SAS® Marketing Automation 5.1

User's Guide

The correct bibliographic citation for this manual is as follows: SAS Institute Inc. 2007. *SAS® Marketing Automation 5.1: User's Guide*. Cary, NC: SAS Institute Inc.

SAS® Marketing Automation 5.1: User's Guide

Copyright © 2007, SAS Institute Inc., Cary, NC, USA

All rights reserved. Produced in the United States of America.

For a hard-copy book: No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise, without the prior written permission of the publisher, SAS Institute Inc.

For a Web download or e-book: Your use of this publication shall be governed by the terms established by the vendor at the time you acquire this publication.

U.S. Government Restricted Rights Notice: Use, duplication, or disclosure of this software and related documentation by the U.S. government is subject to the Agreement with SAS Institute and the restrictions set forth in FAR 52.227-19, Commercial Computer Software-Restricted Rights (June 1987).

SAS Institute Inc., SAS Campus Drive, Cary, North Carolina 27513.

1st printing, October 2007

SAS® Publishing provides a complete selection of books and electronic products to help customers use SAS software to its fullest potential. For more information about our e-books, e-learning products, CDs, and hard-copy books, visit the SAS Publishing Web site at **support.sas.com/pubs** or call 1-800-727-3228.

SAS® and all other SAS Institute Inc. product or service names are registered trademarks or trademarks of SAS Institute Inc. in the USA and other countries. ® indicates USA registration.

Other brand and product names are registered trademarks or trademarks of their respective companies.

Contents

Chapter 1. Overview of SAS Marketing Automation 1

Chapter 2. Getting Started with SAS Marketing Automation 7

Chapter 3. Defining and Administering Campaigns 37

Chapter 4. Using SAS Customer Intelligence Studio 109

Chapter 5. Creating Campaigns 123

Chapter 6. Creating Diagrams 143

Chapter 7. Creating Nodes 153

Chapter 8. Scheduling and Executing Communications 243

Chapter 9. Displaying Information About Campaigns 263

Chapter 10. SAS Campaign Web Studio 283

Chapter 11. Examples 305

Chapter 12. Glossary 335

Index **339**

Chapter 1

Overview of SAS Marketing Automation

Contents

What Is SAS Marketing Automation? **1**
SAS Customer Intelligence **2**
Components of SAS Marketing Automation **2**
What's New in SAS Marketing Automation 5.1 . . . . . **3**
Overview 3
Common User Interface 3
Execution of Custom Nodes 4
Statistically Significant Sample Sizes 4
Splitting by Quartiles, Deciles, and Decimal Percentages 4
Restructuring of Dynamic Processing 4
Custom Node Creation 4
Common Contact History and Common Response History 4
SAS Customer Intelligence Reporting Data Model 5
Common Reporting 5
Improved Integration with SAS Digital Marketing 5
Improved Integration with SAS Marketing Optimization 5

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, including marketers who define communication strategies, executives who need reports on marketing effectiveness, campaign managers who create target segments and execute campaigns, and analysts who model and predict customer behavior.

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

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 Marketing Automation turns disparate, disorganized customer data into profitable marketing campaigns. This solution includes campaign creation and execution, reporting, business intelligence, predictive analytics, 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 e-mail, SMS, MMS, and WAP. The digital marketing can be implemented within single-channel or multi-channel 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.

Components of SAS Marketing Automation

SAS Marketing Automation consists of three components:

SAS Customer Intelligence Studio With Customer Intelligence Studio, you can create a campaign, use diagrams to target a population, schedule the execution of campaigns and communications, and export data to a file or table. For more information, see "SAS Customer Intelligence Studio User Interface" on page 112.

SAS Customer Intelligence Plug-ins for SAS Management Console With the Customer Intelligence plug-ins, you can define the SAS Customer Intelligence Studio environment, including business contexts, campaign definitions, export definitions, and communication definitions. For more information, see "Overview of SAS Customer Intelligence Plug-Ins" on page 37.

SAS Campaign Web Studio With SAS Campaign Web Studio, you can access campaigns through a Web portal. For more information, see "Introduction to SAS Campaign Web Studio" on page 284.

What's New in SAS Marketing Automation 5.1

Overview

SAS Marketing Automation 5.1 has the following changes and enhancements:

- common user interface for inbound and outbound marketing
- execution of custom nodes along with a communication
- statistically significant sample sizes
- splitting by quartiles, deciles, and decimal percentages
- restructuring of dynamic processing (dynamic cells)
- custom node creation
- common contact and response history
- SAS Customer Intelligence Reporting Data Model
- common reporting
- improved integration with SAS Digital Marketing
- improved integration with SAS Marketing Optimization

Common User Interface

A single Customer Intelligence Studio interface provides the same look, feel, and flow for both the SAS Marketing Automation user and the SAS Real-Time Decision Manager user. A single diagram workspace can be used to design campaigns and decision flows. A business user who has access to both campaign and decision flow capabilities will be required to sign in only once.

Execution of Custom Nodes

You can execute a custom node that will run immediately after the campaign is executed without requiring a separate scheduling step. For example, a company that has its own customer list can insert rows from that list into a mail house file after the campaign has executed.

Statistically Significant Sample Sizes

You can split groups into statistically significant sample sizes to ensure proper sizing of control groups.

Splitting by Quartiles, Deciles, and Decimal Percentages

You can split groups into quartiles (4) and deciles (10). You can also group them by a decimal percentage.

Restructuring of Dynamic Processing

Any campaign that has dynamic cells is converted at execution to indicate that counts should be cleared, and cells should be converted to on-change.

Custom Node Creation

Custom nodes can address all client segmentation, profiling, and testing requirements. With this feature, a technical user can create a custom node and save it as a new node on the tool palette. There are two types of custom nodes: a type in which the technical user, such as the administrator, writes SAS code and a second type in which the node is created using the stored process capability of the code node. The business user, such as the marketer, accesses the new node through an icon in the tool palette.

Common Contact History and Common Response History

SAS Marketing Automation 5.1, SAS Real-Time Decision Manager, and SAS Digital Marketing use common contact history and common response history repositories. These common repositories

enable you to produce reports that contain consolidated marketing contact and response information across these solutions.

SAS Customer Intelligence Reporting Data Model

The SAS Customer Intelligence Reporting Data Model enables cross-component reporting and consolidated handling of response and contact history. The model includes SAS Marketing Automation, SAS Interaction Management, SAS Real-Time Decision Manager, SAS Marketing Optimization, SAS Web Analytics, SAS Digital Marketing, and SAS Solutions OnDemand Veridiem MRM.

Common Reporting

SAS Marketing Automation, along with SAS Marketing Optimization, SAS Real-Time Decision Manager, SAS Digital Marketing, and SAS Web Analytics, provides a single report that combines data elements from all of these solutions. The report is produced by SAS Web Report Studio from an information map that references the SAS Customer Intelligence Reporting Data Model.

Improved Integration with SAS Digital Marketing

The integration between SAS Marketing Automation and SAS Digital Marketing includes the following features:

- Integration of the SAS Digital Marketing broadcast at the communication definition in SAS Management Console. This integration significantly reduces the number of steps that are required for integration and also allows the broadcast to be defined much later in the campaign building process.
- A communication identifier that enables the e-mail broadcast to be mapped back to a specific campaign is passed from SAS Marketing Automation to SAS Digital Marketing and is included as part of the common reporting capabilities of SAS Customer Intelligence.
- SAS Digital Marketing updates of the Customer Intelligence common contact and response history tables, thus enabling their inclusion in common reporting.

Improved Integration with SAS Marketing Optimization

The integration between SAS Marketing Automation and SAS Marketing Optimization includes the following features:

- A wizard to guide you through the integration process.
- Enablement of agent table capability in Marketing Optimization when the Marketing Automation campaign is sent for Optimization. The agent capacity can be included in results.
- Population of the Time column in data that is passed from Marketing Automation to Marketing Optmization. This data can be used as part of contact policy enforcement.

Chapter 2

Getting Started with SAS Marketing Automation

Contents

Getting Started with SAS Marketing Automation **7**
Defining a Selection Campaign **8**
Identify an Information Map 8
Create a Business Context 9
Create a Campaign Definition 12
Create an Export Definition 14
Create a Communication Definition 16
Associate Resources with the Business Context 19
Creating a Selection Campaign **20**
Select a Business Context 21
Open a New Campaign 22
Edit the Campaign Brief 23
Adding Nodes to the Diagram **24**
Add a Select Node 25
Add a Multi-select Node 27
Connect the Nodes 29
Add a Cell Node 30
Add a Communication Node 31
Execute a Communication **34**
Publish the Campaign **35**

Getting Started with SAS Marketing Automation

This chapter describes the basic steps in defining, creating and executing a campaign communication in a selection campaign, followed by publishing the campaign to a report. Beyond the basic steps, there are many additional features that you can use to enhance your campaigns. These features are described in later chapters.

Before you can create a campaign in SAS Marketing Automation, you must create an information map that identifies the data that will be used in the campaign. For more information on creating information maps, see *SAS Customer Intelligence 5.1: Administrator's Guide*.

In the first steps of creating a campaign, you will use the Marketing Automation plug-ins in the SAS Management Console to identify an information map, create a business context, define a campaign, stipulate the media for communication, and specify the location and structure of the export file that will contain the customer data.

In the following steps, you will create, execute, and publish a simple campaign that generates a table of customer names and addresses to which to send a catalog.

Defining a Selection Campaign

Before a campaign can be created, a business context, campaign definition, export definition, and communication definition must be specified in the Marketing Automation plug-ins for SAS Management Console. This information can then be used by the creators of campaigns in Customer Intelligence Studio. You must have administrator permissions in order to use the Marketing Automation plug-ins to define campaigns. For more information, see Chapter 3, "Defining and Administering Campaigns."

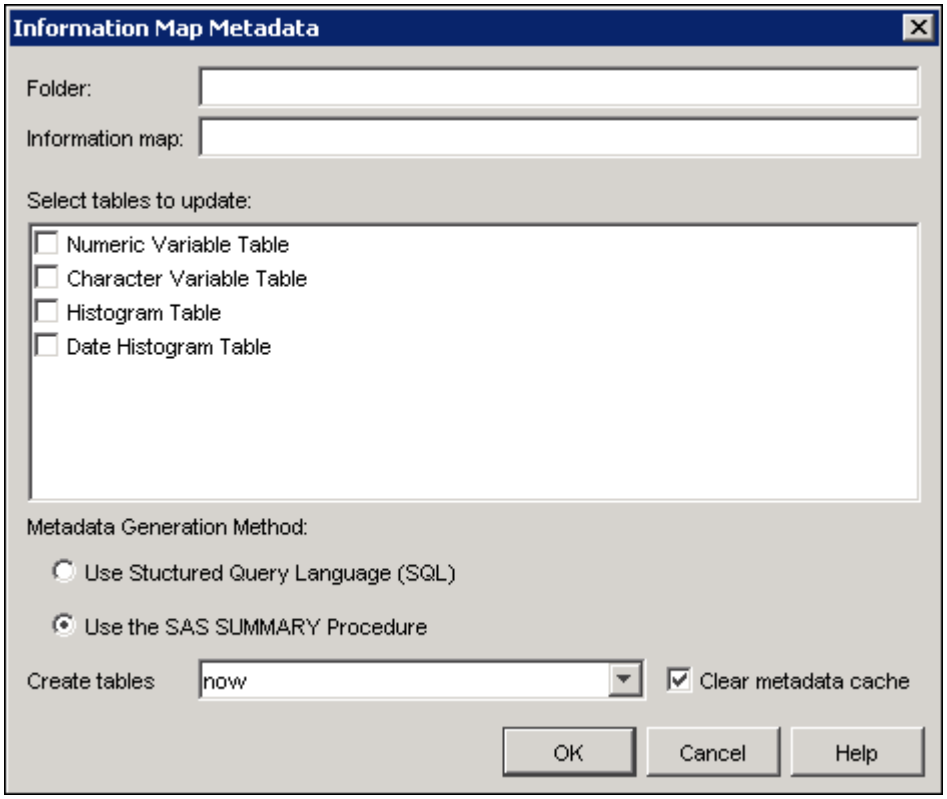
To open the SAS Marketing Automation plug-ins, do the following:

1. Start a SAS Management Console session by selecting **Start ➧ Programs ➧ SAS ➧ SAS Management Console**.
2. To access the SAS Customer Intelligence plug-ins, click the Customer Intelligence folder under Application Management.
3. In the Log On - SAS Customer Intelligence Plug-ins window, enter your user name and password and click **Log On**.

Identify an Information Map

A campaign is based on the data that is contained in an information map. To identify the information map that will form the basis of your campaign, do the following:

1. Open the Administration Resources folder.
2. Right-click the Information Map Metadata plug-in and select **New Information Map**.



3. Enter the name of the folder that contains the information in the **Folder** field.
4. Enter the name of the information map in the **Information Map** field.
5. Select the metadata tables that you want to update from the list of tables.
6. Click **OK** to close the window and save your changes.

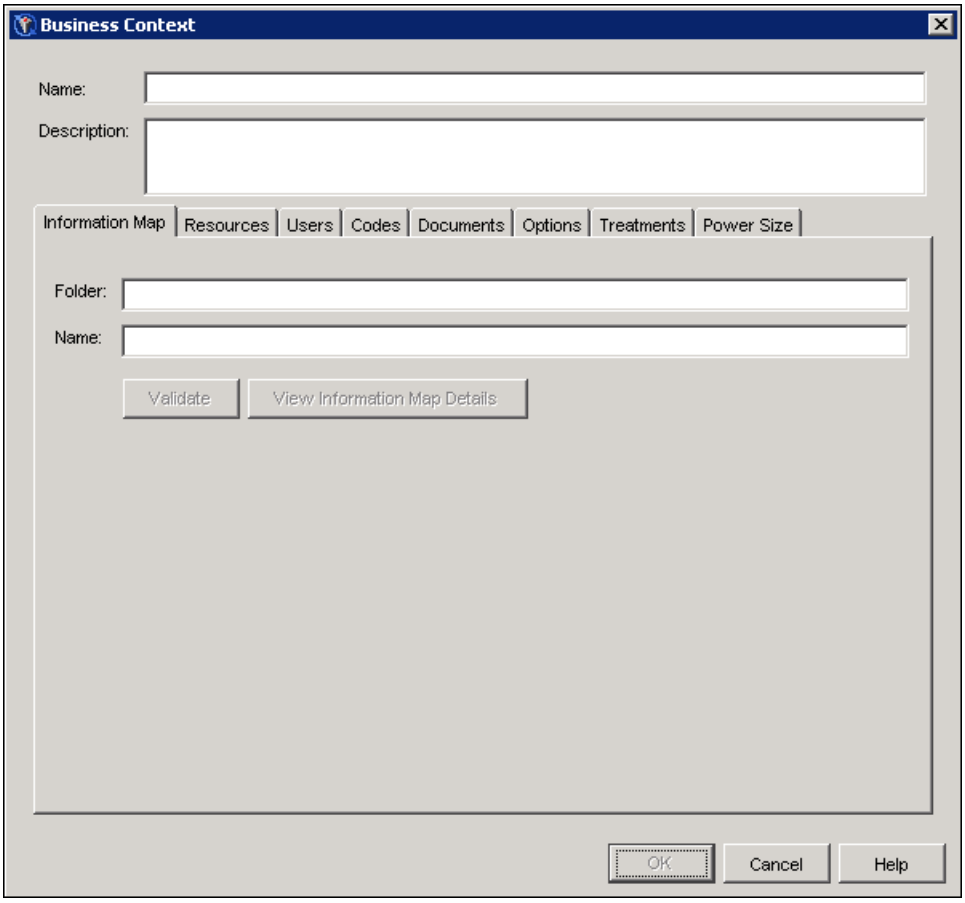
For more information, see "Identifying Information Maps" on page 92.

Create a Business Context

A business context defines the data that an individual user can access. A business context is made up of an information map and a set of definitions, such as campaign definitions. For more information, see "Defining Business Contexts" on page 95.

To name the business context and identify the information map, do the following:

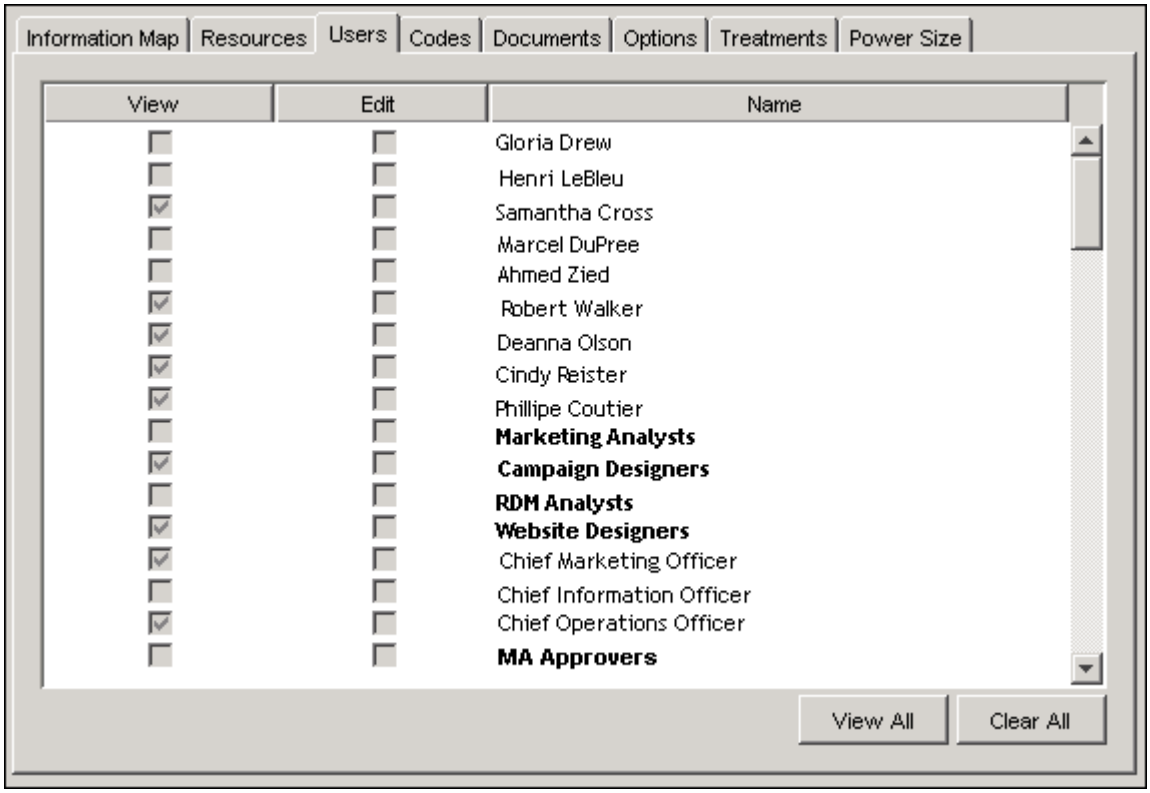
1. Right-click the Business Contexts plug-in and select **New Business Context** to display the Business Context window.



2. Type "My Business Context" in the **Name** field.
3. On the Information Map tab, type the pathname to the folder that contains the information map in the **Folder** field.
4. Type the name of the information map in the **Name** field.

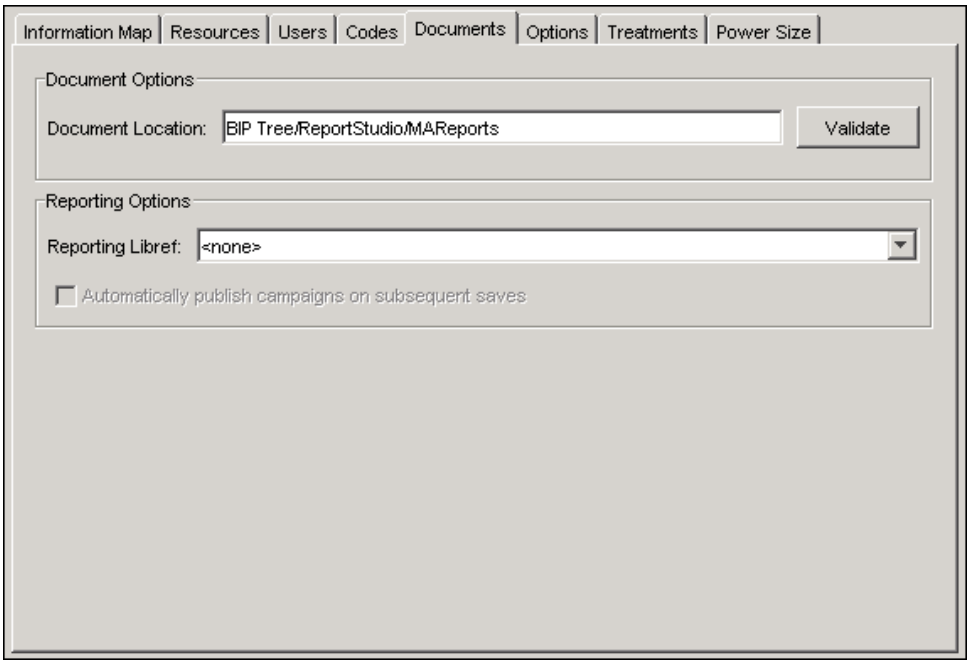
The Resources tab lists the definitions that are associated with the business context. You will create these definitions in later steps.

Select the Users tab to list users who have access to the business context.



To assign **View** permissions to users who will be using the business context in Customer Intelligence Studio, click the **View** check boxes next to their names.

Select the Documents tab to specify the output location and other options for documents and reports. In the Document Options area, a valid default pathname is supplied in the **Document Location** field. You should specify a separate document location for each business context.



You can publish campaign data to the SAS Customer Intelligence Reporting Data Model, a reporting model for SAS Customer Intelligence. You can then use SAS Web Report Studio to view the data in a customized report, or as the treatment performance report that is supplied with the product. In the Reporting Options area of the Documents tab, select a libref for the location of the SAS Customer Intelligence Reporting Data Model from the **Reporting Libref** drop-down list. For more information on using the treatment performance report to view data, see "The Treatment Performance Report" on page 280.

Create a Campaign Definition

Campaign definitions are templates that form the basis for creating campaigns in SAS Customer Intelligence Studio.

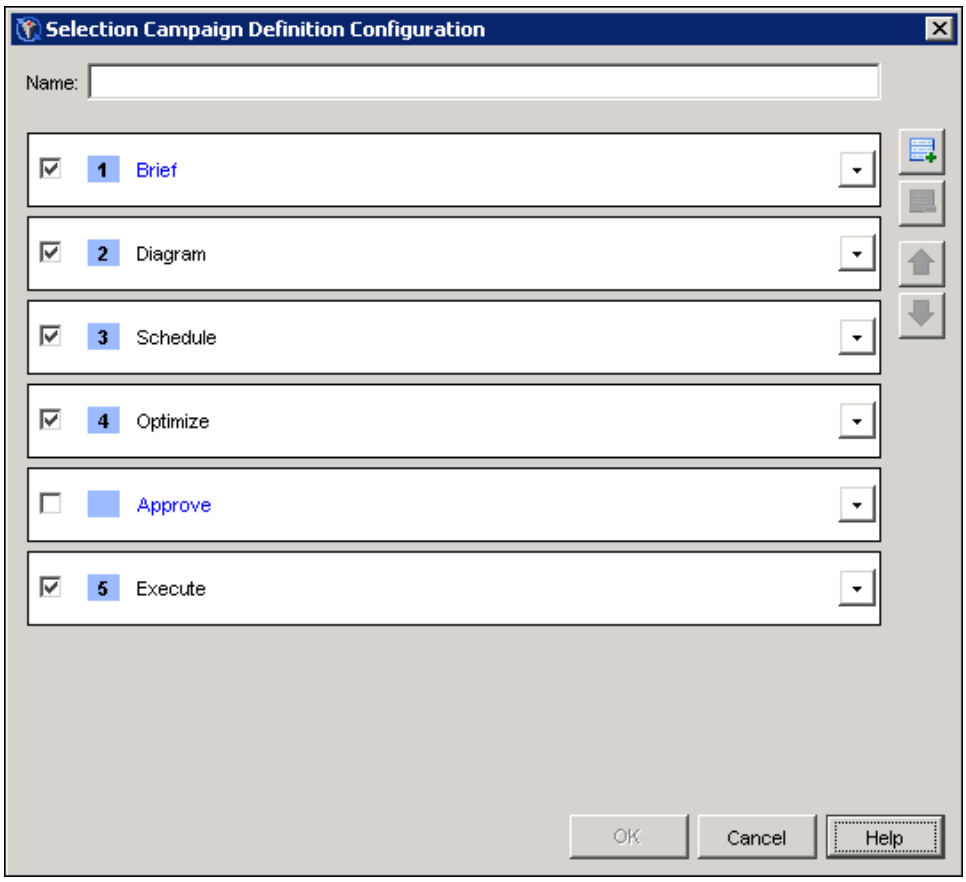
Each campaign definition specifies the following:

- The campaign checklist, which contains the steps that are required to complete the campaign
- The campaign brief, which contains details and key information about the campaign, such as the campaign code

For more information, see "Creating Campaign Definitions" on page 40.

To create a campaign definition, do the following:

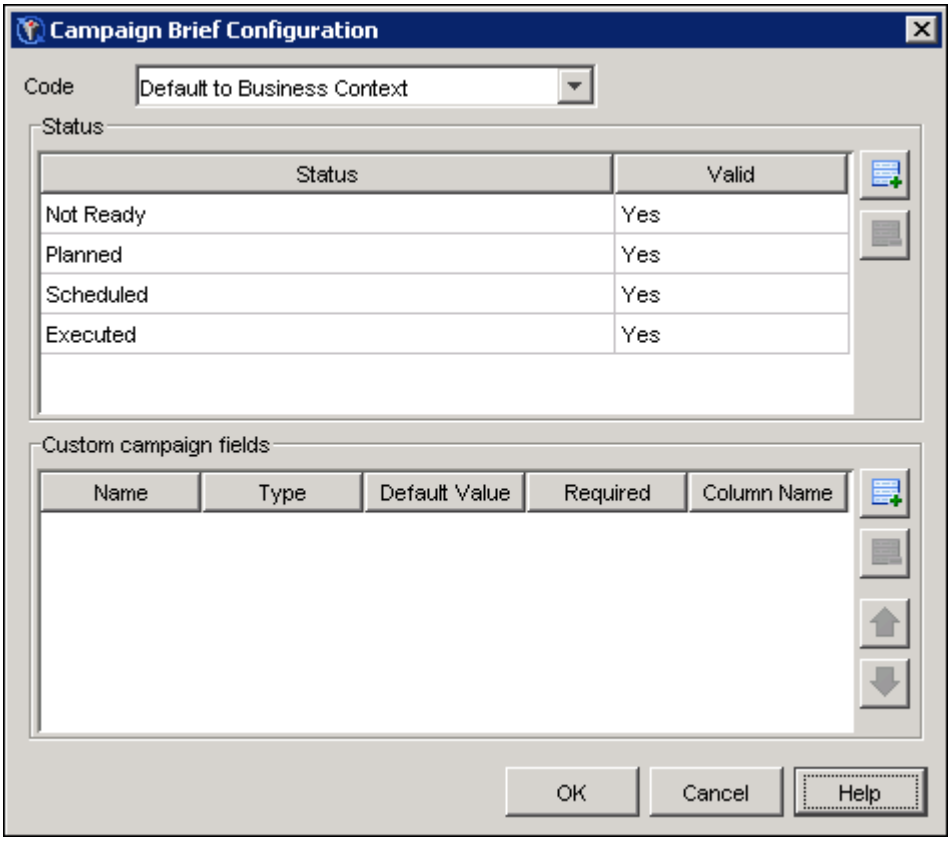
1. Open the Application Resources folder in the Customer Intelligence plug-ins.
2. Right-click the Campaign Definitions plug-in and select **New Selection Definition**.



3. Type **My Campaign Definition** in the **Name** field. You will be able to select this campaign definition in SAS Customer Intelligence Studio.

4. Specify a checklist of tasks that must be finished to complete the campaign. In the Selection Campaign Definition Configuration window, select the check boxes next to **Brief**, **Diagram**, **Schedule**, and **Execute**.

5. Specify the valid statuses and campaign codes for the campaign. Click on **Brief**.



6. In this campaign definition, campaign codes will be required. They will be supplied automatically, but can be edited by the creator of the campaign. Select **Automatic-Editable** from **Code** list.

7. This campaign definition will have four valid statuses that can be selected in the campaign brief. Select **No** from the **Valid** field next to the **Planned** campaign status. The other statuses, **Not Ready**, **Scheduled**, and **Executed**, will be valid.

8. Click **OK** in the Campaign Brief Configuration window, and click **OK** in the Selection Campaign Definition Configuration window to save the new campaign definition.

Create an Export Definition

Export definitions are templates that define the structure of an export file that is created by SAS Customer Intelligence Studio. These templates are based on information maps.

The export definition specifies the following:

- The subject of the export file
- The format of the export file
- The physical storage location of the export file

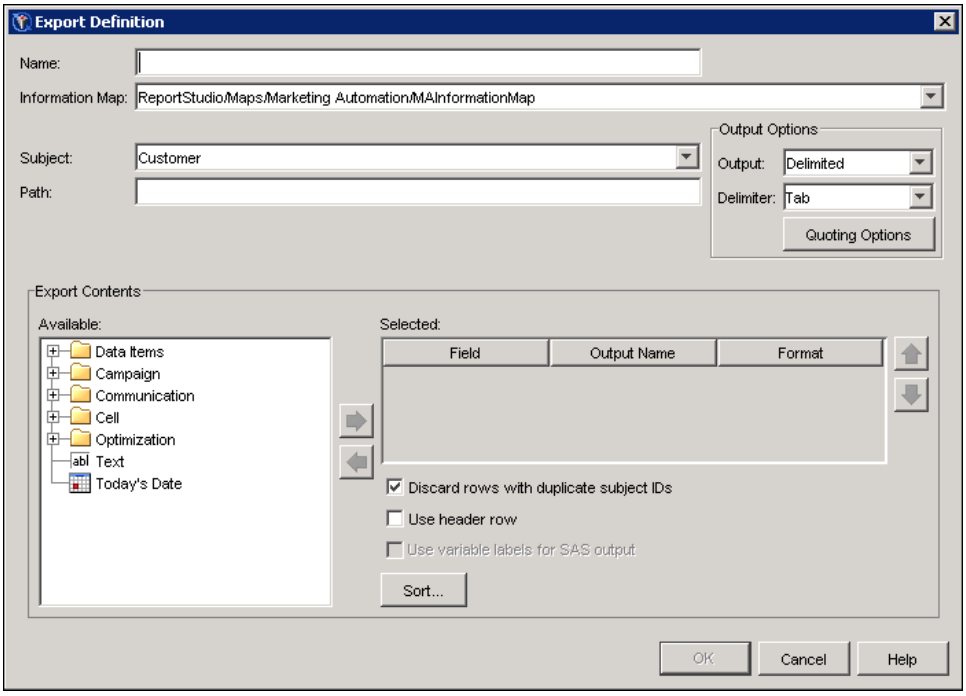
- The fields that are to be written to the export file

For more information, see "Creating Export Definitions" on page 49.

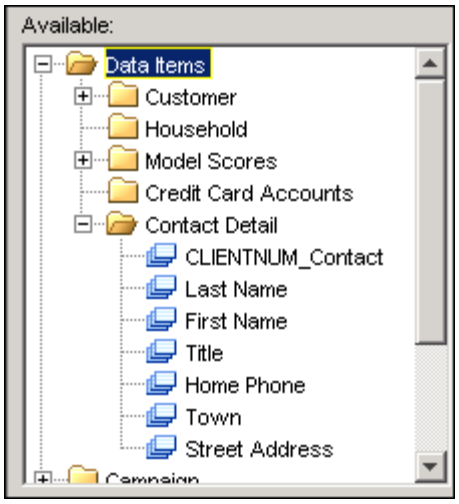
In this example, an export definition named "My Export Definition" is created. The export definition is based on an information map named "MAInformationMap" that has been identified previously.

To create an export definition, do the following:

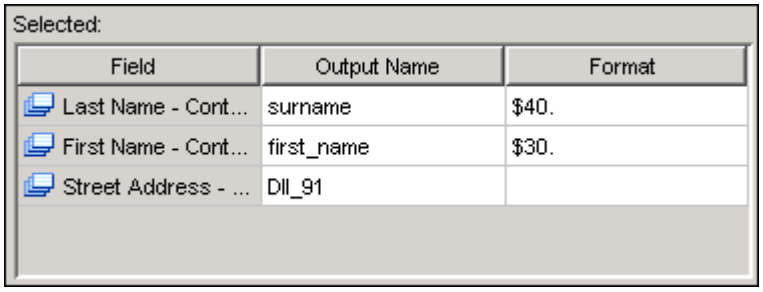
1. Right-click the Export Definitions plug-in in the Application Resources folder and select **New Definition**.



2. Type **My Export Definition** in the **Name** field of the Export Definition window. You will be able to select this export definition in SAS Customer Intelligence Studio.
3. Select an information map from the **Information Map** drop-down list. In this example, the selected information map is **MAInformationMap**.
4. The subject is the type of record that is exported. The list of subjects is defined in the information map. Select a subject from the **Subject** drop-down list. In this example, **Customer** is the selected subject.
5. Specify the location of the export file. In this example, the export file is a tab-delimited file that is stored on a server. Type **\\myserver\MAExport** in the **Path** field.
6. The fields that you can select for inclusion in the export file are also based on the information map. In this example, the information map contains the names and addresses of customers. Expand the **Data Items** and **Contact Detail** folders in the **Available** list in the Export Contents area. Press the **Ctrl** key and select **First Name**, **Last Name**, and **Street Address**.



7. Click to add the **First Name**, **Last Name**, and **Street Address** fields to the export definition.



8. Click **OK** to close the window and save your changes.

Create a Communication Definition

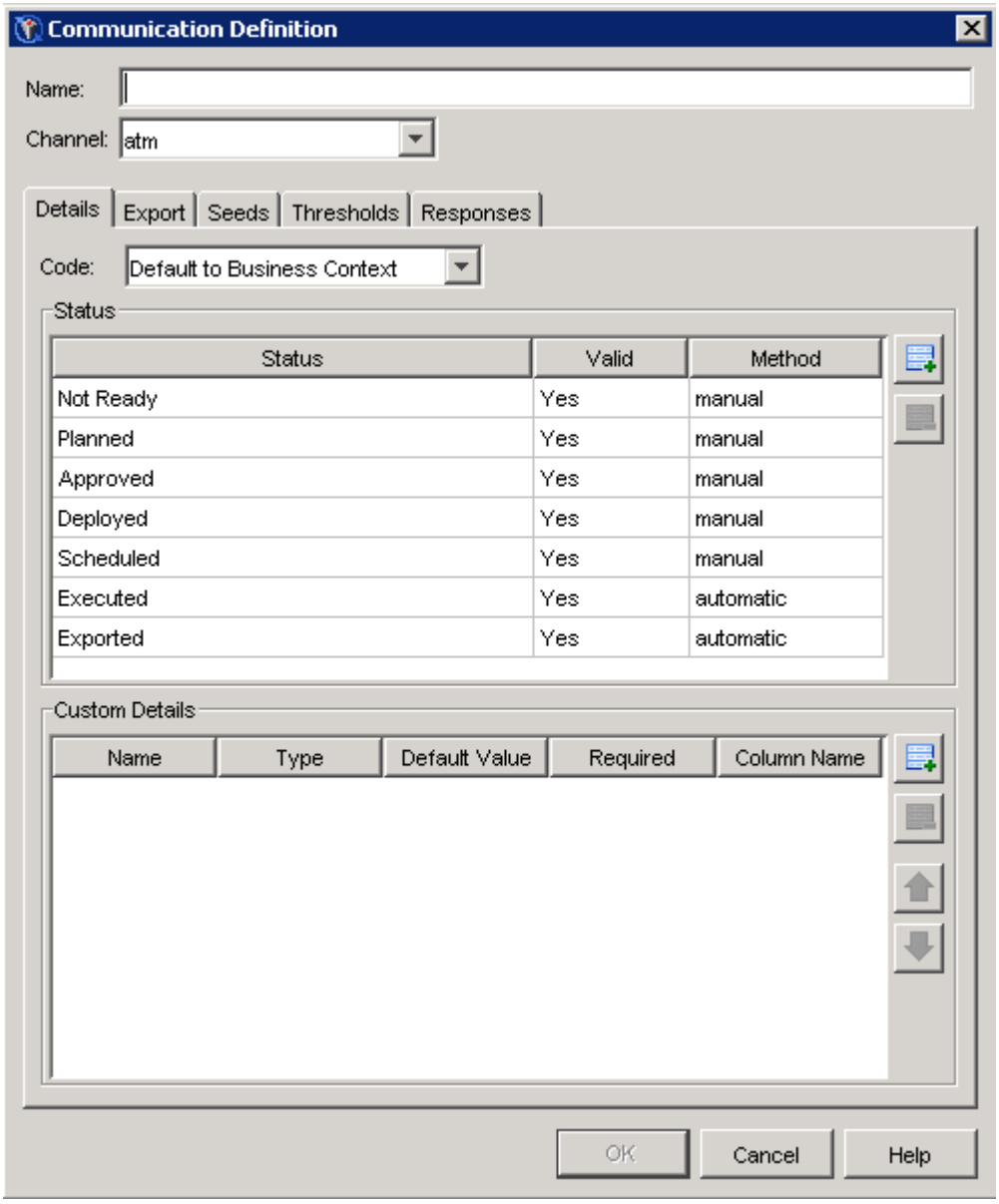
Communication definitions are templates that contain the information that is associated with a communication, including the following:

- communication channel
- communication code
- default export file
- seed lists
- status of the communication
- audience thresholds
- user-defined fields

For more information, see "Defining Communications" on page 57.

In this example, a communication definition named "My Communication Definition" is created. To name a communication definition and select a communication medium, do the following:

1. Right-click the Communication Definitions plug-in in the Application Resources folder and select **New Communication Definition**.

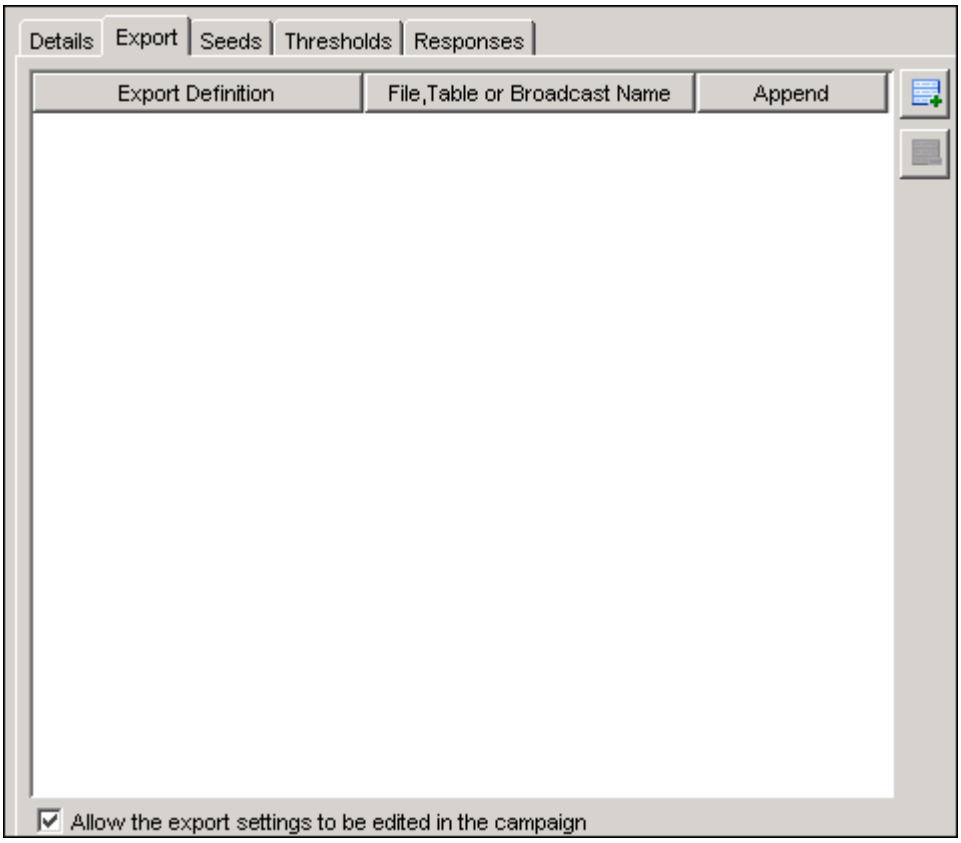


2. Type **My Communication Definition** in the **Name** field of the Communication Definition window. You will be able to select this communication definition in SAS Customer Intelligence Studio.

3. Channels are the media, such as television advertisements or catalogs, for the communications. Select **catalog** from the **Channel** drop-down list.

You can associate export definitions with a communication definition so that the data for the communication is exported in the format that you select. To select an export definition, do the following:

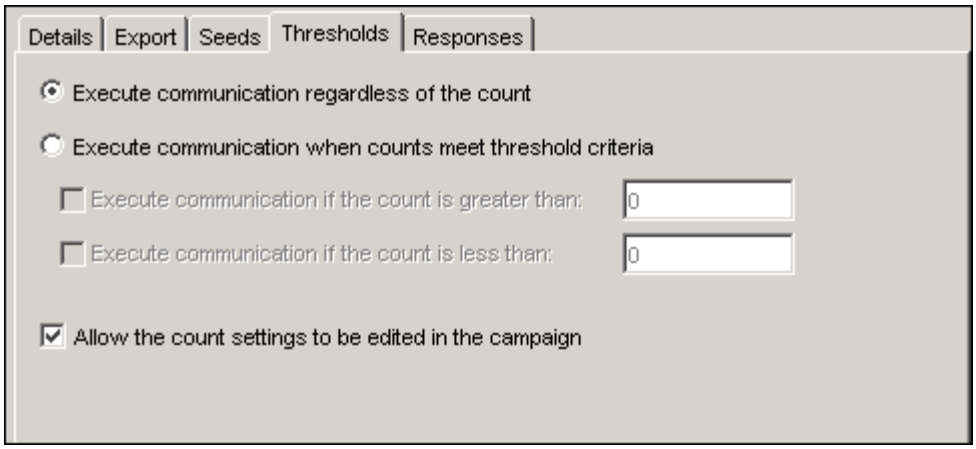
1. Select the **Export** tab to select an export definition for this communication.



2. Click to add a row for an export definition.
3. Select the **Export Definition** field and click ... to display the Select Export Definition window.
4. Select **My Export Definition**, the export definition that you created in the previous section, and click **OK** to associate your new export definition with this communication definition.
5. In the **File, Table or Broadcast Name** column, type a file name for the exported data.

You can specify an audience threshold for the communication so that there must be a minimum audience size in order for the communication to execute. To specify an audience threshold, do the following:

1. Select the **Thresholds** tab.



2. In this example, the communication definition defines an lower limit for the size of the audience. Select **Execute communication when counts meet threshold criteria**.
3. Select **Execute communication if the count is greater than:**, and type **1000** as the value. The communication will not be executed until the size of the audience is at least 1,000.

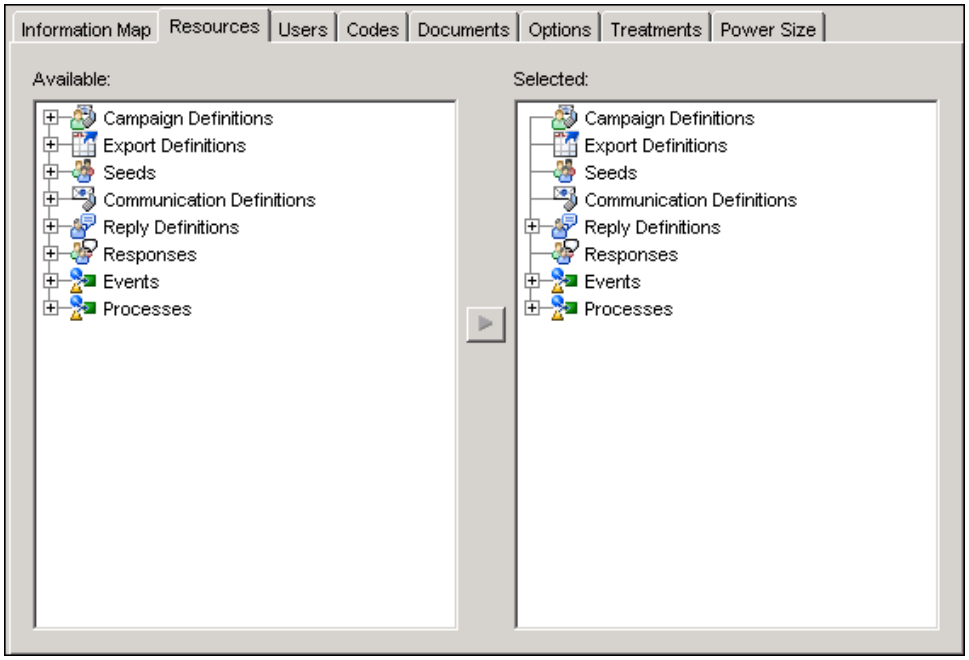
Click **OK** to save and close the new communication definition.

Associate Resources with the Business Context

Campaign, communication, and export definitions must be associated with a business context in order to be available in users of that business context in SAS Customer Intelligence Studio.

To associate the definitions that you have created with the business context that you have created, do the following:

1. Select the Business Contexts plug-in in the Administration Resources folder.
2. In the table of business context names, double-click on My Business Context.
3. In the Business Context window, select the Resources tab. The Resources tab contains the definitions that are associated with the business context.



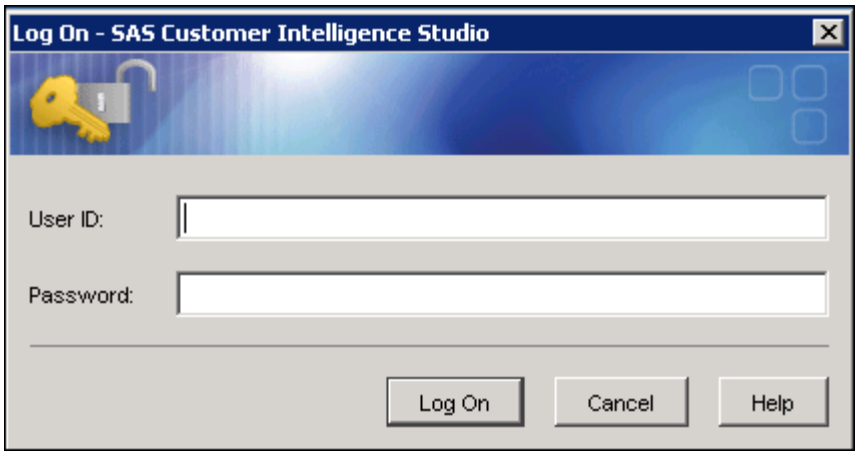
4. Open the Campaign Definitions folder in the **Available** list and select My Campaign Definition.
5. Click the right arrow to copy My Campaign Definition to the **Selected** list.
6. Open the Export Definitions and Communication Definitions folder in the **Available** list and copy My Export Definition and My Communication Definition to the **Selected** list.
7. Click **OK** to close the Business Context window and save your changes.

Creating a Selection Campaign

After the campaign has been defined, you can use SAS Customer Intelligence Studio to create a selection campaign. For more information about creating selection campaigns, see "Creating a Campaign" on page 123.

To log on to SAS Customer Intelligence Studio, follow these steps:

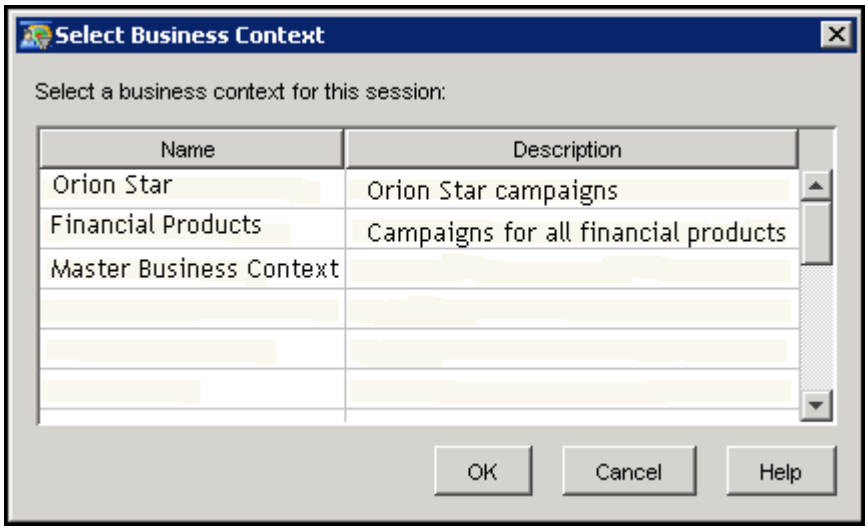
1. Start a SAS Customer Intelligence Studio session by selecting **Programs** ➧ **SAS** ➧ **SAS Marketing Automation** ➧ **SAS Customer Intelligence Studio** from the Start menu.
2. In the Log On - SAS Customer Intelligence Studio window, enter your user ID and password and click **Log On**.



Select a Business Context

To select the business context that you have created, follow these steps:

1. If you have been assigned access permissions to more than one business context in SAS Management Console, the Select Business Context window is displayed after you log on to Customer Intelligence Studio.

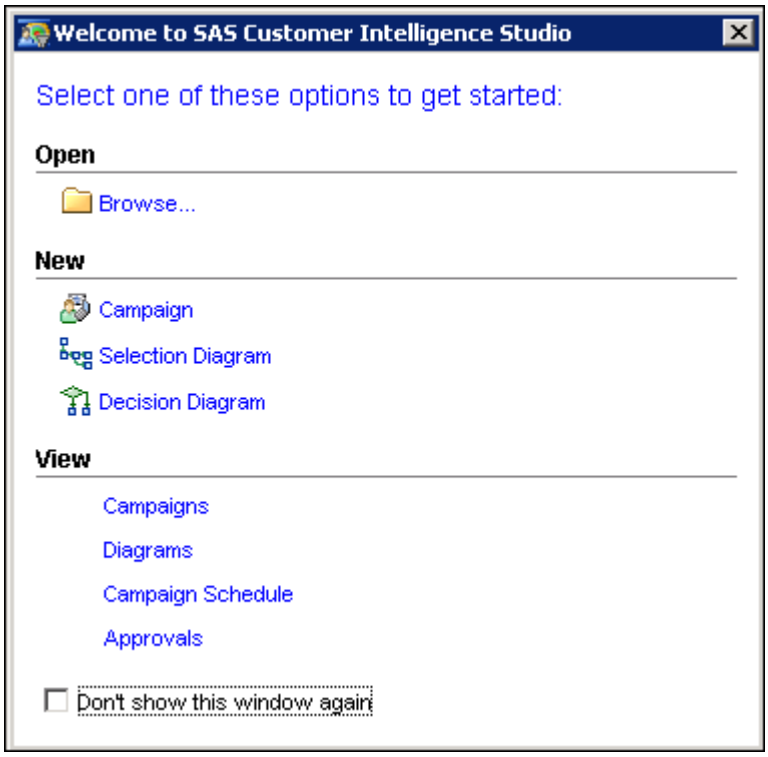


Select **My Business Context**, the business context that you created in the previous section, and click **OK**.

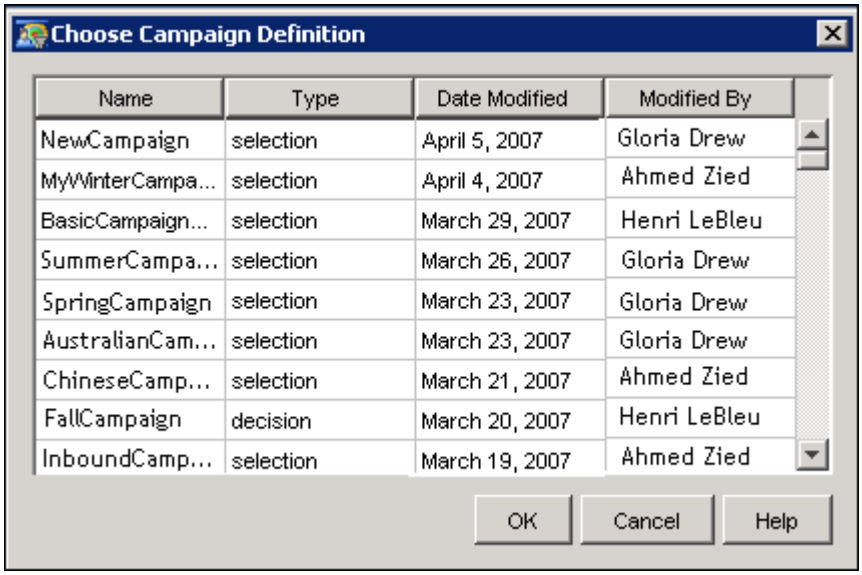
Open a New Campaign

To open a new campaign that uses the selected business context, follow these steps:

1. Click on **Campaign** in the **New** section of the Welcome to SAS Customer Intelligence Studio window.



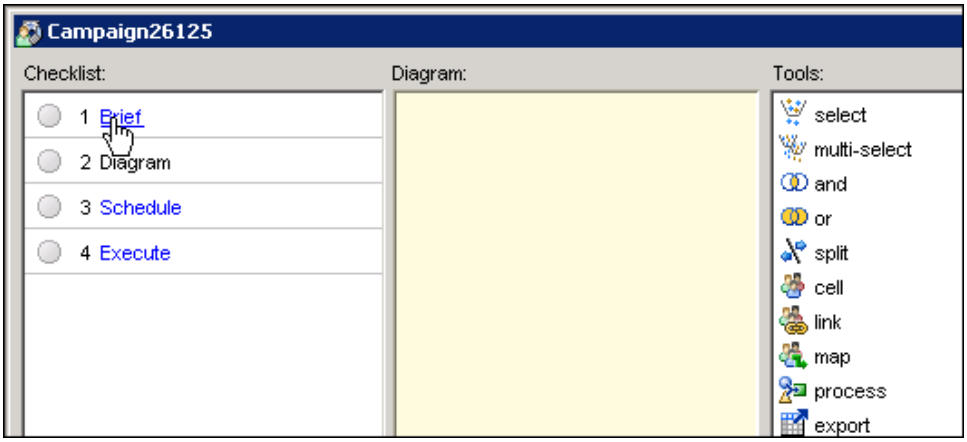
2. In this example, the campaign definition that you created in the previous section is associated by default with the Master Business Context. Select **My Campaign Definition** in the Choose Campaign Definition window and click **OK**.



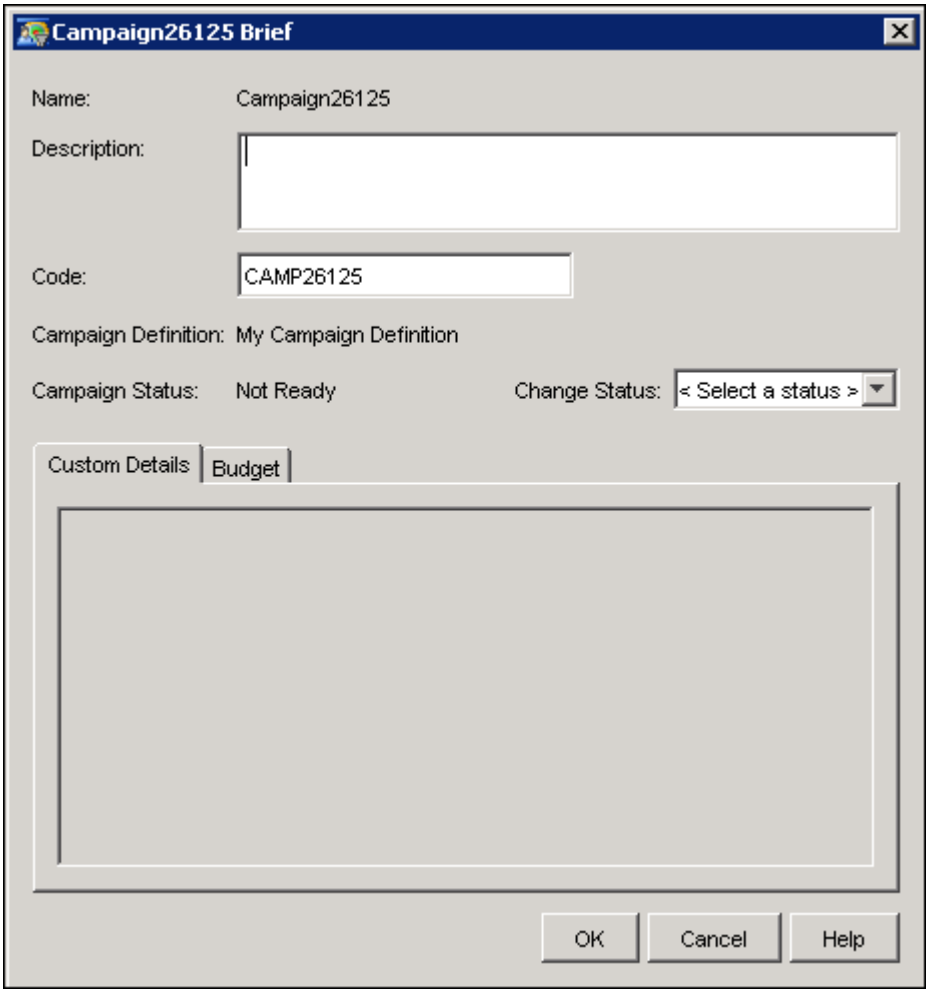
Edit the Campaign Brief

To edit the campaign brief in the new campaign, follow these steps:

1. The new campaign contains the campaign checklist that you specified in the previous section for **My Campaign Definition**. When you create a new campaign, you navigate through the steps in the campaign checklist. Select **Brief** to display the campaign brief.



2. **My Campaign Definition** specifies that a campaign code is automatically supplied for this campaign brief, and that you can edit the campaign code.



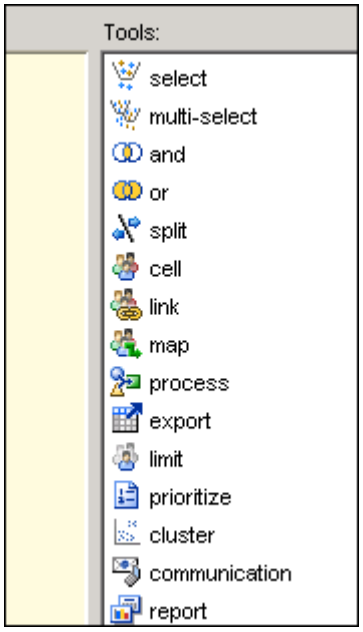
3. Because you have just created this campaign, it is not ready for execution. Select **Not Ready** from the **Change Status** drop-down list.

4. Click **OK** to close and save the campaign brief.

Adding Nodes to the Diagram

In addition to a campaign brief, a campaign contains a diagram that illustrates the process flow of the campaign. A diagram consists of linked nodes that represent groups of customers and the communications that are sent to those customers during a campaign. For more information, see Chapter 6, "Creating Diagrams."

The campaign that you created in the previous section contains a diagram workspace to which you can add nodes. On the right of the campaign workspace is a Tool Palette that you can use to add nodes to the diagram workspace.



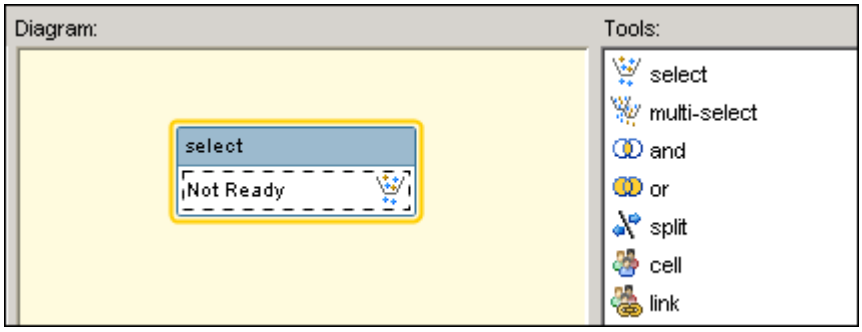
For more information, see Chapter 7, "Creating Nodes."

Add a Select Node

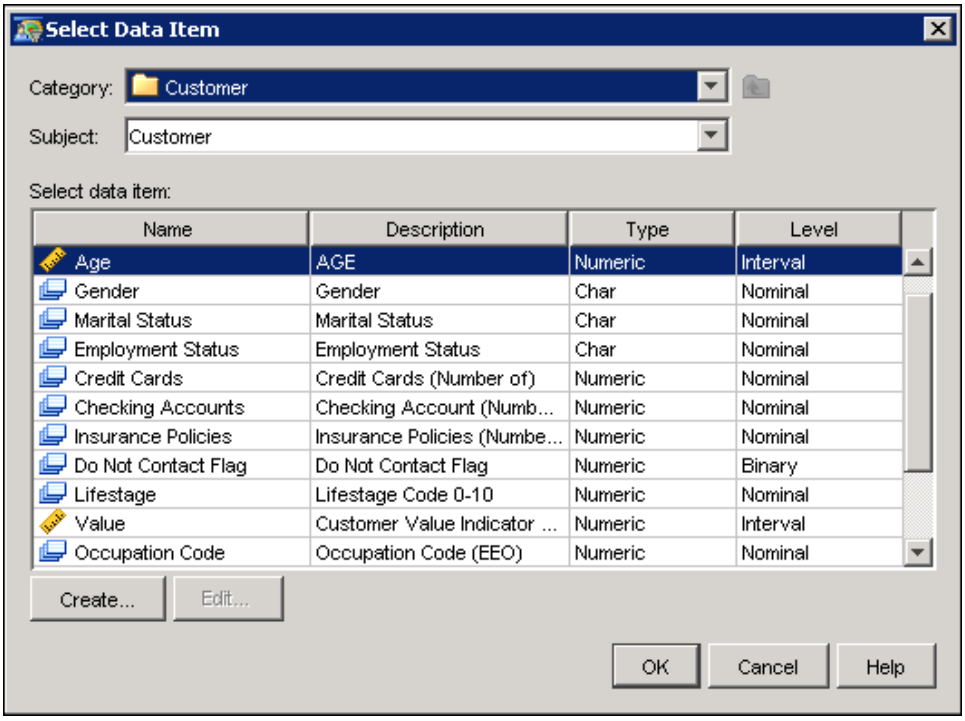
You can use the Select node to select customers based on a single data item. For more information, see "Select Node" on page 160. In this example, low-risk customers are added to the diagram.

To add a Select node to the diagram, follow these steps:

1. Click and drag the **select** tool onto the diagram workspace to create a Select node.



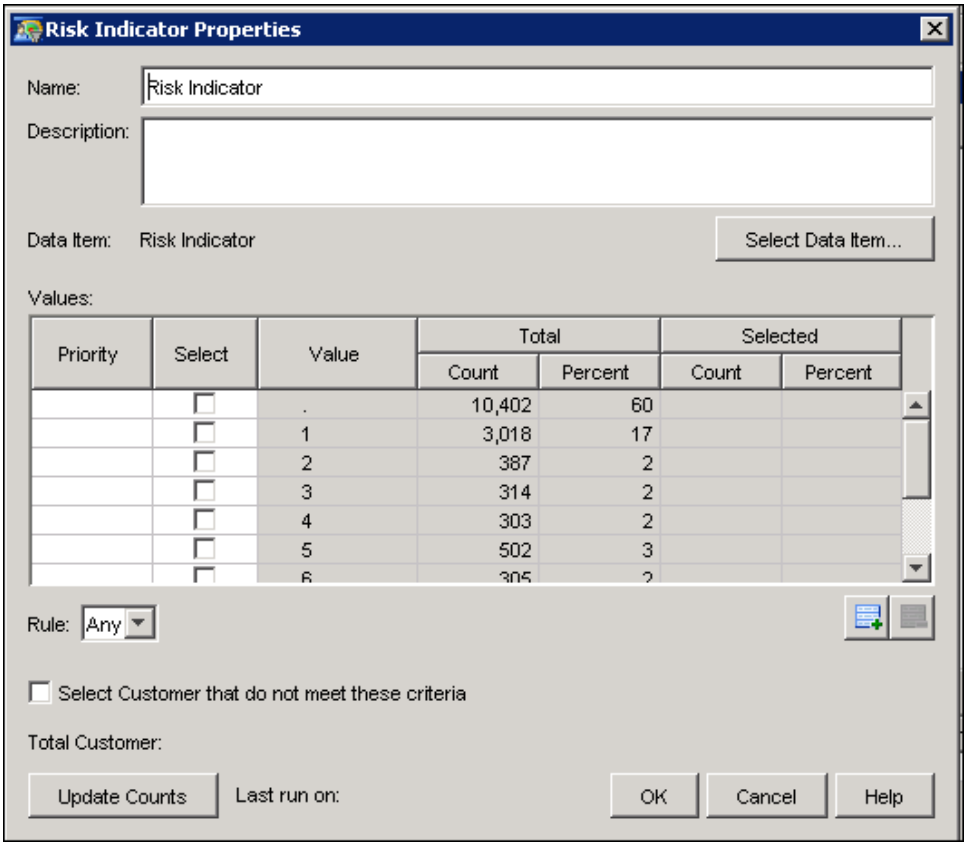
2. Right-click the Select node and select **Properties**. Because no data items have been chosen for this Select node, the Select Data Item window is displayed



In this example, the information map on which the campaign definition is based contains a Customer category with a number of fields such as **Credit Cards**, **Lifestage**, and **Risk Indicator**.

