depending on the setting for the business context. Cell codes are used to identify groups of populations.

**Make cell available for linking** enables you to use the Link node to link to this cell from another diagram. Before you can use the cell as input to a Link node, you must specify a name for the cell and save the campaign.

You can make your campaign data available to SAS Customer Intelligence 360. This data is used to define segments. Select **Make cell data available to SAS Customer Intelligence 360** to send a list of subject IDs to SAS Customer Intelligence 360 when the communication is executed. In order for the campaign data to be available to SAS Customer Intelligence 360, tenant information must be specified on the **Digital Marketing Integration** tab of the business context. For more information, see “[Connect to SAS Customer Intelligence 360](#)” on page [50](#).

Select **Cell represents a control group** to designate the contents of the cell as a control group. That information is written to the campaign report when the campaign is published. Cells that are generated by the A/B Test node do not have this option because they represent champions or challengers.

## Communication Node

### Overview of the Communication Node

An important step in creating a campaign is to specify the communications that are used to target customers. For example, you might create a campaign to sell mortgages to first-time buyers. Communications for this campaign might include an email message, an information packet mailing, a telemarketing effort, and an advertising campaign.

In a communication, the count is the number of unique subjects. The marketing cell is the cell that directly precedes the Communication node. Execution

combines all of the marketing cell counts and returns the number of unique subjects from that combination.

A *response* is the action that a customer takes in response to a communication that was sent by a campaign. Examples of customer responses include requesting a price quote, making an inquiry, or purchasing the product.

Before it can be executed, a Communication node must meet the following requirements:

- A Cell node is connected to the Communication node.
- A subject has been defined for each input node.
- No input nodes are in a **Not ready** state.
- Each export definition has a path or libref that can be accessed from the SAS server.
- Each export definition has a valid output file or table name.
- A code is assigned to the Communication node.
- Each required custom detail has a value.
- Each cell that is connected to a Communication node has a package code.
- If holdout control groups are enabled, the **Size** cell must have a value in the **Holdouts** section.

**Note:** If a Communication node has been optimized, nodes that are upstream from the Communication node can no longer be executed.

When you first open a Communication node, you select a communication definition.

## Specify Communication Node Details

The Details page displays information about the communication.

**Figure 5.9** *Communication Details*

The screenshot shows the 'Communication Properties' dialog box with the 'Details' tab selected. The left sidebar lists categories: Details (selected), Cells, Exports, Thresholds, Holdouts, and Responses. The main pane contains the following fields:

Name:	Communication
Description:	(empty text area)
Code:	COMM17413
Definition:	Catalog
Channel:	Catalog
Type:	Export
<input checked="" type="checkbox"/> Update contact history	
Offers	Minimum: <input type="text"/> Maximum: <input type="text"/>
Budget	Minimum: <input type="text"/> Maximum: <input type="text"/> Unit cost: <input type="text"/>

At the bottom, there is a 'Count' section with fields: Subject: Customer, Total: , Dropped: , Last run on: , and buttons: Update, Preview Export, OK, and Cancel.

A value for **Code** is required. Depending on the setting in the communication definition, the value can be generated automatically or entered manually.

The type of communication depends on the communication definition. Export communications generate an export file. Staged communications store treatments in a staging repository.

Click  to change the communication definition. If you change the communication definition, the communication settings are reset to the default values of the new communication definition.

For export communications, clear **Update contact history** to suppress updating the contact history when the communication is executed. This option is not available in staged communications.

The following fields are available for reporting. If SAS Marketing Optimization is installed at your site, the information in these fields can be used during optimization.

#### Offers

the minimum and maximum number of offers that can be made for a communication.

#### Budget

the minimum and maximum budget for all of the offers in this communication.  
The unit cost is the cost of each unit of the communication.

The **Total** field displays the population that receives the communication. This count is de-duplicated and is the same as the count in a Cell node that is downstream from the Communication node.

The **Dropped** field displays the population that is in manual or automatic holdout control groups and the population that is dropped during optimization. The dropped count is not de-duplicated; the same customer might be in multiple holdout control groups that are linked to the Communication node. In some cases, there might be two input cells that are linked to the Communication node with the same member in a holdout control group in one cell and not in a holdout control group in the other cell. In those cases, the member is included in both the **Total** count and the **Dropped** count. If the same member is in the holdout control group in multiple cells, that member is counted multiple times in the **Dropped** count. The dropped count is displayed only when the value is greater than 0.

The dropped counts from an A/B Test node are displayed in the following way:

#### Champion/Challenger

If the champion and challenger cells are connected to different Communication nodes, the population of the holdout control group is displayed only in the **Dropped** field of the Communication node that is linked to the champion cell.

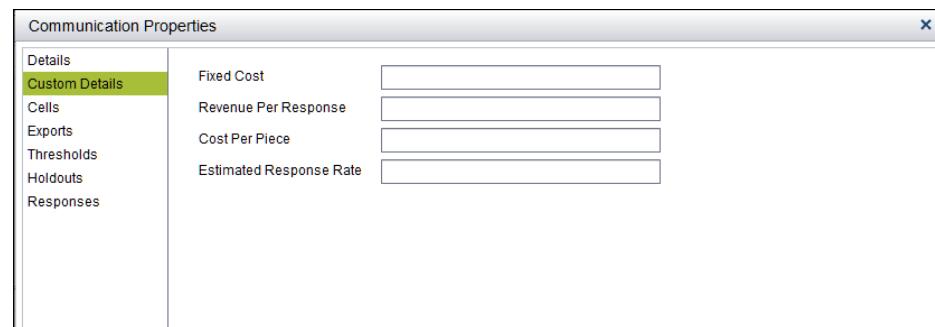
#### Challenger/Challenger

The challenger cells might be connected to different Communication nodes. In that case, the population of the holdout control group is displayed only in the **Dropped** field of the Communication node that is linked to the first challenger cell.

## Display Custom Details

If the selected communication definition has custom details, the details are displayed on the Custom Details page.

*Figure 5.10 Custom Details*



The next to a custom detail displays information about the associated custom detail tag.

## Display Cells

### Display Marketing Cell Count

The Cells page displays the counts that are associated with the attached marketing cells.

*Figure 5.11 Cells Page*

Communication Properties						
Details	Cells (1 of 1)					
	Cell Name	Cell Code	Input Count	Final Marketing Count	Dropped Count	Export Refin...
Cells	Cell	CELL30375				
Exports						
Thresholds						
Holdouts						
Responses						

The Input Count column displays the population that enters the Communication node. The Final Marketing Count column displays the population that receives the communication. The Dropped Count column displays the population that is in manual or automatic holdout control groups and the population that is dropped during optimization.

The Export Refinement column displays the criteria for refining the output. To specify the refinement criteria, select a cell and click . For more information, see “[Refine Output](#)” on page 259.

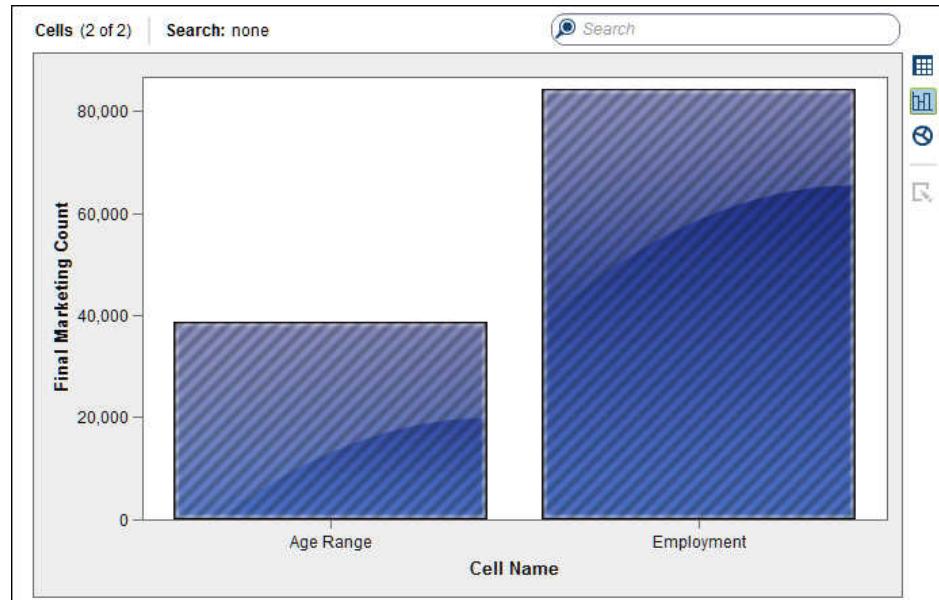
## Display Charts

Click to display a grid of values.

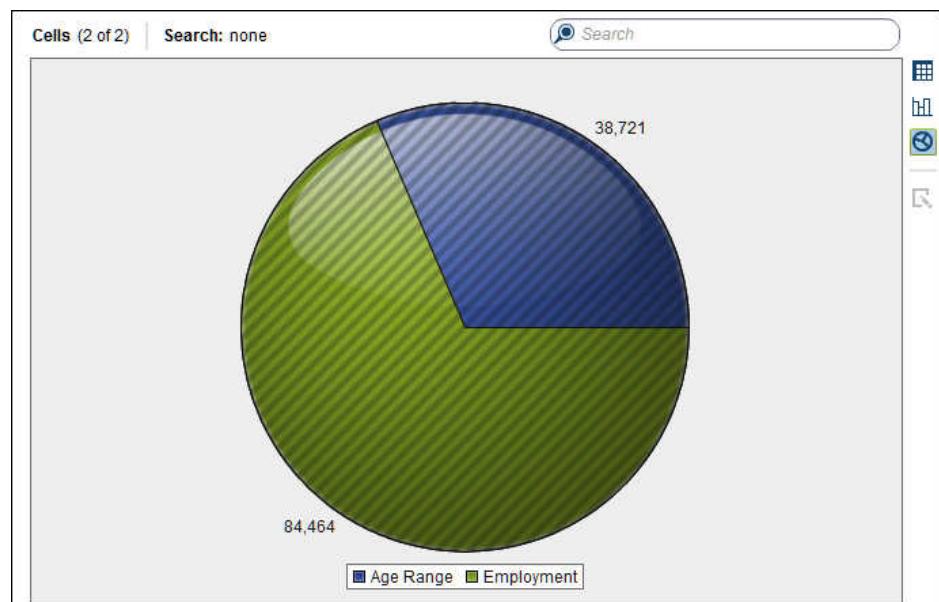
**Figure 5.12** Grid of Values

Cell Name	Cell Code	Input Count	Final Marketing Count	Dropped Count	Export Refin...	
Age Range	CELL30375	38,721				
Employment	CELL34863	84,464				

Click to display a bar chart of values.

**Figure 5.13** Bar Chart of Values

Click to display a pie chart of values.

**Figure 5.14** Pie Chart of Values

## Refine Output

You can export data from any relationship level that has been previously referred to in the campaign. You can refine your data so that extra output records are not included. Refining the data is useful when you import from tables that are in a many-to-one relationship to the subject of the export table.

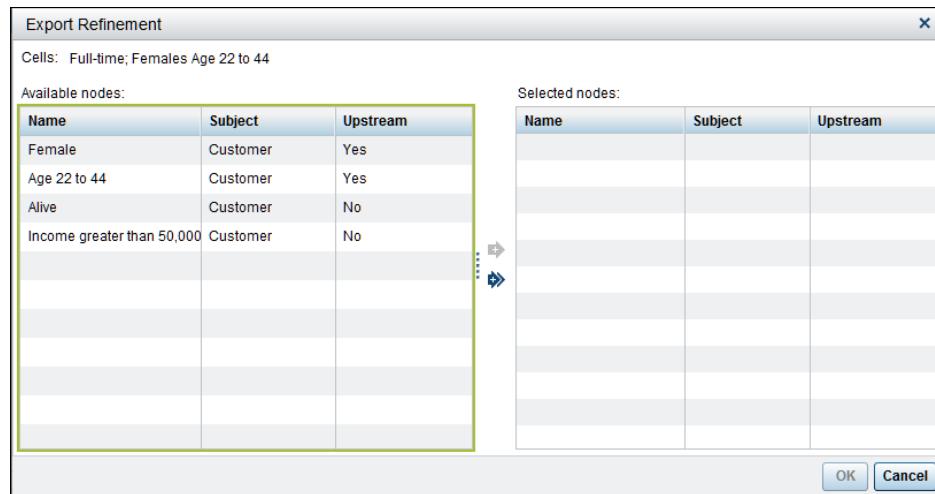
For example, you might create a campaign that includes a Select node that is not connected to a Communication node. You can select a marketing cell and refine the export by selecting data items from any other node, whether the node is connected to the Communication node.

**Note:** If the Communication node is in an optimization campaign, optimization fails if refine output is applied to an upstream node, and there are other upstream nodes that share input into the targeted Communication node.

The Export Refinement column on the Cells page displays the criteria for refining the output. To specify the refinement criteria, select one or more cells and click .

In the Export Refinement window, you can select data from input nodes and other nodes.

*Figure 5.15 Export Refinement*



The list contains upstream nodes that are linked to the Communication node and nodes that are not linked to the Communication node. If you selected multiple cells, the list contains terminal nodes that are not upstream from the cell nodes and upstream nodes that are common to the selected cell nodes.

You can select data from the following types of nodes:

- And
- Cell
- Limit
- Link
- Map
- Or
- Process

- Report Link
- Response
- Select.

You can refine output from multiple cells.

The following node types are not displayed in the table because in some cases you cannot select data from them:

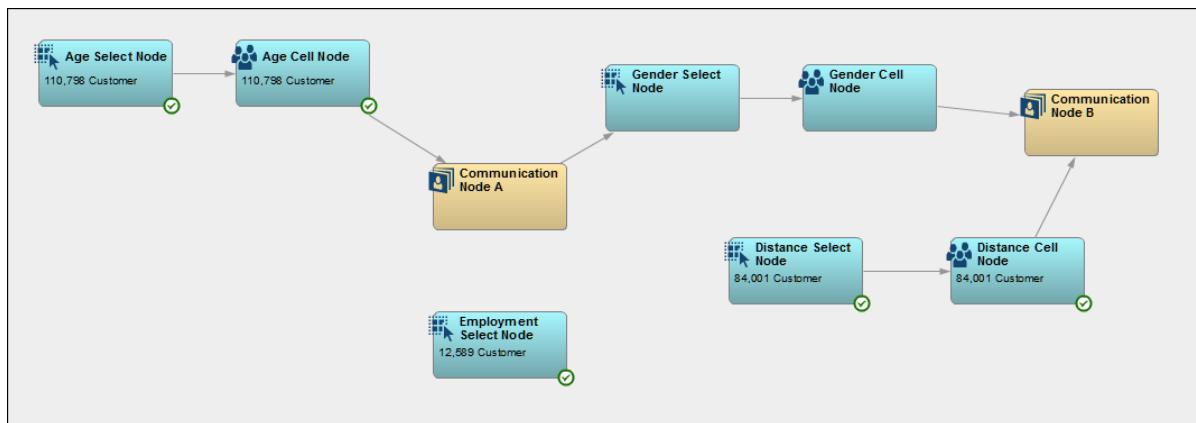
- Split
- Prioritize
- Communication
- Export
- Report.

You can access data for refinement from any data-containing nodes that exist immediately upstream from a node in the following list. Data access is possible until you again encounter any node in the list that is farther upstream:

- Response
- Link
- Communication
- Export
- Report

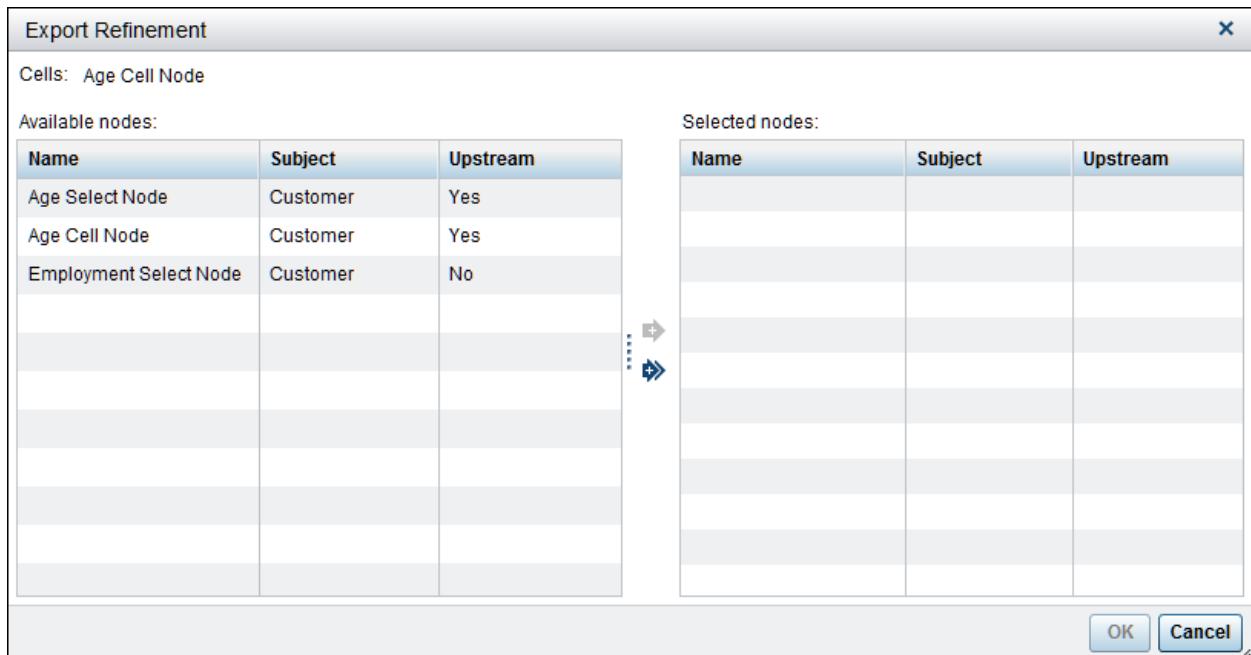
The following diagram is an example:

**Figure 5.16** Access Data for Refinement



The potential refinement nodes for Communication Node A include Age Select Node, Age Cell Node, and Employment Select Node.

**Figure 5.17** Refinement Nodes for Communication Node A



Age Select Node and Age Cell Node are upstream from Communication Node A. Employment Select Node is a terminal node that is not upstream from the Communication node.

For Communication Node B, the refinement nodes do not include Age Select Node or Age Cell Node, due to the intervening Communication Node A. The refinement nodes do include Employment Select Node, because that is a terminal node that is not linked to the Communication node.

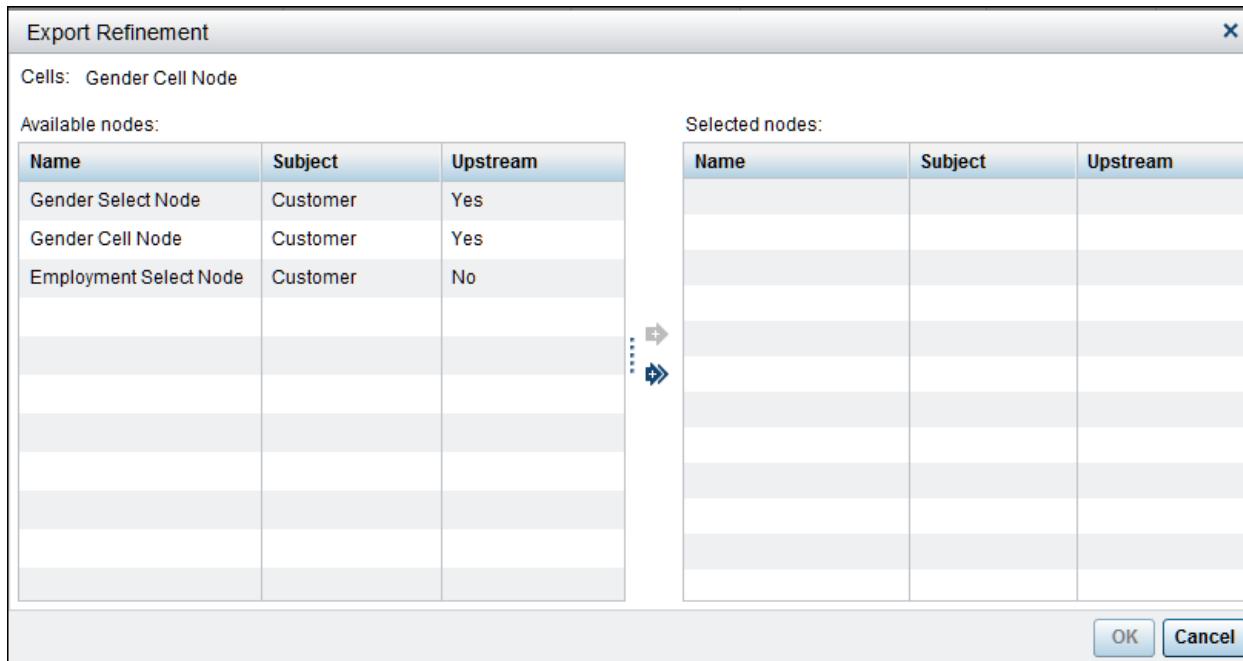
Two cell nodes are linked to Communication Node B.

**Figure 5.18** Communication B Cell Nodes

Communication Node B Properties						
<a href="#">Details</a> <a href="#">Custom Details</a> <b><a href="#">Cells</a></b> <a href="#">Exports</a> <a href="#">Thresholds</a> <a href="#">Holdouts</a> <a href="#">Responses</a>	Cells (2 of 2) <span>Search: none</span>		 <a href="#">Search</a>			
	Cell Name	Cell Code	Input Count	Final Marketing Count	Dropped Count	Export Refinement
	Gender Cell Node	CELL35204				
	Distance Cell Node	CELL38472	84,001			

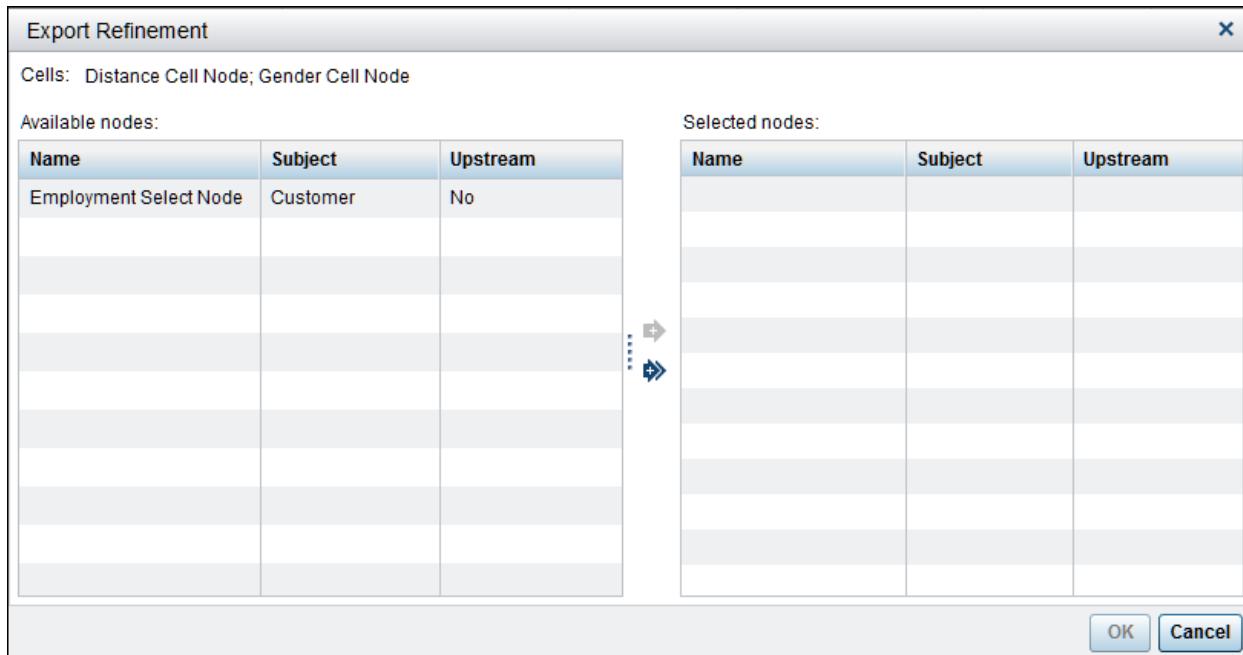
If you select **Gender Cell Node**, **Gender Select Node**, **Gender Cell Node**, and **Employment Select Node** are all available for refinement.

**Figure 5.19** Refinement Nodes Available for Single Selection



If you select both **Gender Cell Node** and **Distance Cell Node**, only Employment Select Node is available for refinement. Employment Select Node is a terminal node that is not upstream from both selections. The other upstream nodes are not common to both Cell nodes.

**Figure 5.20** Common Node for Refinement



**Note:** You cannot access data from nodes whose subjects are stored in a different database engine from the subjects in the Communication node.

## Specify Export Properties

### Types of Communication Nodes

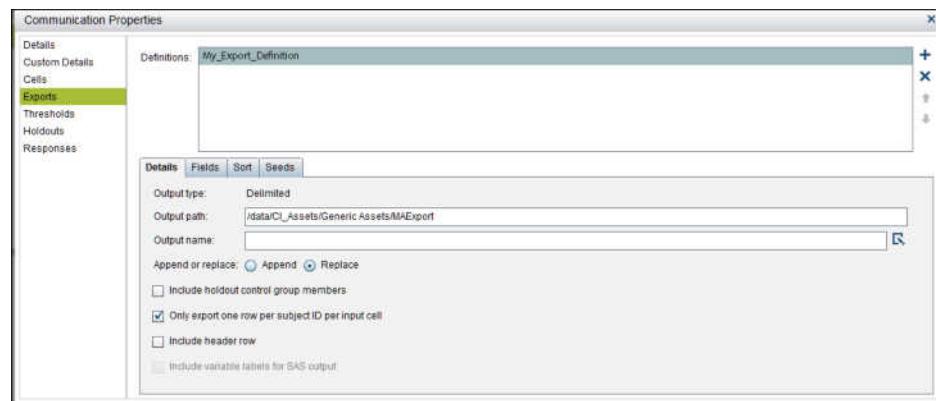
The type of Communication node depends on the communication definition setting. Export type Communication nodes generate an export file. Export Communication node properties include an Exports page.

Staged type Communication nodes store treatments in a staging repository. In Staged Communication node properties, the Exports page is blank. For information about staging treatments, see “[Stage Treatments](#)” on page 168.

### Select an Export Definition

On the Exports page of the Communication node, you can specify whether data is exported when you execute the communication.

*Display 5.3 Exports*



Click **+** to select an export definition. An export file is generated based on each export definition that you have selected. When you select an export definition, you are making a copy of the definition. Any changes that are made afterward to the definition are not reflected in the copy.

### Specify Export Details

The **Details** tab displays the output type and other information.

After you have selected an export definition, the **Output path** field displays the location for the exported data that is specified in the export definition. You can edit the output path.

In the **Output name** field, enter a filename for the exported data. If the export definition is for SAS Digital Marketing, click **...** to select a broadcast. The file or table name must be a valid name for the type of file or table. The name must also be valid for the operating system under which the file or table is created. You can use variables to generate filenames. For more information, see “[Use Variables to Create Export Filenames](#)” on page 264.

Select **Append** or **Replace** to specify whether you want to append or replace the existing file or table. If multiple exports within a campaign are written to the same export file or table, a header row can be inserted at the beginning

automatically. All subsequent exports append data without inserting another header row. To insert only one header row at the beginning, select **Replace** for one communication, and select **Append** for all other communications. The communication that is marked **Replace** writes to the export file first, followed by the communications that are marked **Append**. If the output type is SAS Customer Intelligence 360, **Replace** is the only option that is available.

Select **Include holdout control group members** to include holdout control groups in the export. This option is not available if the output type is SAS Customer Intelligence 360.

To exclude duplicate rows or subjects from the export file, select **Only export one row per subject ID per input cell**. For more information, see “[Export One Row per Subject ID](#)” on page 266.

To use your own column headings as part of the export file, select **Include header row**. This check box is unavailable if the export type is TABLE, SAS DATASET, EXCEL, XML, or SAS Customer Intelligence 360.

To use the variable labels in a SAS format file, select **Include variable labels for SAS output**. This check box is enabled only when the export type is SAS DATASET.

**Note:** If a SAS data set is replaced and **Include variable labels for SAS output** is selected, the specified value for the label is used when replacing a SAS data set. If a SAS data set is replaced and **Include variable labels for SAS output** is not selected, the **Output name** is used as the label. If the data is appended to a SAS data set and **Include variable labels for SAS output** is selected, the SAS label is displayed as the first section of the cell in the Field column. If the data is appended to a SAS data set and **Include variable labels for SAS output** is not selected, the labels in the existing data set are not changed.

## Use Variables to Create Export Filenames

You can use variables to generate text strings in the output filenames of the Communication and Export nodes. For example, if you want to be able to search for files that are exported by a particular campaign, you can create filenames that are based on the campaign name. These variables are available to all output types except SAS Digital Marketing broadcasts.

The following variables generate filenames:

**&CAMP\_CD.**

campaign code. This variable is available in the Communication node and the Export node.

**&CAMP\_NM**

campaign name. This variable is available in the Communication node and the Export node.

**&CAMPVER.**

campaign reporting version. This variable is available in the Communication node and the Export node.

**&COMM\_CD.**

communication code in a Communication node. This variable is available in the Communication node.

**&COMMNM**

name of the Communication node. This variable is available in the Communication node and the Export node.

**&EXPDATE.**

date that the export was created. The format is yyymmdd (for example, "20131231"). This variable is available in the Communication node and the Export node.

**&EXPTIME**

time that the export was created in the format hhmmss (for example, "235959"). The time is based on the time zone of the server. This variable is available in the Communication node and the Export node.

**&FOLDERNM.**

folder that contains the campaign. For example, if the full path to the campaign is `x/y/z/campaign`, then the variable &FOLDERNM is replaced with z. This variable is available in the Communication node and the Export node.

**&MAUSER.**

user name. In an Export node in a diagram, this is the only variable that returns a value. This variable is available in the Communication node and the Export node.

**&OCCURNBR.**

occurrence number. This variable is available in the Communication node.

You can add text to variables, and combine more than one variables. For example, if a campaign code is 123\_CAMP, an output name of

`test&CAMP_CD.output`

generates a file named `test123_CAMPoutput`. If the communication code in the same campaign is COMM123, an output name of

`test&CAMP_CD.COMM_CD.output`

generates a file named `test123_CAMP.COMM123output`. If the filename is generated for a CSV file, the filename would be `test123_CAMP.COMM123output.csv`.

In the generated name, all non-alphanumeric characters, except for underscores, are replaced with underscores (\_). The 32-character limit on output filenames is not applied. When an output name value contains % or &, the length limits on output names are not enforced. If expansion of the output name results in a filename greater than the maximum number of allowed characters for that output type, a stored process error might result. Make sure that the length of the expanded output name is suitable for the destination output type.

Note that each variable is terminated by a period (.). If the variable is used without a terminating period, the following problems might occur:

- If additional characters follow the embedded variable name in a filename, the variable is not recognized and expanded. For example, &CAMP\_CDoutput would result in an output file named `&campcdoutput.csv`.
- If the variable is at the end of the output name, the period (.) that separates the filename from the file type extension vanishes. For example, output&CAMP\_CD would result in an output file named `outputtest123_CAMPcsv`.

**CAUTION!** Invalid filenames cause a run-time failure. Make sure that the generated filenames follow length, character, operating system, database, and other restrictions.

## Export One Row per Subject ID

When you select **Only export one row per subject ID per input cell**, duplicate subject IDs are excluded. In the case of a single cell where a field being exported has a many-to-one relationship with the subject ID of the cell, duplicates are excluded. For example, duplicate subject IDs are excluded when the subject ID is “Customer,” and a single customer has multiple accounts.

Selecting **Only export one row per subject ID per input cell** has no effect when multiple input cells, each having the same subject ID, are linked to a Communication node. To de-duplicate subject IDs in this case, insert a Prioritize node between the cells and the Communication node.

The Communication node processes information in the following way:

- The contact history is updated with an entry for every subject ID and cell pair that is received by the Communication node.
- Export files are not de-duplicated.
- Communication nodes that export only campaign, cell, communication, and package information, and not subject ID information, have a count that consists of the de-duplicated input population. This behavior is the same as that for Communication nodes that export subject ID information.

## Select Columns for Export

Click the **Fields** tab to add and delete columns in the export file. If the output type is SAS Customer Intelligence 360, the fields are already selected.

*Display 5.4 Fields Tab*

Field	Output Name	Format	Type	Sort
Randbin - Customer	RANDBIN		Numeric	
Income - Customer	INCOME	COMMA10.2	Numeric	
Client Id - Customer	CLIENTID	F10.0	Numeric	
Employ - Customer	EMPLOY	SEMPSTAT.	Character	
City - Contact Information - Cust...	CITY	\$35.	Character	
Customer Since - Customer	ACQDATE	DATETIME16.0	Date	
External Opt Out - Customer	OPTOUTEXTERNAL	NOYES.	Numeric	

The **Available** list contains these folders:

- The **Data Items** folder displays items in a hierarchy that is determined by the information map that is associated with the selected export definition. In addition, any calculated data items that you have created are displayed in the **Data Items** folder.
- The **Campaign** and **Optimization** folders contain the set of standard fields that are associated with campaign and communication definitions and with SAS Marketing Optimization, if that product is installed at your site. Also displayed are custom detail tags, links, and custom details that are associated with individual campaign and communication definitions.
- The **Marketing Cell** folder contains standard fields for cells, including cell codes. This folder also contains tracking codes.

- The **Package** folder contains standard fields for package codes and treatment details, and folders that contain fields for custom details and custom detail tags.
- The **Text** item adds a text row with the default name of **Text $n$** , where  $n$  is a number and the series of numbers starts with 1. You can replace the default name and the default output name with meaningful names.
- The **Today's Date** item adds a text column with the default name of Today's Date to the export file. The default output name is **Export\_Date\_Today**. The value for Today's Date is the date that the export file is created.

Use the arrows to move items between the Available hierarchy and the Selected table.

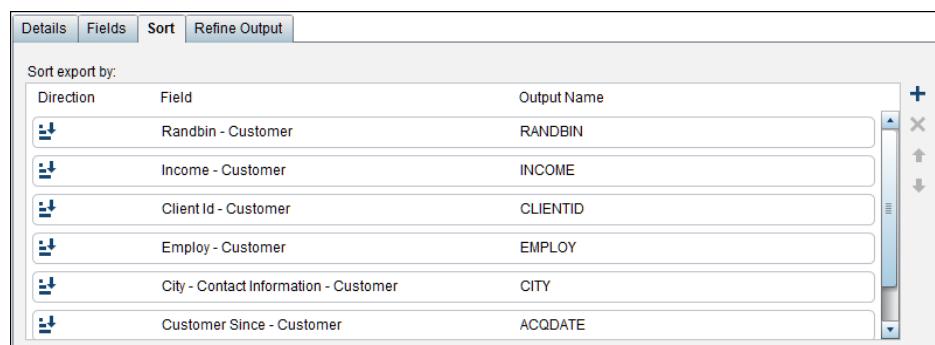
You can modify all of the fields in a **Text** item. For other items, except for the cells in the Field column, you can modify the content of the cells in the Selected table.

The Output Name column headings are automatically populated. You can replace these headings with a unique valid column heading. Output names can contain only alphanumeric characters and the underscore (\_) character.

### Change Sort Order

To specify a different sort order, click the **Sort** tab. This tab is not available if the output type is SAS Customer Intelligence 360.

#### *Display 5.5 Sort*



The screenshot shows the 'Sort' tab of a configuration interface. At the top, there are tabs: Details, Fields, Sort (which is selected), and Refine Output. Below the tabs is a section titled 'Sort export by:' with a table header: 'Direction', 'Field', and 'Output Name'. There are seven rows in the table, each containing a field name and its corresponding output name. To the right of the table is a vertical toolbar with icons for adding (+), deleting (x), and changing the sort order (up and down arrows). The table data is as follows:

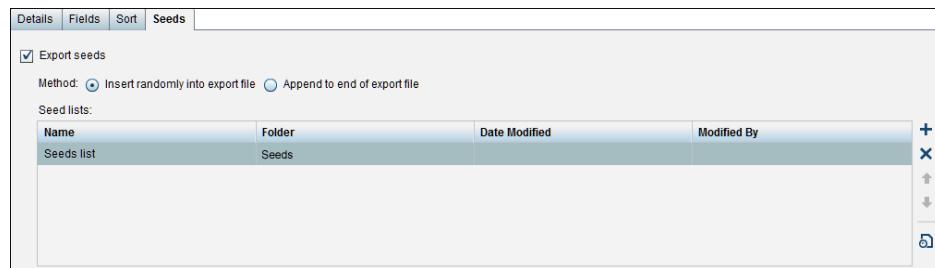
Direction	Field	Output Name
	Randbin - Customer	RANDBIN
	Income - Customer	INCOME
	Client Id - Customer	CLIENTID
	Employ - Customer	EMPLOY
	City - Contact Information - Customer	CITY
	Customer Since - Customer	ACQDATE

Click **+** to select the fields by which to sort. Use the arrows to change the position of the fields.

### Select Seed Lists

On the **Seeds** tab, select **Export seeds** to specify the seeds that are exported when the communication executes and the data is exported. This tab is not available if the output type is SAS Customer Intelligence 360.

Figure 5.21 Seeds



Select a method to determine how the seeds are exported. You can choose to insert the list items randomly into the export file or to append the list to the end of the export file. For example, when you select the former and you are exporting 1000 customers with 10 random seeds, the seeds are scattered randomly among the customer names.

Click to select a seed list.

Click to view members of the selected seed list.

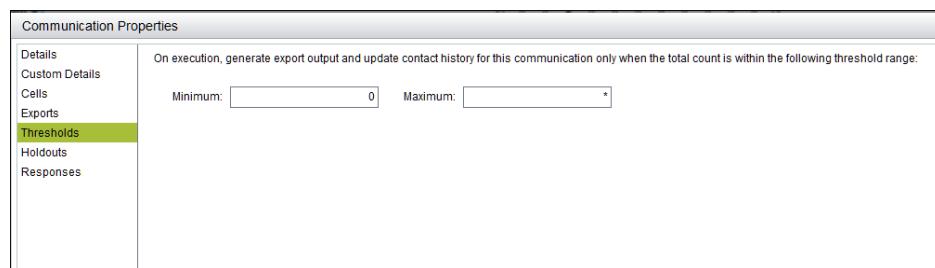
If the fields of the seed list do not match the fields of the export definition that is assigned to the Communication node, the following rules apply:

- If the field is in the seed list, but is not in the export definition, the field is dropped from the export file.
- In some cases, the field might be in the export definition, but does not have a value in the seed list or is not in the seed list. The field inherits the value of the previous record in the export file.

## Set Audience Threshold

The Thresholds page displays information about audience thresholds for the communication when the communication is executed. The threshold does not affect updating counts.

Figure 5.22 Thresholds



The threshold criteria are based on the marketing population count that is displayed in the **Total** field. This count has been de-duplicated and is a count of unique subjects. This count is passed to downstream nodes.

For staged communications, treatments are staged only when the count is within the threshold range. Export output is not generated, and contact history is not updated.

For export communications, when the threshold is not met, the count for the Communication node is 0 and the **Dropped** count includes the entire population. The Communication node does not generate export output and the contact history is not updated in the common data model. Nodes that are downstream from the Communication node are executed. These downstream nodes receive an empty input file from the Communication node.

## Manage Holdout Control Group Settings for a Communication

You can manage control groups on the Holdouts page of the Communication node. This page displays automatic holdout, manual, and A/B Test holdout control groups. A/B Test holdout control groups are displayed on this page if **Enable the holdout control group** is selected in the A/B Test Properties window.

*Figure 5.23 Holdouts Page*

Cell Name	Cell Code	Input Count	Enable Holdout	Holdout Name	Holdout Code	Size	Actual
Node B	CELL35202	110,798	<input checked="" type="checkbox"/>	Node B_Control	CGCELL35202		

You can override the business context or campaign settings for automatic holdout control groups.

For manual control groups, select **Enable Holdout** to designate the control group as a holdout control group and to exclude the population from the communication.

For automatic holdout control groups, select or deselect **Enable Holdout** to override the setting that is specified in the campaign properties.

For automatic holdout control groups, the **Size** column displays the count or percentage that is specified in the campaign properties. Click in the **Size** cell to edit the count or percentage. For information about using the statistical size estimator to specify the count, see “[Determine Sample Size](#)” on page 248.

The holdout control group population must not be larger than the population that is not in the holdout control group. When a Communication node is run, if total count in the marketing cell is less than twice the count specified for a control group, the resulting action is specified in the campaign definition. Either the holdout control group is not populated, or the campaign execution fails.

Select one or more automatic holdout control groups and click to apply the values that are set in the campaign properties. A/B Test and manual holdout control groups are not affected by this setting. A/B Test holdout control groups can be modified in the properties of the A/B Test node or by clicking on the Control Groups page of the campaign.

The value in the **Actual** column is calculated in the following ways:

manual control groups

the count in the marketing cell that has **Cell represents a control group** selected.

## automatic holdout control groups

the number in the automatic holdout control group. This value can be 0 if the input population is not large enough to meet the requirements. Random sampling is used to select the automatic holdout control groups within the Communication node.

## A/B Test holdout control groups

the number in the A/B Test holdout control group. This value can be 0 if the input population is not large enough to meet the requirements.

# **Set Response Options**

On the **Responses** page, specify the details for each response that is associated with the communication.

**Figure 5.24** Responses

To select a response type to be used in the communication, select **Add to Diagram**. Each of the response types that you select here appear as a Response node in your campaign diagram.

To specify an expected response rate, enter a value in the **Expected Rate (%)** cell. The values in the **Expected Count** cell are not updated automatically. You can choose to provide the values for the expected count in this cell.

To associate a value with the expected response for reporting purposes, select a value from the **Response Type** list. You can select one of the following values:

(none)

indicates that the response type is unknown. This is the default.

Converted

indicates that the response is successful.

## Responded

indicates that there is a response.

All responses are added to the total marketing count. Converted responses are added to the successful marketing count.

## Preview Export Tables

If you have permission, you can preview the export contents before the node is executed and the export table is created.

Click **Preview Export** to preview the export table that contains the updated counts.

**Figure 5.25 Export Table**

The screenshot shows the 'MA Tables for MyExportTable' window. On the left, there's a sidebar titled 'Columns' with checkboxes next to column names: RANDBIN, INCOME, CLIENTID, EMPLOY, CITY, ACQDATE, and OPTOUTEXTERNAL. Below this is a 'Column Information' panel with a table showing details for the 'RANDBIN' column, such as Name, Label, Length, Type, Format, Informat, and Varnum. The main right pane displays a grid of data rows with columns labeled RANDBIN, INCOME, CLIENTID, EMPLOY, CITY, ACQDATE, and OPTOUTEXTERNAL. At the bottom of the window, there's a status bar with the text 'Rows: 110798 Filtered rows: 110798 Columns: 7 Selected row: 0' and a 'Close' button.

The Preview Export window displays the format and general content of the export before campaign execution. Fields such as RESPTRACKING\_CD might not contain accurate counts before campaign execution.

The ability to preview export tables is set by the **Allow preview of export tables** capability in SAS Management Console. For more information, see *SAS Marketing Automation: Administrator's Guide* or contact your administrator.

**Note:** Export preview is not available if the output type is SAS Customer Intelligence 360.

## Execute the Communication Node

To execute the Communication node and create an export file, right-click the node and select **Execute**.

## Executing Downstream Nodes

### Rules for Executing Downstream Nodes

When a Process node or an Export that is downstream from a Communication node is executed, counts are updated for the Communication node. The Communication node is not executed.

When a Communication node is executed, nodes that are downstream are executed automatically.

There are exceptions in cases where it is not clear whether to execute nodes that are between multiple Communication nodes. In addition, downstream nodes that receive multiple inputs are not executed because the nodes might be

processing out-of-date information. Branches that are downstream from a Communication node are not executed if they contain the following nodes:

- Communication node
- Response node
- Nodes that can receive multiple inputs, such as And nodes, Or nodes, Prioritize nodes, and Process nodes that receive input from more than one node.