3. This Select node represents low-risk customers. Select **Risk Indicator** and click **OK**.

4. In the Risk Indicator Properties window, you can specify the level of risk.



Type **Low Risk** in the **Name**field.

5. The lowest risk customers have a value of 1. Select the check box next to the cell with a value of 1.

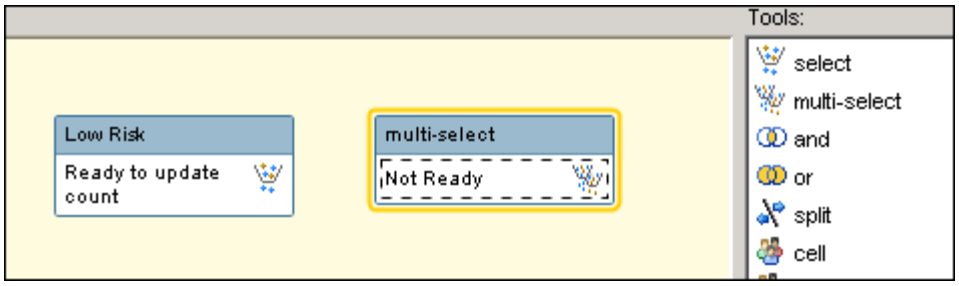
6. Click**OK** to close the window and save your changes to the Select node.

Add a Multi-select Node

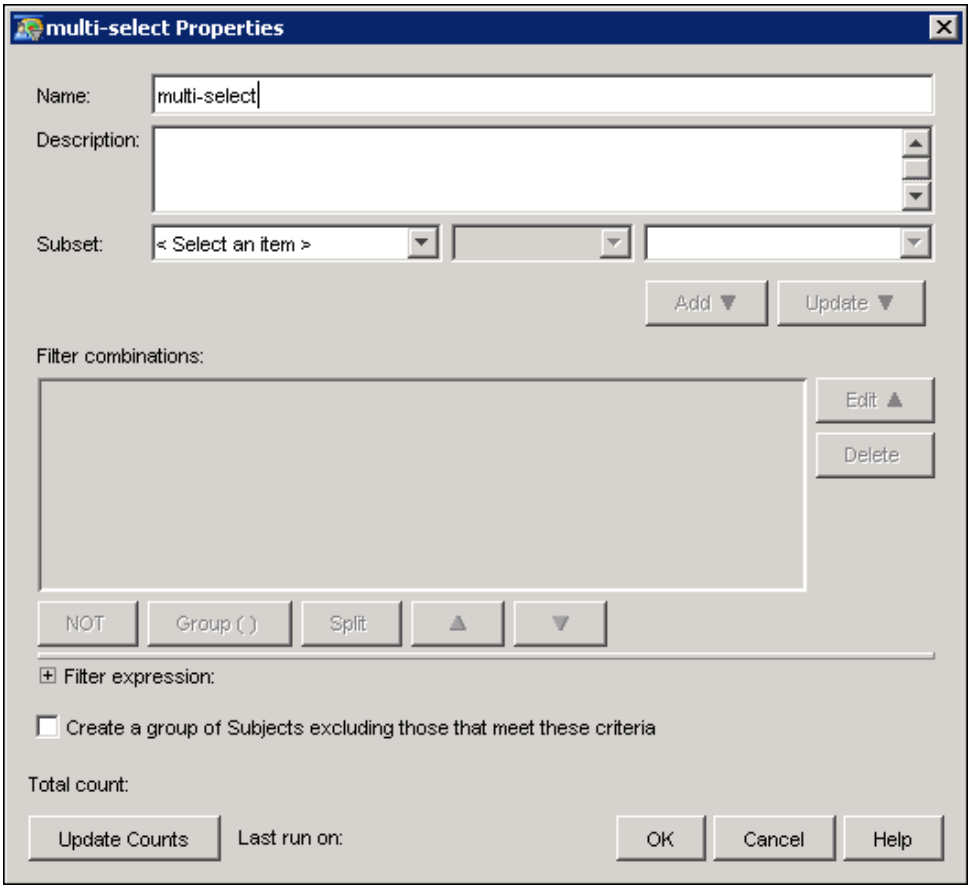
You can use the Multi-select node to select subsets from a number of data items and combine the subsets into a single group. For more information, see “Multi-select Node” on page 178.

In this example, women who work full time and who have credit cards are added to the diagram.

1. Click and drag the **multi-select** tool onto the diagram workspace to create a Multi-select node.



2. Right-click the Multi-select node and select **Properties** to display the Multi-select Node Properties window.



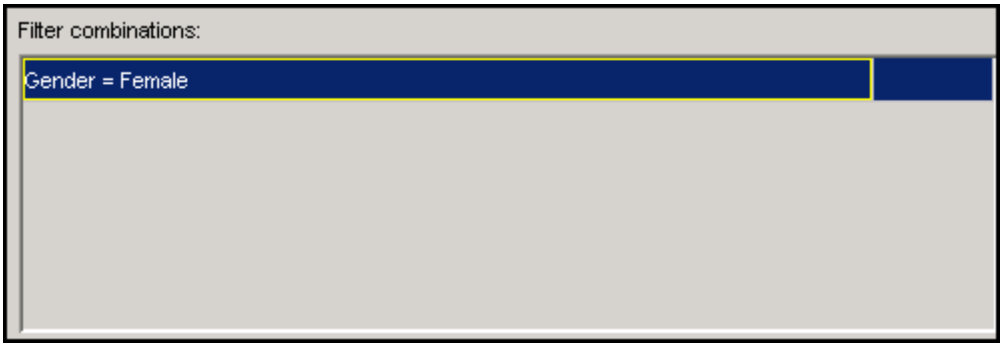
3. This Multi-select node represents women who work full-time and who have credit cards. In the **Name** field, type **Female, full-time, credit**.

4. Select **Data item** from the **Subset** drop-down list.

5. Select **Gender** in the Select Data Item window and click **OK**.

6. Select **Female** from the **Select a value** drop-down list.

7. Click **Add** to add the criterion to the **Filter combinations** area.



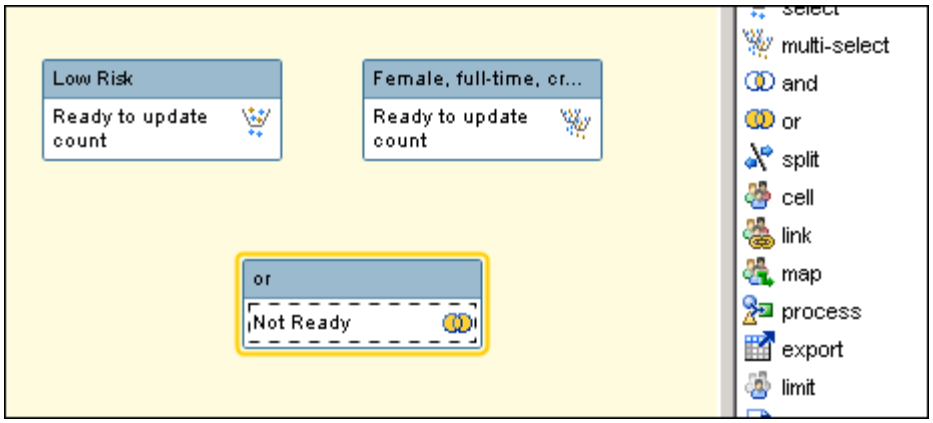
8. Using the same technique, add **Employment status = full-time** and **Credit Cards not= 0** to the **Filter combinations** area.
9. Click **OK** to close the Multi-select Node Properties window and save your changes.

Connect the Nodes

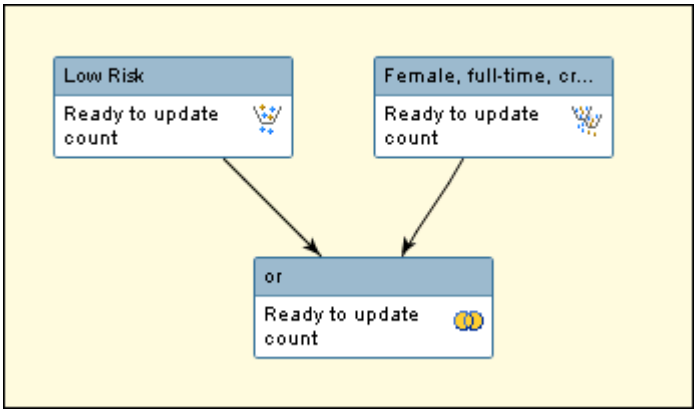
The And and Or nodes enable you to logically combine the criteria from two or more nodes. For more information, see "And and Or Nodes" on page 193.

In this example, the target population fits one of two criteria: they can be either women who work full-time and have credit cards, or they can be low-risk customers.

1. Click and drag the **or** tool onto the diagram workspace to create an Or node.



2. Connect the Select and Multi-select nodes to the Or node by positioning the pointer over the first node. The pointer changes from a cross to a pencil. Select and hold down the left mouse button. Then, drag the pointer to the second node.

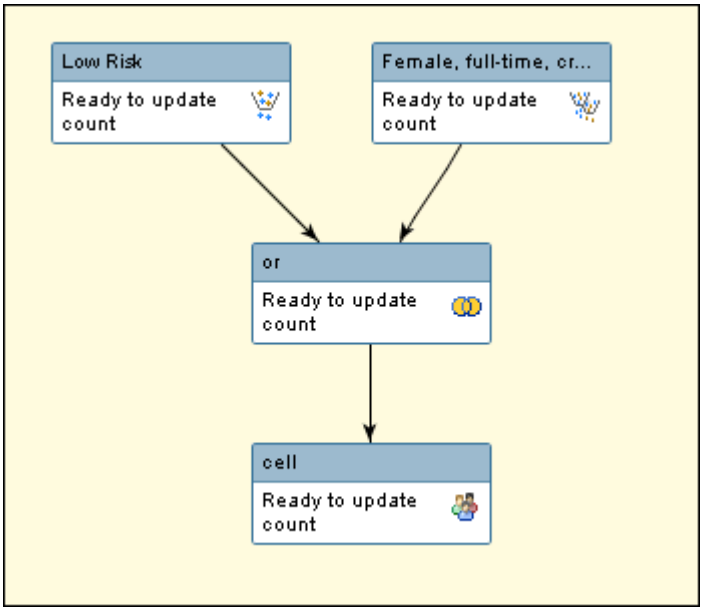


Add a Cell Node

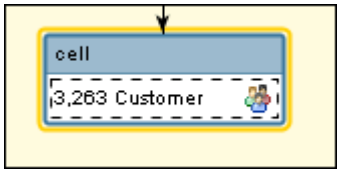
The Cell node summarizes the results of the previous nodes. A Cell node can be linked to by a Communication node. For more information, see "Cell Node" on page 195.

In this example, a cell node is created so that a communication node can be linked to it.

1. Click and drag the **cell** tool onto the diagram workspace to create a Cell node.
2. Connect the Or node to the Cell node.



3. Right-click the Cell node and select **Update Counts** to display the results of the preceding nodes.

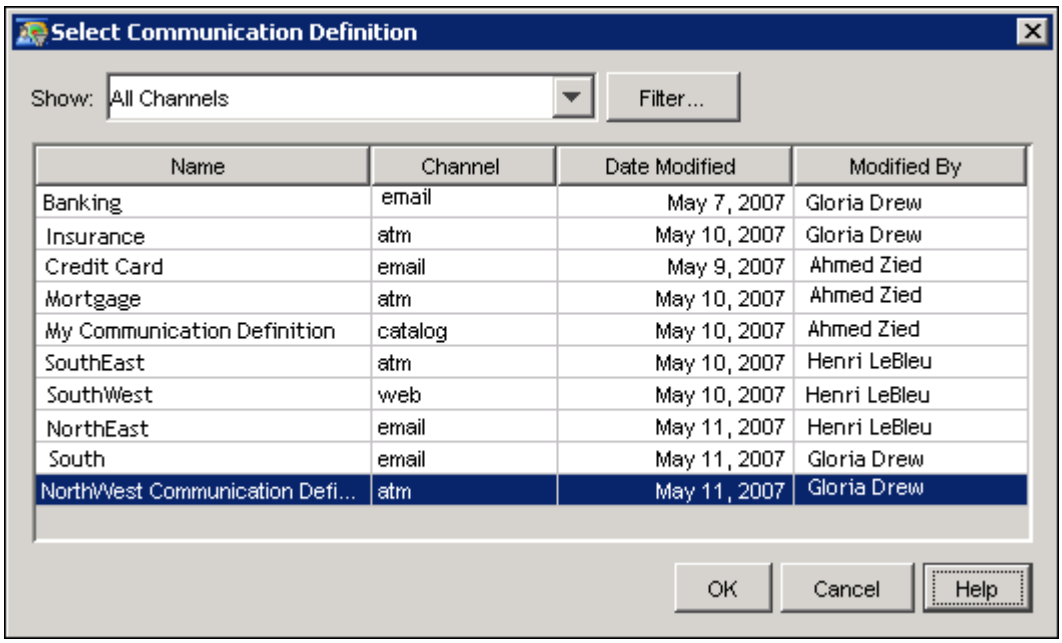


Add a Communication Node

The Communication node specifies the communication that is used to target customers. For more information, see "Communication Node Properties Window" on page 225.

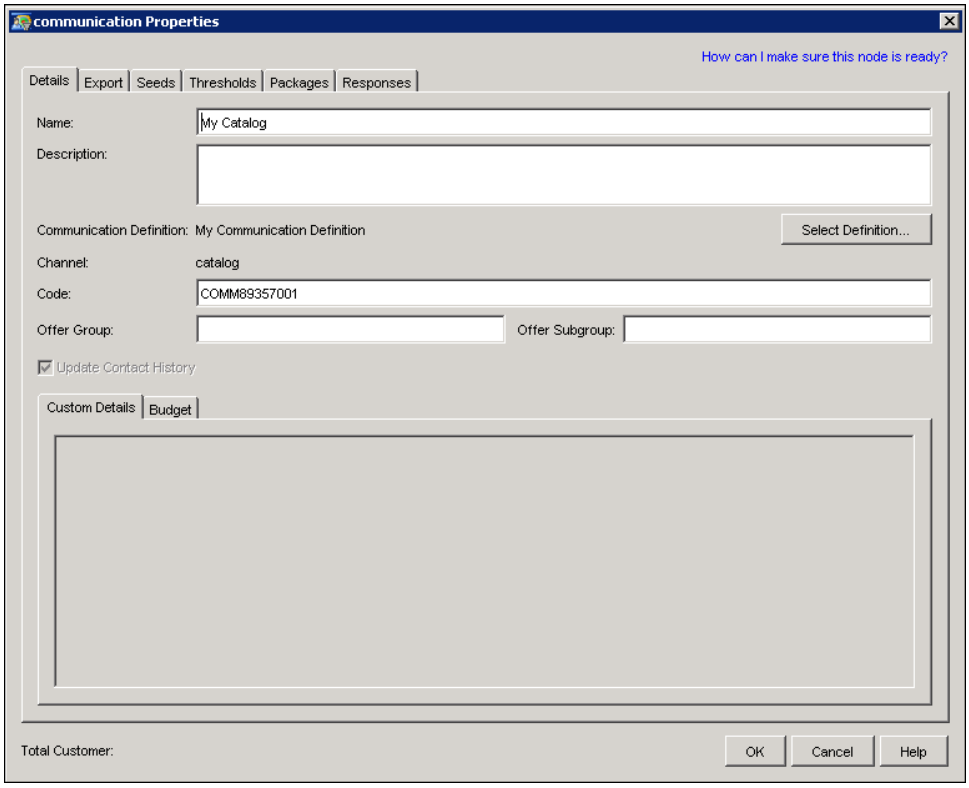
In this example, a catalog will be sent to all of the customers who have met the criteria that are specified in the preceding nodes.

1. Click and drag the **communication** tool onto the diagram workspace to create a Communication node.
2. A Communication node must be preceded by a Cell node. Connect the Cell node to the Communication node.
3. Right-click the Communication node and select **Properties**. The Select Communication Definition window displays a list of communication definitions that are associated with the current business context.

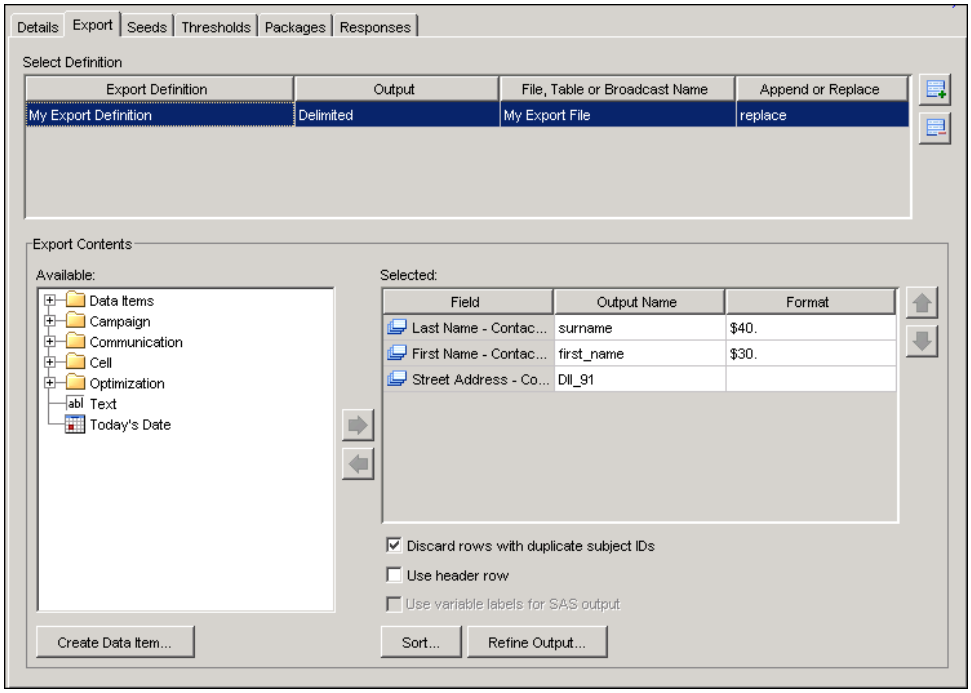


Select **My Communication Definition** and click **OK**. This is the communication definition that you created in the Application Resources plug-in. For more information, see "Create a Communication Definition" on page 16.

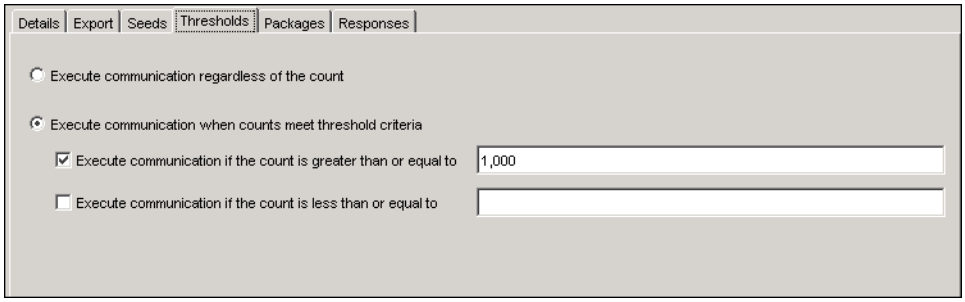
4. After you select a communication definition and click **OK**, the Communication Properties window is displayed. Type **My Catalog** in the **Name** field.



5. Select the Export tab. Note that My Export Definition has been associated with this communication definition. You must designate a destination file or table for the export file. Type **My Export File** in the **File, Broadcast or Table Name** field of the **Select Definition** table.



6. Click the Thresholds tab. Note that the communication will not execute until the audience level is greater than or equal to 1000.



This criterion was set in the communication definition.

7. Click **OK** to close the Properties window.

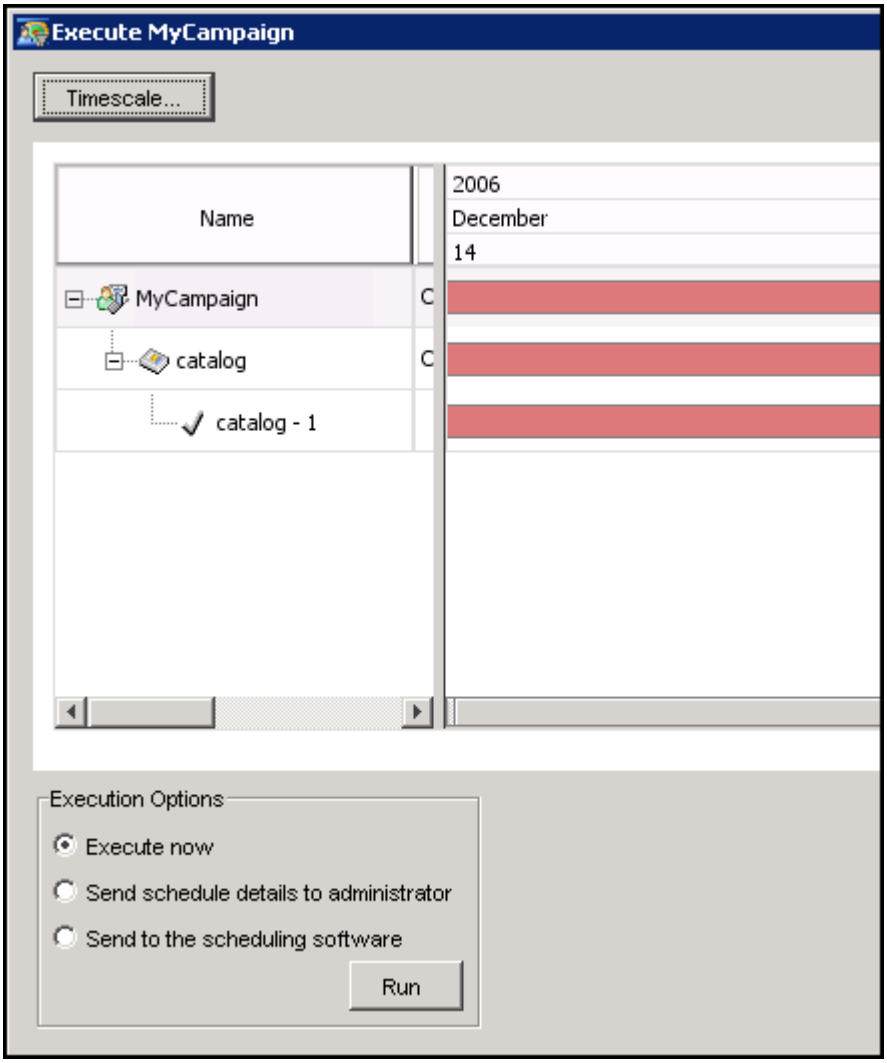
8. Right click the My Catalog node to update the count.

Execute a Communication

When you have created a communication, you can execute the communication immediately or schedule the communication to be executed at a later time. For more information, see Chapter 8, "Scheduling and Executing Communications."

To execute a communication, follow these steps:

1. Select **Execute** in the Campaign Checklist.



2. Select the My Catalog communication.
3. Select **Execute now** and click **Run**.
4. When the communication has finished executing, click **Close**.

5. Verify that the export file was created. The output location is specified in the export definition that was created in "Create an Export Definition" on page 14.
6. In the Campaign Checklist, select **Brief**.
7. Select **Executed** from the **Change Status** drop-down list.

Publish the Campaign

You can publish campaign data to the SAS Customer Intelligence Reporting Data Model. You can then use SAS Web Report Studio to view the data in a report. For more information, see "Publishing Campaigns" on page 278.

To publish the campaign, select **Actions ➧ Publish Reporting Data** from the SAS Customer Intelligence Studio main menu and click **OK** in the dialog box. The report is published to the location that is indicated by the reporting libref that you specified when you created the business context in the Administrative plug-ins in SAS Management Console. For more information, see "Create a Business Context" on page 9.

Chapter 3

Defining and Administering Campaigns

Contents

Overview of SAS Customer Intelligence Plug-Ins **37**
Opening the SAS Customer Intelligence Plug-ins 38
Working with Rows and Columns 39
Application Resources **40**
Creating Campaign Definitions 40
Creating Export Definitions 49
Creating Seeds Lists 54
Defining Communications 57
Showing and Hiding Channels 67
Defining Replies 68
Defining Responses 71
Defining Diagram Tools 73
Defining Global Variables 80
Defining Events and Processes 82
Administration Resources **89**
Setting the Environment 89
Identifying Information Maps 92
Using Campaign Utilities 94
Defining Business Contexts 95
Logging Users Off 104
Optimizing Components 105
Configuring the SAS Digital Marketing Server 107

Overview of SAS Customer Intelligence Plug-Ins

The SAS Customer Intelligence plug-ins for SAS Management Console provide the administrative functions that you use to configure SAS Marketing Automation and SAS Real-Time Decision Manager.

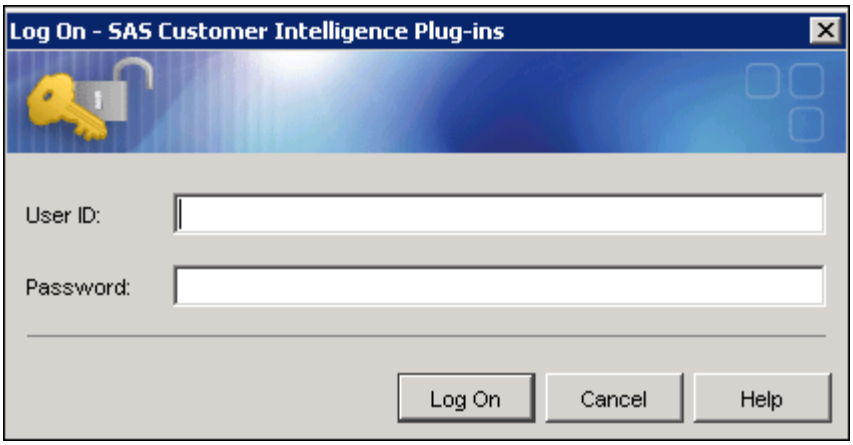
With the SAS Customer Intelligence plug-ins, you can do the following:

- Identify the information maps that structure your campaign data. For more information, see "Identifying Information Maps" on page 92.
- Define campaigns. For more information, see "Creating Campaign Definitions" on page 40.
- Create seeds lists to verify the distribution of your campaigns. For more information, see "Creating Seeds Lists" on page 54.
- Define the type of communications. For more information, see "Defining Communications" on page 57.
- Define the structure and location of exported campaign data. For more information, see "Creating Export Definitions" on page 49.
- Define response codes. For more information, see "Defining Responses" on page 71.
- Select the types of nodes to use in campaign diagrams. For more information, see "Defining Diagram Tools" on page 73.
- Administer security and configure the Customer Intelligence Studio environment. For more information, see "Administration Resources" on page 89.

Opening the SAS Customer Intelligence Plug-ins

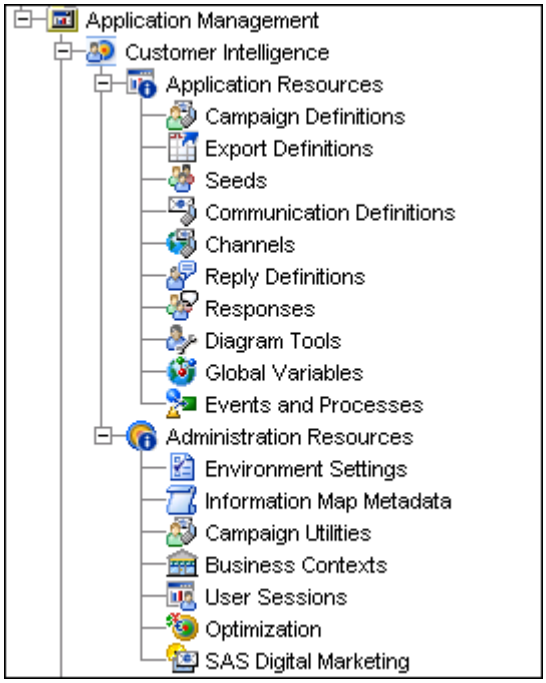
To open the SAS Customer Intelligence plug-ins, take the following steps:

1. Start a SAS Management Console session by selecting **Start** ➧ **All Programs** ➧ **SAS** ➧ **SAS Management Console 9.1**.
2. The navigation tree in SAS Management Console displays the plug-ins in two main categories, Environment Management and Application Management. To access the SAS Customer Intelligence plug-ins, expand the Customer Intelligence branch in the Application Management folder.
3. In the Log On - SAS Customer Intelligence Plug-ins window, enter your user name and password and click **Log On**.



4. The SAS Customer Intelligence plug-ins are divided into two categories: Application Resources and Administration Resources. The Application Resources folder contains the tools you use to define campaign and diagram resources such as communications, replies, responses, and exports. The Administration Resources folder contains the tools to create and manage business contexts, select items for optimization, enhance performance, repair campaigns and diagrams, and configure the SAS Digital Marketing Server.

   Select a plug-in to display the contents in a table at the right of the navigation tree.



Working with Rows and Columns

To sort the rows of a table in alphabetical or chronological order, click the column header that you wish to sort by.

To reposition the columns in the table, click and drag the column headers to their new locations.

To delete a row, select the row and do one of the following:

- Select from the menu **Edit** ➧ **Delete**.
- Right-click the row and select **Delete** from the pop-up menu.
- Press the Delete key.
- Click the Delete icon in the toolbar.

To select more than one row for deletion, press the CTRL key while selecting the rows. To select a range of rows, press the Shift key and select the first and last row in the range.

Application Resources

Creating Campaign Definitions

Use the Campaign Definitions plug-in in the Application Resources folder to make a campaign definition available to users when they create new campaigns in SAS Customer Intelligence Studio. SAS Marketing Automation users can create selection campaigns. SAS Real-Time Decision Manager users can create decision campaigns.

The details that you specify for the campaign definition determine the information that is available to SAS Customer Intelligence Studio users when they create new campaigns.

You use the Campaign Definitions plug-in to perform the following tasks:

- view campaign definitions. For more information see "Viewing Campaign Definitions" on page 41.
- edit campaign definitions. For more information see "Editing Campaign Definitions" on page 41.
- create new campaign definitions. For more information see "Creating New Campaign Definitions" on page 41.

NOTE: If you delete a campaign definition, any user-defined fields that are part of that definition will be unavailable for export within the campaign.

Viewing Campaign Definitions

When you select the Campaign Definitions plug-in from the Application Resources folder, the display area shows the campaign definitions that have been created and their properties: the name of the definition (**Name**), the user ID of the person who recently modified the definition (**Modified By**), and the most recent date on which the definition was modified (**Date Modified**).

Editing Campaign Definitions

To edit the contents of an existing campaign definition, follow these steps:

1. Select the campaign definition in the display area.
2. Right-click the campaign definition and select **Properties**. Depending on the type of campaign definition that you have selected, the Selection Campaign Definition Configuration window or the Decision Campaign Definition Configuration window opens. For more information, see "Campaign Definition Configuration Window" on page 41.

NOTE: After an association has been made to a campaign in Customer Intelligence Studio, further changes to a campaign definition are not reflected in the campaign in which the definition is used.

Duplicating Campaign Definitions

To duplicate an existing campaign definition, follow these steps:

1. Select the campaign definition in the display area.
2. Right-click the campaign definition and select **Duplicate**. A copy of the campaign definition named **Copy of *definition name*** is added to the list of campaign definitions.

Creating New Campaign Definitions

To create a new campaign definition, select the Campaign Definition plug-in and use one of the following ways to open the Campaign Definition Configuration window.

- Select from the menu **Actions** ➡ **New Selection Definition** or **New Decision Definition**.
- Right-click the Campaign Definitions plug-in or a campaign definition in the display area and select **New Selection Definition** or **New Decision Definition**.

Campaign Definition Configuration Window

The Campaign Definition Configuration window displays the details of a campaign definition. Use this window to name the campaign definition and to select the checklist items that are included in a campaign definition and that provide necessary details for the campaign definition.

Valid characters for campaign names are alphanumeric characters, numerals, underscores, blank spaces, and periods.

To include a checklist item in a campaign definition, select the corresponding check box. The selected items are numbered sequentially, based on the order in which they are listed in this window. The numbered items represent the steps that you complete when you create a campaign.

Each of these items corresponds to a row in the Campaign Definition Configuration window. You can perform the following tasks:

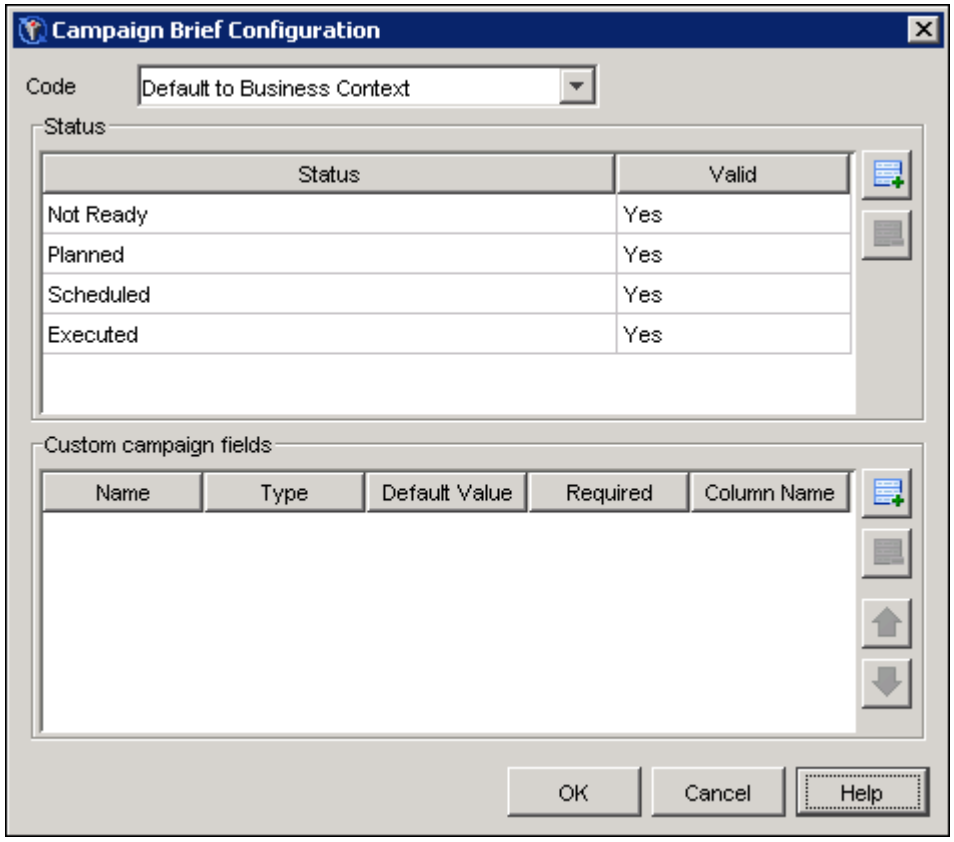
- To add an item, click and specify a name for the section.
- To delete an item, select the item and click .
- To move an item down or up one row, select the item and click or .
- To display and to specify the name and other properties of the user-defined fields for an item, select the corresponding down arrow, such as . See “Working with Fields” on page 45 for more information.

To configure the appearance and functionality of the Campaign Brief window in SAS Customer Intelligence Studio, click **Brief**. For more information, see “Campaign Brief Configuration Window” on page 42.

To assign campaign approval permissions to SAS Customer Intelligence Studio users, click **Approve**. For more information, see “Approval Configuration Window” on page 44.

Campaign Brief Configuration Window

In the Campaign Brief Configuration window, you configure the appearance and functionality of the Campaign Brief window in SAS Customer Intelligence Studio.



The Campaign Brief Configuration window contains the following sections:

Code

Use the drop-down list to specify the following options:

Automatic - Editable

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

Automatic - Not Editable

The code is automatically generated and cannot be edited.

Manual - Editable

The code is supplied manually by the Customer Intelligence Studio user.

Default to Business Context

The code settings default to the settings in the Codes tab for the current business context.

Status

Use the **Status** column to specify the campaign statuses that are available for this campaign definition. You cannot edit these names.

Here is a list of the system-defined names for status for decision campaigns:

- Not Ready
- Planned

Here is a list of the system-defined names for selection campaigns:

- Not Ready
- Planned
- Scheduled
- Executed

In the **Valid** column, specify whether a status is valid for all the campaigns that use this campaign definition. Only valid statuses are displayed in the **Change Status** drop-down list for the campaign in Customer Intelligence Studio.

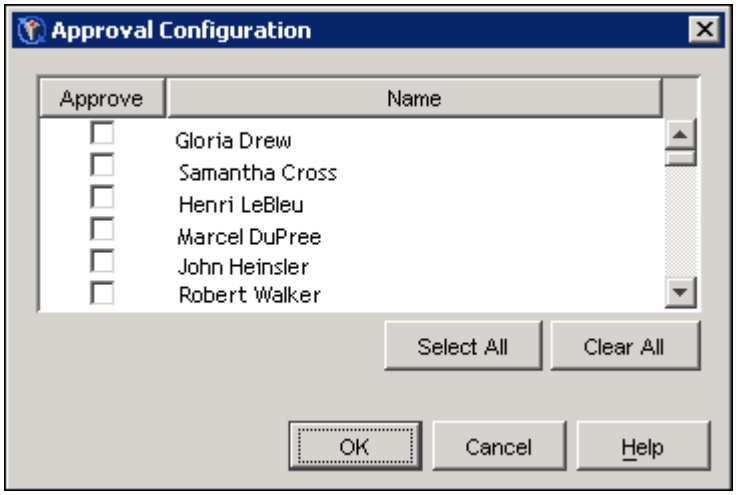
Click to add a custom status.

Custom campaign fields

Use this section to specify the name and properties of the custom fields for a campaign. See "Working with Fields" on page 45 for more information.

Approval Configuration Window

In the Approval Configuration window, you assign approval permissions to users of the campaign definition in Customer Intelligence Studio.



The campaign cannot be executed until it has been approved by one of the users whose name is selected in this window.

To assign approval permissions to one or more users, click the **Approve** box next to the user's name. Click **Select All** to select all of the user names that are listed in the window. Click **Clear All** to delete approval permissions for all of the user names that are listed in the window. Click **OK** to close the window and save your changes.

You can designate an "approvers group" that contains users who have approval permissions for a campaign definition. Group names are displayed in boldface. Users who have approval permissions for a campaign definition must also have view permissions for the business context that includes the campaign definition, or they will not be able to view the campaign. For information about assigning

users to a business context, see "Creating, Editing, or Viewing a Business Context" on page 96.

Working with Fields

To add a user-defined or custom field to a definition, follow these steps:

1. Click to add a row to a table.
2. In the **Name** column, specify a name for the field.
3. In the **Type** column, specify the type for the field by choosing a value from the drop-down list. Possible values are Numeric, Date, Text, Checkbox, List, and Link.
4. In the **Default Value** column, specify a default value for the field, based on the type of the field. Here is a list of the values that you can specify for different types of fields.

Type of Field	Default Value Column
Numeric or Text	Enter a numeric or character value.
Date	Click the Calendar icon and choose a date or enter a valid date. If you enter an invalid date, the field will display a previously entered valid date, or, if there is no previously entered date, a blank cell.
Checkbox	Select **Unchecked** or **Checked** from the drop-down list.
List	Click the Ellipsis icon and create a list of values in the Edit List window. The list must contain at least one value. For more information, see "Edit List Window" on page 45.
Link	Click the Ellipsis icon and create a link in the Edit Link window. For more information, see "Edit Link Window" on page 48.

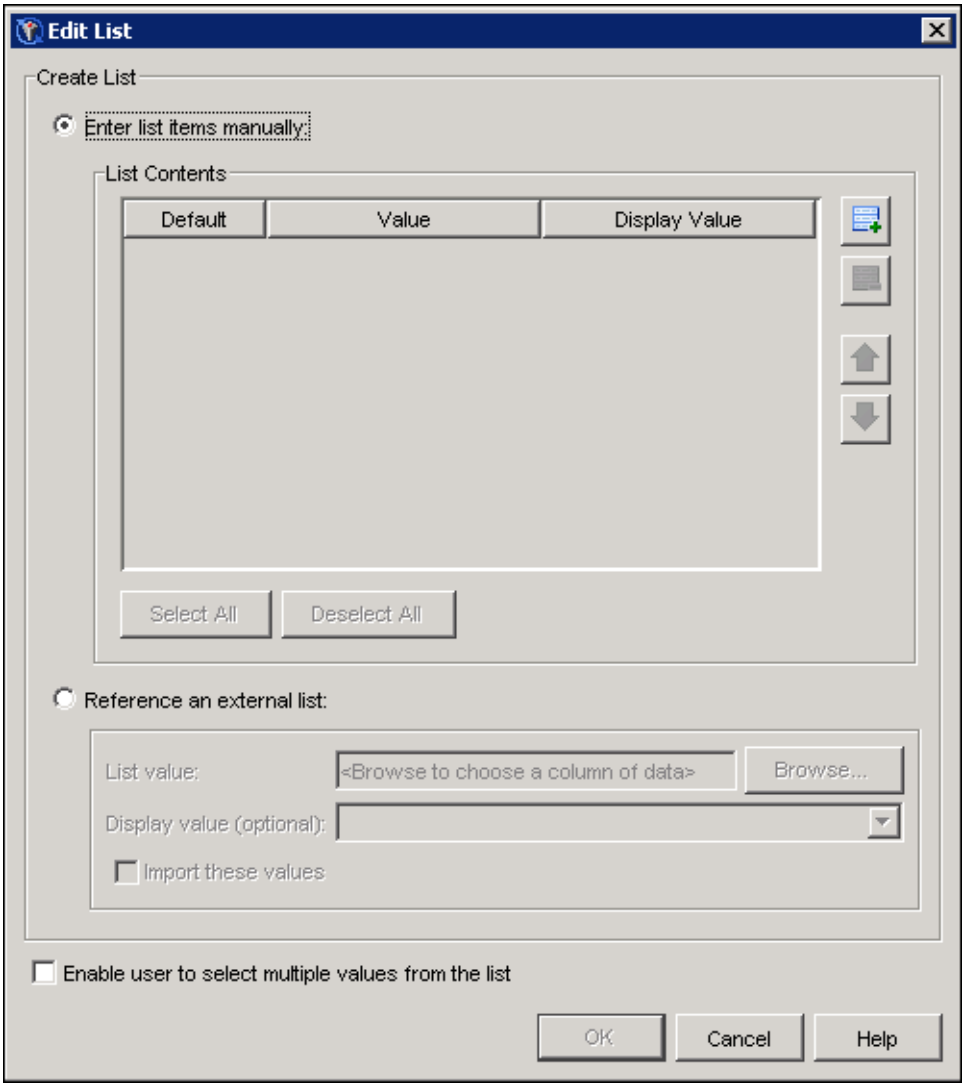
5. In the **Required** column, specify whether a value is required or optional for the field. Select **Yes** if a value is required, and **No** if a value is optional. If **Required** is set to **No**, the word **Optional** is displayed next to the field in Campaign Studio. You can execute campaigns in Customer Intelligence Studio without completing required used-defined fields.

To delete a row, select the field and click .

To move a field up or down one row, select a field and click or .

Edit List Window

In the Edit List window, you manage a list of values that are available in a user-defined drop-down list. You can specify the order in which to display these values and you can specify a default value for the drop-down list. You can add list items manually or include items from an external list. You can also allow the SAS Customer Intelligence Studio user to select more than one value from a list.



To manually add a value to the list, follow these steps:

1. Select **Enter list items manually**. This option is selected by default.
2. Click to add a row to the **List Contents** table.
3. Type the name of the list item in the **Value** column.
4. To display text other than the name of the list item in SAS Customer Intelligence Studio or SAS Campaign Web Studio, type a value in the **Display Value** column.
5. To display a list item by default in SAS Customer Intelligence Studio, select the **Default** check box in the **Default** column.
6. To select all of the list items in the **Default** column at the same time, enable the **Select All** button by selecting the check box next to **Allow user to select multiple values from the list**. This check box is located near the bottom of the **Edit List** window.

7. To move an item up or down in the list, select the item and select and .
8. To remove an item from the list, select the item and click .

To include items from an external list, follow these steps:

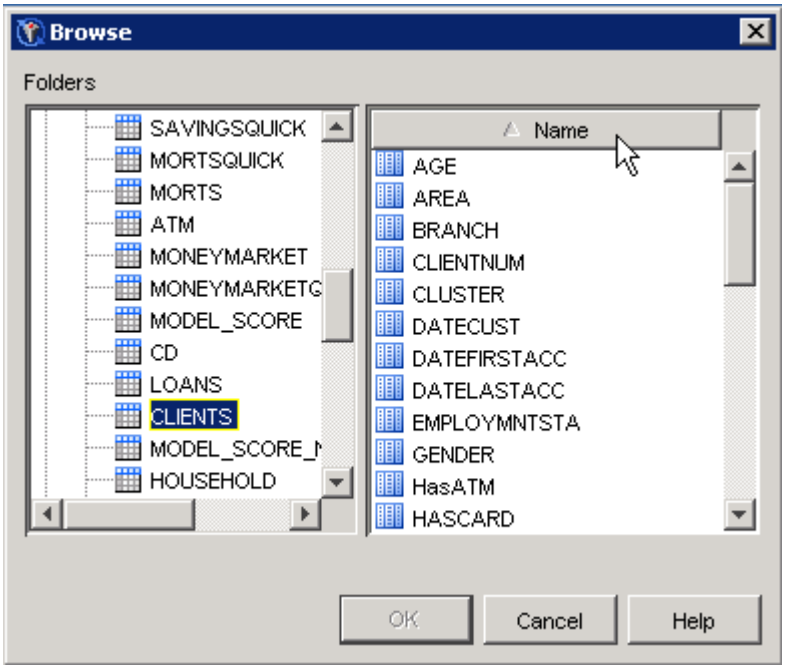
1. Select **Reference an external list**.
2. Click **Browse** to select a column name from the Browse window. The Browse window displays the libraries that are available in the current repository. For more information, see "Browse Window" on page 47.
3. To display a value other than the text in the **List Value** field, select the value from the **Display Value** drop-down list.
4. To import the list values once, rather than dynamically referring to the values at runtime, select **Import these values**.

To enable a user to select more than one value from a list, select **Allow user to select multiple values from list.**

Click **OK** to close the Edit List window and save your changes.

Browse Window

The Browse window displays the contents of the libraries and database schemes that are available in the current repository.



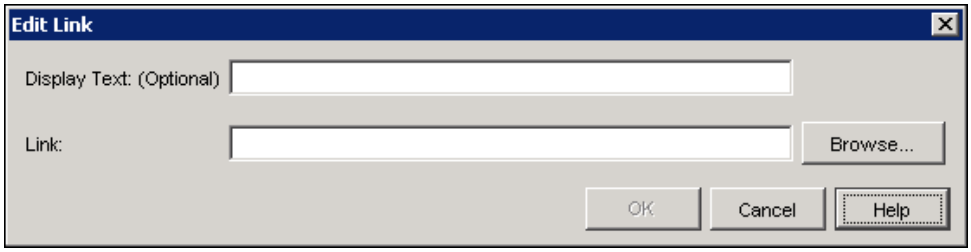
From the Browse window, you can select a column that contains the values for use in the Edit List window or the Treatments tab of the Business Contexts plug-in. For more information, see "Edit List Window" on page 45 and "Treatments Tab" on page 103.

To select a column, follow these steps:

1. Expand a library or a database schema in the Folders pane.
2. Select a data table.
3. Select a column name from the **Name** column. **NOTE:** To sort the **Name** column in ascending order, click the title bar of the **Name** column. To sort the column in descending order, click the title bar again.
4. Click **OK** to add the contents of the column to the Edit List window or Treatments tab.

Edit Link Window

In the Edit Link window, you create a link to an external file such as a spreadsheet or Microsoft Word document.



Type a link in the **Link** field or click **Browse** to select the file in the file system that you want to link to. The link can take one of the following forms:

- a valid URL, for example, **http://www.sas.com**
- the pathname of a file on a local machine, for example, **c:\manuals\sashowto.pdf**
- the pathname of a file on a network, for example, **\\myserver\docs\report.doc**.

You may also supply the **Display Text** value that is displayed in the **Default Value** field in the Campaign Brief Configuration window, on the Custom Details tab of the Communication Definition window, and in the user-defined steps of the campaign definition. There are no restrictions on the length of the display text or the use of special characters.

If you do not supply display text, the value in the **Link** field is displayed.

Creating Export Definitions

Use the Export Definitions plug-in in the Application Resources folder to create, edit, and delete export definitions.

Creating New Export Definitions

To create a new export definition, select the Export Definitions plug-in in the navigation tree of SAS Management Console and use one of the following ways to open the Export Definition window.

- Select from the menu **Actions** ➧ **New Definition**.
- Right-click the Export Definition plug-in and select **New Definition** to display the Export Definition window. For more information, see "Export Definition Window" on page 50.

Duplicating Export Definitions

To duplicate an existing export definition, follow these steps:

1. Select the export definition in the display area.
2. Right-click the export definition and select **Duplicate** to display the Export Definition window. For more information, see "Export Definition Window" on page 50.

NOTE: If you change the information map on which the duplicate export definition is based, data items that are not included in the new information map or that are stored in different folders from the original data items will be removed from the export definition.

Deleting Export Definitions

To delete an existing export definition, follow these steps:

1. Select the export definition in the display area.
2. Right-click the export definition and select **Delete**.

Modifying Export Definitions

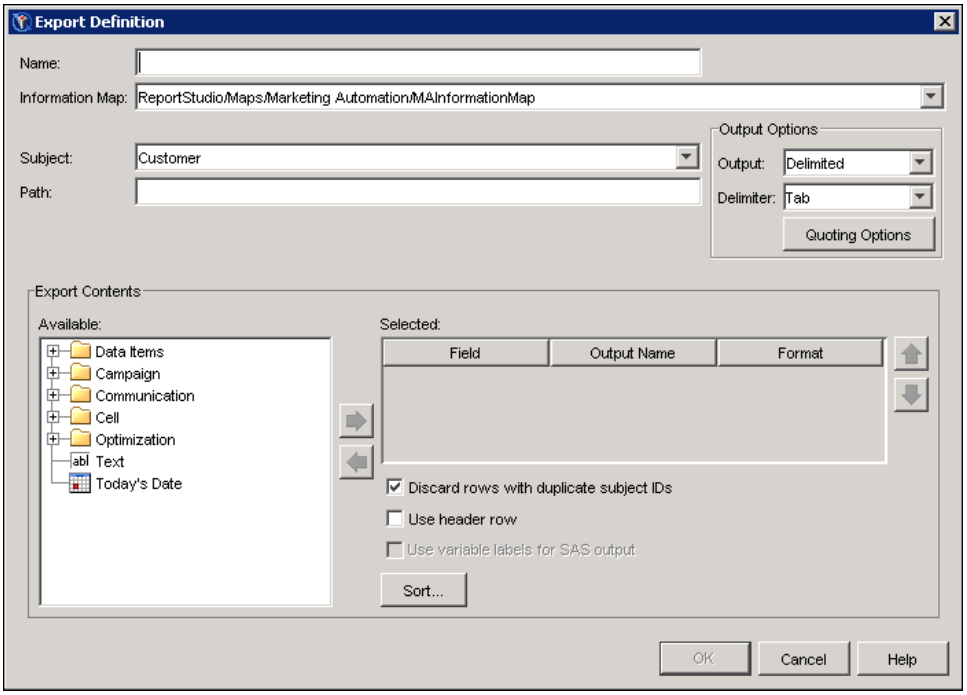
To edit the contents of an existing export definition, follow these steps:

1. Select the export definition in the display area.

2. Right-click the export definition and select **Properties** to display the Export Definition window. For more information, see "Export Definition Window" on page 50.

NOTE: After an association has been made to a campaign, further changes to an export definition are not reflected in the campaign in which the definition is used.

Export Definition Window



In the Export Definition window, you specify the details for an export definition. The following details are included in an export definition:

Name
the name of the export definition.

Information Map
the information map that is associated with the export definition.

Subject
the type of record to export. The values will be the subjects that are defined in the information map.

Output
the type of files to be created and exported, such as Delimited, Microsoft Excel, Table, Positional File, SAS Dataset, XML, and SAS Digital Marketing.

Delimiter
the delimiter that is used in a Delimited file. If you select **Delimited** as the output, you can select **Tab**, **Comma**, or **Space** from the **Delimiter** drop-down list; **Tab** is selected by default.

You can also type a delimiter in the **Delimiter** field; you cannot type a double quotation mark or a tab character. Do not use a colon or a single quotation mark as delimiters.

Quoting Options
the method of determining how values are quoted in the export file. For more information, see "Delimiter Window" on page 52.

Path
the path or libref for the output location. If you select **Table** or **SAS Dataset** from the **Output** drop-down list, the **Path** box is changed to **Libname**. If you select **SAS Digital Marketing**, the libname is supplied. The libname is specified when you configure the SAS Digital Marketing server. For more information, see "Configuring the SAS Digital Marketing Server" on page 107.

The Selected table displays the properties of the data to be exported. To add items to the table, take the following steps:

1. Expand the folders in the **Available** tree hierarchy. The contents of the hierarchy depend on the information map that you have selected. The hierarchy 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 will be removed from the **Selected** table if the names, variable IDs, or subject IDs differ from those in the underlying information map.
   - Campaign and Communication folders contain the set of standard fields that are associated with campaign and communication definitions. Also displayed are user-defined fields that are associated with individual campaign definitions and communication definitions that are unattached to an export definition or that use an export definition that is based on the same information map.
   - The Cell folder contains fields for cell properties, such as Code, Description, and Name.
   - The Optimization folder contains fields to be used in association with SAS Marketing Optimization.
   - The Text item adds a text column that has the default name of Text*n*. 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.

2. Double-click an item or select an item and click the right arrow ( ) to add the item to the Selected table. Each row in that table defines a column in the export file. Hold down the Shift or CTRL keys to select more than one item. Select a folder to select all of the contents of the folder. To delete an item from the selected table, select the item and click the left arrow ( ).

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

SUBJECT_ID*n*
the unique identifier of each recipient. Additional identifiers may 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.

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.

EMAIL
the e-mail address 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. If you change information maps, and the new information map does not contain the fields in the Selected table, the Invalid Items window is displayed. For more information, see "Invalid Items Window" on page 53.

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

To use the Output Name as the column header in the export file, select the **Use header row** check box. This check box is dimmed and unavailable if the export type is Table, SAS Dataset, XML, or Microsoft Excel.

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

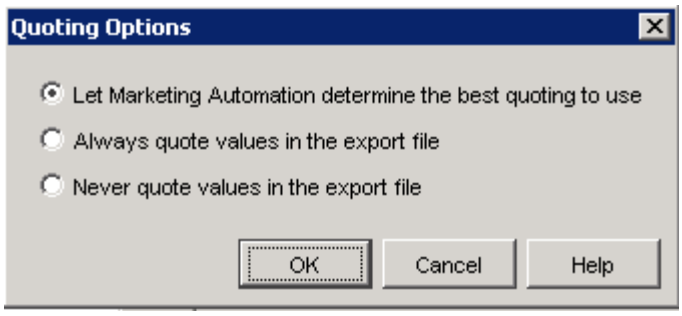
You can enter the contents of the **Position** column of export files that are the Positional File output type. Every row must have a position, the position must be numeric, and there can be no duplicate positions. You can also add and delete rows as well as change the order of the rows.

If an output type of Table, SAS Dataset, 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.
- The name must start with a letter.
- The name must contain only letters, numbers, and underscores.
- The name must be unique.

Delimiter Window

To specify whether or not values are enclosed in quotation marks in the export file, click **Quoting Options** in the Export Definition window.



You can select one of the following options:

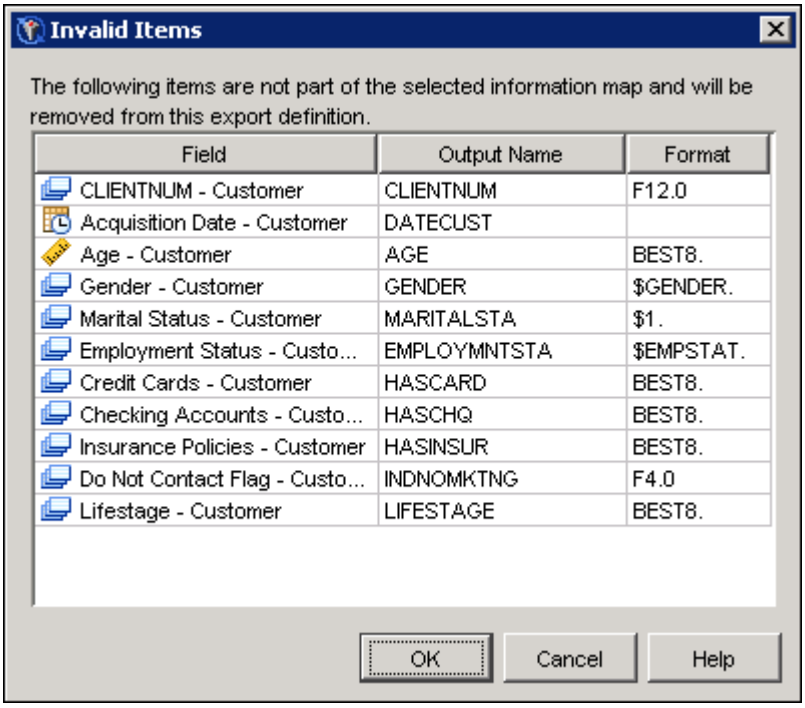
- **Let Marketing Automation determine the best quoting to use** specifies that SAS Marketing Automation will apply quotation marks as specified by the values in the export file. This option is recommended.
- **Always quote values in the export file** specifies that SAS Marketing will apply quotation marks to all of the values in the export file.
- **Never quote values in the export file** specifies that SAS Marketing Automation will not apply quotation marks to the values in the export file. **NOTE:** Do not select this option if you have selected a delimiter that occurs in the data that is being exported.

Sort Order Window

The Sort Order window opens when you click **Sort** on the Fields tab of the Export Definitions window. In the Sort Order window, the data items are displayed in a table. To specify the order of the data items, select a data item and click the arrow buttons. To specify the order of values within data items, select **None**, **Ascending**, or **Descending** from the drop-down list in the **Order** column. By default, all sort orders are set to **None**.

Invalid Items Window

The Invalid Items window is displayed when you select an information map that does not contain the fields listed in the Selected table of the Export Definition window.



Click **OK** to delete the listed fields from the export definition, or click **Cancel** to return to the Export Definition window and select an information map that contains the listed fields.

Creating Seeds Lists

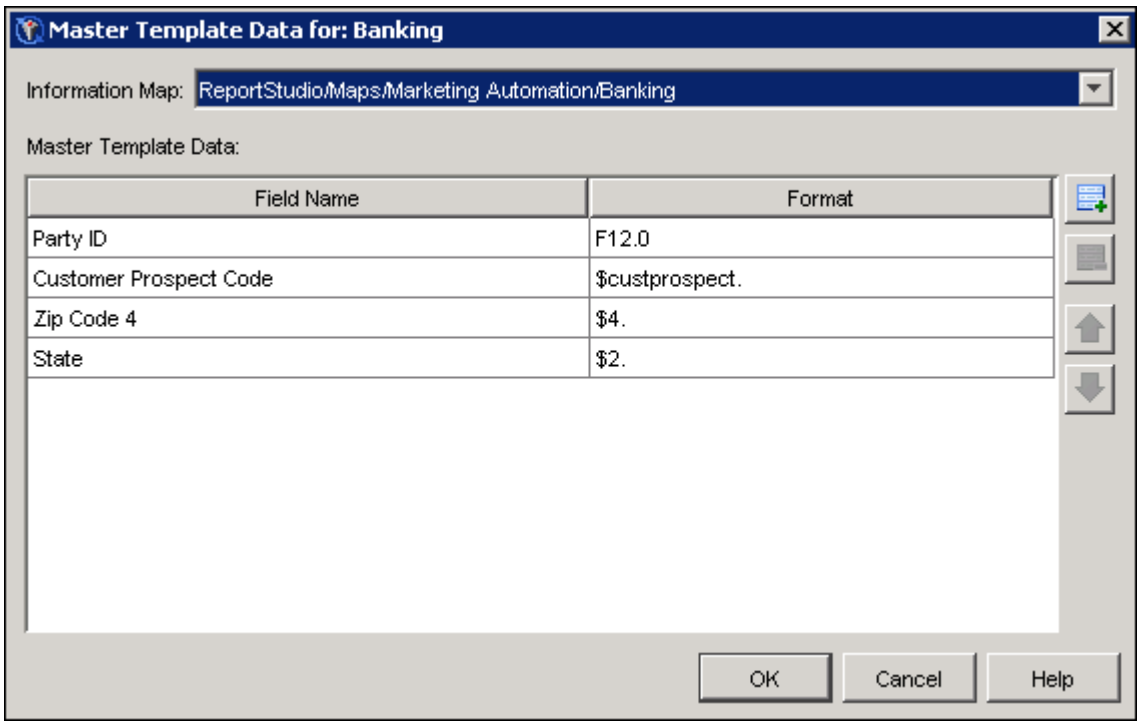
The Seeds plug-in in the Application Resources folder enables you to create and edit seeds lists. Before you can create a seeds list, you must define a master template from which the seeds list is created. To create a master template, either right-click the Seeds plug-in icon and select **Define Master Template** from the pop-up menu, or choose **Actions** ➧ **Define Master Template** from the main menu to display the Edit Master Seeds Template window. For more information, see "Master Template Data Window" on page 54.

To create a seeds list, either right-click the Seeds plug-in and choose **New Seed List** from the pop-up menu or choose **New Seed List** from the main menu.

To edit an existing seeds list, right-click the seed and select **Properties** from the pop-up menu. For more information about editing seeds lists, see "Seed Data Window" on page 55.

Master Template Data Window

The Master Template Data for: *<information map>* window enables you to map the seed data onto variables found in the information map.



Select an information map from the **Information Map** drop-down list. You can define one master template per information map.

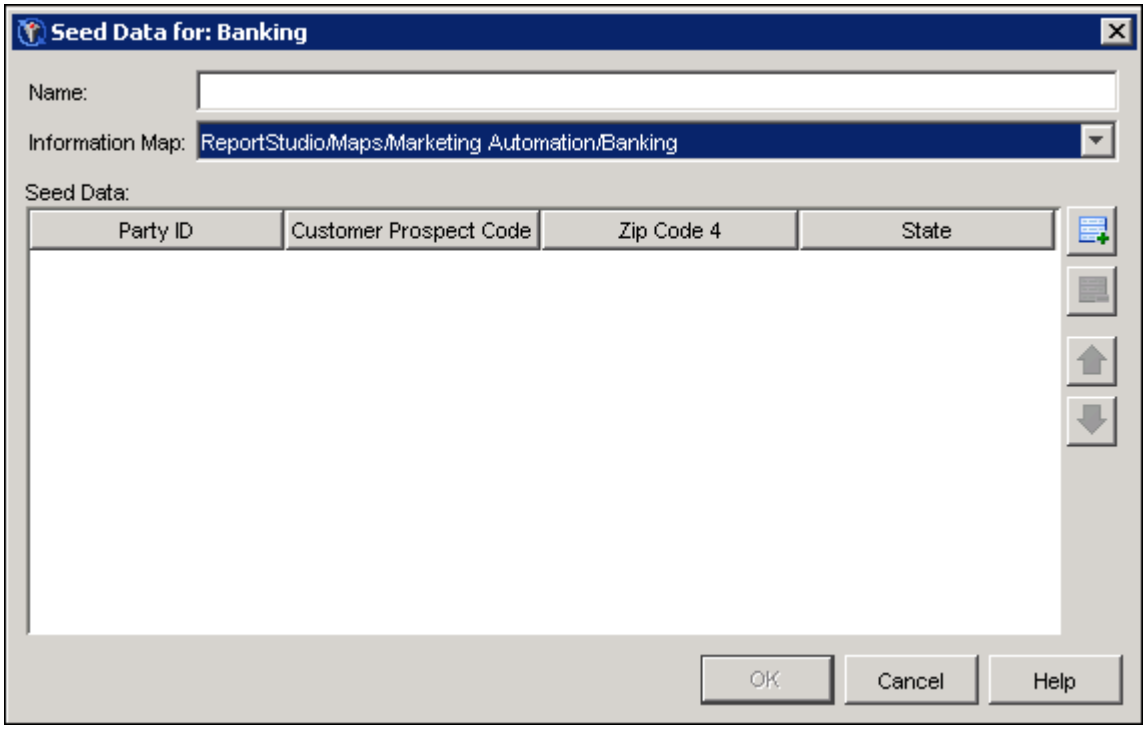
The **Information Map** drop-down list contains all of the information maps that have been defined for the system. To add an information map to the list, create a new business context and supply a valid folder and pathname to the information map. For more information about creating business contexts, see "Defining Business Contexts" on page 95.

When you select a cell in the **Field Name** column, an ellipsis button appears. Click the button to open the Choose Data Item window, with which you can select the fields to include in the seeds list. You can format the fields by specifying formats in the **Format** column. For more information, see "Choose Data Item Window" on page 56.

NOTE: If you change the template and then select a new information map, a dialog box will notify you that you will lose the changes that you have made to the template. Click **OK** to close the window and save your changes, or click **Cancel** to close the window without saving your changes.

Seed Data Window

Use the Seed Data for: *<information map>* window to create and edit seed lists. You can create more than one seeds list per information map.



If a master template has not been defined for any information map, you will not be able to create a seeds list.

Type a name for the new seeds list in the **Name** field. Select the correct information map from the **Information Map** drop-down list to display the appropriate master template.

Click the **Add row** button to add a row to the list. Use the Edit Master Seeds Template window to specify the fields to include in the list. For more information, see "Master Template Data Window" on page 54.

Click **OK** to close the window and save your changes, or click **Cancel** to close the window without saving your changes.

NOTE: After a seeds list has been defined and associated with a communication definition, further changes to the seeds list will not be reflected in the campaign in which the communication definition is used.

Choose Data Item Window

Use the Choose Data Item window to select data items that will be displayed in the Select Data Item window in Customer Intelligence Studio.

Defining Communications

A communication definition determines the name, audience threshold, channel, export file, and responses that will be associated with an individual communication. Use the Communication Definitions plug-in in the Application Resources folder to create, edit, or delete a communication definition.

Creating a New Communication Definition

Right-click the Communication Definitions plug-in and select **New Communication Definition** to display the Communication Definition window. For more information, see "Communication Definition Window" on page 57.

Editing a Communication Definition

Right-click the communication definition name and select **Properties**. The Communication Definition window opens. For more information, see "Communication Definition Window" on page 57.

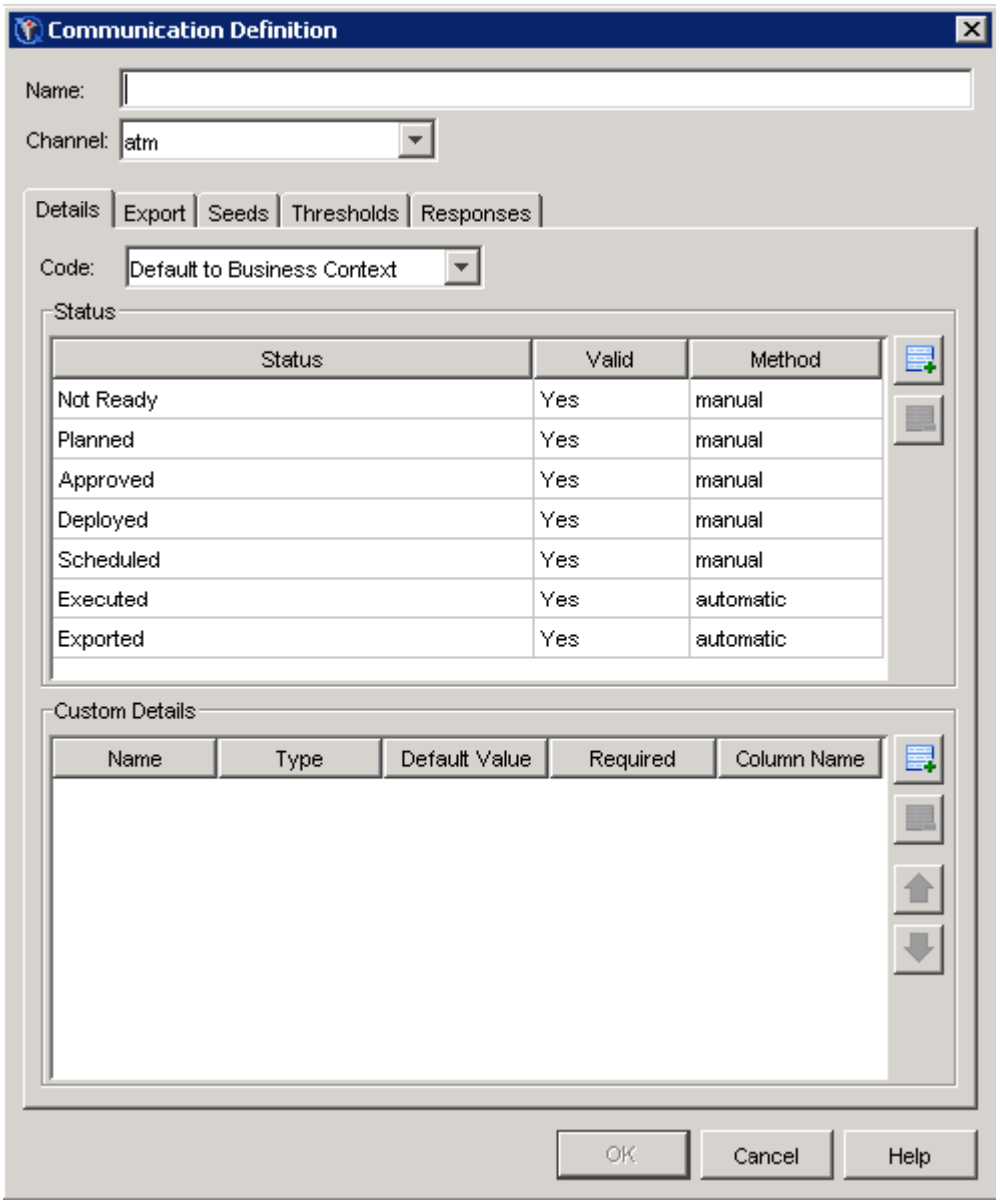
NOTE: After an association has been made with a campaign, further changes to a communication definition are not reflected in the campaign in which the definition is used.

Deleting a Communication Definition

Right-click the communication definition name and select **Delete**. Click **OK** in the Delete Definition window.

Communication Definition Window

In the Communication Definition window, you name the definitions and select a channel for each communication definition.



Type the name of the communication definition in the **Name** field.

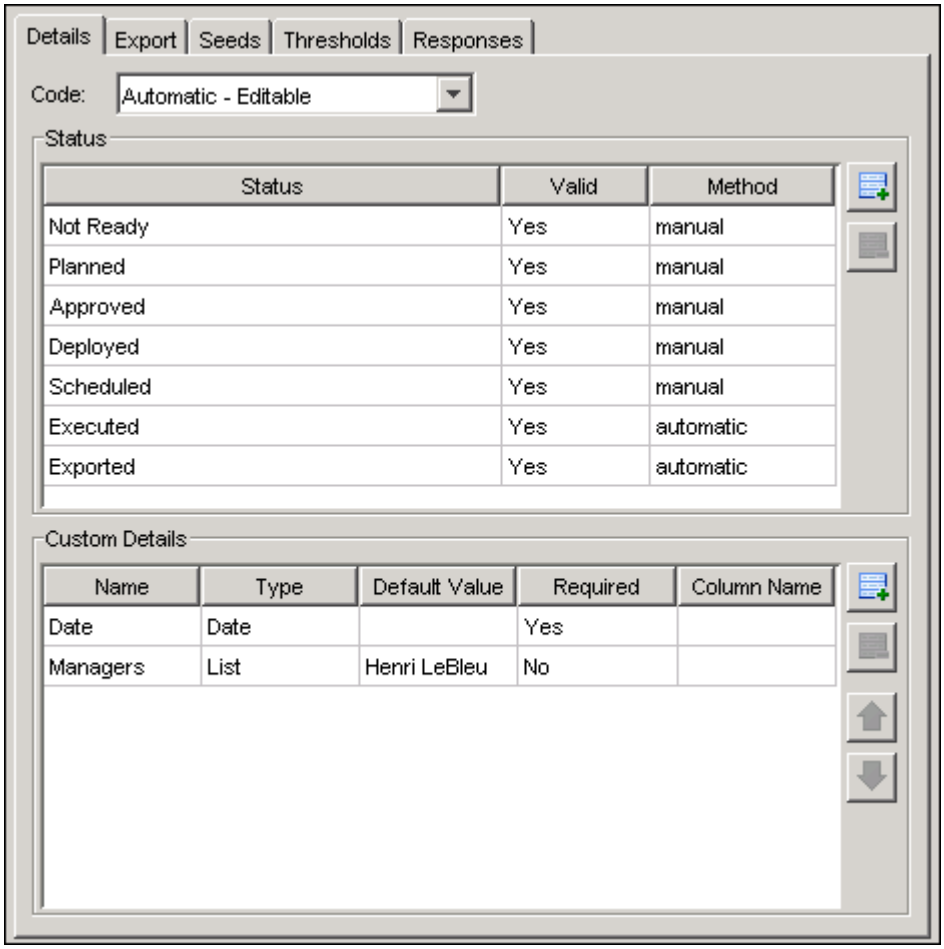
Select a communication medium from the **Channel** drop-down list. Communications that are based on this communication definition will use this channel. In order to add a communication definition, at least one channel must be shown in the Channels plug-in. For more information, see "Showing and Hiding Channels" on page 67.

This window contains the following tabs:

- Details tab. For more information, see "Details Tab" on page 59.
- Export tab. For more information, see "Export Tab" on page 60.
- Seeds tab. For more information, see "Seeds Tab" on page 62.

- Thresholds tab. For more information, see "Thresholds Tab" on page 64.
- Responses tab. For more information, see "Responses Tab" on page 65.

Details Tab



This tab contains controls that are associated with communications details.

Code

Use the drop-down list to indicate whether the code defaults to the current business context, is automatically generated and editable, is automatically generated but is not editable, or is manually generated (always editable). Valid characters for code are alphanumeric characters, numerals, underscores, and periods.

Status table

displays the list of system-defined and user-defined statuses for this communication definition.

Status column

displays the status name. This column can contain user-defined and system-defined

status names. User-defined names are editable; system-defined names are not. When a user clicks in this cell in the Valid column of the Communications window, a drop-down list appears. Here is a list of system-defined names:

- Not Ready
- Planned
- Approved
- Deployed
- Scheduled
- Executed
- Exported

Valid column
enables you to specify whether a status is valid for communications that use this definition. Communications that use this definition can be set to valid statuses. Values are **Yes**, **No**. You cannot change the Exported or Executed status in the **Valid** column.

Method column
displays the method that is set for the communication. You cannot change the method for statuses that are defined by the system.

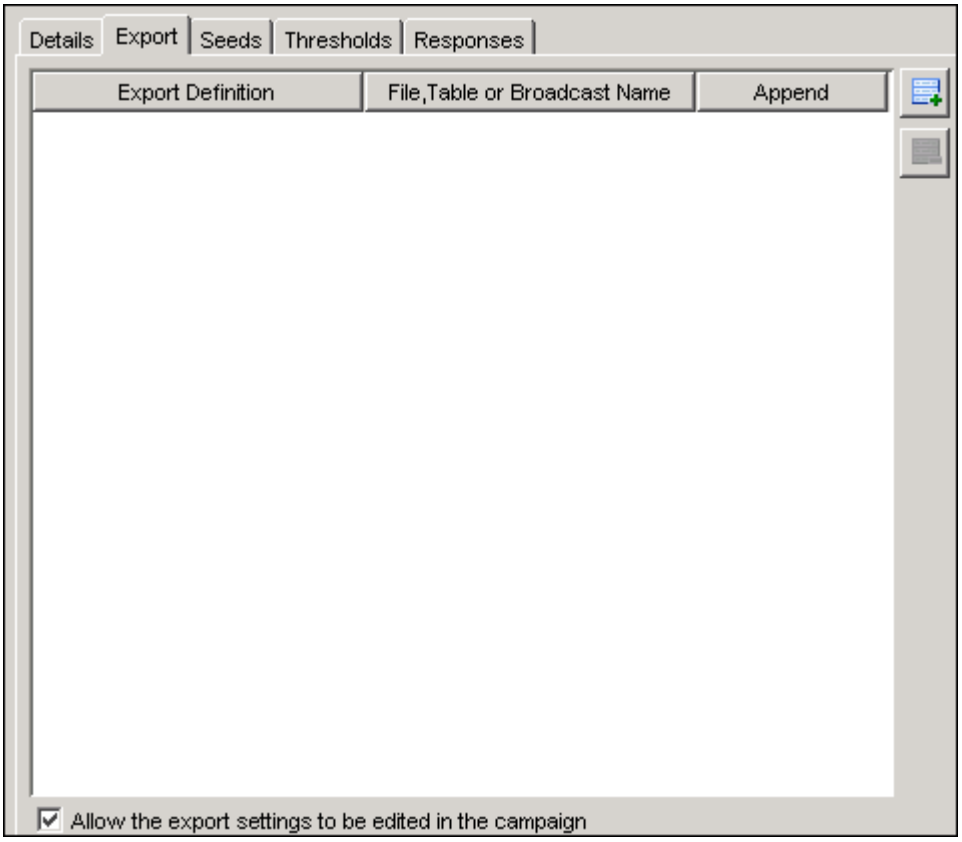
Add Status button
Click to add a row to the bottom of the table and move the pointer to the Status column.

Delete Status button
deletes the selected user-defined row. This button is available when the selected row is user-defined.

In the Custom Details section, you can add custom fields to the communication definition. For more information, see “Working with Fields” on page 45.

Export Tab

This tab displays the controls that are associated with exports.



The table lists the controls that are associated with exports. The values that you set in this table become the default values for communications that use the communication definition. Click to add an export definition to the table. Click to remove an export definition from the table. For more information, see "Select Export Definition Window" on page 65.

Export Definition column
: displays the export definition. If an export definition or seeds list has already been selected for the communication definition, you can select only the export definitions that refer to the same information map as the existing export definition or seeds list. The subjects must match in all selected export definitions. After an export definition has been associated with a communication definition, further changes to the export definition will not be reflected in the campaign in which the communication definition is used. Click ... to select a different export definition. For more information, see "Select Export Definition Window" on page 65.

File, Table or Broadcast Name column
: enables you to enter a file, table, or broadcast name. In the **File, Table or Broadcast Name** column, type a name for file or table name for the exported data, or click the ellipsis to display the Select Broadcast window. For more information, see "Selecting Broadcasts" on page 62. The file or table name must be a valid name for the type of file or table, and for the operating system under which the file or table will be created. Names for export types SAS Dataset and Table are limited to 32 characters, and names for export type XML are limited to 28 characters. Names are restricted to letters, numbers, and the underscore (_) character. If you are exporting to a SAS file or a table, then the first character must be a letter or the underscore (_) character.

Append column
displays the append or replace action that will occur when a file or table is exported. The cell contains a drop-down list. Click the cell to select either Append or Replace. For the XML export type, Replace is the only option.

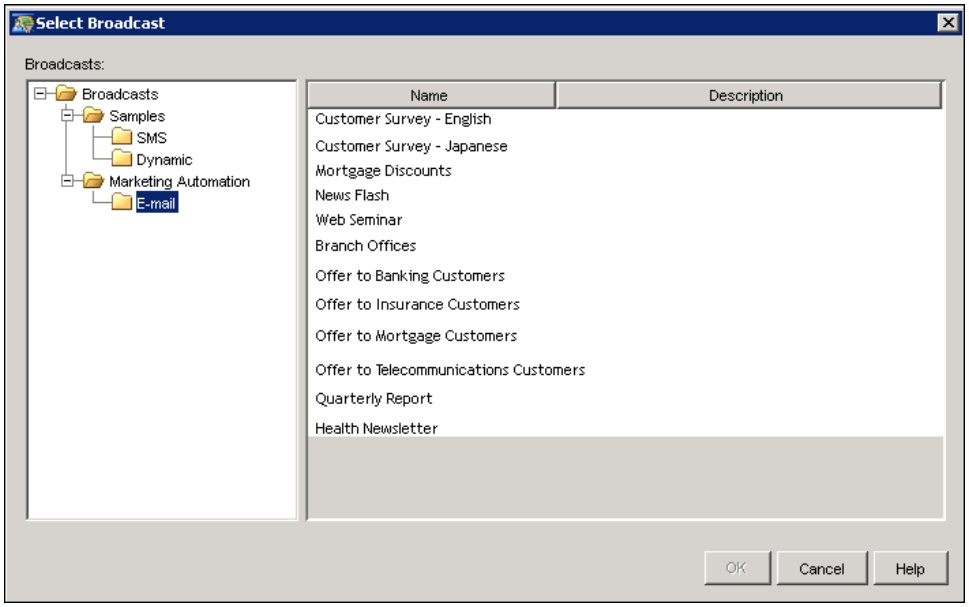
Add Row button
Click this button to add a row to the Export data table.

Delete Row button
Click this button to delete the selected row from the Export data table.

Allow the export settings to be edited in the campaign check box
Select this check box to allow users to edit the cells in the Export Contents table on the Export tab in the Communication Properties window in Customer Intelligence Studio. Clearing the box prevents users from editing cells in the Export Data table. The check box is selected by default in a new communication definition.

Selecting Broadcasts

If SAS Digital Marketing is installed at your site, you can select SAS Digital Marketing as the output type for a communication definition, and then select a broadcast from the Select Broadcast window.

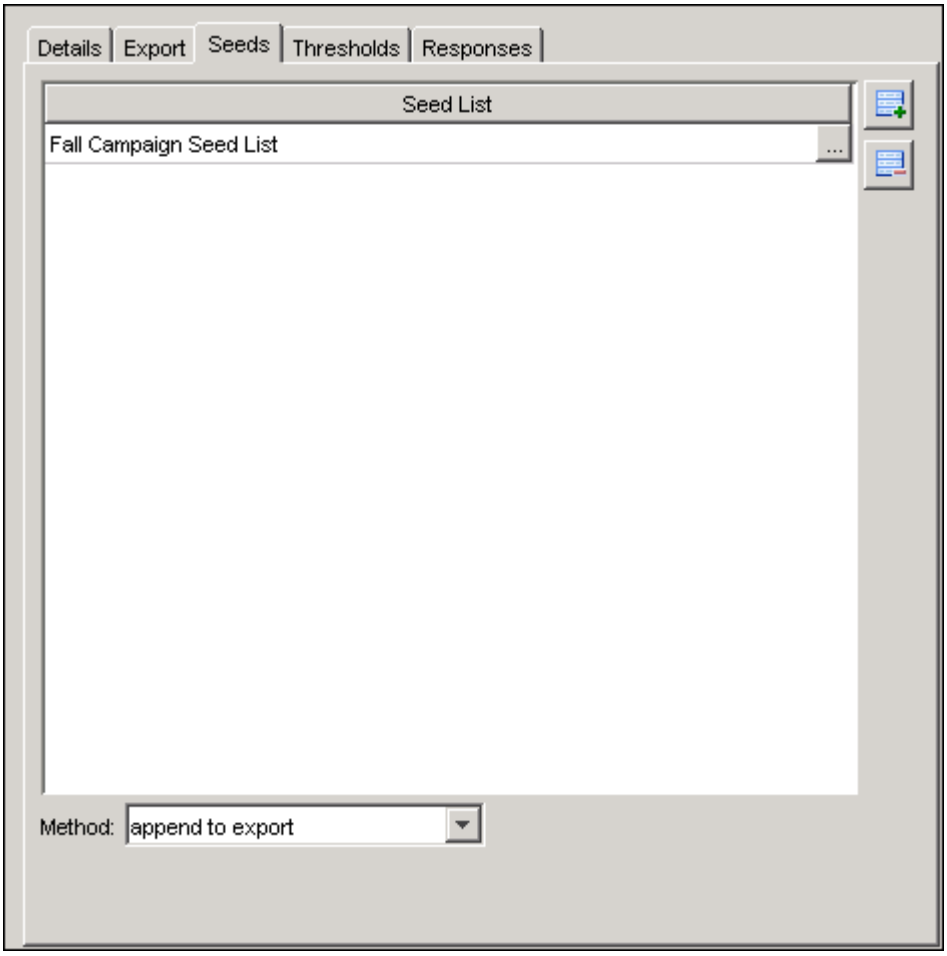


The broadcasts that are displayed have been created in SAS Digital Marketing.

Select a broadcast and click **OK** to close the window and save your changes.

Seeds Tab

The Seeds tab displays the seeds lists that are included in the exported file. You can also specify the method that is used to include seeds in the exported file.



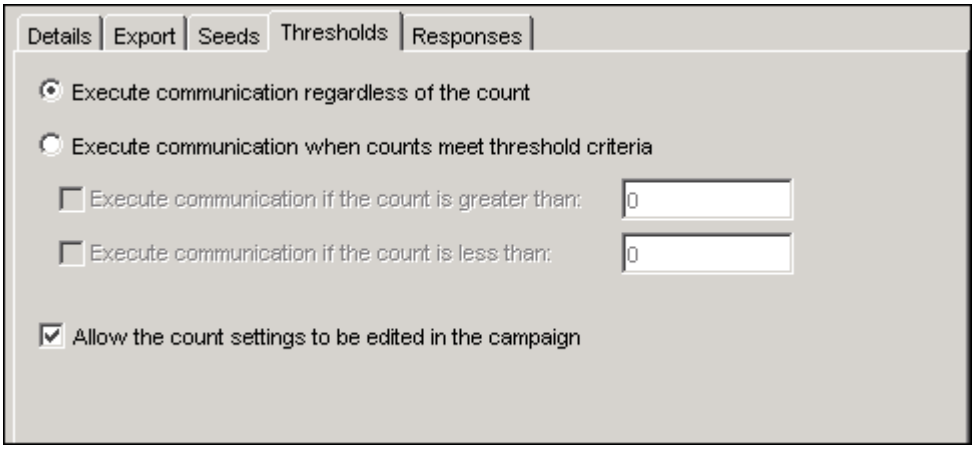
Seed List column

displays the name of the seed list. If an export definition or seed list has already been selected for the communication definition, you can select only export definitions that refer to the same information map as the existing export definition or seed list. When you click the ..., you can select a seed list. For more information, see "Select Seeds List Window" on page 66.

Method drop-down list

enables you to specify how all the items in the Seed List table will be exported. You can choose to append the list to the end of the export file or insert the list items randomly into the export file. If you select the latter and if you are exporting 1000 customers with 10 random seeds, the seeds will be scattered randomly among the customer names.

Thresholds Tab



This tab displays the controls that are associated with the audience threshold for the communication.

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.

Execute communication regardless of the count
executes the communication regardless of the marketing cell count. This option disables the threshold check boxes and text fields.

Execute communication when count meets threshold criteria
runs the communication if the count meets the criteria that are specified in the threshold controls. This option makes threshold check boxes and text fields available.

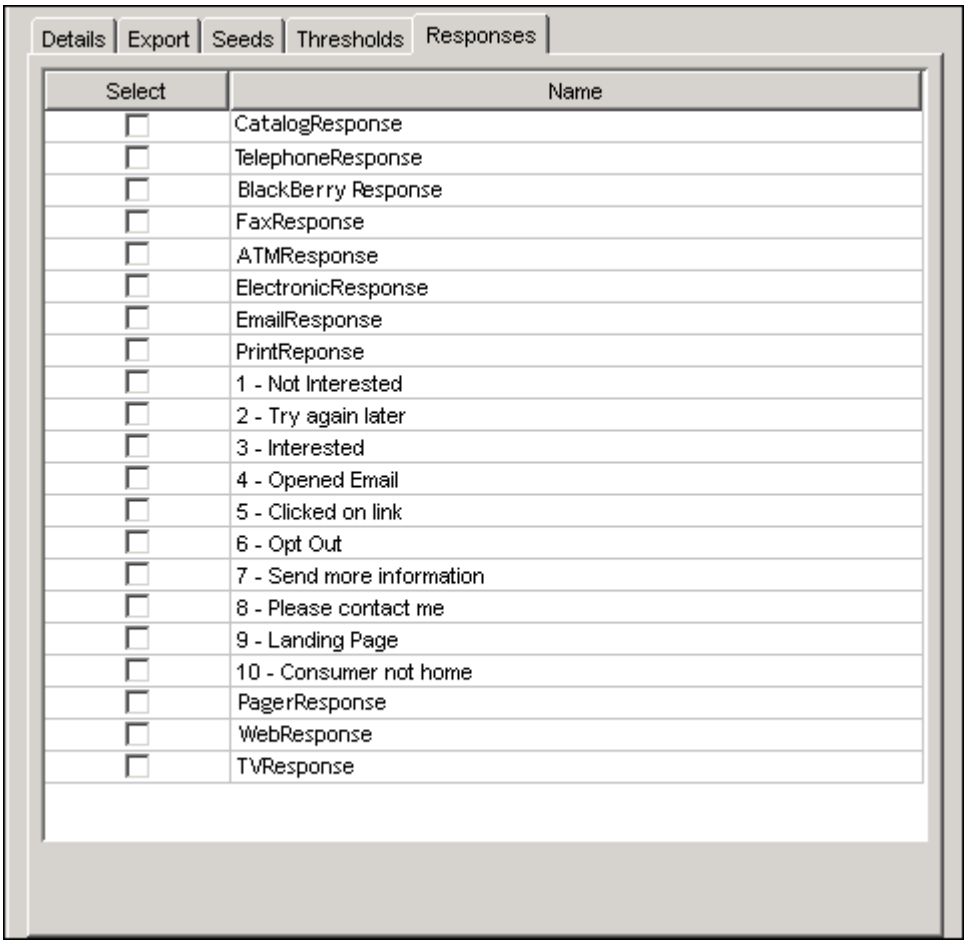
If there is an export associated with the communication that contains no data items, for example, an export that contains a cell code and a communication code, but no items from the Data Items folder, the communication node will always have a count of 1. In this case, you might not want to set a threshold.

Execute communication if the count is greater than
prevents the communication from executing if the count is less than or equal to the value that is displayed. Enter positive integers or zero to specify the minimum count that is necessary to execute the communication.

Execute communication if the count is less than
prevents the communication from executing if the count is greater than or equal to the value that is displayed. Enter positive integers or zero to specify the maximum count that is necessary to execute the communication.

Allow the count settings to be edited in the campaign
enables users to change count settings in Campaign Studio.

Responses Tab



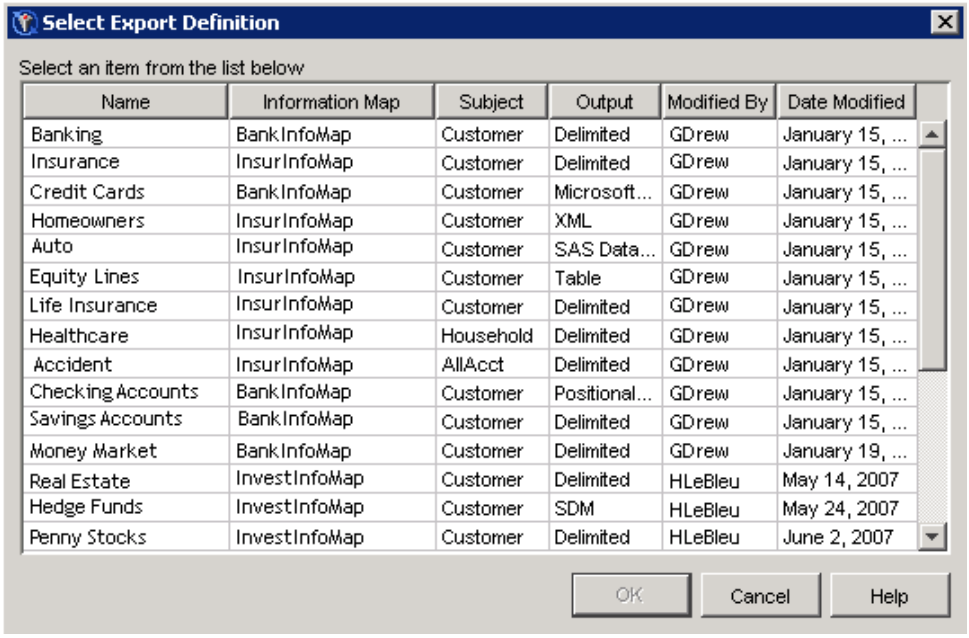
This tab displays the list of responses from the Responses plug-in. Each row is the name of a response that was created in the Responses plug-in. All predefined responses appear in the table. For more information, see "Defining Responses" on page 71.

Select column
: causes the associated response to appear on the Responses tab in the Communications Properties window in Campaign Studio. Clearing the box hides the associated response on the Responses tab.

Name column
: displays the name of the response.

Select Export Definition Window

The Select Export Definition window opens when you click the ellipsis button in the Export Definition cell of the Export Data table. The Export Data table is on the Export tab of the Communications Definition window. In this window, you can select an export definition to use in a Communication node or Export node.



Name column
displays the name of the export definition.

Information Map column
displays the name of the information map on which the export definition is based.

Subject column
displays the subject of the export definition.

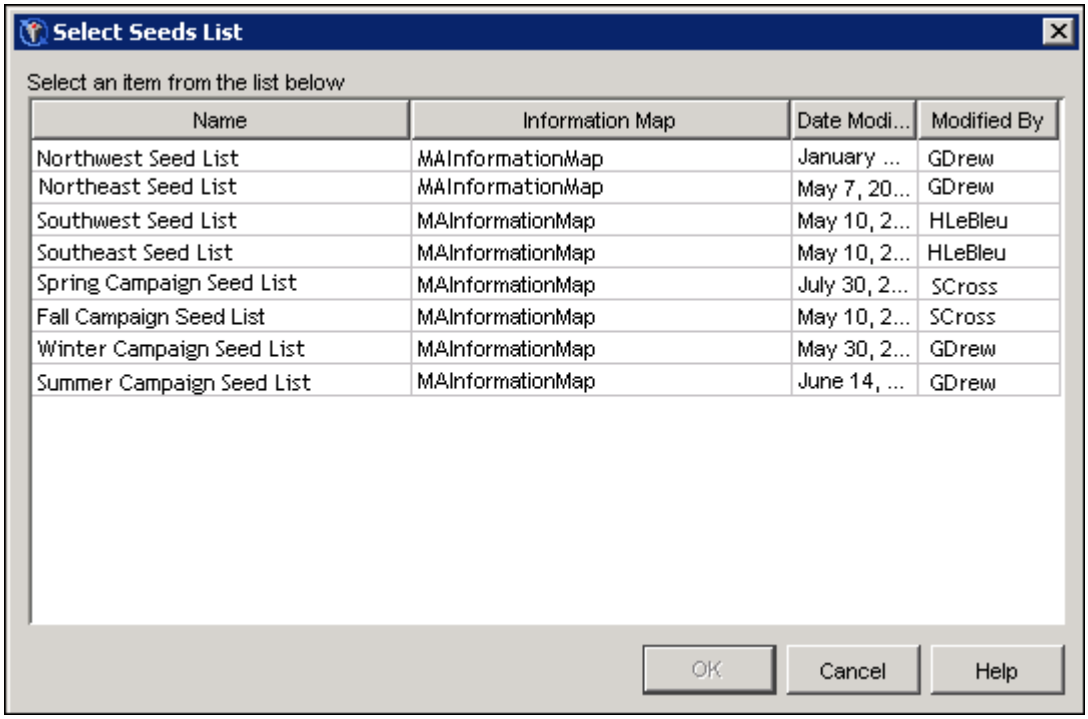
Output column
displays the output created by the definition, such as Delimited, Microsoft Excel, Table, Positional File, SAS Dataset, and XML.

Date Modified column
displays the date and time that the export definition was created..

Modified By column
displays the name of the user who last modified the export definition.

Select Seeds List Window

The Select Seeds List window opens when you add a row to the Seeds tab of the Communication Definition window and click the ellipsis button at the end of the row. In the Select Seeds List window, you can select a seed list to use in a Communication node.



Name column
: displays the name of the seed list.

Information Map column
: displays the information map on which the seed list is based.

Date Modified column
: displays the date and time that the seed list was changed or created.

Modified By column
: displays the name of the user who last modified the seed list.

Showing and Hiding Channels

Use the Channels plug-in in the Application Resources folder to show or hide channels that can be selected for communication definitions.

Right-click a channel name in the Channels plug-in table and select **Show Channel** to make the channel available for selection in Customer Intelligence Studio. Select **Hide Channel** to make the channel unavailable for selection. If a channel is hidden, it cannot be selected in a response or communication definition. If you hide a channel that has already been selected in a response or communication definition, the channel selection defaults to the first item in the list of channels.

Defining Replies

A reply definition determines the channel, code, contact history options, responses, and customer details that will be associated with an individual reply in a decision campaign. Use the Reply Definitions plug-in in the Application Resources folder to create, edit, or delete a reply definition.

Creating a New Reply Definition

To create a new reply definition, right-click the Reply Definitions plug-in and select **New Reply Definition** to display the Edit Reply window. For more information, see "Edit Reply Window" on page 68.

Editing a Reply Definition

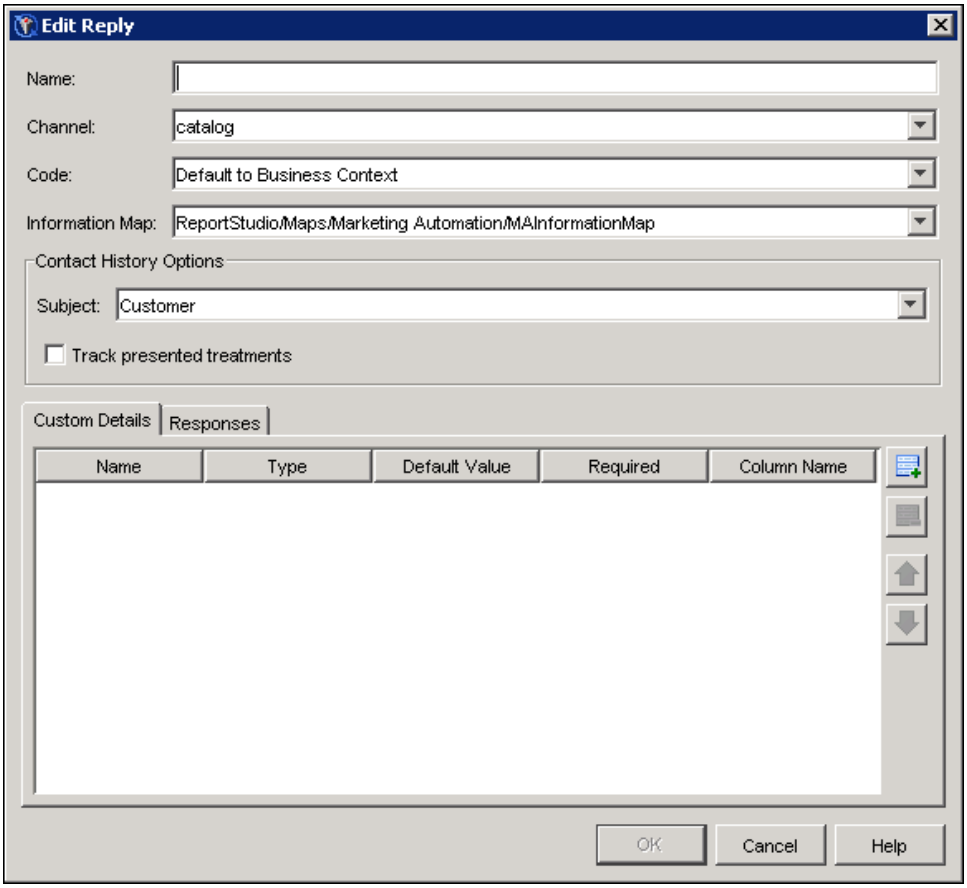
To edit a reply definition, right-click the reply definition name and select **Properties**. The Edit Reply window opens. For more information, see "Edit Reply Window" on page 68.

Deleting a Reply Definition

To delete a reply definition, right-click the reply definition name and select **Delete**. Click **OK** in the Delete Reply window.

Edit Reply Window

In the Edit Reply window, you create or edit a reply definition.



Type the name of the reply definition in the **Name** field. The name must be unique.

Select a communication medium from the **Channel** drop-down list. Replies that are based on this reply definition will use this channel. In order to add a reply definition, at least one channel must be shown in the Channels plug-in. For more information, see "Showing and Hiding Channels" on page 67.

Use the **Code** drop-down list to indicate whether the code defaults to the current business context, is automatically generated and editable, is automatically generated but is not editable, or is manually generated (always editable).

Select an information map from the **Information Map** drop-down list to select an information map.

Select a subject from the **Subject** drop-down list to write the details of the reply to the table for the specified subject. The list of subjects is determined by the information map that you have selected.

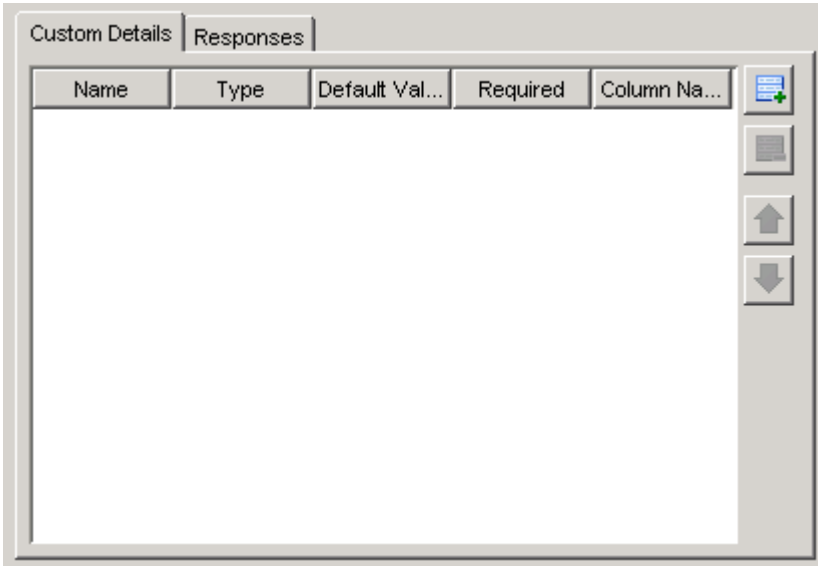
Select **Track presented treatments** to write the details of presented treatments to the table for the specified subject.

This window contains the following tabs:

- Custom Details tab. For more information, see "Custom Details Tab" on page 70.
- Responses tab. For more information, see "Responses Tab" on page 70.

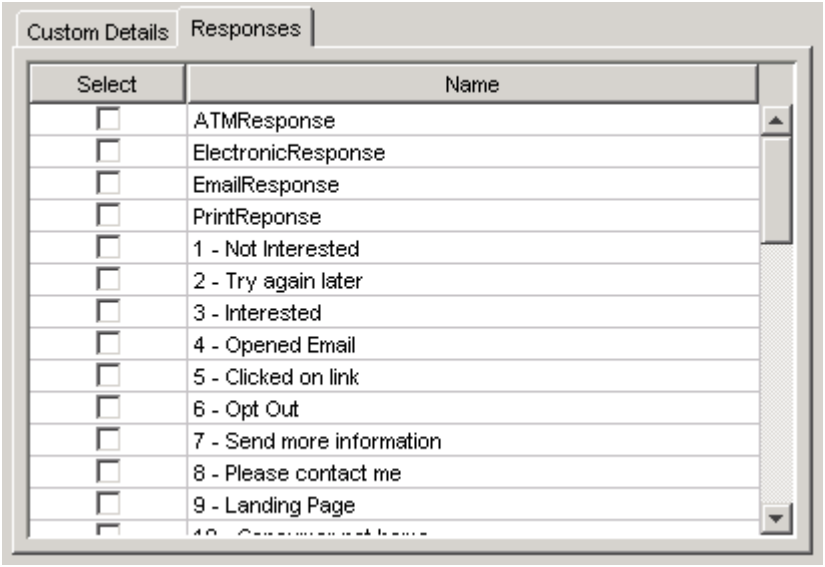
Custom Details Tab

On the Custom Details tab, you can add custom fields to the reply definition. For more information, see “Working with Fields” on page 45.



Responses Tab

The Responses tab displays the list of direct responses from the Responses plug-in.



Each row in the table displays values for one response. All predefined responses appear in the table.

Select column

When you select the check box, the associated response appears on the Responses tab in

the Reply Properties window in Customer Intelligence Studio. Clearing the box hides the associated response on the Responses tab.

Name column
displays the name of the response.

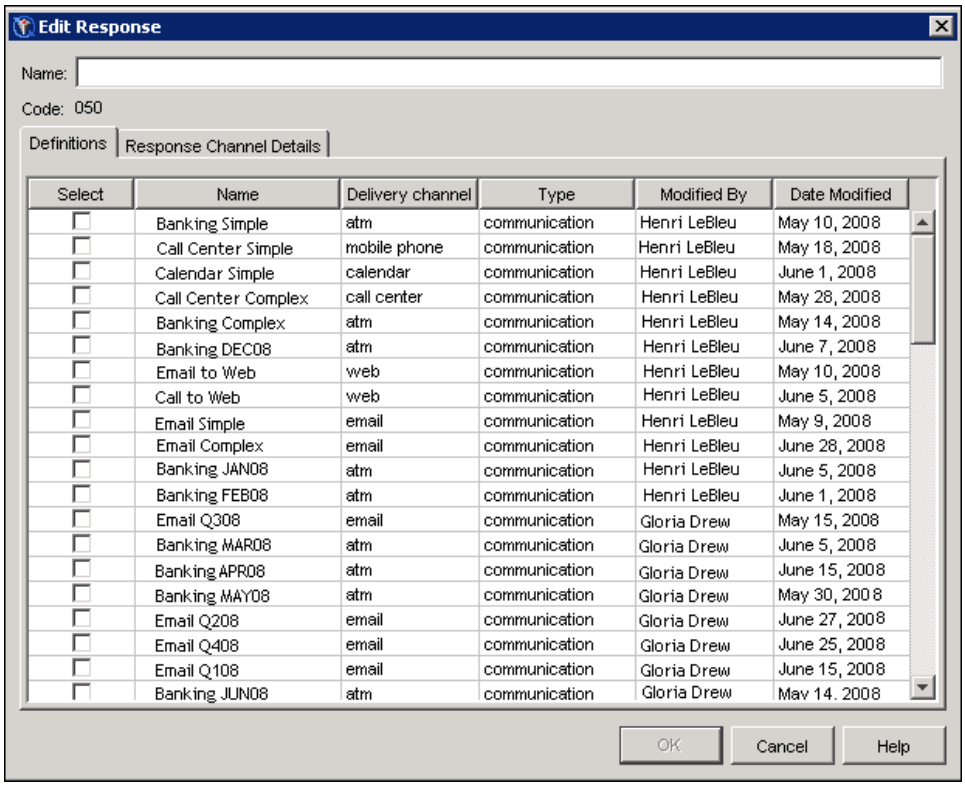
Defining Responses

The Responses plug-in in the Application Resources folder enables you to create, modify, and delete responses in campaigns. The display area at the right of the Responses plug-in shows the names of existing responses, the dates of the most recent modifications, and the names of those who modified the responses.

Creating a Response

To create a new response, select the Responses plug-in and use one of the following ways to display the Edit Response window.

- Select from the menu **Actions** ➧ **New Response**.
- Right-click the Responses plug-in and select **New Response**.



Type the response name in the **Name** field. Response names are limited to a length of 30 characters.

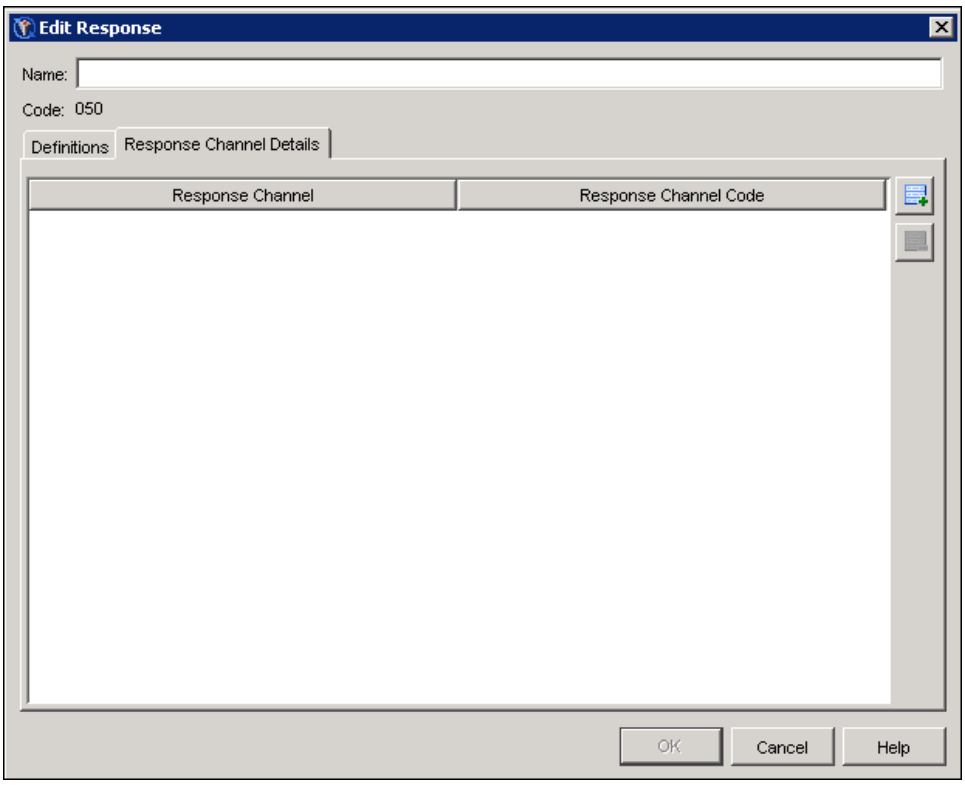
The response code is generated automatically and cannot be edited.

Assigning Communication and Reply Definitions to a Response

The Definitions tab of the Edit Response window lists existing communication and reply definitions. Select one or more definitions to associate with the response.

Assigning Channels to a Response

The Response Channel Details tab maps response channels to a response channel code that is defined by the customer.



To add a response channel to the list, take the following steps:

1. Click to add a row to the table.
2. Click the **Response Channel** cell and select a channel from the drop-down list.
3. Type a code in the Response Channel Code cell. The code should be recognizable by the channel.

To delete a response channel from the list, select the channel and click .

Editing a Response

To edit the contents of an existing response, right-click the name of the response and select **Properties** to display the Edit Response window. For more information, see "Creating a Response" on page 71.

Deleting a Response

To delete an existing response, right-click the name of the response and select **Delete**. Click **OK** in the Delete Response window.

Defining Diagram Tools

The Diagram Tools plug-in in the Application Resources folder enables you to modify the properties of the standard set of tools (nodes) and add custom tools to the Tool Palette in SAS Customer Intelligence Studio. The Diagram Tools table displays the name, type, and permissions for all of the diagram tools. For custom diagram tools, the table also displays the business context, the name of the user who modified the tool, and the date on which the tool was modified.

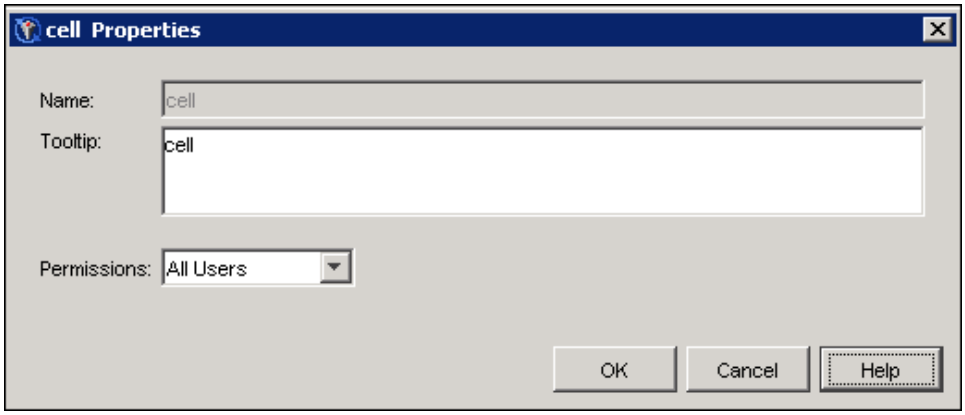
Standard Tools

You can modify the tooltip and permissions settings for standard tools that are delivered with the software.

Displaying Standard Tool Properties

To display the properties of a standard tool, right-click the name of a tool in the table next to the Diagram Tools plug-in and select **Properties**.

The Properties window displays the name, tooltip, and access permissions for the selected tool.



You can edit the text in the **Tooltip** field. This text is displayed when you rest the mouse pointer on the tool in Customer Intelligence Studio.

Select one of the following permission levels from the **Permissions** drop-down list:

None
specifies that the tool is not displayed in the Tool Palette.

Advanced Users
specifies that only advanced users can view the tool. Advanced users have been assigned to the MarketingAutomationAdvancedUser group in the User Manager plug-in in SAS Management Console.

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

When you have made your edits, click **OK** to close the window and save your changes.

Resetting Standard Tools

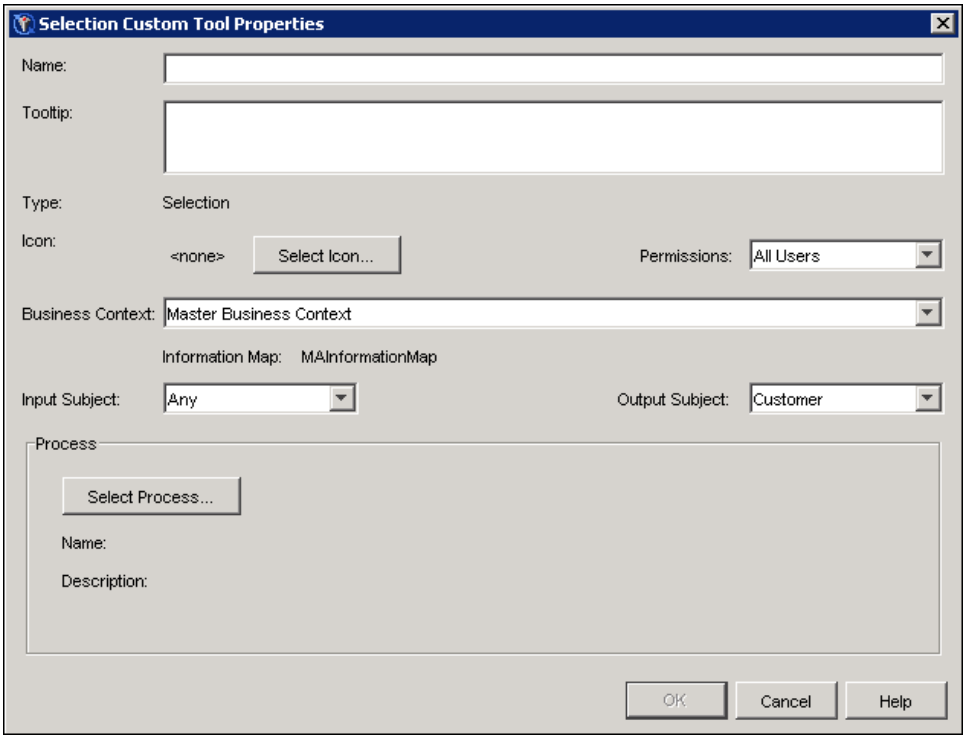
To restore the standard diagram tools to their default settings, right-click the Diagram Tools plug-in and select **Reset Standard Tools** from the pop-up menu.

Custom Tools

You can add functionality to the diagram tools by creating a custom tool from a stored process. The custom tool is displayed in the Tool Palette in Customer Intelligence Studio.

Adding a Selection Custom Tool

If you have licensed SAS Marketing Automation, you can add a selection custom tool by right-clicking the Diagram Tools plug-in and selecting **New Selection Custom Tool**.



Type the name of the tool in the **Name** field. The name must be unique among Selection custom tools and must not be the same as any of the standard tool names that are listed in the Diagram tools table.

Type tooltip text in the **Tooltip** field. This text is displayed when you rest the mouse pointer on the tool in the Tool Palette in Customer Intelligence Studio.

Click **Select Icon** to choose an icon from the Select Icon window. For more information, see "Selecting a Tool Icon" on page 78.

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

None
: specifies that the tool is not displayed in the Tool Palette.

Advanced Users
: specifies that only advanced users can view the tool. Advanced users have been assigned to the MarketingAutomationAdvancedUser group in the User Manager plug-in in SAS Management Console.

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

To associate the tool with a business context, select a business context name from the **Business Context** drop-down list. **Master Business Context** is the default selection.

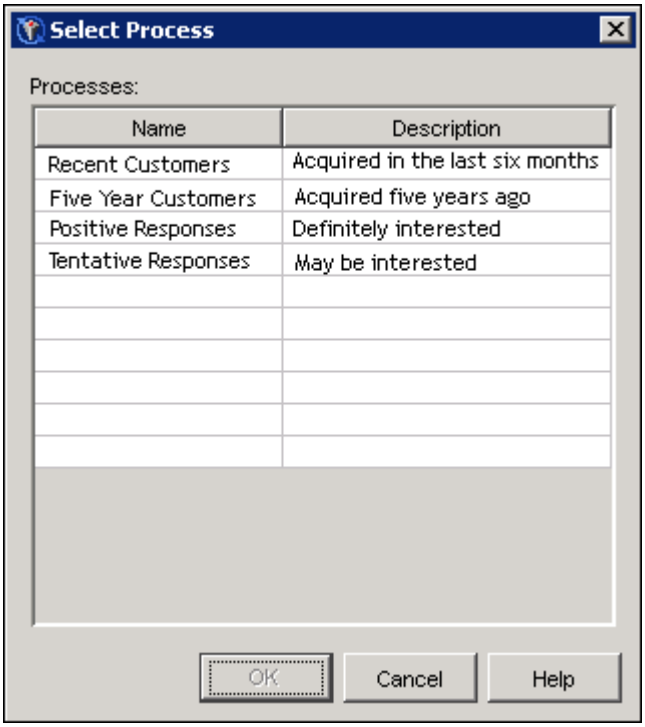
The **Information Map** field displays the information map that is associated with the selected business context.

Subject IDs are stored in the information map. Select input subjects and output subjects from the drop-down lists.

Click **Select Process** to select the stored process that will execute when the node is run. For more information, see "Selecting a Process for a Selection Custom Tool" on page 76.

Selecting a Process for a Selection Custom Tool

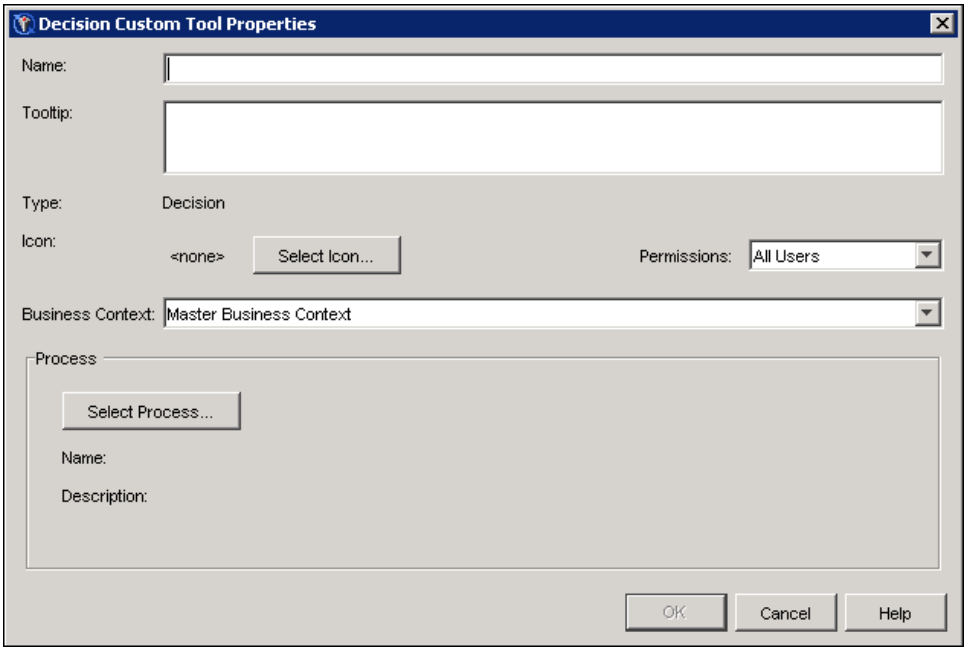
The Select Process window for the Selection Custom Tool displays processes that have been created.



Select a stored process from the Processes list and click **OK** to close the window and associate the process with the custom node. For more information about adding custom tools, see "Custom Tools" on page 74.

Adding a Decision Custom Tool

If you have licensed SAS Real-Time Decision Manager, you can add a custom tool by right-clicking the Diagram Tools plug-in and selecting **New Decision Custom Tool**.



Type the name of the tool in the **Name** field. The name must be unique among Decision custom tools and must not be the same as any of the standard tool names that are listed in the Diagram tools table.

Type tooltip text in the **Tooltip** field. This text is displayed when you rest the mouse pointer on the tool in the Tool Palette in Customer Intelligence Studio.

Click **Select Icon** to choose an icon from the Select Icon window. For more information, see "Selecting a Tool Icon" on page 78.

Select one of the following permissions from the **Permissions** drop-down list:

None
: specifies that the tool is not displayed in the Tool Palette.

Advanced Users
: specifies that only advanced users can view the tool. Advanced users have been assigned to the MarketingAutomationAdvancedUser group in the User Manager plug-in in SAS Management Console.

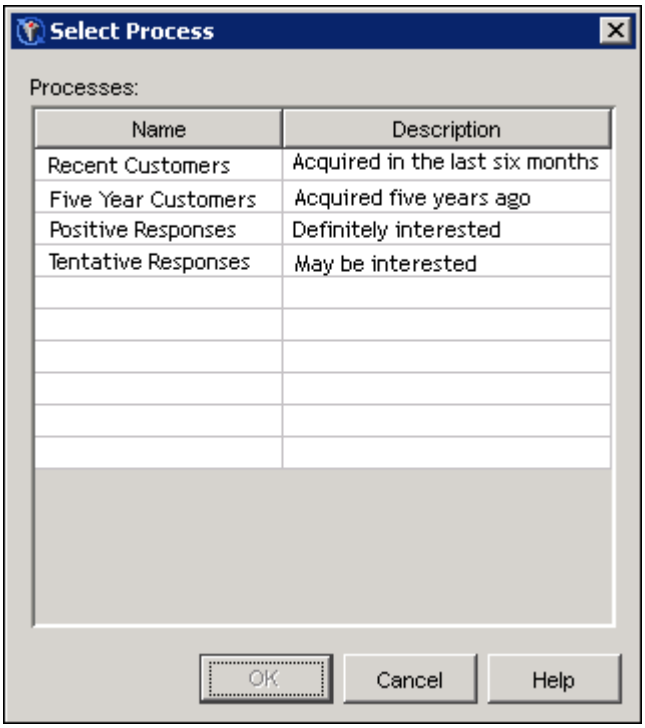
All Users
: specifies that all users can view the tool. This is the default setting.

To associate the tool with a business context, select a business context name from the **Business Context** drop-down list. **Master Business Context** is the default selection.

Click **Select Process** to select the stored process that will execute when the node is run. For more information, see "Selecting an Activity for a Decision Custom Tool" on page 78.

Selecting an Activity for a Decision Custom Tool

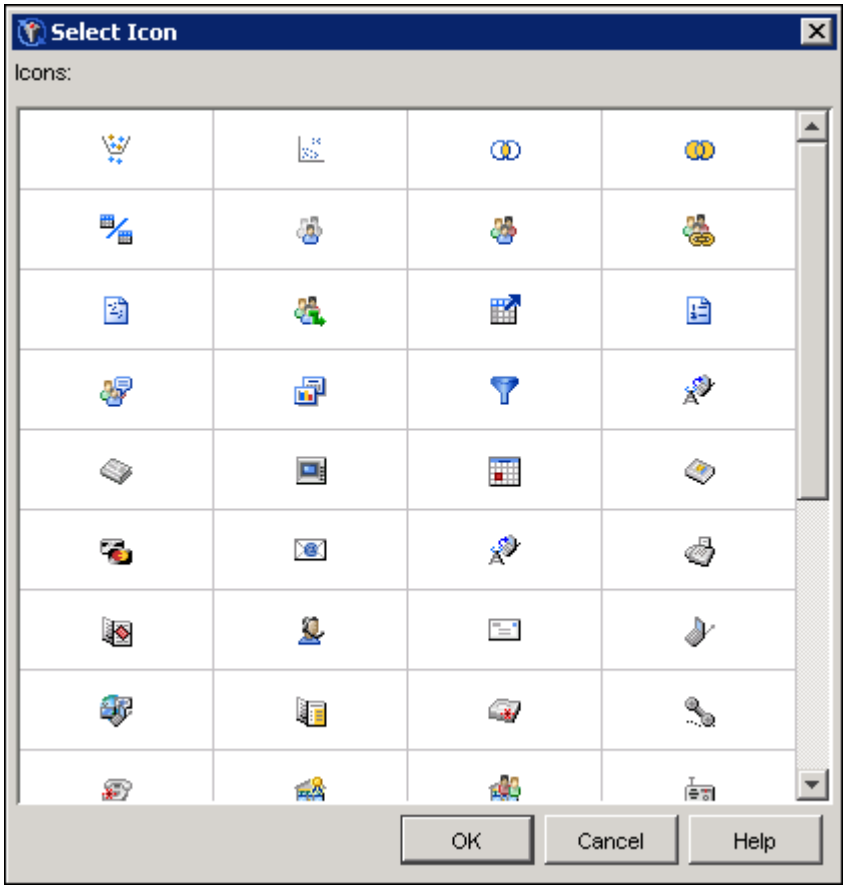
The Select Process window for the Decision Custom Tool displays activities that have been created.



Select an activity from the Processes list and click **OK** to close the window and associate the activity with the custom node. For more information about adding custom tools, see "Custom Tools" on page 74.

Selecting a Tool Icon

The Select Icon window displays icons that you can select to represent custom tools in the Tool Palette.



Select an icon and click **OK** to close the window and save your changes. The selected icon is displayed in the Custom Tool Properties window.

For more information about adding custom tools, see "Custom Tools" on page 74.

Editing Custom Tools

To edit the properties of a custom tool, right-click the name of the tool in the Diagram Tools table and select **Properties** from the pop-up menu. For more information about custom tool properties, see "Adding a Selection Custom Tool" on page 74 and "Adding a Decision Custom Tool" on page 76.

Duplicating Custom Tools

You can duplicate a custom tool by right-clicking the name of the tool in the Diagram Tools table and selecting **Duplicate** from the pop-up menu. A copy of the tool definition named **Copy of <toolname>** is added to the table.

Deleting Custom Tools

You can delete a custom tool by right-clicking the name of the tool in the Diagram Tools table and selecting **Delete** from the pop-up menu. The name of the tool is deleted from the table.

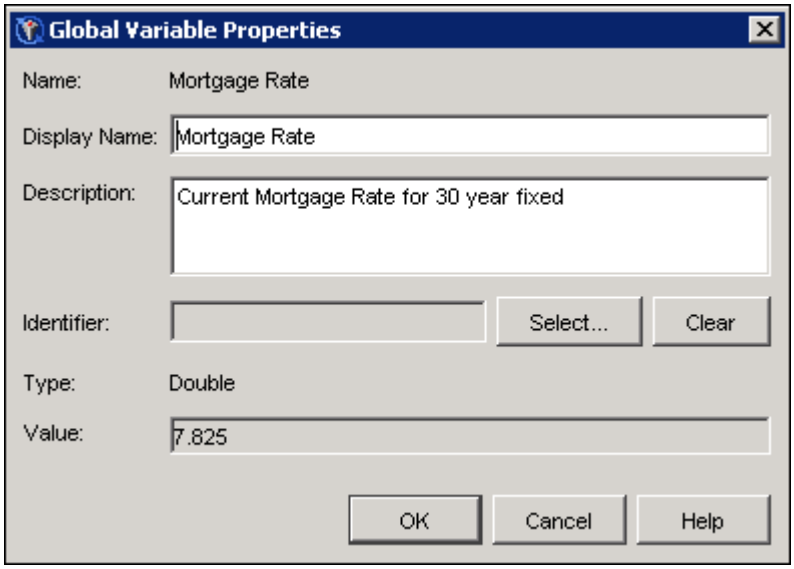
Defining Global Variables

If your site has licensed SAS Real-Time Decision Manager, you can use the global variables that were created in the SAS Real-Time Decision Manager plug-in in your decision campaigns. Global variables are added and deleted through the SAS Real-Time Decision Manager plug-in.

To display the global variables that have been created, select the Global Variables plug-in in the Application Resources folder. Right-click a global variable name and select **Properties** to display the Global Variable Properties window. For more information, see "Global Variable Properties Window" on page 80.

Global Variable Properties Window

The Global Variable Properties window displays the name, display name, description, identifier, type, and value of the global variable.



The **Name** field displays the name that is assigned to the global variable in the SAS Real-Time Decision Manager plug-in.

The **Display Name** field contains the name that is displayed in SAS Customer Intelligence Studio. Optionally, you can type a description in the **Description** field.

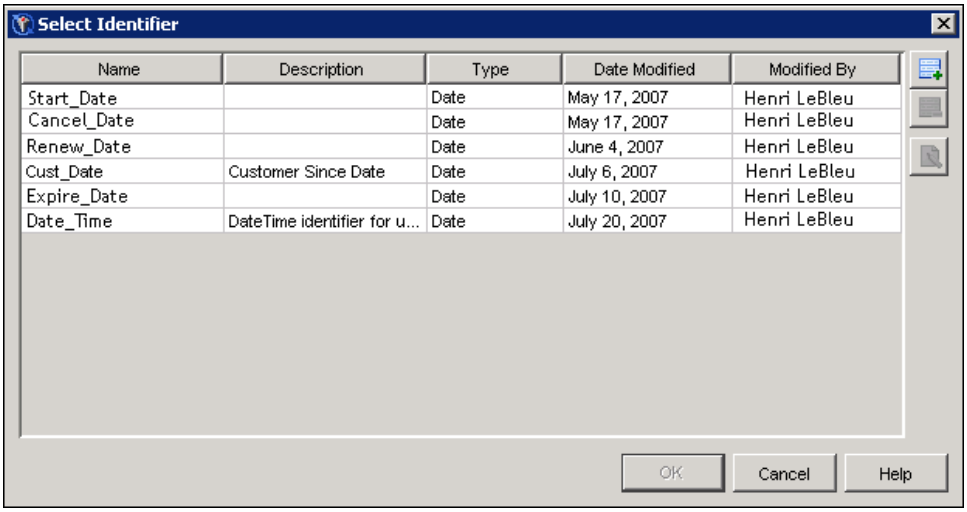
To select an identifier for the global variable, click **Select** to display the Select Identifier window. For more information, see "Selecting an Identifier" on page 81.