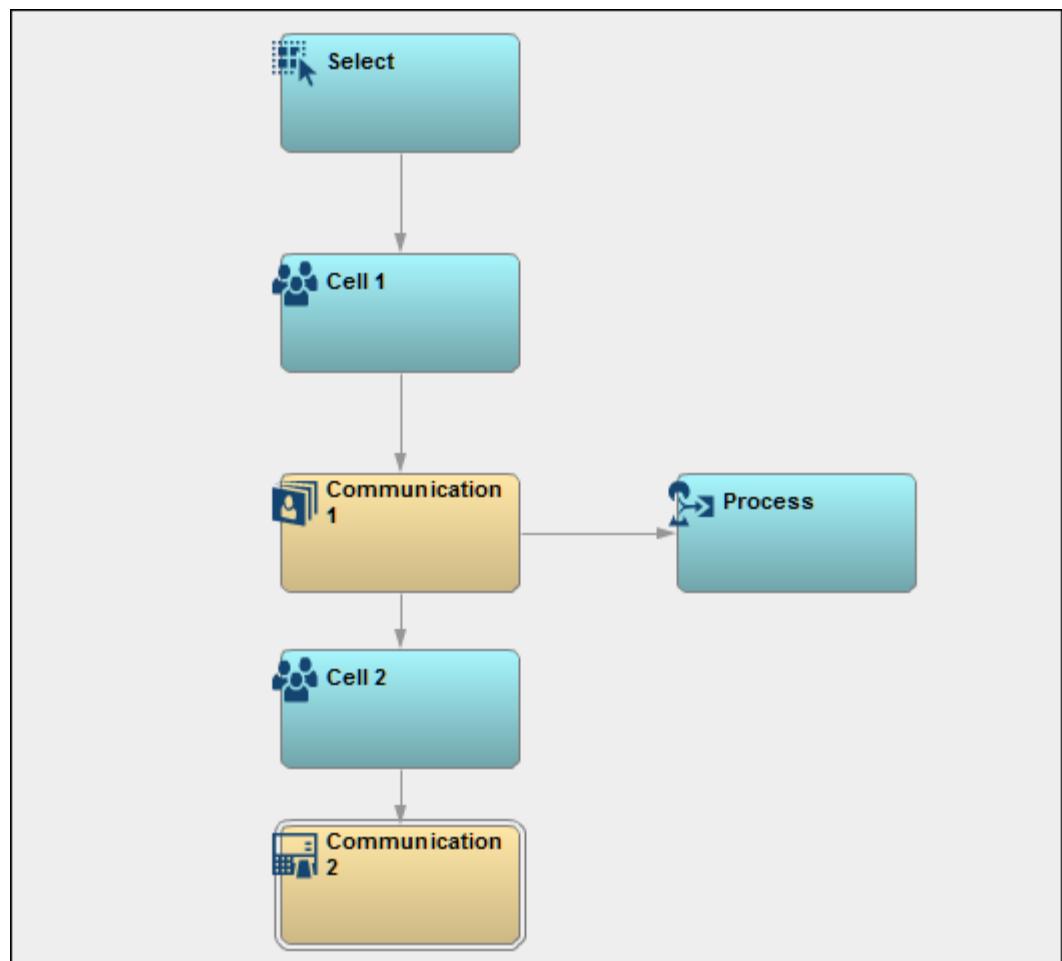
If a Cell node is immediately downstream from a Communication node, the counts in the Cell node are updated regardless of which nodes are downstream from the Cell node.

### Example: Single-Input Process Node Downstream from Communication Node

In the following example, when **Communication 1** is executed, the downstream Process node is also executed because it receives only one input.

**Communication 2** is not executed because it is a downstream Communication node.

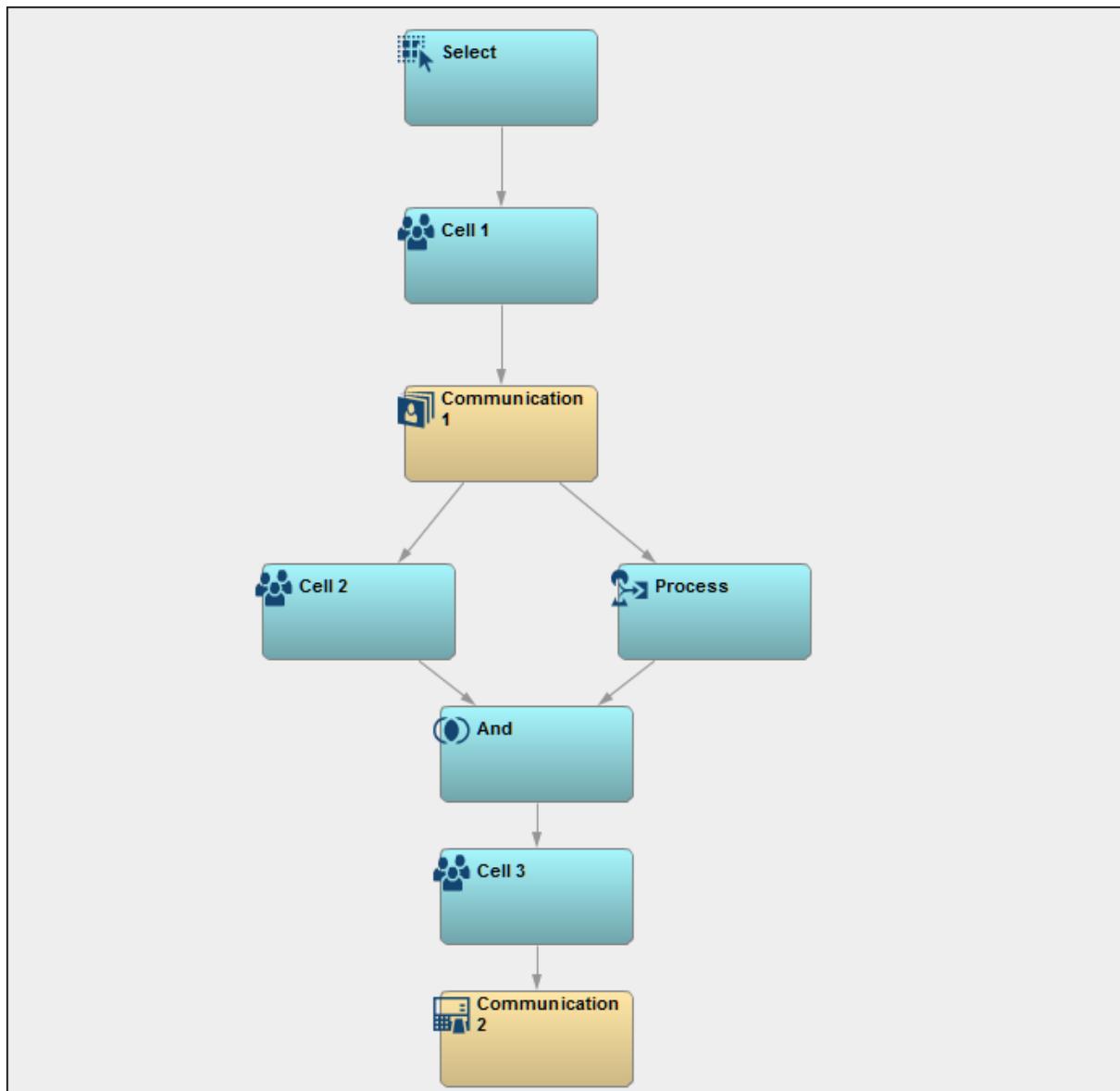
Figure 5.26 Process Node Downstream from Communication Node



### Example: And Node Downstream from Process Node

In the following example, an And node is downstream from a Process node. When **Communication 1** is executed, the branch that contains the downstream Process node is not executed because the branch also contains an And node and **Communication 2**.

*Figure 5.27 And Node Downstream from Process Node*

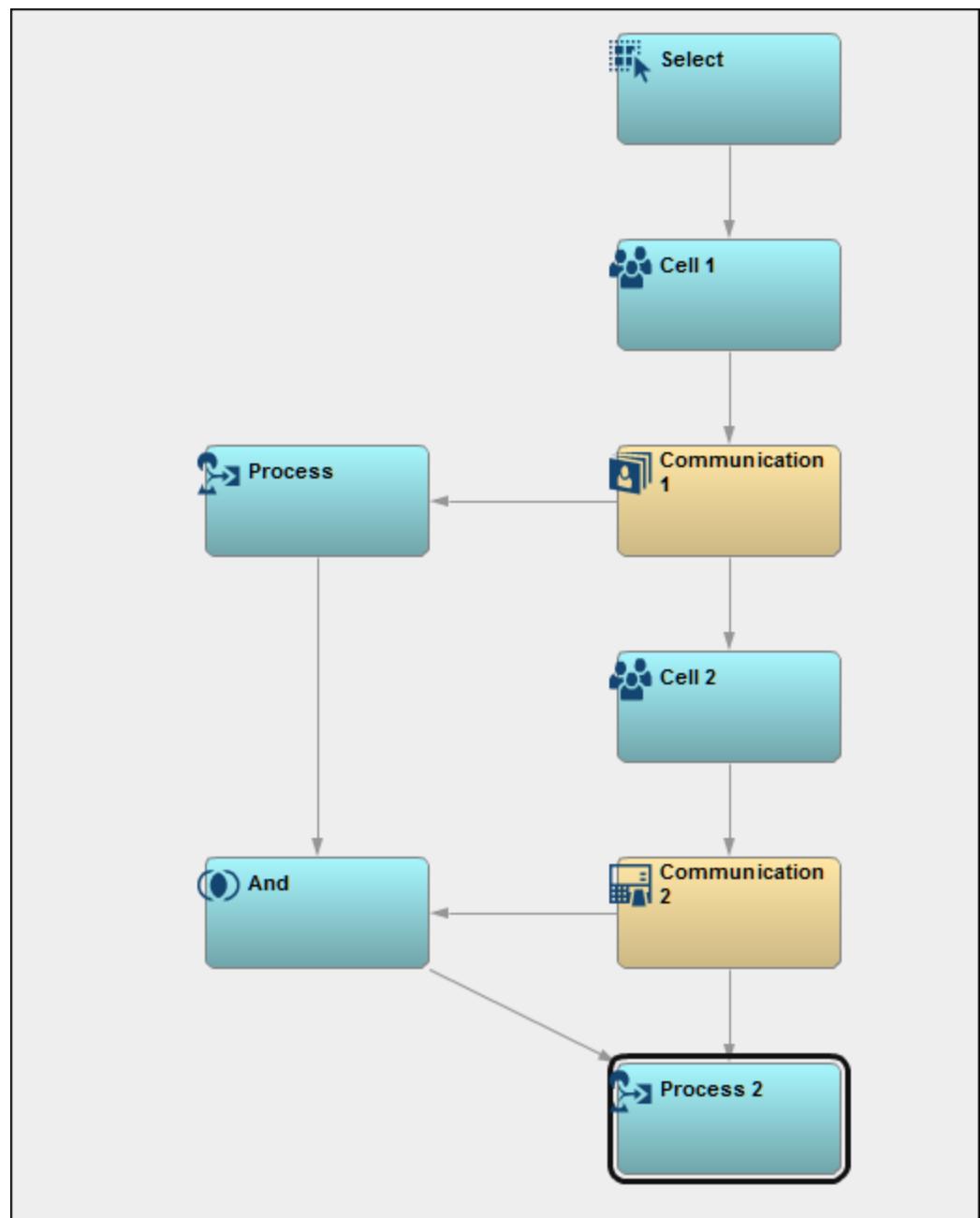


The Process node is executed when **Communication 2** is executed.

### Example: Multiple Process Nodes

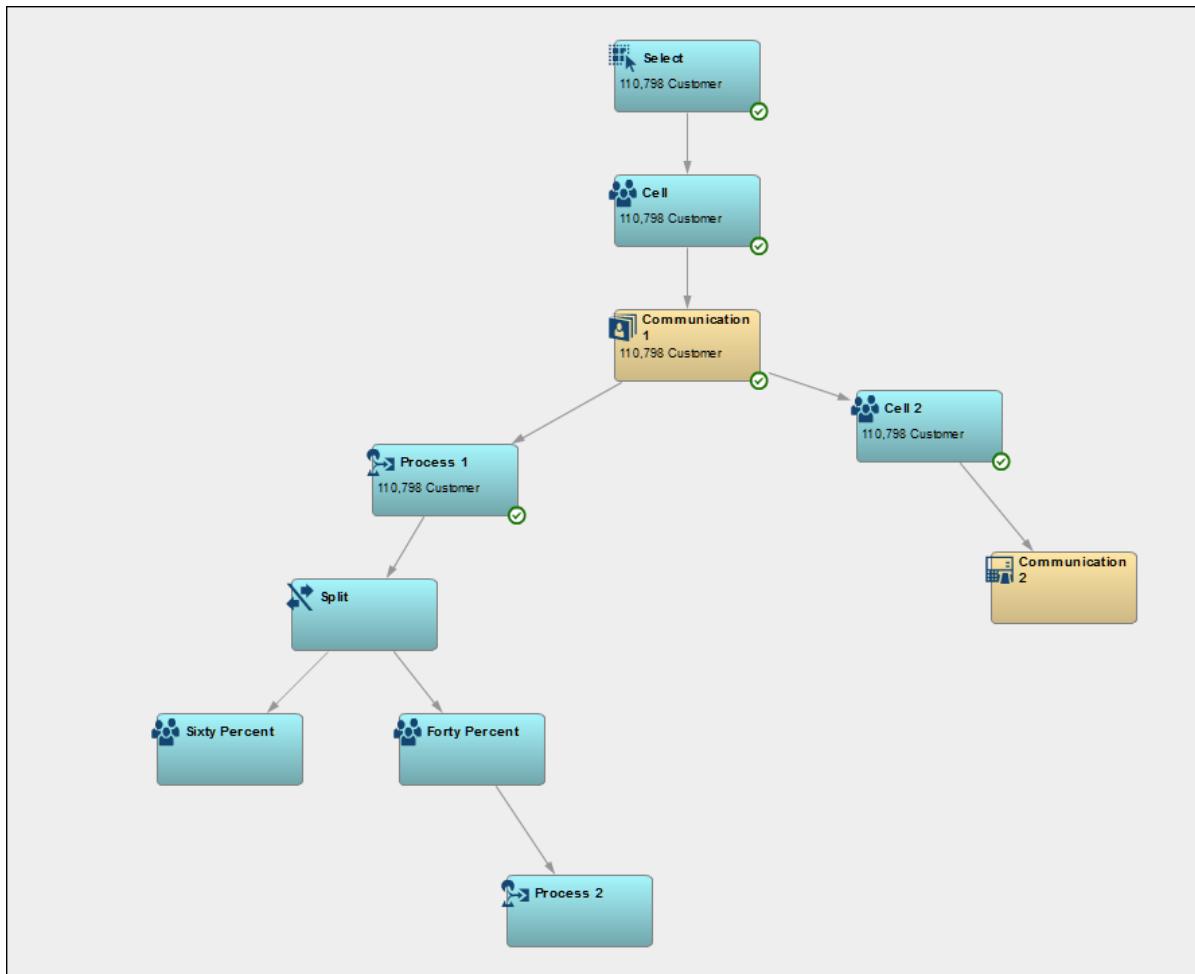
In the following example, when **Communication 1** is executed, **Process 1** is not executed because there is an And node downstream. When **Communication 2** is executed, **Process 1** and **Process 2** are not executed because there is an And node that is downstream from Communication 2.

Figure 5.28 Multiple Process Nodes



### Example: Parallel Branches

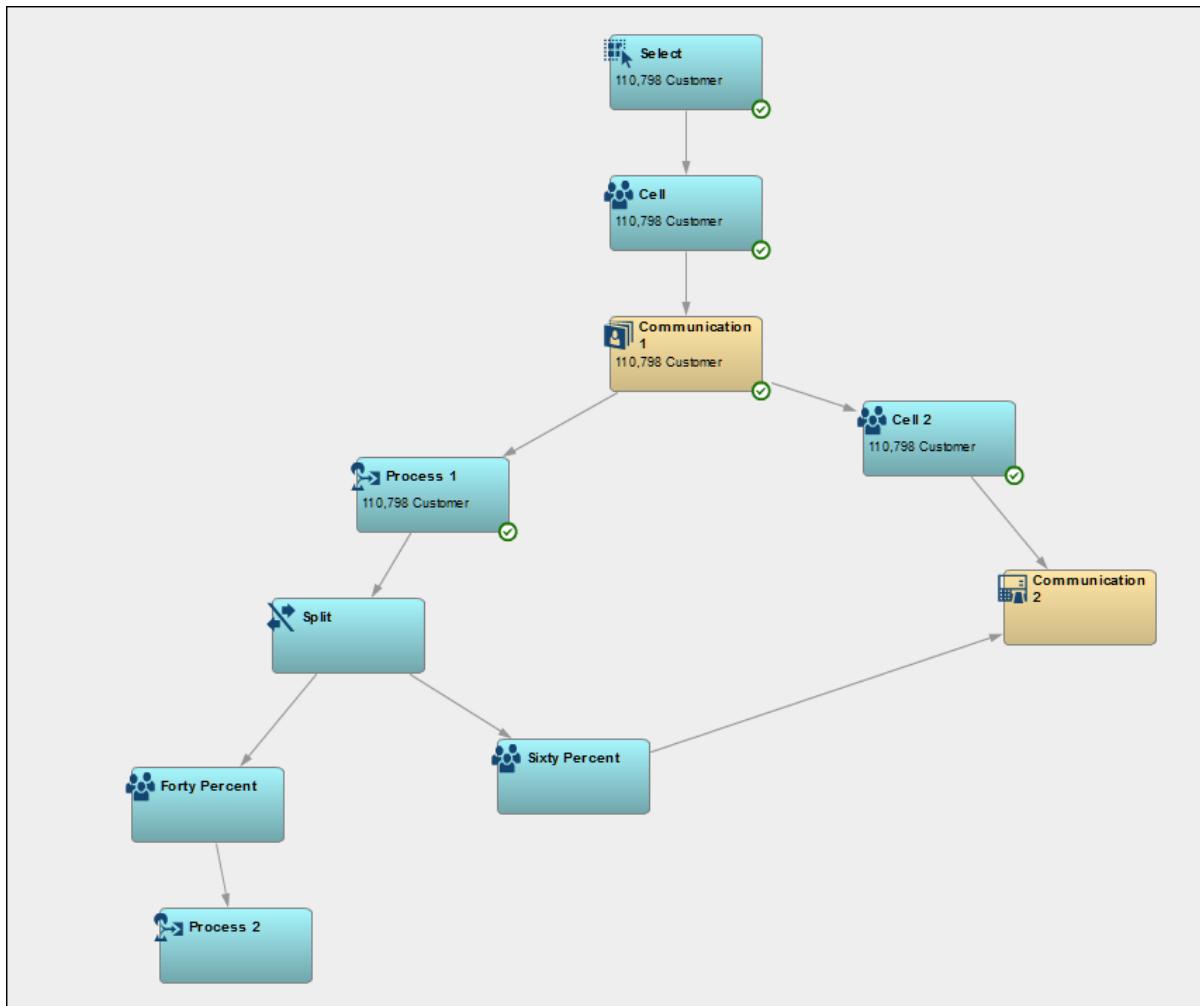
In the following example, there are two separate branches that are downstream from **Communication 1**. **Process 1** and **Process 2** are both executed because there are no multiple input or Communication nodes in that branch. **Communication 2** is not executed.

**Figure 5.29** Parallel Branches

### Example: Connected Branches

In the following example, when **Communication 1** is executed, **Process 1** and **Process 2** are not executed, because there is a Communication node that is downstream from **Process 1**.

Figure 5.30 Connected Branches



## Custom Node

If a custom node has been created, it is displayed in the Tool Palette. You can edit the name and description of the custom node in the Properties window. Any parameters or other options depend on the specifications for the individual node.

To execute a custom node, right-click the node and select **Execute**.

If you execute a Custom node that is downstream from a Communication node, counts are updated for the Communication node. The Communication node is not executed.

For information about creating a custom node, see “[Custom Diagram Tools](#)” on page 115.

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## Export Node

### Overview of the Export Node

The Export node creates a file or table that contains information about the subjects of the preceding nodes. The subject is determined by the preceding nodes and by the export definition. For example, you might have a Map node that maps customers to households and an export variable that has a unique value for customers, such as the name. In this case, the Export node creates an export file that contains names based on the customers that came into the Map node.

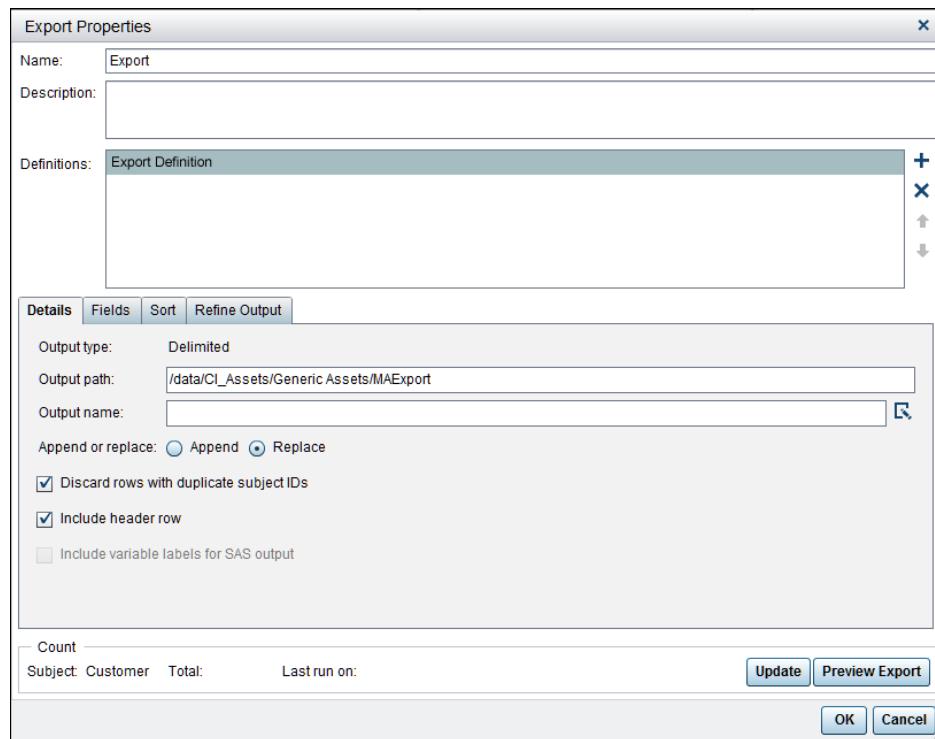
The counts for Export node reflect the number of unique subjects, not the number of records, to be exported. Before its counts can be updated, an Export node must meet the following requirements:

- At least one input node is connected to the Export node. You can connect multiple input nodes through an And node.
- A subject has been defined for each input node.
- There are no input nodes that are in a **Not ready** state.
- Each export definition has a path or libref that can be accessed from the SAS server.
- Each export definition has a valid output file or table name.
- At least one export definition is selected.

### Select an Export Definition

The Export Properties window displays information about the Export node.

Figure 5.31 Export Node Properties



Click **+** to select an export definition. Only export definitions that match the subject of the upstream nodes are listed. You cannot select an export definition until you have selected a data item in a Select node and connected the Select node to the Export node. If you select more than one export definition, an export file is generated for each definition.

## Specify Export Node Details

The **Details** tab displays the name of the export definition and other information.

After you have selected an export definition, the **Output path** field displays the location for the exported data that is specified in the export definition. You can edit the output path.

In the **Output name** field, enter a filename for the exported data. If the export definition is for SAS Digital Marketing, click **Q** to select a broadcast. The file or table name must be a valid name for the type of file or table. The name must also be valid for the operating system under which the file or table will be created. You can use variables to generate filenames. For more information, see ["Use Variables to Create Export Filenames" on page 264](#).

Select **Append** or **Replace** to specify whether you want to append or replace the existing file or table. If multiple exports within a campaign are written to the same export file or table, a header row can be inserted at the beginning automatically. All subsequent exports will append data without inserting another header row. To insert only one header row at the beginning, select **Replace** for one export, and select **Append** for all other exports. The export that is marked **Replace** will write to the export file first, followed by the exports that are marked **Append**.

To exclude duplicate rows or subjects from the export file, select **Discard rows with duplicate subject IDs**.

To use your own column headings as part of the export file, select **Include header row**. This check box is unavailable if the export type is TABLE, SAS DATASET, EXCEL, or XML.

To use the variable labels in a SAS format file, select **Include variable labels for SAS output**. This check box is enabled only when the export type is SAS DATASET.

**Note:** If a SAS data set is replaced and **Include variable labels for SAS output** is selected, the specified value for the label is used when replacing a SAS data set. If a SAS data set is replaced and **Include variable labels for SAS output** is not selected, the **Output name** is used as the label. If the data is appended to a SAS data set and **Include variable labels for SAS output** is selected, the SAS label is displayed as the first section of the cell in the Field column. If the data is appended to a SAS data set and **Include variable labels for SAS output** is not selected, the labels in the existing data set are not changed.

## Select Columns for Export

Click the **Fields** tab to add and delete columns in the export file.

*Figure 5.32 Fields Tab*

Fields Tab					
Available:		Selected:			
		Field	Output Name	Format	Type
► Data Items		Randbin - Customer	RANDBIN		Numeric
► Campaign		Income - Customer	INCOME	COMMA10.2	Numeric
► Marketing Cell		Client Id - Customer	CLIENTID	F10.0	Numeric
abc Text		Employ - Customer	EMPLOY	SEMPSTAT.	Character
Today's Date		City - Contact Infor...	CITY	\$35.	Character
		Customer Since - ...	ACQDATE	DATETIME16.0	Date
		External Opt Out - ...	OPTOUTEXTERNAL	NOYES.	Numeric

The Available list contains these folders:

- **Data Items** are displayed in a hierarchy that is determined by the information map that is associated with the selected export definition. In addition, any calculated data items that you have created are displayed in the **Data Items** folder.
- The **Campaign** folder contains the set of standard fields that are associated with campaign and communication definitions. Also displayed are custom detail tags, links, and custom details that are associated with individual campaign and communication definitions.
- The **Marketing Cell** folder contains standard fields for cells, including cell codes. This folder also contains tracking codes. This folder is not available if an Export node follows a Communication node.
- The **Text** item adds a text row with the default name of *Textn*, where *n* is a number and the series of numbers starts with 1. You can replace the default name and the default output name with meaningful names.

- The **Today's Date** item adds a text column with the default name of Today's Date to the export file. The default output name is Export\_Date\_Today. The value for Today's Date is the date that the export file is created.

Use the arrows to move items between the Available hierarchy and the Selected table.

You can modify all of the fields in a **Text** item. For other items, except for the cells in the Field column, you can modify the content of the cells in the Selected table.

The Output Name column headings are automatically populated. You can replace these headings with a unique valid column heading. Output names can contain only alphanumeric characters and the underscore (\_) character.

## Change Sort Order

To specify a different sort order, click the **Sort** tab. This tab is not available if the output type is SAS Customer Intelligence 360.

*Display 5.6 Sort*

Sort export by:		
Direction	Field	Output Name
	Randbin - Customer	RANDBIN
	Income - Customer	INCOME
	Client Id - Customer	CLIENTID
	Employ - Customer	EMPLOY
	City - Contact Information - Customer	CITY
	Customer Since - Customer	ACQDATE

Click to select the fields by which to sort. Use the arrows to change the position of the fields.

## Refine Output

You can export data from any relationship level that has been previously referred to in the campaign. You can refine your data so that extra output records are not included. Refining the data is useful when you import from tables that are in a many-to-one relationship to the subject of the export table.

On the **Refine Output** tab, you can select data from input nodes and other nodes.

**Figure 5.33** Refine Output

Available nodes:			Selected nodes:		
Name	Subject	Upstream	Name	Subject	Upstream
Process 2	Customer	No			
Employment	Customer	No			

The list contains upstream nodes that are linked to the Export node and nodes that are not linked to the Export node.

You can select data from the following types of nodes:

- And
- Cell
- Limit
- Link
- Map
- Or
- Process
- Report Link
- Response
- Select.

You can refine output from multiple cells.

The following node types are not displayed in the table because in some cases you cannot select data from them:

- Split
- Prioritize
- Communication
- Export
- Report.

You can access data for refinement from any data-containing nodes that exist immediately upstream from a node in the following list. Data access is possible until you again encounter any node in the list that is farther upstream:

- Response
- Link
- Communication
- Export
- Report

**Note:** You cannot access data from nodes whose subjects are stored in a different database engine from the subjects in the Export node.

## Preview Export Tables

If you have permission, you can preview the export contents before the node is executed and the export table is created.

Click **Preview Export** to preview the export table that contains the updated counts.

**Figure 5.34** Export Table

RANDBIN	INCOME	CLIENTID	EMPLOY	CITY
0	46,000.00	10002	Unknown	South Coffeyville
1	15,000.00	10004	Full Time	Willow Lake
1	21,000.00	10005	Full Time	Bayard
0	61,000.00	10006	Student	Bayard
0	17,000.00	10007	Student	Vienna
0	13,000.00	10010	Retired	Wetumpka
1	33,000.00	10011	Full Time	Wetumpka
0	14,000.00	10012	Student	Mead
0	31,000.00	10014	Seasonal	Mead
1	15,000.00	10017	Unknown	Center
0	16,000.00	10020	Retired	Linn Creek
1	9,000.00	10023	Full Time	Viroqua
0	17,000.00	10026	Not Employed	Shorter
0	30,000.00	10027	Student	Shorter
1	11,000.00	10030	Full Time	Santa Barbara
0	34,000.00	10033	Full Time	Chancellor
0	27,000.00	10035	Full Time	Baldwin

The Preview Export window displays the format and general content of the export before campaign execution. Fields such as RESPTRACKING\_CD might not contain accurate counts before campaign execution.

The ability to preview export tables is set by the **Allow preview of export tables** capability in SAS Management Console. For more information, see *SAS Marketing Automation: Administrator's Guide* or contact your administrator.

**Note:** Export preview is not available if the output type is SAS Customer Intelligence 360.

## Execute the Export Node

To execute the Export node, update the counts, and create an export file, right-click the node and select **Execute**.

If you execute an Export node that is downstream from a Communication node, counts are updated for the Communication node. The Communication node is not executed.

## Limit Node

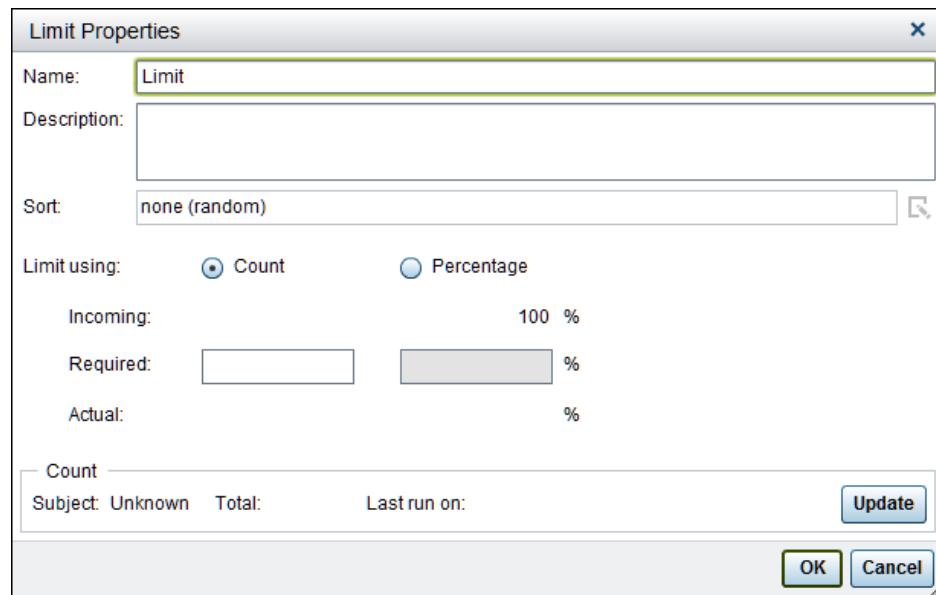
### Overview of the Limit Node

In the Limit node, you specify the settings that are used to create a subset of records.

### Specify Limit Node Details

The Limit Properties window displays information about the Limit node.

*Figure 5.35 Limit Properties*



Click next to the **Sort** field to specify data items to sort the records by. You can specify only the data items that match the subject of the limit node. If there are no predecessor nodes and the subject is undefined, then the **Sort** button is disabled.

Select **Count** to specify a count limit for the subset.

Select **Percentage** to specify a percentage limit for the subset.

### Example: Using the Limit Node to Target the 10,000 Most Profitable Customers

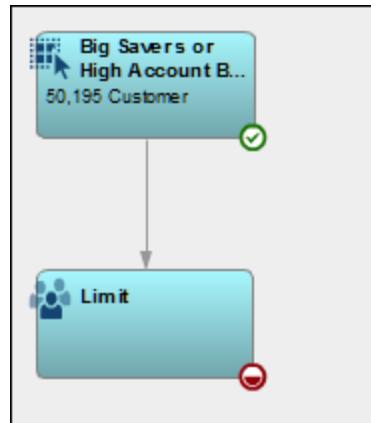
Even after you have made selections within a campaign, the capacity of the budget or channel can limit the number of customers who can be contacted. You use the Limit node to limit the number of customers while making sure that the customers who remain are the most valuable ones to the company.

For example, a bank might have a set budget for a communication that offers a new savings plan to customers who have a high ratio of savings to liquid

accounts. These customers also have an account balance of at least 30,000. The bank has set a budget to limit the offer to 10,000 customers. The campaign designer creates a campaign that selects customers in the Big Savers customer segment and customers with account balances of at least 30,000. The campaign designer can use a Limit node to keep the numbers within budget while selecting the most profitable customers.

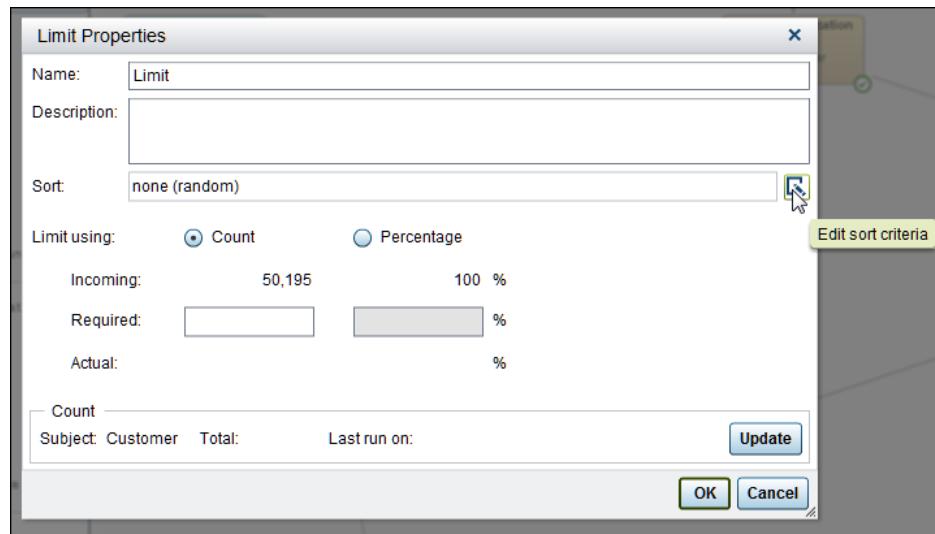
In this diagram, the Select node selects customers who belong to the Big Savers customer segment or customers with a minimum savings account balance of 30,000. The Select node is linked to a Limit node.

**Figure 5.36** Select Node Linked to Limit Node

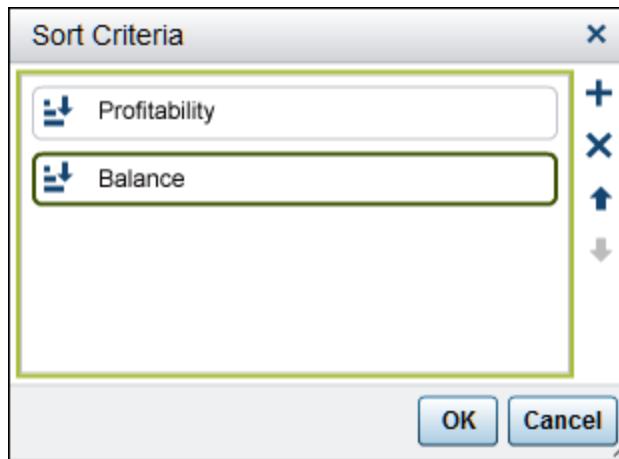


In the Limit Properties window, click to specify the sort criteria.

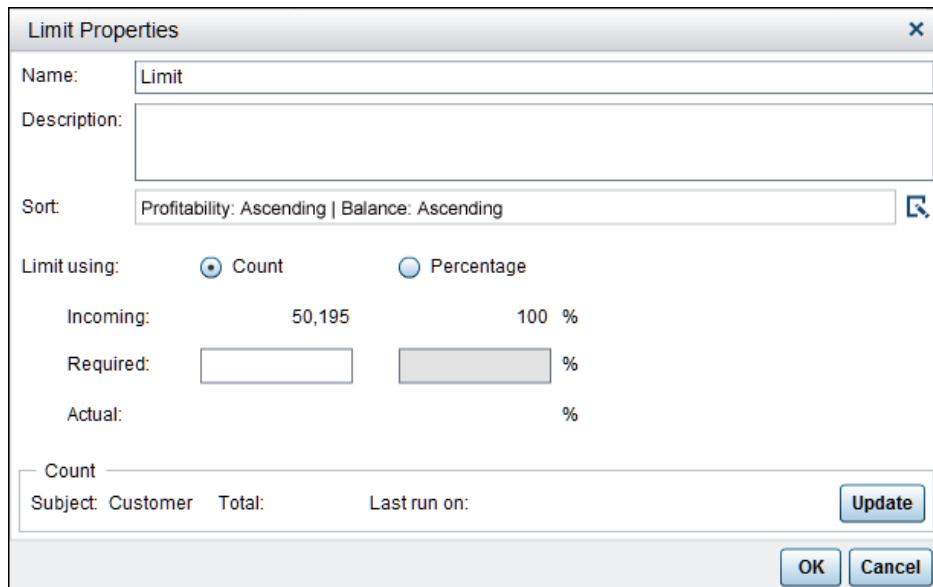
**Figure 5.37** Edit Sort Criteria



In the Sort Criteria window, select the customers with the highest profitability scores. If two or more customers have the same score, a second sort criterion is applied to select the customer with the highest savings account balance.

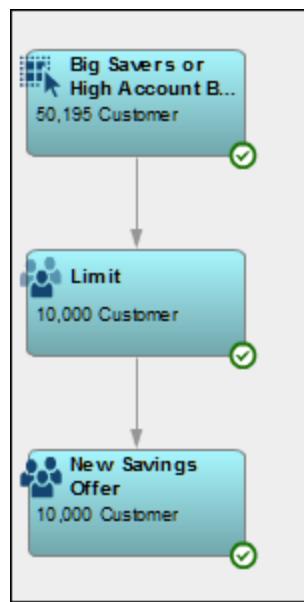
**Figure 5.38** Sort for Profitability and Balance

The Limit node selects the top 10,000 customers, sorted according to the criteria of profitability and account balance.

**Figure 5.39** Profitable Customer with High Account Balances

The results are collected in a Cell node.

Figure 5.40 Resulting Group of 10,000 Most Profitable Customers



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## Link Node

### Overview of the Link Node

You use the Link node to link to a Cell node in a different campaign, or to Cell nodes that are generated by Split, Prioritize, or A/B Test nodes in a different campaign.

In order to be able to link to Cell nodes, select the **Make cell available for linking** check box in the Cell node. You can also select the **Make output cells available for linking** check box in the Split, Prioritize, or A/B Test node.

### Select a Cell

When you first open a Link node, you select a Cell node in a different campaign.

**Figure 5.41** Select Cell

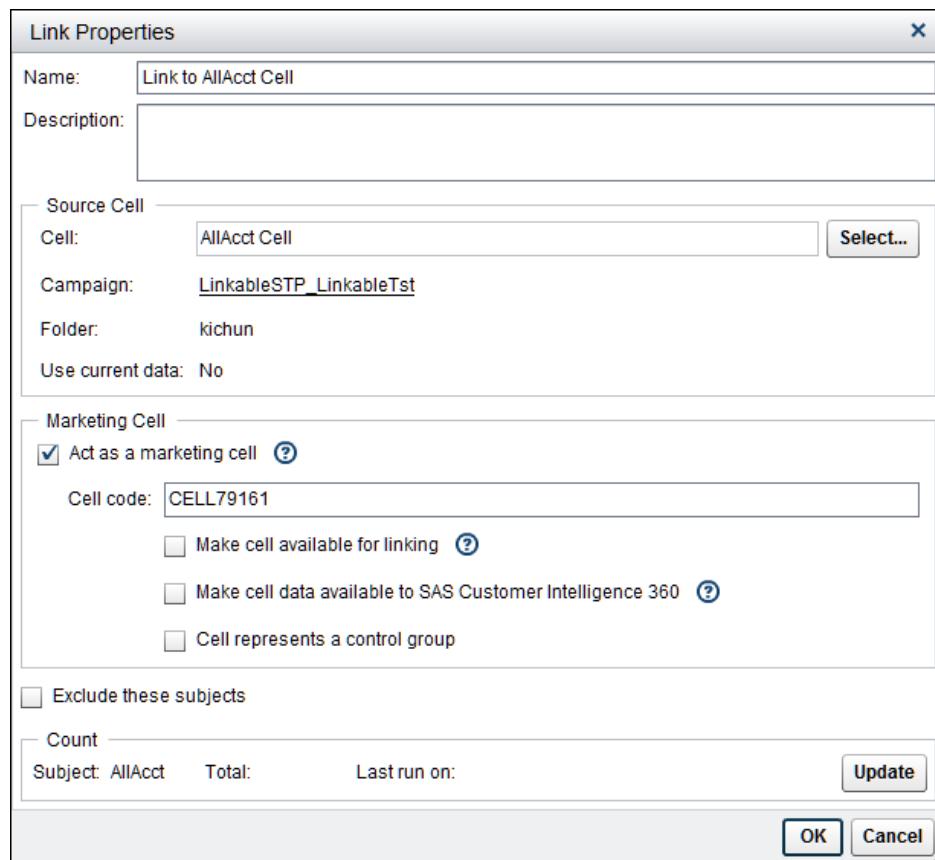
Name	Cell Code	Campaign	Folder	Date Modified
75%	GenericCell1631	Banking	Campaigns	Sep 11, 2014 12:50 PM
Cluster 1	GenericCell1675	Finance	Campaigns	Sep 11, 2014 12:50 PM
Cluster 2	GenericCell1667	Insurance	Campaigns	Sep 11, 2014 12:50 PM
Cluster 3	GenericCell1680	Telecom	Campaigns	Sep 11, 2014 12:50 PM
Female(9)	GenericCell1653	Retail	Campaigns	Sep 11, 2014 12:50 PM
Male(10)	GenericCell1649	Travel	Campaigns	Sep 11, 2014 12:50 PM
Outliers	GenericCell1659	Mortgage	Campaigns	Sep 11, 2014 12:50 PM

To assign a Cell node to the Link node, select the cell from the list.

## Specify Link Node Details

The Link Properties window displays information about the Link node.

Figure 5.42 Link Properties



To change the source cell, click **Select** and select a different Cell node.

Click the campaign name to open the campaign that contains the source cell. The campaign is displayed next to the current campaign.

Select **Act as a marketing cell** to define the Link node as a marketing cell that can be connected to a Communication node. Use the **Cell code** field to specify the marketing cell code. Cell codes are used to identify groups of populations. Cell codes are required and can be either specified manually, or generated automatically. To make it possible for other campaigns to link to the Link node, select **Make cell available for linking**.

You can make your campaign data available to SAS Customer Intelligence 360. This data is used to define segments. Select **Make cell data available to SAS Customer Intelligence 360** to send a list of subject IDs to SAS Customer Intelligence 360 when the communication is executed. In order for the campaign data to be available to SAS Customer Intelligence 360, the tenant information must be specified on the **Digital Marketing Integration** tab of the business context. For more information, see “[Connect to SAS Customer Intelligence 360](#)” on page 50.

Select **Cell represents a control group** to designate the contents of the Link node as a control group.

Use the **Exclude these subjects** check box to specify whether to exclude the selected customers in your campaign.

**Note:** If the values have changed in the campaign that you have linked to, you must close and reopen the current campaign in order to display the changed values.