To remove the assignment of an identifier, click **Clear**.

The **Type** field displays the type that is assigned to the global variable in the SAS Real-Time Decision Manager plug-in.

Selecting an Identifier

An identifier is a description of a variable. Identifiers enable you to use implicit processes in SAS Customer Intelligence Studio; by using an identifier, you can select variables in the Start node and you do not have to add a Process node to your diagram. In the Select Identifier window, you can assign an identifier to a global variable, event, or process.



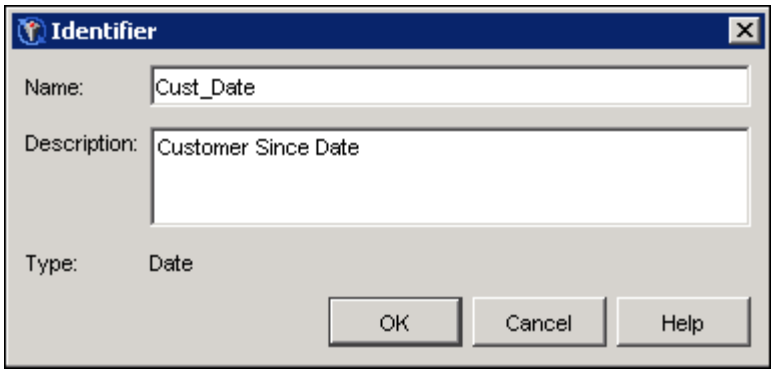
To assign an identifier to a variable, select the name of the identifier and click **OK**.

To edit an identifier, click . To add a new identifier, click . For more information, see "Editing an Identifier" on page 81.

To delete an identifier, select the identifier and click .

Editing an Identifier

In the Identifier window, you can change the name and description of an identifier.



Edit the name of the identifier in the **Name** field. Enter the description of the identifier in the **Description** field. Characters that are not letters or numerals will be converted to underscores.

Click **OK** to close the window and save your changes.

Defining Events and Processes

If your site has licensed SAS Real-Time Decision Manager, you can define events and processes to use in SAS Customer Intelligence Studio diagrams.

Select the Events and Processes plug-in in the Application Resources folder to display the list of events and processes that have been defined.

Use the **Show** drop-down menu to filter the list of events or processes. You can select one of the following filters:

All
: displays all events, processes, models, and services.

Custom Processes
: displays custom activities that have been created in the Real-Time Decision Manager plug-in.

Data Processes
: displays processes that were created in this Events and Processes plug-in. Data processes use the General I/O activity of the SAS Real-Time Decision Manager plug-in.

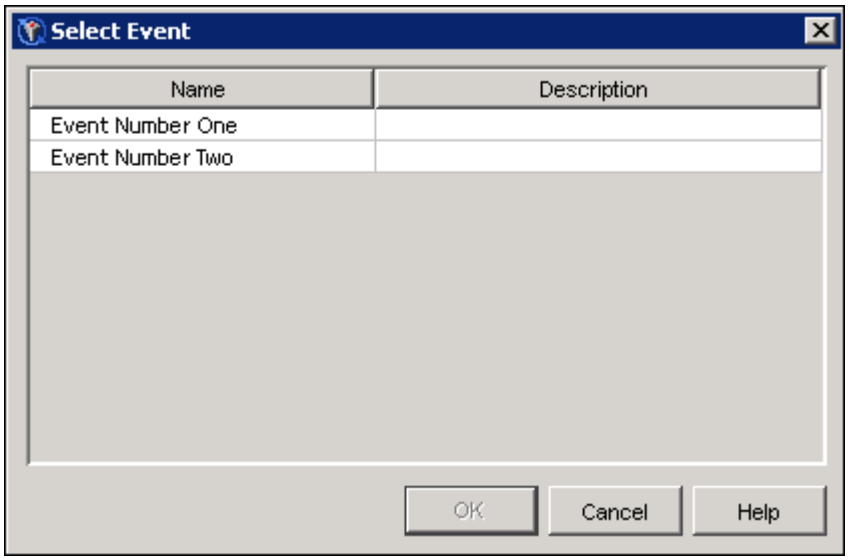
Web Services
: displays Web services that are registered in the Real-Time Decision Manager plug-in.

Models
: displays models that were created in Model Manager and registered in the Real-Time Decision Manager plug-in.

Events
: lists events that were created in the Real-Time Decision Manager plug-in and defined for Customer Intelligence.

Selecting an Event

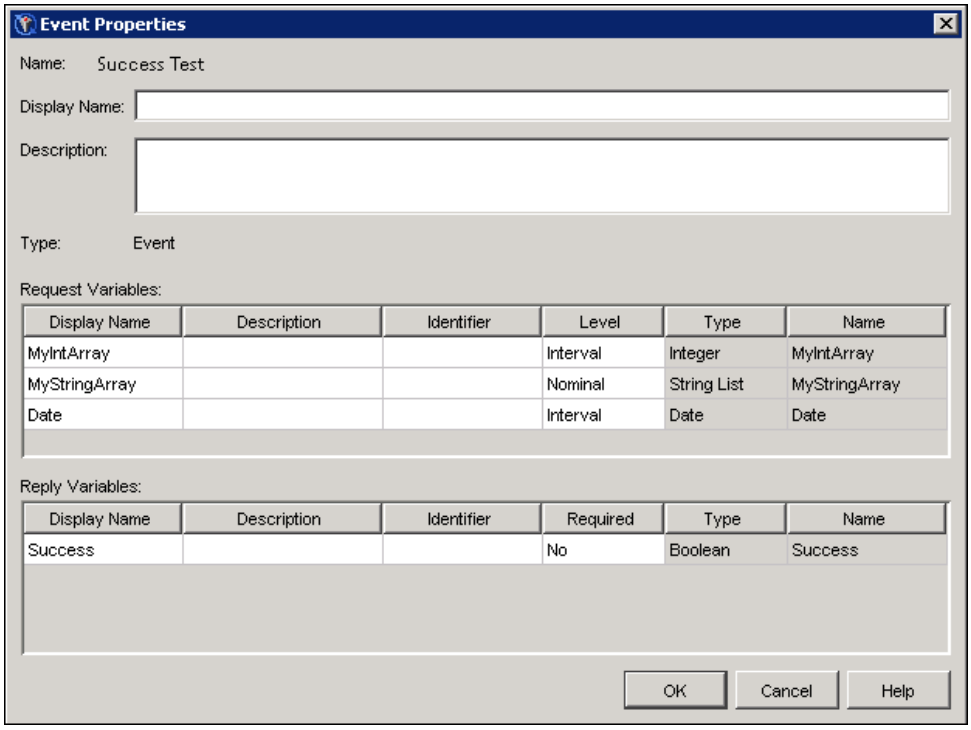
To select an event to add to the list of events, right-click the Events and Processes plug-in and select **New Event**.



The Select Event window lists events that are based on the Web Services Events plug-in in SAS Real-Time Decision Manager. These events are defined for use by Customer Intelligence Studio. Select an event and click **OK** to open the Event Properties window. After a Web service event has been selected, it is no longer available for selection. For more information, see "Edit Event Properties" on page 83.

Edit Event Properties

The Event Properties window displays the name, description, request variables, and reply variables for the event.



The event name is set in the Real-Time Decision Manager plug-in and cannot be edited. You can edit the display name and, optionally, provide a description.

Request variables contain information that is received from an outside source, such as a call center application. Reply variables contain information that is returned from a campaign or diagram to an outside source. For each variable in the Request Variables and Rely Variables tables, you can type a description in the **Description** field. Type an identifier in the **Identifier** field or click the ellipsis to select an identifier. For more information, see "Selecting an Identifier" on page 81.

The level of a request variable is based on the variable type. In Customer Intelligence Studio, the level determines whether the data item is a character string, a single value, or a range of values. Click **Level** field and select a level from the drop-down list. You can set the same level for more than one variable by selecting all of the variables and clicking **Set Level** to display the Select Level window. For more information, see "Selecting a Level" on page 87.

To force a reply for a reply variable, click the **Required** field and select **Yes** from the drop-down list. If a Start node in a Customer Intelligence Studio diagram uses this event, all downstream nodes will be forced to provide a value for the reply variable, such as Product ID.

Click **OK** to close the window and save your changes.

Adding a Process

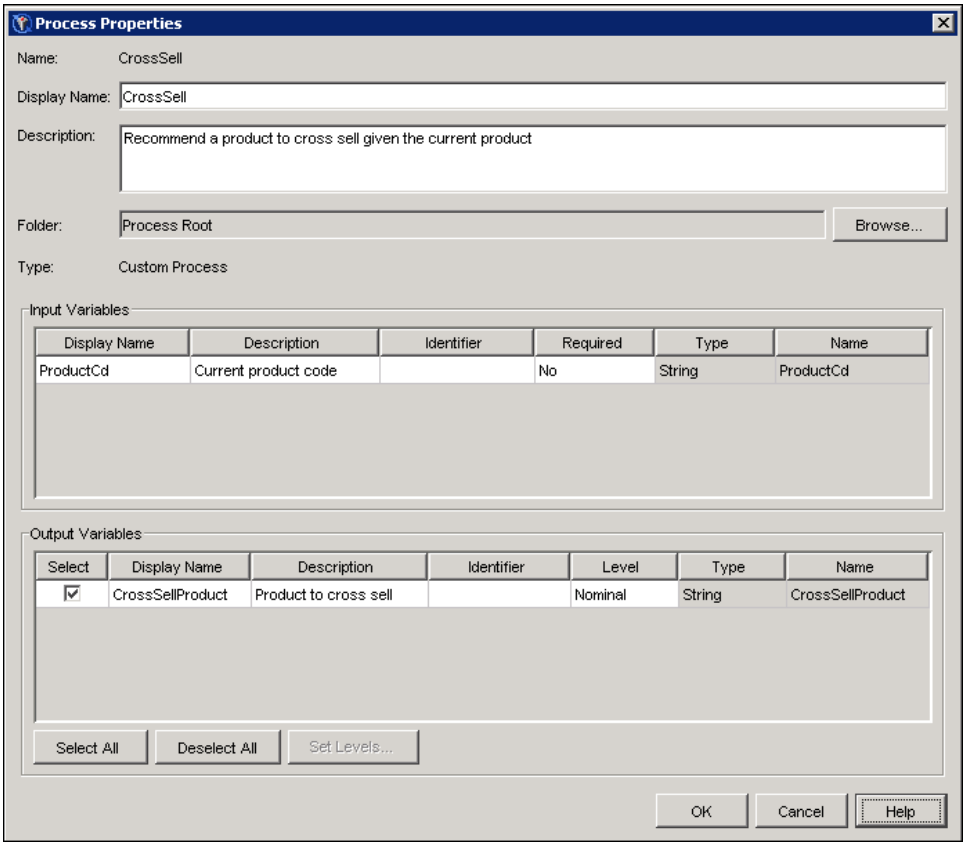
A process is a custom process, Web service, or model that has been defined in the Real-Time Decision Manager plug-in. To add a process, right click the Events and Processes plug-in and select **Add Process** to display the Select Process window. You can add a process more than one time. For more information, see "Selecting a Process" on page 87.

A data process reads and writes tables in a SAS data library. The data process is created independently in the Events and Processes plug-in and did not originate in the Real-Time Decision Manager plug-in. To add a data process, right-click the Events and Processes plug-in and select **Add Data Process** to display the Process Properties window.

Edit Process Properties

The Process Properties window lists the display name, description, and variables for a process. You can edit the display name and, optionally, add a description.

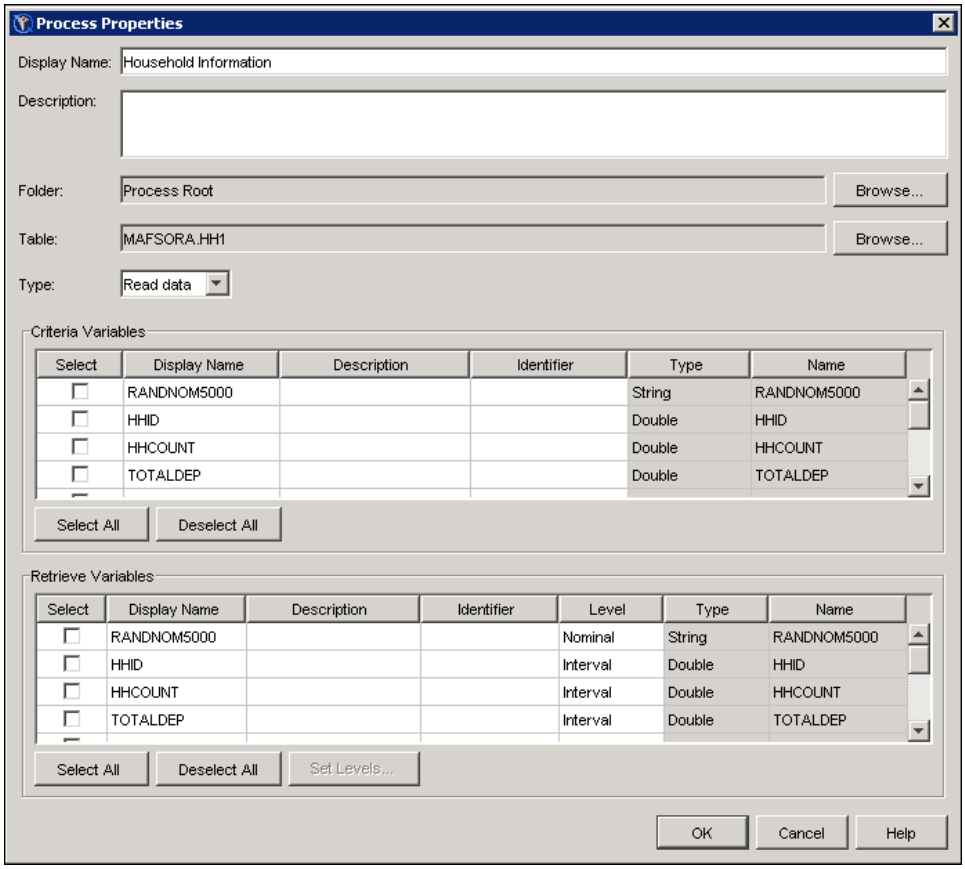
This is an example of a Process Properties window for a custom process:



Custom processes, Web services, and models contain input variables and output variables. Input variables contain the information, such as a product code, that is provided to the process by the Customer Intelligence Studio user. Output variables contain the information, such as a recommended product to cross-sell, that is returned by the process.

For each variable in the Input Variables and Output Variables tables, you can type a description in the **Description** field. Type an identifier in the **Identifier** field or click the ellipsis to select an identifier. The identifier name must be unique in each table. For more information, see "Selecting an Identifier" on page 81. In the Output Variables table, select the variables to display to the Customer Intelligence Studio user. Click **Browse** to select a folder in which to display the variables. For more information, see "Select a Folder" on page 88.

This is an example of a Process Properties window for a data process:



Data processes read and write data to the selected SAS data table. If you are editing a data process, click **Browse** next to the **Table** field and select the table in a SAS data library that will contain your data. For more information, see "Select a Folder" on page 88.

Select the type of process from the **Type** drop-down list. You can select one of the following types:

Read data
: reads all of the data in the table. You must select at least one column in the Criteria Variables table to restrict the data that is retrieved. For example, you could select a primary key, such as Customer ID, to retrieve customer or account information. You can then use the Retrieve Variables table to select the columns to display for each row; you must select at least one column in the Retrieve Variables table. Retrieve variables are available for use in other parts of the diagram in Customer Intelligence Studio. When a criteria variable is returned, you can select retrieve identifiers, such as age, in a Branch or a Filter node without having to add a Process node to the diagram.

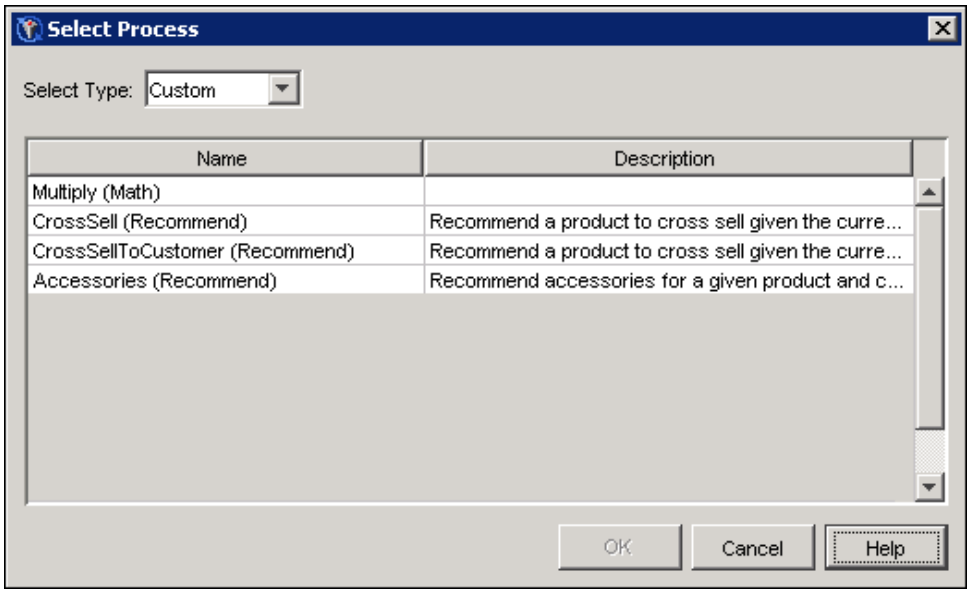
Insert data
: writes data to the table. No values are returned. Use the Insert Variables table to select the variables that you want to insert.

Update data
: updates the data in the table. You must select at least one column in the Criteria Variables

table to restrict the data that is updated. You can then use the Update Variables table to select the columns to update for each row; you must select at least one column in the Update Variables table.

Selecting a Process

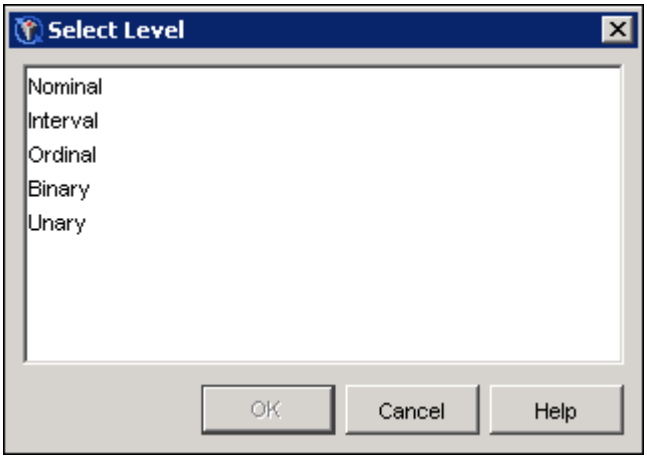
In the Select Process window, you select a process that has been defined in the Real-Time Decision Manager plug-in to add to the list of events and processes.



Select the type of process to display from the **Select Type** drop-down list. Click **OK** to display the Process Properties window. For more information, see "Edit Process Properties" on page 85.

Selecting a Level

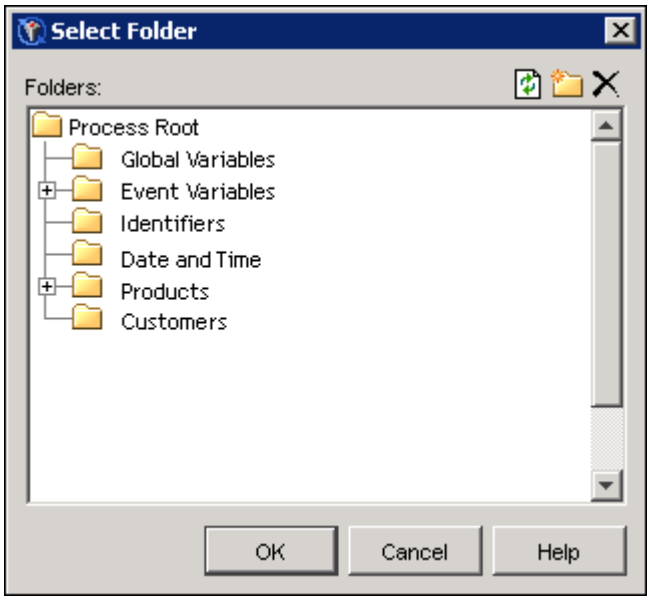
The Select Level window determines the level for multiple variables in the Process Properties window. For more information, see "Edit Process Properties" on page 85.



Select a level for the variables, and click **OK**.

Select a Folder

The Select Folder window organizes the variables in the Select Data Item and Select Value windows in Customer Intelligence Studio.

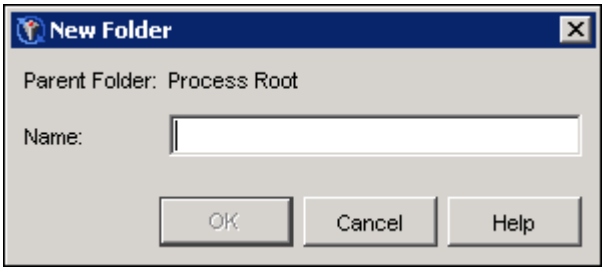


To select a folder to display the variables of the current process, select a folder or click to create a new folder.

Click **OK** to close the window and save your changes.

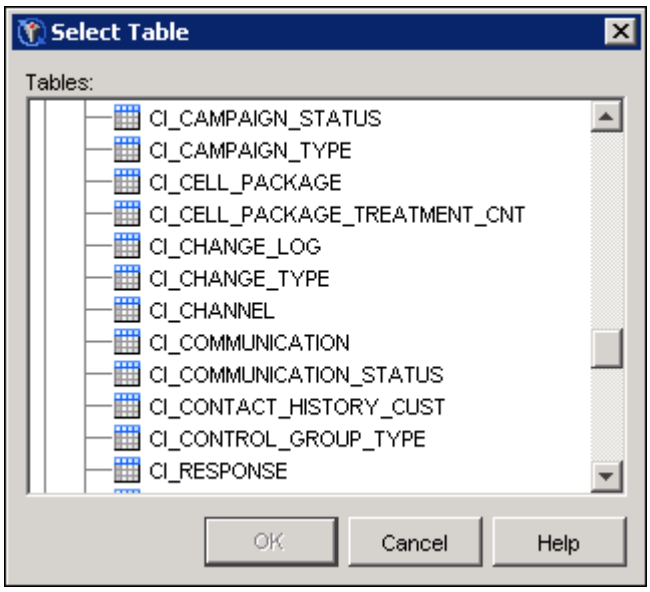
Create a New Data Folder

In the New Folder window, type the name of the folder that you want to create and click **OK**.



Select a Data Table

In the Select Table window, select the SAS data library table that contains the data for a data process.



In order to be displayed in the Select Table window, the table must be registered in the Data Library Manager plug-in in SAS Management Console, the libref must be added to the SAS\SAS\5.1\ServerConfig\RTDM_Libnames.sas file, and the service must be restarted.

Administration Resources

The plug-ins in the Administration Resources folder enable you to create and manage business contexts, select items for optimization, enhance performance, generate metadata, monitor user sessions, and repair campaigns and diagrams.

Setting the Environment

The Environment Settings plug-in in the Administration Resources folder enables you to change the number of rows that are displayed in reports as well as the level of detail that the SAS server returns. You can also modify query performance settings, change the size of the SAS server log, set concurrency parameters, and specify list separators. The options that are available to control environment settings are listed in the table that is displayed at the right of the plug-in.

Changing the Number of Rows in Reports

To change the number of rows that are automatically included in SAS Marketing Automation reports that are generated by the Report node, right-click the **Report Node: Number of rows** option and

select **Properties**. Enter the number of rows and click **OK**. The default number of rows is 5,000. The maximum allowable number of rows is 10,000,000.

Specifying SAS Server Feedback

To specify whether to display the contents of macro code that is running on the SAS server in the Tasks and Logs window, right-click the **SAS server feedback** option and select **Properties**. Select **Display macro code** or **Do not display macro code** from the drop-down list and click **OK**.

Changing the Log Size

To change the log size in bytes, right-click the **Recommended log size** option and select **Properties**. This option controls the size of the log that is generated for any SAS code that is run during a Customer Intelligence Studio session. Enter a new value and click **OK**. The default size is 1,048,576. The maximum size that you can specify is 2,147,483,647. If the log reaches the specified size, older log entries are removed.

Removing Intermediate SQL Tables

To improve application performance by creating temporary tables when the SQL SET function is used, right-click the **Create intermediate tables when using the SQL SET function** option and select **Properties**. Select **No** from the drop-down list and click **OK**.

Creating Temporary Database Tables

To send the contents of cells to the database that is being used by Customer Intelligence Studio so that the query can be processed by the database, right-click the **Create temporary database tables for improved query performance** option and select **Properties**. Select **Yes** from the drop-down list and click **OK**. When the query has finished running, the query results are passed back to Customer Intelligence Studio.

Optimizing Query Performance

To optimize query performance in a diagram that contains SAS tables, right-click the **Optimize query performance for SAS tables** option and select **Properties**. Select **Yes** from the drop-down list and click **OK**.

During query performance optimization, if you update the count in a node that is preceded by a node that creates SAS tables, then the section of the process flow between that node and the node that is updating counts is optimized. Examples of nodes that create SAS tables include the Cell and Link nodes, as well as any stored process node (Cluster, Split, or Limit).

If a Select node, an And node, or an Or node precedes the node that is updating counts, query optimization will not take place. Query performance optimization will not take place if you update

counts from an export node or a report node, because these nodes define output variables that might directly reference database tables.

Increasing SQL Code Efficiency

To increase the efficiency of the SQL code by using joins instead of subqueries wherever possible, right-click the **Minimize the use of subqueries in generated SQL code** option and select **Properties**. Select **Yes** from the drop-down list and click **OK**.

Preserving Rows by Using Outer Joins

To preserve rows so that records are not lost because of an inner join in the information map, right-click the **Preserve selected subjects (using outer join)** option and select **Properties**. Select **Yes** from the drop-down list and click **OK**.

For example, a CUSTOMER table of customer names and a CHECKING table of checking accounts might have an inner join in the information map. The inner join results contain only those customers who have checking accounts. A query that requested all the customers who do not have a closed checking account would result in a table of all customers who have an open checking account. Customers who do not have checking accounts would be excluded. If you select **Preserve selected subjects (using outer join)**, customers who do not have checking accounts would be included in your query results.

Specifying the Number of Tasks Assigned to Query Processing

To specify the number of tasks that are assigned to query processing when **Update Counts** is selected in a Cell node in Customer Intelligence Studio, right-click the **Specify maximum number of concurrent processes per diagram** option and select **Properties**. Enter a number and click **OK**.

Processing Multiple Subjects per Data Type

To process multiple subjects per data type, right-click the **Enable multiple process control** option and select **Properties**. Select **Yes** from the drop-down list and click **OK**.

Specifying the Number of Concurrent Processes

If you have enabled multiple process control, you can specify the number of concurrent processes per data type by right-clicking the **Process limit** option and selecting **Properties**. Specify the number of concurrent processes and click **OK**. Because running more than two processes per CPU will degrade performance, the upper limit for concurrent processes is $2n$, where n is the number of CPUs. If you specify a larger number, subjects will still be processed according to this upper limit. For example, if there are two CPUs, the maximum number of processes is **4**; if you specify a larger number, subjects will be processed in batches of four.

Displaying the Master Business Context

To display the Master Business Context in SAS Customer Intelligence Studio, right-click the **Show Master Business Context in Customer Intelligence Studio** option and select **Properties**. Select **Yes** from the drop-down list and click **OK**. For more information about the Master Business Context, see "Defining Business Contexts" on page 95.

Specifying Delimiters in Exported Lists

To set the delimiter for lists that are exported to external files, right-click the **Separator for exported list values** option and select **Properties**. Select a separator from the drop-down list, or type in a separator, and click **OK**.

Identifying Information Maps

Use the Information Map Metadata plug-in in the Administration Resources folder to view, modify, create, and delete metadata tables for information maps.

Viewing Existing Metadata Tables for Information Maps

When you select the Information Map Metadata plug-in, the display area shows a list of information maps, their folders, the name of the person who last modified the information map, and the most recent date that the metadata tables for the information maps were created or updated through the plug-in.

Modifying Metadata Tables for Information Maps

To modify the metadata tables for an information map, right-click the information map in the display area and select **Properties** to display the Information Map Metadata window. For more information, see "Information Map Metadata Window" on page 93.

Deleting Metadata Tables for Information Maps

To delete all of the metadata tables for an information map, right-click the information map in the display area and select **Delete**.

Creating New Metadata Tables for Information Maps

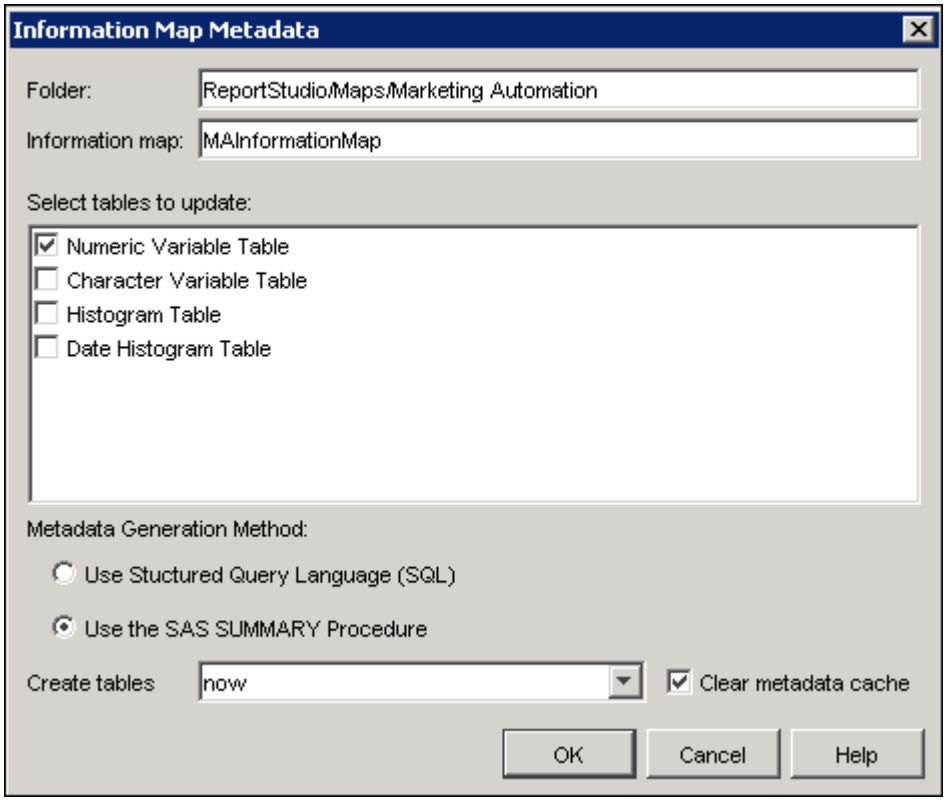
To open the Information Map Metadata window and create or update metadata tables for an information map, use one of the following methods:

- Select from the menu **Actions** ➧ **New Information Map**.
- Right-click the Information Map Metadata plug-in and select **New Information Map**.

Clearing a Metadata Cache for Information Maps

To clear the previously referenced count information that is stored in the metadata cache, right-click an information map in the list and select **Clear Metadata Cache**.

Information Map Metadata Window



When you update a metadata table for an information map, the new folder names appear in the **Folder** column and the new information map names appear in the **Information Map** column of the Information Map Metadata table.

The information map name (for example, MAFunctionalTDATSmall) that was entered will be added to the Information Map column of the Information Map Metadata table.

Select the metadata tables that you want to update from the list of metadata tables. Select either **Use Structured Query Language (SQL)** or **Use the SAS Summary Procedure** to specify if SQL or the Summary procedure should be used in Metadata Generation. Use **Create tables** to specify the date when the metadata tables will be created or updated: either **now** or **on date set using SAS Schedule Manager**. Use the **Clear metadata cache** check box to specify whether to clear the

metadata cache when the metadata count tables are updated.

Using Campaign Utilities

The Campaign Utilities plug-in in the Administration Resources folder enables administrators or users who have edit access to publish reporting data for campaigns, to clear diagram and campaign node counts for selection campaigns, and to repair diagrams and campaigns.

In order to view all the campaigns and diagrams in a business context, select the business context from the **Business Context** drop-down list. The campaign and diagram names are displayed in the table at the right of the Campaign Utilities plug-in.

Repairing Campaigns and Diagrams

The administrator might need to repair a diagram if one of the following conditions is met:

- Clearing the nodes does not enable the user to update counts.
- The diagram is frozen and unable to receive input or to be executed.
- Diagram nodes are in a state of "updating counts" or "locked" when a campaign is opened.
- There are links to nonexistent diagram nodes.
- There are missing tables, due to accidental deletion of campaigns or diagrams that have been imported using the integration utilities.

The repair process unlocks locked nodes, deletes links to missing nodes and tables, and enables users to edit the diagram and recover most, if not all, of their work. The repair process creates a repaired copy of the diagram or campaign.

You can repair the selected diagram or campaign if you are an administrator or if you have edit permissions for the campaign. Make sure that the campaign or diagram is not currently in use by other processes, such as Customer Intelligence Studio. To repair a campaign or diagram, select a business context from the **Business Context** drop-down list, right-click the name of the campaign or diagram, and select **Repair** from the pop-up menu. You can use the CTRL and Shift keys to select more than one campaign or diagram. Click **Yes** in the confirmation dialog box to repair the diagram or campaign. During the repair process, the administrator has owner access. Ownership returns to the previous owner when the repair process is complete.

The repair process works only on diagrams that have been successfully loaded from the Open Metadata Repository (OMR) and DAV. Diagrams that have been corrupted before or during loading cannot be repaired.

If a user logs off during asynchronous execution of a campaign or diagram, the repair process cannot repair the campaign or diagram.

Publishing Reporting Data

To publish campaign data to the SAS Customer Intelligence Reporting Data Model, right-click the campaign name and select **Publish Reporting Data**.

Clearing Node Counts in Selection Campaigns and Diagrams

If users are unable to update the node counts in a diagram, the administrator might need to clear the counts in diagram nodes so that all of the nodes in the selected diagram or campaign are returned to a state of "ready to update." Other users can clear node counts if they have edit permission for the underlying campaign or diagram.

To clear the node counts in a diagram or campaign, right-click the diagram or campaign name and select **Clear Node Counts**.

Defining Business Contexts

A business context defines the information that an individual user can access. For example, in a large, decentralized environment, multiple campaign 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 also make administrative maintenance easier 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.

A business context is made up of an information map and a set of definitions, such as campaign definitions. You can view, create, edit, and delete business contexts from the Business Contexts plug-in in the Administration Resources Folder.

The table at the right of the Business Contexts plug-in lists the name and description of each business context, the location of its information map, the name of the person who last modified the business context, and the date of the last modification.

Click a column header to sort the contents of the table by the selected column.

The Master Business Context contains every campaign definition, export definition, seed list, communication definition, response, reply definition, event, and process that has been configured in the SAS Marketing Automation plug-ins for SAS Management Console. You can restrict users to viewing only those business contexts for which they have specific permission, or you can allow all users access to the Master Business Context. If no business context is created, users have access to all definitions.

Creating, Editing, or Viewing a Business Context

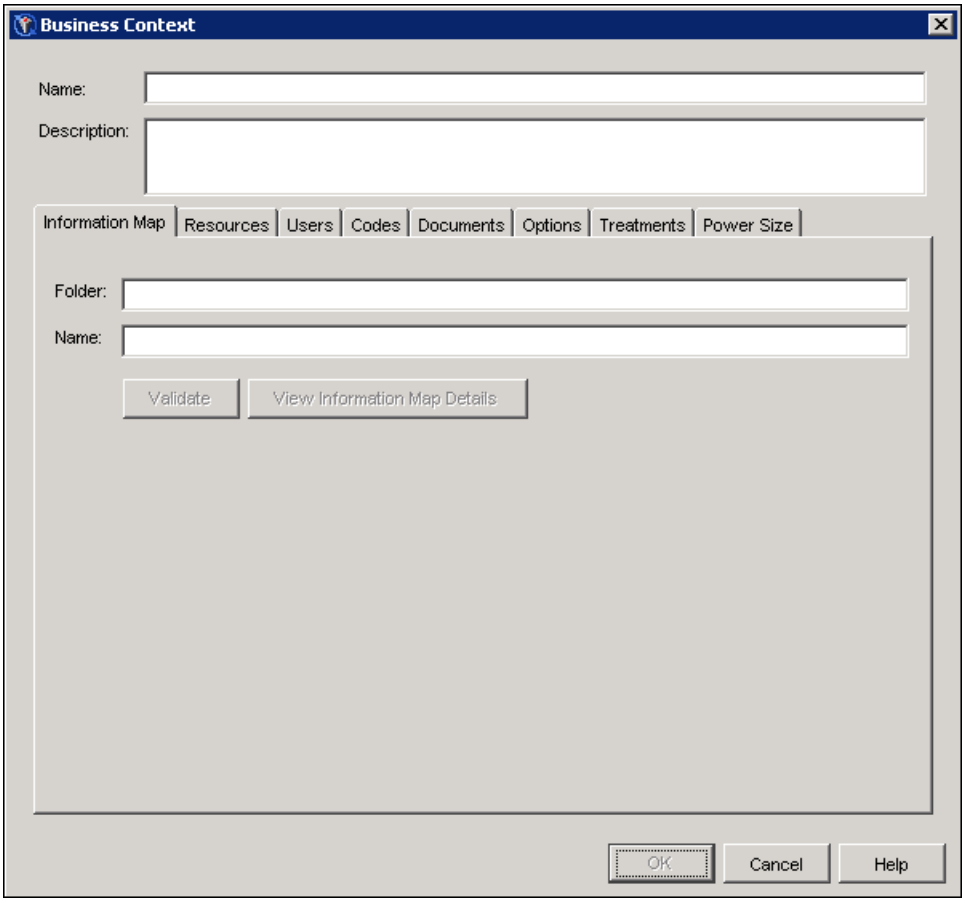
To create a new business context, use one of the following methods:

- Select from the menu **Actions ➧ New Business Context**.
- Right-click the Business Contexts plug-in and select **New Business Context** to display the Business Context window.

NOTE: A newly created business context inherits its document location and code formats from the Master Business Context, unless you change those values.

To edit or view an existing business context, right-click the name of the business context and select **Properties** to display the Business Context window.

The Business Context window specifies the name, description, information map, and other information for a business context.



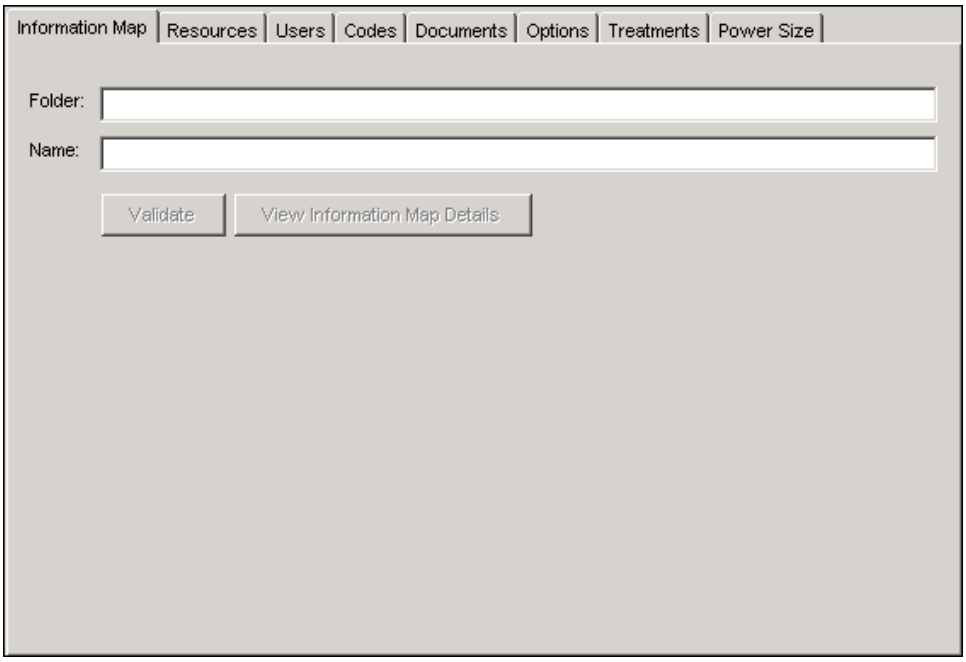
If you do not have edit permission for the business context, you will be able to view, but not edit, the contents.

To create or edit a business context, type a name for the business context in the **Name** field. Optionally, you can type a description in the **Description** field. After a business context has been created, you cannot rename it. Except for the Master Business Context, you can change the description of a business context. When you have finished making changes in the Business Context window, click **OK** to close the window and save your changes.

NOTE: A valid business context name or folder name must contain at least one character and can be no longer than 60 characters. It cannot start with or end with a blank (added blanks are removed). The name cannot contain the following characters: forward slash (/), backslash (\), asterisk (*) question mark (?), colon (:), period (.), angle brackets (<>), vertical bar (|), or quotation marks (").

Information Map Tab

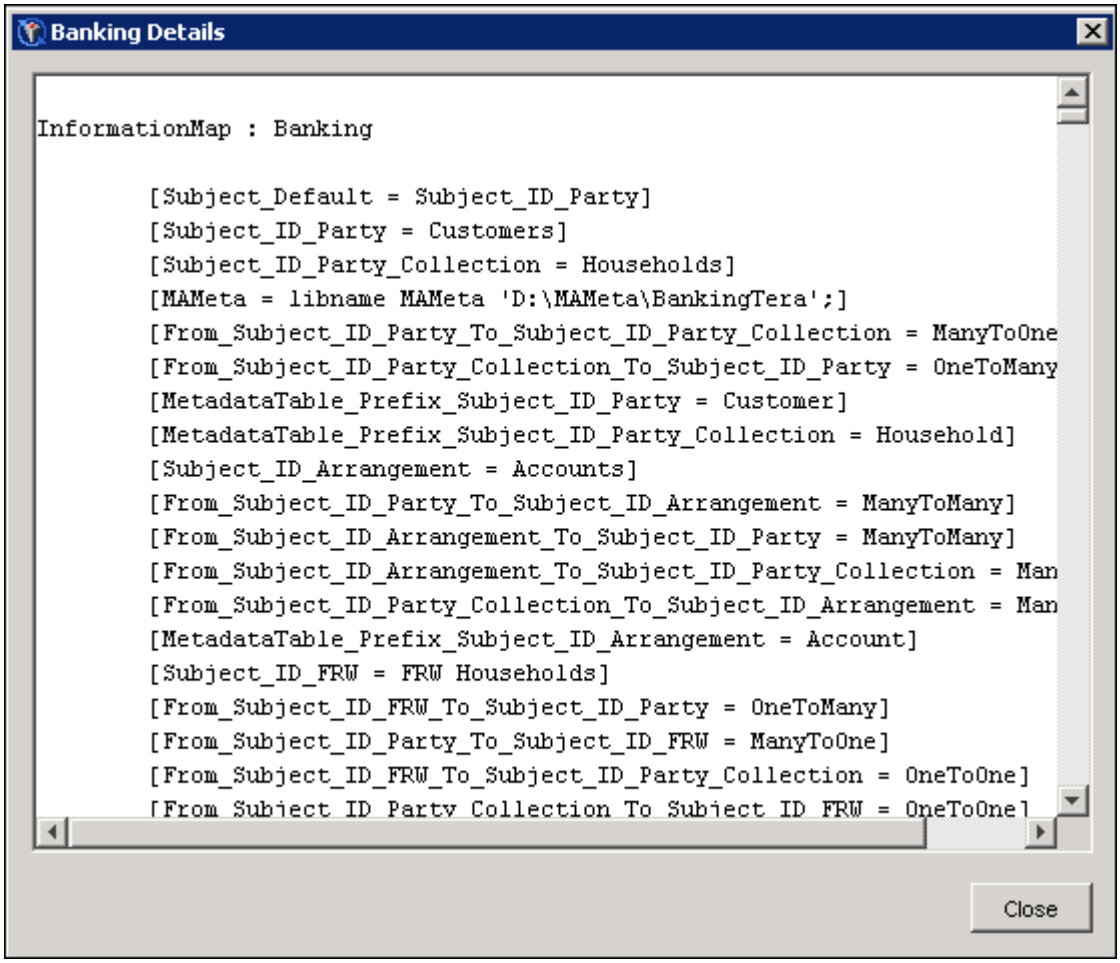
The Information Map tab of the Business Context window identifies the information map on which the business context is based.



To select an information map, follow these steps:

1. Type the pathname to the folder that contains the information map in the **Folder** field.
2. Type the name of the information map in the **Name** field.
3. Click **Validate** to validate the information map. The validation process attempts to locate the information map. If the validation process is not successful, an error message is displayed. When the information map is validated, it becomes available for selection in the Export Definitions and Seeds plug-ins.
4. To display the details of the information map on which the business context is based, click **View Information Map Details** to display the Details window. For more information, see "Details Window" on page 98.

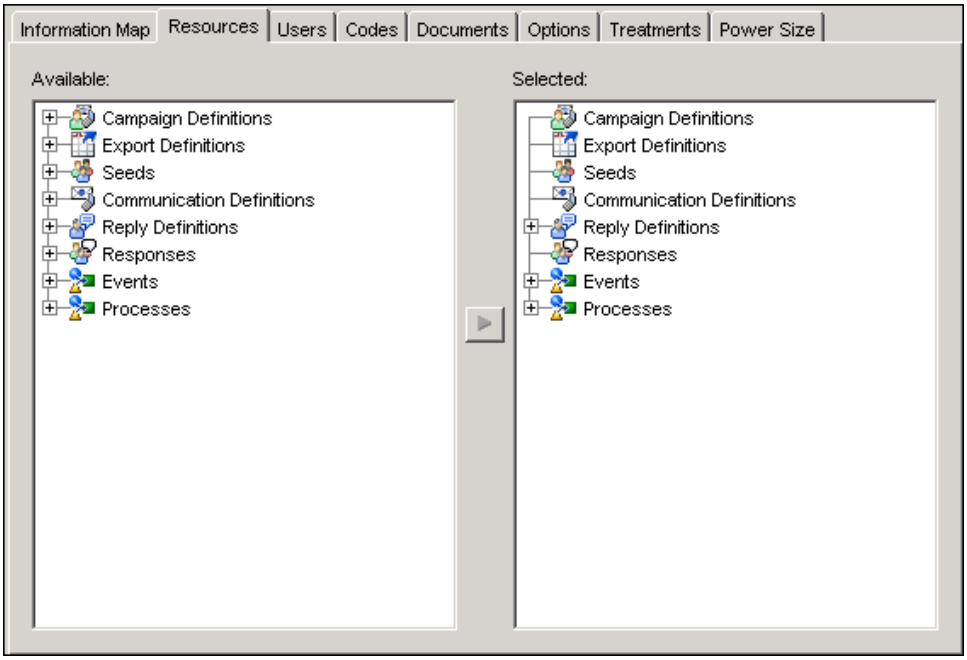
Details Window The Details window displays the details of the information map that is associated with the selected business context.



Click **Close** to close the window.

Resources Tab

The Resources tab of the Business Context window contains the definitions, responses, events, and processes that are associated with the business context.

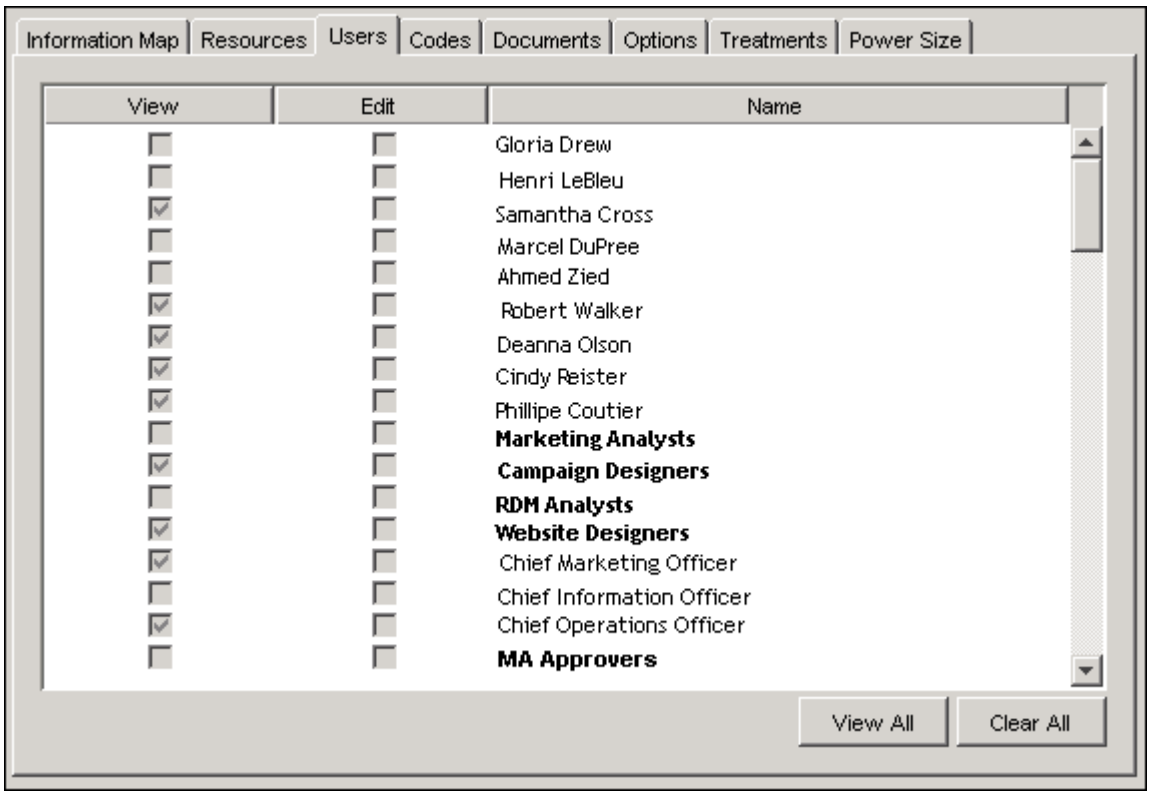


To select resources for a business context, select a resource from the **Available** list and click the right arrow to copy it to the **Selected** list. To remove a resource, select the resource from the **Selected** list and click the left arrow to move it to the **Available** list. Select a folder to move all of the items in the selected folder to the **Selected** list. Press the Shift key or the CTRL key while selecting items to select more than one resource.

NOTE: In the Available list, you can select reply definitions that are associated with the information map that is assigned to the business context. In addition, you can select reply definitions that are not associated with any information map.

Users Tab

The Users tab lists the users and groups in the MarketingAutomationAdvancedUser and MarketingAutomationNoviceUser groups.



Assign **Edit** permissions to users who will be managing and modifying the business context in SAS Management Console. Assign **View** permissions to users who will be using the business context in Customer Intelligence Studio.

Select or clear the **View** check box to assign or disable view access to the business context.

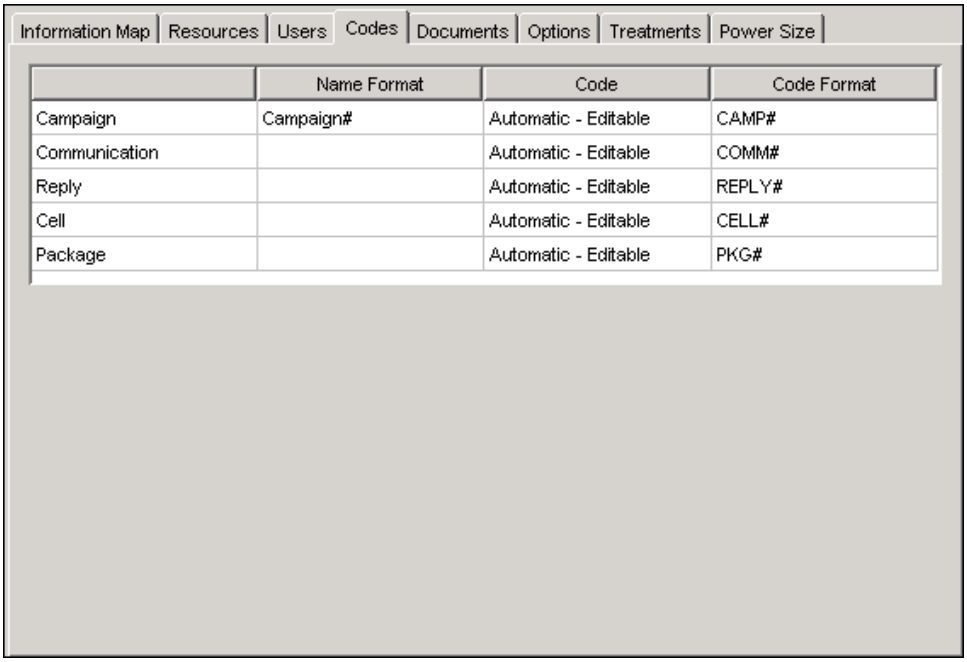
Select or clear the **Edit** check box to assign or disable edit access to the business context.

Select **View All** to assign view permissions to all users except the owner of the business context.

Select **Clear All** to delete view and edit permissions for all users except the owner of the business context.

Codes Tab

On the Codes tab, you can specify the format of codes and campaign names for the selected business context.



Type the name of the campaign, communication, reply, cell, or package in the **Name Format** column. Include the symbol # that will be replaced by a unique number. The # can occur anywhere in the campaign name. For example, in the Orion Star business context, all campaigns might have the name ORION#, where # is replaced by a unique number. By default, the campaign name format is Campaign#.

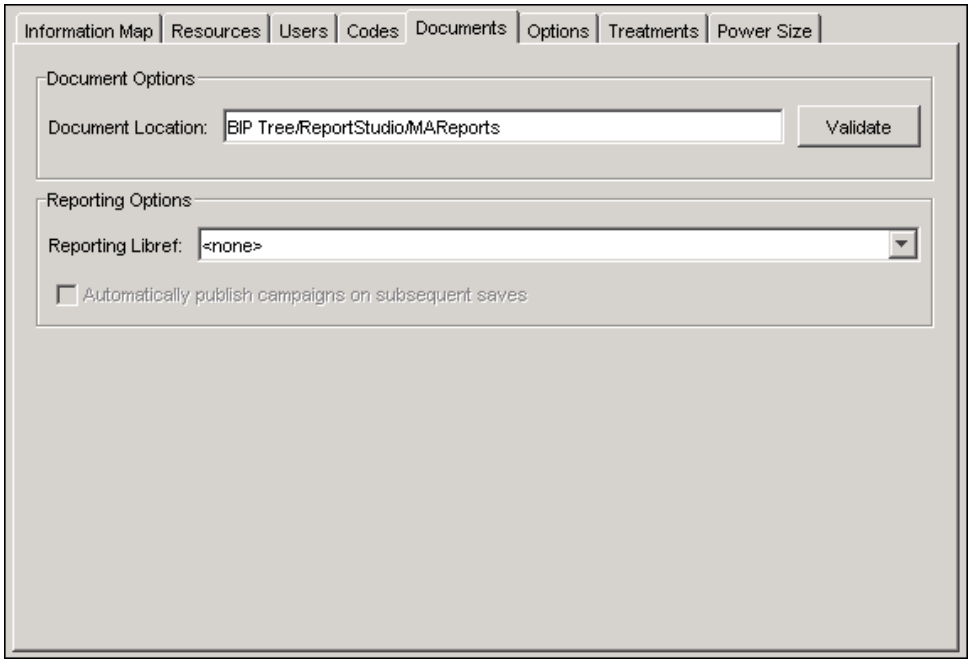
To specify the properties of the code, click on a cell in the **Code** column and select **Automatic - Editable**, **Automatic - Not Editable**, or **Manual - Editable** from the drop-down list.

Code formats are required. Type the code format in the **Code Format** column. Include the symbol # that will be replaced by a unique number. The # can occur anywhere in the code name. The following are the default formats:

- CAMP#
- COMM#
- REPLY#
- CELL#
- PKG#

Documents Tab

The Documents tab specifies the output location and other options for documents and reports.



In the Document Options area, a valid default pathname is supplied in the **Document Location** field. This is the location for documents such as campaign summaries. To change the location, type a fully qualified pathname in the **Document Location** field. Click **Validate** to make sure that the location is valid. By default, the location is specified in a file named ejbjar.xml. You should specify a separate document location for each business context. The location of the document must be in a repository, for example, **BIP Tree/ReportStudio/MAReports**.

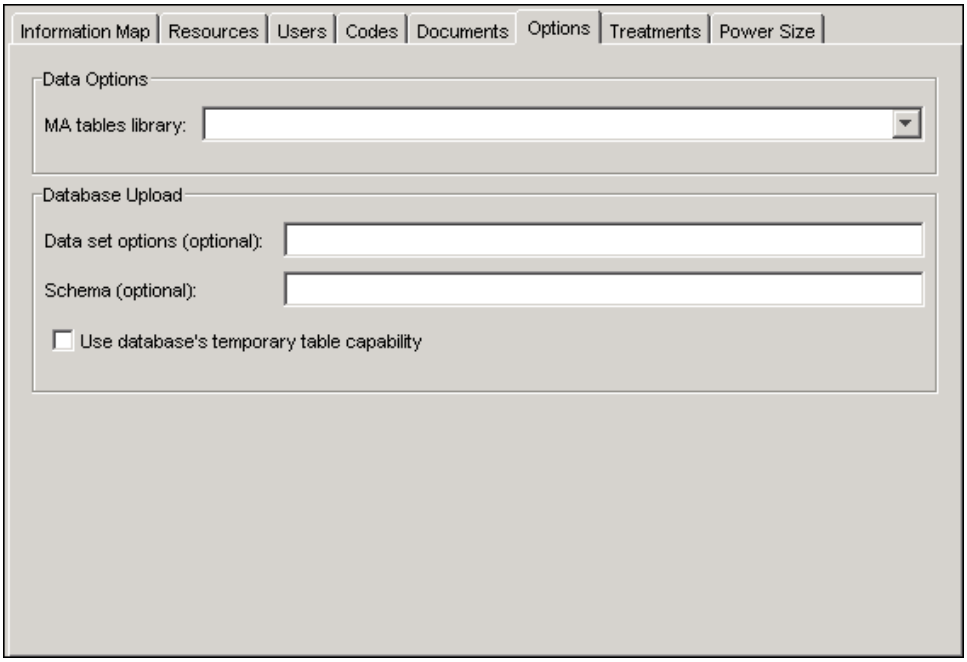
In the Reporting Options area, select a libref for the location of the SAS Customer Intelligence Reporting Data Model from the **Reporting Libref** drop-down list. If **<none>** is displayed, you cannot publish campaigns.

Use the MAREPORT libref to publish campaigns and view the data in a default treatment performance report that is based on data in the SAS Customer Intelligence Reporting Data Model. A treatment performance report displays treatments across several campaigns, and enables you to identify the quality of the responses to a communication. This report can combine data from SAS Marketing Automation, SAS Real-Time Decision Manager, SAS Digital Marketing, SAS Web Analytics, and SAS Marketing Automation. You can use SAS Web Report Studio to view treatment performance reports.

To publish a campaign report every time that the campaign is saved in Customer Intelligence Studio, select **Automatically publish campaigns on subsequent saves**.

Options Tab

The Options tab specifies the location of the MA tables library, data set options that are used during a bulk load, and any temporary schema for the current business context.



Click the **MA tables library** field to select a library from a list of libraries whose libref is MATABLES.

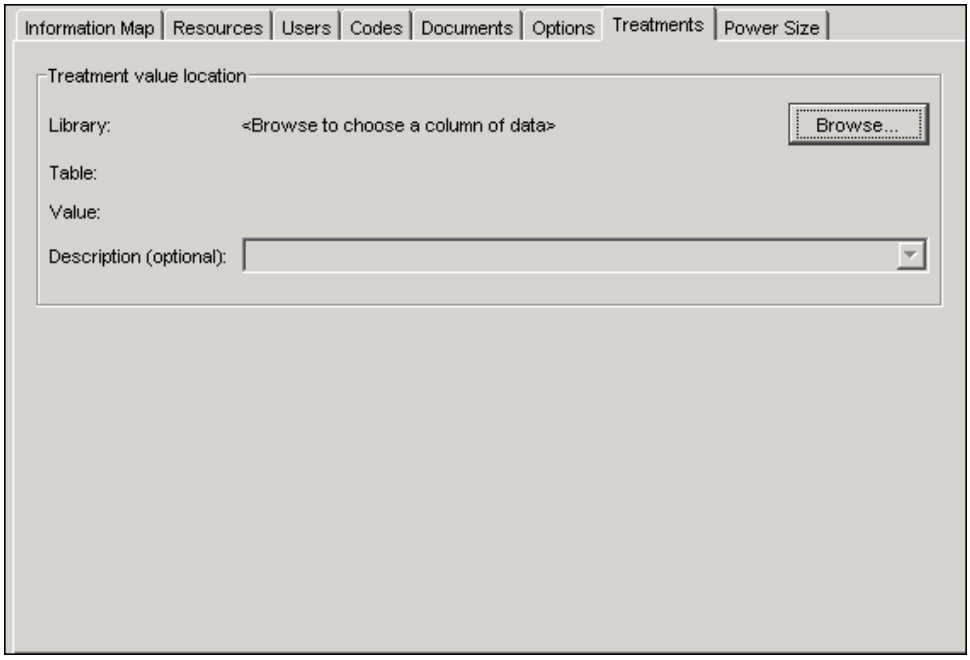
To enable faster uploading of tables and updating of contact history, enter DBSDOPTIONS variable options in the **Data set options** field. Enter values for the DBTEMPSCHEMA option in the **Schema** field.

If the database has native temporary locations, select **Use database's temporary table capability**.

Treatments Tab

The Treatments tab specifies the location of treatment values. A treatment is a type of offer, such as a coupon for a stay at a hotel. Treatments can be associated with marketing cells in campaigns. For example, a collection of treatments, called a package, might contain three coupons: one coupon for a stay at a hotel, one coupon for a dozen roses, and one coupon for computer software. A marketing cell is the cell that immediately precedes a communication node in a selection diagram, or the cell that immediately precedes a reply node in a decision campaign or decision diagram.

You can select from these treatment values when you associate treatments with the marketing cells that are listed on the Packages tab either of either a Reply node or a Communication node in Customer Intelligence Studio.



Click **Browse** to select a column of data that contains the treatment values. For more information, see "Browse Window" on page 47.

Optionally, you can select a column name from the same table as a description. Select a column name from the **Description** drop-down list, or leave **<none>** in the **Description** field.

Power Size Tab

This feature is experimental for SAS Marketing Automation 5.1.

Deleting a Business Context

To delete a business context, right-click the business context name and select **Delete**. Click **OK** in the confirmation dialog box. You must have edit permissions for the business context in order to delete it. You cannot delete the Master Business Context. You cannot delete a business context for which there are any active user sessions, campaigns, diagrams, or definitions; you also cannot delete a business context that has items in the **Selected** list of the Resources tab. For information, see "Resources Tab" on page 98.

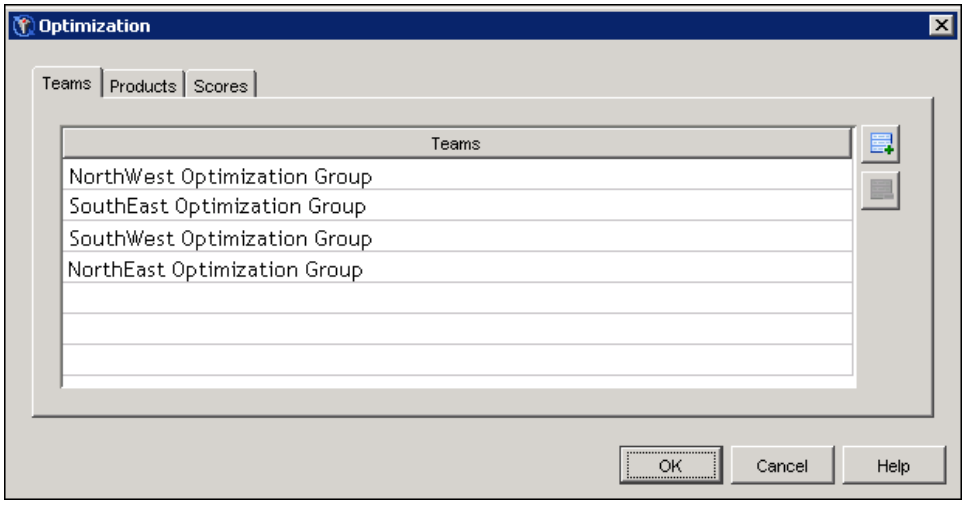
Logging Users Off

The User Sessions plug-in enables you to log users off. A user might be unable to log off from Customer Intelligence Studio because of locked stored processes or some other problem.

To log a user off, right-click the user name and select **Log User Off**. Select **View ➧ Refresh** to update the table and ensure that you are seeing the current users and other information. The administrator can see the entire contents of the table, which displays all user IDs and user names that are currently logged on, the client, the business context, the latest activity, the number of pending processes and the number of locked processes. Other users see only those items that they have permission to view. The name of the current user is greyed out so that it cannot be deleted.

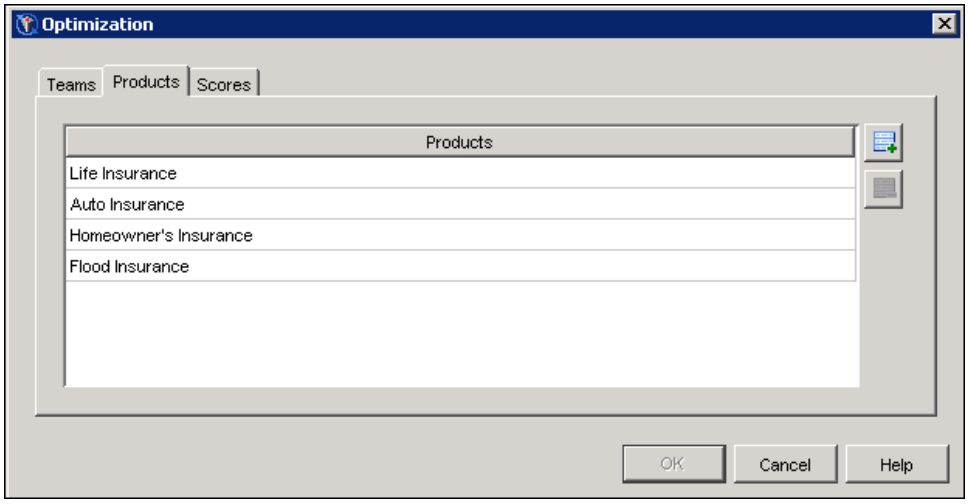
Optimizing Components

The Optimization plug-in in the Administration Resources folder enables you to take advantage of the integration of SAS Marketing Automation and SAS Marketing Optimization by listing the teams, products, and scores to be optimized. Right-click the Optimization plug-in and select **Optimization** from the pop-up menu to display the Optimization window.



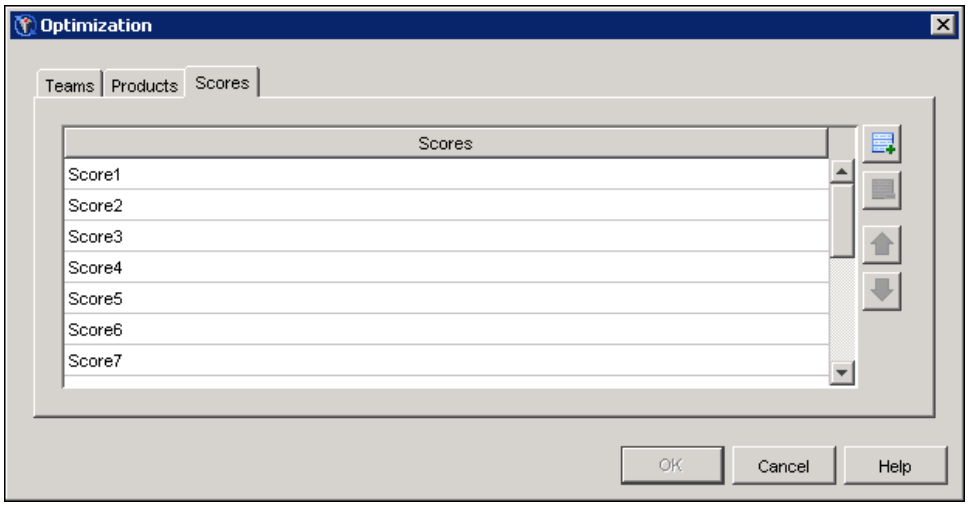
To add a team to the list of teams to be optimized, select the **Teams** tab and click . Type the name of the team in the new row. To remove a team from the list of teams to be optimized, click .

The Products tab displays a list of products to be optimized.



To add a product to the list of products to be optimized, click . Type the name of the product in the new row. To remove a product from the list of products to be optimized, click .

In Marketing Automation 5.1, there is no limit to the number of scores that can be provided. Score names are displayed as column headers in the Optimize window in Customer Intelligence Studio. The Scores tab displays a list of score names.

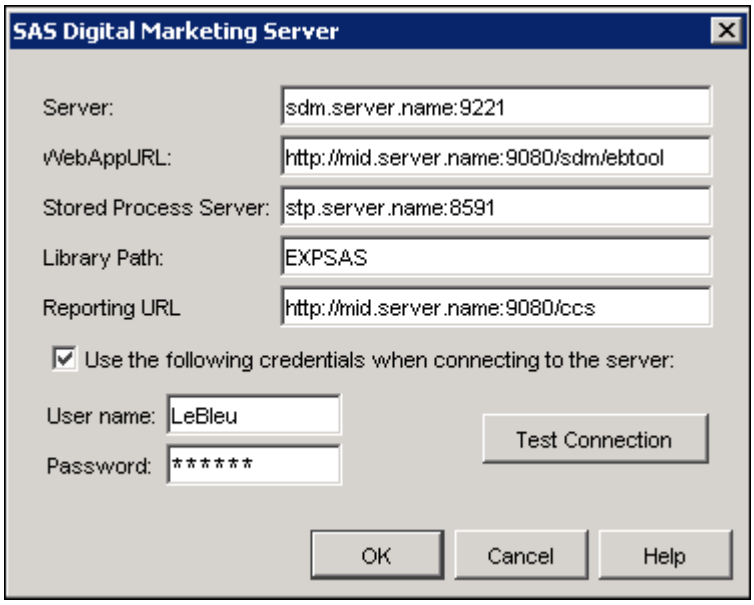


To supply default values for score names, click . Type the name of the score in the new row. To remove a score name from the list, click .

Click **OK** to close the window and save your changes, or click **Cancel** to close the window without saving your changes.

Configuring the SAS Digital Marketing Server

If SAS Digital Marketing is installed at your site, you can broadcast e-mail messages when you execute communications. To configure the SAS Digital Marketing Server, right-click the SAS Digital Marketing plug-in and select **SAS Digital Marketing Server** from the pop-up menu.



In the SAS Digital Marketing Server window, specify the following options:

1. In the **Server** field, enter the machine name and port number of a SAS Digital Marketing server, such as **sdm.server.name:9221**.
2. In the **WebAppURL** field, enter a URL for the ebTool interface, such as **http://mid.server.name:9080/sdm/ebtool**.
3. In the **Stored Process Server** field, enter the machine name and port of the stored process server that is used to deliver recipient list data sets through the SAS Marketing Automation export process.
4. In the **Library Path** field, enter the SAS libref that contains the e-mail recipient table. This libref will be used when you create an export definition that has an output type of SAS Digital Marketing. For more information, see "Export Definition Window" on page 50.
5. In the **Reporting URL** field, enter a URL for the SAS Customer Intelligence Common Reporting service, such as **http://mid.server.name:9080/ccs**. This service is used by SAS Digital Marketing to automatically update contact history and response history information in the SAS Customer Intelligence Reporting Data Model.
6. Select **Use the following credentials when connecting to the server** to enable the **User name** and **Password** fields.

7. Enter a valid user name and password with access permissions for all of the fields in the SAS Digital Marketing Server window.
8. Click **Test Connection** to ensure that you have provided the correct configuration servers and to test that the server you have specified also has the correct settings.
9. Click **OK** to close the window and save your changes.

Chapter 4

Using SAS Customer Intelligence Studio

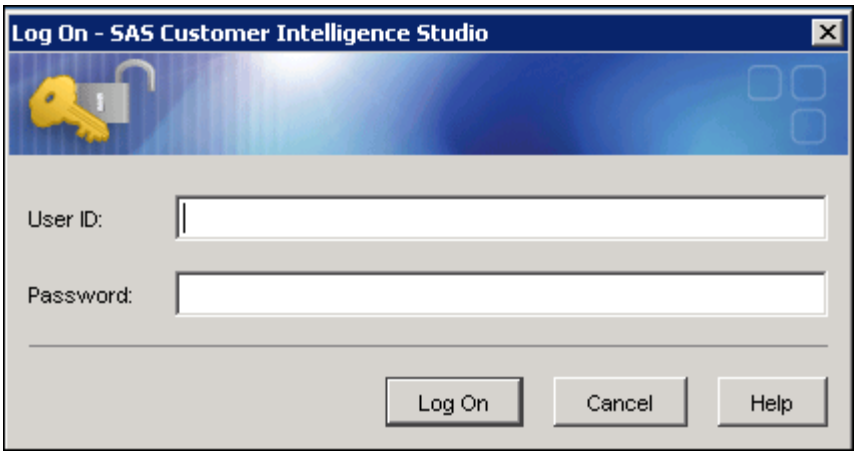
Contents

Starting a SAS Customer Intelligence Studio Session **109**
Business Contexts **110**
Selecting a Business Context 110
Changing a Business Context 111
SAS Customer Intelligence Studio Welcome Screen **112**
SAS Customer Intelligence Studio User Interface **112**
Changing Preferences 114
Using the Drop-Down Menus 115
Using the Toolbar 119
Using the Campaign Checklist Window 120
Using the Tool Palette 121
Using the Properties Pane 121
Using the Diagram Workspace 121
Using the Customer Intelligence Studio Windows 122

Starting a SAS Customer Intelligence Studio Session

To start a session of SAS Customer Intelligence Studio, follow these steps:

1. Select **Programs** ➧ **SAS** ➧ **SAS Marketing Automation** ➧ **SAS Customer Intelligence Studio** from the Start menu.
2. In the SAS Customer Intelligence Studio window, enter your user ID and password.



3. Click **Log On**. The Select Business Context window opens.

Business Contexts

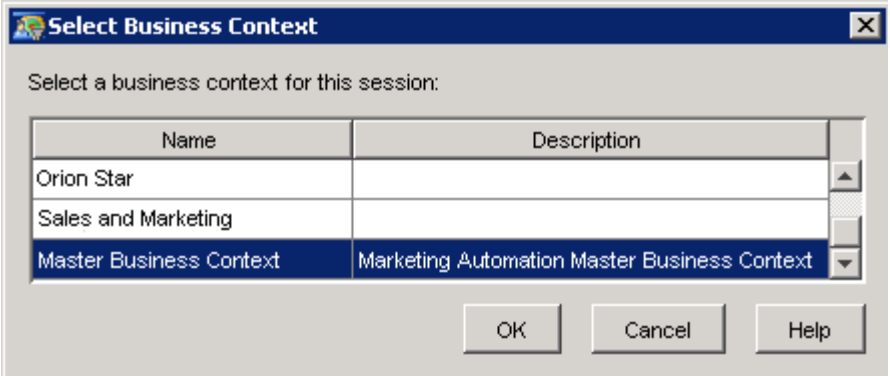
A business context defines the data, definitions, and environment settings that an individual user can access. Different business users within the same company can access different sets of data, templates, and definitions, depending on the business contexts that have been configured for them. One business context might access a flat database structure designed for customer-based marketing, while another business context might access a complex database structure that is designed for prospect-based marketing.

Business contexts are configured in the Marketing Automation Administration plug-in in SAS Management Console. A user can be assigned access to one or more business contexts. For information about configuring business contexts in SAS Management Console, see "Defining Business Contexts" on page 95.

Selecting a Business Context

If your current context is the Master Business Context and if you have been assigned access permissions to more than one business context in the SAS Management Console, the Select Business Context window is displayed after you log on to Customer Intelligence Studio.

The Select Business Context window displays the list of business contexts to which you have access.



Depending on the configuration of business contexts at your site, a Master Business Context might be displayed in the list. This business context contains all information maps and definitions that have been created for your site.

Click **OK** or press the Enter key to accept the default, or select another context and click **OK** or press the Enter key. If the business context is not the Master Business Context, the business context name is displayed on the title bar.

After you select and use a business context, that business context is the default and the Select Business Context window is no longer displayed when you invoke Customer Intelligence Studio.

As you work in Customer Intelligence Studio, you will be able to select only those campaigns that have been assigned to your business context. All campaigns, diagrams and other information are saved as part of the current business context. Other business contexts do not have access to this information.

Changing a Business Context

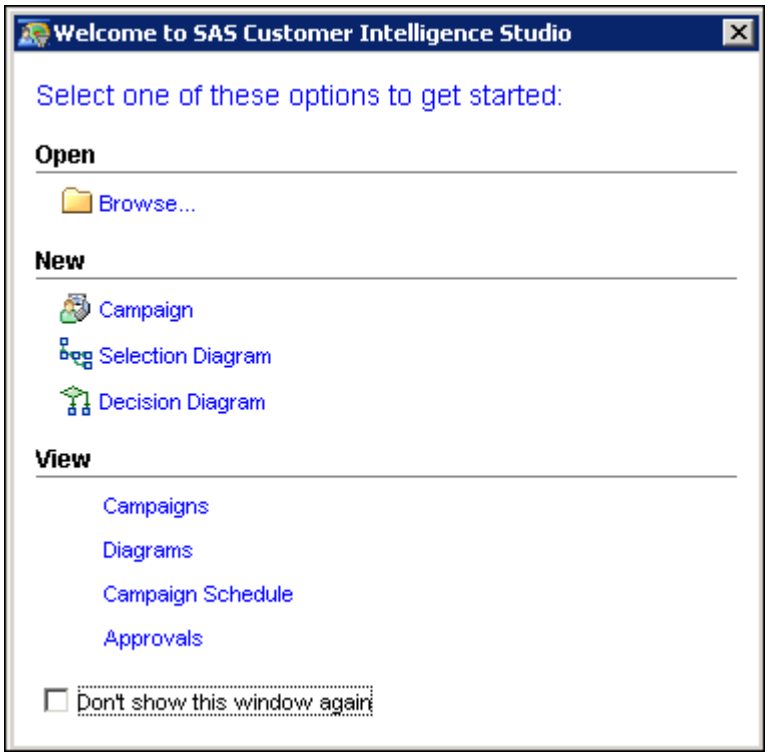
If you have been assigned access permissions to more than one context in the SAS Management Console, you can change the business context that you are using in Customer Intelligence Studio.

To change a business context:

1. Close all open windows in Customer Intelligence Studio.
2. Select **File** ➧ **Change Business Context** from the drop-down menu.
3. In the Select Business Context window, select a different context and click **OK** or press the Enter key.

SAS Customer Intelligence Studio Welcome Screen

After you start a session of SAS Customer Intelligence Studio, the Welcome to SAS Customer Intelligence Studio window opens.



Use the Welcome screen to select an existing campaign, create new campaigns or diagrams, view details about campaigns, diagrams, or campaign schedules, or change the approval status of campaigns. Your most recently used campaigns and diagrams are listed in the **Open** section. If you have licensed SAS Marketing Automation, you can create selection campaigns. If you have licensed SAS Real-Time Decision Manager, you can create decision campaigns.

SAS Customer Intelligence Studio User Interface

SAS Customer Intelligence Studio provides you with a graphical user interface to create, modify, and manage campaigns and communications. You can use SAS Customer Intelligence Studio to perform the following tasks:

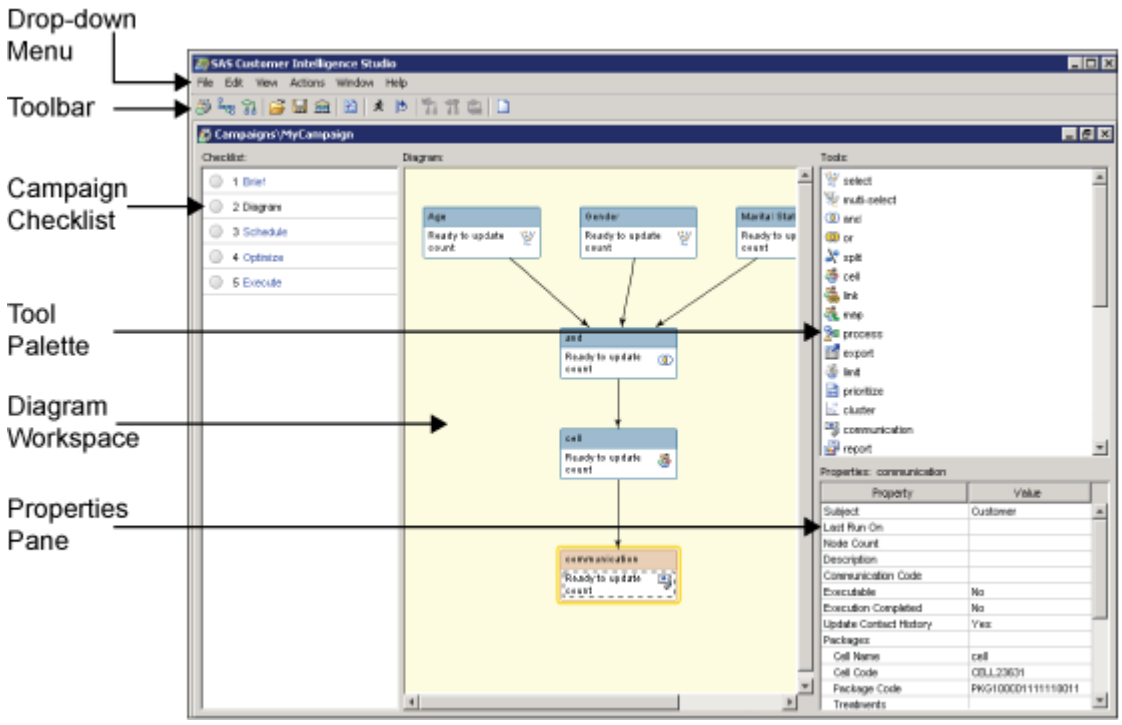
- define your selection of customer groups to target in a marketing campaign
- select channels that are used to communicate with the defined customer groups

- schedule selection campaigns and communications
- create decision campaigns and diagrams
- execute communications
- create audit logs, diagram documents, cell sizing documents, and campaign summary documents.

The SAS Customer Intelligence Studio user interface consists of the following major areas:

- drop-down menus
- toolbar
- campaign checklist
- Diagram Workspace
- tool palette
- properties pane

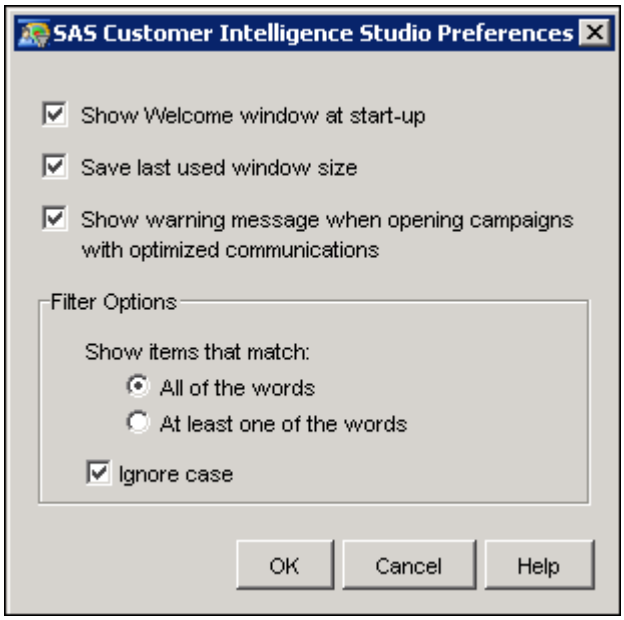
The following figure shows the major areas of the SAS Customer Intelligence Studio user interface. In the figure, a process flow diagram appears in the Diagram Workspace. Note that different campaigns might have different checklists. This figure depicts a selection campaign available in SAS Marketing Automation.



You can toggle each of the areas by selecting **View** ➧ **Display** and the area name.

Changing Preferences

Select **Edit** ➧ **Preferences** to display the Preferences window. In the Preferences window, you can choose whether to display the Welcome window, retain the size of windows between sessions, and set options for filtering and optimization.



Select **Show Welcome window at start-up** to display the Welcome to SAS Customer Intelligence Studio window at start-up.

Select **Save last used window size** to retain the locations and dimensions of resized windows, such as the Campaigns window.

If you have licensed SAS Marketing Optimization, select **Show warning message when opening campaigns with optimized communications** to display a warning message when you open a campaign with optimized communications. Changing a diagram in a campaign that contains optimized communications might nullify previous optimization results.

The Filter Options section controls the display of items in lists where you type text into the **Show** field. Select **All of the words** to display items that contain all of the words that are entered. Select **At least one of the words** to display items that contain at least one of the words that are entered. Select **Ignore case** to apply a filter that is not case-sensitive.

Using the Drop-Down Menus

SAS Customer Intelligence Studio provides the following drop-down menus and keyboard shortcuts. For example, to create a new campaign using keyboard shortcuts, type Alt-F, then N, then C. Shortcuts that use CTRL can be typed directly. The menus and menu items that are available vary depending on which window is active.

File (Alt-F)

New (N)

Campaign (C)
enables you to create a new campaign.

Selection Diagram (S)
enables you to create a new Selection diagram.

Decision Diagram (D)
enables you to create a new Decision diagram.

Open (O or CTRL-O)
enables you to open an existing campaign or diagram.

Close (C)
closes a campaign or diagram.

Save (S or CTRL-S)
saves the current campaign or diagram.

Save As (A)
saves a campaign or diagram, using a name that you specify. Ownership is assigned to the user who saves the campaign or diagram. This user is also assigned edit permission. Permissions for all other users are unchanged. The campaign is assigned a new campaign code and a new communication code, if applicable. The Approval status is set to **False**. The Deployed, Exported, and Executed flags are set to **False**. Communication status is set to **Not Ready**.

Change Business Context (B)
opens Select Business Context window.

(1, 2, ...)
enables you to select a recently opened campaign or diagram.

Exit (X, Alt-F4)
exits the Customer Intelligence Studio session.

Edit (Alt-E)

Cut (T or CTRL-X)
removes the current selection or object and places it in the clipboard.

Copy (C or CTRL-C)
copies the current selection or object and places it in the clipboard.

Paste (P or CTRL-V)
selects all of the objects in the diagram.

Select All (S or CTRL-A)
pastes the most recently cut or copied object from the clipboard.

Delete (D or Delete key)
deletes the selected objects.

Group (G)
groups the selected objects.

Ungroup (U)
ungroups the objects in the selected group.

Expand (E)
expands the selected group.

Collapse (O)
collapses the selected group.

Add Node (A)
opens a window in which you can select a node to add to the diagram.

Preferences (R)
opens the Preferences window.

View (Alt-V)

Campaigns (C)
opens the Campaigns window that displays a list of campaigns that have been created.

Diagrams (A)
opens the Diagrams window that displays a list of diagrams that are not part of campaigns and that satisfy the filter criteria.

Documents (O)
opens the Documents window that displays a list of the various documents that are available.

Campaign Schedule (S)
opens the Campaign Schedule window.

Communications (M)
opens the Communications window that displays a list of the communications that are available in a campaign.

Diagram Properties (P)
opens or closes the Properties window for the selected diagram.

Standard Reply (R)
in a decision campaign, enables you to select a reply definition and open the Standard Reply properties window.

Display (D)

Checklist (K)
opens or closes the Checklist window.

Tools (T)
opens or closes the Tool Palette.

Properties Pane (P)
displays the properties of a diagram in the Diagram Properties window.

Status Bar (S)
turns the application status bar on and off.

Toolbar (B)
turns application toolbar on and off.

Zoom (Z)
enables you to zoom in or out of the diagram. The following options are available:

In (I)
increases the scale of the diagram.

Out (O)
decreases the scale of the diagram.

Fit (F)
adjusts the size of the diagram to fit in the Campaign Studio window.

25%
displays the diagram at 25% of its full size.

50%
displays the diagram at 50% of its full size.

75%
displays the diagram at 75% of its full size.

100%
displays the diagram at 100% of its full size.

Layout (L)
sets the orientation of a diagram. The following options are available:

Right (R)

Left (L)

Up (U)

Down (O)

Overview (V)
displays a schematic view of the diagram in the Overview window.

Tasks and Logs (T)
opens the Tasks and Logs window and displays the Tasks tab.

Actions (Alt-A)

Run Nodes (R)
updates the count information in the selected nodes.

Clear All Counts (C)
clears the counts for all nodes in a campaign or diagram.

Schedule Diagram (S)
schedules the communications in the diagram for execution.

Validate Diagram (V)
validates a decision diagram and displays an error message if the diagram is not valid.

Test Diagram (T)
tests the diagram in a decision campaign.

Mark Diagram for Deployment (M)
marks a decision diagram for deployment and displays an error message if the diagram cannot be deployed.

Reporting Version (P)
displays the reporting versions that have been created.

Publish Reporting Data (b)
publishes the campaign to the SAS Customer Intelligence Reporting Data Model.

Create Document (D)

Diagram (D)
Opens the Create Document window for the diagram.

Audit Log (A)
opens the Audit Log window for the diagram.

Window (Alt-W)

Cascade (C)
places windows on top of each other in cascaded fashion.

Tile Horizontal (H)
places open windows next to each other without overlapping contents.

Tile Vertical (V)
places open windows in a vertical arrangement without overlapping contents.

Save Current Pane Size (S)
saves the layout of the Campaign and Diagram windows.

<window list> (1, 2, ...)
enables you to select which window is active.

Help (Alt-H)

Contents and Index (N)
opens the Contents and Index Help window.

SAS on the Web (B)
opens the SAS on the Web menu.

Technical Support (T)
opens SAS Technical Support Web page.

Frequently Asked Questions (F)
opens the SAS Technical Support FAQ page.

Send Feedback (S)
opens the SAS Contact Us page.

SAS Home Page (H)
opens the SAS Web page.

About SAS Customer Intelligence Studio (A)
displays version, legal, and configuration information for SAS Customer Intelligence Studio.

Using the Toolbar

The Toolbar provides quick access to the functions and tools that you use most frequently. The following table lists the tools that are available.

Tool Icon	Tool Icon Name	Description
	Create a New Campaign	Opens the Choose Campaign Definition window so you can create a new campaign.
	Create a New Selection Diagram	Opens the Selection Diagram window so you can create a new diagram. The Tool Palette and Properties pane also open.
	Create a New Decision Diagram	Opens the Decision Diagram window so you can create a new diagram. The Tool Palette and Properties pane also open.
	Open a Campaign or Diagram	Enables you to open a campaign or diagram.
	Save the Active Campaign or Diagram	Enables you to save a campaign or diagram.
	Change Business Context	Opens the Select Business Context window.
	View Diagram Properties	Opens the Diagram Properties window for the current diagram.
	Run Selected Nodes	Updates the count information in the selected nodes.
	Clear Counts on All Nodes	Clears the counts on all of the nodes in the diagram.
	Validate Diagram	Validates a decision diagram and displays an error message if the diagram is not valid.
	Test Diagram	Opens the Test Diagram window for a decision diagram.
	Mark Diagram for Deployment	Marks a decision diagram for deployment and displays an error message if the diagram cannot be deployed.
	Create Diagram Document	Opens the Create Document window for the diagram.

Using the Campaign Checklist Window

To view the Campaign Checklist window, select **View** ➧ **Display** ➧ **Checklist**.

The Campaign Checklist window displays the list of tasks that should be completed before you can execute a campaign. The checklist displays the name, description, recommended order, and completion state of each task. Different campaigns might have different checklists. For more information about the Campaign Checklist window, see “Campaign Checklist” on page 124.

Using the Tool Palette

To view the Tool Palette, select **View** ➧ **Display** ➧ **Tools**.

The Tool Palette displays the tools that are available in SAS Customer Intelligence Studio and SAS Real-Time Decision Manager. The tool selection depends on whether you are creating a selection diagram in SAS Customer Intelligence Studio or a decision diagram in SAS Real-Time Decision Manager. To add a tool to a diagram, double-click the tool or drag the tool to the Diagram Workspace. For information about tools, see "Introduction to Diagrams and Nodes" on page 143.

Using the Properties Pane

To view the Properties Pane, select **View** ➧ **Display** ➧ **Properties Pane**.

The Properties Pane displays information such as subject and count for a selected node in a diagram.

Using the Diagram Workspace

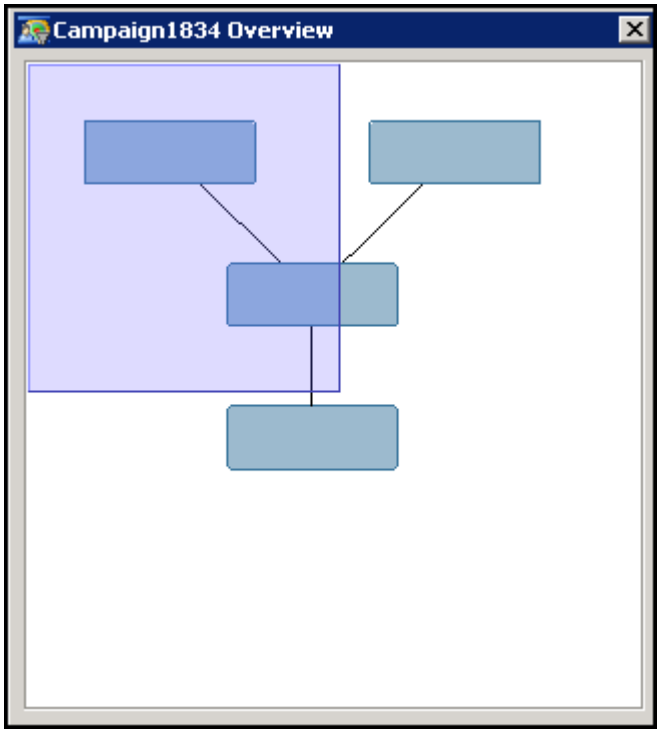
The Diagram Workspace is displayed when you open a campaign or a diagram. In the Diagram Workspace, you create diagrams of groups of customers and the communications that you use to target the customer groups during a campaign.

You can interact with the Diagram Workspace in the following ways:

- To resize the window, place the mouse pointer on the edge of the window and then drag the window to the size that you want.
- To increase or decrease the magnification of the diagram, select **View** ➧ **Zoom**, or select **Zoom** from the pop-up menu.
- To browse the properties of the diagram, select **View** ➧ **Diagram Properties**, or select **Diagram Properties** from the pop-up menu.
- To paste a copied object into the diagram, select **Edit** ➧ **Paste**, or select **Paste** from the pop-up menu.
- To open a compact schematic view of diagram, select **View** ➧ **Overview**, or select **Overview** from the pop-up menu.

Overview Window

The Overview window displays a compact schematic view of the diagram. Here is an example of the Overview window.



Each rectangle represents a node. The shaded area indicates that part of the diagram that is visible in the Diagram Workspace.

Using the Node Pop-up Menus

Here is a list of the actions that you can perform by using the node pop-up menus.

- To open a node properties window, right-click a node in the diagram and select **Properties**.
- To delete a node, select **Delete** from the node's pop-up menu.
- Depending on the node that you have selected, you can perform tasks such as updating the count, exporting a file or table, or creating splits.

Using the Customer Intelligence Studio Windows

Click **OK** or **Cancel** to accept or cancel choices that you have made in windows that have these buttons. Windows that do not have **OK** or **Cancel** buttons can be closed by clicking ☒.

Chapter 5

Creating Campaigns

Contents

Creating a Campaign **123**
Choose Campaign Definition Window 124
Campaign Checklist 124
Custom Details Window 125
Campaign Brief Window 126
Custom Details Tab 128
Budget Tab 128
Editing Links and Selecting from Lists 129
Opening a Campaign **130**
Viewing Campaigns **131**
Campaigns Window 131
Filter Window 133
Validating Decision Diagrams **134**
Testing Decision Campaigns and Diagrams **134**
Selecting a Time Zone 137
Marking Decision Diagrams for Deployment **138**
Optimizing Campaigns **138**
Optimize Window 139

Creating a Campaign

SAS Customer Intelligence Studio enables you to create a campaign and the associated communications by building a diagram in the Diagram Workspace. A campaign must have a diagram, but a diagram does not have to be part of any campaign. You create a campaign and then build a diagram within the campaign.

To create a campaign and then build a diagram within the campaign, follow these steps:

1. Click the Create New Campaign icon on the toolbar or select from the pull-down menu: **File ➧ New ➧ Campaign**.
2. Select a campaign definition in the Choose Campaign Definition window.

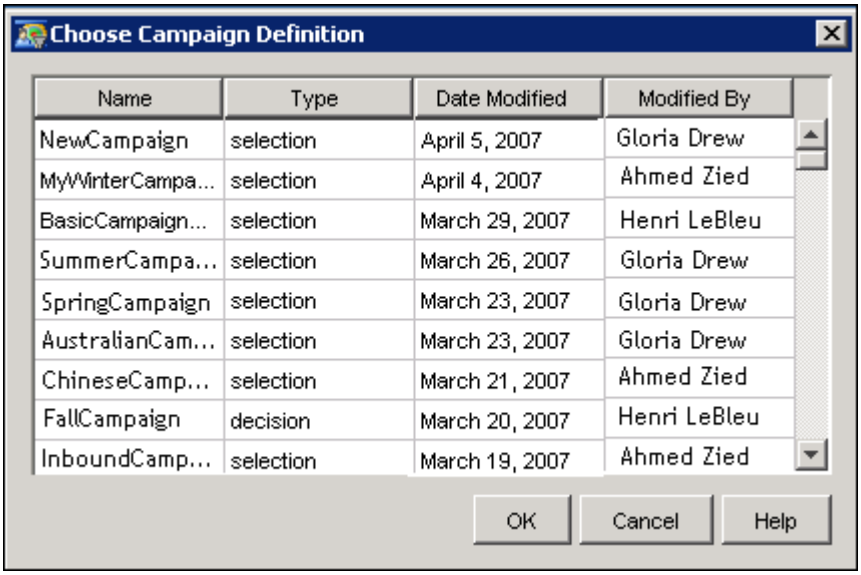
3. Select **View** ➧ **Display** ➧ **Checklist** to display the campaign checklist.
4. Select **View** ➧ **Display** ➧ **Tools** to display the diagram tools.

After you create a selection campaign, you use the diagram and nodes to select groups of customers to target in campaigns, and to define communication channels that are used to communicate with these customers.

After you create a decision campaign, you use the diagram and nodes to create a decision flow to determine which response or reply (typically an offer) will be returned to the customer through the communication channel.

Choose Campaign Definition Window

In the Choose Campaign Definition window, you select the campaign definition to be used when you create a campaign. The first campaign definition is selected by default. You sort the list by clicking on a column heading.

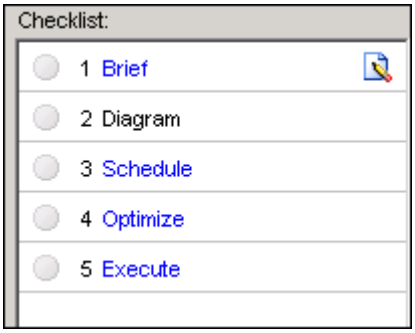


You create campaign definitions in the Campaign Definition plug-in in SAS Management Console. For more information, see “Creating Campaign Definitions” on page 40.

Campaign Checklist

In the Campaign Checklist, you complete a series of tasks before you execute the campaign. For example, a selection campaign must have at least one communication before you can execute the campaign.

This is an example of a checklist in a selection campaign:



This is an example of a checklist in a decision campaign:

The items that are displayed in the Campaign Checklist window depend on the campaign definitions that you create by using the Campaign Definition plug-in in SAS Management Console. You can create customized items when you create the campaign definition. For items that contain user-defined fields, click to display a dialog box in which you can enter values.

When you have completed a task, click the circle next to the task name to display a checkmark. You can toggle the checkmark on and off.

You can use keyboard shortcuts to make changes to the Campaign Checklist:

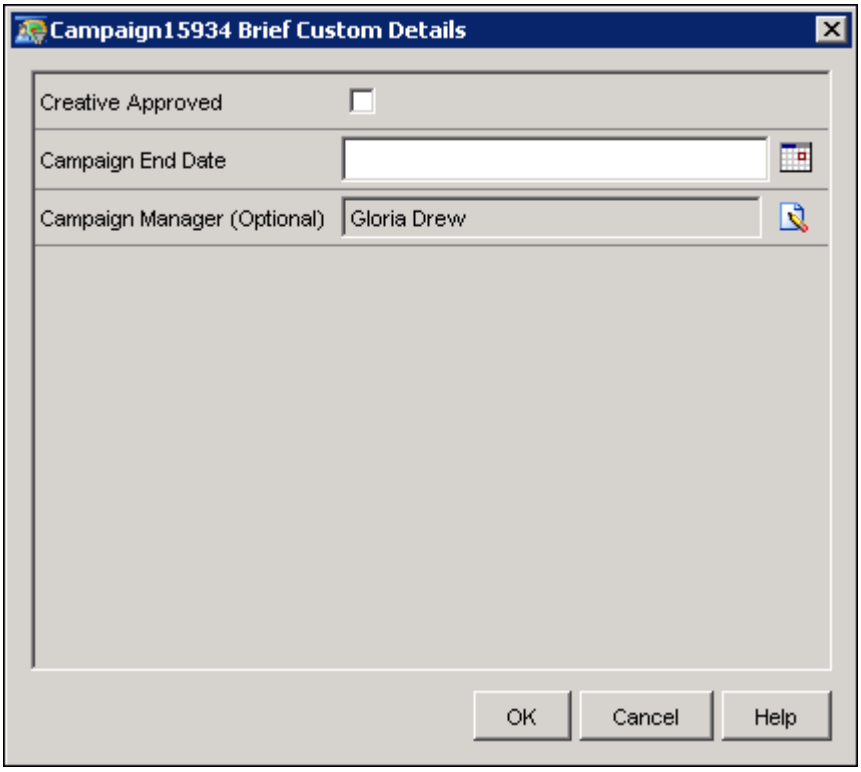
CTRL+1 - CTRL+9
: opens the window of any checklist task that contains a link. For example, CTRL+1 opens the Campaign Brief window.

Alt+1 - Alt+9
: toggles the checkmark for tasks in the checklist.

Shift+1 - Shift+9
: expands or collapses tasks in the checklist.

Custom Details Window

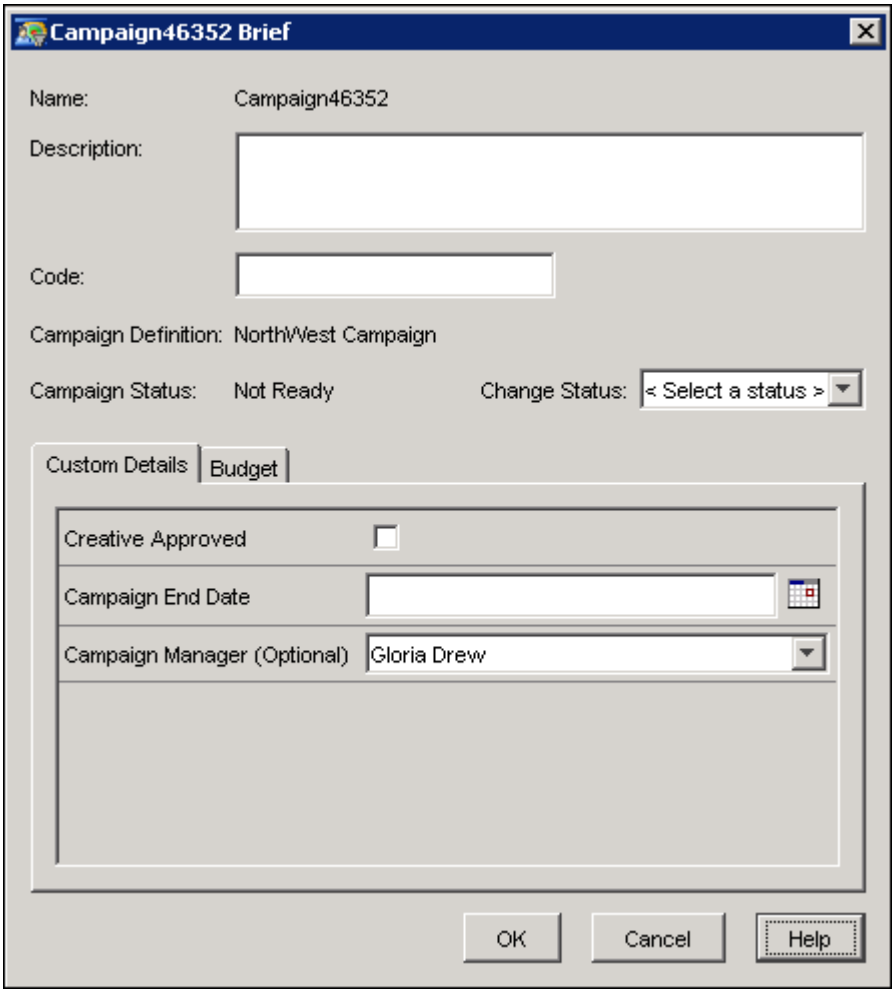
The Custom Details window of the Campaign Brief contains any user-defined fields that were created in the campaign definition.



Enter values for the fields using text entry check boxes, or drop-down lists.

Campaign Brief Window

The Campaign Brief window displays the name, description, campaign definition, campaign status, custom details, and budget for the currently open campaign.



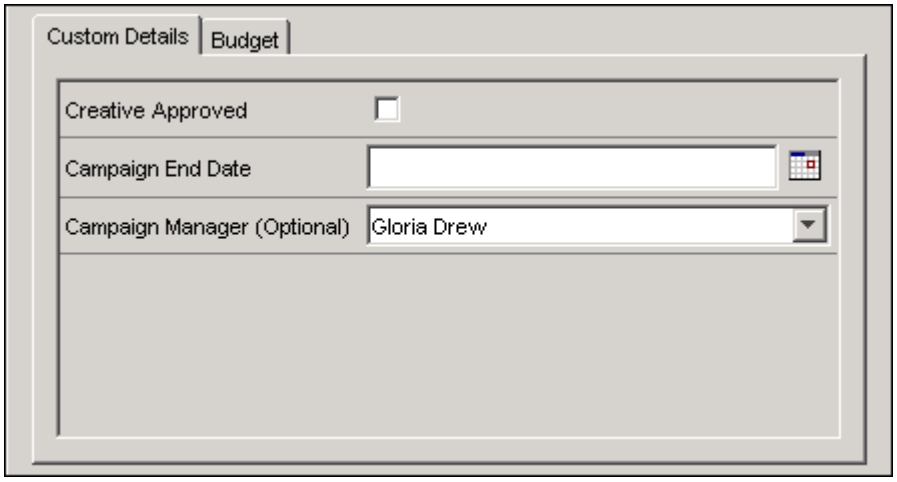
You can modify the description of a campaign and the campaign code. The campaign code is created either automatically or manually, and the code is editable depending on the campaign definition that you created in SAS Management Console. You can change the campaign status by using the **Change Status** drop-down list. The available values depend on the campaign definition that was created in SAS Management Console. Here is a list of the possible values for the campaign status:

- Not Ready
- Planned
- Scheduled
- Executed
- other user-defined statuses.

The Campaign Brief window contains the following tabs:

- Custom Details tab
- Budget tab

Custom Details Tab

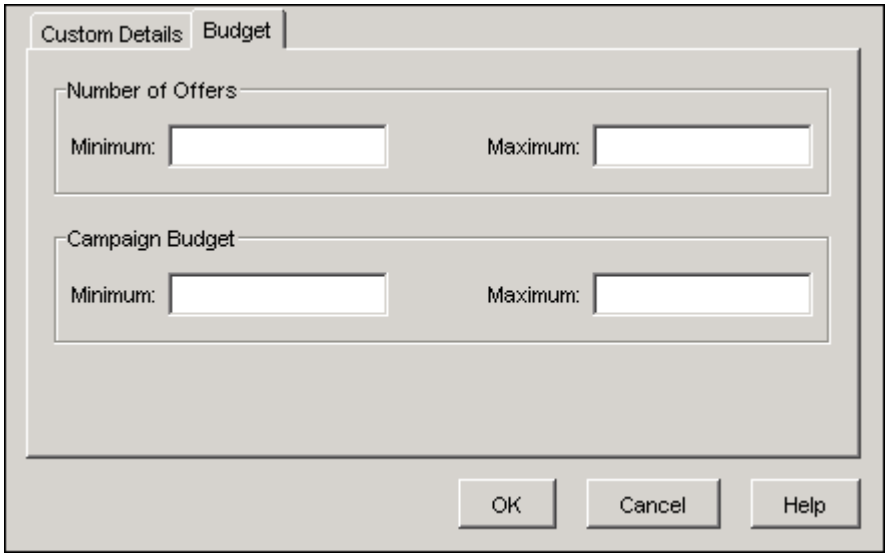


The Custom Details tab contains any user-defined fields that were created in the campaign definition. Enter values for the fields using text entry check boxes, or drop-down lists.

If the campaign definition includes a list from which you can select values, select a value from the drop-down list or click or . For more information, see "Select List Items Window" on page 130.

Budget Tab

The Budget tab enables you to set budget values for your campaign.



The Budget tab contains the following areas:

Number of Offers
enables you to specify the minimum and maximum number of offers that can be made for a campaign.

Campaign Budget
enables you to specify the minimum and maximum budget for all of the offers in this campaign.

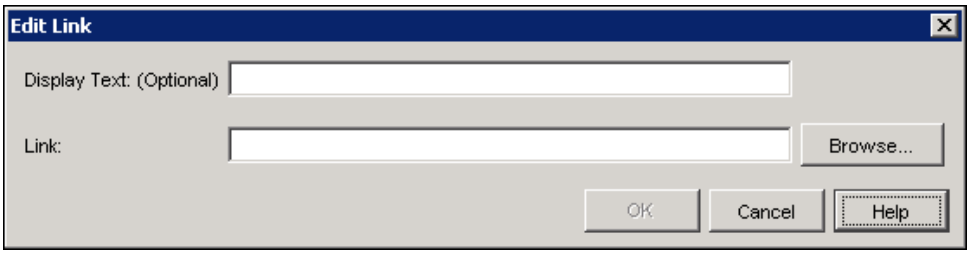
Editing Links and Selecting from Lists

You can change the information that is displayed in links and select items from lists.

Edit Link Window

You can edit user-defined links by clicking to display the Edit Link window.

In the Edit Link window, you create a link to an external file such as a spreadsheet or Microsoft Word document.



Enter a link in the **Link** field. The link can take one of the following forms:

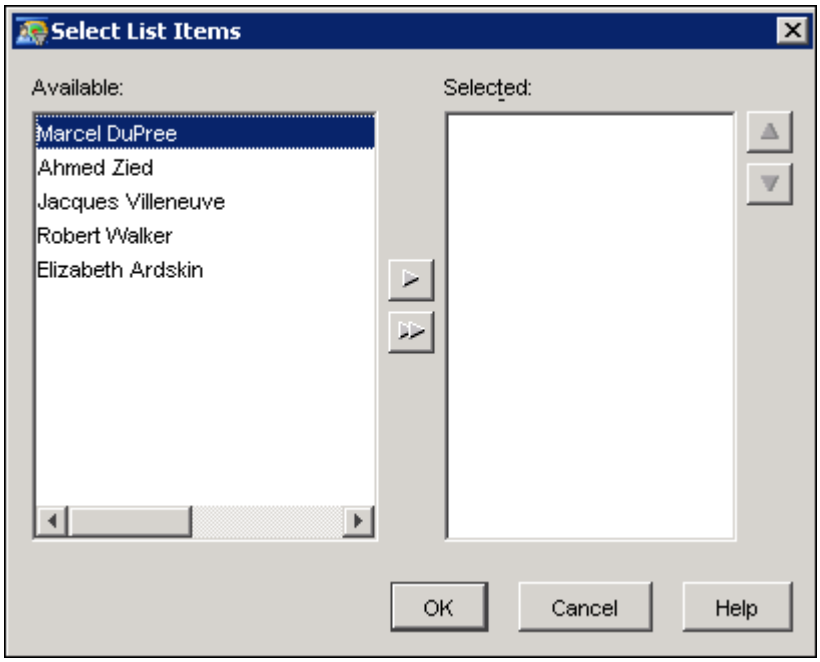
- a valid URL, such as **http://www.sas.com**
- the pathname of a file on a local machine, such as **c:\manuals\sashowto.pdf**
- the pathname of a file on a network, such as **\\myserver\docs\report.doc**.

You can also supply the **Display Text** value that is displayed in the **Default Value** field for user-defined links. There are no restrictions on the length of the display text or the use of special characters.

If you do not supply display text, the value in the **Link** field is displayed.

Select List Items Window

In the Select List Items window, you can select items to add to steps in a campaign, a campaign brief, a campaign communication, a reply node, and a standard reply.



If the list limits you to a single selection, select an item from the drop-down list.

If the list allows you to make more than one selection, select an item from the **Available** list and click to add it to the **Selected** list. Click to add all of the items to the **Selected** list. To remove an item from the **Selected** list, select the item and . Click to remove all of the items from the **Selected** list. To select more than one item in a list, press the CTRL key or Shift key while selecting the items. To change the position of an item in the **Selected** list, select the item and click or .

Click **OK** to close the window and save your changes.

Opening a Campaign

Use one of the following ways to open a campaign:

- Select from the drop-down menu **File** ➧ **Open** and choose a campaign from the Open window. Selecting the **read only** check box is useful when you want to view a campaign and do not want to interfere with the other ongoing or scheduled processes.
- Select from the drop-down menu **View** ➧ **Campaigns** and choose a campaign from the Campaigns window.

- Click the Open a Campaign or Diagram icon in the toolbar.

Viewing Campaigns

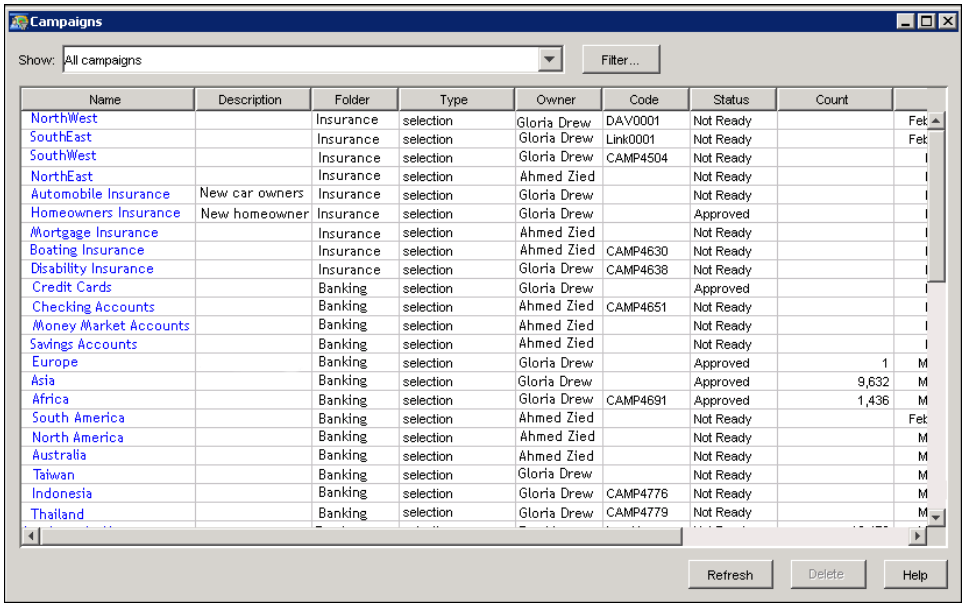
You can view a list of the campaigns that are available in SAS Customer Intelligence Studio. The list identifies the campaigns that belong to you, that you can edit, or that meet the filter criteria that you specify. To view the campaigns, select **View** ➧ **Campaigns** from the pull-down menu.

In the Campaigns window, use the **Show** field to specify the filter criteria by selecting from the drop-down list, or by typing filter text into the field. You can type one or more words into the **Show** field. Case-sensitivity and the effect of using more than one word are controlled by the setting for Filter Options in the Preferences window. For more information, see "Changing Preferences" on page 114.

Suppose that you are a campaign planner and are responsible for several campaigns. When the Campaigns window is open, you can select **Campaigns I own** or **Campaigns I can edit** from the **Show** drop-down list to view a list of the campaigns and their properties. Select a campaign name to open the campaign.

Campaigns Window

The Campaigns window displays a list of campaigns that meet the filter criteria in a table.



Name	Description	Folder	Type	Owner	Code	Status	Count	
NorthWest		Insurance	selection	Gloria Drew	DAV0001	Not Ready		Feb
SouthEast		Insurance	selection	Gloria Drew	Link0001	Not Ready		Feb
SouthWest		Insurance	selection	Gloria Drew	CAMP4504	Not Ready		I
NorthEast		Insurance	selection	Ahmed Zied		Not Ready		I
Automobile Insurance	New car owners	Insurance	selection	Gloria Drew		Not Ready		I
Homeowners Insurance	New homeowner	Insurance	selection	Gloria Drew		Approved		I
Mortgage Insurance		Insurance	selection	Ahmed Zied		Not Ready		I
Boating Insurance		Insurance	selection	Ahmed Zied	CAMP4630	Not Ready		I
Disability Insurance		Insurance	selection	Gloria Drew	CAMP4638	Not Ready		I
Credit Cards		Banking	selection	Gloria Drew		Approved		I
Checking Accounts		Banking	selection	Ahmed Zied	CAMP4651	Not Ready		I
Money Market Accounts		Banking	selection	Ahmed Zied		Not Ready		I
Savings Accounts		Banking	selection	Ahmed Zied		Not Ready		I
Europe		Banking	selection	Gloria Drew		Approved	1	M
Asia		Banking	selection	Gloria Drew		Approved	9,632	M
Africa		Banking	selection	Gloria Drew	CAMP4691	Approved	1,436	M
South America		Banking	selection	Ahmed Zied		Not Ready		Feb
North America		Banking	selection	Ahmed Zied		Not Ready		M
Australia		Banking	selection	Ahmed Zied		Not Ready		M
Taiwan		Banking	selection	Gloria Drew		Not Ready		M
Indonesia		Banking	selection	Gloria Drew	CAMP4776	Not Ready		M
Thailand		Banking	selection	Gloria Drew	CAMP4779	Not Ready		M

The Campaigns window displays the following information about the campaigns.

Name
the campaign name.

Description
a description of the campaign. If a description exists, it is displayed when the mouse pointer hovers over the **Description** cell.

Folder
the location where the campaign is stored.

Type
the type, whether selection or decision, of the campaign.

Owner
the owner of the campaign.

Code
the campaign code.

Status
the campaign status.

Count
the number of customers who are targeted in a campaign.

Start
the start date of a campaign.

End
the end date of a campaign.

Date Run
the date on which the campaign was executed. If the campaign has not yet been executed, a period (.) is displayed.

You can perform the following tasks in the Campaigns window:

- To sort the table, click the heading of a column.
- To open a campaign, click the campaign name link. You can edit a campaign only if you have the permission to edit it. Otherwise, you can only view the campaign.
- To apply filter criteria to the list of campaigns, type filter text into the **Show** field or select one the following items from the drop-down list.
  - **All Campaigns**
  - **Campaigns I can edit**
  - **Campaigns I can view, but not edit**
  - **Campaigns I own**
  - **Campaigns that need approval**
  - **Custom**

  Select **Custom** from the list if you want to create a filter that is based on the values of the table columns. You create a filter for viewing campaigns in the Filter window. For more information, see "Filter Window" on page 133.

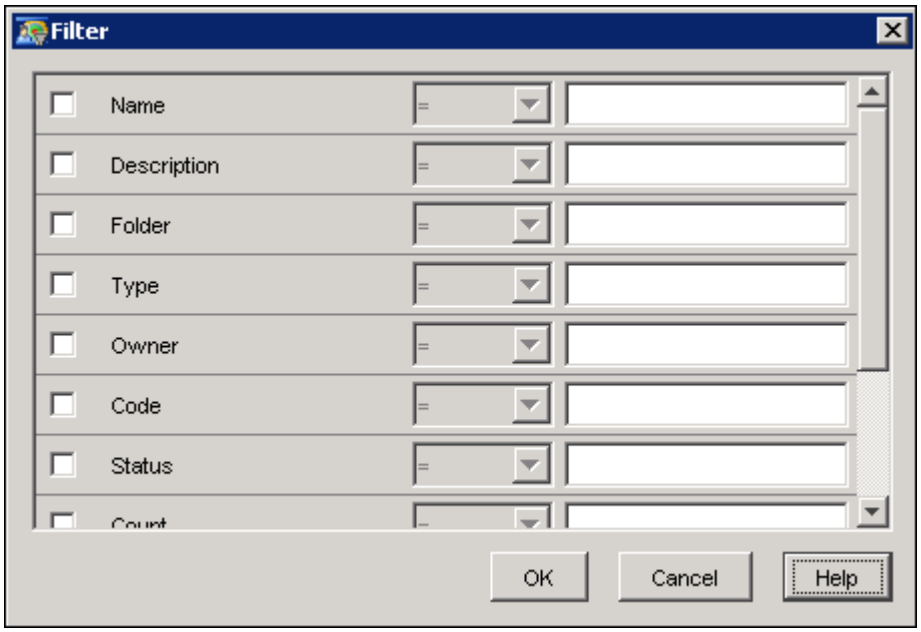
To refresh the list of campaigns, click **Refresh**. To delete one or more campaigns, select the campaigns and click **Delete**. You can delete any campaign for which you have Edit permission.

NOTE: The **Campaigns that need approval** filter displays only campaigns that need approval by the user who is currently logged on.

Filter Window

In the Filter window, select the rows that are used as criteria to filter the list of campaigns, diagrams, documentation, campaign schedules, seed lists, communication definitions, export definitions, or treatments. The criteria that appear in the window depend on the window that you use to open the Filter window.

Here is an example of the Filter window for campaigns:



For example, you can filter the list of campaigns based on the following criteria:

- campaign name
- campaign description
- campaign folder
- campaign owner
- campaign code
- status of a campaign

- count
- start date of a campaign
- end date of a campaign
- date on which a campaign is run.

Validating Decision Diagrams

You can validate decision diagrams to determine whether or not all of the nodes are ready to be deployed. If the diagram is ready to be deployed, the validation process temporarily generates the diagram on the Real-Time Decision Manager design-time server.

To validate a diagram, select **Actions** ➧ **Validate Diagram** or click in the toolbar.

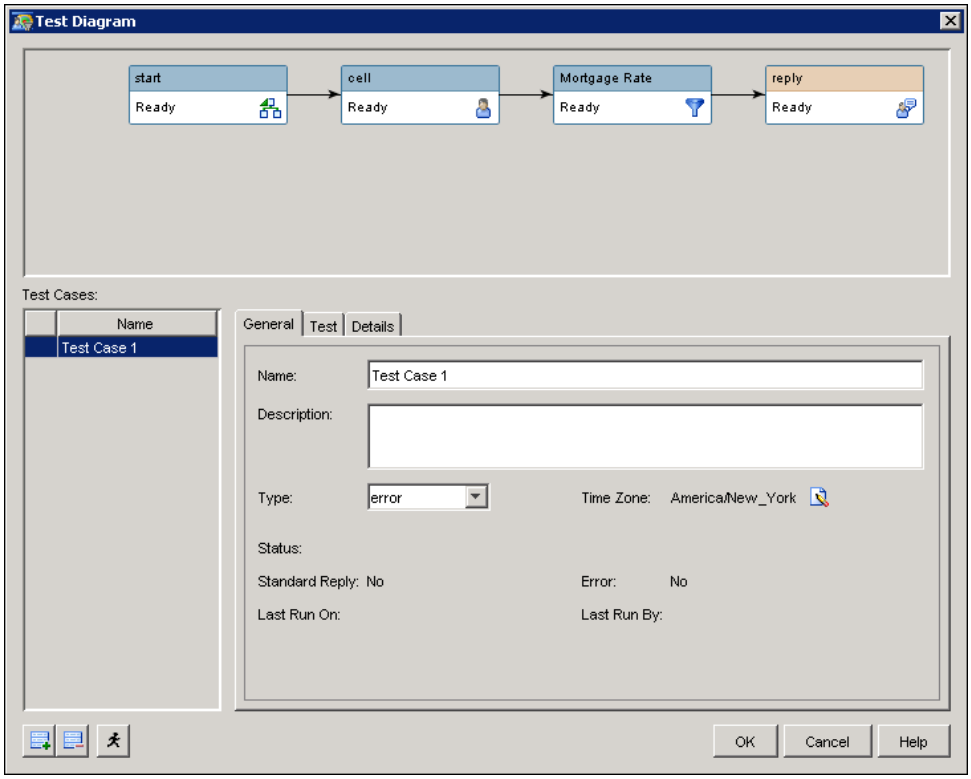
If the validation succeeds, a message is displayed stating that the diagram is valid.

If the validation fails, a message is displayed that describes the errors. Click **OK** and address the errors before attempting to validate the diagram again.

Testing Decision Campaigns and Diagrams

You can test your decision campaigns and diagrams to make sure that they will perform as you expect when they are executed.

To test a diagram, select **Actions** ➧ **Test Diagram** or click in the toolbar. To test a campaign, click the **Test** link in the campaign checklist. A temporary diagram is created in the Real-Time Decision Manager plug-in.



The Test Diagram window displays the nodes of the diagram. After you have run a test case, a node border is green if the node has executed successfully; the border is red if the node caused an error. A node border is blue if the node triggered a standard reply. Right-click the diagram area and select **Zoom** or **Layout** from the pop-up menu to change the display.

The results of test cases can be displayed in documents. To add a test case, do the following:

1. Click to add the test case to the Test Cases list. Click to remove the test case from the list.
2. On the General tab, supply a name for the test case in the **Name** field. Optionally, you can type a description in the **Description** field.
3. Select a test type from the **Type** drop-down list. There are four types of tests:

   Reply
   verifies that the diagram returns the standard reply values when the diagram is executed with the specified request variables.

   Standard Reply
   executes the diagram to verify that the expected standard reply values match the standard reply values that are returned for variables that lie outside the specified values for replies.

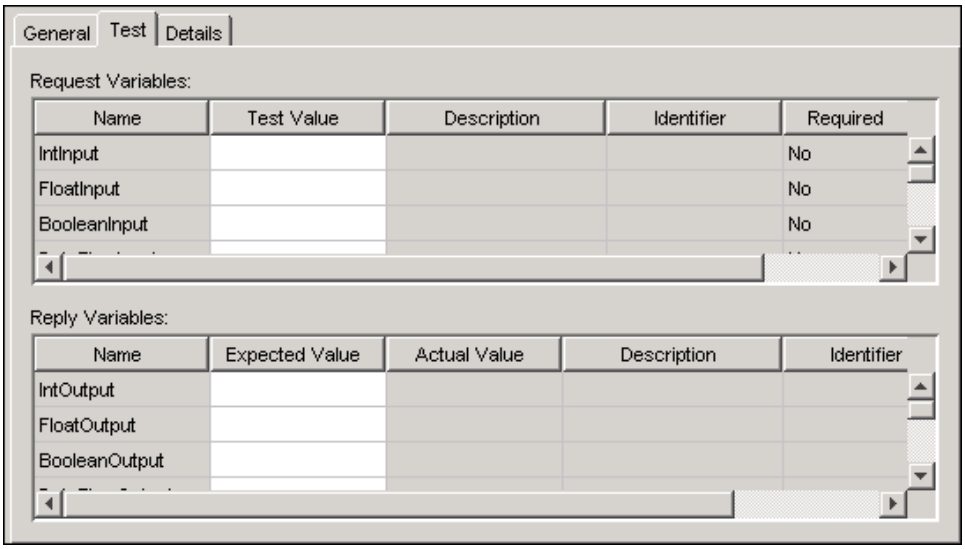
   Error Reply
   verifies that the diagram returns the error reply values when the diagram is executed with the specified request variables.

Error
tests an error that occurred while executing the diagram. When the test runs and exceptions occur, the status is set to Success.

4. Click next to the **Time Zone** field to select a time zone for the test case. For more information, see "Selecting a Time Zone" on page 137.

To supply values for your test case, take the following steps:

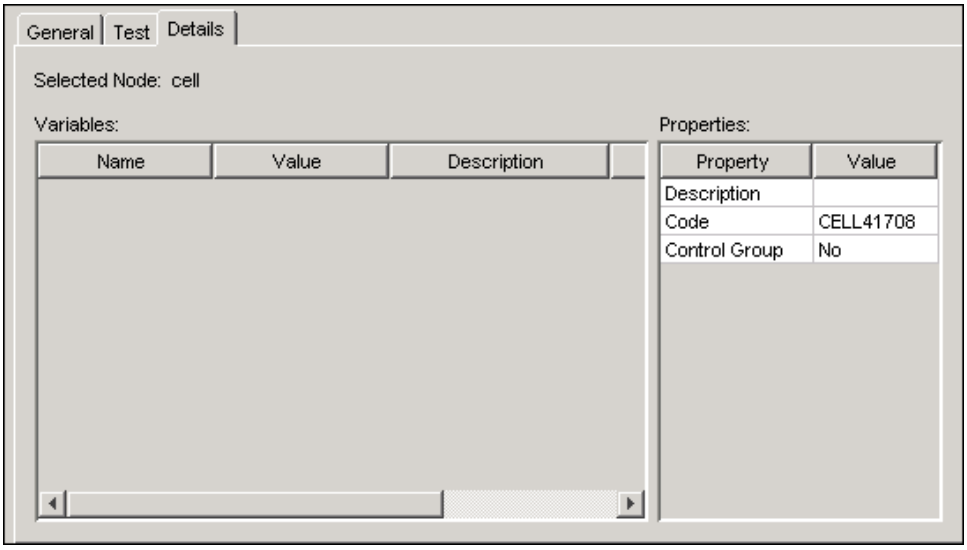
1. Select the Test tab in the Test Diagram window.