## Displaying the Most Current Data

If you have selected **Use the most current data when referenced by a link** on the Properties page of the campaign that contains the Cell node, the most recent data is displayed for the Link node when the campaign that contains the Cell node is executed.

When a campaign that contains a Cell node is executed in order to provide a count to a Link node, the campaign that contains the Cell node is opened in Read-Only mode. Because of this, the count for the campaign that contains the Cell node cannot be saved. The counts for the Cell node and the Link node might not be same, because the counts for the Cell node were updated when the campaign for the Cell node was last opened in Edit mode. The Link node displays the latest count.

In another case, if you clear the counts on the campaign that contains the Cell node and save the campaign, the Cell node does not display a count. When you update counts for the Link node campaign, data from the associated table is displayed in the Link node. The count for the Cell node campaign is not updated.

For more information about the behavior of Link nodes in campaigns, see ["Specify Diagram Properties" on page 159](#).

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## Map Node

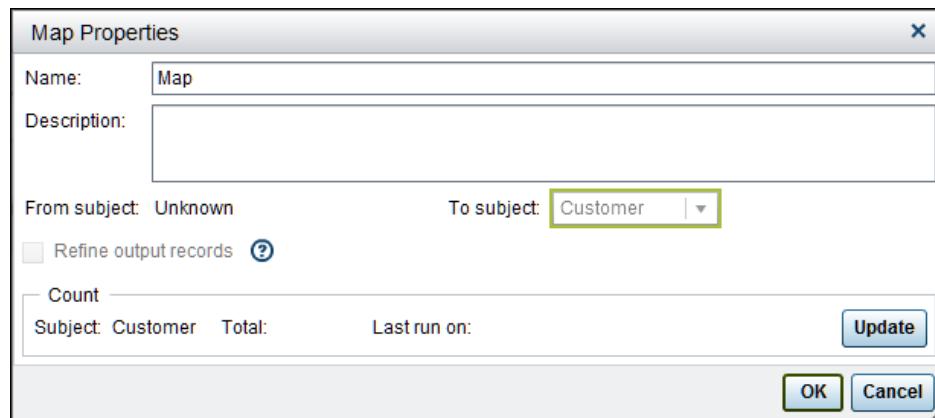
### Overview of the Map Node

You use the Map node to change the record type of a selected group of customers in your diagram. For example, you can map information about the account to the customer in order to generate a list of customers.

### Specify Map Node Details

The Map Properties window displays information about the Map node.

Figure 5.43 Map Properties



### From

displays the subject level of the input node that precedes the Map node in the diagram. Use the following window elements to map this subject to another subject.

### To

specifies the output subject level of the mapping that is performed by the node. Available values are subject levels other than the level that is displayed in **From**.

The combination of the **From** and **To** subject levels determines which mapping controls are enabled. Here are examples:

#### One to one

none of the mapping controls are available. An example of a one-to-one relationship would be customers to accounts, if each customer is restricted to one account, and each account can have only one customer.

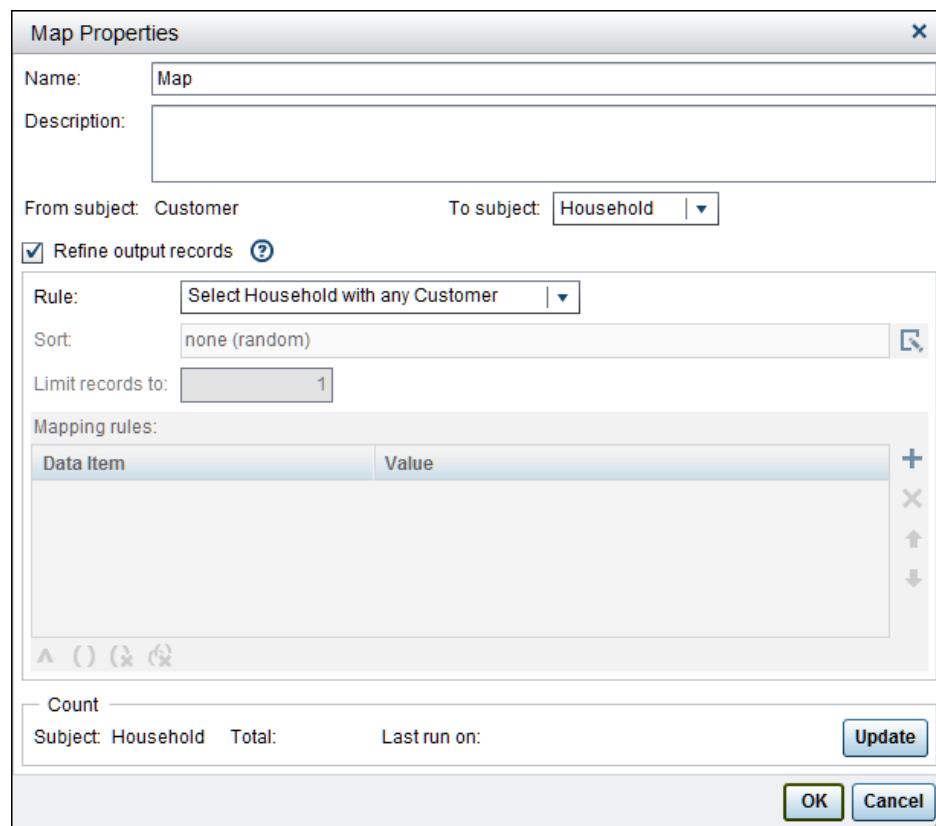
#### One to many, many to many

**Refine output records** is available, **Limit records to** is available, and the Rules table might be available, based on the value of the check box. An example of a one-to-many relationship would be households to customers, if a household could contain more than one customer, and if each customer resided in only one household. An example of a many-to-many relationship would be customers to accounts. Each customer can have more than one account, and each account can be shared by more than one customer.

#### Many to one

**Refine output records** is available, and the Rules table might be available, based on the value of the check box. An example of a many-to-one relationship would be customers to households, if households can contain more than one customer, and customers reside in only one household.

To specify mapping rules, limit the number of output records, and specify the data items to use in sorting records, select **Refine output records**. This option is available when the table relationship between the **From** and **To** subjects is one-to-many, many-to-many, or many-to-one.

**Figure 5.44** Refine Output Records

### Rule

specifies the rule to apply to subjects from the input node. Possible values are **Select subject level with any subject level**, **Select subject level with many subject level**, **Select subject level with one subject level**, and **Select subject level with no subject level**.

### Sort

specifies a data item to sort the records by. After the other criteria are applied, there still might be more than one subject value for the subjects that you are mapping from. The first subject value is chosen based on the sort order. The subject key is always added to the end of the sort order. Therefore, if you do not specify a sort data item, then only the subject ID is used. This item is enabled when the relationship is one-to-many (for example, when there is one household per many customers). Click  to select a data item.

### Limit records to

specifies how many **To** subject level records should be included.

### Mapping rules

displays the selection criteria that are applied when you are mapping the subject levels. Each row in the table represents a data item whose value is used to select the subject, rule, operator, values, and counts. The mapping rules table is available when the table relationship between the **From** and **To** subjects is one-to-many or many-to-many.

Mapping rules are used to identify which records to select when the table relationship between the **From** and **To** subjects is either one-to-many or many-to-many. For example, the table relationship between Household to Customer is

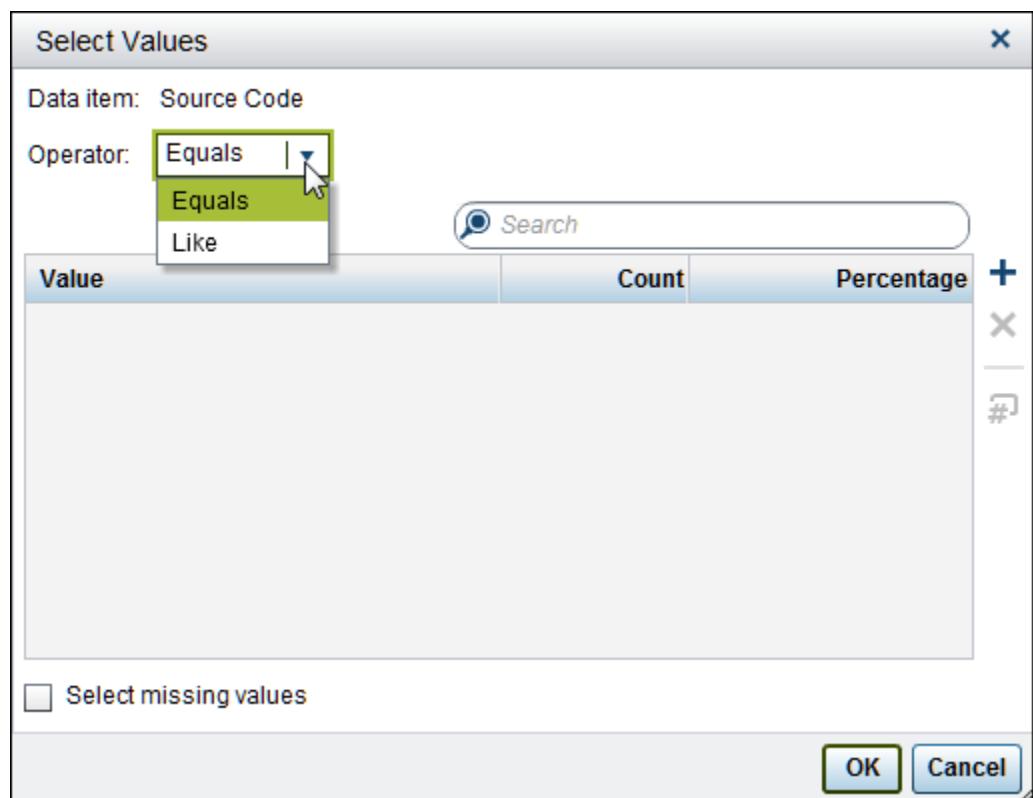
one-to-many. If you want a campaign to target some, but not all, of the customers in a household, you can use the mapping rules to select the customers that you want. You might want to identify the head of the household only, or a member of the household who holds a credit card. If the table relationship between the **From** and **To** tables is many-to-one, then it is not necessary to specify any mapping rules. There are no duplicates to remove from the table that is being mapped to.

To add a rule to the table, click  and select a data item.

Select the **Value** cell and enter a value or click . The values that you can enter depend on the type of data item.

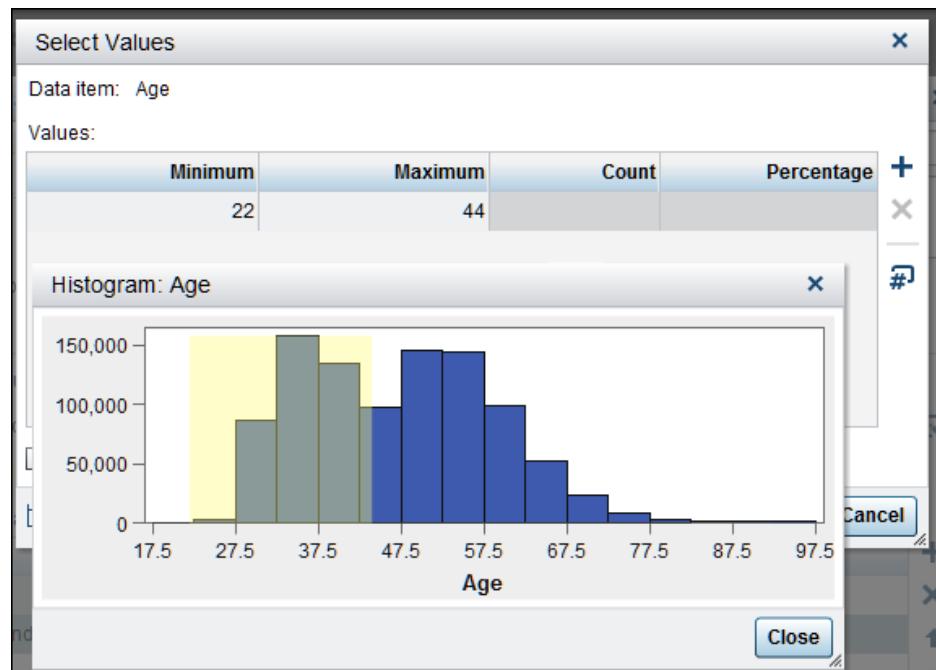
- For nominal, binary, and ordinal data items, you can enter the value or select a value from a list.
- For items that do not contain metadata, you can select a LIKE or EQUALS operator to filter the selection.

*Figure 5.45 Operators for Items without Metadata*



- For interval data items, you can enter a value or a range of values. For example, you can specify 25 to 36 as a range of ages. Click  to create ranges of values.
- For date data items, enter a date or click  to select a date type and to specify ranges of dates.

For data items that can have a range of values, click  to view the selected values in a histogram.

**Figure 5.46** Histogram in Select Values Window

You can change the order of the criteria, group them, and ungroup them. Click the first cell in a row to append an **And** or an **Or** to the preceding criterion. To move a row within an expression, select the row and use the arrows to change its position. To exclude a subset from your data selection, select a row and click . To group criteria, select two or more rows and click . To ungroup criteria, select a row within a group and click . To remove all groups from the table, click .

**Note:** If you delete a row within a group, the entire group is deleted.

## Prioritize Node

### Overview of Prioritize Node

The Prioritize node ranks and de-duplicates the subjects of input nodes or cells and creates output cells according to the priorities that you specify. The only nodes that cannot link to a Prioritize node are the Export, Prioritize, Split, and Report nodes.

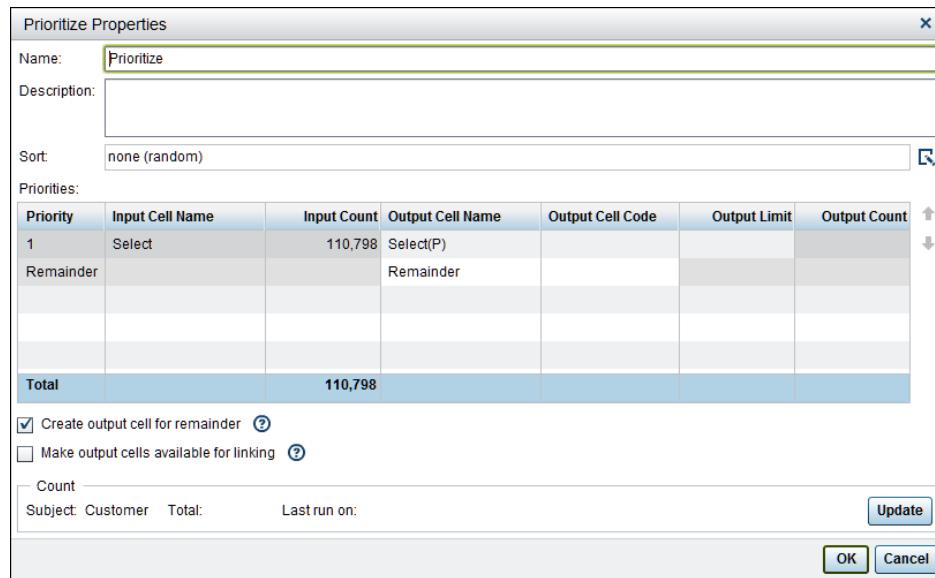
You can use the Prioritize node to both de-duplicate and impose a limit. The result is that subjects that are excluded from one cell are available for subsequent cells in the prioritization.

For example, you might have three non-mutually exclusive segments of customers. Each segment must be limited to a specified number of customers. In the Prioritize node, customers who have been excluded from one segment are still available in the remaining segments. Each segment is de-duplicated against the preceding segment.

## Specify Prioritize Node Details

The Prioritize Properties window displays information about the Prioritize node.

**Figure 5.47** Prioritize Properties



Click next to the **Sort** field to set the sort order for all of the rows in the **Priorities** table. The sort order that is specified in the Prioritize node affects any output cells of the Prioritize node. Sorting does not take effect unless you set limits in the **Priorities** table.

You can edit the Output Cell Name and Output Cell Code cells.

Click in the Output Limit cell to specify sort criteria and a limit for an individual row. If you do not specify a limit, the sort criteria do not take effect. This setting overrides the setting in the **Sort** field.

The value in the Output Count cell is the number of unique subject IDs that are assigned to an output cell. The Prioritize node de-duplicates the input cells. The count of the output cell might decrease for those cells that are prioritized greater than 1, depending on the count for the higher priority cells.

**Remainder** is the number of records that do not belong in any other output cell after limits and de-duplication have been applied. The remainder is calculated when you click **Update**. If you select **Create output cell for remainder**, a remainder output cell is created along with the other cells that are created by the Prioritize node.

Click **Make output cells available for linking** to be able to use a Link node in another campaign to link to these output cells. Before you can use the cell as input to a Link node, the cell must have a name and the campaign must be saved. This option affects cells that are generated after the option is selected. **Make output cells available for linking** can be manually selected or cleared in the generated cells without affecting whether the option is selected in the Prioritize node.

## Process Node

### Overview of the Process Node

The Process node enables you to write your own SAS code to analyze campaign data. You can also use the Process node to select and run stored processes.

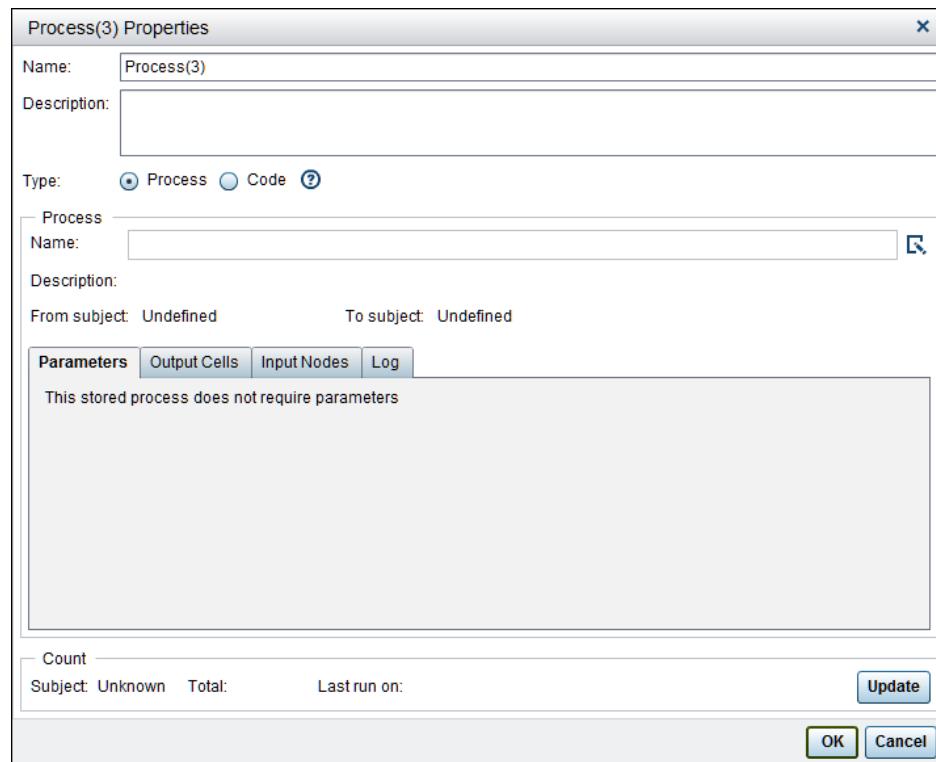
You can link a Process node to any node except for a Communication node. If Process node generates output cells, you can link those cells to a Communication node. The counts for a Process node that generates cells is the count of the unique subject IDs that are distributed to its cells.

When a Process node is the first node in the diagram and begins a selection, you must designate a subject. If a Process node is downstream from an Export node, you can use the Process node to create post-process operations. In this way, you can follow the execution of an export and test an export process.

### Select a Stored Process

In the Type section, select **Process** to select a stored process that has been defined. Click  to select a SAS Marketing Automation stored process. The availability of stored processes is not restricted by business context.

*Figure 5.48 Process Type*



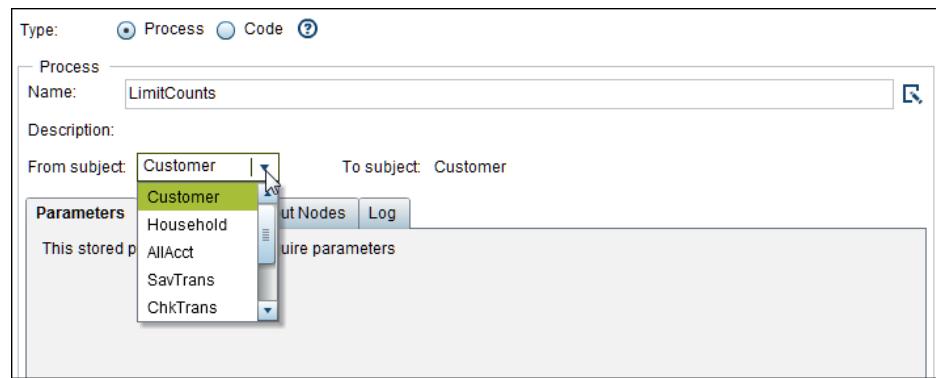
You can select from a list of stored processes that are defined with the keyword MAUser in the SAS Marketing Automation repository.

## Set Stored Process Parameters

You set the parameters for a stored process when you select it.

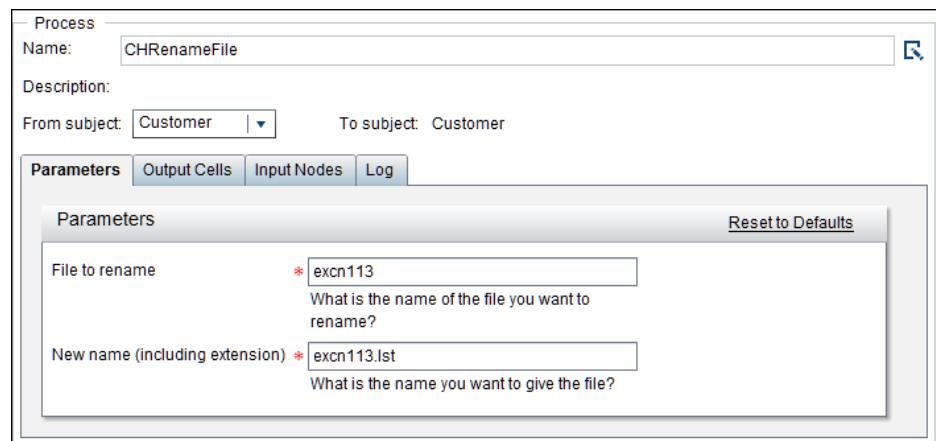
Depending on the stored process, you might be able to select input or output subjects for a newly created node that is not connected to other nodes. Select subjects from the **From subject** and **To subject** lists. If the subjects do not match the subjects of nodes that are linked to the Process node, the links might be broken. The input subjects and output subjects for a stored process are specified during the creation of the stored process. If no input and output subjects have been specified, all subjects are available for selection.

*Figure 5.49 From Subject List*



If the stored process contains parameters, set the required parameter values on the **Parameters** tab. In the stored process, you can specify relative dates such as Today or Tomorrow. The stored process supplies missing values for optional parameters if you do not enter a parameter value.

*Figure 5.50 Stored Process Parameters Example*



## Specify Output Cells

On the **Output Cells** tab, you can change the name and number of output cells that are generated by a stored process.

*Figure 5.51 Stored Process Output Example*

Order	Cell Name	Cell Code	Actual Count	Actual %
1	Output(4)			
2	Output(5)			
3	Output(6)			
4	Output(7)			
<b>Total</b>				

Make output cells available for linking

All output cells have the same subject ID. You can change the names of the output cells. The default name of each generated output cell is `output(n)`, where *n* is a number in a sequence. For example, a Process node has generated output cells that are named Output(1) and Output(2). The next Process node in the diagram generates output cells that are named Output(3) and Output(4).

The default number of output cells that is generated is set by the `NumberofCells` keyword in the stored process. The `MinCells` and `MaxCells` keywords specify the minimum and maximum number of cells. The `NumberofCells` keyword does not have to be specified.

If the `MaxCells` value is specified, and `MinCells` and `NumberofCells` values are not specified, the minimum number of rows is 1. If only the `MinCells` value is specified, the maximum number of rows is unlimited.

Select a row and click the arrows to change the order of output cells.

Select **Make output cells available for linking** to be able to link to these cells from the Link node. This option affects cells that are generated after the option is selected. **Make output cells available for linking** can be manually selected or cleared in the generated cells without affecting whether the option is selected in the Process node.

## Specify Order of Input Nodes

The **Input Nodes** tab displays the nodes that contribute to the Process node.

Figure 5.52 Example of Input Nodes

Input Nodes			
Order	Node Name	Node Code	Count
1	Communication 1	COMM26515	110,798
2	Big Savers or High Account Balances		50,195

Select a row and click the arrows to change the order of input nodes that are submitted to the process.

## Display Logging Messages

If you want to understand how the SAS code is working, select the **Log** tab to display logging messages.

Figure 5.53 Log Example

Log	
Log status: Current	
GLOBAL MOMABASE moma_input_data GLOBAL MOMACRO /data/SASHome/SASFoundation/9.4/u cmacros/mkopt GLOBAL MOMAINPUT /data/SAS/config/Lev1/Applications/SASCUSTOMERIntelligence/SASMarketingOptimization/ moma_input_data GLOBAL MOMA_DEPLOYMENT 0 GLOBAL MOMA_DEPLOYMENT_MISMATCH 1 GLOBAL MOMETA /data/SAS/config/Lev1/Applications/SASCUSTOMERIntelligence/SASMarketingOptimization/ datastore GLOBAL MOMISC /data/SASHome/SASFoundation/9.4/misc/mkopt GLOBAL MOOLAP /data/SAS/config/Lev1/Applications/SASCUSTOMERIntelligence/SASMarketingOptimization/	✖

You can use the contents of the **Log** tab to debug any errors that appear. The campaign name and Process node name are displayed at the top of the log. To copy a log so that you can paste it into an email message or another application, right-click the selected text and select **Copy**.

There are three log statuses:

### Not available

means that the Process node has not been executed or that the logs have been cleared.

### Current

means that the log is from the most recent time that Process node was executed, and that no changes have been made to the process. The log text is grayed-out.

### Outdated

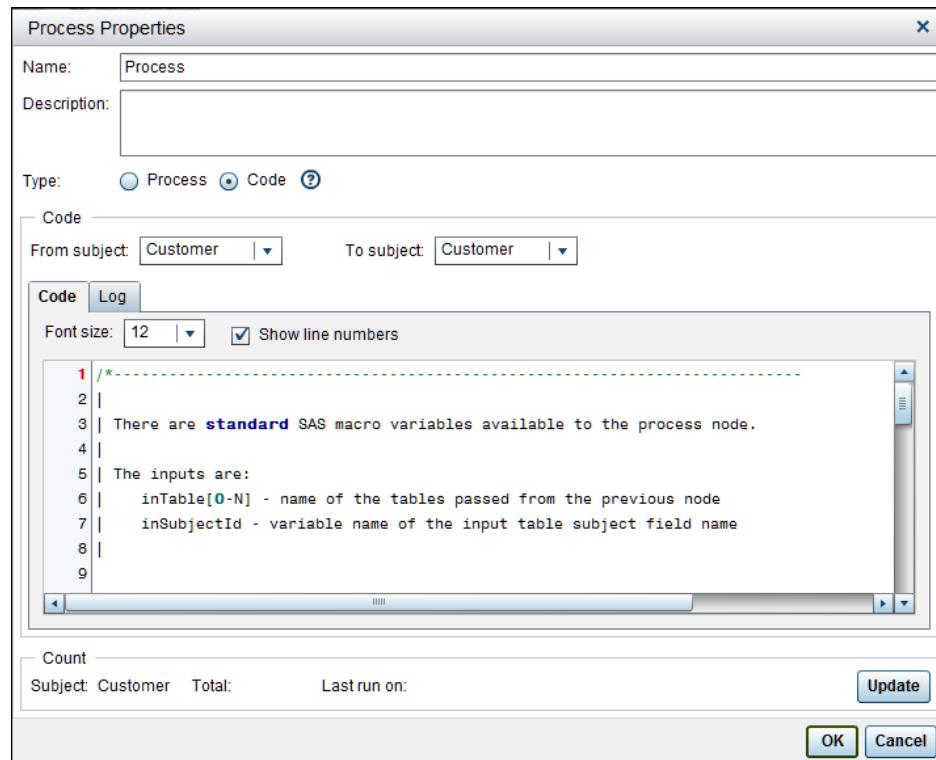
means that changes have been made to the code since the last time the Process node was executed.

Click  to clear the contents of the log.

## Enter Code

Select the **Code** type to enter code.

*Figure 5.54 Code Type*



The **From subject** and **To subject** fields display a list of all of the subjects that are available to the current business context. Only nodes that have the same subject as the subject that is selected from the **From subject** list can be connected upstream from the Process node. Likewise, only nodes that have the same subject as the subject that is selected from the **To subject** list can be connected downstream from the Process node. When a Process node is the first node in the diagram and begins a selection, you must define the subject on which the node is based.

The following code is displayed by default in the text box:

```

/*-----*
|
| There are standard SAS macro variables available to the process node.
|
| The inputs are:
|   inTable[0-N] - name of the tables passed from the previous node
|   inSubjectId - variable name of the input table subject field name
|
| The outputs are:
|   outTable[0-N] - name of the tables passed to the next node
|   outSubjectId - variable name of the output table subject field name
|
| Other macro variables :
|   campCode - the campaign code for this campaign

```

```

|   commCode - the communication code if a communication node is upstream
|   MATableForMacro - Table that holds additional information about the campaign
|
|
+-----*/
/*
|   The following section of sample code could be used if the process/code
|   node is the first node in a path within the drawing.
+-----*/
* data &outTable (KEEP=YOUR SUBJECT_DB_FIELD);
*   set YOUR_CUSTOMER_TABLE;      /* do additional or different logic here */
* run;
/*-----|
|   The following section of sample code could be used if the process/code
|   node is NOT the first node in a path within the drawing.
+-----*/
* data &outTable;
*   set &inTable;                /* do additional or different logic here */
* run;

/*-----|
|   count the number of subjects in the output
+-----*/
%macount (&outTable);

```

This code template is an example of how the Process node is used. You can overwrite this code with code of your own.

## Process Node Macro Variables

The following input and output macro variables are available for use in the Process node.

### campCode

This variable refers to the campaign code for the current campaign. Any Process node in a diagram can use this variable, regardless of what nodes are upstream or downstream from the Process node.

### CINodeName

This variable refers to the name of the current Process node.

### commCode

This variable refers to a Communication node that immediately precedes the Process node. You can reference only one Communication node. If you connect multiple communication nodes to a Process node, then the commCode macro refers to the first Communication node that was joined to the Process node.

The commCode variable enables you to add conditional processing based on communication codes. You can write SAS code that executes only when the communication code equals a certain value.

The commCode macro variable cannot refer to Communication nodes further upstream in the diagram, or to any Communication nodes that are downstream from the Process node.

**CountOnly**

Use the CountOnly macro variable setting to design the behavior of the Process node when **Update** or **Execute** is selected.

When you right-click the Process node and select **Update**, the value of CountOnly is set to `y`. The stored process could be designed to update only the counts and not perform its complete operation.

When you right-click the Process node and select **Execute**, the value of CountOnly is set to `n`. The stored process could be designed to perform its complete operation and update the counts on the node.

**InSubjectID**

If a predecessor node exists, this variable holds the name of the subject ID of the input data table. If no predecessor node exists, then you must specify a valid subject ID so that successor nodes can identify which subject the Process node is based on. To be valid, a subject ID must match a database column name. Otherwise, the following error message is generated when the Process node executes:

The subject ID specified in the Process node does not exist in the information map.

Here is an example of a valid InSubjectId assignment statement:

```
%let InSubjectId=CLIENTNUM;
```

**InSubjectName**

This variable refers to the name of the input subject. The InSubjectName is set when you select the **From** subject in the Process node properties window.

**InTable**

Use this variable to refer to the input tables in your code. You can specify this macro only when there are no nodes preceding the Process node.

If a predecessor node exists, then SAS Customer Intelligence Studio automatically sets the value of the InTable variable to the names of the input tables. When there are multiple inputs to the Process node, multiple table names are separated by spaces. Use `InTable0` and `InTable1` - `InTableN` to return discrete values. Do not change the name of the input table. Doing so invalidates the diagram. The Process node looks for the input table in the same location as tables that were created by other nodes. For example, you might run a Limit node that creates its output table in a library called MTABLES. The Process node looks for the input tables in the MTABLES library.

If no predecessor node exists, then SAS Customer Intelligence Studio sets the value of InTable to missing.

You can specify your own input data table. For example, this statement specifies the data table MTABLES.DATA1 as input to the Process node:

```
%let InTable=MTABLES.DATA1;
```

If you do not specify the InTable variable in your code, the Process node has no inputs.

**InTable0**

This variable stores a count of the number of input tables to the Process node. When there are no inputs to the Process node, this value is 0.

**InTable1 – InTableN**

These variables hold the name of each upstream input table that is linked directly to the Process node.

**MATableForMacro**

This variable points to a data set that is created in the MATables library when a Process node runs. The data set is deleted when the campaign is closed. This data set contains additional useful data items about the campaign or diagram.

**OutSubjectID**

This variable refers to the subject ID of the output data table that is created when the Process node is run. The OutSubjectId is set when you select the **To** subject in the Process node properties window. This is the output table that is passed to successor nodes. The OutSubjectID variable is optional, and in most cases you do not need to specify it. When it is not specified, the subject ID of the output table is the same as the subject ID of the node that immediately precedes the Process node. The OutSubjectID variable should be specified only when you want to create your own version of the Map node. The MA\_Set\_Output\_Subject\_ID macro is used to set the variable value.

**OutSubjectName**

This variable refers to the name of the output subject. The OutSubjectName is set when you select the **To** subject in the Process node properties window.

**OutSubjectType**

This variable generates a space-separated list of unique subject IDs.

`OutSubjectType=C` generates a list of character subject IDs.

`OutSubjectType=N` generates a list of numeric subject IDs. The output type is checked only when the MACntTab macro is run. For more information, see “[Process Node Macros](#)” on page 303.

**OutTable**

Use this variable to refer to the output data table that is created after you run the Process node. This table is used to pass information to successor nodes. SAS Customer Intelligence Studio creates the name of this output table automatically. You cannot override the name. The Process node always creates an output data table if a successor node exists. If the `NumberOfCells`, `MinCells`, or `MaxCells` keywords are specified, the name of the output table is the space-separated names of output cells. If output cells are not generated, the output table name is the same as the Process node name.

The Process node saves the output table in the same location that other nodes have used to save tables. For example, you might run a Limit node that creates its output table in a library called MABLES. The Process node output table is saved in the same library.

**OutTable0**

This variable contains the count of the number of automatically generated output cells. If the `NumberOfCells`, `MinCells`, or `MaxCells` keywords are not specified and no output cells are automatically generated, this variable has a value of 1.

**OutTable1 – OutTableN**

These variables hold the name of the table for each automatically generated output cell. If no output cells are automatically generation, the name is the name of the Process node.

**OutTablesRequired**

This variable specifies whether output tables are required for a successful execution. OutTablesRequired0 indicates that output tables are not required. OutTablesRequired1 indicates that output tables are required.

**Note:** You can create as many tables as you want in the Process node, and assign them any names that you want. However, the name of the final output table (OutTable) that is passed to successor nodes is generated automatically by SAS Customer Intelligence Studio and cannot be changed.

## Process Node Macros

**MAStatus**

tests the macro variable SYSCC when the stored procedure completes execution. Here is an example:

```
%MaStatus( &_stpwkrt.status.txt);
```

**MACntTab**

counts the total number of records in all of the tables that are created by the Process node and displays the count in the Process node properties window.

**MACount**

counts the number of records that are contained in the output table (OutTable) and makes the count in the Process node available to successor nodes.

For example, to obtain the count information from the table that is specified by the variable &OutTable, use the following code:

```
%MACount (&OutTable);
```

Use MACntTab to count the number of records that are contained in the output tables of the generated output cells.

**MA\_Set\_Count**

If your code has already stored the count of the output table in a variable, use MA\_Set\_Count to make the count in the Process node available to successor nodes. In this example, OutTableCount contains the OutTable record count. Use MACntTab to count the number of records that are contained in the output tables of the generated output cells.

```
%MA_Set_Count (&OutTableCount);
```

**Note:** If you want the record count from the Process node to be passed to successor nodes, then you must use either the MACount or MA\_Set\_Count macros. If neither of these macros is specified, the Process node cannot store the record count and instead uses the record count from the predecessor node.

**MA\_Set\_Output\_Subject\_ID**

sets the subject ID of the Process node's output table (OutTable).

This macro can accept a SAS variable name or an information map ID. The parameter that is passed to this macro is validated to ensure that the ID exists in the information map. Any invalid values result in the generation of an exception when the Process node is executed.

If you do not use this macro, then the subject ID of the output table is the same as the subject ID of the input table.

For example, suppose you have a Select node, based on Household, joined to a Process node. The Process node contains code that is used to map Household to Customer. You can use the MA\_Set\_Output\_Subject\_ID macro to specify the OutSubjectID variable:

```
%MA_Set_Output_Subject_ID(CLIENTNUM) ;
```

Successor nodes recognize that the Process node subjectID is CLIENTNUM.

## Gather Additional Information

In order to gather more information, you can specify a stream name, using the following code on a single line:

```
*stream=streamname;
```

### MacroVar

creates a table that is named MACROVAR. For more information, see [Appendix 3, “The MACROVAR Table,” on page 365](#).

### Neighbor

creates tables that are named INPUTNODES and OUTPUTNODES. These tables contain data about the nodes that are adjacent to the Process node.

To make MATableForMacro or Neighbor available in the Process node, add the following special comments to the code:

```
*stream=macrovar;  
*stream=neighbor;
```

Unless you specify otherwise, access to the common data model is Read-only. To enable Read-Write access, add the following special comment to the code:

```
*cdm_readwrite;
```

For information about defining streams, see [“Define Streams” on page 151](#).

## Execute a Process Node

To execute the Process node, right-click the node and select **Execute**.

If you execute a Process node that is downstream from a Communication node, counts are updated for the Communication node. Any nodes before the Process node that need updated counts can be executed. The Communication node is not executed.

If you execute a Communication node that is downstream from a Process node, the Process node is executed.

## Process Node Tables

The Process node creates input and output tables that contain data about the nodes that are adjacent to the Process node. The tables contain the following columns:

Column	Description
NAME	The name of the table in the user interface

DESCRIPTION	The description of the table in the user interface
ID	The generated node ID
CODE	The node code
SUBJECTID	The node subject ID
TABLENAME	The name of the MATable that should be created from an automatically generated cell

---

## Report Link Node

### Overview of the Report Link Node

You use the Report Link node to select an export from a Web Report Studio report.

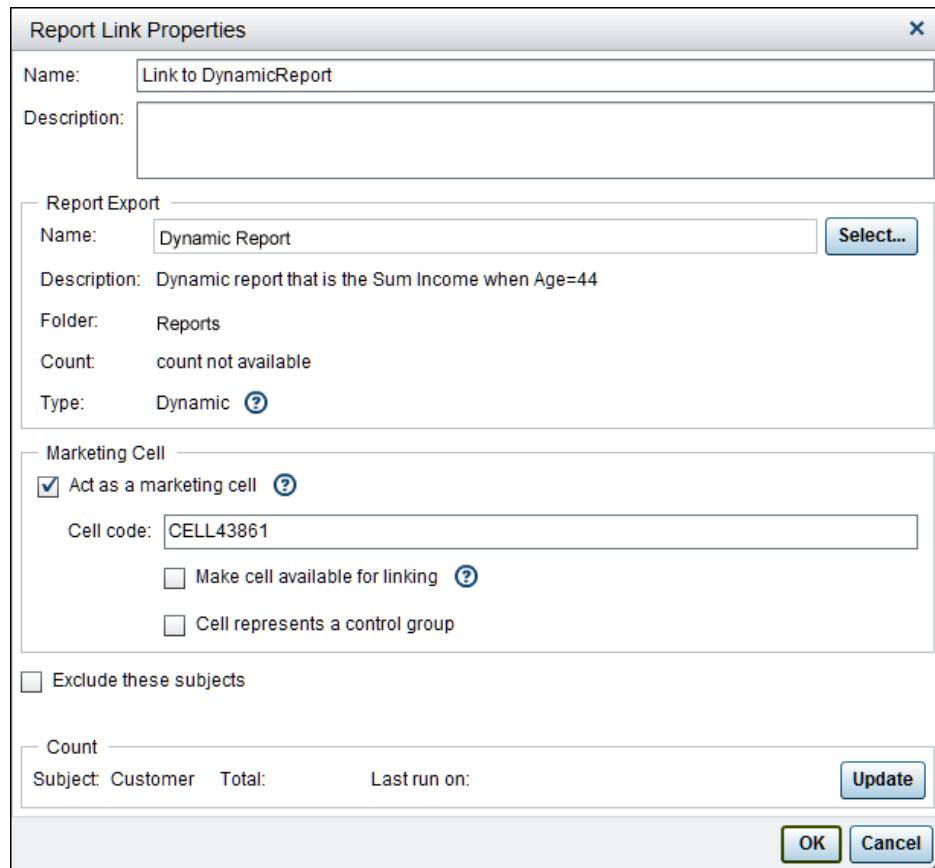
There are no input nodes to the Report Link node. It is an initial node that can be linked to more than one output node. You cannot link a Report Link node to a Response node.

When you first open a Report Link node, you select a report export that has been created in SAS Web Report Studio.

### Specify Report Link Node Details

After you have selected a report export, you specify more information in the Report Link Properties window.

Figure 5.55 Report Link Properties



Click **Select** to select a different SAS Web Report Studio report export.

The **Type** field indicates whether the report link is static or dynamic. Static report links do not reflect changes in date after the reports are generated. Dynamic report links reflect changes in data after the reports are generated.

Select **Act as a marketing cell** to define the Type as a marketing cell that can be connected to a Communication node. Use the **Cell code** field to specify the marketing cell code. Cell codes are required and can be either specified manually, or generated automatically. Cell codes are used to identify groups of populations. To make it possible for other campaigns to link to the Report Link node, select **Make cell available for linking**. Select **Cell represents a control group** to designate the contents of the Report Link node as a control group.

Use the **Exclude these subjects** check box to specify whether to exclude the selected customers in your campaign.

## Response Node

### Overview of the Response Node

Response nodes display the details for the responses that are associated with a communication. A Response node is created when you use the Responses page of the Communication node to add a response to a diagram.

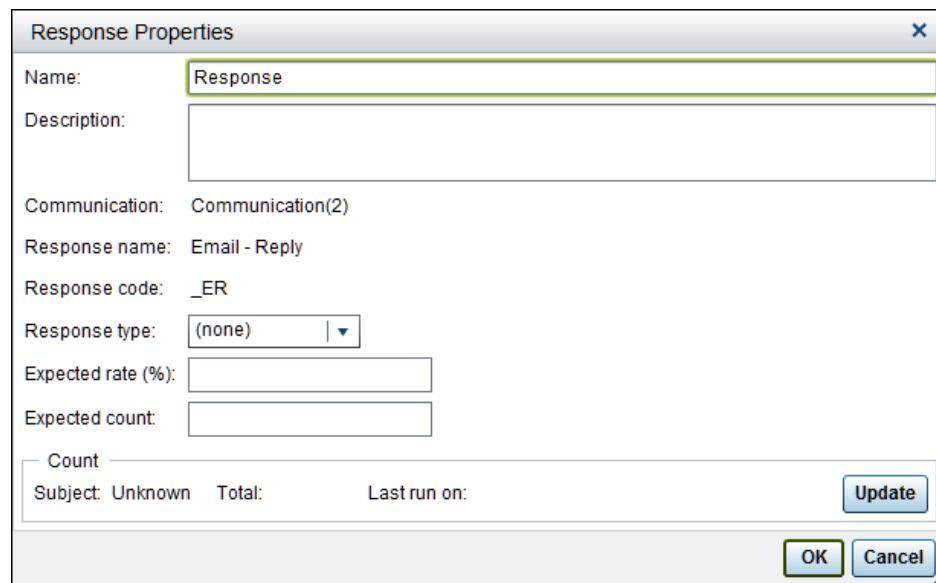
A Response node remains in a **Not ready** state until all of the following criteria are met:

- The campaign has a campaign code.
- The preceding Communication node has a communication code.
- The preceding Communication node is ready.
- The preceding Communication node has been executed at least once.
- The Response node has a response code.
- The response table is defined in the information map so that the response table name and libref can be retrieved.