2. Select the **Value** fields in the Request Variables and Reply Variables tables and type in values or click the ellipsis to select values. To avoid errors in comparing lists that have items in different order, leave the **Value** fields blank.

To run a test case, highlight the test case and click . You can run more than one test case at a time. The results of the test are displayed on the General tab. If a test case fails, an X is displayed next to the name of the test case. If a test case succeeds, a check mark is displayed.

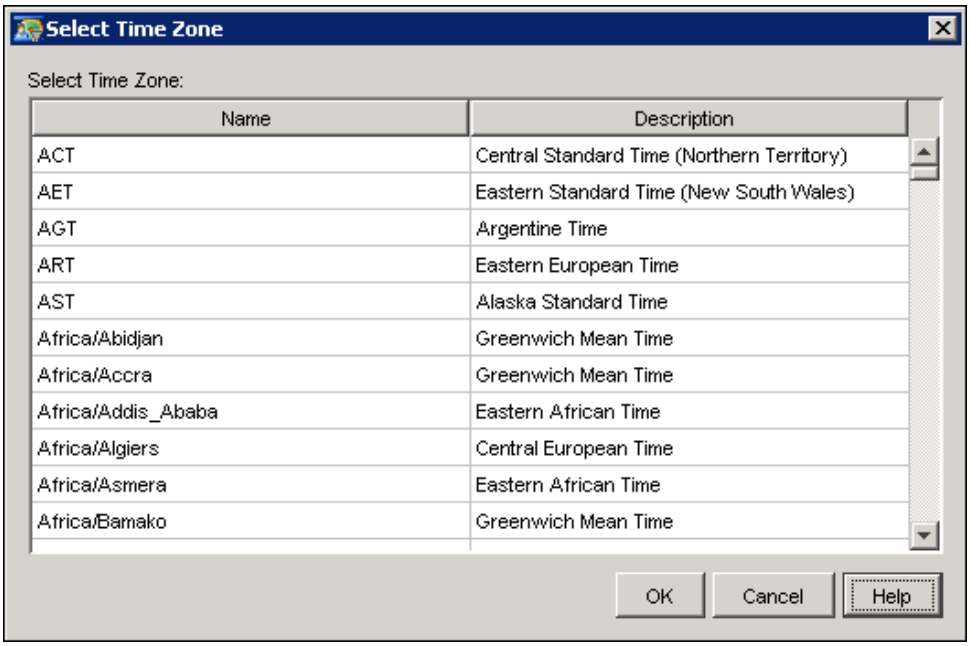
To view the details of a node, click the Details tab and select the node. The properties and variables of the node are displayed.



The Variables table displays all variables that are associated with the selected node, regardless of whether the value was changed. You can use this table for debugging test cases that are not working properly.

Selecting a Time Zone

In the Select Time Zone window, you select a time zone to apply to your test case.



Select a time zone and click **OK** to close the window and save your changes.

Marking Decision Diagrams for Deployment

You should validate, test, and approve a diagram before marking the diagram ready for deployment. An administrator can then promote the diagram to a Real-Time Decision Manager run-time server.

If you have the appropriate access permissions, you can mark a diagram for deployment by saving the diagram and selecting **Actions ➧ Mark Diagram for Deployment**.

The diagram is validated to ensure that all of the nodes are ready for deployment and that the diagram has been approved. If the diagram is valid, it is generated on the Real-Time Decision Manager design-time server and published to the SAS Customer Intelligence Reporting Data Model. The Deployment status in the diagram properties window changes to **Marked for deployment**.

If the diagram is not valid, a message is displayed that describes the errors. Click **OK** in the message window, address the errors, and validate the diagram. Make sure that all required user-defined fields have values. A standard reply is not required in order to mark a diagram for deployment.

If you open and save the diagram after it has been marked for deployment, the Deployment status in the diagram properties window reverts to **Not marked for deployment**.

Optimizing Campaigns

You can take advantage of the integration of SAS Marketing Automation and SAS Marketing Optimization by designating selection campaigns for optimization in Customer Intelligence Studio. You can designate campaigns for optimization in Customer Intelligence Studio by adding optimization fields in the SAS Marketing Automation administrative plug-in for SAS Management Console, using optimization fields in campaign briefs and communication nodes, and selecting the **Optimize** option in the Campaign checklist.

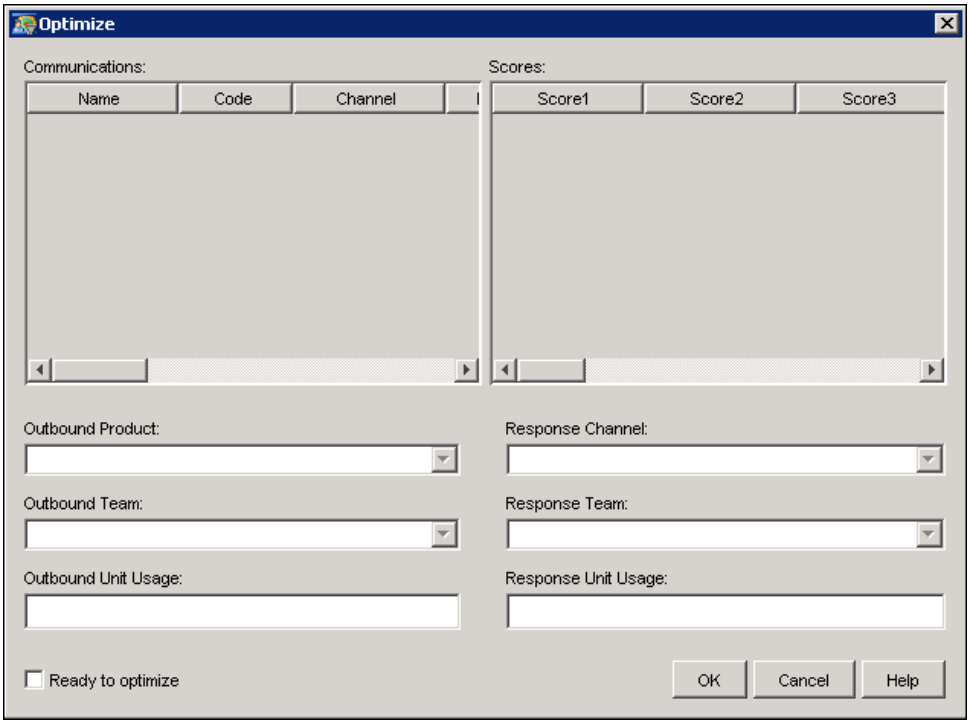
When you have designated campaigns for optimization in Campaign Studio, you can select those campaigns for optimization in SAS Marketing Optimization. You can retrieve data from SAS Marketing Automation on demand. You can optimize the data, and publish the results for SAS Marketing Automation. Optimized customer IDs are available for use by Customer Intelligence Studio.

NOTE: Missing numeric values will be represented by a period (.).

To prepare campaign data for optimization by SAS Marketing Optimization, update the counts on communication nodes, and select **Optimize** in the Campaign Checklist. The Optimize window opens.

Optimize Window

This window enables you to view and set options that affect how SAS Marketing Automation optimizes your campaign.



The Communications table displays communications in the current campaign that are attached to communications in the current campaign.

Name
the name of the communication as specified in the Communications node.

Code
the communication code as specified in the Communications node.

Channel
the outbound channel of the Communication as specified in the communications node.

Initial Count
the pre-optimized count.

Optimized Count
the optimized count. This field is blank until the optimization has been run.

Minimum Budget
the minimum budget for all of the offers in this communication. This value is specified in the Communications node.

Maximum Budget
the maximum budget for all of the offers in this communication. This value is specified in the Communications node.

Minimum Offers
the minimum number of offers that can be made for this communication. This value is specified in the Communications node.

Maximum Offers
the maximum number of offers that can be made for this communication. This value is specified in the Communications node.

Offer Group
the offer group for this communication is a site-specific identifier that can be used to organize communications. This value is specified in the Communications node.

Offer Subgroup
the offer subgroup for this communication is a site-specific identifier that can be used organize communications. This value is specified in the Communications node.

Date
the date that the communication is planned for export. This value is specified in the Communications node.

Unit Cost
the cost of each unit of the communication. This value is specified in the Communications node.

Right-click any column header in the Communications table to display a pop-up menu that contains Optimize window column names. These column names are all selected by default. To suppress a column so that it does not appear in the Optimize window, clear the column name in the popup menu. You cannot suppress the **Name** and **Code** columns.

The Scores table enables you to select a data item for each score. The score predicts propensity to respond to this communication. A communication can have more than one score associated with it. The score names are set in the Optimization plug-in in SAS Management Console. For more information, see "Optimizing Components" on page 105.

Select a communication and provide values for the following fields:

Outbound Product
the product or product category name as defined in SAS Management Console. Click this field to edit it. You can also add a new product to this field by selecting one of the drop-down list options. The default is blank.

Outbound Team
the outbound team as defined in SAS Management Console. You can add a new outbound team by using the drop-down list. The default is blank.

Outbound Unit Usage
the usage of the team as defined for the outbound channel. The default is blank.

Response Channel
the response channel as defined in SAS Management Console. You can add a new response channel by using the drop-down list. The default is blank.

Response Team
: the response team as defined in SAS Management Console. You can add a new response team by using the drop-down list. The default is blank.

Response Unit Usage
: the usage of the team as defined for the response channel. You can add a new usage by using the drop-down list. The default is blank.

Select **Ready to Optimize** to indicate that the campaign is ready for optimization. This option applies to all the communications that are listed. Values appear in the **Optimized Count** column when an optimization has been run.

Click **OK** to close the window and to flag the campaign as ready for Marketing Optimization to optimize. This flag is set when you save the campaign.

NOTE: In order to be optimized, a campaign must have a campaign code.

For more information about SAS Marketing Optimization, see the SAS Marketing Optimization documentation.

Chapter 6

Creating Diagrams

Contents

Introduction to Diagrams and Nodes **143**
Creating a Diagram **146**
Viewing Diagrams **147**
Diagrams Window 147
Viewing the Properties of a Diagram **148**
Diagram Properties Window 148
Clearing Node Counts in a Selection Campaign or Diagram **152**

Introduction to Diagrams and Nodes

SAS Customer Intelligence Studio enables you to create a campaign by using interface components such as diagrams and nodes. A diagram consists of linked nodes that enable you to create groups of customers for inclusion in campaigns and for planning the communications that are sent during a campaign. A node consists of a graphical component (icon) as well as a Properties window.

Here is a list of the features of diagrams:

- A campaign has one diagram only.
- When you save a diagram in a campaign, the entire campaign is saved.
- The user who creates a diagram is the owner of the diagram. The owner of a diagram might select other users as editors or viewers of the diagram.
- A diagram *x* might contain a Link node to a cell in another diagram *y*. In this case, changes to diagram *y* affect diagram *x*.

A node in a diagram can represent one of the following:

- a selection criterion such as selecting the customers who are at least 30 years old or reducing the size of a selected group to 3,000 customers
- a relationship between other selection criteria such as the customers who are female **and** who have more than one checking account

- a communication channel such as a mail or call center
- a report
- a group of subjects who respond to a communication.

NOTE: You can add a Communication or Response node to a diagram only if the diagram is part of a campaign.

The following table lists the nodes and their functionality. You specify or modify the settings of the nodes in their properties windows. To open a node's properties window, right-click a node and select **Properties**.

Table 6.1 Nodes in SAS Customer Intelligence Studio

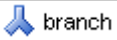
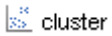
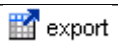
Node Name	Node Icon	Description
And		In a selection diagram, enables you to combine the criteria from two or more nodes by using the AND set function.
Branch		In a decision diagram, enables you to select a single customer for a particular offer.
Cell		Enables you to create a group of customers who can be targeted by a communication, linked to other diagrams in SAS Customer Intelligence Studio, and referenced by other components in the Marketing Automation solution.
Cluster		In a selection diagram, enables you to create clusters of customer groups by using cluster analysis.
Communication		In a selection campaign, represents the communications that you can use to contact the target audience.
Export		In a selection diagram, enables you to export the data about the customers who are selected at the point that the Export node appears in the diagram. You can connect an Export node to any node except a Report node or another Export node.

Table 6.1 Nodes in SAS Customer Intelligence Studio, (continued)

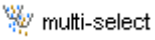
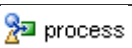
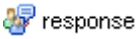
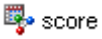
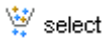
Node Name	Node Icon	Description
Filter		In a decision diagram, enables you to select a single customer based on a data item or process variable.
Limit		In a selection diagram, enables you to create a subset of the customers in order to reduce the number of customers who are available in the successor nodes in the diagram.
Link		In a selection diagram, enables you to create a link from a diagram to a Cell node in another diagram or in the same diagram.
Map		In a selection diagram, enables you to change the subject of a data item or change the selected customers in a campaign diagram.
Multi-filter		In a decision diagram, enables you to select a single customer based on a number of data items or process variables.
Multi-select		In a selection diagram, enables you to select subsets from a number of data items and combine the subsets into a single group that comprises your target population.
Or		In a selection diagram, enables you to combine the criteria from two or more nodes by using the OR set function.
Prioritize		In a selection diagram, enables you to prioritize subjects into new cells.
Process		Enables you to write and run SAS code in a diagram.

Table 6.1 Nodes in SAS Customer Intelligence Studio, (continued)

Node Name	Node Icon	Description
Reply		In a decision diagram, enables you to specify the properties, such as user-defined fields, reply variables, and packages, of a reply.
Report		In a selection diagram, creates a report on the customers who are selected at the point that the Report node appears in a diagram.
Response		In a selection diagram, represents a group of customers who responded to a communication. You can target the customers by a communication, create links to the customer from other diagrams, and refer to the customers from outside the diagram.
Score		In a decision diagram, enables you to supply input values for a model process.
Select		In a selection diagram, enables you to select the customers to be included or excluded in the campaign by using the value of an assigned data item.
Split		In a selection diagram, enables you to divide customers into two or more cells.
Start		In a decision diagram, selects the event that drives the diagram.
Start		In a decision diagram, enables you to create a link to another decision diagram.

Creating a Diagram

To create a diagram, click the Create a New Selection Diagram icon or the Create a New Decision Diagram icon on the toolbar or select from the menu: **File ➧ New ➧ Selection Diagram or Decision Diagram**.

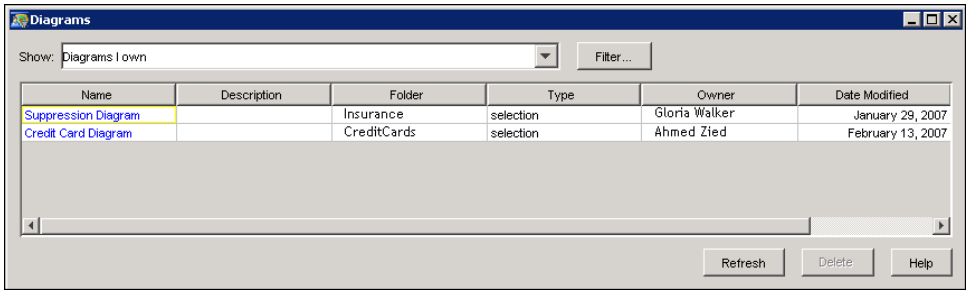
In SAS Customer Intelligence Studio, you can create as many diagrams as you want. A diagram does not have to be part of any campaign.

Viewing Diagrams

In SAS Customer Intelligence Studio, a campaign must have a diagram, but a diagram does not have to be part of any campaign. To view a list of the diagrams that are not part of any campaign, select **View** ➧ **Diagrams** from the main menu. The Diagrams window opens.

Diagrams Window

The Diagrams window displays a list of diagrams that are not part of any campaign.



Use the **Show** field to specify the filter criteria by selecting from the drop-down list, or by typing filter text into the field. You can type one or more words into the **Show** field. Case-sensitivity and options for using single words or phrases are controlled by the setting for Filter Options in the Preferences window. For more information, see "Changing Preferences" on page 114.

You can select one of the following items from the **Show** drop-down list.

- **All Diagrams**
- **Diagrams I can edit**
- **Diagrams I can view, but not edit**
- **Diagrams I own**
- **Custom**

Select **Custom** to create a customized filter in the Filter window.

The following information about the diagrams is displayed:

Name
the diagram name.

Description
a description of the diagram. If a description exists, it is displayed when the mouse pointer hovers over the **Description** cell.

Folder
the location where the diagram is stored.

Type
the type, whether selection or decision, of the diagram.

Owner
the owner of the diagram.

Date Modified
the most recent date on which the diagram was modified.

Date Run
the date on which the diagram was executed. If the diagram has not yet been executed, a period (.) is displayed.

Click **Filter** to open the Filter window.

To refresh the list of diagrams, click **Refresh**. To delete one or more diagrams, select the diagrams and click **Delete**. You can delete any diagram for which you have Edit permission.

Viewing the Properties of a Diagram

To view the properties of a separate diagram or a diagram that is within a campaign, select **View** ➧ **Diagram Properties** from the main menu. The Diagram Properties window opens.

Diagram Properties Window

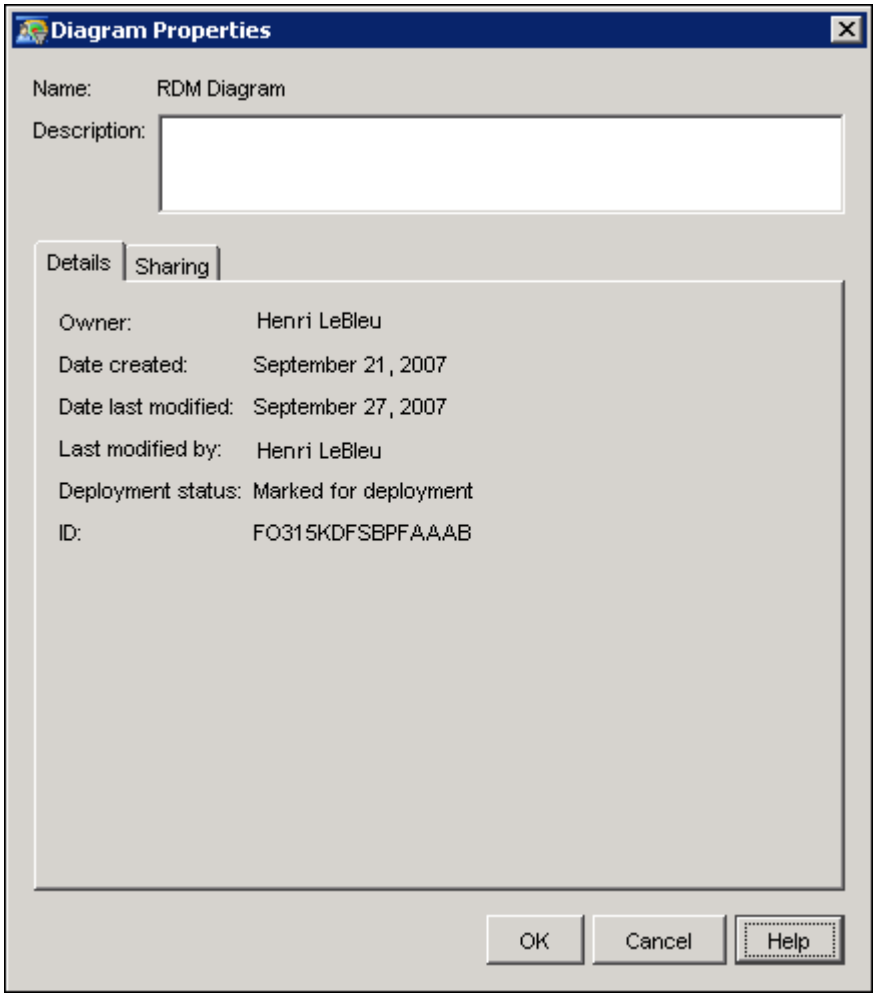
The Diagram Properties window displays information such as name and description about the current diagram.

You can edit the contents of the **Description** field.

Details Tab of Decision Diagram

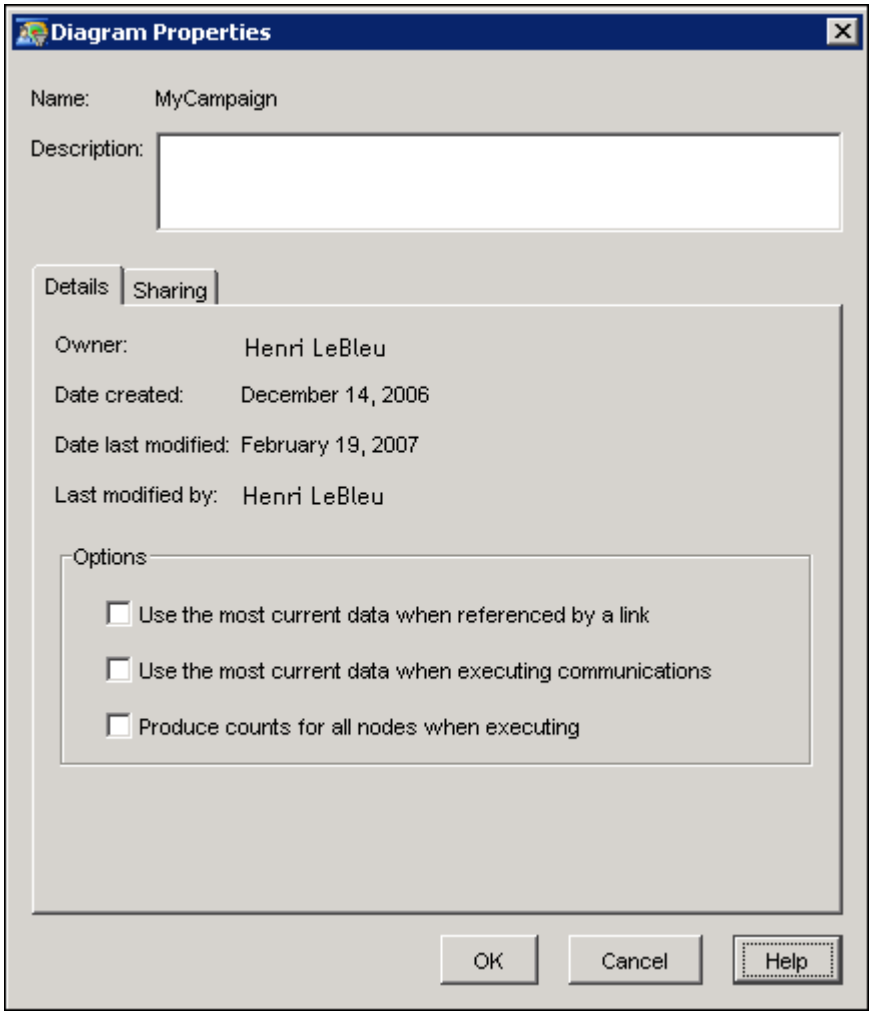
If you have licensed SAS Real-Time Decision Manager and are viewing a decision diagram, the Details tab displays the owner's name, creation date, date on which the diagram was last modified, and the name of the user who last modified the diagram. The tab also indicates whether the diagram

has been marked for deployment and the flow ID that is used to deploy the diagram to the SAS Real-Time Decision Manager run-time server.



Details Tab of Selection Diagram

If you have licensed SAS Marketing Automation and are viewing a selection diagram, the Details tab displays the owner's name, creation date, date on which the diagram was last modified, and the name of the user who last modified the diagram.



In some cases you want to have the most current data displayed when you execute a diagram. In other cases, it is not necessary to have the most current data. Refreshing data can affect performance adversely.

Select **Use the most current data when referenced by a link** to refresh data when the diagram is executed if the diagram is a target diagram that is referenced by a Link node.

Produce counts for all nodes when executing controls whether to optimize execution by combining the SQL queries for multiple nodes into one query, when possible. For example, if there are two Select nodes that are connected to an And node and the **Produce counts for all nodes when executing** check box is cleared, a single SQL statement is issued, and the count is displayed only for the And node. If the **Produce counts for all nodes when executing** check box is selected, three SQL statements are executed (one statement for each select node, and one statement for the And node); counts are displayed on all three nodes, at the cost of a greater number of executions and a longer runtime.

If the diagram is contained within a campaign, select **Use the most current data when executing communications** to clear the counts for all of the upstream nodes prior to the execution of a single communication.

The above options apply to the execution of a diagram, not to updating counts or to running selected nodes.

Using Pre-existing Data

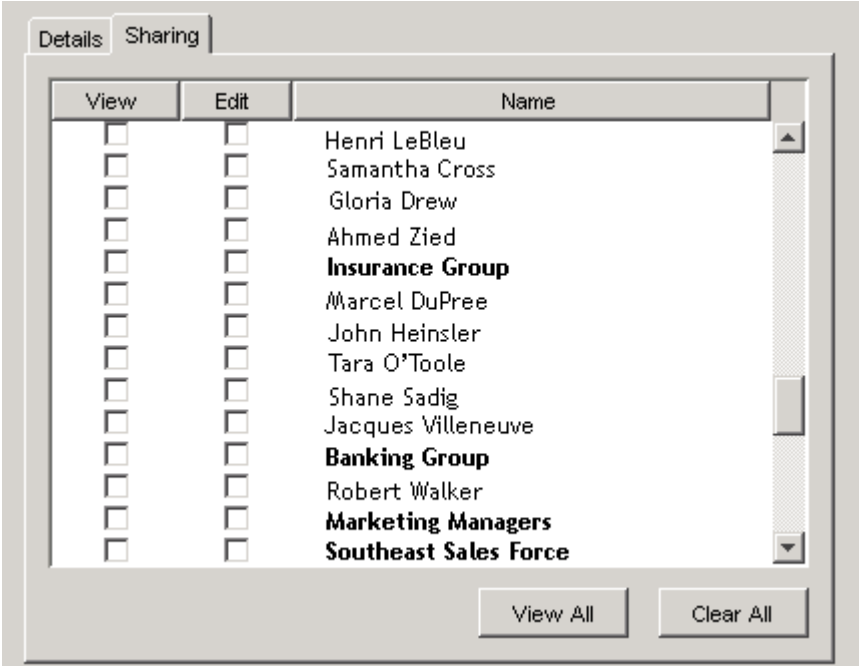
You can save processor time by clearing the check box for an option. For example, you might have a target diagram whose cell node is linked to from link nodes in several separate diagrams. The underlying data is updated once per night. All of the campaigns are executed on the same nightly schedule. You would need only to execute the diagram 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 diagram, clearing all of the counts, followed by executions of the campaigns.

If your campaign has valid data, you can use counts that have already been generated. For example, 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 and using the counts that have already been computed.

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 will minimize 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.

Sharing Tab

The Sharing tab displays the names of users or user groups that have been defined in the User Manager plug-in in SAS Management Console. Only the names of those users who have been assigned to the current business context are displayed.



User group names are in boldface type. To grant view or edit permission to a user or user group, select the corresponding check box.

To grant view permission to all users, click **View All**. To clear the check boxes for everyone except the owner of the diagram, click **Clear All**. In order to edit user or group permissions, you must have edit access to the diagram.

Clearing Node Counts in a Selection Campaign or Diagram

You might want to clear the counts for all of the nodes in a campaign or diagram. Recall that execution of individual nodes within the diagram does not automatically clear the node counts prior to execution. For example, you would clear the counts in a diagram if you are using a process node to produce output on an irregular basis and you want the output to reflect all recent updates to underlying data. In this case, you can open the diagram, clear the counts, and then execute the process node.

To clear the counts for all nodes in a campaign or diagram, select **Actions ➧ Clear All Counts** from the main menu.

Chapter 7

Creating Nodes

Contents

Using the Nodes **154**
Adding Nodes to a Diagram 155
Copying and Pasting Nodes 155
Deleting Nodes 155
Connecting Nodes in a Diagram 156
Moving Nodes in a Diagram 156
Opening the Properties Window of a Node 156
Common Features in a Node Properties Window 157
Collapsing and Expanding Nodes 157
Rules and Tips for Using the Nodes 158
Entering Date and Time Values 159
Select Node **160**
Select Data Item Window 162
Specifying Selection Criteria in the Select Node 165
Using the Values Table 167
Using the Histogram 168
Using the Groups Table 169
Using the Calculated Data Item Window 171
Cross-Campaign Prioritization 173
Multi-select Node **178**
Select Values Window 180
Cluster Node **181**
Table Tab 181
Pie Tab 182
Bubble Tab 183
Creating Cells from Clusters 184
Split Node **185**
Creating Splits by Using Counts or Percentages 187
Creating Splits by Using Values from a Previous Node 188
Creating Splits by Using Values from a Data Item 189
Grouping Splits 190
Limit Node **191**
Sort Criteria Window 192
And and Or Nodes **193**

Cell Node **195**
Cell Nodes in Selection Diagrams 195
Using Cell Codes 196
Cell Nodes in Decision Diagrams 197
Process Node **198**
Manual Mode 199
Select Stored Process Window 200
Process Node Macro Variables 202
Process Node Macros 203
Defining Stored Processes 204
Custom Node **207**
Link Node **207**
Select Cell Window 208
Map Node **209**
Export Node **212**
Naming the Export Node 214
Selecting Export Definitions 214
Selecting Columns for Export 216
Creating Data Items, Changing Sort Order, and Refining Output 217
Sort Export Line Items Window 217
Refine Output Window 218
Select Export Definition Window 221
Prioritize Node **221**
Limit Criteria Window 224
Communication Node **225**
Communication Node Properties Window 225
Response Node **234**
Response Node Properties Window 234
Criteria for Executing a Response Node 235
Defining an Inferred Response 236
Report Node **237**
Creating Graphs in the Graph Wizard 238

Using the Nodes

The following sections describe how to work with the nodes in a diagram.

Adding Nodes to a Diagram

There are several ways that you can add nodes to a diagram:

- Drag node icons from the Tools window to the Diagram Workspace.
- Select **Edit** ➧ **Add Node** from the main menu and select a node or nodes from the list in the Add Node window.
- Double-click a node icon.

Copying and Pasting Nodes

You can copy or cut and paste the Communication and Export nodes in a diagram or between diagrams.

To copy or cut and paste a node, follow these steps:

1. Right-click the Communication or Export node that you want to copy and select **Copy** or **Cut** from the pop-up menu.
2. Right-click in the diagram where you want to paste the copied node and select **Paste** from the pop-up menu.

If you are copying nodes within a diagram, the copied node is positioned to the right and below the original node. The name of the copied node is *copied-node-name*(1).

All of the Communication node properties are copied, except for the following:

- A number is appended to the name of the node, for example, **communication(2)**.
- Refine output settings are not copied.
- Response settings are not copied.
- A new communication code is generated.

Deleting Nodes

To delete one or more nodes from the diagram, complete one of the following steps:

- Select the node or nodes that you want to delete and press the Delete key.

- Right-click the node or nodes that you want to delete and select **Delete** from the pop-up menu.
- Select the node or nodes that you want to delete and select **Diagram ➧ Delete Node(s)** from the menu.

The following nodes cannot be deleted:

- nodes that are currently running
- Response nodes
- Cell nodes that are generated from a Split, Branch, or Prioritize node
- Groups that contain at least one node that cannot be deleted
- Link nodes that are linked to or from nodes that are currently running.
- Link nodes that are linked to generated nodes.

Connecting Nodes in a Diagram

You connect nodes in the Diagram Workspace to create a process flow. Follow these steps to connect nodes:

1. Position the pointer over the first node. The pointer changes from a cross to a pencil.
2. Select and hold down the left mouse button. Then, drag the pointer to the second node.

Moving Nodes in a Diagram

To move a node, follow these steps:

1. Place the pointer over a node icon, wait until the pointer becomes a cross, and then select the node.
2. Drag the node icon to a new location. The connection arrows typically bend or stretch to accommodate the move.

Opening the Properties Window of a Node

You open the properties window of a node by using one of the following methods:

- Right-click a node and select **Properties**.
- Double-click a node in the Diagram Workspace.

For some nodes, such as the Select node, you must assign a data item to the node before you can open the properties window. In this case, you are prompted to select a data item when you try to open the properties window.

Common Features in a Node Properties Window

Here is a list of the common features that are available in the properties window of a node.

Name
enables you to specify the name of the node. The name must be unique among node names in the same diagram. Any leading or trailing spaces in a name are trimmed. The contents of the name appears in a node in a diagram.

Update Counts
updates the count information that is displayed in the node properties window. All export definitions for Communication and Export nodes must be valid before the counts for those nodes can be updated.

Last run on
displays the time that the node was run.

Add Row button
adds a row to the table.

Delete Row button
deletes a selected row from the table.

The Add Row and Delete Row buttons are not available if the node's properties window does not have a table. Nodes such as the And, Or, Cell, or Cluster nodes do not have tables.

Collapsing and Expanding Nodes

To collapse a group of nodes in a diagram, follow these steps:

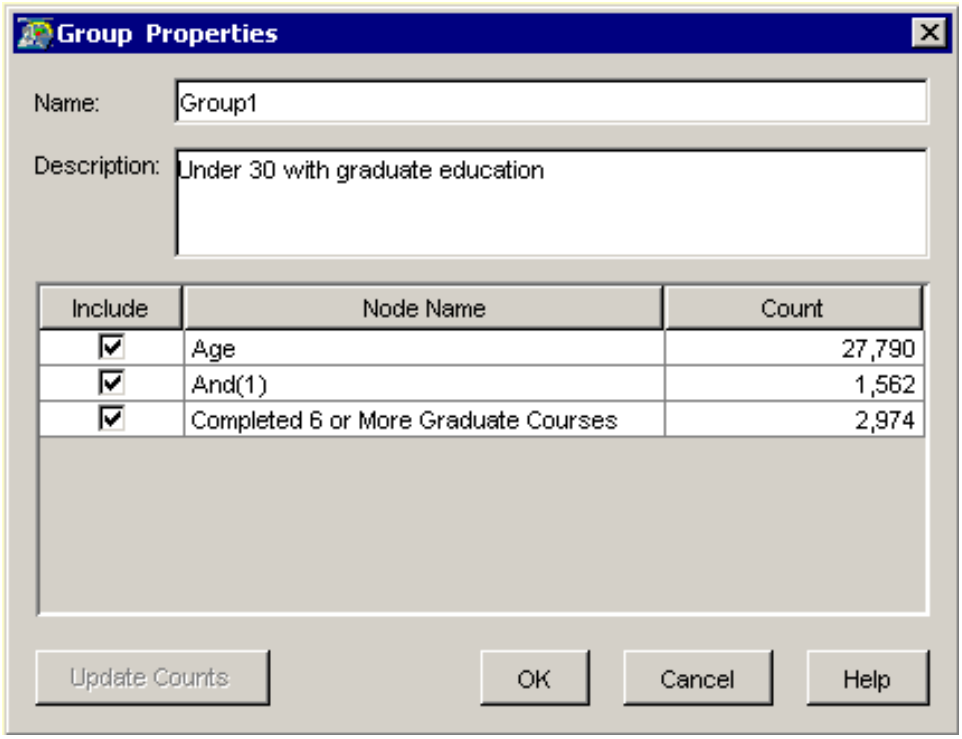
1. Group the nodes that you want to collapse by clicking and dragging a selection area around the nodes. To add individual nodes to a group, press the CTRL key while clicking each node.
2. Right-click a selected node and select **Group**.
3. Right-click again in the area and select **Collapse**. A new node appears that represents the collapsed nodes. The node is denoted with a group icon.

4. To expand the node, right-click the group node and select **Expand**. The separate nodes appear surrounded by the dashed line.

When the nodes are grouped (surrounded by a dashed line), you can right-click any node in the group to see the properties window for that node. Click anywhere inside the group area other than a node to see the properties window for the group.

Group Properties Window

This is an example of a Group Properties window in a selection diagram:



Use the Group Properties window to specify the name and description of the node group that you have created. You can remove a node from the group by unchecking the node's **Include** check box.

In a selection diagram, click **Update Counts** to update the counts for the entire group.

Rules and Tips for Using the Nodes

Here is a list of the rules to follow when using nodes in a selection diagram to create a selection campaign. Logical nodes include the And and Or nodes.

- The origin of a link that ends in a Communication node must be a Cell or Response node. All Communication nodes must be connected to a Cell or Response node.

- You can create multiple links to an And, Or, or Communication node only.
- You can create multiple links from a Split or Communication node only.
- Any node except the Export node can be the origin of more than one link node. Neither the Export node nor the Report node can be an origin of a link.
- Only the And, Or, and Communication nodes can be the destination for more than one link.
- The Link node cannot be the destination of a link.
- You cannot move or delete a connection between two nodes while one or both of the nodes are executing.

Entering Date and Time Values

In some node properties windows, you can enter 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:

- 1/22/07
- 1/22/2007
- 01/22/07
- January 22, 2007
- jan 22, 2007

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:

- 1/22/07 9:30 am
- jan 22, 2007 9:30 AM

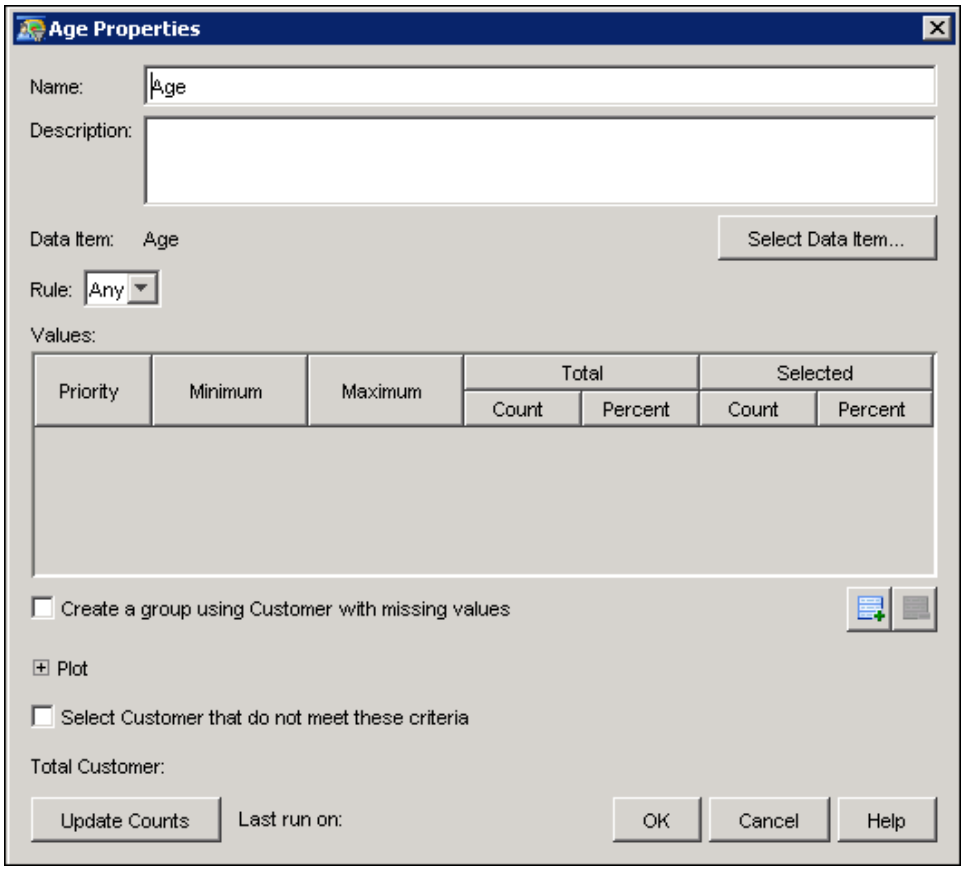
Select Node

The Properties window of the Select node enables you to specify the criteria that are used to select customers. The name of this window depends on the name of the data item that is assigned to the Select node.

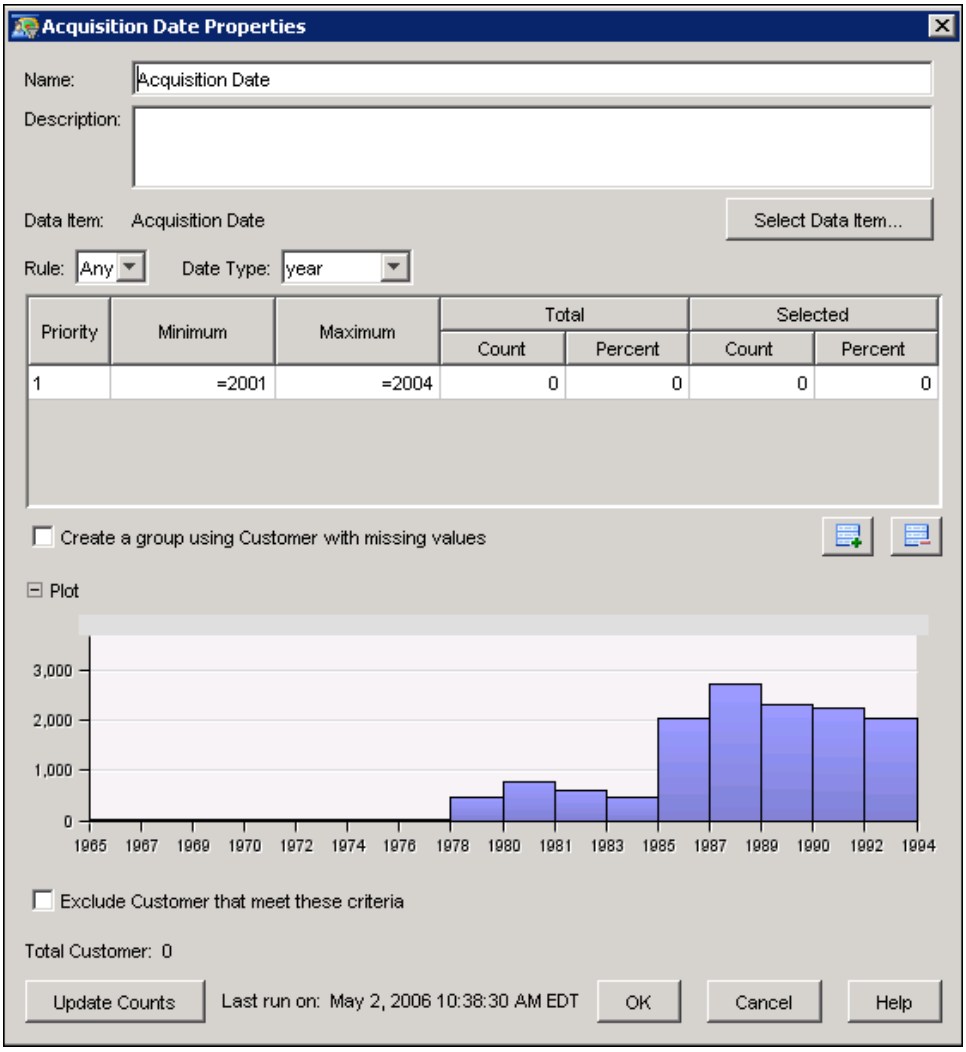
If no data item is assigned to the Select node when you open the properties window of the Select node, the Select Data Item window opens. See "Select Data Item Window" on page 162 for more information.

The options and selection methods that are available in the Select node properties window depend on the type of data item that is assigned to the Select node.

- If a categorical data item is assigned to the Select node, the Values table displays the values of the data item. Use the Values table to specify the criteria. See "Using the Values Table" on page 167 for more information.
- If an interval data item (including a date data item) is assigned to the Select node, you use the Histogram or the Groups table to specify the criteria. See "Using the Histogram" on page 168 and "Using the Groups Table" on page 169 for more information. For examples of valid date and time values, see "Entering Date and Time Values" on page 159.



- If the selected data item represents a date, choose a date type by using the **Date Type** drop-down list.



Use the **Date Type** drop-down list to specify how the dates are displayed in the histogram. You can choose the following values from the drop-down list.

whole date
: displays the whole date.

day
: displays a numeric value that represents the day of a date. Numeric values can range from 1 through 31.

month
: displays a numeric value that represents the month of a date. Numeric values can range from 1 through 12.

year
: displays a numeric value that represents the year of a date.

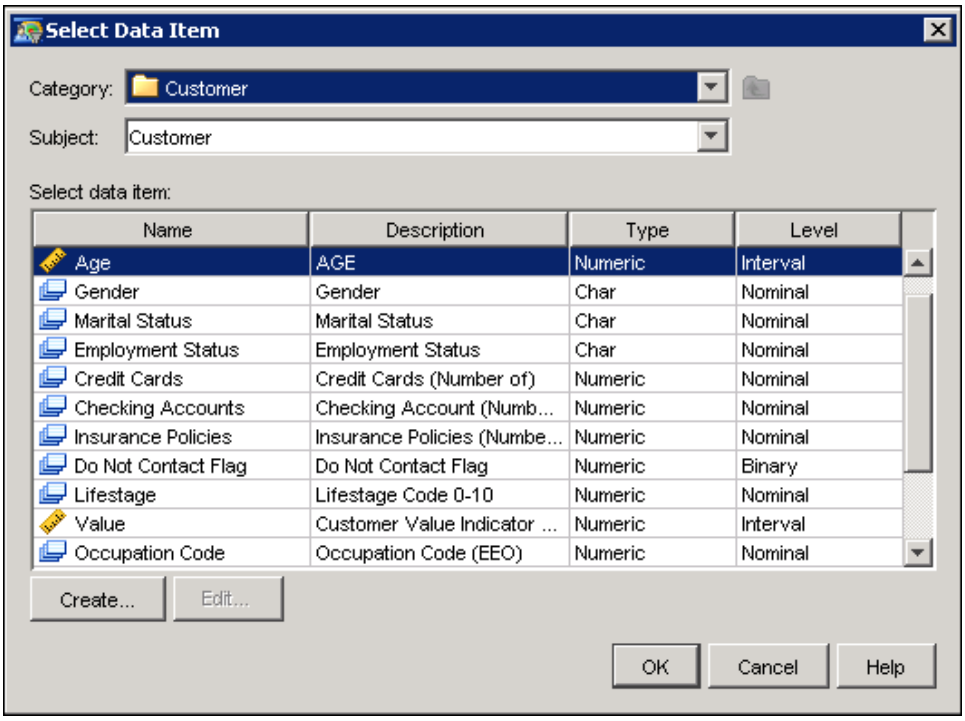
today
displays a numeric value that represents the number of days since today. A value of zero means today. Negative and positive numerical values represent dates in the past and in the future, respectively. For example, -1 represents yesterday and 2 represents the day after tomorrow.

Select Data Item Window

In the Select Data Item window, assign a data item to a node.

Selecting a Data Item in a Selection Diagram

Select the category and subject that contain the data item.



The **Category** list displays the names of data categories or folders in the information map that SAS Marketing Automation uses. You define information maps in SAS Information Map Studio. If the administrator has set up nested folders in the information map, you will see a hierarchy in SAS Customer Intelligence Studio. Data items are organized into these folders. For a specific folder, you can specify more than one subject in the information map.

The items in the **Subject** list are the subjects of data items that are shown in the table. Your selection in the **Subject** list determines the contents of the table. For example, if you select **Customer**, the table displays the variables that provide information at the customer level, such as gender, age,

income level, occupation, and previous responses to direct mail. If you select **Customer** as the subject and **Account Balance** as the data item, the account balance of each customer will be calculated. If you select **Household** as the subject and **Account Balance** as the data item, the account balance per household will be calculated.

The table displays the name, description, type, and measurement level of the data items.

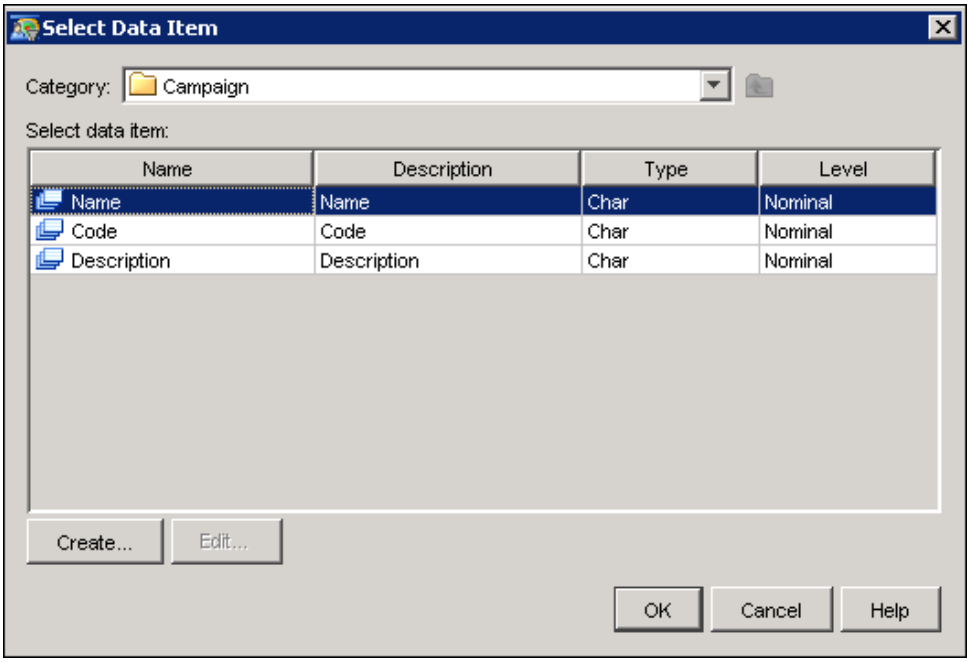
Follow these steps to assign a data item:

1. Choose a category from the **Category** drop-down list.
2. Choose a subject from the **Subject** drop-down list.
3. Select a data item in the table, or click **Create** to create a calculated data item.
4. Click **OK**. The Select node's properties window opens.

To edit an existing calculated data item, select the row that contains the data item and click **Edit**. For more information, see "Using the Calculated Data Item Window" on page 171.

Selecting a Data Item in a Decision Diagram

Select the category that contains the data item.



Select a category from the **Category** drop-down list. A category is displayed if there is at least one variable that has been defined for that category that matches the variable type that you are entering. Depending on the type of node and the nodes that precede it, you can select data items from one of the following categories:

Global Variables
lists the global variables that are defined in the SAS Customer Intelligence plug-ins in SAS Managment Console. For more information, see "Defining Global Variables" on page 80.

Event Variables
lists the event request variables that are selected in the Start node that precedes the current node.

Output Variables
lists the output variables from the Subdiagram and Process nodes that are on the path that precedes the current node. There is one data item per output variable.

Implicit Processes
lists processes that are not explicity referenced in the diagram. There is one folder for each implicit process. Implicit process folders are displayed under one or more of the following conditions:

- There are identifiers that are associated with the outputs from upstream nodes that are on the same path as the current node.
- There are identifiers that are associated with event request variables.
- There are identifiers that are associated with global variables.
- There are processes that have no input variables.

Inside each implicit process folder you will see a list of data items, one for each process output variable.

Identifiers
lists any data items that have identifiers and are listed in the Global Variables, Event Variables or Upstream Nodes folders.

Calculated Items
lists any calculated data items that have been defined for the current node.

Campaign
lists data items that have been defined for the campaign, such as the campaign name, campaign code, and description.

Cell
lists data items that have been defined for the preceding cell, such as cell name, cell code, and description. The Cell category is available only with the Reply node and with standard replies.

Reply
lists data items that have been defined for the reply, such as reply name, reply code, and description. The Reply category is available only with the Reply node and with standard replies.

Date and Time
lists the **Today's Date and Time** data item.

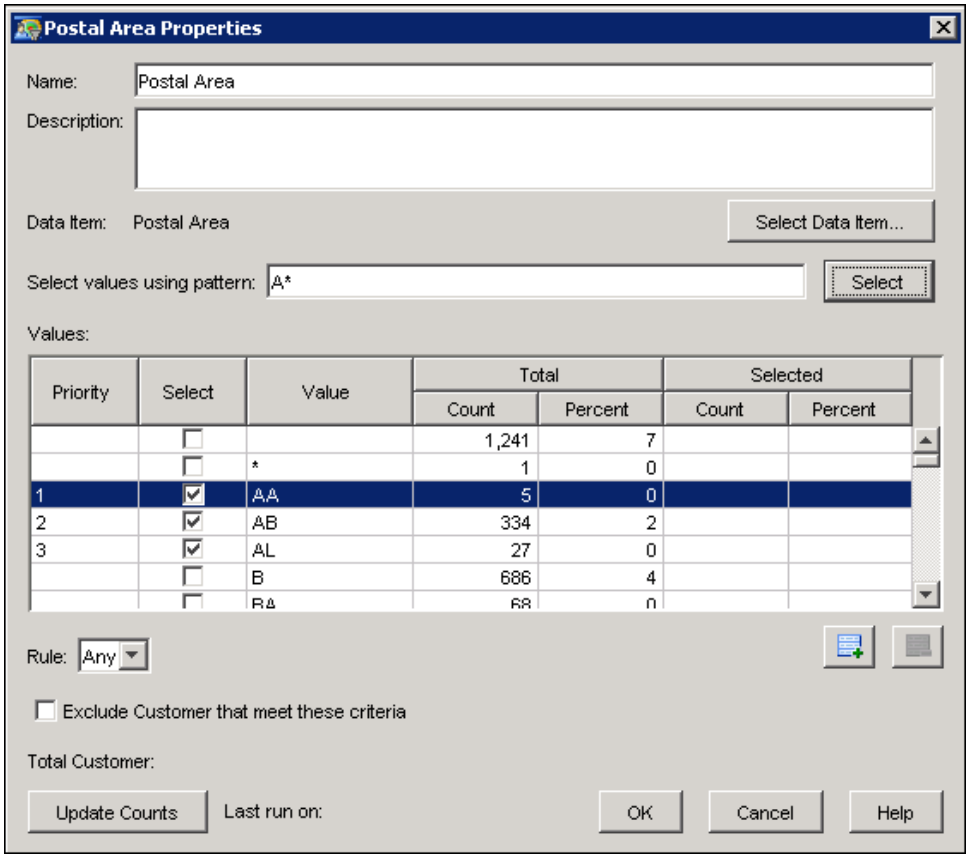
Specifying Selection Criteria in the Select Node

Follow these steps to specify a selection criterion:

1. Specify a name for the Select node in the **Name** field.
2. Specify a pattern to select values or manually select the values in the **Values** table.
3. Use the **Rule** drop-down list to specify how the customers will be selected.

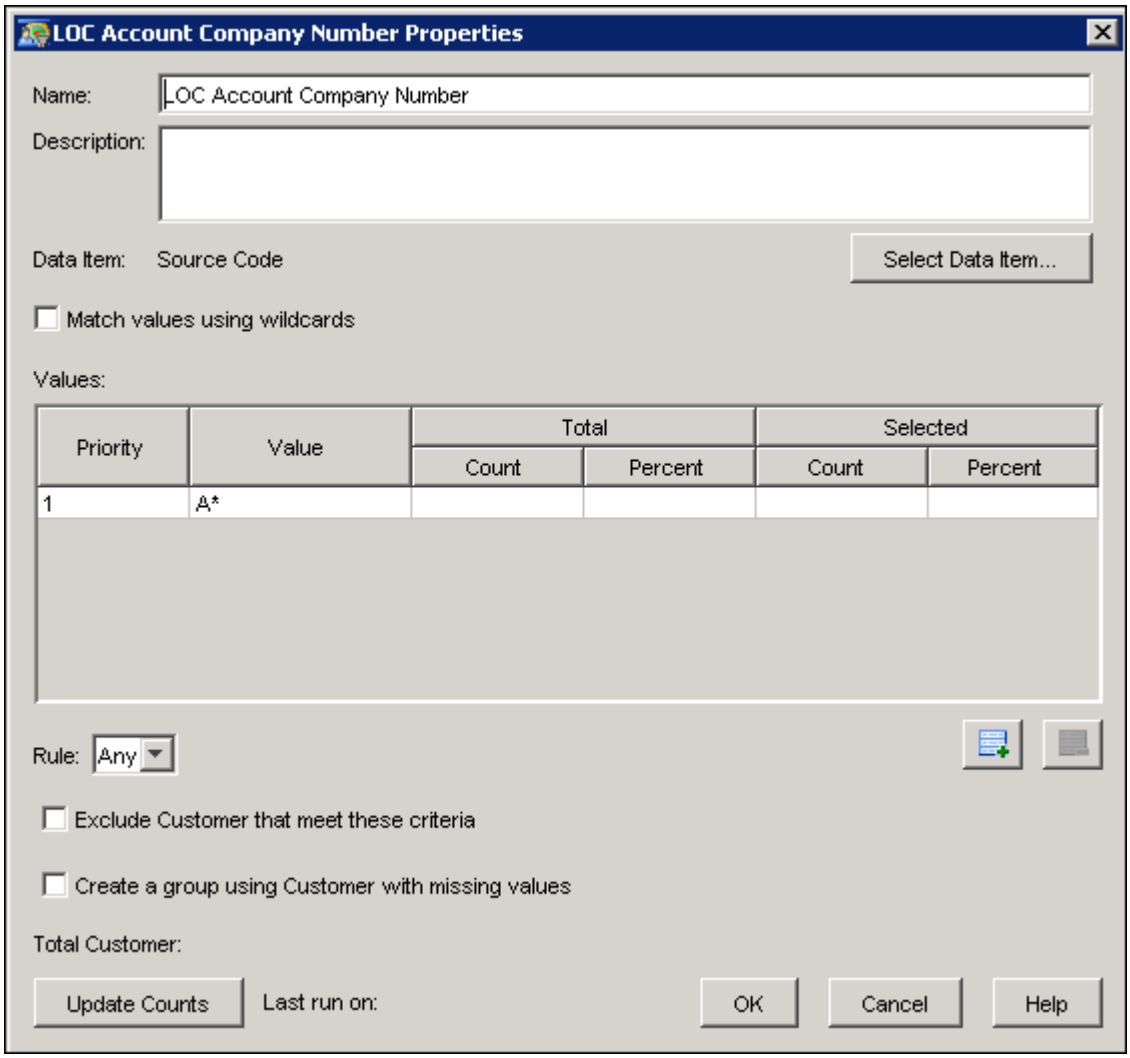
The **Data Item** label displays the name of the data item that is assigned to the Select node. To choose a different data item, click **Select Data Item** to open the Select Data Item window. For more information, see "Select Data Item Window" on page 162.

If the data item is associated with metadata, you can use a pattern to select values by typing a pattern followed by an asterisk (*) in the **Select values using pattern** field and click **Select**. For example, to select all of the values that begin with "A," type **A*** in the **Select values using pattern** field. The field is case-sensitive.



NOTE: If you use a pattern to select values from data that is associated with metadata, and if the data has changed, you must reopen the Select node and reapply the pattern to update the data.

If a discrete character data item is not associated with metadata, you can use a pattern to select values by selecting **Match values using wildcards** and typing a pattern in the **Value** column of the **Values** table. The pattern is matched against the database using the SQL LIKE operator. Valid wildcard values are a question mark (?), an asterisk (*), an underscore (_), and a percent symbol (%).



After you have defined the selection criteria, use the **Select <subject> that do not meet these criteria** check box to specify whether to include the selected customers in your campaign. When you select this check box, the Select node icon in the diagram includes a red X, and the number of subjects who were excluded (or dropped) is displayed.

The **Rule** drop-down list enables you to define more precisely the set of customers that are selected. For example, suppose that the data item that you specify for the Select node is Automobile Manufacturer, the data item contains three values (Ford, Chevrolet, and Dodge), and you have selected the values Ford and Dodge. Depending on the value that you choose in the **Rule** drop-down list, different selection rules are created.

Value in the Rule List	Selection Criterion
All	The customers who own Ford or Dodge cars only.
Any	The customers who own at least one Ford or one Dodge.
One	The customers who own exactly one Ford or one Dodge.
Many	The customers who own more than one Ford or more than one Dodge.
None	The customers who do not own either a Ford or a Dodge.

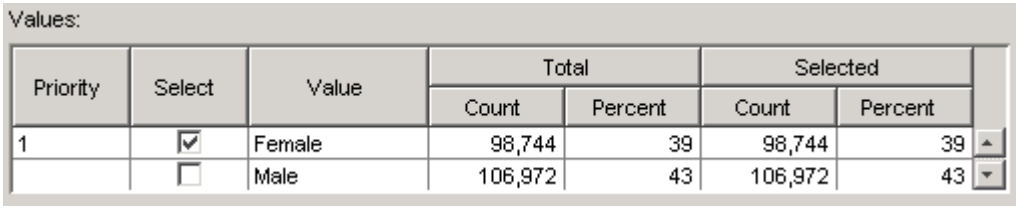
The **Total count** of the selected subjects is displayed.

When you make changes to the selection criteria, the total count is not updated automatically. Click **Update Count** to update the information.

Using the Values Table

For a categorical data item, the **Values** table displays the information about the selected data item.

Here is an example of the **Values** table.



The **Values** table contains the following information. Each row of the table represents the customers who have the value of the data item.

Priority
enables you to choose the group that a customer is assigned to if the customer can be assigned to more than one group. See "Export Node" on page 212 for more information. Valid values are 1 to the number of selected rows in the table. This column is not available if the selected data item is a filter that was created in an information map.

Select
indicates whether to include the value in the criteria for selecting customers.

Value
displays the values of the selected data item.

Total Count
displays the number of subjects who have values in the range that a row defines.

Total Percent
displays the percent of subjects who have values in the range that a row defines.

Selected Count
displays the number of subjects who have values in the range that a row defines, taking predecessor nodes into account.

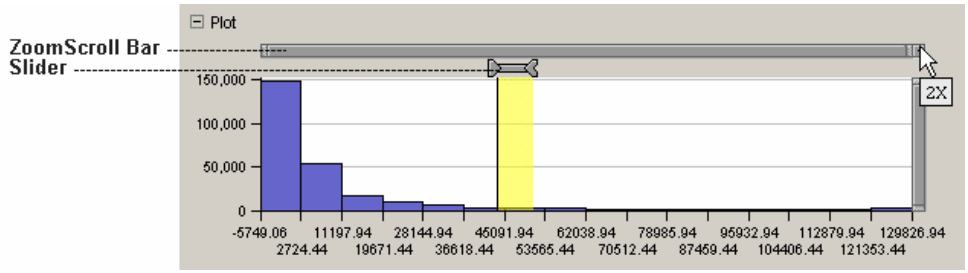
Selected Percent
displays the percent of customers that have values in the range that a row defines, taking predecessor nodes into account.

Each row of the Values table corresponds to a selection. Missing values form a separate group. When multiple rows are selected in the Values table, the resulting selections are created by combining the individual selection by using the OR operand.

Using the Histogram

The histogram displays the distribution of the values of an interval data item. Each bar defines a range of the values. The range of the defined group is highlighted in the histogram.

Here is an example of the histogram:

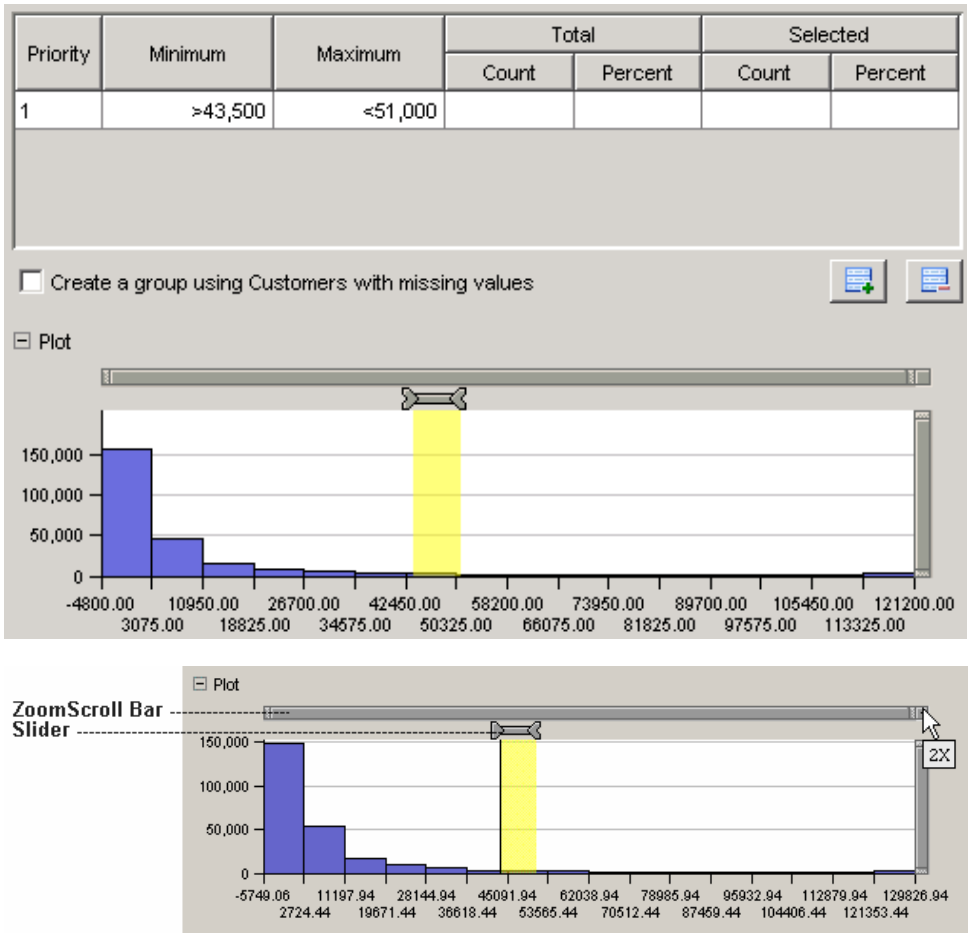


You can perform the following tasks in the histogram:

- To zoom in the histogram, click the button to the right of the ZoomScroll bar. After you zoom in the plot, you can use the ZoomScroll bar to navigate the plot.
- To create a group, click and drag in the area between the histogram and the ZoomScroll bar.
- Use the slider to move the group. To change the minimum or maximum value of a group in the histogram, place your mouse pointer over the ends of the slider and drag it to a new location. Moving a group changes the minimum and maximum of the group, but not the range of the group.