## Specify Response Node Details

The Response node displays information about a response. The information that you enter in the Response node overrides the information that is specified on the Responses page of the Communication node. The values that you enter for the response type, expected rate, and expected count are used as a reference for reporting purposes.

*Figure 5.56 Response Node*



Select a value from the **Response type** list. You can select one of the following values:

**(none)**

indicates that the response type is unknown. This is the default.

**Converted**

indicates that the response is successful.

**Responded**

indicates that there is a response.

Enter a percentage value in the **Expected rate (%)** field . A valid value cannot exceed 100.

Enter a value in the **Expected count** field.

## Select Node

### Overview of the Select Node

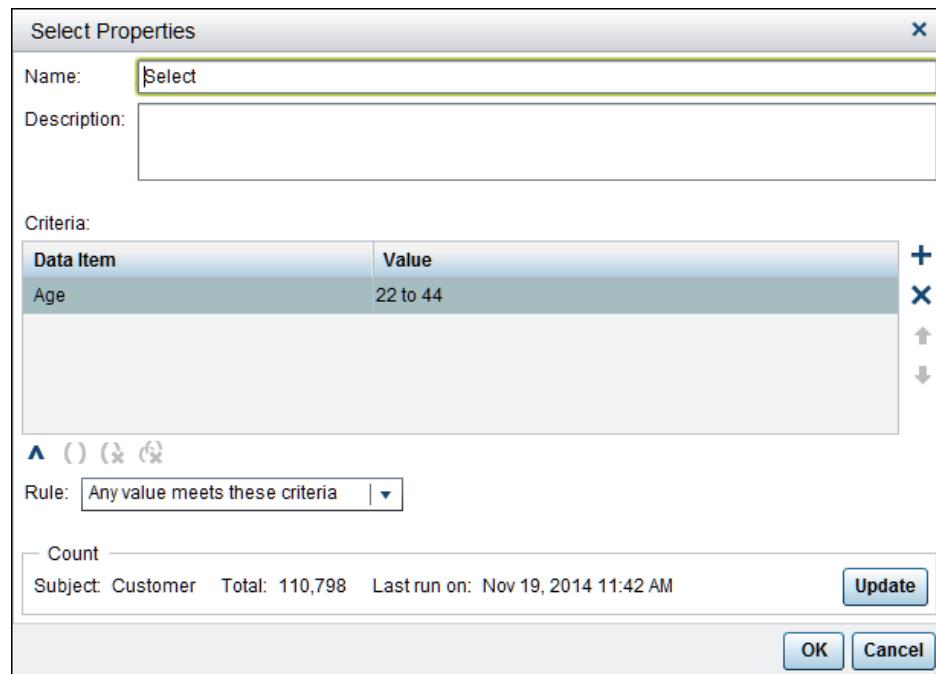
With the Select node, you specify the criteria that are used to select customers. You can select subsets from a number of data items and combine the subsets into a single group that comprises your target population.

### Specify Criteria

#### Select a Data Item

When you first open the Select node, you select a data item. The data item that you select is listed in the Select Properties window.

*Figure 5.57 Select Properties*



By default, the node name is the name of the first data item that is selected when the node is initially opened. You can edit the name.

#### Enter a Value

Select the Value cell and enter a value or click . You can create an expression by selecting a data item, calculated item, custom detail, or custom detail tag in the Value cell.

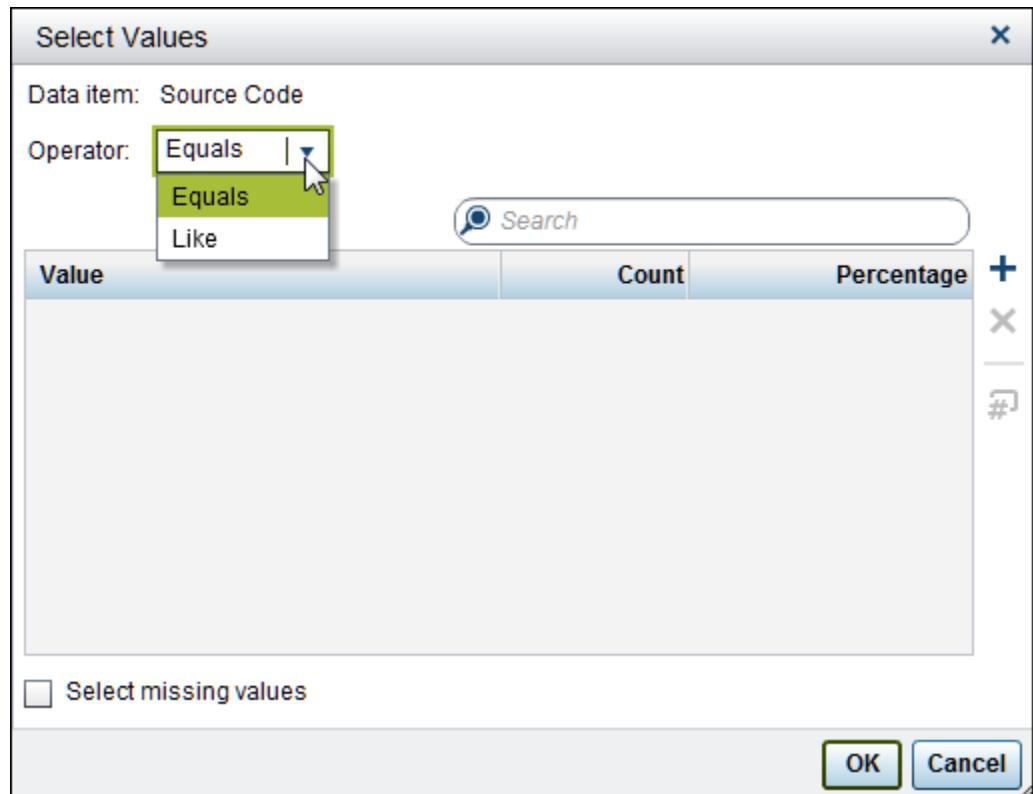
**Note:** Use unformatted values for custom details, calculated items, or variables.

You cannot select custom details or custom detail tags at the campaign group level. The selection in the Value cell must match the type in the Data Item cell. For more information, see “[Example of Creating an Expression](#)” on page 315.

The values that you can enter in the Value cell depend on the type of data item.

- For nominal, binary, and ordinal data items, you can enter the value or select a value from a list.
- For items that do not contain metadata, you can select a LIKE or EQUALS operator to filter the selection.

*Figure 5.58 Operators for Items without Metadata*



- For interval data items, you can enter a value or a range of values. For example, you can specify 25 to 36 as a range of ages. Click  to create ranges of values.
- For date data items, enter a date or click  to select a date type and to specify ranges of dates.
- For character data items, you can specify variables that represent campaign information. For example, you can include customers that have received offers previously in another campaign. You can select items from the Campaign category or you can enter the following campaign variables in the Value cell:

```
<<code  
    campaign code  
  
<<description  
    campaign description  
  
<<name  
    campaign name
```

To select a customer based on more than one data item, click  to add an item to the list of criteria.

## Valid Values

The following tables list examples of valid criteria that you can enter in a Value cell.

**Table 5.1 Examples of Valid Numeric Values**

Category	Entered Value	Displayed Value
Single value	3	3
	(3)	3
	1.32	1.32
	10,538	10,538
	=10	10
	-25	-25
	(-25)	-25
	(-10,438)	-10,438
Multiple single values	1;3;5	1;3;5
	1; 3; 5	1; 3; 5
	2.25;3.25;4.25	2.25;3.25;4.25
	1,250;1,565	1,250;1,565
	(5);(6);(7)	5;6;7
	(-10);-5;0;5;(10)	-10;-5;0;5;10
Single range	1-5	1 to 5
	1 to 5	1 to 5
	(1-5)	1 to 5
	10.5-99.5	10.5 to 99.5
	10,000-20,000	10,000 to 20,000
	-5 to -3	-5 to -3
	(-5)-(-3)	-5 to -3

	((-5)-(-3))	-5 to -3
	((-5)-3)	-5 to 3
	-5-3	-5 to -3
Single values with range	1;2;4-7	1; 2; 4 to 7
	1;2;4 to 7	1;2;4 to 7
	-50;-45;(-5)to(-3)	-50; -45; -5 to -3
Single operator	>3	>3
	(>3)	>3
	<50.5	<50.5
	>=10,500	>=10,500
	<-6	<-6
	<(-6)	<-6
Multiple operators	>3 to 7	>3 to 7
	>3-7	>3 to 7
	4-<8	4 to <8
	4 to <8	4 to <8
	>5 to <10	>5 to <10
	>5-<10	>5 to <10
	>(-5)-(-3)	>-5 to -3
	(-10) to 10	-10 to 10
Mixed interval data items	1;5;10;20-50;>100	1; 5; 10; 20 to 50; >100
	<1;5;10-10	< 1; 5; 10
	1-5;10-10;20-30	1 to 5; 10; 20 to 30
	1 to 5; 20 to 40	1 to 5; 20 to 40

Date format is dependent on locale. The following examples use the en\_US locale.

**Table 5.2** Examples of Valid Date Values

Category	Entered Value	Displayed Value
Single value	02/28/2016	Feb 28, 2016
	2/28/16	Feb 28, 2016
	=(2/28/16)	Feb 28, 2016
	=2/28/16	Feb 28, 2016
	Feb 28, 2016	Feb 28, 2016
	feb 28, 2016	Feb 28, 2016
	February 28, 2016	Feb 28, 2016
Date operators	Day: 15	Day: 15
	Month: feb	Month: February
	Month: 2	Month: February
	Year: 2016	Year: 2016
	Today: 7	Today: 7
Multiple single values	02/28/2016;03/31/2016	Feb 28, 2016; Mar 31, 2016
	Month: jan; feb; jun	Month: January; February; June
	Month: 1;2;6	Month: January; February; June
	Year: 2015; 2016	Year: 2015; 2016
Single range	2/5/2015 - 2/28/2016	Feb 5, 2015 to Feb 28, 2016
	Feb 5, 2015 - Feb 28, 2016	Feb 5, 2015 to Feb 28, 2016
	Day: 1-15	Day: 1 to 15
	Month: feb - apr	Month: February to April
	Year: 2010 - 2015	Year: 2010 to 2015
Single values mixed with ranges	Jan 1, 2015; Feb 1 2015; Mar 1, 2015 – Mar 1, 2016	Jan 1, 2015; Feb 1, 2015; Mar 1, 2015 to Mar 1, 2016

	2015	Jan 1, 2015 to Dec 31, 2015
	January 2015	Jan 1, 2015 to Jan 31, 2015
	Feb, 2015	Feb 1, 2015 to Feb 28, 2015
	Month: 1; 5-7	Month: January; May to July
	Year: 2010; 2015 to 2018	Year: 2010; 2015 to 2018
Single operator	>02/28/2016	>Feb 28, 2016
	<10/18/1967	<Oct 18, 1967
	<2016	<Jan 1, 2016
	<=2016	<=Dec 31, 2016
	<January 2016	<Jan 1, 2016
	<=January 2016	<=Jan 31, 2016
	>January, 2016	>Jan 31, 2016
	>=January, 2016	>=Jan 1, 2016
	Month: >=feb	Month: >=February
	Day: <=15	Day: <=15
	Year: <2016	Year: <2016
	Year: >=2015	Year: >=2015
Multiple operators	<2006;>2015	<Jan 1, 2006; >Dec 31, 2015
	<2006;>=2015	<Jan 1, 2006; >=Jan 1, 2015
	Month: <=mar; >=oct	Month: <=March; >=October
	Year: <2006; >2015	Year: <2006; >2015

**Table 5.3 Examples of Valid String Values**

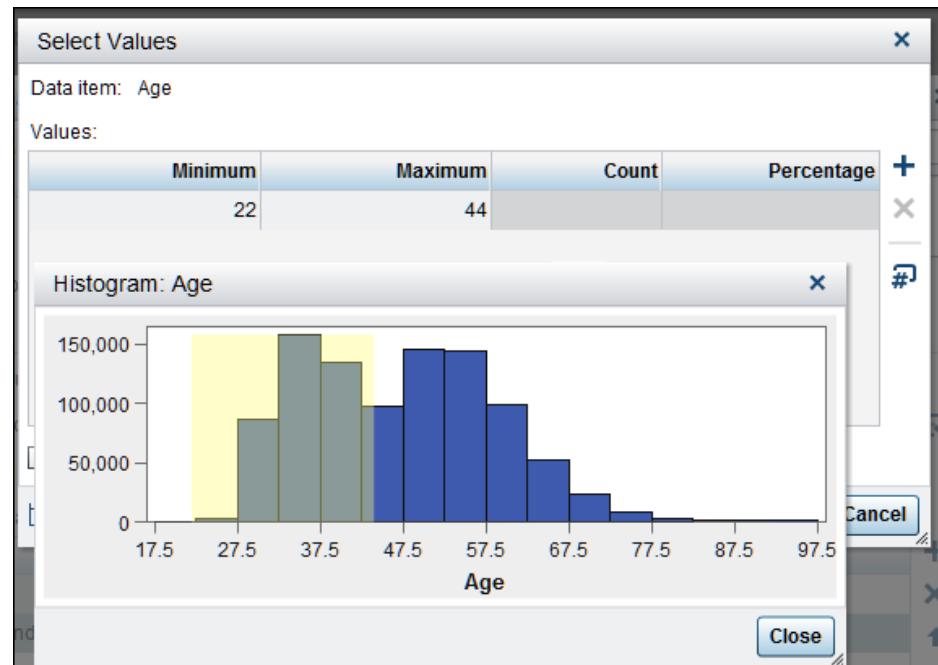
Category	Entered Value	Displayed Value
One single value	A	A

	NC	NC
	North Carolina	North Carolina
Like operator	Like:ab*	Like: ab*
	like:ab?	Like: ab?
Supported only for character items with no metadata. The semicolon must be used in order for the like operator to be recognized. This example is parsed as equals "like ab*".	like ab*	like ab*
Multiple single values. Use a backslash (\) to enter a semicolon in an actual value.	A;B;C	A;B;C
	NC;SC;NY	NC;SC;NY
	A\;B;C	A;B; C

## View a Histogram of Values

For data items that can have a range of values, click  to view the selected values in a histogram.

*Figure 5.59 Histogram in Select Values Window*



## Example of Creating an Expression

You can use the Select node to compare two values. For example, you might want to select customers whose savings balance is greater than twice the amount of their checking balance. In this case, there is a calculated item named “2x checking” that calculates a value that is twice the amount of the checking account for a customer ID.

A data item named “Checking Account Balance” is selected for the left-hand side of the expression.

**Figure 5.60** Left-hand Side of Expression

Criteria:	
Data Item	Value
Checking Account Balance	<input type="text"/> 
	   

For the Value cell on the right-hand side of the expression, the “2x checking” item is selected from the Calculated Items folder.

**Figure 5.61** Select Calculated Item



A greater than ( > ) symbol is inserted in the Value cell.

**Figure 5.62** Right-hand Side of Expression

Criteria:	
Data Item	Value
Checking Account Balance	> <<Calculate Items.2x checking>>

## Organize Criteria

You can change the order of the criteria, group them, and ungroup them. Click the first cell in a row to append an **And** or an **Or** to the preceding criterion. To move a row within an expression, select the row and use the arrows to change its position. To exclude a subset from your data selection, select a row and click . To group criteria, select two or more rows and click . To ungroup criteria, select a row within a group and click . To remove all groups from the table, click .

**Note:** If you delete a row within a group, the entire group is deleted.

## Select Node Rules

The contents of the **Rule** list depend on the type of data items. You might be able to select one of the following rules:

- Any value meets these criteria
- One value meets these criteria
- More than one value meets these criteria
- No value meets these criteria
- All values meet these criteria.

In each of the following examples, a business case is paired with the appropriate rule. The subject database contains customers who have V, D, or M type credit cards, or who do not have any credit cards.

Select customers who have any V type cards, regardless of any other cards that they might or might not have.

The **Criteria** table lists V type cards.

The rule is **Any value meets these criteria**.

Select customers who have only one V type card.

The **Criteria** table lists V type cards.

The rule is **One value meets these criteria**.

Select customers who have more than one card. The types of those cards must be either V or D.

The **Criteria** table lists V and D type cards.

The rule is **More than one value meets these criteria**.

Select customers who have no D or M cards.

The **Criteria** table lists D and M type cards.

The rule is **No value meets these criteria**.

Select customers who have only V or M cards.

The **Criteria** table lists V and M type cards.

The rule is **All values meet these criteria**.

## Split Node

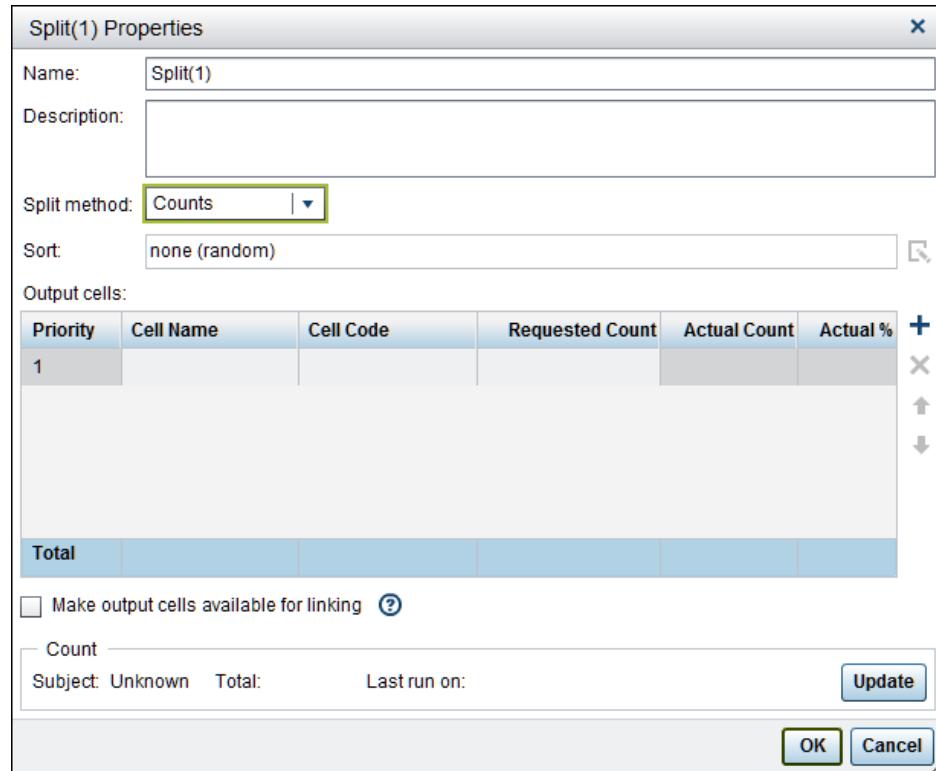
### Overview of the Split Node

The Split node splits incoming records into two or more cells. The Split node is preceded by an input node that provides a population to split.

### Specify Split Node Details

The Split Properties window displays information about the Split node.

*Figure 5.63 Split Properties*



Select **Make output cells available for linking** to use the Link node to link to these output cells from another diagram. Before you can use a cell as input to a Link node, the cell must have a name and the diagram must be saved. You can use the default cell name or provide a new name for the cell. This option affects cells that are generated after the option is selected. **Make output cells available for linking** can be manually selected or cleared in the generated cells without affecting whether the option is selected in the Split node.

### Create Splits By Using Counts

To create splits by using counts, choose **Counts** from the **Split method** list.

Click  next to the **Sort** field to select a data item by which to sort the incoming population. If you do not specify a sort order, the subset of records is generated in a random order.

Add a row to the table for each cell that you want to create. A cell name must be provided for every cell.

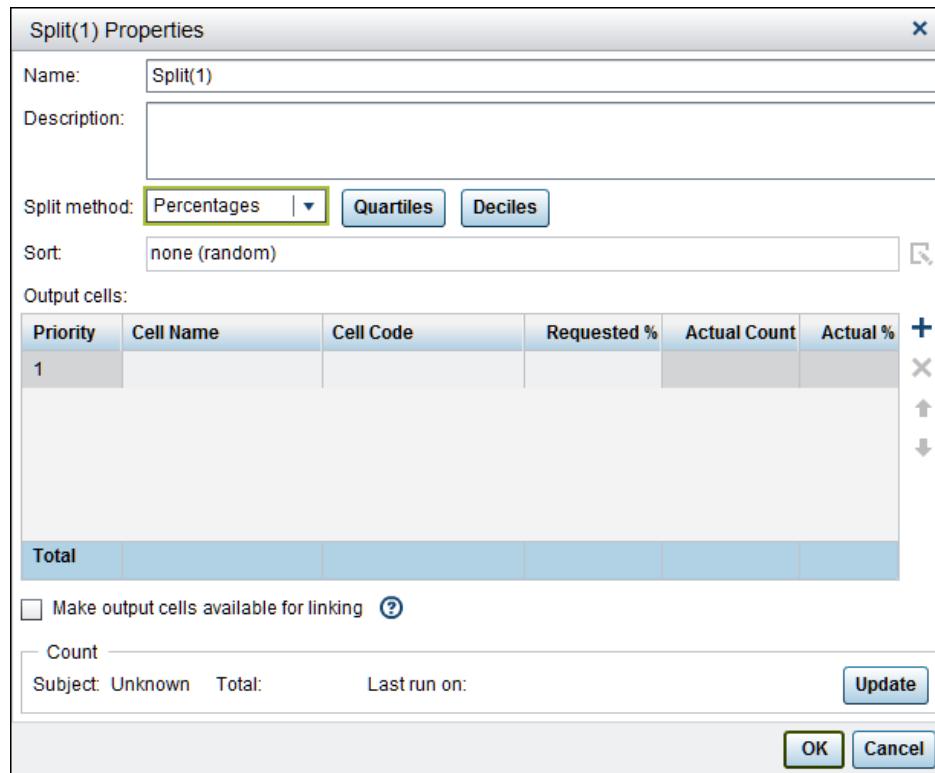
In the **Requested Count** cell, enter the actual count of the segment that you want to assign to each of the cells.

A remainder row calculates the remainder when you update the counts. To create a remainder row, add a row and insert an asterisk (\*) in the **Requested Count** cell. A remainder output cell is added to the diagram. The remainder row cannot be moved, and it must be the last row in the table; you cannot insert any rows below the remainder row.

## Create Splits By Using Percentages

To create splits by using percentages, choose **Percentages** from the **Split method** list.

*Figure 5.64 Create Splits By Using Percentages*



In the **Requested %** column, enter the percentage of the segment that you want to assign to each of the cells. You can enter a value of less than 1%. Click **Quartiles** to specify four segments of 25%. Click **Deciles** to specify ten segments of 10%. You can alter the percentages and edit the cells of the Decile and Quartile rows.

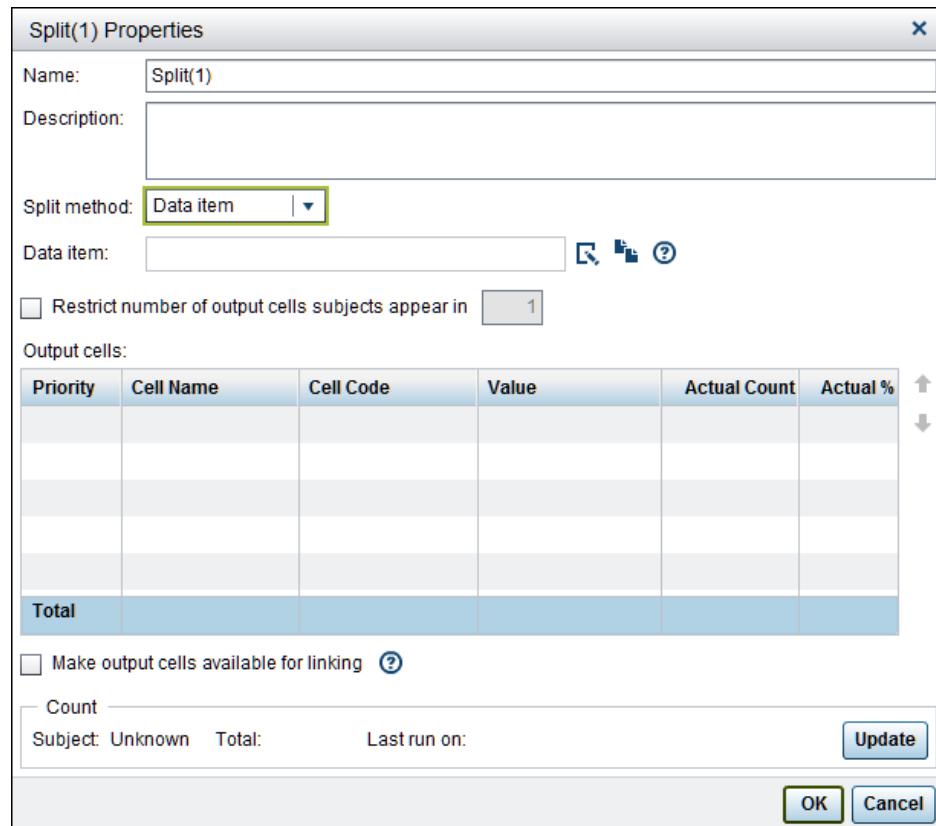
A remainder row calculates the remainder when you update the percentages. To create a remainder row, add a row and insert an asterisk (\*) in the **Requested %**

cell. A remainder output cell is added to the diagram. The remainder row cannot be moved, and it must be the last row in the table; you cannot insert any rows below the remainder row.

## Create Splits By Using Values from a Data Item

To create splits by using values from a data item, choose **Data item** from the **Split method** list.

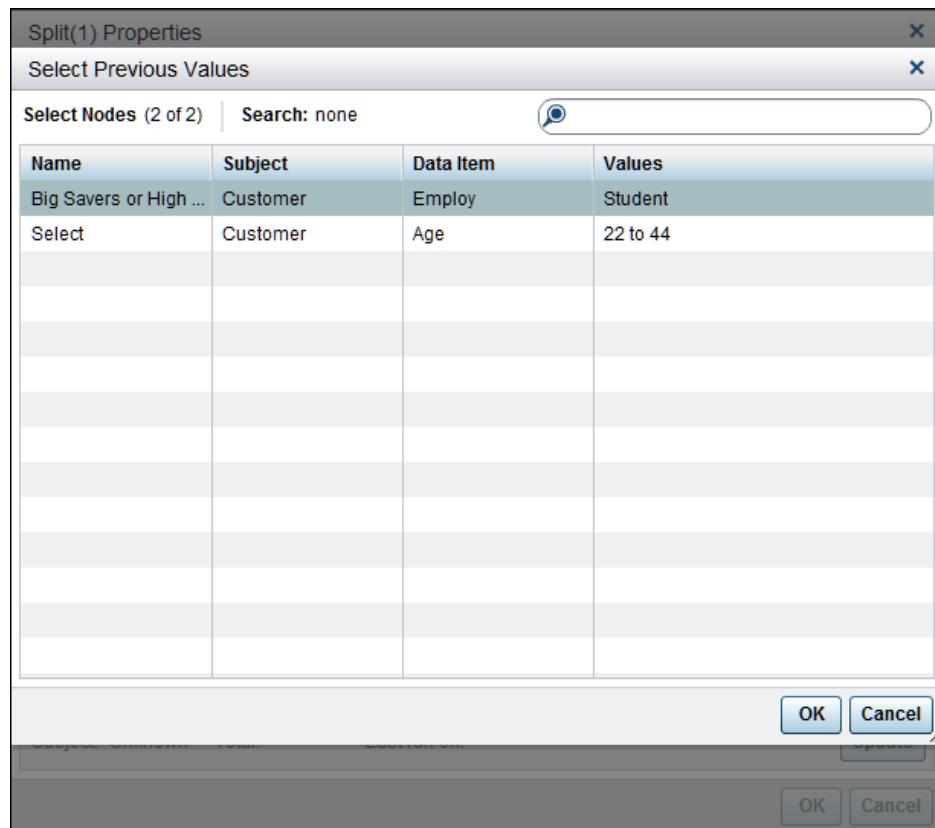
*Figure 5.65 Create Splits By Using Values from a Data Item*



Click to select a data item and assign a value to the data item.

Click to select a node from which to copy data values.

**Figure 5.66** Select Previous Value



You can copy a data item value from Select nodes that have a single criteria row, and that have the same subject as the Split node. After the data item value is copied to the Split node, it will not be affected by any changes to the original data item in the Select node. You can modify the data items after you have copied them to the Split node.

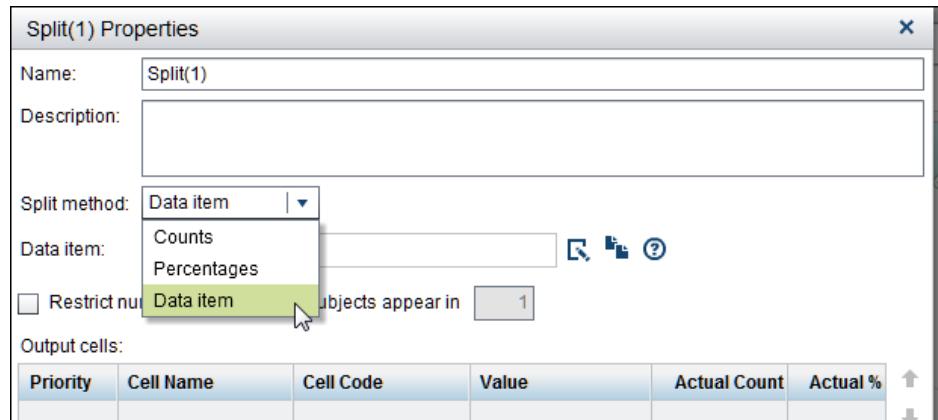
A subject might be listed more than once in a database. For example, a customer might have more than one account. To restrict the number of cells that list a subject and limit the number of times that the subject is counted, select **Restrict number of output cells subjects appear in**. Specify a number.

## Specify Order of Data Item Values

For data items that have a list of values, you can select the order in which the values appear in the table in the Split Properties window. To specify the order of data item values, take the following steps:

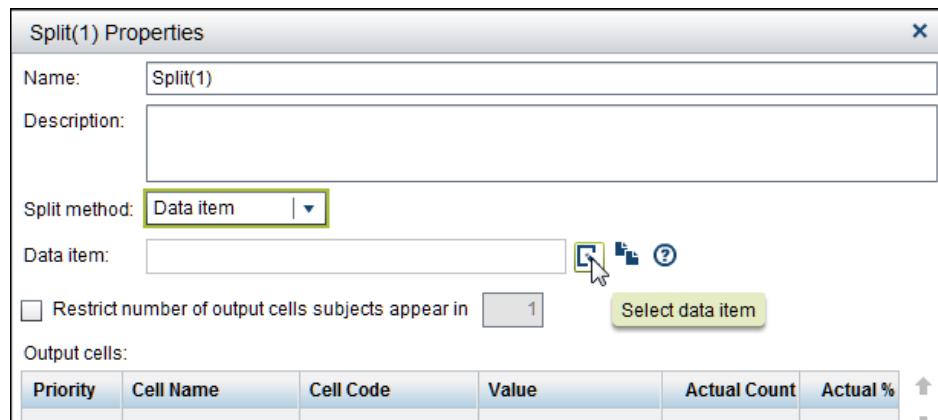
- ## 1 Select Data Item .

Figure 5.67 Select Data Item



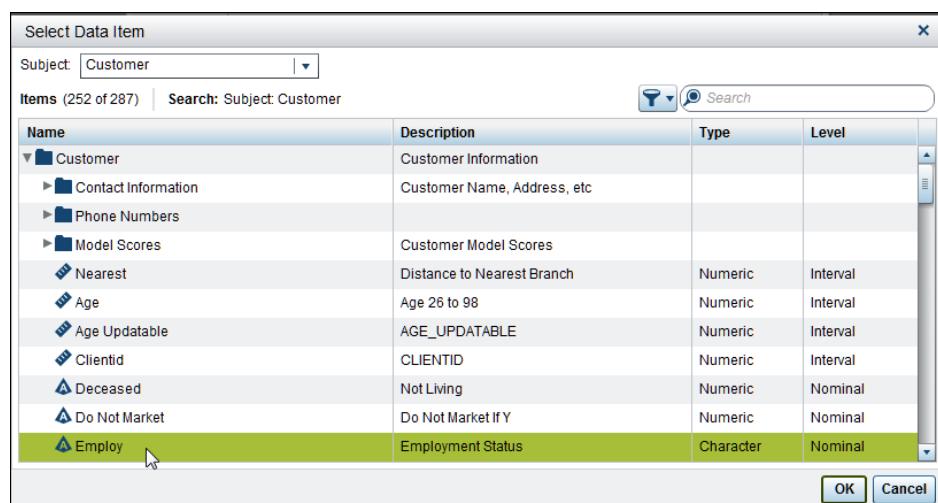
2 Click .

Figure 5.68 Select a Data Item



3 In the Select Data Item window, select a data item that has a list of values.

Figure 5.69 Data Item with List of Values



4 In the Select Values window, set the order of the values.

Figure 5.70 Set Value Order

Select Values				
	Data item:	Employ		
Select	Value	Count	Percentage	
<input type="checkbox"/>	Full Time	88,104	<input type="checkbox"/>	35
<input checked="" type="checkbox"/> 2	Not Employed	37,386	<input type="checkbox"/>	15
<input type="checkbox"/>	Retired	37,953	<input type="checkbox"/>	15
<input checked="" type="checkbox"/> 1	Seasonal	12,589	<input type="checkbox"/>	5
<input type="checkbox"/>	Student	50,195	<input type="checkbox"/>	20
<input type="checkbox"/>	Unknown	25,407	<input type="checkbox"/>	10

**OK** **Cancel**

The order is based on the order in which the rows are selected. If you deselect a row, the row's number is removed and the order numbers of rows with higher numbers are decreased by 1.

Check the **Select** column to select all of the rows. Any rows that have not been selected are assigned priority numbers, beginning with the next available number and proceeding down the rows from the top of the table.

If you use the **Search** field to reduce the number of visible rows, and click **Select**, only the rows that are shown in the table are added to the Split node.

If changes are made to the row order in the Split Properties window, those changes are reflected in the Select Values window.

# 6

## Displaying Information about Campaigns

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## Working with Documents

### Overview of Documents

Documents are reports that summarize the information in your campaign. Documents are created in PDF format.

### Create Documents

To create documents, open a campaign and click  in the toolbar.

In the Create Document window, you select the content that you want to include in a document.

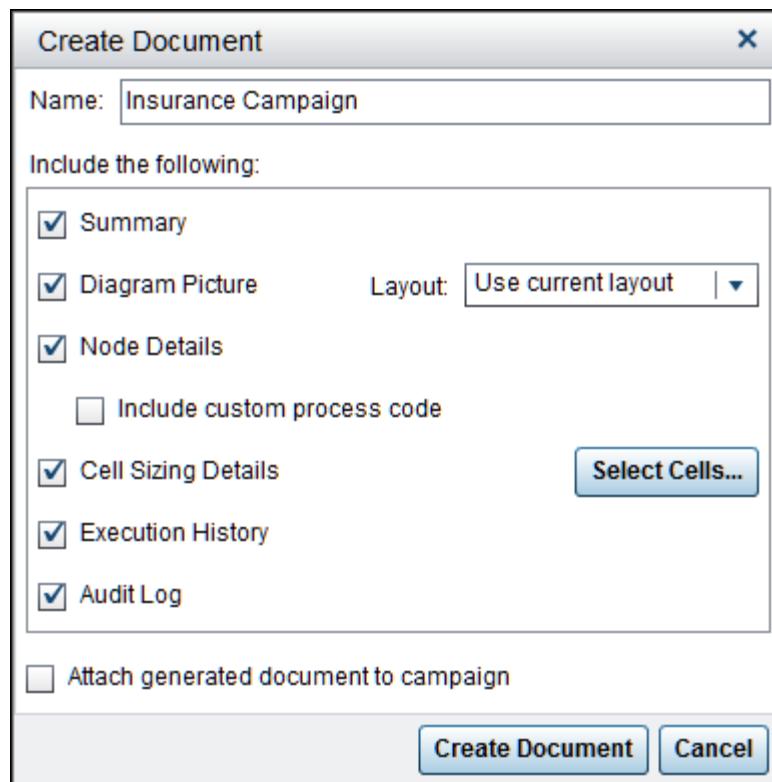
*Display 6.1 Create Document*

Image annotations are not included in the document.

You can select the following types of documents:

**Summary**

displays all of the information about a campaign. If the campaign definition has custom details, tables appear in the report for those items.

**Diagram Picture**

displays an image of the diagram. To change the direction in which the nodes are displayed in the main diagram in the document, select an item from the **Layout** list.

**Node Details**

displays the properties of every node. Select **Include custom process code** to display the code that is used in code-based Process nodes.

**Cell Sizing Details**

displays the counts and exclusion criteria for selected cells and their upstream nodes. Click **Select Cells** to specify the cell information that will be included.

**Execution History**

displays the execution history for the campaign.

**Audit Log**

displays the SAS and SQL code for nodes that have been executed.

Select **Attach generated document to campaign** to save the document on the Attachments page. If you do not select this option, the generated documents are not saved. The name of the attachment is the name that you have specified for the document. The name does not have to be unique. The date and time that the

document is saved differentiate it from other attachments with the same name. This option is not available if the campaign does not have an Attachments page or if you do not have Edit access to the campaign.

Click **Create Document** to create and view the types of documents that you have selected. You can save the documents to another location.

**Note:** In order to view documents in the Google Chrome browser, allow pop-ups for the current URL. To view a non-Western language in Adobe PDF format, you might need to download the font pack for that language from [www.adobe.com](http://www.adobe.com). Non-supported languages are not displayed in text fields in the PDF document. For example, Hebrew text that is entered in a text field for custom details is not displayed in the PDF document.

---

## Publishing Campaigns

### Overview of Publishing Campaigns

You can publish campaign reporting data to the common data model. You can then view the reports in SAS Customer Intelligence Studio. The location of the common data model is specified by the common date model libref for the current business context.

### Publish Campaign Reporting Data

Campaign reporting data is published to the common data model every time that a campaign is executed. Under some circumstances, you might want to publish a campaign manually. For example, you might want to update the contact history for a campaign. Click  in the toolbar for a campaign or a campaign group to publish campaign data to the common data model.

Publishing a campaign manually ensures that all changes, such as control group settings for a cell, are updated in the common data model.

---

## Creating Reports

### Overview of Creating Reports

After you publish campaigns, you can create and view reports that are based on data in the common data model. The data is extracted from the common data model and loaded into a library that is accessible by SAS Customer Intelligence Studio. The data in a report displays only information from campaigns that are in the current business context.

To create and view reports, select the Reports workspace. The Reports workspace must be enabled for the current business context. For more information, see “[Set Reporting Options](#)” on page 40.

**Figure 6.1** Reports Workspace


The screenshot shows the SAS Customer Intelligence Studio interface with the 'Reports' tab selected. The main area displays a table of reports with columns: Name, Source Template, Folder, and Date Modified. The table contains the following data:

Name	Source Template	Folder	Date Modified
History Report 1	Occurrence History Report	Reports	Sept 8, 2014 04:55 PM
Churners	Campaign Channel Report	Reports	Aug 13, 2014 03:14 PM
Campaign Status	Campaign Status Report	Reports	Sept 25, 2014 01:42 PM
History Report 2	Occurrence History Report	Reports	Aug 13, 2014 03:15 PM
Treatments 1	Treatment Performance Report	Reports	Oct 24, 2014 03:38 PM
Treatments 2	Treatment Performance Report	Reports	Oct 24, 2014 03:38 PM
History Report 3	Occurrence History Report	Reports	Oct 24, 2014 03:39 PM

**Note:** In order for the Reports workspace to be displayed on any device, including mobile devices, SAS Visual Analytics Administration and Reporting must be installed at your site.

## Create a Report

You can create a new report or base your report on an existing template. To use a template, click  and select a template. You are first prompted to save the new report. After you have saved the report, it displays in a new browser window. For information about creating reports in SAS Visual Analytics, see *SAS Visual Analytics: User's Guide* at <http://support.sas.com/documentation/onlinedoc/va/index.html>

The following templates are provided with SAS Customer Intelligence Studio. These templates are examples that you can customize for your site.

**Campaign Channel Report**

displays campaign count by channel.

**Campaign Status Report**

displays campaigns by status.

**Occurrence History Report**

displays occurrence history details for the specified campaign.

**Treatment Performance Report**

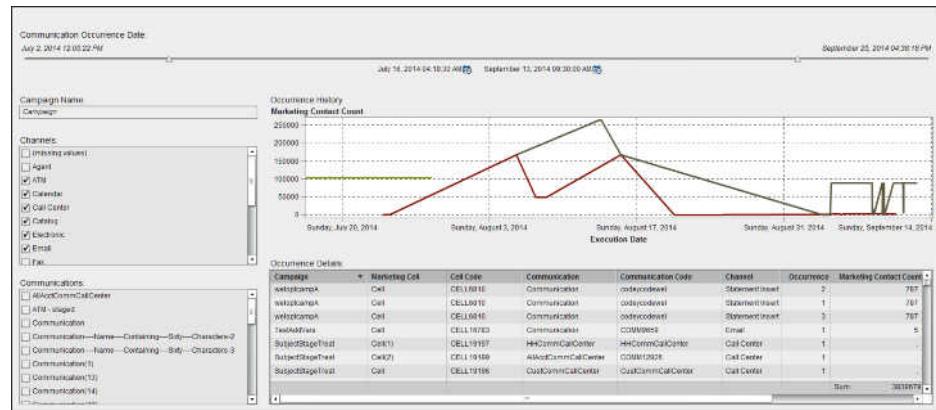
displays treatment contact and response counts, treatment details, campaign type, channel, and campaign export date for the specified treatment.

**Note:** The example templates are in English only.

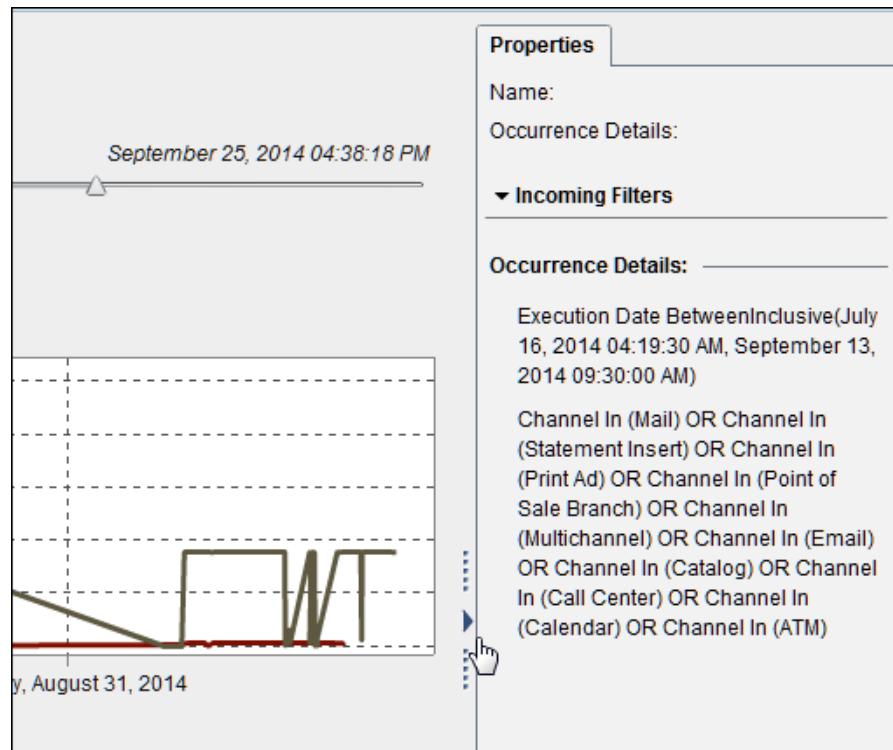
Reports that you create from the sample templates will already have the required extended attributes for display in SAS Customer Intelligence Studio. For information about the requirements for displaying new reports and report templates in SAS Customer Intelligence Studio, see *SAS Marketing Automation: Administrator's Guide*.

## View Reports

Double-click a report name to view it. The report is displayed in a new tab in your browser.

**Figure 6.2** Sample Report

Click the arrow to view section properties.

**Figure 6.3** View Report Section Properties

To print the report to a PDF file, right-click a section and select **Print section name to PDF**. You can select the sections that you want to print.

For information about viewing SAS Visual Analytics reports on a mobile device, see *SAS Visual Analytics: User's Guide* at <http://support.sas.com/documentation/onlinedoc/va/index.html>.



# 7

## Scheduling Campaigns and Communications for Execution

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---

## Create a Schedule

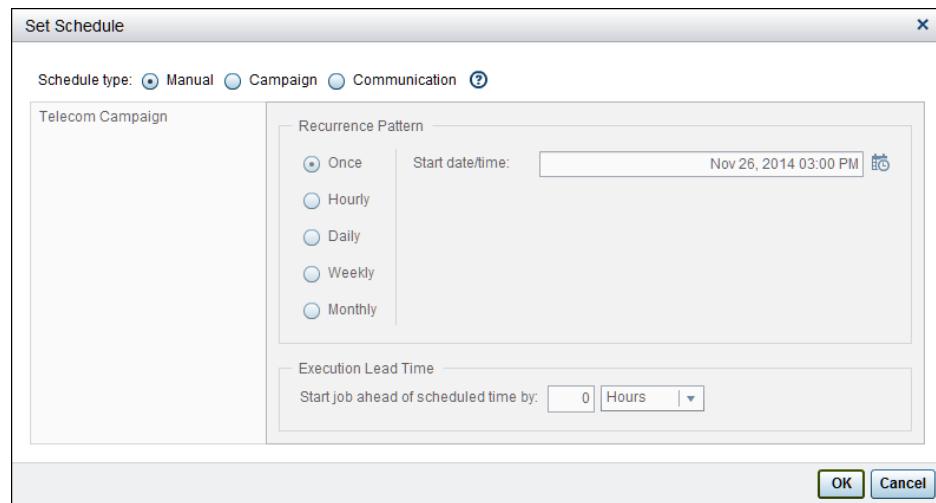
### Set the Schedule for a Campaign

On the Schedule page for campaigns, you schedule campaigns and communications for execution. Click **Set Schedule**.

*Figure 7.1 Campaign Schedule Page*

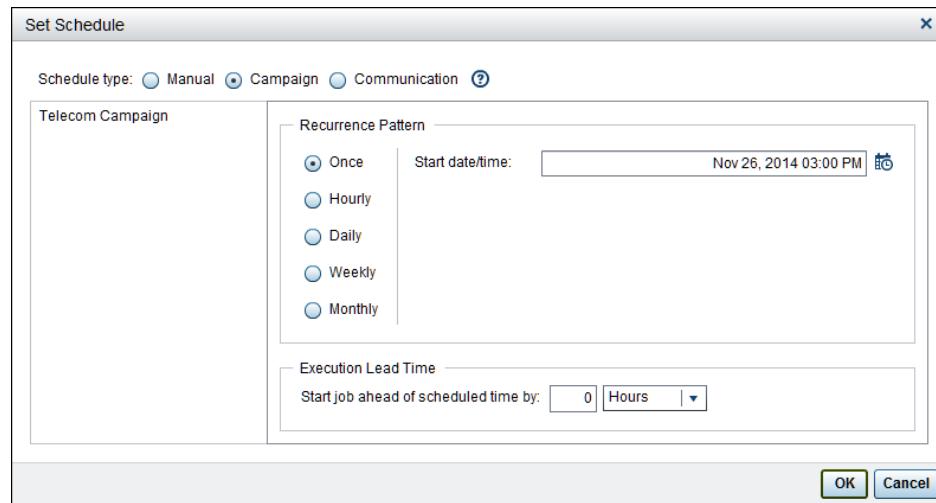


In the Set Schedule window, you specify the details of execution. Select **Manual** if you do not want to set a schedule.

**Figure 7.2** Manual Schedule Type for Campaign

You execute the campaign on the Execution page. For more information, see ["Execute a Campaign" on page 338](#).

Select **Campaign** or **Communication** to set the schedule for the entire campaign or for individual communications.

**Figure 7.3** Campaign Schedule Type

If you have set individual communication schedules, you create a new schedule when you select **Campaign**. The existing communication schedules are not modified. If you select **Communication** again, the Communication nodes revert to their previous schedules.

If you select **Save as** to save a new copy of the campaign, the default start date for the copied schedule is set to an hour in the future.

When a campaign is executed, the counts are cleared on all of the nodes in the campaign. A single job is executed. This opens a single copy of the campaign with Write access.

When an individual communication is executed, the counts on the nodes that are upstream from the Communication node might not be cleared. The clearing of counts on upstream nodes depends on whether **Use the most current data**

**when executing communications** is selected on the Campaign Properties page. For more information, see “[Specify Campaign Properties](#)” on page 158. One job is executed for each communication. During execution, each communication opens a copy of the campaign with Write access.

When you schedule individual communications for execution, make sure that the execution schedules do not overlap. For example, a campaign might have two Communication nodes. If each communication is scheduled to execute at 2:00 a.m. every day, failure is likely because the first communication execution opens the campaign with Write access. The second communication, which is executed in a separate job, is not able to access the campaign because the campaign is locked by the first communication. Failure is also likely if the time difference between each scheduled occurrence is so short that campaigns are still locked for the next scheduled execution.

If more than one campaign is writing to the same export file, and the campaigns are scheduled to execute within several minutes of each other, some campaigns might fail to execute. A campaign cannot open an export file that is opened for writing by another campaign.

Select one of the following recurrence patterns:

#### **Once**

The task is run only once.

#### **Hourly**

The task is run according to the number of hours that you specify. For example, if you specify **3** as the number of hours, the task is run eight times within a 24-hour period.

#### **Daily**

The task is run according to the number of days that you specify.

#### **Weekly**

The task is run according to the number of weeks that you specify. You also must specify the day of the week that the task is run.

#### **Monthly**

The task is run according to the number of months and the day of the month that you specify. You also must specify the day of the month that the task is run.

Click  to specify a start date and time.

Specify the end of the recurrence by selecting one of the following:

#### **No end date**

The recurrence does not end.

**Note:** Select an end date for better performance. If you select **No end date**, processing is much slower.

#### **End date/time**

Click  or enter a value to specify the last send date. For information about valid date and time values, see “[Date and Time Values](#)” on page 144.

#### **End after**

Enter the number of occurrences, hours, days, weeks, or months for which the scheduled task is to run.

Execution lead time is the time that is needed between executing the campaign and the actual send date for the campaign. The execution can occur before the

start date of a campaign. For example, if a campaign is scheduled to start on the 27th with two days' lead time, the campaign actually executes on the 25th.

Specify the number of hours, days, weeks, or months. The default value for the lead time is 0.

After you have created a schedule, click  to view the scheduled executions. For more information, see “[Execute a Campaign](#)” on page 338.

## Set the Schedule for a Non-Optimization Campaign Group

You can use non-optimization campaign groups to collect several campaigns in a single group. You can then schedule the campaigns to execute on a single group schedule or on an offset to a group schedule.

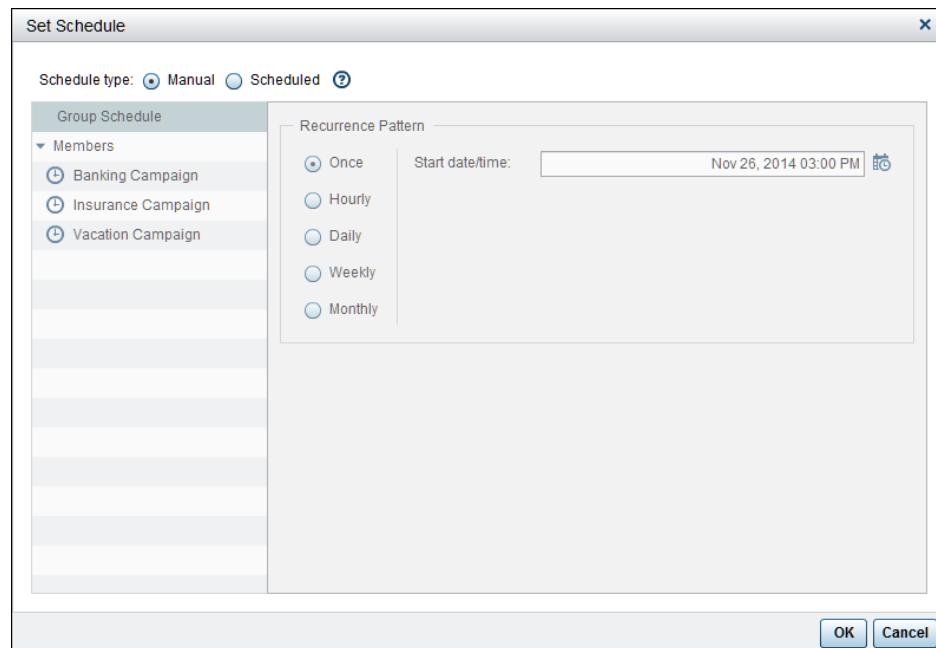
On the Schedule page for a campaign group, you schedule the campaign group or individual campaigns for execution. Click **Set Schedule**.

**Figure 7.4** Campaign Group Schedule Page



In the Set Schedule window, you specify the details of execution. Select **Manual** if you do not want to set a schedule.

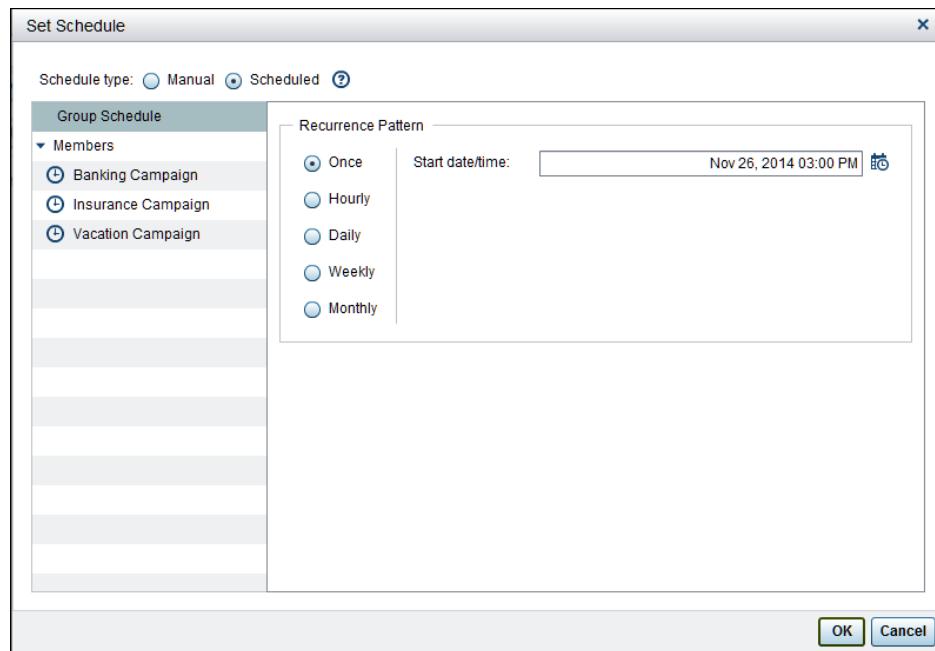
**Figure 7.5** Manual Schedule Type for Non-optimized Campaign Group



You execute the campaign group on the Execution page. For more information, see “[Execute a Campaign](#)” on page 338.

Select **Scheduled** and **Group Schedule** to set the same schedule for all of the campaigns in the campaign group.

Figure 7.6 Set Group Schedule



Select one of the following recurrence patterns:

#### **Once**

The task is run only once.

#### **Hourly**

The task is run according to the number of hours that you specify. For example, if you specify 3 as the number of hours, the task is run eight times within a 24-hour period.

#### **Daily**

The task is run according to the number of days that you specify.

#### **Weekly**

The task is run according to the number of weeks that you specify. You also must specify the day of the week that the task is run.

#### **Monthly**

The task is run according to the number of months and the day of the month that you specify. You also must specify the day of the month that the task is run.

Click to specify a start date and time.

Specify the end of the recurrence by selecting one of the following:

#### **No end date**

The recurrence does not end.

**Note:** Select an end date for better performance. If you select **No end date**, processing is much slower.

#### **End date/time**

Click or enter a value to specify the last send date. For information about valid date and time values, see “[Date and Time Values](#)” on page 144.

### End after

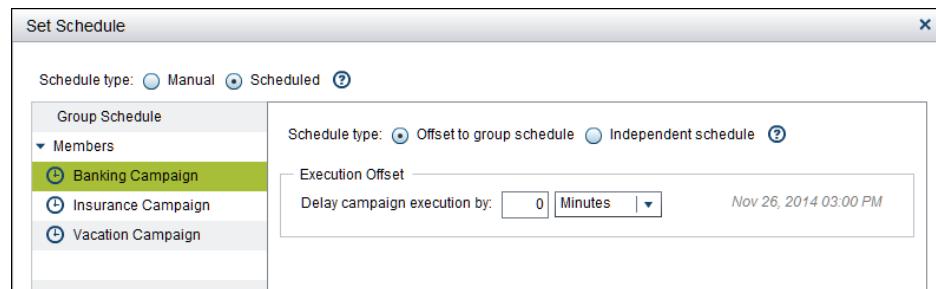
Enter the number of occurrences, hours, days, weeks, or months for which the scheduled task is to run.

Execution lead time is the time that is needed between executing the campaign and the actual send date for the campaign. The execution can occur before the start date of a campaign. For example, if a campaign is scheduled to start on the 27th with two days' lead time, the campaign actually executes on the 25th.

Specify the number of hours, days, weeks, or months. The default value for the lead time is 0.

To set the schedule for an individual campaign within the group, select **Scheduled** and the campaign name.

*Figure 7.7 Set Individual Non-Optimization Campaign Schedule*



Select **Offset to group schedule** to execute the individual campaign after the scheduled execution for the group. Select the amount of time that the individual campaign execution will be delayed.

Select **Independent schedule** to create an individual campaign schedule that has no relation to the campaign group schedule.

**Note:** Editing a campaign schedule that is offset to the group schedule causes the campaign schedule to be independent of the group schedule. Changes are not reflected in the other campaigns in the group.

You can modify the schedules of individual campaigns that are in a campaign group whose scheduled start date is in the past. You can also add campaigns that have already begun execution to a new campaign group. You cannot modify the schedules of campaigns or campaign groups whose execution schedules have completed. After you have made your changes, click **Send Schedule** to resubmit the schedule. Some third-party scheduling software might not process the modified schedule correctly. For best results, send the schedule details to an administrator for processing.

After you have created a schedule, click to view the scheduled executions. For more information, see “[Execute or Optimize a Campaign Group](#)” on page [341](#).

## Set the Schedule for an Optimization Campaign Group

You use optimization campaign groups to collect several optimization campaigns in a single group. You can coordinate the optimization schedule and execution schedules for a campaign group so that the execution schedules of individual campaigns occur automatically at specified intervals after optimization. During

optimization, campaign group members are Read-only. Member campaigns do not execute until campaign group optimization is complete.

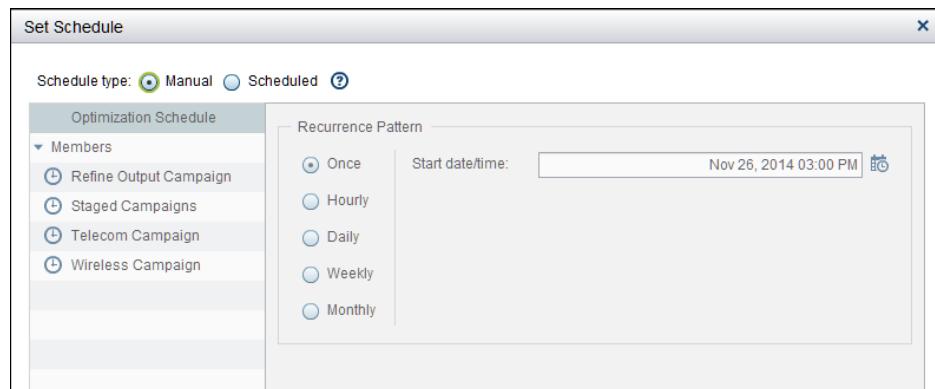
On the Schedule page for a campaign group, you schedule the campaign group for optimization. Click **Set Schedule**.

**Figure 7.8** Campaign Group Schedule Page



In the Set Schedule window, you specify the details of optimization and execution. Select **Manual** if you do not want to set a schedule.

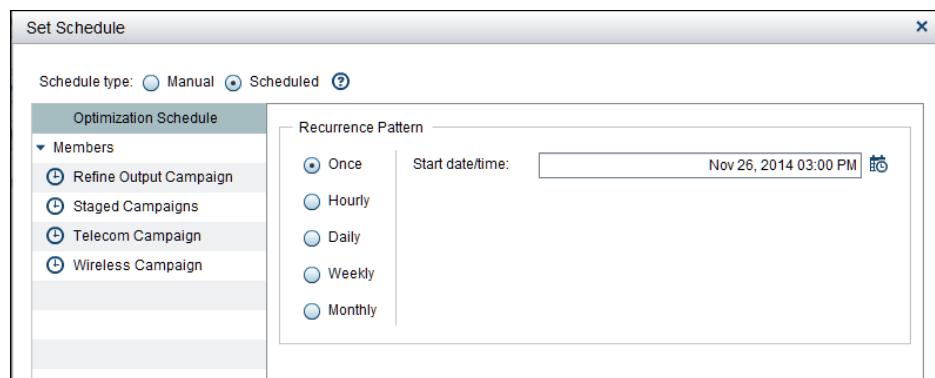
**Figure 7.9** Manual Schedule Type for Optimization Campaign Group



You execute the campaign group on the Execution page. For more information, see “[Execute a Campaign](#)” on page 338.

Select **Scheduled** to set the optimization schedule for the campaign group and the execution schedule for the members. Select **Optimization Schedule** to set the optimization schedule. During optimization, campaign counts are updated and sent to SAS Marketing Optimization. The optimized counts are returned to SAS Marketing Automation.

**Figure 7.10** Set Group Optimization Schedule



The optimization schedule includes only the campaigns that execute within the optimization horizon. If no horizon has been set, the optimization schedule

includes all campaigns that are scheduled to execute in the future. For more information, see “[Specify Data Settings](#)” on page 213.

Select one of the following recurrence patterns to specify how often to run the optimization..

#### Once

The task is run only once.

#### Hourly

The task is run according to the number of hours that you specify. For example, if you specify 3 as the number of hours, the task is run 8 times within a 24-hour period.

**Note:** If the task is run by an operating system scheduler, the end time does not apply, and the executions will recur until midnight of the end date. For example, if the end date and time is specified as **July 19, 2014 10:00 AM**, the schedule will run until midnight on July 19.

#### Daily

The task is run according to the number of days that you specify.

#### Weekly

The task is run according to the number of weeks that you specify. You also must specify the day of the week that the task is run.

#### Monthly

The task is run according to the number of months and the day of the month that you specify. You also must specify the day of the month that the task is run.

Click  to specify a start date and time.

Specify the end of the recurrence by selecting one of the following:

##### No end date

The recurrence does not end.

**Note:** Select an end date for better performance. If you select **No end date**, processing is much slower.

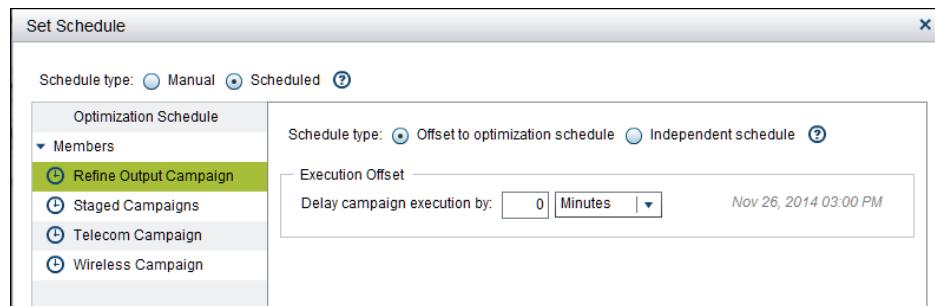
##### End date/time

Click  or enter a value to specify the last send date. For information about valid data and time values, see “[Date and Time Values](#)” on page 144.

##### End after

Enter the number of occurrences, hours, days, weeks, or months for which the scheduled task is to run.

To set the execution schedule for an individual campaign within the group, select the campaign name. Execution creates an export file and updates the contact history for a campaign.

**Figure 7.11** Set Member Execution Schedule

Select **Offset to optimization schedule** to execute the individual campaign in relation to the scheduled optimization for the group. Select the amount of time that the individual campaign execution will be delayed. The amount of time cannot be greater than the time between optimizations. A campaign cannot execute more than once using the results of a single optimization. For example, suppose you set the schedule for an optimization campaign group to be **Hourly**. If you set the offset for a member campaign to be one day, the hourly executions for the last day of the schedule would occur after the last optimization. The executions would use the same optimization results. Validation will fail for the campaign group.

Select **Independent schedule** to create an individual campaign schedule that has a different recurrence pattern from the optimization schedule. The same campaign cannot be executed more than once within the same optimization schedule.

You can modify the schedules of individual campaigns that are in a campaign group whose scheduled start date is in the past. You can also add campaigns that have already begun execution to a new campaign group. You cannot modify the schedules of campaigns or campaign groups whose execution schedules have completed.

You can modify the schedules of campaigns or campaign groups whose optimization schedules have completed. If a campaign group contains some campaigns with completed schedules and some campaigns with schedules that have not completed, only the uncompleted schedules are sent to the schedule manager. If the end dates for all of the schedules in a campaign group are in a past, no schedule is sent to the schedule manager.

After you have made your changes, click **Send Schedule** to resubmit the schedule. Some scheduling software might reject schedules that have a start date in the past. For best results, send the schedule details to an administrator for processing.

Click **Validate** to validate the schedule that you have set.

After you have created a schedule, click to view the scheduled executions. For more information, see “[Execute or Optimize a Campaign Group](#)” on page 341.

## Execute a Campaign or Campaign Group

### Overview of Executing Campaigns and Campaign Groups

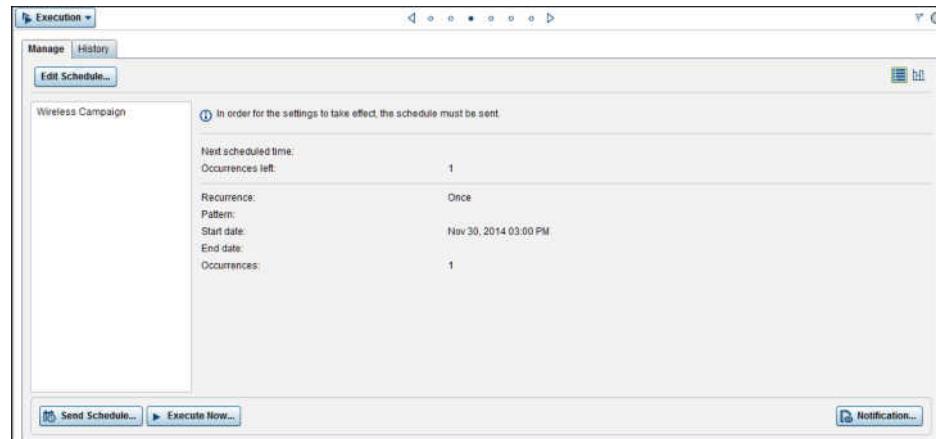
You can execute campaigns and campaign groups if you have the appropriate permissions. If you do not have the appropriate permissions, the SAS Marketing Automation administrator at your site can execute the campaigns and campaign groups for you. An export file is created during execution. Campaigns that require approval must be approved before they can be executed.

You cannot execute an individual campaign that is a member of a campaign group.

### Execute a Campaign

On the **Manage** tab of the Execution page, you manage execution details for the campaign.

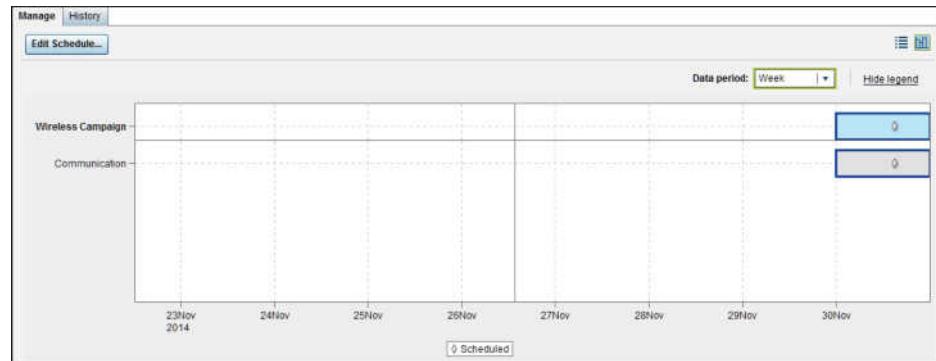
*Figure 7.12 Manage Campaign Execution*



If you have already set a schedule on the Schedule page, click **Edit Schedule** to change the schedule details. If you have not set a schedule, click **Set Schedule**. You cannot modify the schedules of communications that have been sent to the scheduler. For more information, see “[Set the Schedule for a Campaign](#)” on page 329 and “[Set the Schedule for a Non-Optimization Campaign Group](#)” on page 332.

A schedule that contains a single occurrence does not display an end date.

After you have created a schedule, click to view the scheduled executions.

**Figure 7.13** Scheduled Executions for Campaign

Select a range from **Data period** to view the selected span of executions.

Rest the mouse pointer on an occurrence to display the details.

**Figure 7.14** Scheduled Occurrence

The following symbols indicate the status of scheduled and manual executions:

**Red diamond (✗)**

indicates a failed scheduled execution.

**Green diamond (✓)**

indicates a successful scheduled execution.

**White diamond (○)**

indicates a future scheduled execution.

**Blue diamond (●)**

indicates a future scheduled execution that has been sent to the administrator for scheduling.

**Purple diamond (●)**

indicates a future scheduled execution that has been sent to the scheduling software.

**Red circle (✗)**

indicates a failed execution via **Execute Now**.

**Green circle (✓)**

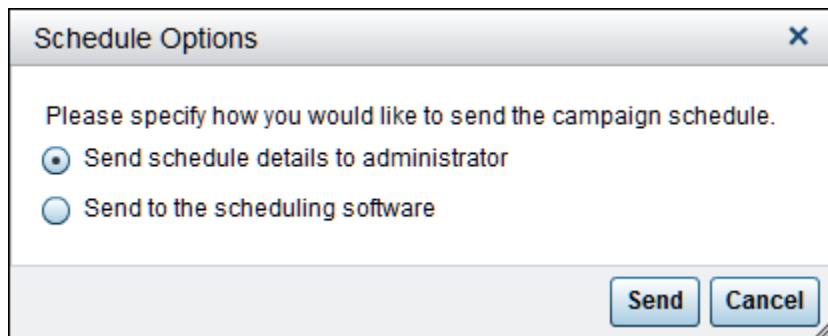
indicates a successful execution via **Execute Now**.

Click **Hide legend** to hide the key to schedule symbols.

To send a campaign or communication to the administrator or the scheduling software, select a bar in the chart and click **Send Schedule**.

If no bars are selected, and the **Campaign** schedule type is selected on the Schedule page, the entire campaign is executed as a single flow. If the **Communication** schedule type is selected, select the communications that you want to schedule. You cannot send individual communications to the scheduler if the **Campaign** schedule type has been selected.

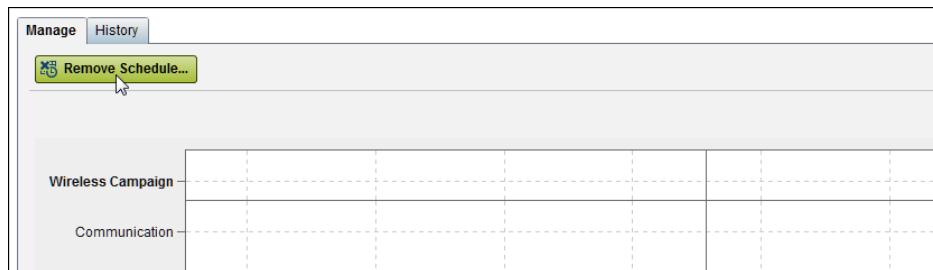
Figure 7.15 Schedule Options for Campaign



**CAUTION!** Avoid using campaign names that are longer than 60 characters or campaign codes that are longer than 30 characters. Scheduled communications can fail if a campaign contains multiple communications and a campaign name that is longer than 60 characters or a campaign code that is longer than 30 characters. If a campaign or communication name is 60 characters long and the campaign or communication is sent to the scheduling software, the last character is truncated in the flow or job name in SAS Management Console.

If a schedule has been sent to the scheduler, click **Remove Schedule** to remove the schedule from the scheduling software.

Figure 7.16 Remove Schedule



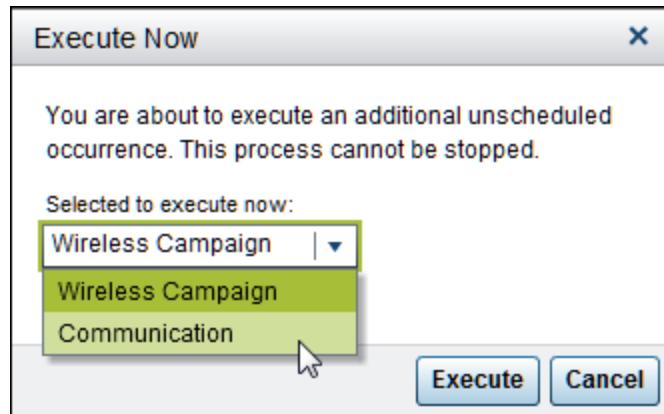
A sent schedule might contain future occurrences that have not yet executed. You can remove a sent schedule so that you can edit the settings. When a schedule is removed from the scheduling software, the status of the campaign is set to **Designing**.

To discover if any changes have been made to a schedule after you send it to an administrator, click . You can synchronize the schedule to match the changes that have been made by the administrator. For information about synchronizing the schedules for campaign groups, see “[Synchronize the Schedule](#)” on page [345](#).

Because of differences between SAS Schedule Manager and SAS Marketing Automation, synchronizing changes might affect the schedule in unexpected ways. For example, after synchronization, a schedule that is scheduled to end after a specified number of recurrences might have a fixed end date that matches the date that is calculated to match the date of the last occurrence. You can create more complex schedules in SAS Schedule Manager than you can create in SAS Marketing Automation. If the SAS Schedule Manager schedule is more complex, the schedules cannot be synchronized and a message advises you to view the schedule in SAS Schedule Manager.

Click **Execute Now** to execute an additional unscheduled occurrence of a campaign or a communication. Select the communication that you want to execute.

*Figure 7.17 Execute Now*



When a campaign is executed, the counts are cleared on all of the nodes in the campaign. A single job is executed. This opens a single copy of the campaign with Write access.

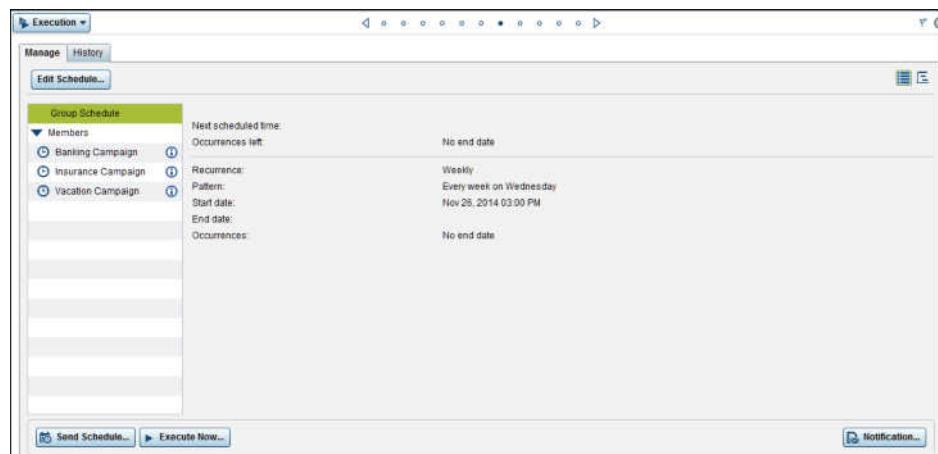
When an individual communication is executed, the counts on the nodes that are upstream from the Communication node might not be cleared. The clearing of counts on the upstream nodes depends on whether **Use the most current data when executing communications** is selected on the Campaign Properties page. For more information, see “[Specify Campaign Properties](#)” on page 158. One job is executed for each communication. During execution, each communication opens a copy of the campaign with Write access.

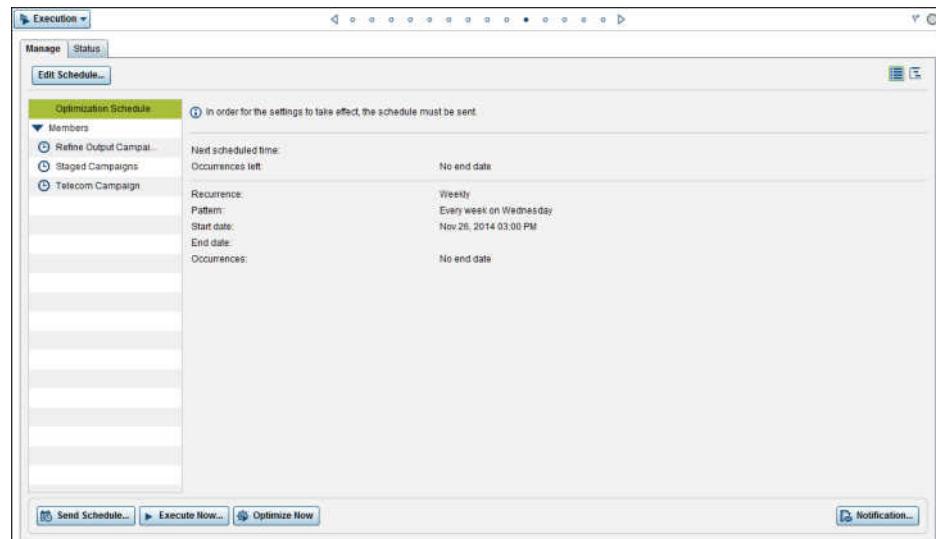
## Execute or Optimize a Campaign Group

### Manage Execution Details

On the **Manage** tab of the Execution page, you manage execution details for the campaign group.

*Figure 7.18 Manage Non-Optimization Campaign Group Execution*

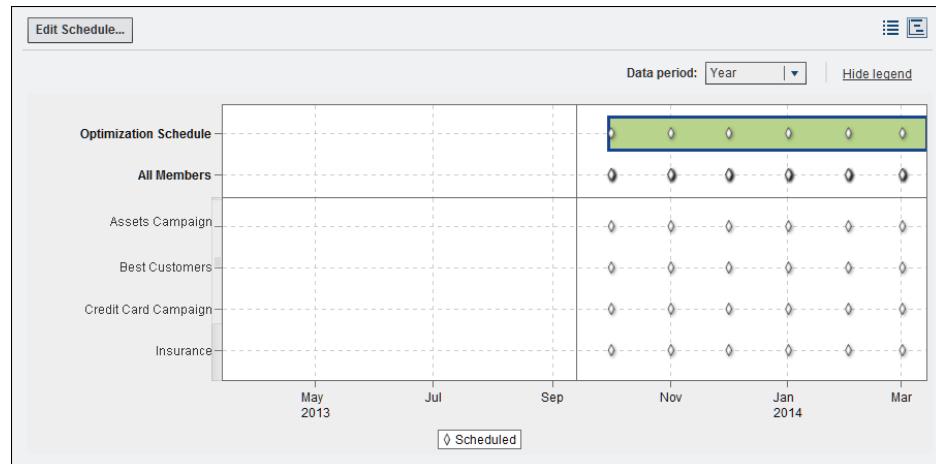


**Figure 7.19** Manage Optimization Campaign Group Execution

## Edit and View the Schedule

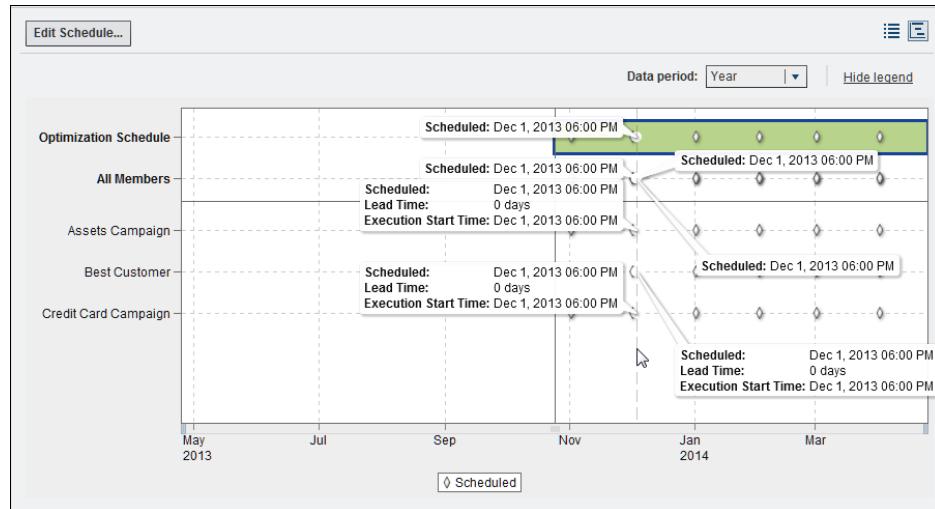
If you have already set a schedule on the Schedule page, click **Edit Schedule** to change the schedule details. If you have not set a schedule, click **Set Schedule**. For more information, see “[Set the Schedule for a Non-Optimization Campaign Group](#)” on page 332 and “[Set the Schedule for an Optimization Campaign Group](#)” on page 334.

After you have created a schedule, click to view the schedule.

**Figure 7.20** Schedule for Optimization Campaign Group

Select a range from **Data period** to view the selected span of executions.

To view the information for all of the occurrences for a particular time, move the vertical dotted line to the occurrences.

**Figure 7.21** View Schedule for Multiple Occurrences

Rest the mouse pointer on an occurrence to display the details.

The following symbols indicate the status of scheduled and manual executions:

**Red diamond (✗)**

indicates a failed scheduled execution.

**Green diamond (✓)**

indicates a successful scheduled execution.

**White diamond (○)**

indicates a future scheduled execution.

**Blue diamond (●)**

indicates a future scheduled execution that has been sent to the administrator for scheduling.

**Purple diamond (●)**

indicates a future scheduled execution that has been sent to the scheduling software.

**Red circle (✗)**

indicates a failed execution via **Execute Now**.

**Green circle (✓)**

indicates a successful execution via **Execute Now**.

Click **Hide legend** to hide the key to schedule symbols.

To view all of the executed occurrences of communications within a member campaign, open the campaign and view the schedule.

### Send the Schedule

You can send the schedules of individual members of non-optimization campaign groups. Optimization campaign groups are sent as a whole; you cannot send the schedules of individual members. To send the campaign group or a member to the administrator or the scheduling software, select a bar in the chart and click **Send Schedule**. If no bars are selected, the entire campaign group is executed as a single flow. You must have the appropriate permissions to send the schedule directly to the scheduling software.

**Figure 7.22** Schedule Options for Non-Optimization Campaign Group

Schedule Options

Please specify how you would like to send the campaign schedules.

Send schedule details to administrator

Send to the scheduling software

Select schedules to send:

<input type="checkbox"/>	Name	Code	Recurrence Pattern	Schedule Type
<input checked="" type="checkbox"/>	Banking Campaign	CAMP17231	Weekly	Offset To Group
<input type="checkbox"/>	Insurance Campaign	CAMP17230	Weekly	Offset To Group
<input checked="" type="checkbox"/>	Vacation Campaign	CAMP17232	Weekly	Offset To Group

**Send** **Cancel**

You can add a campaign to an optimization campaign group after the schedule has been sent. The group schedule is not updated automatically. Edit the schedule for the new campaign and click **Send Schedule** to include the new campaign in the optimization. For more information, see “[Manage Execution Details](#)” on page 341.

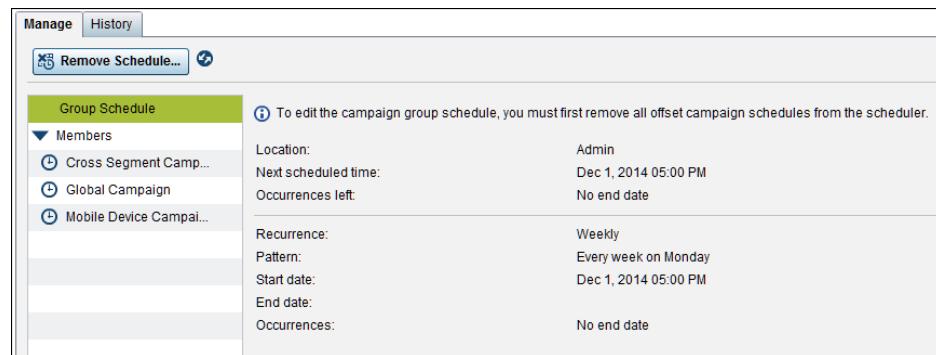
You can remove a campaign from an optimization campaign group after the schedule has been sent. When you remove the campaign, the campaign group is saved automatically and the campaign's schedule is removed.

When a campaign is removed from an optimization campaign group, the campaign inherits the campaign group schedule and optimization settings.

**CAUTION! Avoid using campaign names that are longer than 60 characters or campaign codes that are longer than 30 characters.** Scheduled communications can fail if a campaign contains multiple communications and a campaign name that is longer than 60 characters or a campaign code that is longer than 30 characters. If a campaign or communication name is 60 characters long and the campaign or communication is sent to the scheduling software, the last character is truncated in the flow or job name in SAS Management Console.

# Remove the Schedule

If a schedule has been sent, click **Remove Schedule** to remove the schedule from the scheduling software.

**Figure 7.23** Remove Schedule

## Synchronize the Schedule

Click to synchronize the schedule with any changes that have been made by an administrator or through the Schedule Manager. Because of the amount of time required for campaign groups, synchronization occurs only the first time that the Schedule or Execution page is opened for a campaign group. To synchronize again, click .

**CAUTION! Use the Schedule Manager to modify schedules.** If you are an administrator, do not modify schedules directly through LSF or OS Scheduler. These changes are not detected by the Schedule Manager or SAS Marketing Automation.

## Execute Now

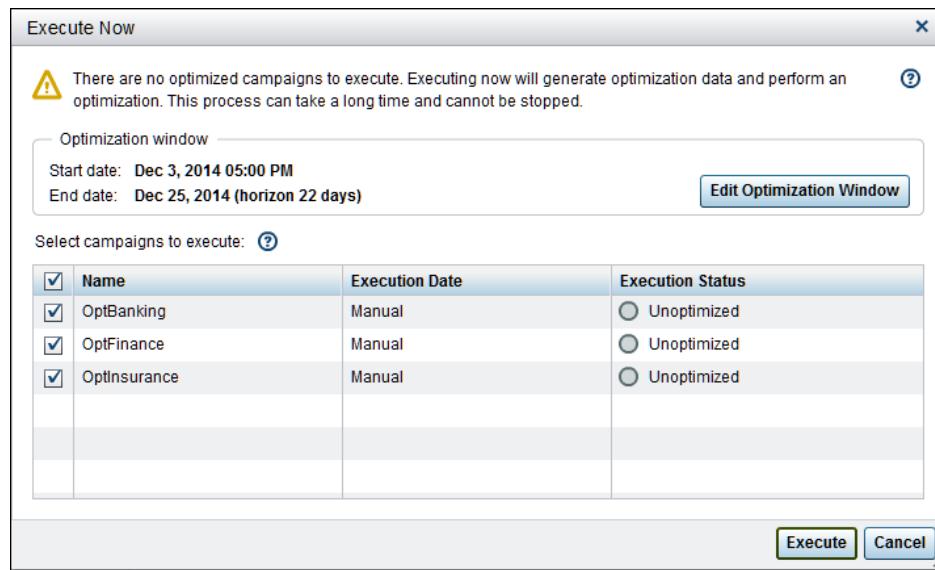
Select the schedule or a member campaign and click **Execute Now** to start an additional unscheduled execution of the campaign group. Select the campaigns to execute.