When you place your mouse pointer over a slider, a tool tip displays the boundaries of the group.

In the following example, observe that no solid vertical lines are displayed for the boundaries of the group that includes values greater than (>) 43,500 but less than (<) 51,400. The reason for this is that the boundary conditions do not have the equal sign (=), so the boundary values, 43,500 and 51,400, are excluded from the group.



To toggle between the inclusion and exclusion of the boundary values, follow these steps:

1. Select the slider of the group.
2. Right-click and select **Include/Exclude**.

To delete a group, follow these steps:

1. Select the slider of a group.
2. Right-click and select **Delete**.

When you make changes to the groups in the histogram, the contents of the Groups table are updated.

Using the Groups Table

The Groups table is similar to the Values table except that you use the Groups table for interval variables. You use the Groups table to create groups of customers based on the values of the data

item. Each row represents a group of customers. The groups that you define must be mutually exclusive. The Groups table contains the following columns.

Priority indicates which group a customer is assigned to if the customer can be assigned to more than one group based on the selection criteria. See "Export Node" on page 212 for more information. Valid values range from 1 to the number of rows in the table. This column is not available if the selected data item is a filter that has been created in an information map.

Minimum
specifies the minimum of the group.

Maximum
specifies the maximum of the group.

Total Count
displays the number of customers that have values in the range that a row defines.

Total Percent
displays the percent of customers that have values in the range that a row defines.

Selected Count
displays the number of customers that have values in the range that a row defines, taking predecessor nodes into account.

Selected Percent
displays the percent of customers that have values in the range that a row defines, taking predecessor nodes into account.

To add a group, follow these steps.

- Click the Add Group tool icon below the Groups table to add a new row to the table.
- Specify boundary conditions (<, =, or >) and values in the **Minimum** and **Maximum** columns.
- Click **Update Counts** to update the count information in the Groups table.

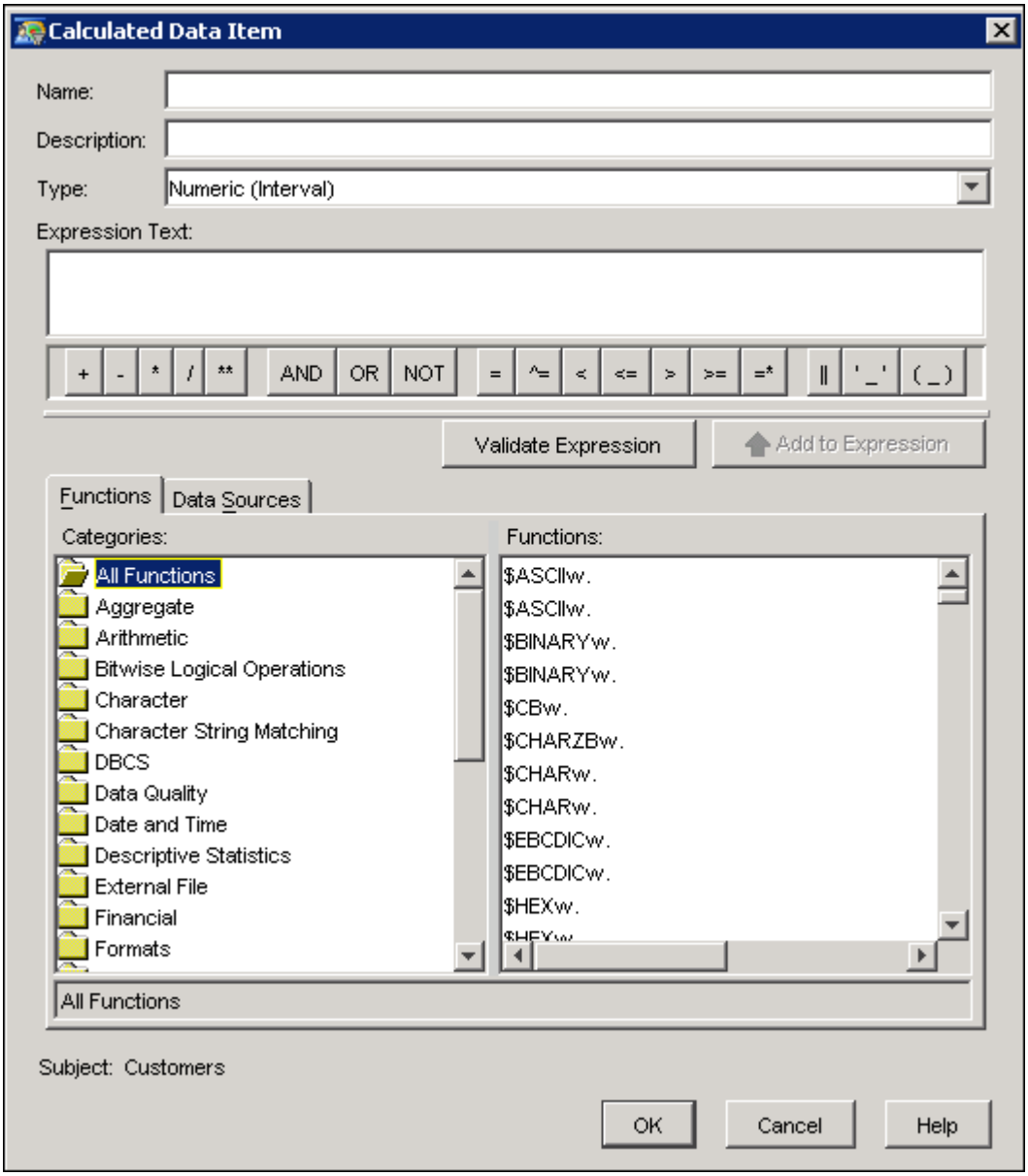
To delete a group, select the group in the table and click the Delete Group tool icon.

The following table describes valid values that you can enter in the **Maximum** and **Minimum** columns for a date type data item. If the **Date Type** is set to a whole date, the values that you enter must be in the format mm/dd/yy. If the **Date Type** is set to day, valid values in these columns are from 1 to 31. If the **Date Type** is set to month, valid values are from 1 to 12. For examples of valid date and time values, see "Entering Date and Time Values" on page 159.

Date Type	Valid value
whole date	date in the format mm/dd/yy
day	integer from 1 to 31
month	integer from 1 to 12
year	integer that represents a four digit year
today	integer that represents the number of days since today. A value of zero means today. Negative and positive values represent dates in the past and in the future, respectively. For example, -1 represents yesterday and 2 represents the day after tomorrow.

Using the Calculated Data Item Window

This is an example of a Calculated Data Item window in a selection diagram:



Use this window to combine data items, functions, and operators to create expressions.

The Calculated Data Item window contains the following elements:

Name
specifies the name of the calculated data item.

Description
specifies an optional description of the calculated data item.

Type
specifies a type for the calculated data item. Note that **Type** is unavailable in selection diagrams if the calculated data item that is currently being edited is used in any select node (including the current one) in the diagram.

Expression Text
: displays the combination of functions and mathematical operations that is used to derive a value. To enter an expression, you can type directly in the field or use the operator toolbar, the Functions tab, and the Data Sources tab to add operators, functions, and data to your expression. If the divisor in your expression is a data item that inserts a value of zero, then you receive an error message and you cannot build the expression. To clear the expression, use the BACKSPACE or DELETE keys.

Operator toolbar
: contains symbols that you can add to the expression, including arithmetic operators, comparison operators, and logical operators.

Validate Expression
: verifies whether the current expression text is valid.

Add to Expression
: adds the currently selected function or data item to the expression. This button is enabled only when you select a function or data source that can be inserted into the expression.

Functions tab
: displays the list of available functions that you can use to create expressions. They are categorized by type. To add a function to the expression, double-click an item on the Functions tab, or select the item and click **Add to Expression**. The choice of functions depends on whether you are creating a selection diagram or a decision diagram. For more information on using SAS functions, refer to the SAS documentation at `http://support.sas.com/documentation/onlinedoc/sas9doc.html`.

Data Sources tab
: displays a list of data elements and data or metadata values that you can add to the expression. To add data to the expression, double-click an item on the Data Sources tab, or select the item and click **Insert**.

NOTE: Some calculated data items, such as x > y, result in Boolean expressions. SAS Real-Time Decision Manager uses a value of 1 if the expression is true and a value of 0 if the expression is false.

Cross-Campaign Prioritization

SAS Customer Intelligence Studio enables you to refine your contact list for a communication through a process called cross-campaign prioritization. Use cross-campaign prioritization to exclude customers from a campaign if they are already targeted in other campaigns, past or future.

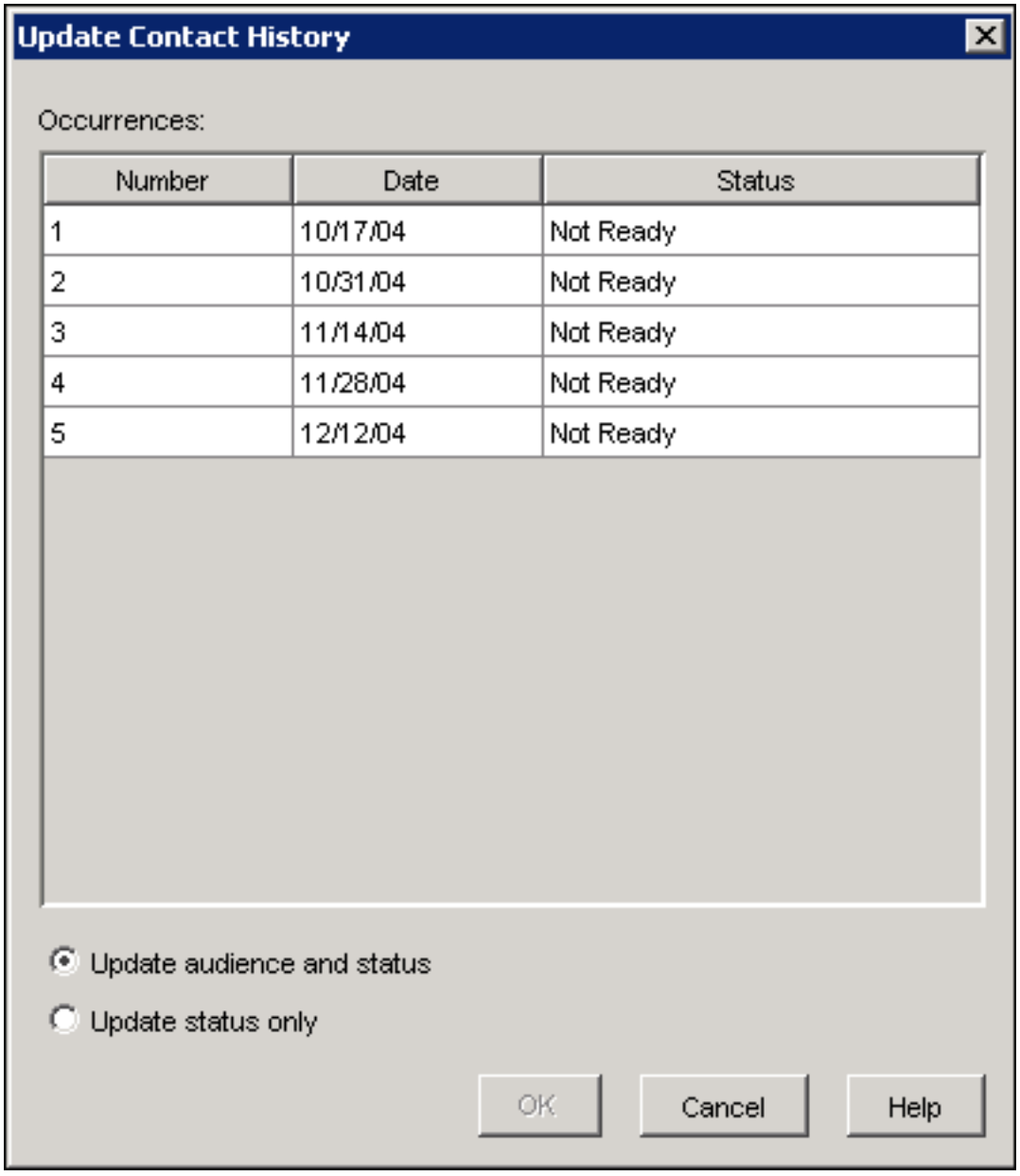
To refine your contact list, follow these steps:

1. Update with future contacts.
2. Create a group of customers to exclude.
3. Exclude that group from the current campaign.

Updating Contact History

Contact information about customers can be obtained from Contact History data or from Customer Contact Statistics. When you execute a communication, you automatically update information about past communications. To enter contact information about future communications for a campaign, follow these steps:

1. Open the window listing communications for the campaign by selecting **Communications** from the Campaign menu.
2. Update contact history information for a planned communications by clicking **Update Contact History**.
3. Enter update information and select one of the available options:
   - **Update audience and status** replaces contact history with the current population for the selected communication and occurrence, as well as update status. The current population is the communication's population from the current diagram.
   - **Update status** updates only the status of the selected communication and occurrence.



Creating an Exclusion Cell

After you define a cell of customers to exclude from a communication, that cell can be used in the current campaign, a different campaign, or in a reusable Contact Strategy diagram, which can be accessed by numerous other campaign diagrams.

There are several methods for defining a cell to exclude from a communication. Below are some suggestions for defining a cell that you want to exclude from a communication:

- Select by contact history data items, such as campaign code or status, that you know you want to exclude from a campaign. For example, designate customers who are already targeted by a known campaign that is similar to the current campaign.

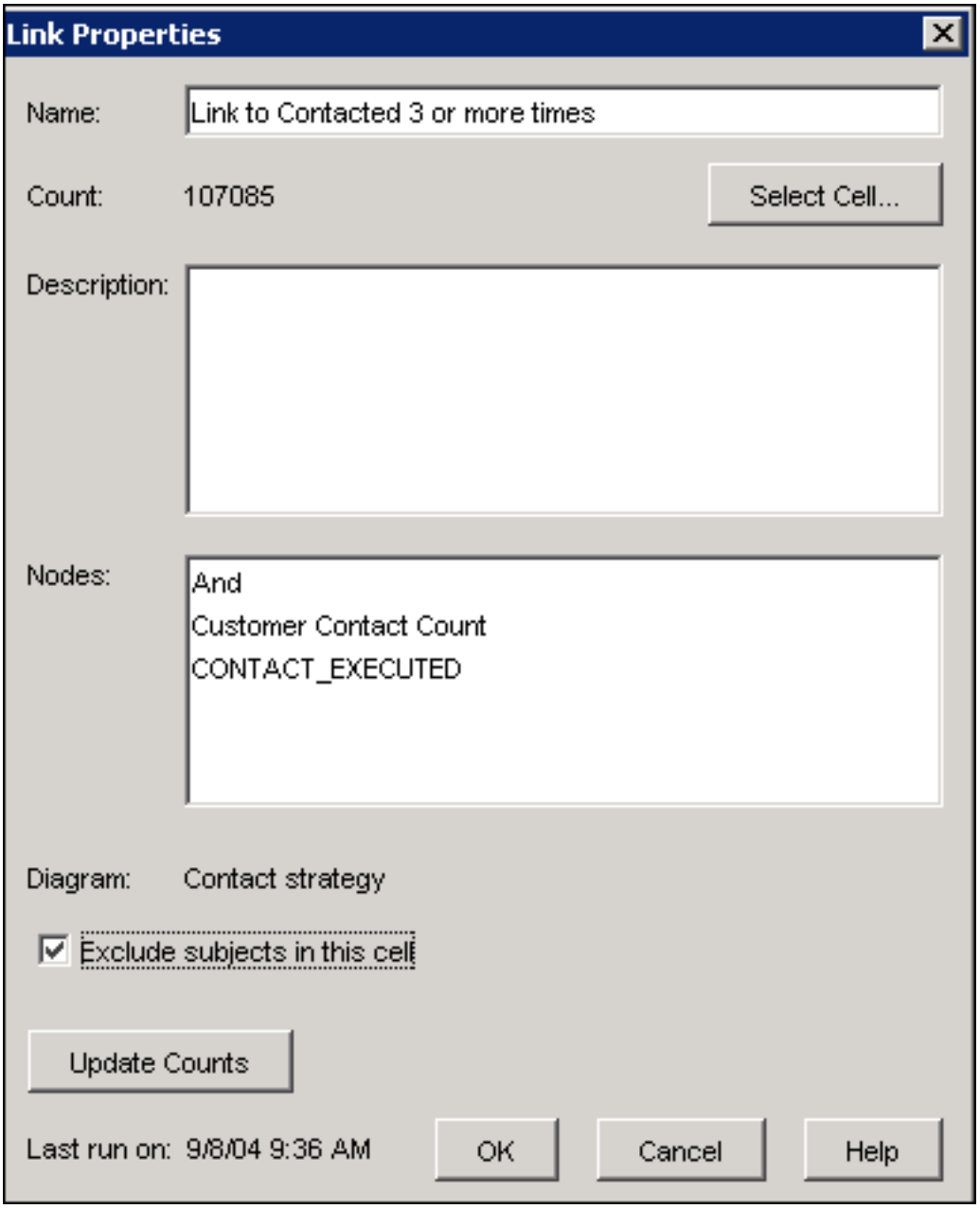
- Use the Prioritize node to create segments (cells of customers) that you can exclude from various campaigns. Here is an example: a list of customers that you do not want to contact, such as a list of preferred customers.
- Select by certain contact history data items, such as dates or status, and a count data item. For example, specify that you do not want to contact any customers who have been contacted more than three times in a designated time period. This can include both past and planned future contacts. For example, `CONTACT_EXECUTED_DTTM` is a good date variable to use for this purpose.
- Select summary data items that contain counts of contacts by customer, from a summary table defined in the information map. For example, exclude customers who have been targeted in the last 60 days or will be targeted in the next 60 days.

For more information about working with nodes to define a contact list, see "Specifying Selection Criteria in the Select Node" on page 165.

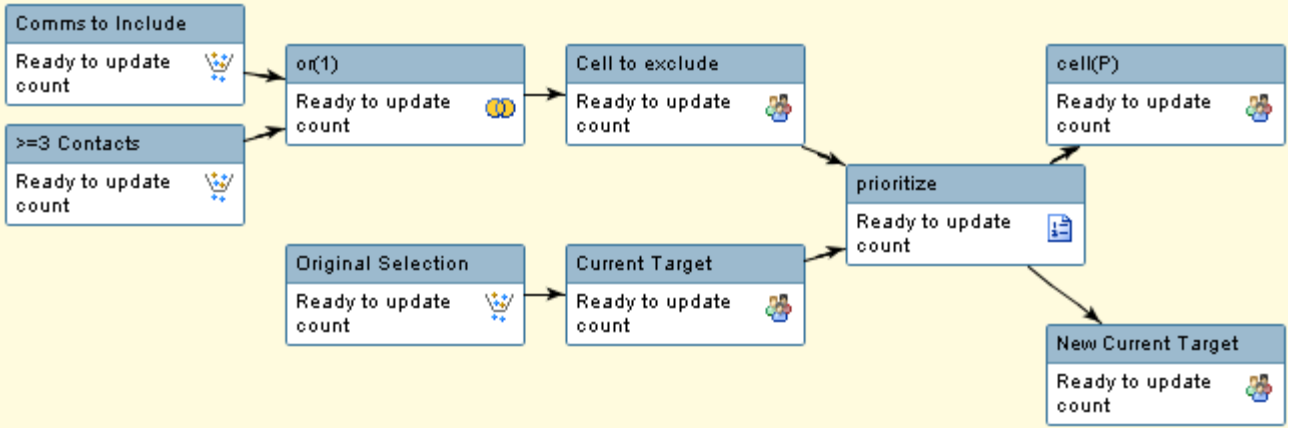
Excluding a Cell from a Diagram

When you have defined the subset of customers to exclude, remove them from the current campaign diagram by using one of the following methods:

- Link to the cell to be excluded with the Exclude check box selected. The resulting cell will not contain the customers in the exclusion group.

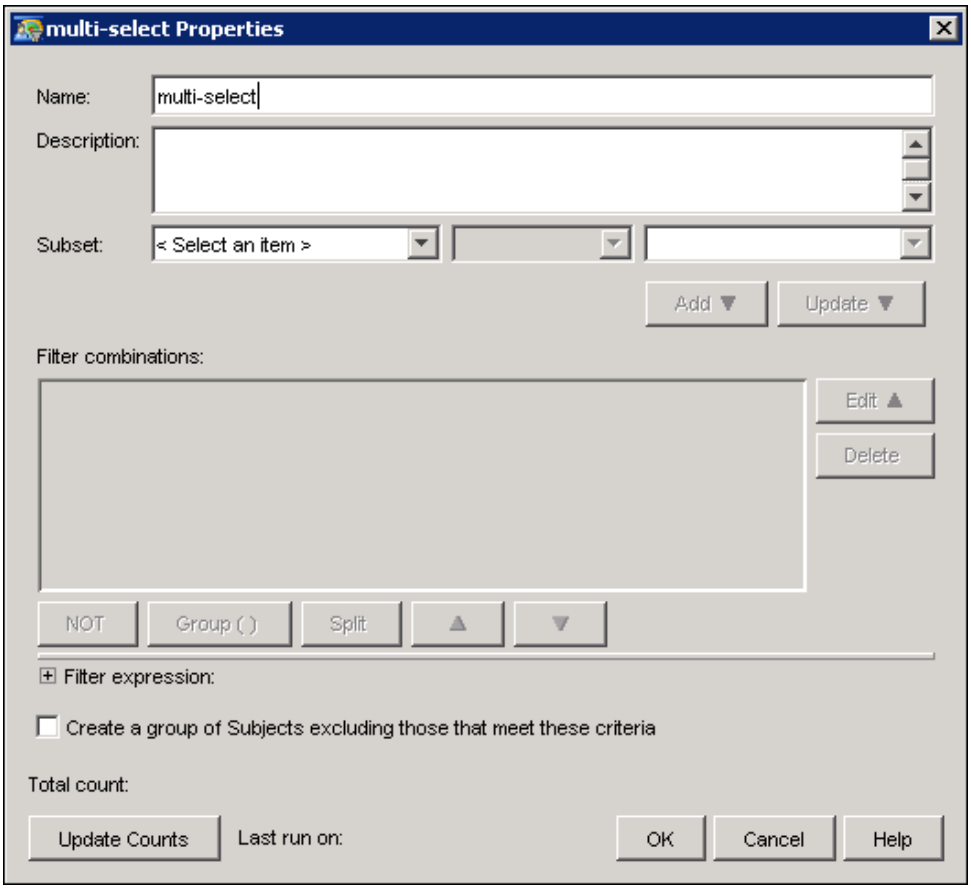


- Connect the cell or cells to be excluded and the current campaign cell to a Prioritize Node. Give the cells that you want to exclude a higher priority than the cell currently targeted by this campaign. What will remain in the target cell will be the customers who were originally targeted without the customers who have a higher priority.



Multi-select Node

The Multi-select node enables you to select subsets from a number of data items and combine the subsets into a single group that comprises your target population.



To combine subsets from more than one data item:

1. Type a name for the node in the **Name** field. The default name is multi-select. Optionally, you can type a description in the **Description** field.

2. To create a subset of the data, select an item from the **Subset** drop-down list. The **Subset** drop-down list displays **Data Item** and the five items that were most recently selected while the Multi-select Node Properties window was open.

3. Select an operand from the drop-down list. The choice of operands depends on whether nominal, binary, ordinal, interval, or date items are selected. If you select an interval item, such as **age**, you can specify a range of values. If you select a nominal item, such as **marital status**, you can use a pattern to select values. You can also specify whether values are missing or not missing. For information on using the LIKE operand, refer to the SAS documentation at `http://support.sas.com/documentation/onlinedoc/sas9doc.html`.

4. Select or enter a value in the value box. The values that you can select depend on the type of data item.

   - For nominal, binary, and ordinal data items, you can select an item from a single list of values. The last item in the list is **Select values**, which displays the Select Values window. For more information, see "Select Values Window" on page 180. The list of values is not displayed if you select **is missing** or **is not missing** as the operand.
   - For interval data items, you can select from a single list of values if you select **=**, **<**, **>**, **not =**, **>=**, or **<=** as the operand. If you select **in range** or **not in range** as the operand, you can select the range from a second list. The list of values is not displayed if you select **is missing** or **is not missing** as the operand.
   - For date data items, you can select an item from a single list of values if you select **=**, **<**, **>**, **not =**, **>=**, or **<=** as the operand. If you select **in range** or **not in range**, **day**, **month**, **year**, **today** as the operand, you can select the range from a second list. The list of values is not displayed if you select **is missing** or **is not missing** as the operand. For examples of valid date and time values, see "Entering Date and Time Values" on page 159.

5. Click **Add** to add the condition to the **Filter combinations** area. The **Filter expression** box displays the expression that you create in the **Filter combinations** area.

6. You can change the order of the conditions, group them, and ungroup them. Each condition is appended by an AND operand to the preceding condition. To exclude a subset from your data selection, select a condition and click **NOT**. To group conditions, select two more conditions and click **Group**. To ungroup conditions, select a condition within a group and click **Split**. To move a condition within an expression, select a condition and click ↓ or ↑.

7. To edit a condition, select the condition in the **Filter combinations** area and click **Edit**. Edit the condition in the **Subset** area and click **Update** to apply your edits to the condition.

8. To delete a condition, select the condition in the **Filter combinations** area and click **Delete**. If you delete a condition that is within a group, all of the groups to which the condition belongs will be deleted. To delete a single condition within a group, split the condition from the group and then delete it. You will need to regroup the conditions that remain.

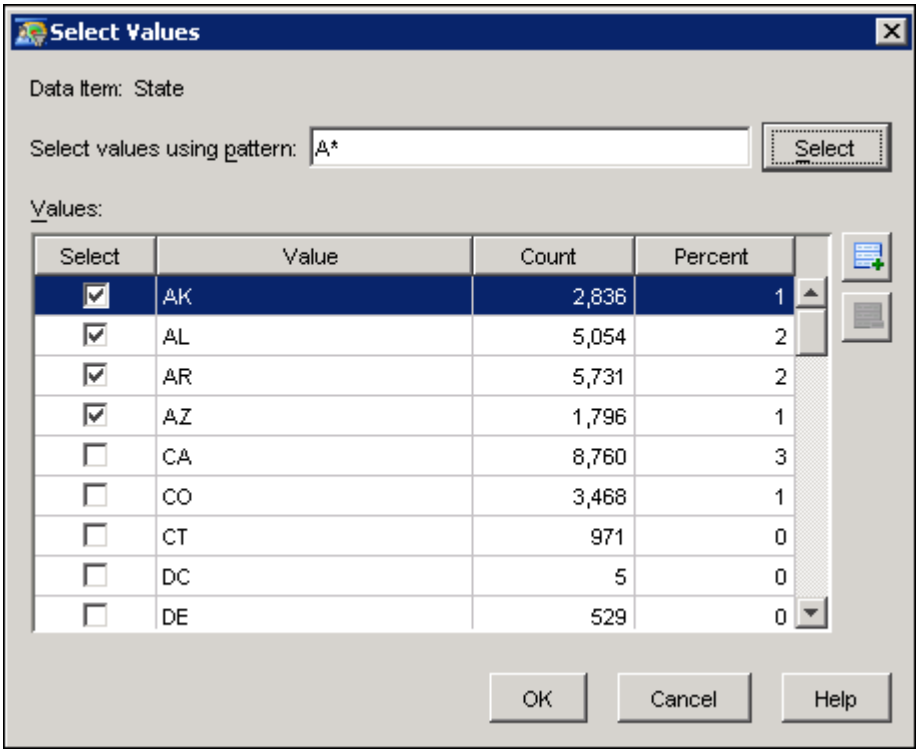
9. To exclude the subjects that are included in the expression, select **Create a group of Subjects excluding those that meet these criteria**.

10. To update the counts that are generated by the expression, click **Update Counts**. The total is displayed next to **Total <subjects>**.

11. Click **OK** to save your expression and close the Multi-select Node Properties window.

Select Values Window

In the Select Values window, you can type in the values that you want to include in a Multi-filter node, or select the values that you want to include in a Multi-select node. You can also specify a pattern to select items in a Multi-select node.



To manually select values, click the box in the **Select** column next to each value that you want to select.

For items other than character data without metadata, you can use a pattern to select values. Type a pattern followed by an asterisk (*) in the **Select values using pattern** field and click **Select**. For example, to select all of the values that begin with "A," type **A*** in the **Select values using pattern** field. The field is case-sensitive.

NOTE: If you use a pattern to select values from data that is associated with metadata, and the data has changed, you must reopen the Multi-select node and reapply the pattern to update the data.

Click to add a row to the Select Values table. To delete a row, select the row and click . You can delete only the rows that you have created.

When you have selected your values, click **OK** to close the window and add the values to the selected subset.

Cluster Node

The Cluster node enables you to perform subject grouping by using a cluster analysis. The cluster analysis generates disjoint clusters. You create cells from these clusters and then target the clusters with different communications.

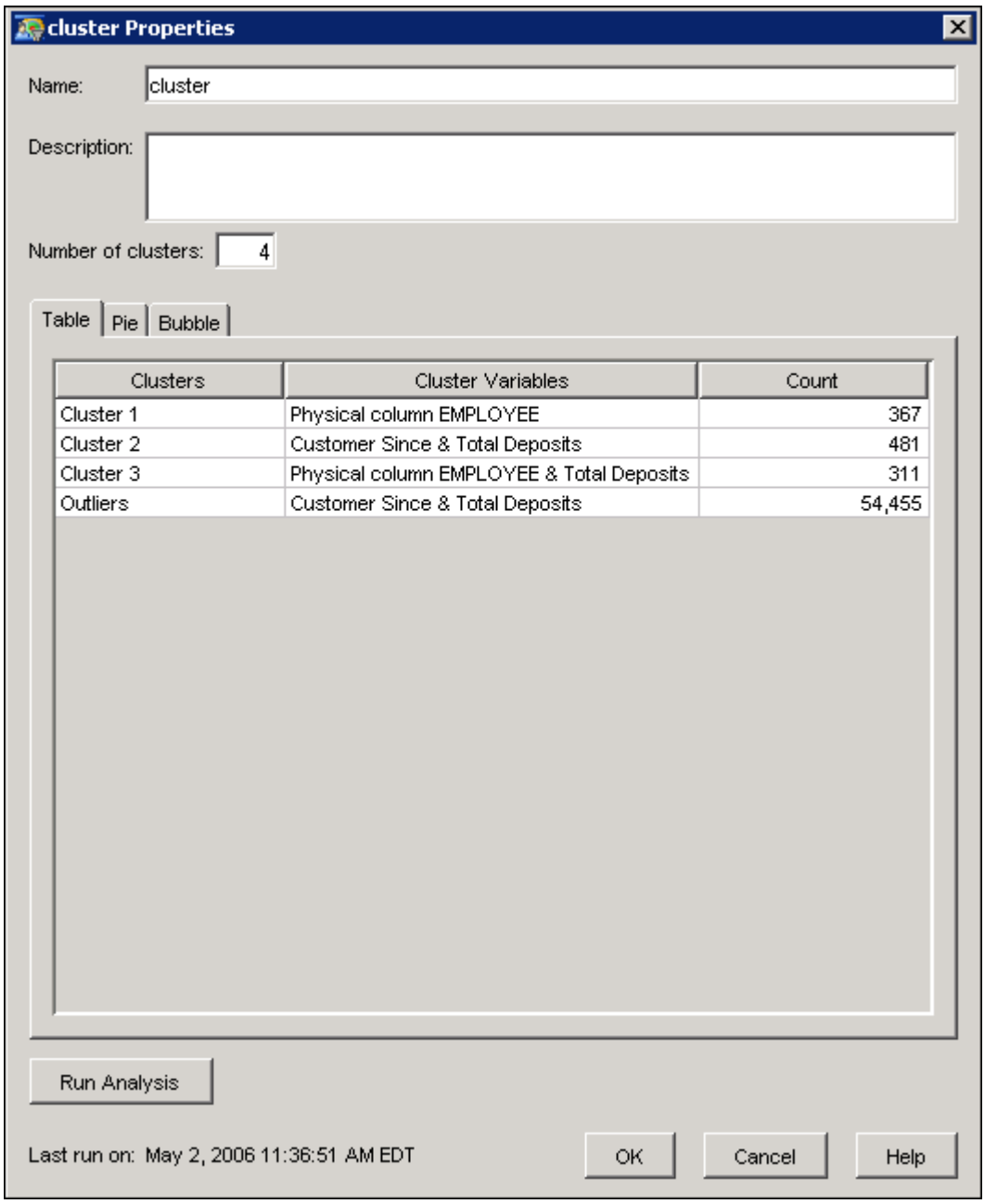
The Cluster Node properties window has the following tabs:

- Table tab displays the cluster name, variables, and subjects in each cluster.
- Pie tab displays a cluster pie chart.
- Bubble tab displays a cluster ellipse plot.

Table Tab

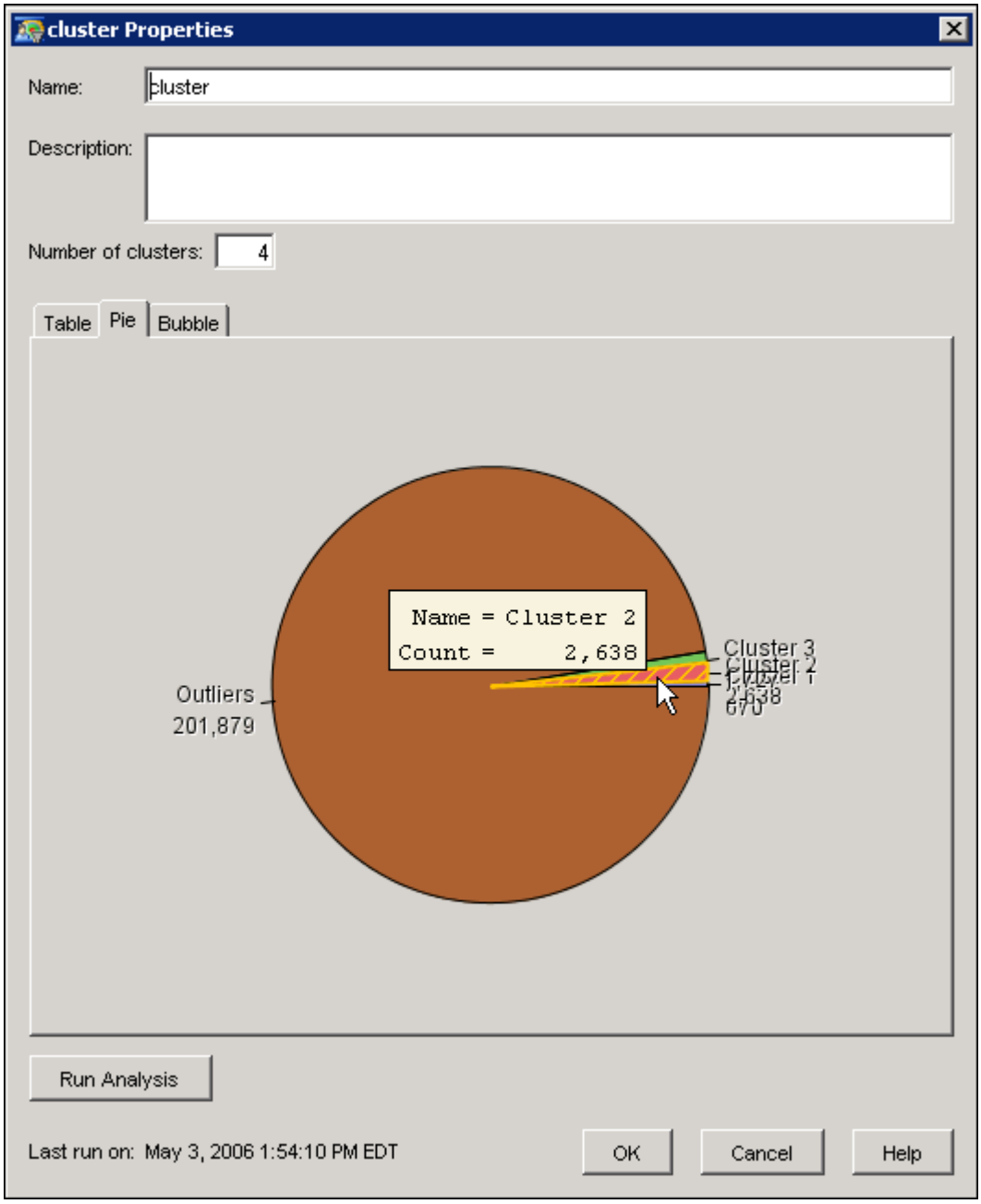
The Table tab displays the cluster name (**Clusters**), the cluster variables that define the clusters (**Cluster Variables**), and the number of subjects that are available in each cluster (**Count**).

The default names of the clusters are Cluster 1, Cluster 2, . . . , and Cluster N, where N is a unique number for each cluster.



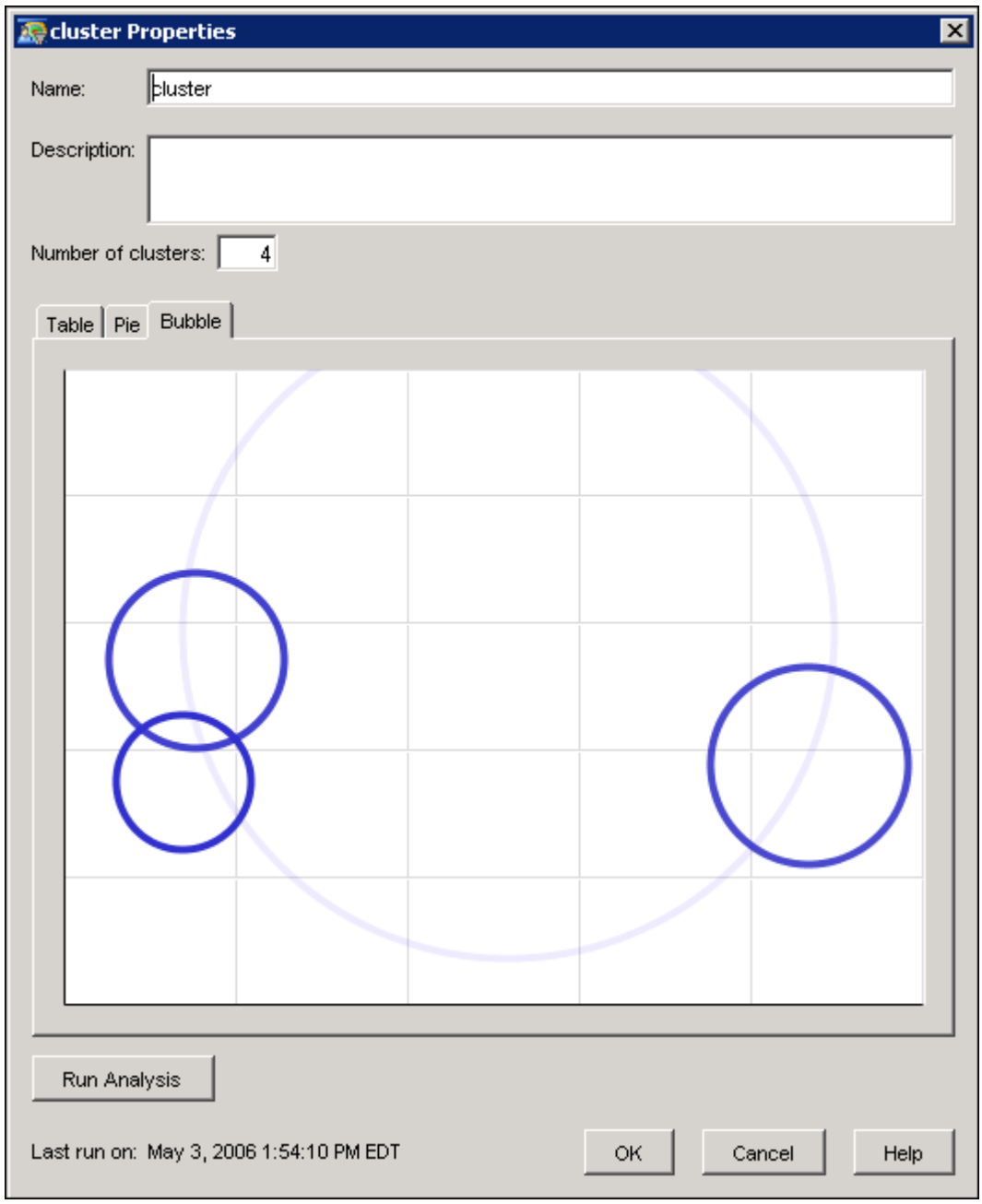
Pie Tab

The Pie tab displays a cluster pie chart. A slice of the pie represents a cluster. The size of the slice corresponds to the cluster size, which is the number of customers in that cluster.



Bubble Tab

The Bubble tab displays a cluster ellipse plot. An ellipse represents a cluster. The size of the ellipse represents how well-defined a cluster is in general. Smaller ellipses signify a more well-defined cluster. The distance between clusters and the size of the ellipse together represent the distinctiveness of the clusters. Ellipses that have minimal overlap represent more distinct clusters, and are preferred.

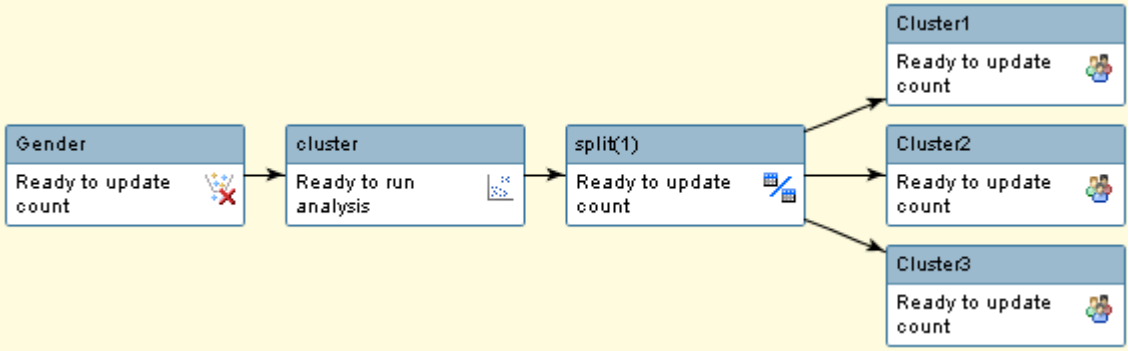


Creating Cells from Clusters

In SAS Customer Intelligence Studio, you must use a Split node together with the Cluster node to create cells from clusters. To do this, follow these steps.

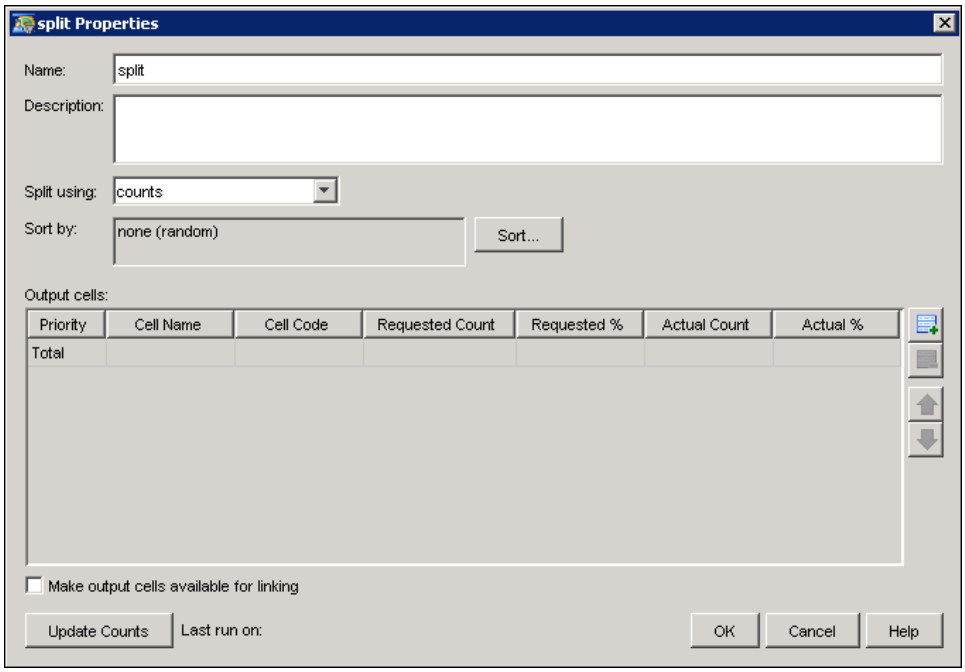
1. Add a Split node to your diagram, and connect the Cluster node to the Split node.
2. Open the Properties window of the Split node.

3. In the **Split using** list, select **values from a previous node**.
4. Select the name of the Cluster node from the Node drop-down list.



Split Node

The Split node properties window enables you to specify the options that are used to split records into two or more cells. The Split node must be preceded by an input node that provides a population to split.



Optionally, you can type a new name for the split node in the **Name** field.

Use the **Split using** list to make a selection. The options that are available in this properties window and in the table of contents depend on the value that you select in the **Split using** list.

You can split records based on any of the following values:

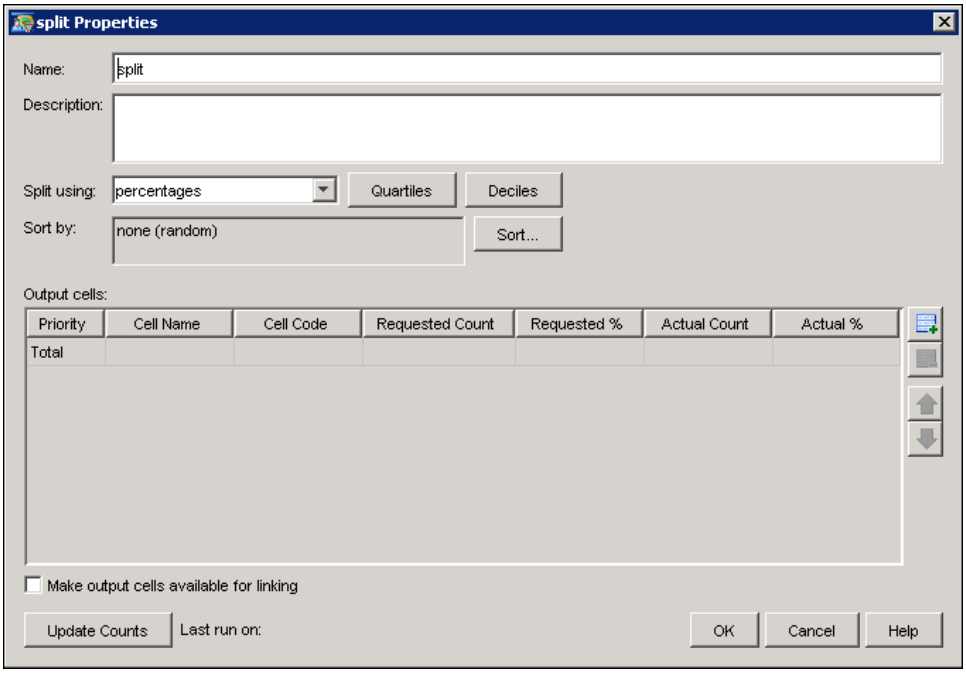
- counts
- percentages
- values from a previous node
- values from a data item.

NOTE: You cannot split records using values from a previous node if the previous node is a multi-select node.

You can specify how to sort the data items when you create splits by using counts or percentages. The **Sort by** box displays the sort order for each data item. If you do not specify a sort order, the subset of records will be generated in a random order. For information about specifying a sort order, see "Sort Criteria Window" on page 192.

Make output cells available for linking enables you to use the Link node to link to these output cells from another diagram. Before you can use the 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. By default, Split nodes will not have output cells available for linking. For more information about using the Link node to link to cells in another diagram, see "Link Node" on page 207.

Creating Splits by Using Counts or Percentages

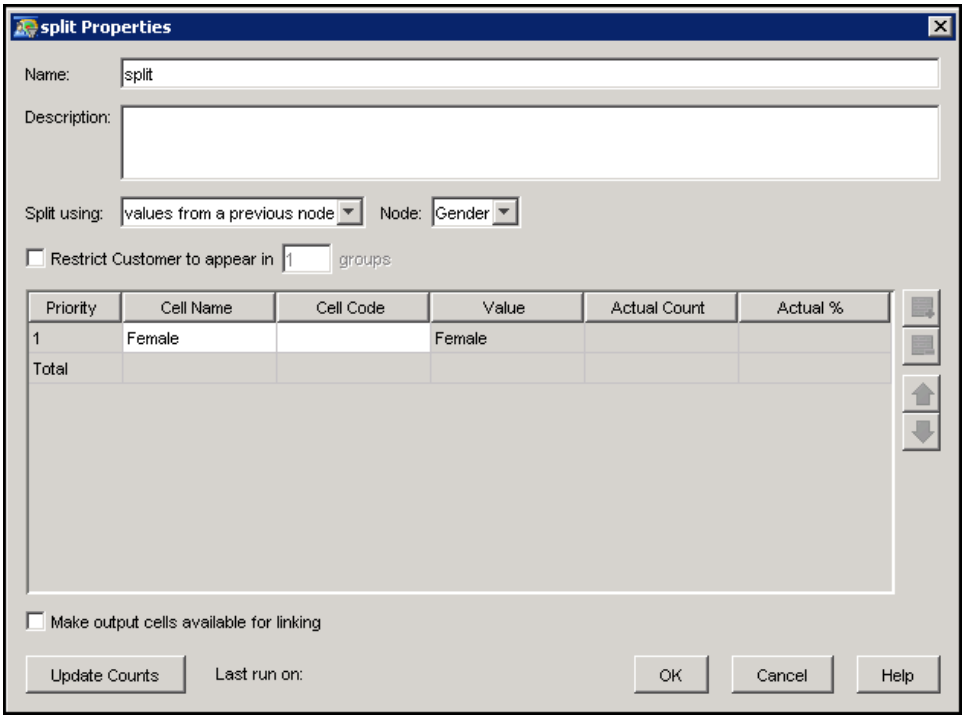


Follow these steps to create splits based on the counts or percentages of the cells:

1. Choose **counts** or **percentages** from the **Split using** list. When using percentages, you can enter the requested percentages in the table, or you can click **Deciles** or **Quartiles** to automatically populate the table with four rows or with ten rows.
2. Click **Sort** to specify a method for assigning subjects to groups. By default, a random number function is used to assign customers to cells.
3. Add a row to the table for each cell that you want to create. Specify a name for each cell in the **Cell Name** column.
4. Optionally, you can specify a cell code for each cell in the **Cell Code** column.
5. Specify either one of the following values:
   - In the **Requested %** column in the table, enter the percentage of the segment that you want to assign to the Split node for 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.
   - In the **Requested Count** column, enter the actual count of the segment that you want to assign to the Split node for each of the cells.

When you create a split that is based on counts or percentages, you can create a remainder row that calculates the remainder when you select **Update Counts**. A remainder output cell is added to the diagram. To create a remainder row, add a row and insert an asterisk (*) in the **Requested Count** or **Requested %** column. 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.

Creating Splits by Using Values from a Previous Node

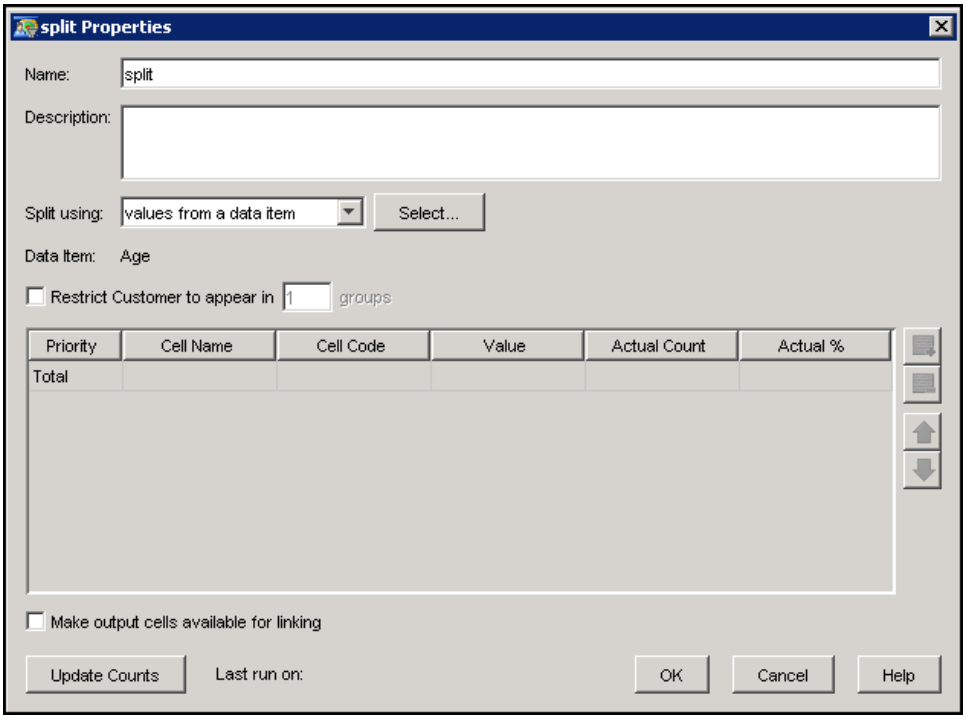


The **Value** column in the table displays the values of the groups that are created in the selected node.

Follow these steps to create splits according to the values from a previous node:

1. Choose **values from a previous node** from the **Split using** list.
2. Select the name of a previous node from the Node list, which displays the names of the Select and Cluster nodes that are upstream from the Split node. If you choose Select nodes, at least one of the Select nodes must not have **Exclude <subject> that meet these criteria** selected.
3. Optionally, specify **Restrict <subject> to appear in** to restrict the number of subjects who can appear in each group

Creating Splits by Using Values from a Data Item



The **Value** column in the table displays the values of the groups that are specified using the Select button.

Select **values from a data item** when you want to split on a variable that is different from the input node. For example, if a predecessor Select node has selected female customers, in the Split node you could specify **values from a data item** and select the Account Balance data item to split the population of female customers into account balance ranges.

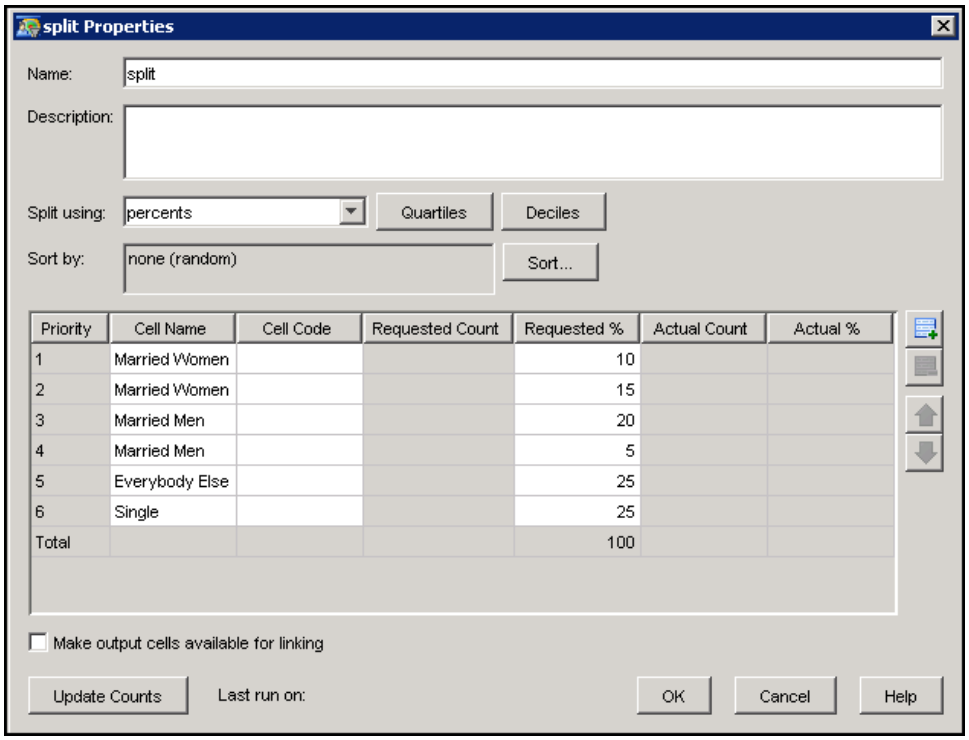
Follow these steps to create splits according to the values from a data item:

1. Select **values from a data item** from the **Split using** list.
2. Click **Select** to open the Select Data Item window. Use this window to select the data item or items that you want to use to split the customers into cells. For more information, see "Selecting a Data Item in a Selection Diagram" on page 162.
3. Optionally, specify **Restrict Customer to appear in** to restrict the number of customers who can appear in each group.
4. By default, the values of the data items that you selected become the output cell names. You can change the cell names in the **Cell Name** column.

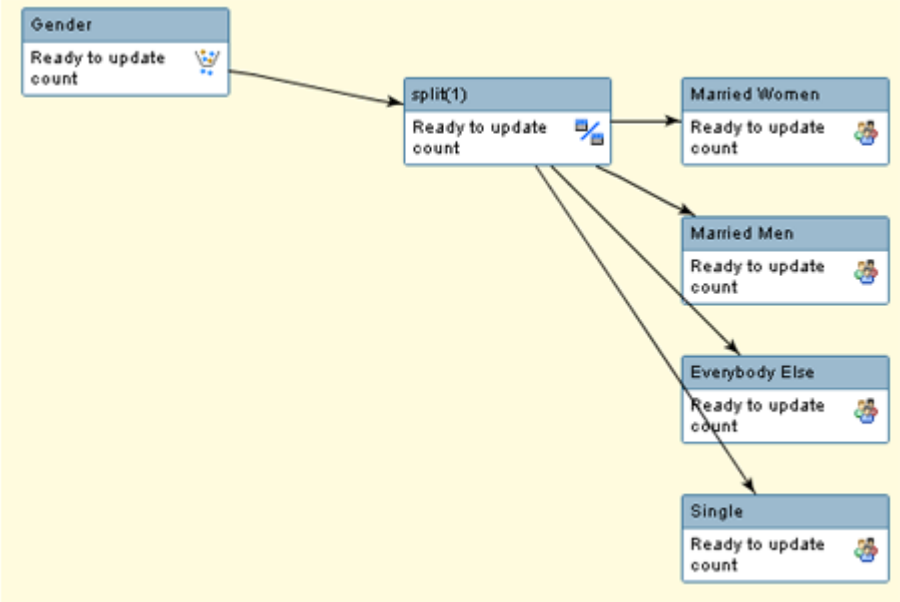
Grouping Splits

You can group splits by assigning the same cell name to more than one line item in the Split node properties window.

In the following example, married customers are consolidated into two groups, Married Women and Married Men.



When you click **OK**, the diagram looks like this.

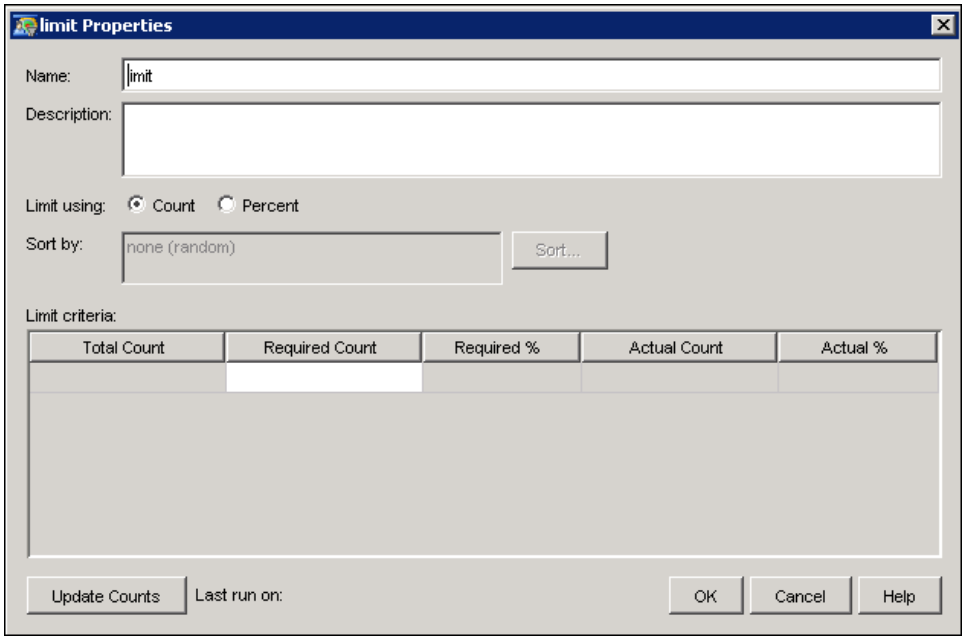


Here are some conditions to consider when you make changes to existing split groups in the Split node:

- If you do not change the name of a group, the group cell remains unchanged, and its downstream links remain.
- If you change the name of a group, but do not change its membership, then the name of the cell is changed to the new group name, and its downstream links remain.
- If you change both the name and membership of a group, then its cell name is changed to the new group name and its downstream links are broken.
- If you add a new group, a new cell is created that has no downstream links.
- If you delete a group (that is, you delete all line items that have the same group name), its cell is deleted.

Limit Node

The Limit node enables you to specify the settings that are used to create a subset of records.



Limit using enables you to specify how to limit the number of records. Here are the available options:

Count
uses the value that you specify in the Required Count column to create the subset.

Percent
uses the value that you specify in the Required % column to create the subset.

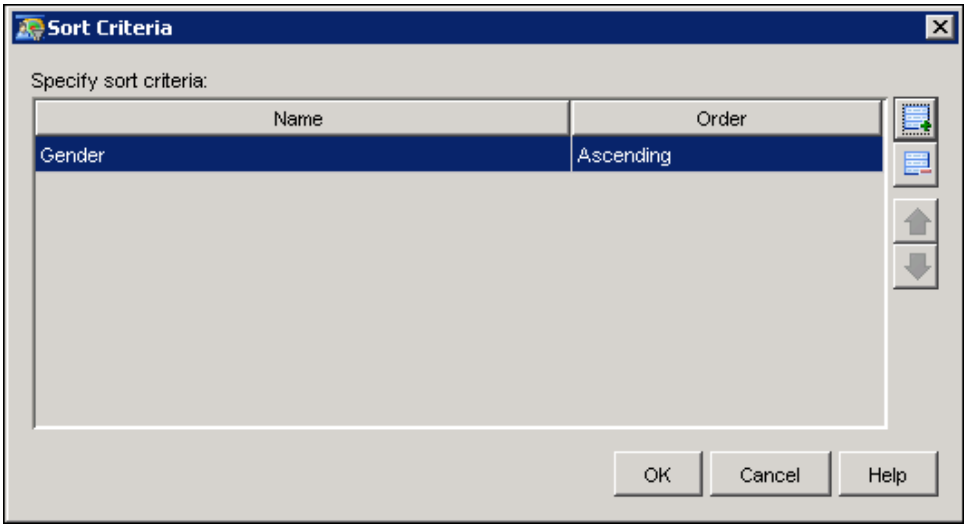
Optionally, you can click **Sort** to specify data items to sort the records by. You can specify only the data items that match the subject of the limit node. If there are no predecessor nodes and the subject is undefined, then the **Sort** button is disabled.

The **Sort by** box displays the sort order for each data item. If you do not specify any data items, the subset of records will be ordered randomly.

To specify data items to sort the records by, click **Sort**. The Sort Criteria window appears.

Sort Criteria Window

Use the Sort Criteria window to specify data items to use as sort criteria in the Limit and Prioritize nodes.