When you click **Execute Now** in an optimization campaign group, and there are no optimized campaigns that are ready to execute, optimization data is generated for all campaigns that are in the optimization window. An optimization is performed before executing the selected campaigns. If there are optimized campaigns, an optimization is not performed before executing the selected campaigns. If the campaign group has already been optimized and not all of the optimized campaigns have executed, **Execute Now** applies only to previously unexecuted campaigns.

For the **Manual** schedule type, optimization is performed for all member campaigns.

For the **Scheduled** schedule type, the selection of campaigns that are included in the optimization is based on the optimization window and horizon information for the campaign group.

Figure 7.24 Execute Now Window for Scheduled Optimization Group



The horizon is used to determine the end date. The length of the horizon is set on the Optimization Settings page. If no horizon is set for the campaign group, the table lists all of the campaigns that have executions that are scheduled in the future.

The default start date is the next optimization date, if one exists, or the current date if there are no future optimizations scheduled. Click **Edit Optimization Window** to set a new start date.

Select the campaigns that will execute after the optimization is complete. Click **Execute** to execute the selected campaigns.

## Optimize Now

Click **Optimize Now** to optimize an optimization campaign group. If the schedule type is **Manual**, all campaigns in the campaign group are optimized. For the **Scheduled** schedule type, the selection of campaigns that are included in the optimization is based on the optimization window and horizon information for the campaign group. For campaigns that use the Priority-based method, all campaigns are optimized regardless of schedule.

If you select **Suppress generation of input data** in the Optimize Now window, you can make changes to SAS Marketing Optimization input data tables without regenerating SAS Marketing Automation campaign data. The modifications are incorporated when the input data tables are refreshed in SAS Marketing Optimization. After the input data tables have been refreshed by SAS Marketing Optimization, the preferred scenario is optimized and promoted back to SAS Marketing Automation. Campaigns in the campaign group are not executed again. Changes, including the Start date, that have been made to the campaign group since the last generation of input data are ignored. Structural changes to SAS Marketing Optimization input data tables are ignored.

**Note:** If you select this option, campaign group input data is still validated during optimization, and error messages are displayed. The errors do not have an effect on the optimization behavior. Generation of input data is suppressed.

If you select **Suppress generation of input data**, you can modify the input data tables and incorporate the changes into the scenarios. The data items that you

can add, delete, or modify include constraints, contact policies, suppressions, and customer IDs. Note that you can modify only rows in the existing input data tables. New columns or tables are not processed. For example, if you add an agent table to the input data, the agent table is not incorporated by SAS Marketing Optimization. In this circumstance, there might be validation errors.

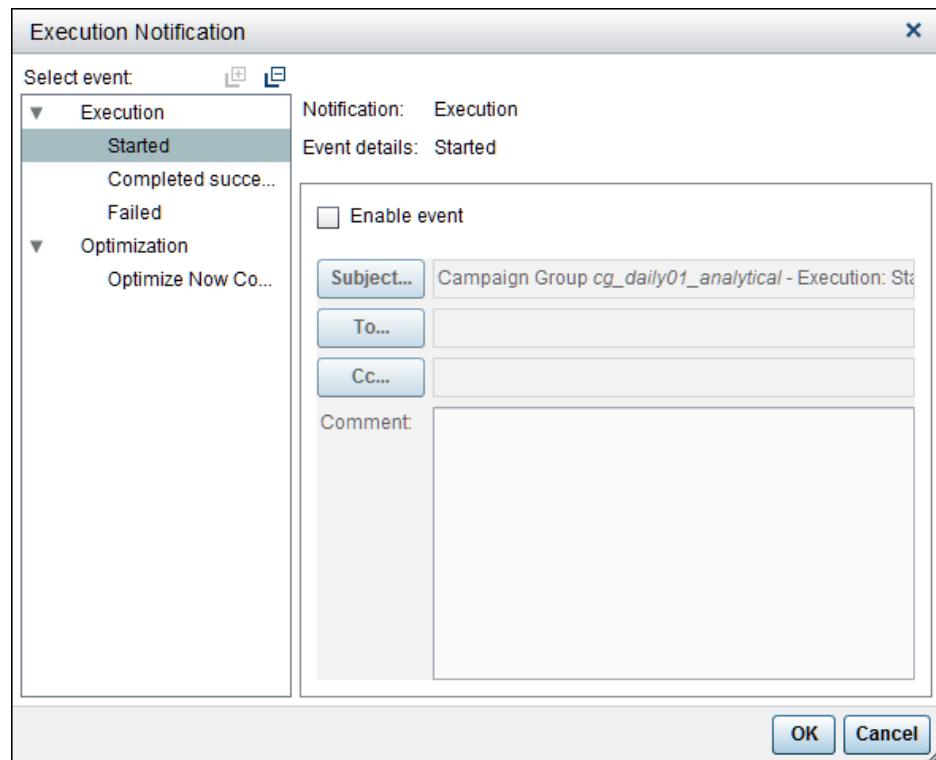
Manual changes that are made to SAS Marketing Optimization input tables are overwritten when you click **Optimize Now** without selecting **Suppress generation of input data**. If you click **Execute Now** when you are working with an optimization campaign group or during scheduled optimizations, the manual changes are also overwritten.

For information about optimization settings, see “[Execute Now](#)” on page 345.

## Send Email Notifications

Click **Notification** to set up email notifications of executions.

*Figure 7.25 Execution Notification*



Select the type of notification and the event for which the email message will be sent.

Select **Enable event** to modify the subject line and to select addressees. In order to receive the notification, the correct email addresses must be assigned to the users in the User Manager plug-in in SAS Management Console. For more information, see *SAS Marketing Automation: Administrator’s Guide*.

Click **To** and **Cc** to designate the recipients of the message. For more information, see “[Select Users and Groups](#)” on page 178.

Enter any additional information in the **Comment** field.

Click **Subject** to change the subject line of the email message. For more information, see “[Change the Subject](#)” on page 178.

**Note:** The availability of notifications depends on the setting in the current business context.

## View Execution History

The **History** tab displays non-optimization campaigns and communications that have been executed.

*Figure 7.26 History Tab for Campaign Execution*

Communication	Communication Code	Type	Status	Count	Date Executed
Occurrence No. 2	COMM14183	Manual	Successful	5	Jun 4, 2014 04:12 PM
Occurrence No. 1	COMM14183	Manual	Successful	5	Jun 4, 2014 03:49 PM

You can delete occurrences that have been executed successfully. For example, if you have performed a trial execution of a communication to make sure that it executes successfully, you can delete that occurrence from the history table. When an occurrence is deleted, the common data model is updated to remove contact history and the communication occurrence. In order to preserve the history of executions, the entry in the history table remains, with a status of “Deleted” and no occurrence number.

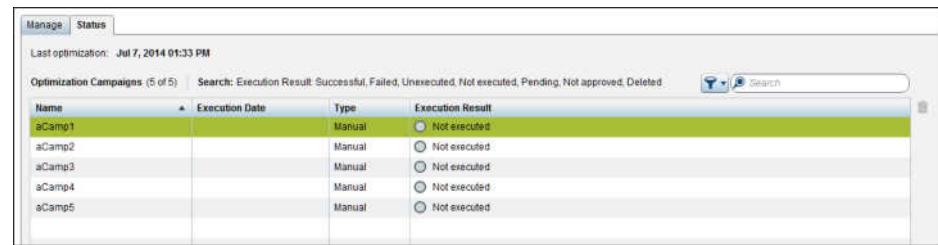
Failed executions appear in the execution history table and on the Gantt chart, but do not have an associated occurrence number. Only successful occurrences have entries in the common data model.

Executions are tracked at the communication level, rather than the campaign level. Each execution attempt is assigned the next sequential occurrence number. The occurrence number for an execution is the previous highest successful execution number, increased by an increment of 1. Occurrence numbers are not reused if a higher occurrence number exists. For example, if occurrence numbers 1, 2, 3 and 4 are executed, and occurrence number 3 is deleted, the next execution is assigned occurrence number 5. Occurrence number 3 is not reused because a higher-numbered occurrence, occurrence number 4, exists. If occurrence numbers 4 and 3 are deleted, then the next execution is assigned occurrence number 3.

There is no limit on occurrence numbers.

## View Optimization Status

The **Status** tab displays the execution history of an optimization campaign group.

**Figure 7.27 Status Tab**

The screenshot shows a software interface titled "Status" under the "Manage" tab. At the top, it displays "Last optimization: Jul 7, 2014 01:33 PM". Below this is a search bar with the placeholder "Search: Execution Result: Successful, Failed, Unexecuted, Not executed, Pending, Not approved, Deleted". A table titled "Optimization Campaigns (5 of 5)" lists five campaigns: aCamp1, aCamp2, aCamp3, aCamp4, and aCamp5. The columns are "Name", "Execution Date", "Type", and "Execution Result". All campaigns are listed as "Manual" type and "Not executed".

Name	Execution Date	Type	Execution Result
aCamp1		Manual	<input checked="" type="radio"/> Not executed
aCamp2		Manual	<input type="radio"/> Not executed
aCamp3		Manual	<input type="radio"/> Not executed
aCamp4		Manual	<input type="radio"/> Not executed
aCamp5		Manual	<input type="radio"/> Not executed

All campaigns that are scheduled to execute in the current optimization cycle are listed in the Optimization Campaigns table. This might not include all the members of the campaign group. For example, if the campaign group is on a weekly optimization cycle , and a campaign executes monthly, that campaign is not listed if the scheduled execution does not fall within the current optimization cycle. If the **Manual** schedule type is selected, all member campaigns are listed.

Campaigns that have not been included in the most recent optimization are not listed in the table.



# Appendix 1

## Migrating Files from a Previous Release

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## Overview of Migrating Files to 6.5

If you migrate files to 6.5 from a previous release, the following changes take effect.

---

### Attachments

Attachments that are migrated with a campaign from a previous release do not retain the date on which they were added to a campaign. Instead, the date reflects when the campaign was imported into the new environment.

---

### Campaigns

Campaigns and campaign definitions that are migrated from a previous release might not retain their page order. In the default page order for the current release, the Comments page precedes the Attachments page.

---

### Campaign Groups

If a campaign group from a previous release does not have a campaign group code, the code is automatically generated in the current release.

---

### Optimized Campaigns

Optimized campaigns that are migrated from a previous release will be unoptimized in the current release.

---

### Process Node

In Process nodes that are migrated from a previous release, if the count for any output cell is not greater than or equal to zero, the process fails. In order for the process to succeed, create empty tables for output cells that are not populated.

---

## Response Definitions

To accommodate the sample campaigns and campaign definitions that are provided with SAS Customer Intelligence Studio, 15 response definitions with specific response codes are created on the target system. These response definitions are created if there are no response definitions on the target system with the same response code. If a response definition with the same name already exists, but it has a different response code, the new response definition is created with a numeric suffix (for example, Accepted Public Treatment(1)). The following table lists the response definitions and codes that are created during migration.

*Table A1.1 Automatically Created Response Definitions and Codes*

Name	Code
Automatically captured Comment response (Facebook)	_CM
Automatically captured Like response (Facebook)	_LK
Automatically captured Reply Mention response (Twitter)	_RP
Automatically captured Retweet response (Twitter)	_RT
Accepted Public Treatment	_AP
Rejected Public Satisfied Resolution	_PS
Rejected Public Unknown Resolution	_PU
Rejected Public Dissatisfied Resolution	_PD
Accepted In Case Treatment	_AC
Rejected In Case Satisfied Resolution	_CS
Rejected In Case Unknown Resolution	_CU
Rejected In Case Dissatisfied Resolution	_CD

---

## Reports

If you migrate Web Report Studio reports such as the Treatment Performance Report from a previous release, a view replaces the CI\_CELL\_PACKAGE\_TREATMENT\_CNT table in the common data model.

The reports will continue to be generated successfully in the current release. All previous values are retained. Counts in these reports will not be updated in 6.5.

## Scheduling

If you migrate files from 5.4 or 5.4.1 to 6.5, the execution lead time for schedules is set to 0 hours.

## Treatment Custom Details

In 6.4, a change was made in the way that treatment custom details of type Numeric Range or Date Range are published in the common data model. This change affects the following tables:

- CI\_CAMP\_GRP\_PAGE\_DATE\_UDF
- CI\_CAMP\_GRP\_PAGE\_NUM\_UDF
- CI\_CAMP\_PAGE\_DATE\_UDF
- CI\_CAMP\_PAGE\_NUM\_UDF
- CI\_TREATMENT\_DATE\_UDF
- CI\_TREATMENT\_NUM\_UDF
- CI\_COMMUNICATION\_DATE\_UDF
- CI\_COMMUNICATION\_NUM\_UDF

In 6.3 and earlier releases, the NUM\_UDF\_NM and DATE\_UDF\_NM column names for these tables were published as *CustomDetailName Min* and *CustomDetailName Max*. For example, suppose that there is a treatment custom detail of type Numeric Range named My Range. The column names in the common data model table would be published as *My Range Min* and *My Range Max*.

In 6.4, the NUM\_UDF\_NM and DATE\_UDF\_NM column names are published as *CustomDetailName Minimum Value* and *CustomDetailName Maximum Value*. The column names in the My Range custom detail would be published as *My Range Minimum Value* and *My Range Maximum Value*.

Because of this change, you must update the column names for files that you have migrated to 6.4 from previous releases. The NUM\_UDF\_NM and DATE\_UDF\_NM column names must be changed from *Min* to *Minimum Value* and from *Max* to *Maximum Value*. These updates should be performed with explicit pass-through, using the PROC SQL EXECUTE statement to preserve the referential integrity of each table. The column names are part of the table key.

The following example updates the table column names for an Oracle database. In some cases, the database might not support direct updating of column values that form part of the key. Make a copy of the table, apply the updates, and overwrite the original table with the copy.

```
%let path = pathname ; /* From tnsnames.ora      */
%let user = username ; /* Oracle User/Schema    */
```

```
%let pass = password ; /* Oracle Password */  
  
PROC SQL NOERRORSTOP;  
  
CONNECT TO ORACLE (USER=&USER PASS=&PASS PATH=&PATH) ;  
  
execute(update CI_CAMP_GRP_PAGE_DATE_UDF  
        set DATE_UDF_NM = 'My Range Minimum Value'  
        where DATE_UDF_NM = 'My Range Min') by oracle;  
  
execute(update CI_CAMP_GRP_PAGE_NUM_UDF  
        set NUM_UDF_NM = 'My Range Minimum Value'  
        where NUM_UDF_NM = 'My Range Min') by oracle;  
  
execute(update CI_CAMP_PAGE_DATE_UDF  
        set DATE_UDF_NM = 'My Range Minimum Value'  
        where DATE_UDF_NM = 'My Range Min') by oracle;  
  
execute(update CI_CAMP_PAGE_NUM_UDF  
        set NUM_UDF_NM = 'My Range Minimum Value'  
        where NUM_UDF_NM = 'My Range Min') by oracle;  
  
execute(update CI_TREATMENT_DATE_UDF  
        set DATE_UDF_NM = 'My Range Minimum Value'  
        where DATE_UDF_NM = 'My Range Min') by oracle;  
  
execute(update CI_TREATMENT_NUM_UDF  
        set NUM_UDF_NM = 'My Range Minimum Value'  
        where NUM_UDF_NM = 'My Range Min') by oracle;  
  
execute(update CI_COMMUNICATION_DATE_UDF  
        set DATE_UDF_NM = 'My Range Minimum Value'  
        where DATE_UDF_NM = 'My Range Min') by oracle;  
  
execute(update CI_COMMUNICATION_NUM_UDF  
        set NUM_UDF_NM = 'My Range Minimum Value'  
        where NUM_UDF_NM = 'My Range Min') by oracle;  
  
execute(update CI_CAMP_GRP_PAGE_DATE_UDF  
        set DATE_UDF_NM = 'My Range Maximum Value'  
        where DATE_UDF_NM = 'My Range Max') by oracle;  
  
execute(update CI_CAMP_GRP_PAGE_NUM_UDF  
        set NUM_UDF_NM = 'My Range Maximum Value'  
        where NUM_UDF_NM = 'My Range Max') by oracle;  
  
execute(update CI_CAMP_PAGE_DATE_UDF  
        set DATE_UDF_NM = 'My Range Maximum Value'  
        where DATE_UDF_NM = 'My Range Max') by oracle;  
  
execute(update CI_CAMP_PAGE_NUM_UDF  
        set NUM_UDF_NM = 'My Range Maximum Value'  
        where NUM_UDF_NM = 'My Range Max') by oracle;  
  
execute(update CI_TREATMENT_DATE_UDF
```

```

set DATE_UDF_NM = 'My Range Maximum Value'
where DATE_UDF_NM  = 'My Range Max') by oracle;

execute(update CI_TREATMENT_NUM_UDF
        set NUM_UDF_NM = 'My Range Maximum Value'
        where NUM_UDF_NM  = 'My Range Max') by oracle;

execute(update CI_COMMUNICATION_DATE_UDF
        set DATE_UDF_NM = 'My Range Maximum Value'
        where DATE_UDF_NM  = 'My Range Max') by oracle;

execute(update CI_COMMUNICATION_NUM_UDF
        set NUM_UDF_NM = 'My Range Maximum Value'
        where NUM_UDF_NM  = 'My Range Max') by oracle;

quit;

```

For more information about using the PROC SQL pass-through facility, see SAS *SQL Procedure User's Guide* at <http://support.sas.com/documentation/onlinedoc/base/index.html>.

## Overview of Migrating Files to 6.1

There are several differences between previous releases and 6.1. If you migrate files from 5.4 or 5.4.1 to 6.1 and later releases, the following changes take effect.

## Campaigns and Diagrams

In 6.1, there are no stand-alone diagrams. Diagrams that are migrated from the previous release are converted to campaigns in 6.1. The converted diagrams retain their names, except in cases where a campaign of the same name exists in the same folder. In these cases, the name of converted diagram is *campaignname(n)*, where *n* is a number incremented by one. A campaign code is automatically generated, regardless of the setting in the business context in the previous release.

Diagrams that are converted to campaigns are based on a special campaign definition, named **Diagram to Campaign Migration Definition**. This definition does not appear in the Definitions workspace.

In campaigns, the folder path for migrated definitions is blank.

In campaigns and campaign definitions, custom details from the previous release are displayed as custom detail pages in 6.1. Custom details from the Campaign Brief window in the previous release are migrated to Custom Detail pages in 6.1. Custom details that are associated with steps in the Campaign Definition Properties window in the previous release are migrated to multiple Custom Detail pages. There is one page for each step. The names of the step-based Custom Detail pages are *checklist step name* Custom Details. Custom details that are associated with the Brief step are named Brief Step Custom

Details. During migration, the Brief page is split into the Properties page and Budget page. The Brief page, Properties page, and step-based Custom Detail pages are added to the Checklist Summary page. These changes also apply to campaign groups.

Campaigns are not required to have Communication nodes. Campaigns that do not have Communication nodes can be executed. However, those campaigns cannot be published to the common data model.

---

## Select Nodes and Multi-select Nodes

In SAS Marketing Automation 6.1, you can use Select nodes to select subsets from a number of data items and combine the subsets into a single group. Select nodes and Multi-select nodes from the previous release will be converted to Select nodes in 6.1.

The following table lists the Select Node rules in SAS Marketing Automation 5.4 and the rules that they are converted to in 6.1. In some cases a **not** is applied to the criteria, in addition to the rule selection. The rules for 5.4 also apply to 5.41.

5.4 Rule	6.1 Equivalent
Select subject where any values meet these criteria	Any value meets these criteria
Select subject where any values do not meet these criteria	<code>not(criteria)</code> Any value meets these criteria
Select subject where more than one value meets these criteria	More than one value meets these criteria
Select subject where more than one value does not meet these criteria	<code>not(criteria)</code> More than one value meets these criteria
Select subject where one value meets these criteria	One value meets these criteria
Select subject where one value does not meet these criteria	<code>not(criteria)</code> One value meets these criteria
Select subject where all values meet these criteria	All values meet these criteria
Select subject where no values meet these criteria	No value meets these criteria

If a query that is generated by a Select node in 5.4 contains missing values, the missing values are displayed in the Select node properties in 6.1. For example, if the rule to **Select subject where any values do not meet these criteria** is selected for employees in 5.4, the Select node properties in 6.1 display Employee = (Missing) or not Employee = Yes.

In a Multi-select node in 5.4, where the rule is `not (dataitem=value)` and **Create a group of subjects excluding those that meet these criteria** is selected, the Select node in 6.1 applies the following rules.

- If the data item is in the same table as the subject key, the Select node applies one of the following criteria.
  - `not (dataitem=value)`
  - `dataitem=Missing`
- If the data item is in a different table than the subject key, **No value meets these criteria** is selected.

---

## Split Node

In the previous release, the Split node offered an option to split on values from a previous node. In Release 6.1, this will be converted to an option to split on values from a data item.

---

## Cluster Node

The Cluster node is not selectable as a diagram tool in Release 6.1. You cannot edit the properties of Cluster nodes in campaigns that have been migrated from a previous release. Cluster nodes cannot be copied and pasted in diagrams.

Select the Cluster node and click  to view the properties of the Cluster node.

---

## Report Node

The Report node is not available in SAS Marketing Automation 6.1. Report nodes are removed from campaigns that are migrated from a previous release.

---

## Codes

If a cell code from a previous release contains special characters, the special characters are converted to underscores (`_`) when the campaign is first opened in 6.1.

Any codes that are in the diagram in the previous release are retained in the 6.1 campaign. New codes are set to **Automatic-editable**, regardless of the settings for the business context.

---

## Custom Details

List type dynamic custom details from previous releases are converted to the type of the source table column in the current release. For example, if the table column type is numeric, the list type custom detail is converted to numeric type. This might cause conflicts with the column type that is defined for the custom detail in the common data model.

To resolve the conflict, modify the column type in the common data model to reflect the type of the converted custom detail.

---

## Custom Detail Tags

In 6.1, list type custom detail tags in the previous release are converted to Text type.

---

## Seeds

In SAS Marketing Automation 6.1, the contents of a seed list in a campaign are updated whenever you update the contents of the seed list in the Definitions workspace in SAS Customer Intelligence Studio.

All objects that are associated with a business context in the previous release are migrated to that business context in 6.1. For example, if a seed list is associated with business contexts BC\_A and BC\_B in the previous release, the seed list is migrated to business contexts BC\_A and BC\_B in 6.1. The objects are stored in the Definitions folder for the business context.

During migration from the previous release, a new seed list is not created if an existing SAS Marketing Automation 6.1 seed list already provides the same functionality. A new seed list is not created if all of the following conditions are met:

- The seed lists in the previous release and in 6.1 contain the same columns.
- The seed lists in the previous release and in 6.1 contain the same rows and the same values for each column.
- The SAS Marketing Automation 6.1 seed list name begins with the seed list name in the previous release. For example, if the 5.4 seed list name is SeedsForMailing, the following 6.1 seed list names can serve as a potential match: SeedsForMailing, SeedsForMailing(1), and SeedsForMailing1.

A new 6.1 seed list has the same name as the seed list in the previous release. If the name already exists in 6.1, a number is appended to the seed list name. For example, three 5.4 campaigns each have a copy of the Employees seed list. Each copy has slightly different contents. When these campaigns are migrated to 6.1, three seed lists are created: Employees(1), Employees(2), and Employees(3).

If a communication definition in the previous release references a seed list that already exists in 6.1, the communication definition is updated to use the Release 6.1 seed list. If the seed list does not exist in 6.1, a new seed list is created.

---

## Documents

Documents from the previous release are listed on the Attachments page of the campaign in 6.1.

---

## Campaign Status

If any communication from a campaign from the previous release has executed at least once and there are no future scheduled occurrences, the status of the campaign is **Complete** after migration to 6.1. If any communications have executed and there are future scheduled occurrences, after migration to 6.1, the status of the campaign is **Executing**. If no communications have been executed and the campaign has been sent to the scheduler, the status is **Scheduled**.

For campaigns that have an approval step, the following rules apply:

- If the most recent approval history entry is Approved, then the status of the migrated campaign is **Approved**.
- If the most recent approval history is Requested, then the status of the migrated campaign is **Requested**.
- If the most recent approval history entry is Denied, then the status of the migrated campaign is **Denied**.
- Otherwise, the status of the migrated campaign is **Designing**.

---

## Shared Definitions

A campaign, campaign group, communication, or custom detail group definition might be used in more than one business context in the previous release. After migration to 6.1, an initial definition is created in the first business context in the list of business contexts that were migrated. A shared definition is created in each of the remaining business contexts.

---

## Access Permissions

Access permissions are set in the User Manager in SAS Management Console. For migrated files, the permissions must match the **Name** field on the **General** tab in the properties for each user.

User permissions that have been imported from a previous release might be invalid for the current release. Delete the invalid user permissions before validating the campaign.



# Appendix 2

## Keyboard Shortcuts

The following keyboard shortcuts are available in SAS Customer Intelligence Studio.

*Table A2.1 Keyboard Shortcuts*

Keys	Result	Example
Ctrl+F8	Activates Test Mode in a SAS Real-Time Decision Manager campaign	Press Ctrl+F8 on the Diagram page to toggle between Test Mode and editing the diagram.
Ctrl-Delete	Clears the user state. The user state is the position and views of pages, and the position and size of windows.	Press Ctrl-Delete to display the Page Manager in its default position.
Ctrl+S	Saves the item. <sup>1</sup>	Press Ctrl+S in an open campaign to save the campaign.
Ctrl+Shift+Left Arrow	Moves the highlighted item from the list of selected items to the list of available items	In the Select Campaign Treatments window, press Ctrl+Shift+Left Arrow to move the highlighted treatments from the list of selected treatments to the list of available treatments.
Ctrl+Shift+Right Arrow	Moves the highlighted item from the list of available items to the list of selected items	In the Select Campaign Treatments window, press Ctrl+Shift+Right Arrow to move the highlighted treatments from the list of available treatments to the list of selected treatments.
Ctrl+Shift+S	Opens the Save As window	Press Ctrl+Shift+S in an open campaign to save the campaign under a different name or to save a new campaign.

1. The Ctrl+S keyboard shortcut is not available in Internet Explorer

Ctrl+Shift+Spacebar	Adds a new item	Press Ctrl+Shift+Spacebar to add a new campaign.
Delete	Deletes the selected item	Select a campaign name and press Delete to delete the campaign.
End	Moves the selection to the last row in a list	Press End to select the last page name in the Page Manager.
Enter	Opens the selected item	Select a campaign name and press Enter to open the campaign.
Esc	Closes the open item	In the Cell Properties window, press Esc to close the window.
Home	Moves the selection to the first row in a list	Press Home to select the first campaign name in the table.
Shift+Tab	Changes the focus to the previous user interface component	Press Shift+Tab to select the previous tool in the Tool Palette.
Spacebar	Opens the selected item	Tab to a page in the Page Manager and press the spacebar to open the selected page.
Up or Down arrow	Moves to the next or previous item in a list	Press the down arrow to select a campaign name that is farther down in the table.
Tab	Changes the focus to the next user interface component	Press the Tab key to select the next tool in the Tool Palette.

# Appendix 3

## The MACROVAR Table

The MacroVar stream creates a table named MACROVAR. The table contains values that are generated by macro variables. For more information, see “[Define Streams](#)” on page 151.

The table contains the following columns:

### CATEGORY

is the category of the macro variable. These are the categories:

- CAMPAIGNINFO
- CAMPAIGNUDF
- CICOMMONINFO
- COMMUNICATIONINFO
- COMMUNICATIONUDF
- EXPORTINFO
- INPUTCELL
- OUTPUTINFO

### NAME

is the name of the macro variable.

### DATATYPE

is the data type of the macro variable. The following table lists the actual and exported data types.

Actual Data Type	Exported Data Type
Boolean and Numeric	Numeric
Date	Date
All other types	Char

### VALUE

is the value of the macro variable. Cell codes and names are returned, in addition to the macro variables that are listed below.

### PARENT

is the parent for the corresponding row details. This column resolves any ambiguity that could arise when there are multiple Communication nodes and

it is not clear which rows belong to which nodes. The following table lists the values for the PARENT column.

Condition	Column Value
VARCATEGORY = CAMPAIGNINFO	Campaign Code
VARCATEGORY = CAMPAIGNUDF	Campaign Code
VARCATEGORY = COMMUNICATIONINFO	Communication Code
VARCATEGORY = COMMUNICATIONUDF	Communication Code
VARCATEGORY = EXPORTINFO AND VARNAME = EXPORT_NAME	Communication Code
VARCATEGORY = EXPORTINFO AND VARNAME != EXPORT_NAME	Export Name
VARCATEGORY = CICOMMONINFO	Not applicable

The following values are exported.

Name	Description	Data Type	Category
CAMP_CODE	Campaign code	Char	CAMPAIGNINFO
CAMP_NAME	Campaign name	Char	CAMPAIGNINFO
MIN_BUDGET	Campaign brief minimum budget	Numeric	CAMPAIGNINFO
MAX_BUDGET	Campaign brief maximum budget	Numeric	CAMPAIGNINFO
MIN_OFFERS	Minimum offers	Numeric	CAMPAIGNINFO
MAX_OFFERS	Maximum offers	Numeric	CAMPAIGNINFO
UDF_NAME	Campaign user-defined field. The name of the macro variable is the name of the field.	UDF_TYPE	CAMPAIGNUDF

The following macro variable values are associated with CICOMMON.

Name	Description	Data Type	Category
CICOMMON_LIBNAME	CICOMMON library name statement	Char	CICOMMONINFO

CH_TABLE_NAME _XXX	Contact history table name. XXX is replaced by the subject.	Char	CICOMMONINFO
RH_TABLE_NAME _XXX	Response history table name. XXX is replaced by the subject.	Char	CICOMMONINFO
PT_TABLE_NAME _XXX	Presented treatment table name. XXX is replaced by the subject.	Char	CICOMMONINFO

The following macro variable values are available only if a Communication node is upstream from a Process node. The values are derived from Communication nodes that are directly linked to the Process node. The following values are exported.

Name	Description	Data Type	Category
COMM_CODE	Communication code	Char	COMMUNICATION INFO
COMM_NAME	Communication name	Char	COMMUNICATION INFO
MIN_BUDGET	Minimum budget	Numeric	COMMUNICATION INFO
MAX_BUDGET	Maximum budget	Numeric	COMMUNICATION INFO
UNIT_COST	Unit cost	Numeric	COMMUNICATION INFO
MIN_OFFERS	Minimum offers	Numeric	COMMUNICATION INFO
MAX_OFFERS	Maximum offers	Numeric	COMMUNICATION INFO
UDF_NAME	Communication user-defined field. The name of the macro variable is the name of the field.	UDF_TYPE	CAMPAIGNUDF
EXPORT_NAME	Export name	Char	EXPORTINFO

The following values are generated for cells that provide input into a Communication node that is upstream from a Process node.

Name	Description	Data Type	Category
CELLPACKAGE	Cell package ID	Numeric	INPUTCELL
CELLNAME	Name of input cell	Char	INPUTCELL
CELLCODE	Input cell code	Char	INPUTCELL
CELLPKGCODE	Input cell package code	Char	INPUTCELL
SUBJECT	Input cell subject	Char	INPUTCELL

The export name is exported along with the following values.

Name	Description	Data Type	Category
EXPORT_TYPE	Numeric constant indicating the export type, such as Excel or Delimited.	Numeric	EXPORTINFO
EXPORT_PATH	Path where export files are saved	Char	EXPORTINFO
EXPORT_DESTINATION	Export filename	Char	EXPORTINFO

Macro variables return the following values from automatically generated output cells.

Name	Description	Data Type	Category
OUTCELLNAME0	Number of output cells generated	Numeric	OUTPUTINFO
OUTCELLNAME $n$	Name of output cell	Char	OUTPUTINFO
OUTTABLE0	Number of output MATables data sets generated	Numeric	OUTPUTINFO
OUTTABLE $n$	Name of MATables data set	Char	OUTPUTINFO

# Appendix 4

## Using SAS Language Elements in Expressions

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---

### About SAS Language Elements

You use SAS expressions, functions, formats, informats, macro variables, and operators when you create calculated items. The following topics list the SAS language elements that are available in SAS Marketing Automation.

For examples and complete descriptions, see *SAS Language Elements by Name, Product, and Category*, *SAS SQL Procedure User's Guide*, and *SAS National Language Support (NLS): Reference Guide* at <http://support.sas.com/documentation/onlinedoc/base/index.html>.

---

### SAS Expressions in SAS Marketing Automation

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CASE <operand> WHEN <condition> THEN  
<expression> ELSE <expressions> END

The CASE expression is used to select result values if certain conditions are met. The CASE expression returns a single value that is conditionally evaluated for each row. The CASE expression can have multiple WHEN-THEN clauses. The ELSE clause is optional.

## SAS Functions in SAS Marketing Automation

<b>ABS(argument)</b>	The ABS function returns a nonnegative number that is equal in magnitude to that of the argument.
<b>AIRY(x)</b>	The AIRY function returns the value of the AIRY function.
<b>ANYALNUM(string&lt;,start&gt;)</b>	The ANYALNUM function searches a character string for an alphanumeric character and returns the first position at which it is found.
<b>ANYALPHA(string&lt;,start&gt;)</b>	The ANYALPHA function searches a character string for an alphabetic character and returns the first position at which it is found.
<b>ANYCNTRL(string&lt;,start&gt;)</b>	The ANYCNTRL function searches a character string for a control character and returns the first position at which it is found.
<b>ANYDIGIT(string&lt;,start&gt;)</b>	The ANYDIGIT function searches a character string for a digit and returns the first position at which it is found.
<b>ANYFIRST(string &lt;,start&gt;)</b>	The ANYFIRST function searches a character string for a character that is valid as the first character in a SAS variable name under VALIDVARNAME=V7. It returns the first position at which that character is found.
<b>ANYGRAPH(string&lt;,start&gt;)</b>	The ANYGRAPH function searches a character string for a graphical character and returns the first position at which it is found.
<b>ANYLOWER(string&lt;,start&gt;)</b>	The ANYLOWER function searches a character string for a lowercase letter and returns the first position at which it is found.
<b>ANYNAME(string &lt;,start&gt;)</b>	The ANYNAME function searches a character string for a character that is valid in a SAS variable name under VALIDVARNAME=V7. The function returns the first position at which that character is found.
<b>ANYPRINT(string&lt;,start&gt;)</b>	The ANYPRINT function searches a character string for a printable character and returns the first position at which it is found.
<b>ANYPUNCT(string&lt;,start&gt;)</b>	The ANYPUNCT function searches a character string for a punctuation character and returns the first position at which it is found.

---

ANYSPACE( <i>string&lt;,start&gt;</i> )	The ANYSPACE function searches a character string for a whitespace character (blank, horizontal and vertical tab, carriage return, line feed, form feed). The function returns the first position at which it is found.
ANYUPPER( <i>string&lt;,start&gt;</i> )	The ANYUPPER function searches a character string for an uppercase letter and returns the first position at which it is found.
ANYXDIGIT( <i>string&lt;,start&gt;</i> )	The ANYXDIGIT function searches a character string for a hexadecimal character that represents a digit and returns the first position at which that character is found.
ARCOS( <i>argument</i> )	The ARCOS function returns the arccosine (inverse cosine) of the argument. The value returned is in radians.
ARCOSH( <i>argument</i> )	The ARCHOSH function returns the inverse hyperbolic cosine.
ARSIN( <i>argument</i> )	The ARSIN function returns the arcsine (inverse sine) of the argument. The value returned is in radians.
ARSINH( <i>argument</i> )	The ARSINH function returns the inverse hyperbolic sine.
ATAN( <i>argument</i> )	The ATAN function returns the arctangent (inverse tangent) of the argument. The value returned is in radians.
ATAN2( <i>argument1,argument2</i> )	The ATAN2 function returns the arc tangent of two numeric variables.
ATANH( <i>argument</i> )	The ATANH function returns the inverse hyperbolic tangent.
ATTRC( <i>data-set-ID, attr-name</i> )	The ATTRC function returns the value of a character attribute for a SAS data set.
ATTRN( <i>data-set-ID, attr-name</i> )	The ATTRN function returns the value of a numeric attribute for the specified SAS data set.
AVG( <i>argument</i> )	The AVG function returns the average of the values in the specified data item.
AVG(DISTINCT <i>argument</i> )	The AVG(DISTINCT) function returns the average of the distinct values in the specified data item.
BAND( <i>argument1, argument2</i> )	The BAND function returns the bitwise logical AND of two arguments.
BASECHAR( <i>instr(,Unicode type)</i> )	Converts characters to base characters.
BETA( <i>a,b</i> )	The BETA function returns the value of the beta function.

---

BETAINV( <i>p, a, b</i> )	The BETAINV function returns the <i>p</i> th quantile from the beta distribution with shape parameters <i>a</i> and <i>b</i> .
BLACKCLPRC( <i>E, t, F, r, sigma</i> )	The BLACKCLPRC function calculates call prices for European options on futures, based on the Black model.
BLACKPTPRC( <i>E, t, F, r, sigma</i> )	The BLACKPTPRC function calculates put prices for European options on futures, based on the Black model.
BLKSHCLPRC( <i>E, t, S, r, sigma</i> )	The BLKSHCLPRC function calculates call prices for European options on stocks, based on the Black-Scholes model.
BLKSHPTPRC( <i>E, t, S, r, sigma</i> )	The BLKSHPTPRC function calculates put prices for European options on stocks, based on the Black-Scholes model.
BLSHIFT( <i>argument1, argument2</i> )	The BLSHIFT function returns the bitwise logical left shift of two arguments.
BNOT( <i>argument</i> )	The BNOT function returns the bitwise logical NOT of an argument.
BOR( <i>argument1, argument2</i> )	The BOR function returns the bitwise logical OR of two arguments.
BRSHIFT( <i>argument1, argument2</i> )	The BRSHIFT function returns the bitwise logical right shift of two arguments.
BXOR( <i>argument1, argument2</i> )	The BXOR function returns the bitwise logical EXCLUSIVE OR of two arguments.
BYTE( <i>n</i> )	The BYTE function returns one character in the ASCII or the EBCDIC collating sequence. For EBCDIC collating sequences, <i>n</i> is between 0 and 255.
CAT( <i>string&lt;,string,...&gt;</i> )	The CAT function concatenates character strings without removing leading or trailing blanks.
CATS( <i>string&lt;,string,...&gt;</i> )	The CATS function concatenates character strings and removes leading and trailing blanks.
CATT( <i>string&lt;,string,...&gt;</i> )	The CATT function concatenates character strings and removes trailing blanks.
CATX( <i>separator,string&lt;,string,...&gt;</i> )	The CATX function concatenates character strings, removes leading and trailing blanks, and inserts separators.
CDF('dist', <i>quantile,parm-1,...,parm-k</i> )	The CDF function computes cumulative distribution functions.
CEIL( <i>argument</i> )	The CEIL function returns the smallest integer that is greater than or equal to the argument.

<b>CEILZ(argument)</b>	The CEILZ function returns the smallest integer that is greater than or equal to the argument, using zero fuzzing.
<b>CEXIST(entry&lt;, 'U'&gt;)</b>	The CEXIST function verifies the existence of a SAS catalog or SAS catalog entry (returns 1 if exists, 0 if not).
<b>CHOOSEC (index-expression, selection-1 &lt;...selection-n &gt;)</b>	The CHOOSEC function returns a character value that represents the results of choosing from a list of arguments.
<b>CHOSEN (index-expression, selection-1 &lt;...selection-n &gt;)</b>	The CHOSEN function returns a numeric value that represents the results of choosing from a list of arguments.
<b>CINV(<i>p, df&lt;, nc&gt;</i>)</b>	The CINV function returns the <i>p</i> th quantile from the chi-square distribution with degrees of freedom <i>df</i> and a noncentrality parameter <i>nc</i> .
<b>CLOSE(data-set-ID)</b>	The CLOSE function closes a SAS data set and returns a value.
<b>CNONCT(<i>x,df,prob</i>)</b>	The CNONCT function returns the nonnegative noncentrality parameter from a noncentral chi-square distribution whose parameters are <i>x</i> , <i>df</i> , and <i>nc</i> .
<b>COLLATE(<i>start-position &lt;, end-position&gt;   (start-position &lt;, , length&gt;)</i>)</b>	The COLLATE function returns an ASCII or EBCDIC collating sequence character string.
<b>COMB(<i>n, r</i>)</b>	The COMB function computes the number of combinations of <i>n</i> elements taken <i>r</i> at a time and returns a value. If the expression cannot be computed, a missing value is returned.
<b>COMPBL(<i>source</i>)</b>	The COMPBL function removes multiple blanks in a character string by translating multiple consecutive blanks into a single blank.
<b>COMPARE(<i>string, string &lt;, modifiers &gt;</i>)</b>	The COMPARE function returns the position of the leftmost character by which two strings differ, or returns 0 if there is no difference.
<b>COMPGED(<i>string, string &lt;, cutoff &gt; &lt;, modifiers &gt;</i>)</b>	The COMPGED function compares two strings by computing the generalized edit distance.
<b>COMPLEV(<i>string, string &lt;, cutoff &gt; &lt;, modifiers &gt;</i>)</b>	The COMPLEV function compares two strings by computing the Levenshtein edit distance.
<b>COMPOUND(<i>amount,future,rate,number</i>)</b>	The COMPOUND function returns compound interest parameters.
<b>COMPRESS(<i>source&lt;,characters-to-remove&gt;</i>)</b>	The COMPRESS function removes specific characters from a character string.
<b>CONSTANT(<i>constant&lt;,parameter&gt;</i>)</b>	The CONSTANT function computes some machine and mathematical constants.

CONVX( <i>y,f,c(1),...,C(k)</i> )	The CONVX function returns the convexity for an enumerated cash flow.
CONVXP( <i>A,C,n,K,k0,y</i> )	The CONVXP function returns the convexity for a periodic cash flow stream, such as a bond.
COS( <i>argument</i> )	The COS function returns the cosine.
COSH( <i>argument</i> )	The COSH function returns the hyperbolic cosine.
COUNT( <i>argument</i> )	The COUNT function returns the number of values in the specified data item.
COUNT(DISTINCT <i>argument</i> )	The COUNT(DISTINCT) function returns the number of distinct values in the specified data item.
COUNT(*)	The COUNT(*) function returns the number of rows in a table without any duplicate elimination.
COUNTC( <i>string, charlist &lt;,modifier(s)&gt;</i> )	The COUNTC function counts the number of characters in the first argument that appear (or do not appear) in the second argument.
COUNTW( <i>string&lt;,charlist , modifier(s)&gt;</i> )	The COUNTW function counts the number of words in a character expression.
CSS( <i>argument</i> )	The CSS function returns the corrected sum of squares of the provided values.
CSS(DISTINCT <i>argument</i> )	The CSS(DISTINCT) function returns the corrected sum of squares of all distinct provided values.
CV( <i>argument</i> )	The CV function returns the coefficient of variation of the provided values.
CV(DISTINCT <i>argument</i> )	The CV(DISTINCT) function returns the coefficient of variation of the distinct provided values.
DACCDB( <i>period,value,years,rate</i> )	The DACCDB function returns accumulated declining balance depreciation.
DACCDBSL( <i>period,value,years,rate</i> )	The DACCDBSL function returns the accumulated declining balance with conversion to a straight-line depreciation.
DACCSL( <i>period,value,years</i> )	The DACCSL function returns the accumulated straight-line depreciation.
DACCSYD( <i>period,value,years</i> )	The DACCSYD function returns the accumulated sum-of- years-digits depreciation.
DACCTAB( <i>period,value,t1,...tn</i> )	The DACCTAB function returns the accumulated depreciation from specified tables, where t1,...tn are numeric fractions of depreciation for each time period.
DAIRY( <i>x</i> )	The DAIRY function returns the derivative of the AIRY function.

DATDIF( <i>sdate, edate, basis</i> )	The DATDIF function returns the number of days between two dates.
DATE()	The DATE function returns the current date as a SAS date value.
DATEJUL( <i>julian-date</i> )	The DATEJUL function converts a Julian date to a SAS date value.
DATEPART( <i>datetime</i> )	The DATEPART function extracts the date from a SAS datetime value.
DATETIME()	The DATETIME function returns the current date and time of day.
DAY( <i>date</i> )	The DAY function returns the day of the month from a SAS date value.
DCREATE( <i>directory-name&lt;,parent-directory&gt;</i> )	The DCREATE function returns the complete pathname of a new, external directory.
DEPDB( <i>period,value,years,rate</i> )	The DEPDB function returns the declining balance depreciation.
DEPDBSL( <i>period,value,years,rate</i> )	The DEPDBSL function returns the declining balance with conversion to a straight-line depreciation.
DEPSL( <i>period,value,years</i> )	The DEPSL function returns the straight-line depreciation.
DEPSYD( <i>period,value,years</i> )	The DEPSYD function returns the sum-of-years-digits depreciation.
DEPTAB( <i>period,value,t1,...,tn</i> )	The DEPTAB function returns depreciation from specified tables, t1,...tn.
DEQUOTE( <i>argument</i> )	The DEQUOTE function removes quotation marks from a character value.
DEVIANCE( <i>distribution,variable,shape-parameter(s)&lt;,epsilon&gt;</i> )	The DEVIANCE function computes the deviance.
DHMS( <i>date, hour, minute, second</i> )	The DHMS function returns a SAS datetime value from date, hour, minute, and second.
DIGAMMA( <i>argument</i> )	The DIGAMMA function returns the value of the DIGAMMA function.
DQCASE( <i>char-value,'case-definition' &lt;,'locale'&gt;</i> )	The DQCASE function alters the capitalization of a character value.
DQGENDER( <i>char-value,'parsed-value'&lt;,'locale'&gt;</i> )	The DQGENDER function returns a gender definition from a character value.
DQGENDERINFOGET('parsed-value'<,'locale'>)	The DQGENDERINFOGET function returns the name of the parse definition that is associated with a gender definition.

DQGENDERPARSED( <i>parsed-value</i> , <i>'parsed-value'&lt;,'locale'&gt;</i> )	The DQGENDERPARSED function returns a gender definition from a parsed (delimited) value.
DQIDENTIFY( <i>char-value</i> , <i>'identification-definition'&lt;,'locale'&gt;</i> )	The DQIDENTIFY function categorizes a value based on an identification definition.
DQLOCALEGUESS( <i>char-value</i> , <i>'guess-definition'</i> )	The DQLOCALEGUESS function determines the locale that is most likely represented by a character value.
DQLOCALEINFOGET('info-type')	The DQLOCALEINFOGET function returns information about locales.
DQLOCALEINFOLIST('definition-type'<,'locale'>)	The DQLOCALEINFOLIST function displays the names of the definitions in a locale and returns a count of those definitions.
DQMATCH( <i>char-value</i> , <i>'match-definition'&lt;,'sensitivity','locale'&gt;</i> )	The DQMATCH function generates a match code for a character value.
DQMATCHINFOGET('match-definition'<,'locale'>)	The DQMATCHINFOGET function returns the name of the parse definition that is associated with a match definition.
DQMATCHPARSED( <i>parsed-value</i> , <i>'match-definition'&lt;,'sensitivity,locale'&gt;</i> )	The DQMATCHPARSED function returns a match code from a parsed (delimited) value.
DQPARSE( <i>char-value</i> , <i>'parse-definition'&lt;,'locale'&gt;</i> )	The DQPARSE function parses a value and returns all tokens.
DQPARSEINFOGET('parse-definition'<,'locale'>)	The DQPARSEINFOGET function returns the token names in a parse definition.
DQPARSETOKENGET( <i>parsed-value</i> , <i>'token','parse-definition'&lt;,'locale'&gt;</i> )	The DQPARSETOKENGET function returns a named token from a parsed (delimited) value.
DQPARSETOKENPUT( <i>parsed-value</i> , <i>token-value</i> , <i>'token-name','parse-definition'&lt;,'locale'&gt;</i> )	The DQPARSETOKENPUT function inserts a named token into a parsed (delimited) string.
DQPATTERN( <i>char-value</i> , <i>'pattern-analysis-definition'&lt;,'locale'&gt;</i> )	The DQPATTERN function analyzes a character value and returns the pattern analysis of that value.
DQSCHEMEAPPLY( <i>char-value</i> , <i>scheme&lt;,'scheme-format','mode'&gt;</i> )	The DQSCHEMEAPPLY function returns a character value that was transformed by a scheme.
DQSRVARCHJOB( <i>job-name</i> , <i>&lt;host&gt;</i> , <i>&lt;port&gt;</i> , <i>&lt;macro-name1&gt;</i> , <i>macro-value1</i> , <i>macro-name2</i> , <i>macro-value2...&gt;</i> )	The DQSRVARCHJOB function runs a dfPower Architect job and returns a job identifier.
DQSRVCOPYLOG( <i>job-ID</i> , <i>&lt;host&gt;</i> , <i>&lt;port&gt;</i> , <i>filename</i> )	The DQSRVCOPYLOG function copies a job's log file.
DQSRVDELETELOG( <i>job-ID</i> , <i>&lt;host&gt;</i> , <i>&lt;port&gt;</i> )	The DQSRVDELETELOG function deletes a job's log file.
DQSRVJOBSTATUS( <i>job-ID</i> , <i>&lt;host&gt;</i> , <i>port</i> , <i>timeout</i> , <i>interval</i> )	The DQSRVJOBSTATUS function returns the status of a submitted job.

DQSRVKILLJOB(<job-ID, <host>, port)	The DQSRVKILLJOB function terminates a running job.
DQSRVPROFJOBFILE(job-name, <host>, port, results-filename, append, description <,macro-name1,macro-value1,macro-name2,macro-value2...>)	The DQSRVPROFJOBFILE function runs a file-type Profile job and returns a job identifier.
DQSRVPROFJOBREP(job-name, <host>, port, repository, report, description <,macro-name1,macro-value1,macro-name2,macro-value2...>)	The DQSRVPROFJOBREP function runs a repository-type Profile job and returns a job identifier.
DQSRVUSER(userid, password)	The DQSRVUSER function authenticates a user.
DQSTANDARDIZE(char-value,'standardization-definition'<,'locale'>)	The DQSTANDARDIZE function returns a standardized version of a character value.
DQTOKEN(char-value,'token','parse-definition'<,'locale'>)	The DQTOKEN function parses a value and returns one token.
DUR(y,f,c(1),...c(k))	The DUR function returns the modified duration for an enumerated cash flow.
DURP(A,c,n,K,k0,y)	The DURP function returns the modified duration for a periodic cash flow stream, such as a bond.
ENVLEN(variable-name)	The ENVLEN function returns the length of an environment variable.
ERF(argument)	The ERF function returns the value of the (normal) error function.
ERFC(argument)	The ERFC function returns the value of the (normal) error function.
EUROCURR(from-currency-amount,from-currency-code,to-currency-code)	The EUROCURR function converts one European currency to another.
EXP(argument)	The EXP function returns the value of the exponential function.
EXIST(member-name<,member-type>)	The EXIST function verifies the existence of a SAS library member.
FACT(n)	The FACT function computes a factorial.
FEXIST(fileref)	The FEXIST function verifies the existence of an external file associated with a fileref.
FILEEXIST(file-name)	The FILEEXIST function Verifies the existence of an external file by its physical name.
FIND(string,substring<,startpos><,modifiers >)	The FIND function searches for a specific substring of characters within a character string that you specify.
FINDC(string,characters<,startpos><,modifiers >)	The FINDC function searches for specific characters that either appear or do not appear within a character string that you specify.

<code>FINV(<i>p,ndf,ddf</i>&lt;,<i>nc</i>&gt;)</code>	The FINV function returns a quantile from the F distribution.
<code>FIPNAME(<i>expression</i>)</code>	The FIPNAME function converts FIPS codes to uppercase state names.
<code>FIPNAMEL(<i>expression</i>)</code>	The FIPNAMEL function converts FIPS codes to mixed case state names.
<code>FIPSTATE(<i>expression</i>)</code>	The FIPSTATE function converts FIPS codes to two-character postal codes.
<code>FLOOR(<i>argument</i>)</code>	The FLOOR function returns the largest integer that is less than or equal to the argument.
<code>FLOORZ(<i>argument</i>)</code>	The FLOORZ function returns the largest integer that is less than or equal to the argument, using zero fuzzing.
<code>FNONCT(<i>x,ndf,ddf,prob</i>)</code>	The FNONCT function returns the value of the noncentrality parameter of an F distribution.
<code>FREQ(<i>argument</i>)</code>	The FREQ function computes the frequency of the provided column.
<code>FUZZ(<i>argument</i>)</code>	The FUZZ function returns the nearest integer if the argument is within 1E-12.
<code>GAMINV(<i>p,a</i>)</code>	The GAMINV function returns a quantile from the gamma distribution.
<code>GAMMA(<i>argument</i>)</code>	The GAMMA function returns the value of the GAMMA function.
<code>GEOMEAN(<i>numValue</i>&lt;,<i>numValue</i>,...&gt;)</code>	The GEOMEAN function returns the geometric mean.
<code>GEOMEANZ(<i>numValue</i>&lt;,<i>numValue</i>,...&gt;)</code>	The GEOMEANZ function returns the geometric mean, using zero fuzzing.
<code>GETPXLANGUAGE()</code>	The GETPXLANGUAGE function returns the current 2 letters language code.
<code>GETPXLOCALE()</code>	The GETPXLOCALE function returns the current POSIX LOCALE name.
<code>GETPXREGION()</code>	The GETPXREGION function returns the current 2 letters region code.
<code>HMS(<i>hour, minute, second</i>)</code>	The HMS function returns a SAS time value from hour, minute, and second.
<code>HOLIDAY('<i>holiday</i>', <i>year</i>)</code>	The HOLIDAY function returns the date of the specified holiday for the specified year.
<code>HOUR(&lt;<i>time   datetime</i>&gt;)</code>	The HOUR function returns the hour from a SAS time or datetime value.

<b>HTMLDECODE(<i>expression</i>)</b>	The HTMLDECODE function decodes a string containing HTML numeric character references or HTML character entity references and returns the decoded string.
<b>HTMLENCODE(<i>expression</i>&lt;,<i>options</i>&gt;)</b>	The HTMLENCODE encodes characters using HTML character entity references and returns the encoded string.
<b>IBESSEL(<i>nu</i>,<i>x</i>,<i>kode</i>)</b>	The IBESSEL function returns the value of the modified Bessel function.
<b>IFC(<i>numValue</i>,<i>charValue</i>,<i>charValue</i>&lt;,<i>charValue</i>&gt;)</b>	The IFC function returns a character value of an expression based on whether the expression is true, false, or missing.
<b>IFN(<i>numValue</i>,<i>numValue</i>,<i>numValue</i>&lt;,<i>numValue</i>&gt;)</b>	The IFN function returns a numeric value of an expression based on whether the expression is true, false, or missing.
<b>INDEX(<i>source</i> ,<i>excerpt</i>)</b>	The INDEX function searches the source for the character string specified by the excerpt.
<b>INDEXC(<i>source</i> ,<i>excerpt-1</i>&lt;, ... <i>excerpt-n</i>&gt;)</b>	The INDEXC function searches the source for any character present in the excerpt.
<b>INDEXW(<i>source</i> ,<i>excerpt</i>)</b>	The INDEXW function searches the source for a specified pattern as a word.
<b>INPUT(<i>source</i> ,<i>informat</i>)</b>	The INPUT function returns the value produced when a SAS expression that uses a specified informat expression is read.
<b>INPUTC(<i>source</i> ,<i>informat</i>&lt;,<i>w</i>&gt;)</b>	The INPUTC function enables you to specify a character informat at run time.
<b>INPUTN(<i>source</i> ,<i>informat</i>&lt;,<i>w</i>&lt;,<i>d</i>&gt;&gt;)</b>	The INPUTN function enables you to specify a numeric informat at run time.
<b>INT(<i>argument</i>)</b>	The INT function returns the integer value.
<b>INTCINDEX(<i>interval</i>&lt;<i>multiple</i>&gt;.&lt;<i>shift-index</i>&gt;, &lt;<i>date-time-value</i>&gt;)</b>	The INTCINDEX function returns the cycle index, when a date, time, or datetime interval and value are specified.
<b>INTCK('<i>interval</i>', <i>from</i>, <i>to</i>)</b>	The INTCK function returns the number of time intervals in a given time span.
<b>INTCYCLE(<i>interval</i>&lt;<i>multiple</i>&gt;.&lt;<i>shift-index</i>&gt;)</b>	The INTCYCLE function returns the date, time, or datetime interval at the next higher seasonal cycle, when a date, time, or datetime interval is specified.
<b>INTFMT(<i>interval</i>&lt;<i>multiple</i>&gt;.&lt;<i>shift-index</i>&gt;,'<i>size</i>')</b>	The INTFMT function returns a recommended format, when a date, time, or datetime interval is specified.
<b>INTGET(<i>date-1</i>, <i>date-2</i>, <i>date-3</i>)</b>	The INTGET function returns an interval based on three consecutive dates.

<code>INTINDEX(interval&lt;multiple&gt;.&lt;shift-index&gt;, date-time value)</code>	The INTINDEX function returns the seasonal index, when a date, time, or datetime interval and value is specified.
<code>INTNX('interval', start-from, increment &lt;,'alignment'&gt;)</code>	The INTNX function advances a date, time, or datetime value by a given interval, and returns a date, time, or datetime value.
<code>INTRR(frequency,c0,c1,...,cn)</code>	The INTRR function returns the internal rate of return as a fraction.
<code>INTSEAS(interval&lt;multiple&gt;.&lt;shift-index&gt;)</code>	The INTSEAS function returns the length of the seasonal cycle, when a date, time, or datetime interval is specified.
<code>INTTEST(interval&lt;multiple&gt;&lt;.shift-index&gt;)</code>	The INTTEST function returns 1 if a time interval is valid, and returns 0 if a time interval is invalid.
<code>INTZ(argument)</code>	The INTZ function returns the integer portion of the argument, using zero fuzzing.
<code>IQR(value1&lt;,value2...&gt;)</code>	The IQR function returns the interquartile range.
<code>IRR(frequency,c0,c1,...,cn)</code>	The IRR function returns the internal rate of return as a percentage.
<code>JBESSEL(nu,x)</code>	The JBESSEL function returns the value of the Bessel function.
<code>JULDATE(date)</code>	The JULDATE function returns the Julian date from a SAS date value.
<code>JULDATE7(date)</code>	The JULDATE7 function returns a seven-digit Julian date from a SAS date value.
<code>KCOMPARE(source , &lt;pos, &lt;count,&gt;&gt; findstr)</code>	The KCOMPARE function returns the result of a comparison of character strings.
<code>KCOMPRESS(source &lt;characters-to-remove&gt;)</code>	The KCOMPRESS function removes specific characters from a character string.
<code>KCOUNT(source )</code>	The KCOUNT function returns the number of double-byte characters in a string.
<code>KCVT(text,intype,outtype&lt;,options&gt;)</code>	The KCVT function converts DBCS data into other 2-byte codes.
<code>KINDEX(source , excerpt)</code>	The KINDEX function searches a character expression for a string of characters.
<code>KINDEXC(source , excerpt-1&lt;, ...excerpt-n&gt;)</code>	The KINDEXC function searches a character expression for specific characters.
<code>KLEFT(argument)</code>	The KLEFT function left-aligns a SAS character expression by removing unnecessary leading DBCS blanks and Shift Out/Shift In (SO/SI) control characters.

<b>KLENGTH(argument)</b>	The KLENGTH function returns the length of an argument.
<b>KLOWCASE(argument)</b>	The KLOWCASE function converts all letters in an argument to lowercase.
<b>KREVERSE(argument)</b>	The KREVERSE function reverses a character expression.
<b>KRIGHT(argument)</b>	The KRIGHT function right-aligns a character expression by trimming trailing DBCS blanks and Shift Out/Shift In (SO/SI) control characters.
<b>KSCAN(argument, n&lt;, delimiters&gt;)</b>	The KSCAN function selects a given word from a character expression.
<b>KSTRCAT(argument-1, argument-2, ...)</b>	The KSTRCAT function concatenates character strings.
<b>KSTRIP(string)</b>	Removes leading and trailing blanks from a character string.
<b>KSUBSTR(argument, position&lt;, n&gt;)</b>	The KSUBSTR function extracts a substring from an argument.
<b>KSUBSTRB(argument, position&lt;, n&gt;)</b>	The KSUBSTRB function extracts a substring from an argument based on byte position.
<b>KTRANSLATE(source , to-1, from-1&lt;, ...to-n, from-n&gt;)</b>	The KTRANSLATE function replaces specific characters in a character expression.
<b>KTRIM(argument)</b>	The KTRIM function removes trailing DBCS blanks and Shift Out/Shift In (SO/SI) control characters from character expressions.
<b>KTRUNCATE(number, length)</b>	The KTRUNCATE function truncates a numeric value to a specified length.
<b>KUPCASE(argument)</b>	The KUPCASE function converts all single-byte letters in an argument to uppercase.
<b>KUPDATE(argument, position, n&lt;, characters-to-replace&gt;)</b>	The KUPDATE function inserts, deletes, and replaces character value contents.
<b>KUPDATEB(argument, position, n&lt;, characters-to-replace&gt;)</b>	The KUPDATEB function inserts, deletes, and replaces character value contents based on byte unit.
<b>KURTOSIS(argument, argument, ...)</b>	The KURTOSIS function returns the kurtosis (or 4th moment).
<b>KVERIFY(source , excerpt-1&lt;, ...excerpt-n&gt;)</b>	The KVERIFY function returns the position of the first character that is unique to an expression.
<b>LARGEST(k,value1&lt;,value2...&gt;)</b>	The LARGEST function returns the kth largest nonmissing value.
<b>LEFT(argument)</b>	The LEFT function left-aligns a SAS character string.

<b>LENGTH(argument)</b>	The LENGTH function returns the length of an argument.
<b>LENGTHC(string)</b>	The LENGTHC function returns the length of a character string, including trailing blanks.
<b>LENGTHM(string)</b>	The LENGTHM function returns the amount of memory (in bytes) that is allocated for a character string.
<b>LENGTHN(string)</b>	The LENGTHN function returns the length of a non-blank character string, excluding trailing blanks, and returns 0 for a blank character string.
<b>LGAMMA(argument)</b>	The LGAMMA function returns the natural logarithm of the GAMMA function.
<b>LIBREF(libref)</b>	The LIBREF function verifies that a libref has been assigned.
<b>LOG(argument)</b>	The LOG function returns the natural (base e) logarithm.
<b>LOG2(argument)</b>	The LOG2 function returns the logarithm to the base 2.
<b>LOG1PX(x)</b>	The LOG1PX function returns the log of 1 plus the argument.
<b>LOG10(argument)</b>	The LOG10 function returns the logarithm to the base 10.
<b>LOGBETA(a,b)</b>	The LOGBETA function returns the logarithm of the beta function.
<b>LOGCDF(dist,quantile&lt;,parm-1,...&gt;)</b>	The LOGCDF function computes the logarithm of a left cumulative distribution function.
<b>LOGISTIC(x&lt;,y...&gt;)</b>	The LOGISTIC function returns the logistic value.
<b>LOGPDF('dist',quantile,parm-1,...,parm-k)</b>	The LOGPDF function computes the logarithm of a probability density (mass) function.
<b>LOGPMF('dist',quantile,parm-1,...,parm-k)</b>	The LOGPMF function computes the logarithm of a probability density (mass) function.
<b>LOGSDF('dist',quantile,parm-1,...,parm-k)</b>	The LOGSDF function computes the logarithm of a survival function.
<b>LOWCASE(argument)</b>	The LOWCASE function converts all letters in an argument to lowercase.
<b>MAD(value1&lt;,value2...&gt;)</b>	The MAD function returns the median absolute deviation from the median.
<b>MAX(argument)</b>	The MAX function returns the largest value in the specified data item.

<b>MD5(<i>string</i>)</b>	The MD5 function returns the result of the message digest of a specified string.
<b>MEAN(<i>argument</i>)</b>	The MEAN function computes the mean of the provided values.
<b>MEAN(DISTINCT <i>argument</i>)</b>	The MEAN(DISTINCT) function returns the mean of distinct values in the specified data item.
<b>MDY(<i>month, day, year</i>)</b>	The MDY function returns a SAS date value from month, day, and year values.
<b>MIN(<i>argument</i>)</b>	The MIN function returns the smallest value in the specified data item.
<b>MINUTE(<i>time   datetime</i>)</b>	The MINUTE function returns the minute from a SAS time or datetime value.
<b>MOD(<i>argument-1, argument-2</i>)</b>	The MOD function returns the remainder.
<b>MODZ(<i>argument-1,argument-2</i>)</b>	The MODZ function returns the remainder from the division of the first argument by the second argument, using zero fuzzing.
<b>MONTH(<i>date</i>)</b>	The MONTH function returns the month from a SAS date value.
<b>MORT(<i>amount,payment,rate,number</i>)</b>	The MORT function returns amortization parameters.
<b>N(<i>argument</i>)</b>	The N function returns the number of nonmissing values in the specified data item.
<b>N(DISTINCT <i>argument</i>)</b>	The N(DISTINCT) function returns the number of nonmissing distinct values in the specified data item.
<b>NETPV(<i>rate,frequency,c0,c1,...,cn</i>)</b>	The NETPV function returns net present value with rate expressed as a fraction.
<b>NLDATE(<i>date, descriptor</i>)</b>	The NLDATE function converts the SAS date value to the date value of the specified locale by using the date format descriptors.
<b>NLDATM(<i>date, descriptor</i>)</b>	The NLDATM function converts the SAS datetime value to the time value of the specified locale by using the datetime- format descriptors.
<b>NLTIME(<i>date, descriptor&lt;, start&gt;</i>)</b>	The NLTIME function converts the SAS time or the datetime value to the time value of the specified locale by using the NLTIME descriptors.
<b>NMISS(<i>argument</i>)</b>	The NMISS function returns the number of missing values in the specified data item.
<b>NMISS(DISTINCT <i>argument</i>)</b>	The NMISS(DISTINCT ) function returns the number of missing distinct values in the specified data item.
<b>NORMAL(<i>seed</i>)</b>	The NORMAL function returns a random variate from a normal distribution.

NOTALNUM( <i>string&lt;,start&gt;</i> )	The NOTALNUM function searches a character string for a non-alphanumeric character and returns the first position at which it is found.
NOTALPHA( <i>string&lt;,start&gt;</i> )	The NOTALPHA function searches a character string for a non-alphabetic character and returns the first position at which it is found.
NOTCNTRL( <i>string&lt;,start&gt;</i> )	The NOTCNTRL function searches a character string for a character that is not a control character and returns the first position at which it is found.
NOTDIGIT( <i>string&lt;,start&gt;</i> )	The NOTDIGIT function searches a character string for any character that is not a digit and returns the first position at which that character is found.
NOTFIRST( <i>string &lt;,start&gt;</i> )	The NOTFIRST function searches a character string for an invalid first character in a SAS variable name under VALIDVARNAME=V7. The function returns the first position at which that character is found.
NOTGRAPH( <i>string&lt;,start&gt;</i> )	The NOTGRAPH function searches a character string for a non-graphical character and returns the first position at which it is found.
NOTLOWER( <i>string&lt;,start&gt;</i> )	The NOTLOWER function searches a character string for a character that is not a lowercase letter and returns the first position at which that character is found.
NOTNAME( <i>string &lt;,start&gt;</i> )	The NOTNAME function searches a character string for an invalid character in a SAS variable name under VALIDVARNAME=V7, and returns the first position at which that character is found.
NOTPRINT( <i>string&lt;,start&gt;</i> )	The NOTPRINT function searches a character string for a non-printable character and returns the first position at which it is found.
NOTPUNCT( <i>string&lt;,start&gt;</i> )	The NOTPUNCT function searches a character string for a character that is not a punctuation character and returns the first position at which it is found.
NOTSPACE( <i>string&lt;,start&gt;</i> )	The NOTSPACE function searches a character string for a character that is not a whitespace character (blank, horizontal and vertical tab, carriage return, line feed, form feed). The function returns the first position at which it is found.
NOTUPPER( <i>string&lt;,start&gt;</i> )	The NOTUPPER function searches a character string for a character that is not an uppercase letter and returns the first position at which that character is found.
NOTXDIGIT( <i>string&lt;,start&gt;</i> )	The NOTXDIGIT function searches a character string for a character that is not a hexadecimal character and returns the first position at which that character is found.

<code>NPV(<i>rate,frequency,c0,c1,...,cn</i>)</code>	The NPV function returns net present value with rate expressed as a percentage.
<code>NWKDOM(<i>n, weekday, month, year</i>)</code>	The NWKDOM function returns the date for the nth occurrence of a weekday for the specified month and year.
<code>ORDINAL(<i>count, argument, argument, ...</i>)</code>	The ORDINAL function returns the largest value of a part of a list.
<code>PATHNAME(<i>libref, &lt;search level&gt;</i>)</code>	The PATHNAME function returns the physical name of a SAS library or returns a blank.
<code>PCTL(<i>percentage,value1&lt;,value2...&gt;</i>)</code>	The PCTL functions Computes percentiles with a definition of 5.
<code>PCTL1(<i>percentage,value1&lt;,value2...&gt;</i>)</code>	The PCTL1 functions Computes percentiles with a definition of 1.
<code>PCTL2(<i>percentage,value1&lt;,value2...&gt;</i>)</code>	The PCTL2 functions Computes percentiles with a definition of 2.
<code>PCTL3(<i>percentage,value1&lt;,value2...&gt;</i>)</code>	The PCTL3 functions Computes percentiles with a definition of 3.
<code>PCTL4(<i>percentage,value1&lt;,value2...&gt;</i>)</code>	The PCTL4 functions Computes percentiles with a definition of 4.
<code>PCTL5(<i>percentage,value1&lt;,value2...&gt;</i>)</code>	The PCTL5 functions Computes percentiles with a definition of 5.
<code>PDF('dist',<i>quantile,parm-1,...,parm-k</i>)</code>	The PDF function computes probability density (mass) functions.
<code>PERM(<i>n&lt;,r&gt;</i>)</code>	The PERM function computes the number of permutations of n items taken r at a time.
<code>PMF('dist',<i>quantile,parm-1,...,parm-k</i>)</code>	The PMF function computes probability density (mass) functions.
<code>POISSON(<i>m,n</i>)</code>	The POISSON function returns the probability from a POISSON distribution.
<code>PROBBETA(<i>x,a,b</i>)</code>	The PROBBETA function returns the probability from a beta distribution.
<code>PROBBNML(<i>p,n,m</i>)</code>	The PROBBNML function returns the probability from a binomial distribution.
<code>PROBBNRM(<i>x,y,r</i>)</code>	The PROBBNRM function returns the standardized bivariate normal distribution.
<code>PROBCHI(<i>x,df&lt;,nc&gt;</i>)</code>	The PROBCHI function returns the probability from a chi-squared distribution.
<code>PROBF(<i>x,ndf,ddf&lt;,nc&gt;</i>)</code>	The PROBF function returns the probability from an F distribution.

PROBGAM( <i>x,a</i> )	The PROBGAM function returns the probability from a gamma distribution.
PROBHYP( <i>n,K,n,x&lt;,r&gt;</i> )	The PROBHYP function returns the probability from a hypergeometric distribution.
PROBIT( <i>p</i> )	The PROBIT function returns a quantile from the standard normal distribution.
PROBMC( <i>distribution, q, prob, df, nparms&lt;, parameters&gt;</i> )	The PROBMC function computes a probability or a quantile from various distributions for multiple comparisons of means.
PROBNEGB( <i>p,n,m</i> )	The PROBNEGB function returns the probability from a negative binomial distribution.
PROBNORM( <i>x</i> )	The PROBNORM function returns the probability from the standard normal distribution.
PROBT( <i>x,df&lt;,nc&gt;</i> )	The PROBT function returns the probability from a Student's t distribution.
PROPCASE( <i>argument</i> )	The PROPCASE function converts all words in an argument to proper case.
PRT( <i>argument</i> )	The PRT function returns the probability of a greater absolute value of Student's t.
PRT(DISTINCT <i>argument</i> )	The PRT(DISTINCT) function returns the probability of a greater absolute value of Student's t for the distinct values in the data item.
PRXCHANGE( <i>expression,times,source</i> )	The PRXCHANGE function performs a pattern-matching replacement.
PRXMATCH( <i>pattern-ID,source</i> )	The PRXMATCH function searches for a pattern match and returns the position at which the pattern is found.
PRXPAREN( <i>pattern-ID</i> )	The PRXPAREN function returns the last bracket match for which there is a match in a pattern.
PUT( <i>source ,format.</i> )	The PUT function returns a value using a specified format.
PUTC( <i>source ,format.</i> )	The PUTC function enables you to specify a character format at run time.
PUTN( <i>source ,format.</i> )	The PUTN function enables you to specify a numeric format at run time.
PVP( <i>A,c,n,K,k0,y</i> )	The PVP function returns the present value for a periodic cash flow stream, such as a bond.
QTR( <i>date</i> )	The QTR function returns the quarter of the year from a SAS date value.

QUANTILE( <i>dist,probability,parm-1,...</i> )	The QUANTILE function computes the quantile from a specified distribution.
QUOTE( <i>argument</i> )	The QUOTE function adds double quotation marks to a character value.
RANBIN( <i>seed,n,p</i> )	The RANBIN function returns a random variate from a binomial distribution.
RANCAU( <i>seed</i> )	The RANCAU function returns a random variate from a Cauchy distribution.
RAND( <i>dist,parm-1,...</i> )	The RAND function generates random numbers from a specified distribution.
RANEXP( <i>seed</i> )	The RANEXP function returns a random variate from an exponential distribution.
RANGAM( <i>seed,a</i> )	The RANGAM function returns a random variate from a gamma distribution.
RANGE( <i>argument, argument, ...</i> )	The RANGE function returns the range of the provided values.
RANK( <i>x</i> )	The RANK function returns the position of a character in the ASCII or EBCDIC collating sequence.
RANNOR( <i>seed</i> )	The RANNOR function returns a random variate from a normal distribution.
RANPOI( <i>seed,m</i> )	The RANPOI function returns a random variate from a Poisson distribution.
RANTBL( <i>seed,p1,...</i> )	The RANTBL function returns a random variate from a tabled probability.
RANTRI( <i>seed,h</i> )	The RANTRI function returns a random variate from a triangular distribution.
RANUNI( <i>seed</i> )	The RANUNI function returns a random variate from a uniform distribution.
RESOLVE( <i>argument</i> )	The RESOLVE function returns the resolved value of an argument after it has been processed by the macro facility.
REPEAT( <i>argument,n</i> )	The REPEAT function repeats a character expression.
REVERSE( <i>argument</i> )	The REVERSE function reverses a character expression.
RIGHT( <i>argument</i> )	The RIGHT function right-aligns a character expression.
ROUND( <i>argument, round-off-unit</i> )	The ROUND function rounds to the nearest rounding unit.

ROUNDE(argument<,rounding-unit>)	The ROUNDE function rounds the first argument to the nearest multiple of the second argument. The function returns an even multiple when the first argument is halfway between the two nearest multiples.
ROUNDZ(argument<,rounding-unit>)	The ROUNDZ function rounds the first argument to the nearest multiple of the second argument, with zero fuzzing.
RXMATCH(rx, string)	The RXMATCH function parses a pattern ID returned from RXPARSE and returns the position of the beginning of the pattern.
RXPARSE(pattern-expression)	The RXPARSE function parses a pattern and returns a value.
SAVING(future,payment,rate,number)	The SAVING function returns the future value of a periodic saving.
SCAN(argument,n<,delimiters>)	The SCAN function returns a given word from a character expression.
SCANQ(string,n<,delimiters>)	The SCANQ function returns the nth word from a character expression, ignoring delimiters that are enclosed in quotation marks.
SDF('dist',quantile,parm-1,...,parm-k)	The SDF function computes a survival function.
SECOND(time   datetime)	The SECOND function returns the second from a SAS time or datetime value.
SIGN(argument)	The SIGN function returns the sign of a value or 0.
SIN(argument)	The SIN function returns the sine.
SINH(argument)	The SINH function returns the hyperbolic sine.
SKEWNESS(argument, argument, argument, ...)	The SKEWNESS function returns the skewness.
SMALLEST(k,value1<,value2...>)	The SMALLEST function returns the kth smallest nonmissing value.
SOUNDEX(argument)	The SOUNDEX function encodes a string to facilitate searching.
SPEDIS(query,keyword)	The SPEDIS function determines the likelihood of two words matching, expressed as the asymmetric spelling distance between two words.
SQRT(argument)	The SQRT function returns the square root.
STD(argument)	The STD function returns the standard deviation of the provided values.
STD(DISTINCT argument)	The STD(DISTINCT) function returns the standard deviation of the distinct provided values.

<b>STDERR(argument)</b>	The STDERR function returns the standard error of the mean of the provided values.
<b>STDERR(DISTINCT argument)</b>	The STDERR(DISTINCT x) function returns the standard error of the mean of the distinct provided values.
<b>STFIPS(postal-code)</b>	The STFIPS function converts state postal codes to FIPS state codes.
<b>STNAME(postal-code)</b>	The STNAME function converts state postal codes to uppercase state names.
<b>STNAMEL(postal-code)</b>	The STNAMEL function converts state postal codes to mixed case state names.
<b>STRIP(string)</b>	The STRIP function returns a character string with all leading and trailing blanks removed.
<b>SUBPAD(string,position&lt;,length&gt;)</b>	The SUBPAD function returns a character string with all leading and trailing blanks removed.
<b>SUBSTR(argument,position&lt;,n&gt;) = characters to replace</b>	The SUBSTR function replaces character value contents.
<b>SUBSTRN(string,position&lt;,length&gt;)</b>	The SUBSTRN function returns a substring, allowing a result with a length of zero.
<b>SUM(argument)</b>	The SUM function returns the sum of values in the specified data item.
<b>SUM(DISTINCT argument)</b>	The SUM(DISTINCT) function returns the sum of the distinct provided values.
<b>SUMWGT(argument)</b>	The SUMWGT function returns the sum of the WEIGHT variable values.
<b>SUMWGT(DISTINCT argument)</b>	The SUMWGT(DISTINCT) function returns the sum of the WEIGHT variable of distinct values.
<b>SYSGET(environment-variable)</b>	The SYSGET function returns the value of the specified host environment variable.
<b>SYMGET(argument)</b>	The SYMGET function returns the value of a macro variable during DATA step execution.
<b>SYSMSG()</b>	The SYSMSG function returns the text of error messages or warning messages from the last data set or external file function execution.
<b>SYSPARM()</b>	The SYSPARM function returns the system parameter string.
<b>SYSPROCESSID()</b>	The SYSPROCESSID function returns the process ID of the current process.

SYSPROCESSNAME(<process-id>)	The SYSPROCESSNAME function returns the process name that is associated with a given process ID, or returns the name of the current process.
SYSPROD( <i>product-name</i> )	The SYSPROD function determines whether a product is licensed.
SYSRC()	The SYSRC function returns a system error number.
T( <i>argument</i> )	The T function returns the Student's t value for testing the hypothesis that the population mean is zero.
T(DISTINCT <i>argument</i> )	The T(DISTINCT) function returns the Student's t value for testing the hypothesis that the population mean of distinct values is zero.
TAN( <i>argument</i> )	The TAN function returns the tangent.
TANH( <i>argument</i> )	The TANH function returns the hyperbolic tangent.
TIME()	The TIME function returns the current time of day.
TIMEPART( <i>datetime</i> )	The TIMEPART function extracts a time value from a SAS datetime value.
TINV( <i>p,df&lt;,nc&gt;</i> )	The TINV function returns a quantile from the t distribution.
TNONCT( <i>x,df,prob</i> )	The TNONCT function returns the value of the noncentrality parameter from the Student's t distribution.
TODAY()	The TODAY function returns the current date as a SAS date value.
TRANSLATE( <i>source ,to-1,from-1&lt;,...to-n,from-n&gt;</i> )	The TRANSLATE function replaces specific characters in a character expression.
TRANWRD( <i>source ,target,replacement</i> )	The TRANWRD function replaces or removes all occurrences of a word in a character string.
TRIGAMMA( <i>argument</i> )	The TRIGAMMA function returns the value of the TRIGAMMA function.
TRIM( <i>argument</i> )	The TRIM function removes trailing blanks from character expression and returns one blank if the expression is missing.
TRIMN( <i>argument</i> )	The TRIMN function removes trailing blanks from character expressions and returns a null string if the expression is missing.
TRUNC( <i>argument</i> )	The TRUNC function truncates a numeric value to a specified length.
TZONEID()	Returns the current time zone ID.

TZONENAME()	Returns the current standard or daylight saving time zone name.
TZONES2U( <i>datetime, time-zone-name</i> )	Converts a SAS datetime value to a UTC datetime value.
TZONEU2S( <i>time-zone-ID</i> )	Converts a UTC datetime value to a SAS datetime value.
UNIFORM( <i>seed</i> )	The UNIFORM function returns a random variate from a uniform distribution.
UPCASE( <i>argument</i> )	The UPCASE function converts all letters in an argument to uppercase.
URLDECODE( <i>expression</i> )	The URLDECODE function returns a string that was decoded using the URL escape syntax.
URLENCODE( <i>expression</i> )	The URLENCODE function returns a string that was encoded using the URL escape syntax.
USS( <i>argument</i> )	The USS function returns the uncorrected sum of squares of the provided values.
USS(DISTINCT <i>argument</i> )	The USS(DISTINCT) function returns the uncorrected sum of squares of the distinct provided values.
VAR( <i>argument</i> )	The VAR function returns the variance of the provided values.
VAR(DISTINCT <i>argument</i> )	The VAR(DISTINCT) function returns the variance of the distinct provided values.
VERIFY( <i>source ,excerpt-1&lt;,...excerpt-n&gt;</i> )	The VERIFY function returns the position of the first character unique to an expression.
WEEK(<sas_date>, <descriptor>)	The WEEK function returns the week-number value.
WEEKDAY( <i>date</i> )	The WEEKDAY function returns the day of the week from a SAS date value.
WHICHC( <i>string,charValue&lt;,charValue...&gt;</i> )	The WHICHC function searches for a character value that is equal to the first argument, and returns the index of the first matching value.
WHICHN( <i>argument,numValue&lt;,numValue...&gt;</i> )	The WHICHN function searches for a numeric value that is equal to the first argument, and returns the index of the first matching value.
YEAR( <i>date</i> )	The YEAR function returns the year from a SAS date value.
YIELDP( <i>A,c,n,K,k0,p</i> )	The YIELDP function returns the yield-to-maturity for a periodic cash flow stream, such as a bond.
YRDIF( <i>sdate, edate, basis</i> )	The YRDIF function returns the difference in years between two dates.

YYQ( <i>year, quarter</i> )	The YYQ function returns a SAS date value from the year and quarter.
ZIPCITY( <i>zip-code</i> )	The ZIPCITY function returns a city name and the two-character postal code that corresponds to a ZIP code.
ZIPCITYDISTANCE( <i>zip-code1, zip-code2</i> )	ZIPCITYDISTANCE function returns the geodetic distance between two ZIP code locations.
ZIPFIPS( <i>zip-code</i> )	The ZIPFIPS function converts ZIP codes to FIPS state codes.
ZIPNAME( <i>zip-code</i> )	The ZIPNAME function converts ZIP codes to uppercase state names.
ZIPNAMEL( <i>zip-code</i> )	The ZIPNAMEL function converts ZIP codes to mixed case state names.
ZIPSTATE( <i>zip-code</i> )	The ZIPSTATE function converts ZIP codes to state postal codes.

## SAS Formats in SAS Marketing Automation

<i>w.d</i>	Writes standard numeric data one digit per byte
\$ <i>w.</i>	Writes standard character data
\$ASCII <i>w.</i>	Converts native format character data to ASCII representation
\$BIDI <i>w.</i>	Converts a logically ordered string to a visually ordered string, and vice versa
\$BINARY <i>w.</i>	Converts character data to binary representation
\$BYVAL <i>w.</i>	Converts single char to by-value rep for MODULE
\$CHAR <i>w.</i>	Writes standard character data
\$CPTDW <i>w.</i>	Processes and converts Hebrew string encoded in IBM-PC (cp862) to a string in Windows encoding (cp1255)
\$CPTWD <i>w.</i>	Processes and converts Hebrew string encoded in Windows (cp1255) to a string in IBM-PC encoding(cp862)
\$CSTR <i>w.</i>	C string null termination for MODULE
\$EBCDIC <i>w.</i>	Converts native format character data to EBCDIC representation

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\$Fw.	Standard character
\$HEXw.	Converts character data to hexadecimal representation
\$KANAw.	Converts katakana Script to romaji Script
\$KANJIw.	Adds shift codes to DBCS data
\$KANJIw.	Kanji formatting for message files
\$KANJIw.	Removes shift codes from DBCS data
\$KTRUNCw.	Truncates DBCS data
\$LOGVSw.	Converts a string in left-to-right-logical order to a character string in visual order
\$LOGVSRw.	Converts a string in right-to-left-logical order to a character string in visual order
\$MSGCASEw.	Writes character data in uppercase when the MSGCASE system option is in effect
\$OCTALw.	Converts character data to octal representation
\$QUOTEw.	Writes data values that are enclosed in double quotation marks
\$REVERJw.	Writes character data in reverse order and preserves blanks
\$REVERSw.	Writes character data in reverse order and left aligns
\$ROMAJIw.	Converts Japanese romaji script to katakana
\$UCS2Bw	Writes data in big-endian 16-bit UCS2 (universal character set 2) Unicode encoding
\$UCS2Lw.	Writes data in little-endian, 16-bit UCS2 (universal character set 2) Unicode encoding
\$UCS2Xw.	Writes data in 16-bit UCS2 (universal character set 2) Unicode encoding
\$UCS4Bw.	Writes data in big-endian, 32-bit UCS4 (universal character set 4) Unicode encoding
\$UCS4Lw.	Writes data in little-endian, 32-bit UCS4 (universal character set 4) Unicode encoding
\$UCS4Xw.	Writes data in 32-bit UCS4 (universal character set 4) Unicode encoding
\$UESCw.	Writes all national characters in Unicode escape format

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\$UESCEw.	Writes Unicode escaped string in native encoding
\$UNCRw.	Writes all national characters in NCR (numeric Character Representation)
\$UNCREw.	Writes NCR (numeric Character Representation) in native encoding
\$UPARENw.	Writes data in Unicode hexadecimal format
\$UPARENEw.	Writes Unicode hexadecimal format in native encoding
\$UPCASEw.	Converts character values to uppercase
\$UTF8Xw.	Writes a character string in UTF-8 (universal transformation format) encoding
\$VARYINGw.	Writes character data of varying length
\$VSLOGw.	Converts a string in visual order to a character string in left-to-right order
\$VSLOGRw.	Converts a string in visual order to a character string in right-to-left order
AFRDFDDw.	Afrikaans: format equivalent to DDMMYY
AFRDFDEw.	Afrikaans: DATEw. equivalent
AFRDFDNw.	Afrikaans: format equivalent to WEEKDAY
AFRDFDTw.d	Afrikaans: format equivalent to DATETIME
AFRDFDWNw.	Afrikaans: format equivalent to DOWNNAME
AFRDFMNw.	Afrikaans: format equivalent to MONNAME
AFRDFMYw.	Afrikaans: format equivalent to MONYY
AFRDFwdxw.	Afrikaans: format equivalent to WORDDATX
AFRDFWKXw.	Afrikaans: format equivalent WEEKDATX
B8601DXw.	Converts UTC datetime values into user local time and writes local time (SAS datetime values) with time zone offsets
B8601LXw.	Writes SAS datetime values with time zone offsets
B8601TXw.	Writes SAS datetime values with time zone offsets
BESTw.	SAS chooses the best notation

BESTXw. <i>d</i>	Trims leading or trailing blanks that appear before an informat
BINARYw.	Converts numeric values to binary representation
CATDFDDw.	Catalan: format equivalent to DDMMYY
CATDFDEw.	Catalan: format equivalent to DATEw.
CATDFDNw.	Catalan: format equivalent to WEEKDAY
CATDFDTw. <i>d</i>	Catalan: format equivalent to DATETIME
CATDFDWNw.	Catalan: format equivalent to DOWNNAME
CATDFMNw.	Catalan: format equivalent to MONNAME
CATDFMYw.	Catalan: format equivalent to MONYY
CATDFwdxw.	Catalan: format equivalent to WORDDATX
CATDFWKXw.	Catalan: format equivalent to WEEKDATX
COMMAXw. <i>d</i>	Writes numeric values with commas and decimal points
COMMAw. <i>d</i>	Writes numeric values with commas and decimal points
CRODFDDw.	Croatian: format equivalent to DDMMYY
CRODFDEw.	Croatian: DATEw. equivalent
CRODFDNw.	Croatian: format equivalent to WEEKDAY
CRODFDTw. <i>d</i>	Croatian: format equivalent to DATETIME
CRODFDWNw.	Croatian: format equivalent to DOWNNAME
CRODFMNw.	Croatian: format equivalent to MONNAME
CRODFMYw.	Croatian: format equivalent to MONYY
CRODFwdxw.	Croatian: format equivalent to WORDDATX
CRODFWKXw.	Croatian: format equivalent WEEKDATX
CSYDFDDw.	Czech: format equivalent to DDMMYY
CSYDFDEw.	Czech: format equivalent to DATEw.
CSYDFDNw.	Czech: format equivalent to WEEKDAY
CSYDFDTw. <i>d</i>	Czech: format equivalent to DATETIME

CSYDFDW <sub>Nw</sub> .	Czech: format equivalent to DOWNNAME
CSYDFMN <sub>w</sub> .	Czech: format equivalent to MONNAME
CSYDFMY <sub>w</sub> .	Czech: format equivalent to MONYY
CSYDFWDX <sub>w</sub> .	Czech: format equivalent to WORDDATX
CSYDFWKX <sub>w</sub> .	Czech: format equivalent to WEEKDATX
D <sub>w.s</sub>	Writes significant digits
DANDFDD <sub>w</sub> .	Danish: format equivalent to DDMMYY
DANDFDE <sub>w</sub> .	Danish: format equivalent to DATE <sub>w</sub> .
DANDFDN <sub>w</sub> .	Danish: format equivalent to WEEKDAY
DANDFDT <sub>w.d</sub>	Danish: format equivalent to DATETIME
DANDFDW <sub>Nw</sub> .	Danish: format equivalent to DOWNNAME
DANDFMN <sub>w</sub> .	Danish: format equivalent to MONNAME
DANDFMY <sub>w</sub> .	Danish: format equivalent to MONYY
DANDFWDX <sub>w</sub> .	Danish: format equivalent to WORDDATX
DANDFWKX <sub>w</sub> .	Danish: format equivalent WEEKDATX
DATE <sub>w</sub> .	Writes date values in the form ddmmmyy or ddmmmyyyy
DATEAMPM <sub>w.d</sub>	Writes datetime values in the form ddmmmyy:hh:mm:ss.ss with AM or PM
DATETIME <sub>w.d</sub>	Writes datetime values in the form ddmmmyy:hh:mm:ss.ss
DAY <sub>w</sub> .	Writes the day of the month
DDMMYY <sub>w</sub> .	Writes date values in the form ddmmyy or ddmmyyyy
DDMMYYB <sub>w.d</sub>	ddmmyy with blank delimiting
DDMMYYC <sub>w.d</sub>	ddmmyy with colon delimiting
DDMMYYD <sub>w.d</sub>	ddmmyy with hyphen delimiting
DDMMYYN <sub>w.d</sub>	ddmmyy with no delimiting
DDMMYYP <sub>w.d</sub>	ddmmyy with period delimiting
DDMMYYSw <sub>d</sub>	ddmmyy with slash delimiting

DESDFDDw.	Swiss-German: format equivalent to DDMYY
DESDFDEw.	Swiss-German: format equivalent to DATEw.
DESDFDNw.	Swiss-German: format equivalent to WEEKDAY
DESDFDTw.d	Swiss-German: format equivalent to DATETIME
DESDFDWnw.	Swiss-German: format equivalent to DOWNNAME
DESDFMNw.	Swiss-German: format equivalent to MONNAME
DESDFMYw.	Swiss-German: format equivalent to MONYY
DESDFwdxw.	Swiss-German: format equivalent to WORDDATX
DESDFWKXw.	Swiss-German: format equivalent to WEEKDATX
DEUDFDDw.	German: format equivalent to DDMYY
DEUDFDEw.	German: format equivalent to DATEw.
DEUDFDNw.	German: format equivalent to WEEKDAY
DEUDFDTw.d	German: format equivalent to DATETIME
DEUDFDWnw.	German: format equivalent to DOWNNAME
DEUDFMNw.	German: format equivalent to MONNAME
DEUDFMYw.	German: format equivalent to MONYY
DEUDFWDXw.	German: format equivalent to WORDDATX
DEUDFWKXw.	German: format equivalent to WEEKDATX
DOLLARXw.d	Writes numeric values with dollar signs, commas, and decimal points
DOLLARw.d	Writes numeric values with dollar signs, commas, and decimal points
DOWNNAMEw.	Writes the name of the day of the week
DTDATEw.	Expects a datetime value as input and writes date values in the form ddmmmyy or ddmmmyyyy
DTMONYYw.	Writes the date part of a datetime value as the month and year in the form mmmyy or mmmmyyy
DTWKDATXw.	Writes the date part of a datetime value as the day of the week and the date in the form day-of-week, dd month-name yy (or yyyy)

DTYEARw.	Writes the date part of a datetime value as the year in the form yy or yyyy
DTYYQCw.	Writes the date part of a datetime value as the year and the quarter and separates them with a colon (:)
Ew.	Writes numeric values in scientific notation
E8601DXw.	Converts UTC datetime values into user local time and writes local time (SAS datetime values) with time zone offsets
E8601LXw.	Writes SAS datetime values with time zone offsets
E8601TXw.	Writes SAS datetime values with time zone offsets
ESPDFDDw.	Spanish: format equivalent to DDMMYY
ESPDFDEw.	Spanish: format equivalent to DATEw.
EURDFDDw.	Writes international date values in the form dd.mm.yy or dd.mm.yyyy
EURDFDEw.	Writes international date values in the form ddmmmyy or ddmmmyyyy
EURDFDNw.	Writes the day of the week for international date values
EURDFDTw.d	Writes international datetime values in the form ddmmmyy:hh:mm:ss.ss or ddmmmyyyy hh:mm:ss.ss
EURDFDWNw.	Writes the name of the day of the week for international date values
EURDFMNw.	Writes the name of the month
EURDFMYw.	Writes the month and the year in the form mmmyy or mmmyyyy
EURDFwdxw.	Writes international date values as the name of the month, the day, and the year in the form dd month-name yy (or yyyy)
EURDFWKXw.	Writes international date values as day of week and date in the form day-of-week, dd month-name yy (or yyyy)
EUROw.d	Writes numeric values with a leading euro symbol (E), a comma that separates every three digits, and a period that separates the decimal fraction
EUROXw.d	Writes numeric values with a leading euro symbol (E), a period that separates every three digits, and a comma that separates the decimal fraction
Fw.d	Standard numeric format

FLOAT <i>w.d</i>	Generates a native single-precision, floating-point value by multiplying a number by 10 raised to the dth power
FRACT <i>w.</i>	Converts values to fractions
FINDFDD <i>w.</i>	Finnish: format equivalent to DDMMYY
FINDFDE <i>w.</i>	Finnish: format equivalent to DATE <i>w.</i>
FINDFDN <i>w.</i>	Finnish: format equivalent to WEEKDAY
FINDFDT <i>w.d</i>	Finnish: format equivalent to DATETIME
FINDFDWN <i>w.</i>	Finnish: format equivalent to DOWNNAME
FINDFMN <i>w.</i>	Finnish: format equivalent to MONNAME
FINDFMY <i>w.</i>	Finnish: format equivalent to MONYY
FINDFWDX <i>w.</i>	Finnish: format equivalent to WORDDATX
FINDFWKX <i>w.</i>	Finnish: format equivalent to WEEKDATX
FRADFDD <i>w.</i>	French: format equivalent to DDMMYY
FRADFDE <i>w.</i>	French: format equivalent to DATE <i>w.</i>
FRADFDN <i>w.</i>	French: format equivalent to WEEKDAY
FRADFDT <i>w.d</i>	French: format equivalent to DATETIME
FRADFDWN <i>w.</i>	French: format equivalent to DOWNNAME
FRADFMN <i>w.</i>	French: format equivalent to MONNAME
FRADFMY <i>w.</i>	French: format equivalent to MONYY
FRADFWDX <i>w.</i>	French: format equivalent to WORDDATX
FRADFWKX <i>w.</i>	French: format equivalent to WEEKDATX
FRSDFDD <i>w.</i>	Swiss-French: format equivalent to DDMMYY
FRSDFDE <i>w.</i>	Swiss-French: format equivalent to DATE <i>w.</i>
FRSDFDN <i>w.</i>	Swiss-French: format equivalent to WEEKDAY
FRSDFDT <i>w.d</i>	Swiss-French: format equivalent to DATETIME
FRSDFDW <i>n.w.</i>	Swiss-French: format equivalent to DOWNNAME
FRSDFMN <i>w.</i>	Swiss-French: format equivalent to MONNAME

FRSDFMYw.	Swiss-French: format equivalent to MONYY
FRSDFwdxw.	Swiss-French: format equivalent to WORDDATX
FRSDFWKXw.	Swiss-French: format equivalent to WEEKDATX
HDATEw.	Writes date values in the form yyyy mmmmm dd with mmmmmm month in Hebrew
HEBDATEw.	Writes date values according to the Jewish calendar
HEXw.	Converts real binary (floating-point) values to hexadecimal representation
HHMMw.d	Writes hours and minutes in the form hh:mm
HOURw.d	Writes hours and decimal fractions of hours
HUNDFDDw.	Hungarian: format equivalent to DDMMYY
HUNDFDEw.	Hungarian: format equivalent to DATEw.
HUNDFDNw.	Hungarian: format equivalent to WEEKDAY
HUNDFDTw.d	Hungarian: format equivalent to DATETIME
HUNDFDWnw.	Hungarian: format equivalent to DOWNNAME
HUNDFMNw.	Hungarian: format equivalent to MONNAME
HUNDFMYw.	Hungarian: format equivalent to MONYY
HUNDFwdxw.	Hungarian: format equivalent to WORDDATX
HUNDFWKXw.	Hungarian: format equivalent to WEEKDATX
IBw.d	Writes integer binary format
IBRw.d	Writes integer binary (fixed-point) values in Intel and DEC formats
IEEEw.d	Generates an IEEE floating-point value by multiplying a number by 10 raised to the dth power
IEERw.d	Writes the reverse of IEEE format
IS8601DAw.	Writes the ISO 8601 standard date
IS8601DNw.	Writes the ISO 8601 standard date from datetime value
IS8601DTw.d	Writes the ISO 8601 datetime with no GMT offset
IS8601DZw.d	Writes the ISO 8601 datetime with GMT offset

IS8601LZw.d	ISO 8601 local time with GMT offset
IS8601TMw.d	ISO 8601 time with no GMT offset
IS8601TZw.d	ISO 8601 time with GMT offset
ITADFDDw.	Italian: format equivalent to DDMMYY
ITADFDEw.	Italian: format equivalent to DATEw.
ITADFDNw.	Italian: format equivalent to WEEKDAY
ITADFDTw.d	Italian: format equivalent to DATETIME
ITADFDWNw.	Italian: format equivalent to DOWNNAME
ITADFMNw.	Italian: format equivalent to MONNAME
ITADFMYw.	Italian: format equivalent to MONYY
ITADFWDXw.	Italian: format equivalent to WORDDATX
ITADFWKXw.	Italian: format equivalent to WEEKDATX
JULDATEw.d	Writes date as 7-digit Julian date
JULDAYw.	Writes the Julian day of the year
JULIANw.	Writes Julian dates in the form yyddd or yyyyddd
LOGMATURw.	Writes maturity given log of maturity
LOGPROBw.	Writes p-value given negative log of probability
MACDFDDw.	Macedonian: format equivalent to DDMMYY
MACDFDEw.	Macedonian: format equivalent to DATEw.
MACDFDNw.	Macedonian: format equivalent to WEEKDA
MACDFDTw.d	Macedonian: format equivalent to DATETIME
MACDFDWNw.	Macedonian: format equivalent to DOWNNAME
MACDFMNw.	Macedonian: format equivalent to MONNAME
MACDFMYw.	Macedonian: format equivalent to MONYY
MACDFwdx.	Macedonian: format equivalent to WORDDATX
MACDFWKXw.	Macedonian: format equivalent to WEEKDATX
MATURITYw.	Prints maturity given maturity (0,inf)

MDYAMPMw.d	Formats as mm/dd/yy:hh:mm
MINGUOw.	Writes date values in Taiwanese form
MMDDYYw.	Writes date values in the form mmddyy or mmddyyyy
MMDDYYBw.d	Formats as mmddyy with blank delimiting
MMDDYYCw.d	Formats as mmddyy with colon delimiting
MMDDYYDw.d	Formats as mmddyy with hyphen delimiting
MMDDYYNw.d	Formats as mmddyy with no delimiting
MMDDYYPw.d	Formats as mmddyy with period delimiting
MMDDYYSw.d	Formats as mmddyy with slash delimiting
MMSSw.d	Writes the number of minutes and seconds since midnight
MMYYxw.	Writes the month and the year and separates them by a character
MMYYCw.d	Writes month and year as mm:yyyy
MMYYDw.d	Writes month and year as mm-yyyy
MMYYNw.d	Writes month and year as mmYYYY
MMYYPw.d	Writes month and year as mm.yyyy
MMYYSw.d	Writes month and year as mm/yyyy
MONNAMEw.	Writes the name of the month
MONTHw.	Writes the month of the year
MONYYw.	Writes the month and the year in the form mmmyy or mmmyyy
MRBw.d	Microsoft real binary (floating point) numeric
NEGPARENw.d	Writes negative values in parentheses
NENGOW.	Writes Japanese dates in the form e.yymmdd
NLDATEw.	Converts a SAS date value to the date value of the specified locale
NLDATELw.	Converts a SAS date value to the date string of the specified locale and then writes the date value as a date in the form: date, month, year

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NLDATEMw.	Converts a SAS date value to the date string of the specified locale and then writes the date value as a date
NLDATEMDLw.	Converts a SAS date value to the date string of the specified locale and then writes the date value as the month and day of the month
NLDATEMDMw.	Converts a SAS date value to the date string of the specified locale and then writes the date value as the month and day of the month
NLDATEMDSw.	Converts a SAS date value to the date string of the specified locale and then writes the date value as the month and day of the month
NLDATEMNw.	Converts a SAS date value to the date value of the specified locale in the format of name-of-month
NLDATES	Converts a SAS date value to the date string of the specified locale and then writes the date value as a date string
NLDATEWw.	Converts a SAS date value to the date of the specified locale in the format of the date and day of the week
NLDATEWNw.	Converts the SAS date value to the date of the specified locale in the format of the name of the day of the week
NLDATEYMLw.	Converts a SAS date value to the date string of the specified locale and then writes the date values as the month and year
NLDATEYMMw.	Converts a SAS date value to the date string of the specified locale, and then writes the date values as the month and year with abbreviations
NLDATEYMSw.	Converts a SAS date value to the date string of the specified locale and then writes the date value as a date and year
NLDATEYQLw.	Converts a SAS date value to the date string of the specified locale and then writes the date value as the year and the year's quarter value (Q1–Q4) using abbreviations
NLDATEYQMw.	Converts a SAS date value to the date string of the specified locale and then writes the date value as the year and the year's quarter value (Q1–Q4) using abbreviations
NLDATEYQSw.	Converts a SAS date value to the date string of the specified locale. The format then writes the date value as the year and the year's quarter value (1–4) with numbers and delimiters.
NLDATMw.	Converts a SAS date-time value to the date-time value of the specific locale

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NLDATMAPw.	Converts a SAS date-time value to the date-time value of the specified locale with AM or PM in the format
NLDATMLw.	Converts a SAS date value to the date string of the specified locale and then writes the date value as a date in the form: month, date, year, and time
NLDATMMw.	Converts a SAS date value to the date string of the specified locale. The format then writes the date value as a date and time with abbreviations for the month and time.
NLDATMMDLw.	Converts a SAS date value to the date string of the specified locale and then writes the date value as the month and day of the month
NLDATMTMw.	Converts the time portion of a SAS date-time value to the date-time value of the specified locale
NLDATMWw.	Converts a SAS date value to a date-time value in the format of the day-of-the-week value and the date-time value of the specified locale
NLDATMYMSw.	Converts a SAS date value to the date string of the specified locale and then writes the month and year with numbers and delimiters
NLDATMYQSw.	Converts a SAS date value to the date string of the specified locale. The format then writes the date value as the year and the year's quarter value using numbers and delimiters.
NLDDFDDw.	Dutch: format equivalent to DDMMYY
NLDDFDEw.	Dutch: format equivalent to DATEw.
NLDDFDNw.	Dutch: format equivalent to WEEKDAY
NLDDFDTw.d	Dutch: format equivalent to DATETIME
NLDDFDWNw.	Dutch: format equivalent to DOWNNAME
NLDDFMNw.	Dutch: format equivalent to MONNAME
NLDDFMYw.	Dutch: format equivalent to MONYY
NLDDFWDXw.	Dutch: format equivalent to WORDDATX
NLDDFWKXw.	Dutch: format equivalent WEEKDATX
NLMNIAUDw.d	International monetary format for Australian Dollar
NLMNICADw.d	International monetary format for Canadian Dollar
NLMNICHFw.d	International monetary format for Swiss Franc

NLMNICNYw.d	International monetary format for Chinese Yuan
NLMNIDKKw.d	International monetary format for Danish Krone
NLMNIEURw.d	International monetary format for Euro
NLMNIGBPw.d	International monetary format for Pound Sterling
NLMNIHKDw.d	International monetary format for Hong Kong Dollar
NLMNIILSw.d	International monetary format for Israeli Shekel
NLMNIJPYw.d	International monetary format for Japanese Yen
NLMNIKRWw.d	International monetary format for Korean Won
NLMNIMYRw.d	International monetary format for Malaysian Ringgit
NLMNINOKw.d	International monetary format for Norwegian Krone
NLMNINZDw.d	International monetary format for New Zealand Dollar
NLMNIPLNw.d	International monetary format for Polish Zloty
NLMNIRURw.d	International monetary format for Russian Ruble
NLMNISEKw.d	International monetary format for Swedish Krona
NLMNISGDw.d	International monetary format for Singapore Dollar
NLMNITWDw.d	International monetary format for New Taiwan Dollar
NLMNIUSDw.d	International monetary format for US Dollar
NLMNIZARw.d	International monetary format for South African Rand
NLMNLAUDw.d	Monetary format for Australian Dollar
NLMNLCADw.d	Monetary format for Canadian Dollar
NLMNLCHFw.d	Monetary format for Swiss Franc
NLMNLCCNYw.d	Monetary format for Chinese Yuan
NLMNLDKKw.d	Monetary format for Danish Krone
NLMNLEURw.d	Monetary format for Euro
NLMNLGBPw.d	Monetary format for Pound Sterling
NLMNLHKDw.d	Monetary format for Hong Kong Dollar
NLMNLILSw.d	Monetary format for Israeli Shekel

NLMNLJPYw.d	Monetary format for Japanese Yen
NLMNLKRWw.d	Monetary format for Korean Won
NLMNLMYRw.d	Monetary format for Malaysian Ringgit
NLMNLNOKw.d	Monetary format for Norwegian Krone
NLMNLNZDw.d	Monetary format for New Zealand Dollar
NLMNLPLNw.d	Monetary format for Polish Zloty
NLMNLRURw.d	Monetary format for Russian Ruble
NLMNLSEKw.d	Monetary format for Swedish Krona
NLMNLSGDw.d	Monetary format for Singapore Dollar
NLMNLTWDw.d	Monetary format for New Taiwan Dollar
NLMNLUSDw.d	Monetary format for US Dollar
NLMNLZARw.d	Monetary format for South African Rand
NLMNYw.d	Writes the monetary format of the local expression in the specified locale
NLMNYIw.d	Writes the monetary format of the international expression in the specified locale
NLNUMW.d	Writes the numeric format of the local expression in the specified locale
NLNUMIw.d	Writes the numeric format of the international expression in the specified locale
NLPCTw.d	Writes the percentage data of the local expression in the specified locale
NLPCTIw.d	Writes the percentage data of the international expression in the specified locale
NLTIMAPw.	Converts SAS time values to the locale sensitive time string with AM or PM
NLTIMEw.	Converts SAS time values to the locale sensitive time string
NORDFDDw.	Norwegian: format equivalent to DDMMYY
NORDFDEw.	Norwegian: format equivalent to DATEw.
NORDFDNw.	Norwegian: format equivalent to WEEKDAY
NORDFDTw.d	Norwegian: format equivalent to DATETIME

NORDFDWNw.	Norwegian: format equivalent to DOWNAME
NORDFMNw.	Norwegian: format equivalent to MONNAME
NORDFMYw.	Norwegian: format equivalent to MONYY
NORDFWDXw.	Norwegian: format equivalent to WORDDATX
NORDFWKXw.	Norwegian: format equivalent to WEEKDATX
NUMXw.d	Writes numeric values with a comma for the decimal point
OCTALw.	Converts numeric values to octal representation
ODDSRw.d	Formats an odds ratio value
PCPIBw.d	Produces Intel PIB representation
PDw.d	Writes data in packed decimal format
PDJULGw.	Writes packed Julian date values in the hexadecimal format yyyydddF for IBM
PDJULIw.	Writes packed Julian date values in the hexadecimal format ccyydddF for IBM
PERCENTw.d	Prints numbers as percentages
PERCENTNw.d	Produces percentages, using a minus sign for negative values
PIBw.d	Writes positive integer binary (fixed-point) values
PIBRw.d	Writes positive integer binary (fixed-point) values in Intel and DEC formats
PKw.d	Writes values in unsigned packed decimal format
POLDFDDw.	Polish: format equivalent to DDMMYY
POLDFDEw.	Polish: format equivalent to DATEw.
POLDFDNw.	Polish: format equivalent to WEEKDAY
POLDFDTw.d	Polish: format equivalent to DATETIME
POLDFDWNw.	Polish: format equivalent to DOWNAME
POLDFMNw.	Polish: format equivalent to MONNAME
POLDFMYw.	Polish: format equivalent to MONYY
POLDFwdxw.	Polish: format equivalent to WORDDATX

POLDFWKXw.	Polish: format equivalent to WEEKDATX
PTGDFDDw.	Portuguese: format equivalent to DDMMYY
PTGDFDEw.	Portuguese: format equivalent to DATEw.
PTGDFDNw.	Portuguese: format equivalent to WEEKDAY
PTGDFDTw.d	Portuguese: format equivalent to DATETIME
PTGDFDWNw.	Portuguese: format equivalent to DOWNNAME
PTGDFMNw.	Portuguese: format equivalent to MONNAME
PTGDFMYw.	Portuguese: format equivalent to MONYY
PTGDFwdxw.	Portuguese: format equivalent to WORDDATX
PTGDFWKXw.	Portuguese: format equivalent to WEEKDATX
PUNCHw.	Write column binary punch data
PVALUEw.d	Writes p-values
QTRw.	Writes the quarter of the year
QTRRw.	Writes the quarter of the year in Roman numerals
RBw.d	Writes real binary data (floating-point) in real binary format
ROMANw.	Writes Roman numerals
ROWw.	Writes column binary row data
RUSDFDDw.	Russian: format equivalent to DDMMYY
RUSDFDEw.	Russian: format equivalent to DATEw.
RUSDFDNw.	Russian: format equivalent to WEEKDAY
RUSDFDTw.d	Russian: format equivalent to DATETIME
RUSDFDWNw.	Russian: format equivalent to DOWNNAME
RUSDFMNw.	Russian: format equivalent to MONNAME
RUSDFMYw.	Russian: format equivalent to MONYY
RUSDFwdxw.	Russian: format equivalent to WORDDATX
RUSDFWKXw.	Russian: format equivalent to WEEKDATX

S370FFw.d	Converts native standard numeric data to EBCDIC representation
S370FHEXw.	IBM 370 hexadecimal format
S370FPDw.d	Writes packed decimal data in IBM mainframe format
S370FPDUw.d	Writes unsigned packed decimal data in IBM mainframe format
S370FPIBw.d	Writes positive integer binary data in IBM mainframe format
S370FIBUw.d	Writes unsigned integer binary data in IBM mainframe format
S370FRBw.d	Writes real binary (floating-point) data in IBM mainframe format
S370FZDw.d	Writes zoned decimal data in IBM mainframe format
S370FZDLw.d	Writes zoned decimal leading-sign data in IBM mainframe format
S370FZDSw.d	Writes zoned decimal separate leading-sign data in IBM mainframe format
S370FZDTw.d	Writes zoned decimal separate trailing-sign data in IBM mainframe format
S370FZDUw.d	Writes unsigned zoned decimal data in IBM mainframe format
SIZEKw.d	Specifies number in K units
SIZEKBw.d	Specifies number in KB units
SIZEKMGw.d	Specifies number in MB units
SLODFDDw.	Slovenian: format equivalent to DDMMYY
SLODFDEw.	Slovenian: format equivalent to DATEw.
SLODFDNw.	Slovenian: format equivalent to WEEKDAY
SLODFDTw.d	Slovenian: format equivalent to DATETIME
SLODFDWnw.	Slovenian: format equivalent to DOWNNAME
SLODFMNw.	Slovenian: format equivalent to MONNAME
SLODFMYw.	Slovenian: format equivalent to MONYY
SLODFWDXw.	Slovenian: format equivalent to WORDDATX

SLODFWKXw.	Slovenian: format equivalent to WEEKDATX
SSNw.	Writes Social Security numbers
SVEDFDDw.	Swedish: format equivalent to DDMMYY
SVEDFDEw.	Swedish: format equivalent to DATEw.
SVEDFDNw.	Swedish: format equivalent to WEEKDAY
SVEDFDTw.d	Swedish: format equivalent to DATETIME
SVEDFDWNw.	Swedish: format equivalent to DOWNNAME
SVEDFMNw.	Swedish: format equivalent to MONNAME
SVEDFMYw.	Swedish: format equivalent to MONYY
SVEDFWDXw.	Swedish: format equivalent to WORDDATX
SVEDFWKXw.	Swedish: format equivalent to WEEKDATX
TIMEw.d	Writes hours, minutes, and seconds in the form hh:mm:ss.ss
TIMEAMPMw.d	Writes hours, minutes, and seconds in the form hh:mm:ss.ss with AM or PM
TODw.d	Writes the time portion of datetime values in the form hh:mm:ss.ss
TWMDYw.	Formats into a concatenation of time, week, month, day, and year
VAXRBw.d	Writes real binary (floating-point) data in VMS format
WEEKw.	Week number in decimal format using the U algorithm
WEEKDATEw.	Writes the day of the week and the date in the form day-of-week, month-name dd, yy (or yyyy)
WEEKDATXw	Writes day of week and date in the form day-of-week, dd month-name yy (or yyyy)
WEEKDAYw.	Writes the day of the week
WEEKUw.	Writes a week number in decimal format using the U algorithm
WEEKVw.	Writes a week number in decimal format using the V algorithm
WEEKWw.	Writes a week number in decimal format using the W algorithm

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WORDDATE <i>w.</i>	Writes date values as the name of the month, the day, and the year in the form month-name dd, yyyy
WORDDATX <i>w.</i>	Writes date values as the day, the name of the month, and the year in the form dd month-name yyyy
WORDF <i>w.</i>	Converts numeric values to words
WORDSw.	Converts numeric values to words
XYYMMDD <i>w.</i>	Writes date values in the form yymmdd or yyyyymmdd, with a minimum width of six characters
YEAR <i>w.</i>	Writes the year part of a date value
YEN <i>w.d</i>	Writes numeric values with yen signs, commas, and decimal points
YYMMx <i>w.</i>	Writes the year and month and separates them by a character
YYMMC <i>w.d</i>	Writes the year and month and separates them by a colon
YYMMD <i>w.d</i>	Writes the year and month and separates them by a hyphen
YYMMDD <i>w.</i>	Writes date values in the form yymmdd or yyyyymmdd
YYMMDB <i>w.d</i>	Writes date values in the form yymmdd or yyyyymmdd and delimits the values by a blank
YYMMDC <i>w.d</i>	Writes date values in the form yymmdd or yyyyymmdd and delimits the values by a colon
YYMMDDD <i>w.d</i>	Writes date values in the form yymmdd or yyyyymmdd and delimits the values by a hyphen
YYMMDDN <i>w.d</i>	Writes date values in the form yymmdd or yyyyymmdd and does not delimit the values
YYMMDP <i>w.d</i>	Writes date values in the form yymmdd or yyyyymmdd and delimits the values by a period
YYMMDS <i>w.d</i>	Writes date values in the form yymmdd or yyyyymmdd and delimits the values by a slash
YYMMN <i>w.d</i>	Writes the year and the month and does not delimit the values
YYMMP <i>w.d</i>	Writes the year and the month and delimits the values by a period
YYMMS <i>w.d</i>	Writes the year and the month and delimits the values by a slash
YYMON <i>w.</i>	Writes the year and the month abbreviation

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YYQxw.	Writes the year and quarter and separates them by a character
YYQCw.d	Writes the year and quarter and separates them by a colon
YYQDw.d	Writes the year and quarter and separates them by a hyphen
YYQNw.d	Writes the year and quarter and does not delimit the values
YYQPw.d	Writes the year and quarter and separates them by a period
YYQRxw.	Writes the year as an integer and the quarter in Roman numerals
YYQRCw.d	Writes the year as an integer and the quarter in Roman numerals, separated by a colon
YYQRDw.d	Writes the year as an integer and the quarter in Roman numerals, separated by a hyphen
YYQRNw.d	Writes the year as an integer and the quarter in Roman numerals and does not delimit the values
YYQRPw.d	Writes the year as an integer and the quarter in Roman numerals, separated by a period
YYQRSw.d	Writes the year as an integer and the quarter in Roman numerals, separated by a forward slash
YYQSw.d	Writes the year and quarter as integers, separated by a slash
YYQZw.	Writes the year and quarter with a leading zero in the quarter
Zw.d	Writes standard numeric data with leading 0s
ZDw.d	Writes data in zoned decimal format

## SAS Informats in SAS Marketing Automation

w.d	Reads standard numeric data
\$w.	Reads standard character data
\$ASCIIw.	Converts ASCII character data to native format

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\$BINARYw.	Converts binary data to character data
\$CBw.	Reads standard character data from column-binary files
\$CHARw.	Reads character data with blanks
\$CHARZBw.	Converts binary 0s to blanks
\$EBCDICw.	Converts EBCDIC character data to native format
\$HEXw.	Converts hexadecimal data to character data
\$OCTALw.	Converts octal data to character data
\$PHEXw.	Converts packed hexadecimal data to character data
\$QUOTEw.	Removes matching quotation marks from character data
\$REVERJw.	Reads character data from right to left and preserves blanks
\$REVERSw.	Reads character data from right to left and left aligns
\$SASNAMEw.	Converts character data to valid SAS name
\$UPCASEw.	Converts data values to uppercase
\$VARYINGw.	Reads character data of varying length
ANYDTDTDEw.	Reads and extracts date values from DATE, DATETIME, DDMMYY, JULIAN, MMDDYY, MONYY, TIME, YYMMDD, or YYQ informat values
ANYDTDTMw.	Reads and extracts datetime values from DATE, DATETIME, DDMMYY, JULIAN, MMDDYY, MONYY, TIME, YYMMDD, or YYQ informat values
BINARYw.d	Converts positive binary values to integers
BITSw.d	Extracts bits
BZw.d	Converts blanks to 0s
CBw.d	The CB informat reads standard numeric values from column-binary files
COMMAXw.d	Removes embedded characters
COMMAw.d	Removes embedded characters
DATEw.	Reads date values in the form ddmmmyy or ddmmmyyyy

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DATETIMEw.	Reads datetime values in the form ddmmmyy hh:mm:ss.ss or ddmmmyyyy hh:mm:ss.ss
DDMMYYw.	Reads date values in the form ddmmyy or ddmmyyyy
Ew.d	Reads numeric values that are stored in scientific notation and double-precision scientific notation
EURDFDEw.	Reads international date values
EURDFDTw.	Reads international datetime values in the form ddmmmyy hh:mm:ss.ss or ddmmmyyyy hh:mm:ss.ss
EURDFMYw.	Reads month and year date values in the form mmmyy or mmmyyyy
EUROw.d	Reads numeric values and removes embedded characters in European currency
EUROXw.d	Reads numeric values and removes embedded characters in European currency
FLOATw.d	Reads a native single-precision, floating-point value and divides it by 10 raised to the dth power
HEXw	Converts hexadecimal positive binary values to either integer (fixed-point) or real (floating-point) binary values
HHMMSSw.	Allows hhmmss input with optional colons
IBw.d	Reads integer binary (fixed-point) values, including negative values
IEEEw.d	Reads an IEEE floating-point value and divides it by 10 raised to the dth power
JULIANw.	Reads Julian dates in the form yyddd or yyyyddd
MINGUOw.	Reads dates in Taiwanese form
MMDDYYw.	Reads date values in the form mmddyy or mmddyyyy
MONYYw.	Reads month and year date values in the form mmmyy or mmmyyyy
MSECw.	Reads TIME MIC values
NENGOW.	Reads Japanese date values in the form eyymmd
NUMXw.d	Reads numeric values with a comma for the decimal point
OCTALw.d	Converts positive octal values to integers

PDw.d	Reads data that is stored in IBM packed decimal format
PDTIMEw.	Reads packed decimal time of SMF and RMF records
PERCENTw.d	Converts percentages into numeric values
PIBw.d	Reads positive integer binary (fixed-point) values
PKw.d	Reads unsigned packed decimal data
PUNCH.d	Reads whether a row of column-binary data is punched
RBw.d	Reads numeric data that are stored in real binary (floating-point) notation
RMFDURw.	Reads duration intervals of RMF records
RMFSTAMPw.	Reads time and date fields of RMF records
ROWw.d	Reads a column-binary field down a card column
S370FFw.d	Reads EBCDIC numeric data
S370FIBUw.d	Reads unsigned integer binary data in IBM mainframe format
S370FIBw.d	Reads integer binary data in IBM mainframe format
S370FPDUw.d	Reads unsigned packed decimal data in IBM mainframe format
S370FPDw.d	Reads packed data in IBM mainframe format
S370FPIBw.d	Reads positive integer binary data in IBM mainframe format
S370FRBw.d	Reads real binary (floating-point) data in IBM mainframe format
S370FZDBw.d	Reads IBM 370 zoned decimal data
S370FZDLw.d	Reads zoned decimal leading-sign data in IBM mainframe format
S370FZDSw.d	Reads zoned decimal separate leading-sign data in IBM mainframe format
S370FZDTw.d	Reads zoned decimal separate trailing-sign data in IBM mainframe format
S370FZDUw.d	Reads unsigned zoned decimal data in IBM mainframe format
S370FZDw.d	Reads zoned decimal data in IBM mainframe format

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SHRSTAMPw.	Reads date and time values of SHR records
SMFSTAMPw.	Reads time-date values of SMF records
VAXRBw.d	Reads real binary (floating-point) data in VMS format
TIMEw.	Reads hours, minutes, and seconds in the form hh:mm:ss.ss
TODSTAMPw.	Reads an 8-byte time-of-day stamp
TUw.	Reads timer units
YENw.d	Removes embedded yen signs, commas, and decimal points
YMDDTTMw.d	Reads datetime values using Y/M/D on input
YYQw.	Reads quarters of the year
YYMMDDw.	Reads date values in the form yyymmdd or yyyyymmdd
ZDBw.d	Reads zoned decimal data in which zeros have been left blank
ZDVw.d	Reads and validates zoned decimal data
ZDw.d	Reads zoned decimal data

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## SAS Macro Variables in SAS Marketing Automation

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SYSDATE9	The date on which the SAS job began execution
SYSDATE	The date on which the SAS job began execution
SYSDAY	The day of the week on which the SAS job began execution
SYSERR	The return code set by SAS procedures
SYSINDEX	The number of macros that have started execution
SYSINFO	The return code information set by some SAS procedures
SYSJOBID	The name of the currently running batch job or user ID
SYSLAST	The name of the most recently created SAS data set

---

SYSRC	The last return code generated by an operating system command
SYSSCP	The abbreviation for the operating system that you are using
SYSTIME	The time at which the SAS job started executing
SYSVER	The release of SAS software that you are using

## Operators in SAS Marketing Automation

$(matrix1 \parallel matrix2)$	The horizontal concatenation operator ( $\parallel$ ) produces a new matrix by horizontally joining matrix1 and matrix2.
$(matrix1 // matrix2)$	The vertical concatenation operator ( $//$ ) produces a new matrix by vertically joining matrix1 and matrix2.
$(matrix1 @ matrix2)$	The direct product operator (@) produces a new matrix that is the direct product (also called the Kronecker product) of matrix1 and matrix2.
$(matrix1 + matrix2)$ or $(matrix + scalar)$	The addition infix operator (+) produces a new matrix containing elements that are the sums of the corresponding elements of matrix1 and matrix2.
$(matrix1 / matrix2)$ or $(matrix / scalar)$	The division operator (/) divides each element of matrix1 by the corresponding element of matrix2, producing a matrix of quotients.
$(matrix1 * matrix2)$	The matrix multiplication infix operator (*) produces a new matrix by performing matrix multiplication.
$(table-expression1 \text{ EXCEPT } table-expression2)$	The EXCEPT operator produces rows that are part of the first query but not the second. The CORRESPONDING (match columns by name) and ALL (preserve duplicate rows) keywords are optional.
$(table-expression1 \text{ INTERSECT } table-expression2)$	The INTERSECT operator produces rows that are common to both query results. The CORRESPONDING (match columns by name) and ALL (preserve duplicate rows) keywords are optional.
$(table-expression1 \text{ OUTER UNION } table-expression2)$	The OUTER UNION operator concatenates the two query results. The CORRESPONDING (match columns by name) keyword is optional.
$(table-expression1 \text{ UNION } table-expression2)$	The UNION operator produces all unique rows from both queries. The CORRESPONDING (match columns by name) and ALL (preserve duplicate rows) keywords are optional.



# Glossary

**audience**

a target group for a campaign.

**broadcast**

a communication that is distributed by SAS Digital Marketing software through email or through another electronic medium.

**business context**

a designation that identifies the information that a user can access. Data access is restricted to only the information that is required for a specific business need. A user can have access to more than one business context.

**campaign**

a planned set of one or more communications that are directed at a selected group of customers or potential customers for a commercial goal.

**campaign checklist**

a list of campaign steps that you should consider when you create a campaign.

**campaign definition**

a template that defines information about the underlying structure of a campaign including campaign checklist items, custom details, and whether the campaign is a selection campaign or a decision campaign. Campaign definitions are specified in SAS Management Console.

**campaign group**

a collection of SAS Customer Intelligence campaigns.

**campaign schedule**

a schedule of activities that begins with the first date on which a communication is exported and ends with the last date on which a communication is exported.

**cell**

a marketing campaign's target group.

**cell splitting**

the process of dividing a selection group into cells. For example, if you are sending an email message to a particular group of people, you might want to split this group into cells, and send each cell a slightly different email. Cell splitting enables you to compare the potential success of different communications.

**champion/challenger control group**

a type of control group. Members of a champion/challenger control group receive either a champion communication or a challenger communication that is intended to outperform the champion.

**channel**

a mode of communication such as an email message or a print mailing.

**communication**

a specific marketing activity or communication with the consumer, such as an email message or a print mailing, that is aimed at achieving a commercial goal. A communication is part of a campaign. Each campaign can contain one or many communications. Each communication can be associated with one channel.

**communication definition**

a template that defines information about a communication, such as its export definition, code, channel, and custom details. Communication definitions are defined in SAS Management Console.

**contact history**

a record of the groups of individuals or organizations that have been identified to be contacted for a communication.

**control group**

a group that is used to evaluate the effectiveness of a communication.

**customer database**

a data mart that contains customer information that you can use to manage the customer lifecycle. A customer database typically includes customer demographics, transaction history, and responses to previous campaigns, as well as other historical information.

**diagram**

a general term for a collection of nodes that make up a SAS Marketing Automation or SAS Real-Time Decision Manager process.

**direct response**

a reply that you receive from a contact. You can track or trace a direct response, based on data from your call center or web site.

**downstream node**

See successor node

**execute**

to run one or more communications within a campaign, producing output in the form of flat files and tables or in the form of email messages.

**export**

to produce a results list in any of a variety of file or table formats. The details of the export are specified in an export definition.

**export definition**

a collection of information about the format of the data to be exported, the types of data to be exported, and other options. Export definitions are defined in SAS Management Console.

**holdout control group**

a type of control group. Members of a holdout control group do not receive a communication. After a communication has been sent, the actions of the holdout control group can be compared with the actions of groups that received a communication.

**inferred response**

a response that cannot be directly attributed to a particular communication. For example, a purchase response for a product could be inferred as being due to an email message that was sent about an upcoming holiday, although there might be no way to verify that.

**lights-out processing**

the ability to execute a recurrent process without human intervention. For example, all optimization steps are completed when you click Optimize Now in a campaign group.

**macro variable**

a variable that is part of the SAS macro programming language. The value of a macro variable is a string that remains constant until you change it.

**node**

a graphical region of a diagram that contains information about a process flow operation. A node consists of a graphical component (icon) as well as a properties window.

**occurrence**

an instance of a communication, whether executed or even scheduled to be executed.

**optimization group**

a designation that identifies the input data that is created from a campaign for a business context. Information about the campaigns, communications, and customers in the campaign group is used to create the input data tables that are required to create and optimize scenarios.

**predecessor node**

a node that precedes another node in a diagram. A predecessor node is also called an upstream node.

**preferred scenario**

a scenario that is assigned to a campaign group and that is used for optimization by the campaign group.

**prioritization**

a method that prevents duplicate communications from being sent. You can prioritize selection groups to exclude individuals or organizations that are already included in another selection group.

**recurring schedule**

a campaign or communication event that is scheduled to occur more than once. A recurring schedule is set up to recur automatically at user-defined intervals.

**response**

the reaction that an individual has to a campaign, such as requesting a quote, making an inquiry, opening an email message, or buying the product.

**seed**

an individual or organization to whom you send a communication to verify that a communication has been processed correctly. Typically, seeds are company employees who would not have been selected for the specific communication.

**selection diagram**

a specific type of diagram that is used in SAS Marketing Automation. A selection diagram typically results in cells that can be linked to by other diagrams or by campaigns. It cannot have communication nodes and so does not update contact history.

**selection group**

a list of subjects who have been identified for an action such as receiving a communication. Typically, a selection group is represented by a cell node in a diagram.

**subject**

the hierarchical level to which selection criteria are applied. For example, a record can be selected because of household, customer, or account criteria. All three hierarchical levels are subjects.

**successor node**

a node that follows another node. A successor node is also called a downstream node.

**symbolic variable**

See macro variable

**upstream node**

See predecessor node

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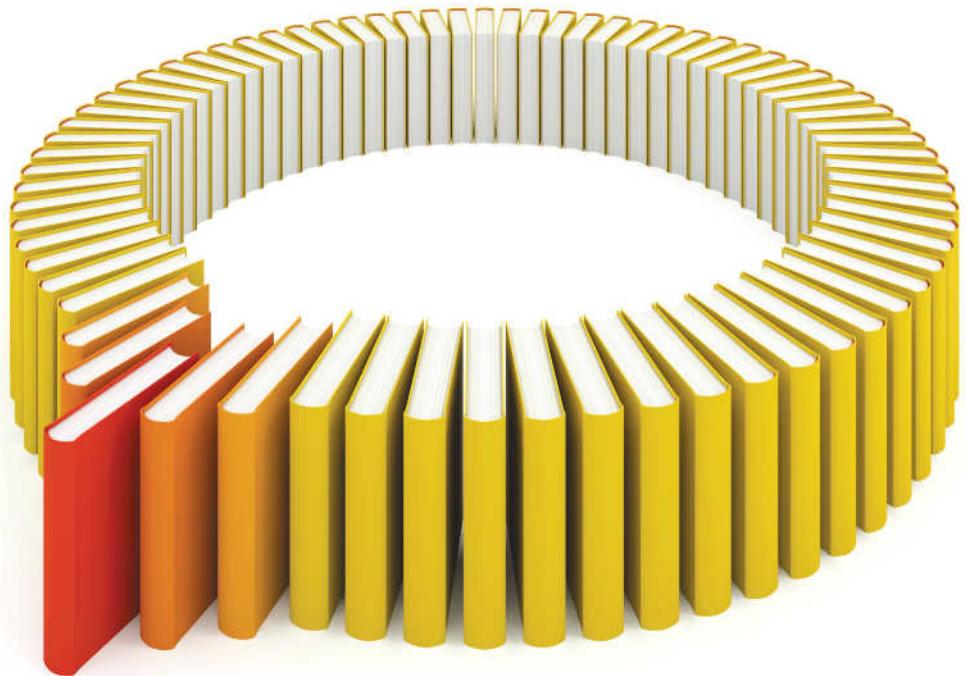
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