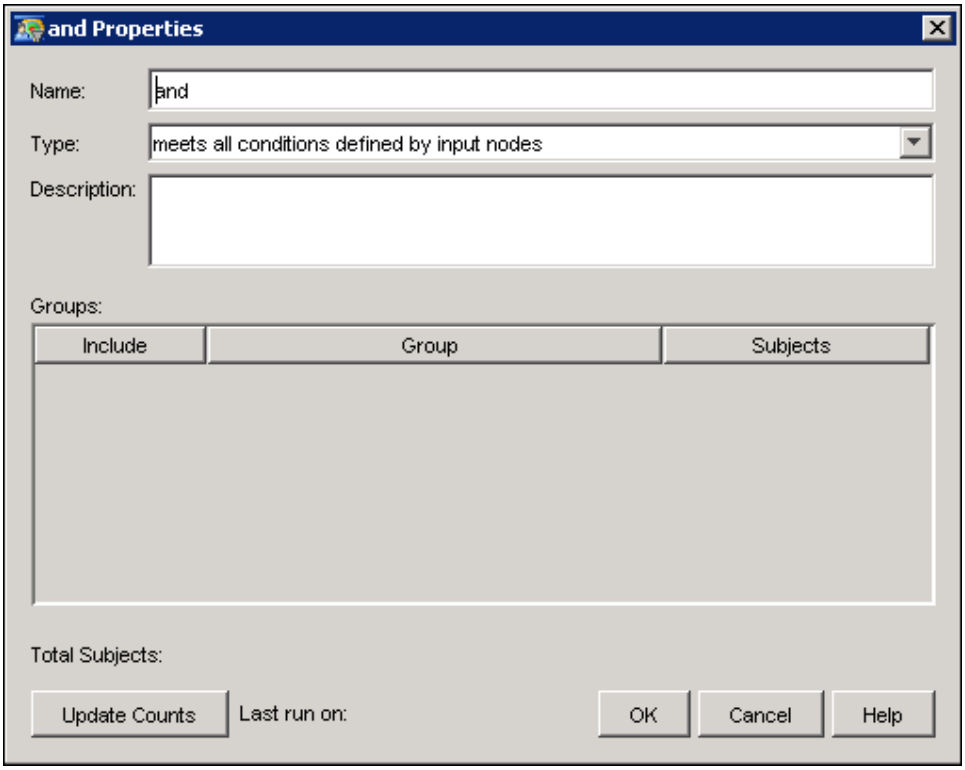


To specify data items:

1. Click . The Select Data Item window opens.
2. Choose a data item and click **OK** to close the Select Data Item window. You can add multiple data items to the sort criteria table.
3. Select **Ascending** or **Descending** in the **Order** column for each data item and click **OK**.

And and Or Nodes

The And and Or nodes enable you to logically combine the criteria from two or more nodes.



You specify a name for the And or Or node in the **Name** box. Select the rule that the node uses from the **Type** drop-down list. Here are the available rules for And nodes:

meets all conditions defined by input nodes
This means that a logical AND 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 Intersect should be used to query the database.

unspecified
This indicates that the node was developed in SAS Marketing Automation 4.2 or earlier.

Here are the available rules for Or nodes:

meets any conditions defined by input nodes
This means that a logical OR 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 Union should be used to query the database.

unspecified
This indicates that the node was developed in SAS Marketing Automation 4.2 or earlier.

Each row in the table corresponds to a node that is linked to the And or Or node. The table contains the following columns:

Include
: indicates whether the criterion from the linked node that is specified on this line is included in the calculation of total count. If you clear a check box, the link between the node and the And or Or node is broken.

Group
: displays the name of each of the linked nodes.

Subjects
: displays the total count of the subjects that are selected by the corresponding node. This column header displays the name of the subjects. In this example, Customer is the subject that is displayed as the column header.

If there are no nodes linked to the And or Or node then the table is empty.

Below the table, the **Total Subjects** label displays the total count of subjects that are selected by combining the criteria of the selected nodes. After you select or clear the check boxes in the table, click **Update Counts** to recalculate the total count. When recalculation is complete, the text of this label changes to the name of the subjects and the updated total count is displayed. In this example, the label displayed is **Total Customer**.

Update Counts starts the recalculation of the total count and unique counts. This button is enabled when the user selects or clears a check box in the table or changes the **Type** drop-down list.

Cell Node

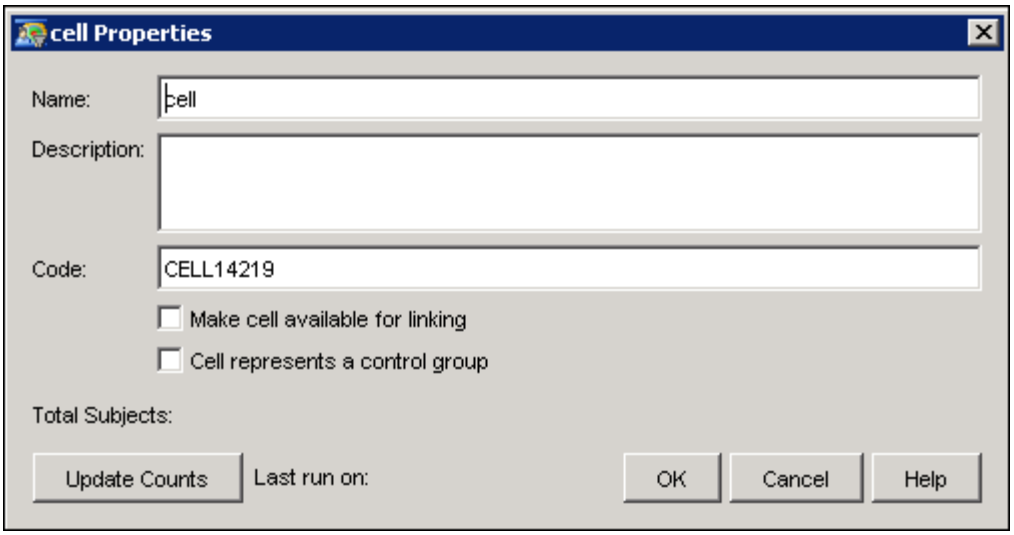
The Cell node combines the data items from the preceding nodes and displays the number of unique subjects.

Cell Nodes in Selection Diagrams

In selection diagrams, the Cell node can be used in the following ways:

- preceding a Communication node
- as a target for diagrams that you want to link to the current diagram
- preceding a Prioritize node
- preceding an AND or OR node.

The marketing cell is the cell node that directly precedes the communication node. Execution of the communication combines all of the marketing cell counts and returns the number of unique subjects from that combination.



Specify a name for the Cell node in the **Name** field. The name of the Cell node is displayed when you select a cell to include in another diagram. Therefore, each cell should have an identifying name.

Optionally, you can provide a description of the Cell node in the **Description** field.

Use the **Code** field to specify cell codes. Cell codes are required and can be either specified manually, or generated automatically. For information about the automatic generation of cell codes, see "Creating, Editing, or Viewing a Business Context" on page 96. Cell codes are used to identify groups of populations. For information about using cell codes to make multiple cells available for export in a single communication, see "Using Cell Codes" on page 196.

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 diagram.

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.

Using Cell Codes

You can create cell codes within a cell node, and then make the cell codes available for export in a communication or an export node. For example, you might want to design a campaign that cross-sells to customers by targeting them through multiple channels, such as mail, telemarketing, and e-mail. You have structured the campaign so that, upon completion, a number of cells are created for analysis:

- Cell 1: Mail to Females, age 18-30, with a checking balance greater than or equal to $1000.
- Cell 2: Telephone call to females, age 18 - 30, with a checking balance greater than or equal to $1000.

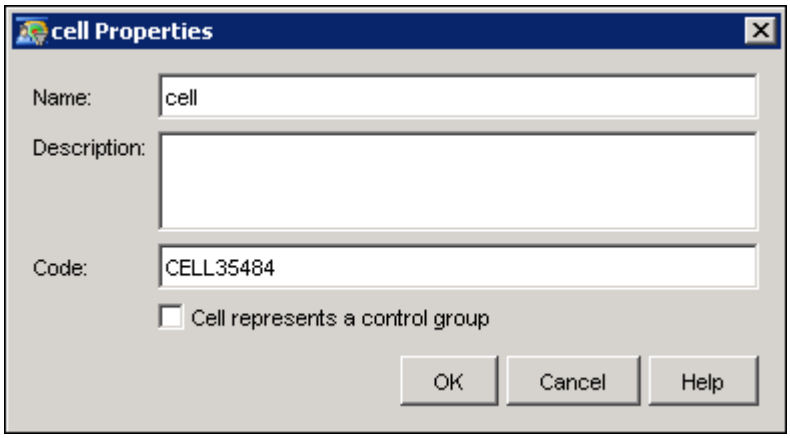
- Cell 3: E-mail message to females, age 18 - 30, with a checking balance greater than or equal to $1000.
- Cell 4: Mail and telephone call to females, age 18 - 30, with a checking balance greater than or equal to $1000.
- Cell 5: Mail and e-mail message to females, age 18 - 30, with a checking balance greater than or equal to $1000.

A single file must be sent to each of three separate vendors; each file contains only the groups of customers that that particular vendor is responsible for contacting. In order to accomplish this, a cell code is associated with each record within a cell to identify the record as part of that group. In addition, e-mail cells are associated with a special code to identify whether the e-mail message is sent as part of another contact.

By adding cell codes to the export file, you can process the file after it has been exported from SAS Marketing Automation and break the file into multiple files that are based on cell code.

Cell Nodes in Decision Diagrams

In decision diagrams, the Cell node precedes a Reply node.



Specify a name for the Cell node in the **Name** field.

Optionally, you can provide a description of the Cell node in the **Description** field.

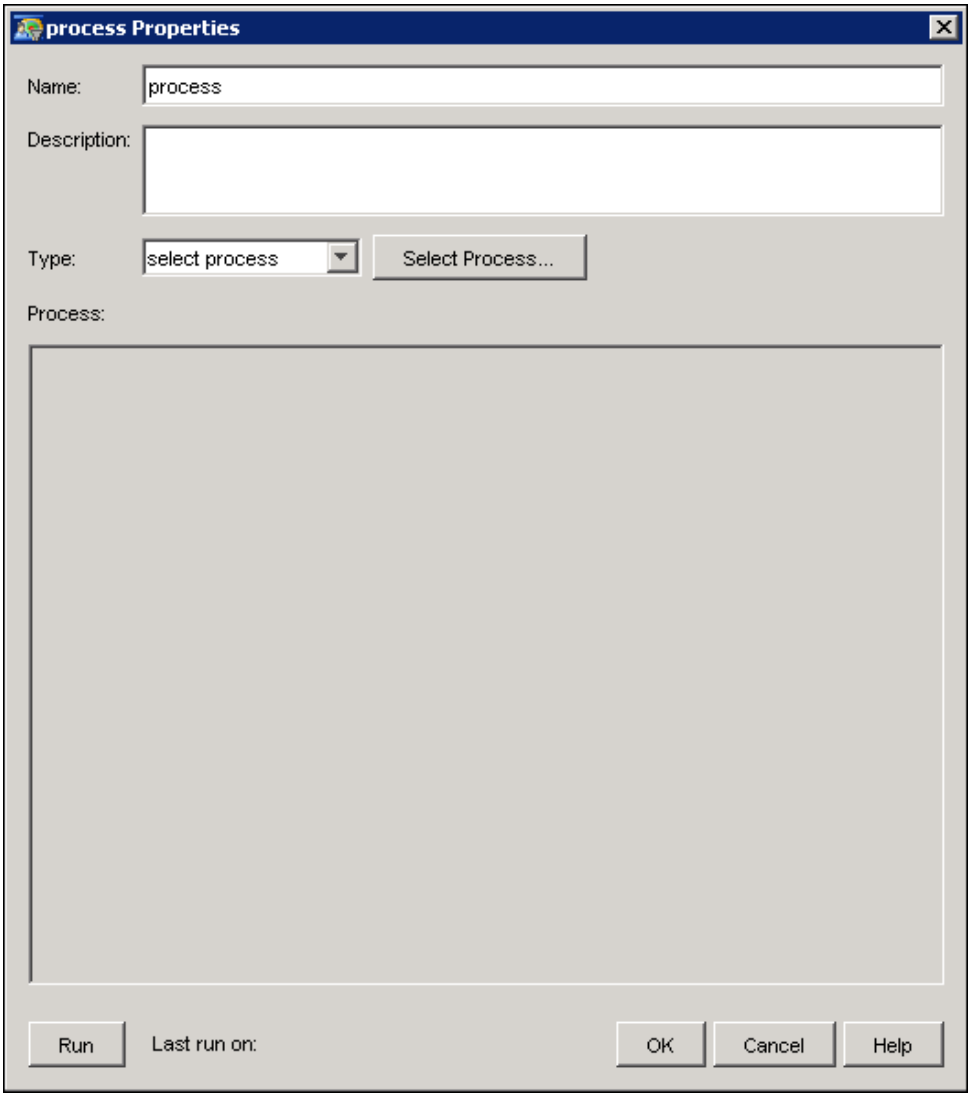
Use the **Code** field to specify cell codes. Cell codes are required and can be either specified manually, or generated automatically. For information about the automatic generation of cell codes, see "Creating, Editing, or Viewing a Business Context" on page 96.

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.

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 run stored SAS processes.

You can place a Process node to follow an export node in a diagram. This enables you to create post-process operations that follow the execution of an export and to test an export process.



The Process node runs in two modes, referred to as *manual mode* and *stored process mode*. In manual mode, you enter the code to be run in a text box in the properties window. In stored process mode, you select a stored process to run that has already been defined and exists separately from the diagram.

Manual Mode

Select **Manual mode** from the **Type** drop-down list to enter code in the text box. 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 - name of the table passed from the previous node
|    inSubjectId - variable name of the input table subject field name
|
| The outputs are:
|    outTable - name of the table passed to the next node
|    outSubjectId - variable name of the output table subject field name
|
| Other available macro variables:
|    campCode - the campaign code for this campaign
|    commCode - the communication code if a communication node is upstream
|
+-------------------------------------------------------------------------*/

/*-------------------------------------------------------------------------
|  The following section of sample code could be used if the process/code
|  node is the first node in a path within the drawing.  Replace the
|  YOUR_SUBJECT_DB_FIELD with your actual subject column such as CUST_NUM.
+-------------------------------------------------------------------------*/
* data &outTable (KEEP=YOUR_SUBJECT_DB_FIELD);
*    set YOUR_CUSTOMER_TABLE;     /* do additional or different logic here */
* run;
* %let inSubjectId=YOUR_SUBJECT_DB_FIELD;
* %let outSubjectId=YOUR_SUBJECT_DB_FIELD;

/*-------------------------------------------------------------------------
|  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.  Note:  The
|  outSubjectId needs to be set if the logic changes subjects.
+-------------------------------------------------------------------------*/
* data &outTable;
*    set &inTable;                /* do additional or different logic here */
* run;

/*-------------------------------------------------------------------------
|  count the number of subjects in the output
+-------------------------------------------------------------------------*/
%macount(&outTable);

%let OutSubjectId = &InSubjectId;

run;
```

This code template is an example of how the Process node is used. You can overwrite this code with code of your own.

After you have entered your code, click **Run** to submit it.

NOTE: The Process node does not validate any SAS code that you enter. You must ensure that your code is specified correctly. If a Process node follows an export node, then the Process node should be allowed to execute only after export process has completed.

Beginning a Selection

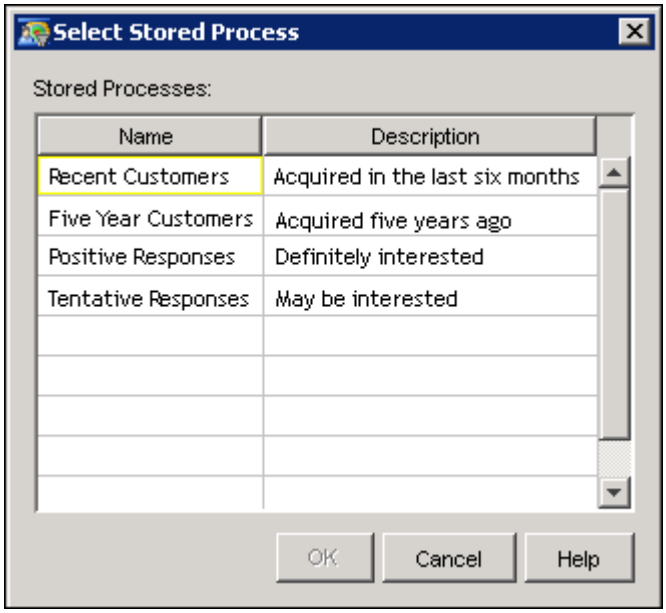
In manual mode, when a Process node is the first node in the diagram and begins a selection, you must define the subject on which the code node is based. The InSubjectID macro variable defines the subject and enables successor nodes to identify the subject on which the code node is based. Assuming that the SAS variable name is PTY_ID, the macro variable is used as follows.

```
%let InSubjectID = PTY_ID;
```

Note that SAS Customer Intelligence Studio does not know what the subject is until the Process node has run. You cannot connect the Process node to any successor nodes until the Process node has run, but you can connect predecessor nodes.

Select Stored Process Window

In stored process mode, when a Process node that contains a user stored process is the first node in the diagram and begins a selection, the stored process must define the subject on which the Process node is based. The MA_Set_Output_Subject_ID macro defines the subject and enables successor nodes to identify the subject on which the Process node is based. Assuming that the SAS variable name is PTY_ID, the macro variable is used as follows.



The list displays what stored processes are defined with the keyword MAUser in the SAS Marketing Automation repository. Select the stored process that you want to use. A window appears that enables you to set the parameters for the stored process that you have chosen. The exact appearance of this window depends on the parameters that are required for the stored process that you have chosen.

Set the required parameter values and click **OK**. For parameters that are labeled **(Optional)**, the stored process will supply empty or null values if you do not enter a parameter value.

The Process Node supports only the following parameter types:

- String
- Boolean
- Date
- Float
- Integer

The following parameter types are ignored by SAS Customer Intelligence Studio, even if they are defined or modified in SAS Management Console:

- colrprm (color)
- fileprm (file name)
- multprm (multi-line text)

Beginning a Selection

In stored process mode, when a Process node that contains a user-stored process is the first node in the diagram and begins a selection, the stored procedure is required to expose the name of the SAS variable that is used to the diagram. This is done using the macro MA_Set _Output_Subject_ID. Assuming that the SAS variable name is 'PTY _ID' the macro is used as follows.

```
%let outVar = PTY_ID;
. . . .
%MA_Set_Output_Subject_ID ( &outVar );
```

Note that SAS Customer Intelligence Studio does not know what the subject is until the Process node has run. You cannot connect the Process node to any successor nodes until the Process node has run, but you can connect predecessor nodes.

Process Node Macro Variables

The following input and output macro variables are available for use in the Process node.

InTable

Use this variable to refer to the input table 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 name of the input table. Do not change the name of the input table. Doing so will invalidate the diagram. The Process node looks for the input table in the same location as tables that were created by other nodes. For example, if you run a Limit node, and the Limit node creates its output table in a library called MATABLES, then the Process node will look for the input tables in the MATABLES library.

If no predecessor node exists, then Customer Intelligence Studio sets the value of InTable to NULL.

You can specify your own input data table. For example, this statement specifies the data table MATABLES.DATA1 as input to the Process node:

```
%let InTable=MATABLES.DATA1;
```

If you do not specify the InTable variable in your code, the code node will have no inputs.

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 Code 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;
```

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.

The Process node saves the output table in the same location that other nodes have used to save tables. For example, if you run a Limit node, and the Limit node creates its output table in a library called MATABLES, then the Process node output table will be saved in the same library.

OutSubjectID

Use this variable to refer to the subject ID of the output data table that is created when the Process node is run. 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 will be 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.

campCode

This variable refers to the campaign code for the current campaign. Any Code node in a diagram can use this variable, regardless of what nodes are upstream or downstream from the 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 will refer 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.

NOTE: You can create as many tables as you want in the Code 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( &_stpwork.status.txt);
```

For more information, see "Error Checking" on page 206.

MACount

counts the number of records that are contained in the output table (OutTable) and makes the count 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);
```

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 available to successor nodes. In this example, OutTableCount contains the OutTable record count.

```
%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 will 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 to map from Household to Customer. You can use the MA_Set_Output_Subject_ID macro to specify the OutSubjectID variable:

```
user code to map from Household to Customer

%MA_Set_Output_Subject_ID(CLIENTNUM);
```

Successor nodes will recognize that the Process node subjectID is CLIENTNUM.

Defining Stored Processes

The syntax that is required to connect code that was entered in manual mode or in stored process mode to other nodes in a diagram is the same for either mode. However, there are specific macros that are used in stored process mode to enable stored processes to be used by Customer Intelligence Studio.

Making a Stored Process Available from Stored Process Mode

For a stored process to be usable in stored process mode it is necessary to register the stored process definition in the data repository for the application. This can be done using SAS Management Console, but any tool that can manipulate the metadata will work. For simplicity, the definitions will be described using the SAS Management Console.

The stored processes can be set up in any location within the SAS Marketing Automation repository. You decide how best to organize your stored processes. For a new stored process definition, the parameters will be required in the order given by the new process wizard. For an existing process definition, the values can be edited in any order.

Name
Specifies the name of the stored process that you are defining. Slashes, backslashes, and control characters cannot be used in this field. This field is required.

Description
Contains a description of the stored process. This field is optional.

Keywords
Click **Add** button and enter the keyword **MAUser**. This is essential for Customer Intelligence Studio to detect the stored process available in stored process mode.

SAS Server
Specifies the name of the SAS server that will run the stored process you are defining.

Source Repository
Specifies the path of the repository that contains the stored process.

Manage
Enables you to add, modify, or delete repositories.

Input
Specifies the type of input for the stored process. This property must be set to None.

Streams
Enables you to specify input stream details. This property should be ignored.

Output
Specifies the type of results produced by the stored process. This property must be set to Transient result package or the stored process will fail.

Details
Enables you to specify output details. This property is not applicable to transient result packages and should be ignored.

Constraints
Enables you to specify any constraints on the values for the parameters. This button is disabled if the attribute type for the parameter is either Boolean or Multi-line text.

Parameters
Enables you to create macro variables to be used as parameters for the stored process that you are creating. You do not need to re-create the system-defined macro variables that are listed in "Process Node Macro Variables" on page 202, because they are always available to the stored process.

Label
Specifies the parameter name that is displayed to the user. Slashes, backslashes, and control characters cannot be used in this field. This field is required. This is the name that will be shown on the dialog box to edit the parameter values. The name can be descriptive and does not need to correspond to the name of the SAS variable.

SAS Variable Name
Specifies the name of the SAS macro variable to hold the parameter value. SAS macro variable names must start with an alphabetic character (A-Z or a-z) or an underscore (_) and can contain only alphanumeric characters (A-Z, a-z, or 0-9) or underscores. SAS macro variable names are limited to 32 characters.

Description
Contains a description of the parameter. This field is optional.

Modifiable
Specifies whether the user can change the value of the parameter.

Visible
Specifies whether a user is able to view the parameter and its value. This property must be set to `true`.

Required
Specifies whether the parameter must have a non-blank value in order for the stored process to run.

Expert
Specifies that the parameter is hidden from a typical user. The recommended action is to set this to `false`.

Type
Enables you to specify the type of the parameter. You can choose from the following attribute types: Boolean, Color, Date, File Name, Float, Integer, Multi-line Text, or String.

Default
Enables a default value to be assigned to the parameter. This field is optional. For Boolean parameters, you can enter only a value of true or false.

Note: if you change the parameter type after you have already entered a default value, then the value you entered is cleared.

Error Checking

The use of the MAStatus macro is mandatory at the end of stored processes that are used in stored process mode. This macro detects the value of SYSCC and sets a value into the output results for use by Campaign Studio. Here is an example that uses MAStatus:

```
%mastatus( &_stpwork.status.txt );
```

If the MAStatus macro is not used, the following error message appears.

```
The stored procedure must check for errors with the macro call %mastatus(
&_stpwork.status.txt );
```

If an error is detected, the following error message appears.

```
The Process node contains SAS code that is invalid.
```

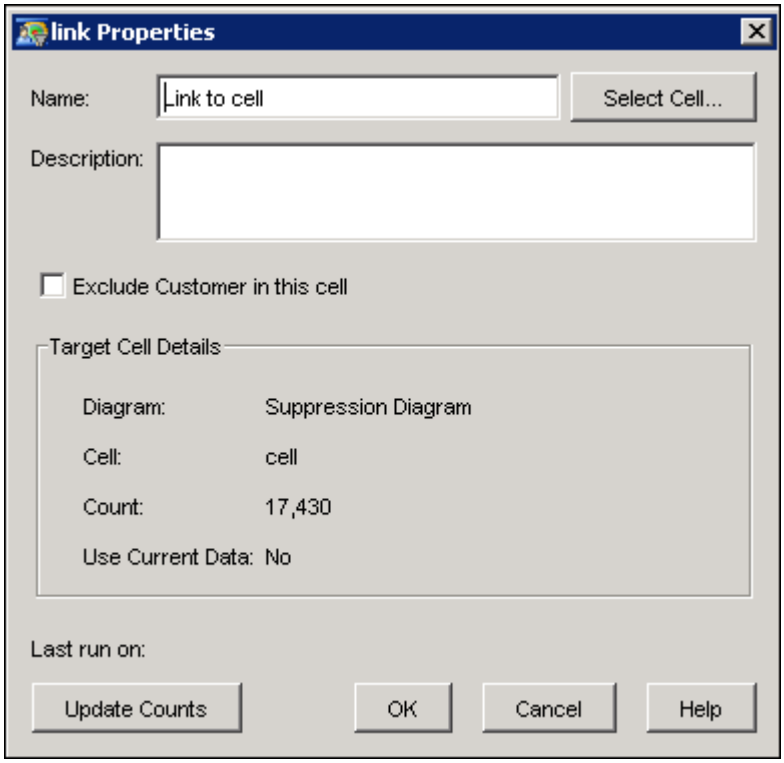
Custom Node

If a custom node has been created in the Diagram Tools plug-in in SAS Management Console, the custom node will be displayed in the Tool Palette. You can edit the name and description of the custom node. Any parameters or other options depend on the specifications for the individual node.

For more information, see "Custom Tools" on page 74.

Link Node

You use the Link node to link to a Cell node in a different diagram, or to Cell nodes that are generated by Split or Prioritize nodes in a different diagram. Be sure to select the **Make cell available for linking** check box in the Cell node or the **Make output cells available for linking** check box in the Link or Prioritize node. You must assign a Cell node to the Link node when you open the Link Node Properties window. After you have assigned a Cell node to the Link node in the Select Cell window, the Link Node Properties window opens.



In the **Name** field, you can edit the name of the Link node. In the **Description** field, you can edit the Link node description. By default, the description of the selected cell is displayed.

To change the target cell, click **Select Cell** and select a different cell from the Select Cell window.

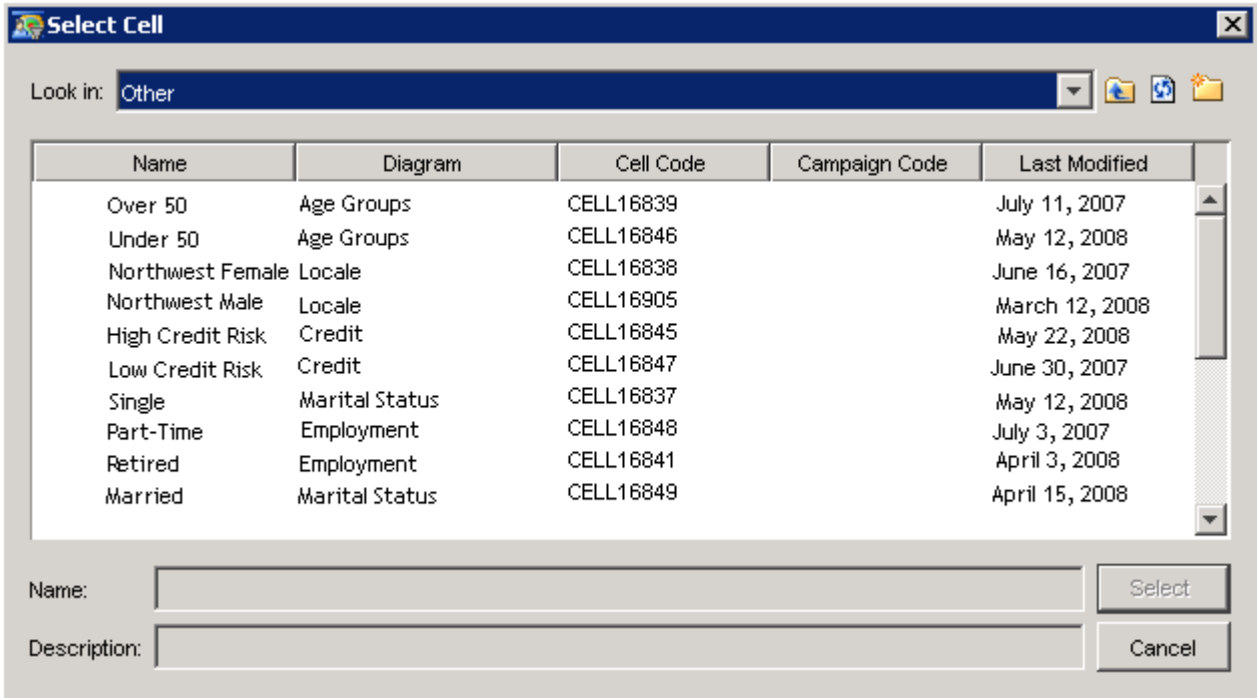
You can use the **Exclude <subject> in this cell** check box to specify whether to exclude the selected customers in your campaign. When you select this check box, the Link node icon in the diagram includes a red X, and the window displays the number of subjects who were excluded (or dropped).

The Target Cell Details section displays the name of the selected diagram as well as the cell and the count. The **Use Current Data** field indicates whether the most recent data is displayed. The most recent data for a cell is displayed when the **Use the most current data when referenced by a link** option for the target diagram has been selected. For more information, see "Diagram Properties Window" on page 148.

For information about making cells available for linking, see "Split Node" on page 185, "Cell Node" on page 195, or "Prioritize Node" on page 221.

Select Cell Window

In the Select Cell window, choose a cell from the list in order to assign the cell to the Link node. You can select only one cell. You cannot use the Link node to link to a cell in the same diagram.



The following actions are available in the Select Cell window:

Up one level

moves up one level.

Refresh

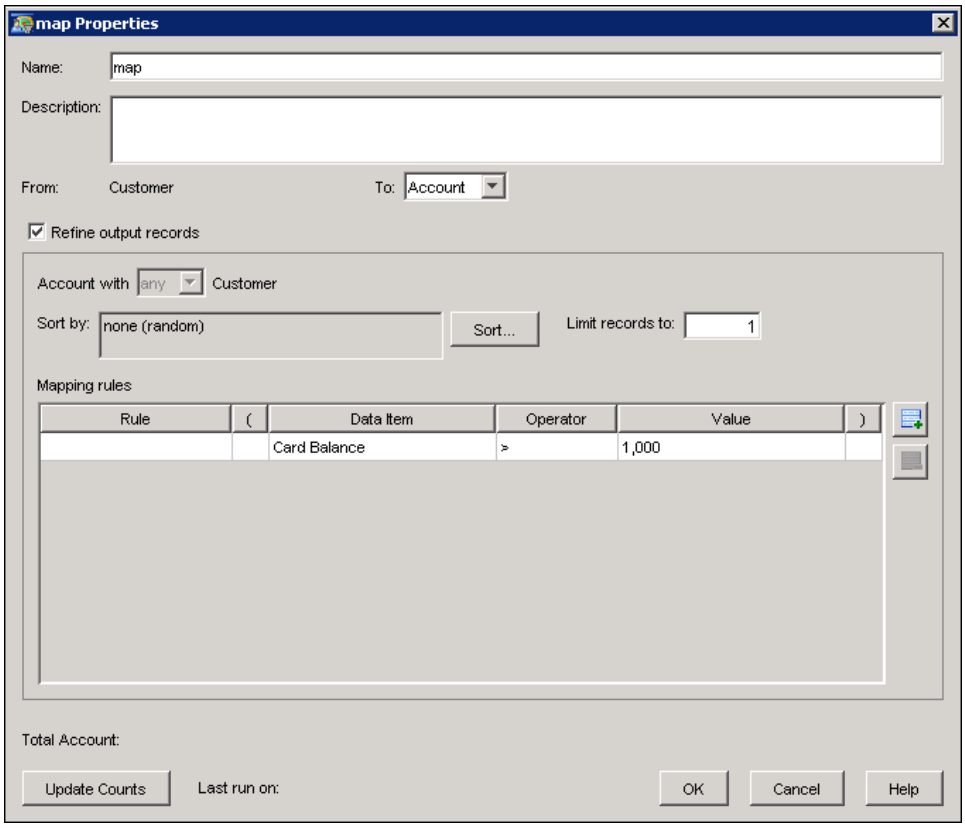
refreshes the contents of the current folder.

New folder

creates a new folder.

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.



Name

specifies the name of the map node. The name must be unique among node names in the same diagram.

Description

displays a description of the node. This field is optional.

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 each customer resided in only one household. An example of a many to many relationship would be customers to accounts, if 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.

Refine output records

specifies that the following items will become active, depending on the type of mapping that is being performed. This item is enabled when the table relationship between the From and To subjects is one to many, many to many, or many to one.

<subject level> with **<subject level>**

specifies the rule to apply to subjects from the input node. Possible values are **any**, **many**, **one**, and **no**.

Limit records to

specifies how many "to" subject level records should be included.

Sort by

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 sort order always has the subject key added to the end, so if you do not specify a sort data item, then only the subject ID is used. For information about specifying a sort order, see "Sort Criteria Window" on page 192. This item is enabled when **Refine output records** is selected.

Mapping rules

The mapping rules table 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, the 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, and the **Refine output records** check box is selected.

Rule
: This item is disabled for the first row. For rows after the first row, cells in this column contain a drop-down list that specifies two values: and, or.

(
: enables you to create nested Boolean expressions.

Data item
: Click the ellipsis button to open the Select Data Item window and specify the name of the data item whose values will be used to map subjects.

Operator
: specifies the operator for the row.

Value
: specifies the value(s) of the data item, the name of another data item, or an expression, depending on the type of data item and the operator in the row. The following table gives guidelines on the formats of values.

)
: enables you to create nested Boolean expressions.

For the "is missing" and "is not missing" operators, the value cell is disabled.

The following table describes the types of data items that you can specify in the Map node.

Data Item Type	Value
Character Data	any character string. The string must match the value in the database, not the formatted value that might be displayed in the select node.
Numeric Data	specifies numeric values in the default format for your location. For example, in the United States you would specify 5,000. If a range operator is selected, the minimum and maximum values are separated by either a space or the word "to". For example, either of the following are permitted: • 5,000 10,000 • 5,000 to 10,000
Date Data	specifies date values in the default format for their locale. For example, in the United States you would specify 5/15/04. In Europe, you would specify 15/5/04. Ranges are formatted the same as numeric items; values are separated by space or the word "to". For examples of valid date and time values, see "Entering Date and Time Values" on page 159.

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 since there are no duplicates to remove from the table that is being mapped to.

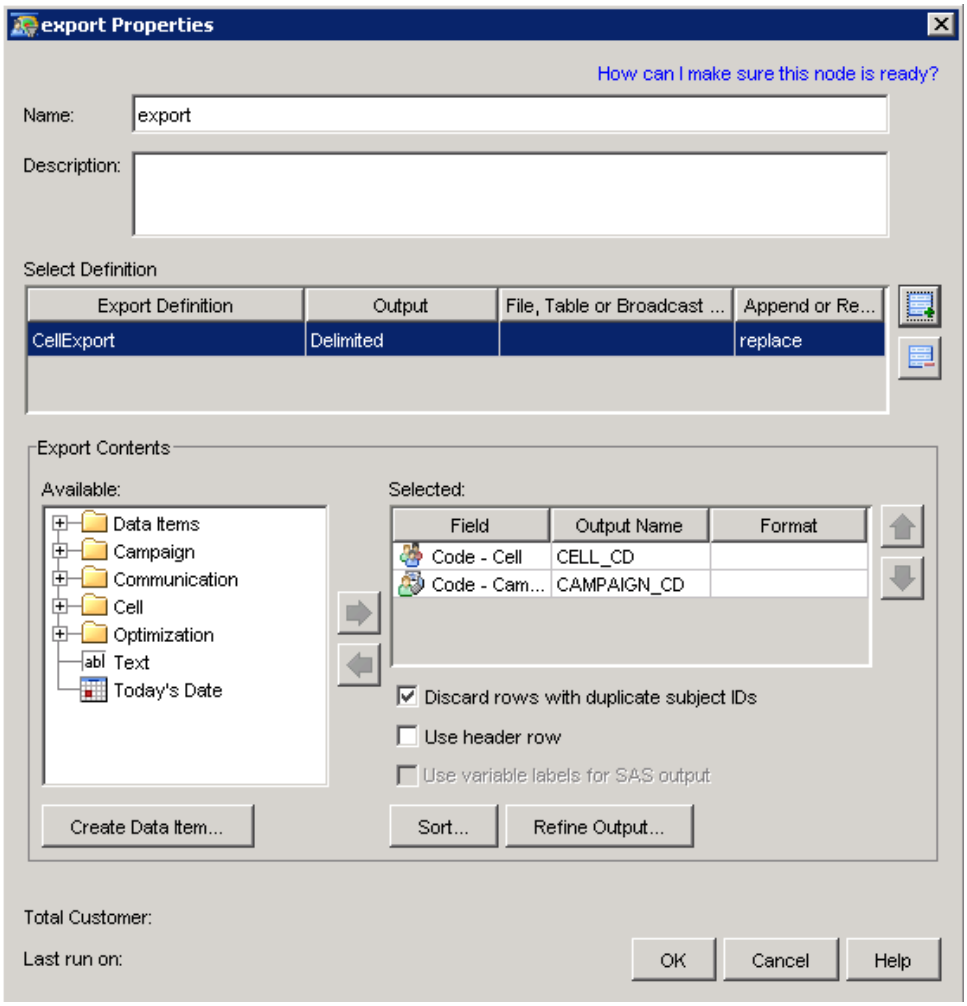
Export Node

In the Export Node Properties window, you can specify export definitions, destinations, and an append or replace action. You can also refine the output of records, and export data from any relationship level that has been referred to in the campaign or diagram.

The exported file or table contains a list of subject identifiers and other information about the subject. The subject is determined by the preceding nodes and by the export definition. The export definition defines the format of the exported file or table.

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 variable Name. In this case, the export selects the names based on the customers that came into the Map node. For more information about the Map node, see “Map Node” on page 209.

Here is an example of the Export Node Properties window:



Before its counts can be updated, an Export node must meet the following requirements:

1. At least one input node is connected to the export node.
2. A subject has been defined for each input node.
3. There are no input nodes that are in a Not Ready state.
4. Each export definition has a path or libname that can be accessed from the SAS server.
5. Each export definition has a valid output file or table name.
6. At least one export definition must have been selected.

The counts for export and Communication nodes reflect the number of unique subjects, not the number of records, to be exported.

Naming the Export Node

Type a name for the export node in the **Name** field. Optionally, you can type a description in the **Description** field.

Selecting Export Definitions

To select export definitions for inclusion in a communication node or an export node, follow these steps:

1. Click to add a row to the Select Definition table.
2. In the Select Export Definition window, select an export definition and click **OK**. Only export definitions that match the subject of the upstream node or nodes are listed. You cannot select an export definition until you have assigned a subject ID to a select node and linked the select node to the export node. For more information about the Select Export Definition window, see "Select Export Definition Window" on page 221.

   You configure an export definition in the Export Definition plug-in in SAS Management Console. An export definition includes the following elements that can be modified in Customer Intelligence Studio.

   - format type
   - set of data items that are in a particular order
   - for files in Positional format, the position of each data item.

3. In the **File, Table or Broadcast Name** column, type a name for file or table name for the exported data. If you are selecting an export definition for a Communication node, you can also click the ellipsis to display the Select Broadcast window. For more information, see "Selecting Broadcasts" on page 215. The file or table name must be a valid name for the type of file or table, and for the operating system under which the file or table will be created.
4. In the **Append** column, use the drop-down list to specify whether you want to append or replace the existing data. Do not select **Append** for an Excel file type. Use the Delimited file type instead.

   Note: Do not change the columns to export and then use the append option because all of the appended values will not be exported properly.

When you export to a file in Positional format, if the final column contains a database or text field that is not user-defined and that contains a string of blanks, the entire string will be printed if you have specified an export format for that field. If you do not specify an export format for that field, the field will contain a single blank.

Note that quoting and delimiter options are set in the Export Definition plug-in in SAS Management Console. Find out from your administrator how the options are set because they could produce errors in the exported data file.

For example, if the quoting option is set at **Always quote values in the export file**, and the delimiter is set as a double quotation mark ("), then values in the data file that were surrounded by double quotation marks will begin with two double quotation marks (""). The result is that a blank data field will be exported for that value. This is true for any character that you set as a delimiter in the Export Definition plug-in in SAS Management Console.

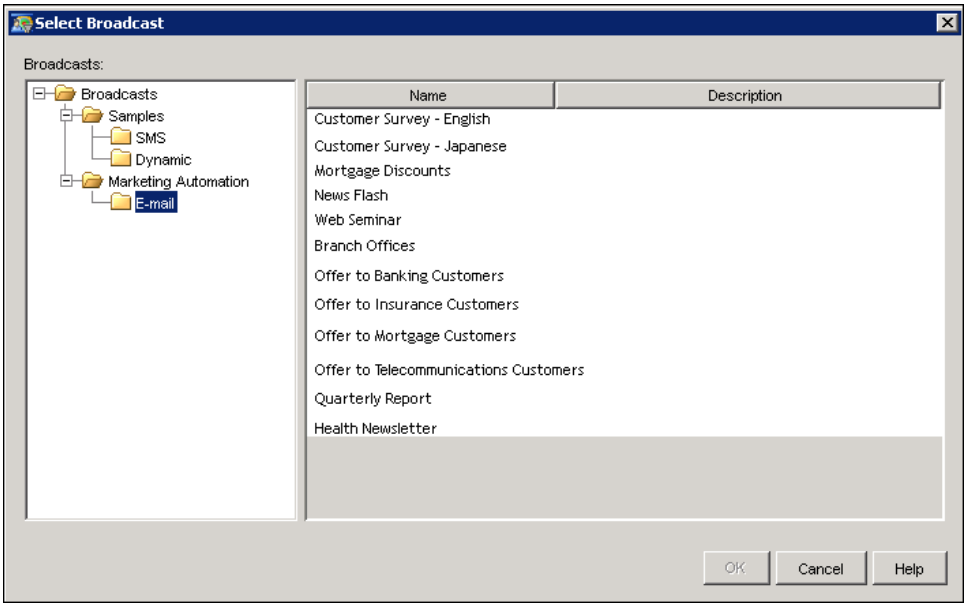
To delete an export definition, select the definition in the Select Definition table and click . This action removes the export definition from the list of exports that are produced from this export node. The export definition is still available for use in this diagram and other diagrams.

When you export the data, an export file is generated based on each export definition that you have included.

When you select an export definition, you are making a copy of the definition for use by the export node. Any changes that are made afterward to the definition in the SAS Management Console will not be reflected in the copy that is used by the export node.

Selecting Broadcasts

If SAS Digital Marketing is installed at your site, you can select SAS Digital Marketing as the output type for a communication in a selection campaign, and then select a broadcast from the Select Broadcast window.



The broadcasts that are displayed have been created in SAS Digital Marketing.

Select a broadcast and click **OK** to close the window and save your changes.

Selecting Columns for Export

You can add and delete columns to and from the export file.

To add columns to the export file from a hierarchy of available items, follow these steps:

1. Expand the folders in the **Available** tree hierarchy. The hierarchy 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.
   - Campaign, Communication, and Optimization folders contain the set of standard fields that are associated with campaign and communication definitions and with Marketing Optimization, if that product is installed at your site. Also displayed are user-defined fields that are associated with individual campaign and communication definitions.
   - The Cell folder contains standard fields for cells, including cell codes. For information about cell codes, see "Cell Node" on page 195.
   - The Text item adds a text row with default name of Text*n*, where *n* is a number; 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.
2. Double-click an item or select an item and click the right arrow to add the item to the Selected table. Each row in that table defines a column in the export file. Hold down the Shift or CTRL keys to select more than one item. To delete an item from the Selected table, select the item and click the left arrow .

If you are adding fields in the Export tab of a Communication node, and the output type is SAS Digital Marketing, the following output column names are required:

SUBJECT_ID*n*
: the unique identifier of each recipient. Additional identifiers may be included in the export file. Each subject identifier must include a unique integer and be kept in sequence, for example, SUBJECT_ID1, SUBJECT_2, SUBJECT_ID3.

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.

EMAIL
: the e-mail address of the recipient.

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 headers are automatically populated. You can replace these headers with a unique valid column header. Output names can contain only alphanumeric characters and the underscore (_) character.

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

To use your own column headers as part of the export file, select the **Use header row** check box. 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 **Use 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 **Use 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 **Use 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 **Use 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 **Use variable labels for SAS output** is not selected, the labels in the existing data set are not changed.

At the bottom of the Export Node Properties window, the current count and the creation time of the last export file are displayed. If the count is 0, the contact history is updated and a zero-length export file is created that will overwrite an existing file of the same name.

Creating Data Items, Changing Sort Order, and Refining Output

To combine data elements, functions, and operators to create expressions, click **Create Data Item**. For more information about creating data items, see "Using the Calculated Data Item Window" on page 171.

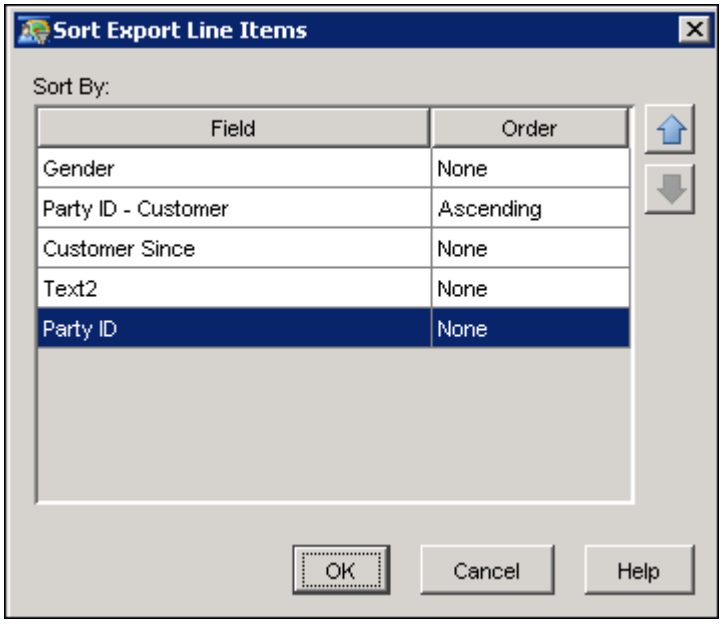
To specify a different sort order, click **Sort** to display the Sort Export Line Items window. The sort order applies to all of the export definitions that are listed in the Select Definition table. For more information about sorting, see "Sort Export Line Items Window" on page 217.

To export data from any relationship level that has been referred to in the campaign, click **Refine Output**. The Refine Output settings apply to all of the export definitions that are listed in the Select Definition table. For more information about refining output, see "Refine Output Window" on page 218.

Calculated data items that are created in this way are displayed in a Calculated Items folder in the Data Items folder in the Export Node Properties window.

Sort Export Line Items Window

You can change sort order in the Sort Export Line Items window.



Use the up and down arrows to reorder the fields that you want to sort by. Click the **Order** field in each row and select **Ascending**, **Descending**, or **None** from the drop-down list.

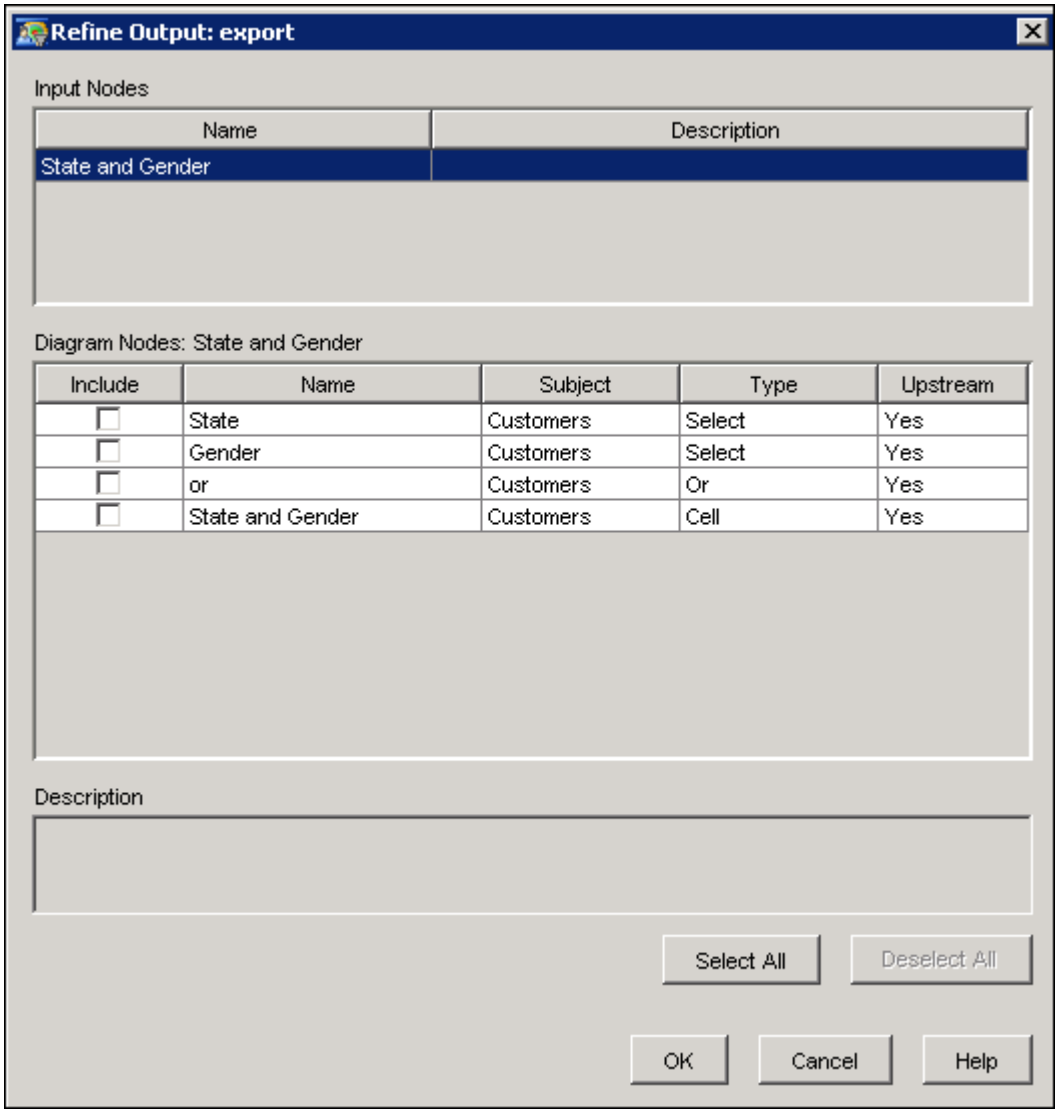
Click **OK** to save your changes, or click **Cancel** to close the window without saving your changes.

Refine Output Window

You can export data from any relationship level that has been previously referred to in the campaign and you can refine your data so that extra output records are not included when you import from tables that are in a many-to-one relationship to the subject of the export table.

For example, if you create an export file at the Customer subject level, but include data from an Account level table, multiple output rows might be included for a single customer ID if a customer has multiple accounts, even if in an earlier step the customer IDs were filtered according to account type. In order to prevent this data redundancy, you can specify the use of additional filtering variables when creating the final export table.

In the Refine Output window, you can select data from input nodes and other nodes.



The **Description** field displays the description of the cell node before the cell node was linked to the Export node. Any changes in the description after the cell node is linked to the Export node are not reflected in the **Description** field.

The Diagram Nodes table contains the nodes that you can use in your query, including upstream nodes that are linked to the communication or export node. The Diagram Nodes table also displays nodes in the diagram workspace that are not connected to the current flow. Click a column heading to sort the rows in a column.

You can select data from the following types of nodes:

- cell
- select
- multi-select
- and

- or
- limit
- response
- code
- link
- map.

The following node types are not displayed in the table because (in some cases) you cannot select data from them:

- split
- prioritize
- communication
- cluster
- export
- report.

A node in the following list acts as a wall between (1) another node in this list that is downstream from it and (2) any data-containing nodes that exist upstream from it:

- response
- link
- communication
- export
- report

In other words, you can access data for refinement from any data-containing nodes that exist immediately upstream from a node in the previous list until you again encounter any node in this list that is farther upstream.

For example, in the following diagram:

Select A -> Cell B -> Communication C -> Select D -> Cell E -> Communication F

The potential refinement nodes for Communication node F include cell node E and select node D, but do not include select node A or cell node B due to the intervening Communication node C.

Click the check box next to a node name to include the node in your query. Click **Select all** to select all of the nodes in the table. Click **Deselect all** to clear all of the nodes in the table.

Click **OK** to close the window and save your changes, or click **Cancel** to close the window without saving your changes.

Select Export Definition Window

In the Select Export Definition window, choose an export definition that is used in a Communication node or an Export node by selecting a row.

The Select Export Definition window displays a table that lists the export definitions that are created by using the Export Definition plug-in in SAS Management Console. Each row in the table shows the following properties of an export definition:

Name
the name of an export definition.

Type
the type of relationship level that is created, such as customer, household, or account.

Output
the output that an export definition generates.

Date Modified
the date and time that an export definition was modified.

Owner
the user ID of the owner of an export definition.

Click **Filter** to open the Filter window. In the Filter window, you can define a filter for displaying export definitions by using a combination of the properties that are displayed as columns or values in those columns in the Select Export Definition window. For more information, see "Filter Window" on page 133.

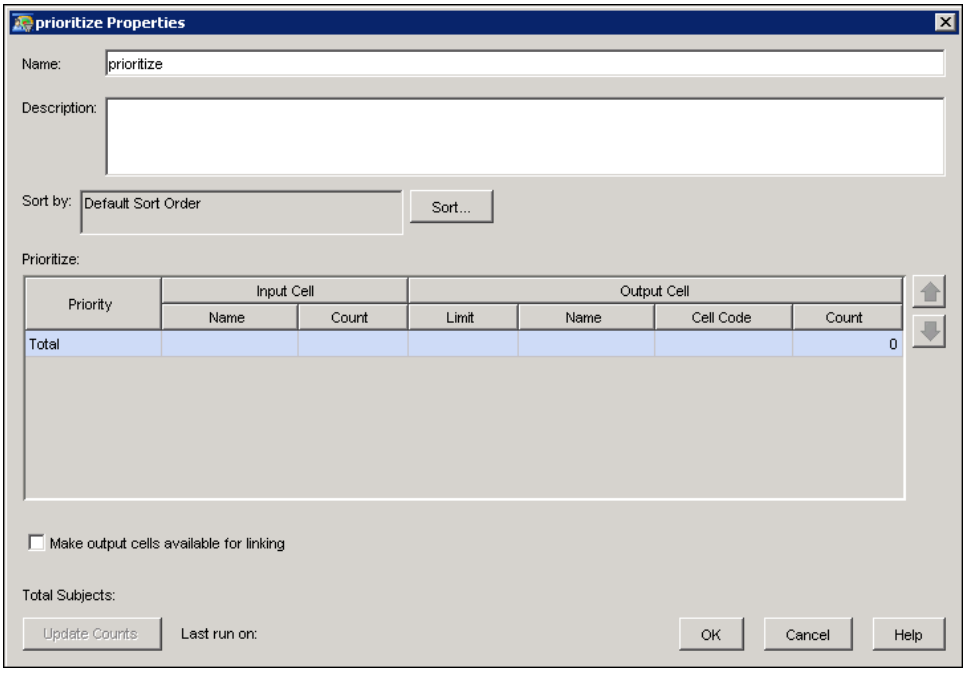
Prioritize Node

The Prioritize node enables you to prioritize subjects and group them in new cells. You can use this node to create different communications that target different groups.

The Prioritize node will rank and de-duplicate the subjects of input cells and create output cells according to the priorities that you specify.

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.



The Prioritize Node Properties window contains the following elements:

Name
the name of the Prioritize node.

Description
the field in which you can optionally type a description of the node.

Sort by
the sort order for all of the rows in the Prioritize table. The sort order that is specified in the Prioritize node affects any output cells of the Prioritize node. The default sort order is based on the subject ID of the input cells. If you use the Limit Criteria window to set a sort order for a row, the global sort order is overridden for that row. For information about the Limit Criteria window, see "Limit Criteria Window" on page 224. Global sorting and individual cell sorting do not take effect unless you specify limits in the Prioritize table.

Prioritize table

The Prioritize table contains information about the input and output cells.

Priority
the group that a customer is assigned to. You can select the priority if the customer is a member of more than one input cell.

Input cell
the predecessor nodes that are linked to the Prioritize node. The only nodes that can link to a Prioritize node are a Cell node or a Response node. There is one input cell row for each linked node.

Name (Input Cell)
the name of the input cell.

Count (Input Cell)
the count of the number of subjects that are assigned to the input cell.

Output Cell
the output cells that are created from running the Prioritize node. There is one row for each output cell.

Limit
the sort criteria for limiting Prioritize node selections. Select the Limit cell and click the ellipsis to display the Limit Criteria window. If you do not specify a limit, the **Sort by** setting does not take effect.

Name (Output Cell)
the name of the output cell.

Cell Code
the cell code of the output cell. Type a value in this field to create a new cell code and to specify the cell code of the output cell.

Count (Output Cell)
the number of unique subject IDs that are assigned to an output cell. Because the Prioritize node de-duplicates the input cells, for those cells that are prioritized greater than 1, the count of the output cell might decrease, depending on the membership of the higher priority cells.

Remainder
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 select **Update Counts.** You can edit the name and the cell code of the remainder. A remainder output cell is created along with the other cells that are created by the Prioritize node.

Total
the total counts for the input and output cells.

Make output cells available for linking
enables you to use the Link node to link to these output cells from another diagram. By default, prioritize nodes that are created in Marketing Automation 4.4 will not have output cells available for linking. Before you can use the cell as input to a Link node, you must specify a name for the cell and save the diagram. For more information about using the Link node to link to cells in another diagram, see "Link Node" on page 207.

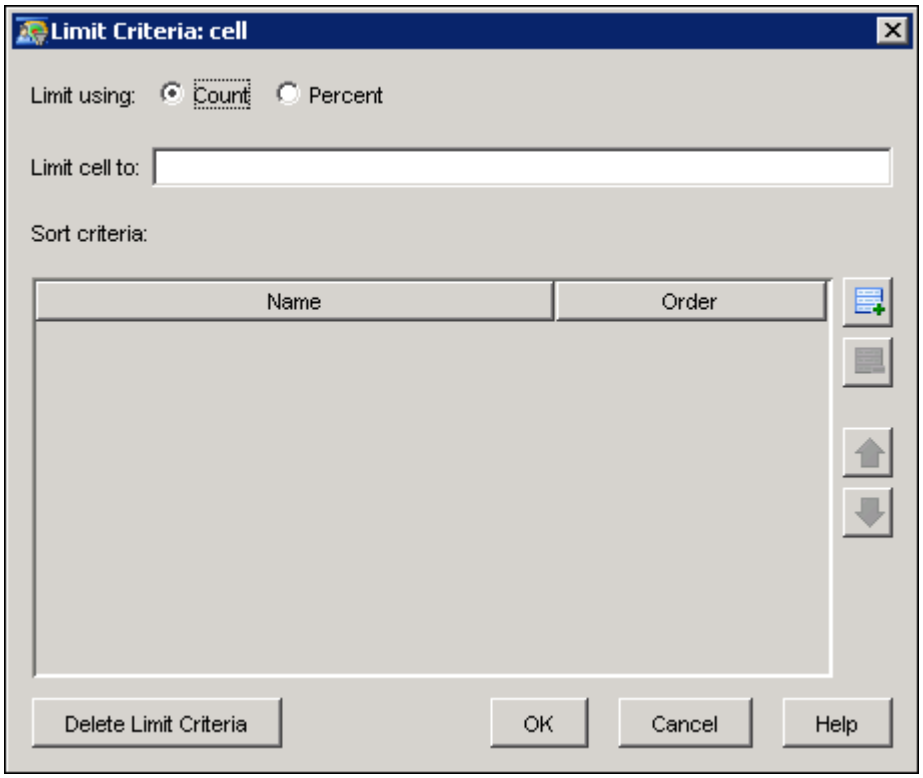
Total <Subject>
displays the total count of unique subject IDs that have been prioritized.

Update Counts button
runs the prioritization and updates the counts of the output cells.

Last run on
displays the date and time that the counts were updated.

Limit Criteria Window

In the Limit Criteria window, you specify the counts or percentages to be used as limiting criteria for the selected cell or row in the Prioritize node. You can use the Limit Criteria window to set the sort order for the selected cell or row.



Limit using
specifies whether to limit the value by count or by percent. The **Count** option is selected by default.

Limit <cellname> to
displays the limit for the selected row.

Sort criteria
displays the sort criteria that you specify. If a global sort order has been set for the Prioritize node, then setting the sort criteria for a particular output cell overrides the global setting for that cell. Click to select sort criteria from the Select Data Items window. For more information about the Select Data Items window, see "Select Data Item Window" on page 162. If you do not enter any limit criteria, the global sort order is used.

Delete Limit Criteria
deletes the limit for the selected row and the sort criteria.

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 e-mail message, an information packet mailing, a telemarketing effort, and an advertising campaign.

A *response* is the action that a customer takes in response to a communication that was sent by your campaign. Examples of customer responses include requesting a price quote, making an inquiry, or purchasing the product.

The Communication node is displayed in the tool palette for a campaign. Individual diagrams do not contain Communication nodes.

The Communication Definitions plug-in in SAS Management Console is used to define a communication and its responses. For more information, see "Defining Communications" on page 57.

To specify a communication in a campaign, follow these steps:

1. Add a Communication node to your diagram.
2. Choose a communication definition. For more information, see "Select Communication Definition Window" on page 227.
3. Connect the Communication node to a Cell node.

Communication Node Properties Window

When you open the properties window of a Communication node for the first time, the Choose Communication Definition window opens. Choose a communication definition in that window and click **OK** to display the Communication Node Properties window. Use the tabs to define the communication that will be sent to the targeted customers. Examples of communication methods include a printed advertisement, calendar, direct mail catalog, mail, fax, call center, e-mail message, mobile phone, television, and Web.

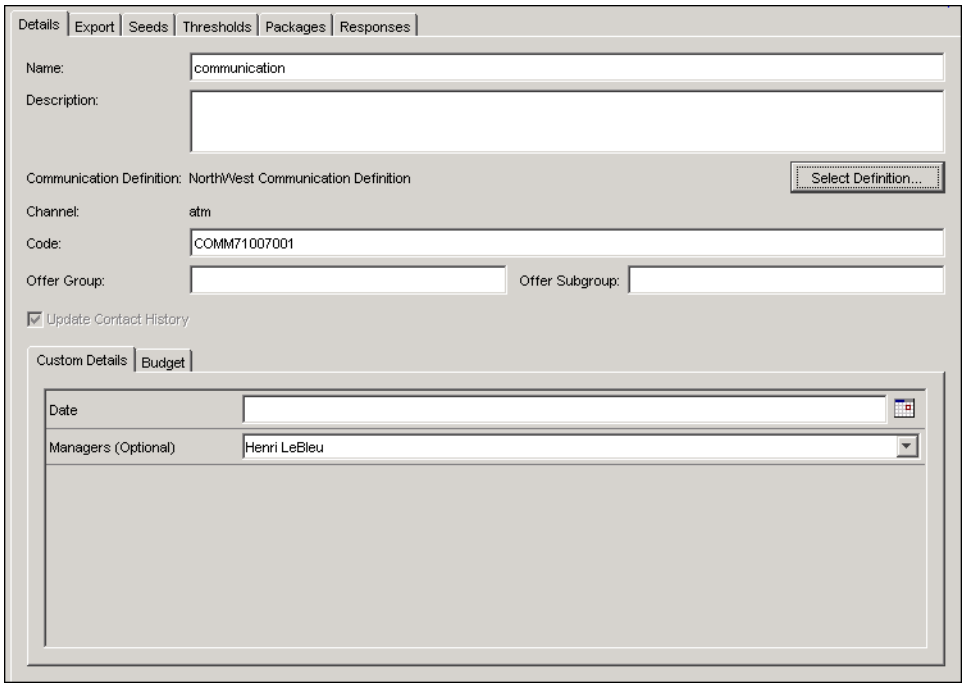
Before it can be executed, a Communication node must meet the following requirements:

1. At least one input node, such as a marketing cell or response node, is connected to the communication node.
2. A subject has been defined for each input node.
3. There are no input nodes that are in a Not Ready state.
4. Each export definition has a path or libref that can be accessed from the SAS server.
5. Each export definition has a valid output file or table name.

6. A code must be assigned to the Communication node.
7. Each custom detail that is required must have a value.

Details Tab

On the Details tab, specify the name and description of the communication.



Click **Select Definition** to change the communication definition for a Communication node. Your selection affects the contents that are displayed on the Details tab. For more information, see "Select Communication Definition Window" on page 227.

The **Offer Group** and **Offer Subgroup** boxes are site-specific identifiers that are used to organize communications.

Clear **Update Contact History** to suppress updating the contact history when the communication is executed.

The Custom Details subtab displays the user-defined fields for the selected communication definition.

You can also specify the budget for the communication. The Budget subtab contains the following fields, all of which are available for reporting:

Number of Offers Minimum
: minimum number of offers that can be made for a communication.

Number of Offers Maximum
: maximum number of offers that can be made for a communication.

Communication Budget Minimum
minimum budget for all of the offers in this communication.

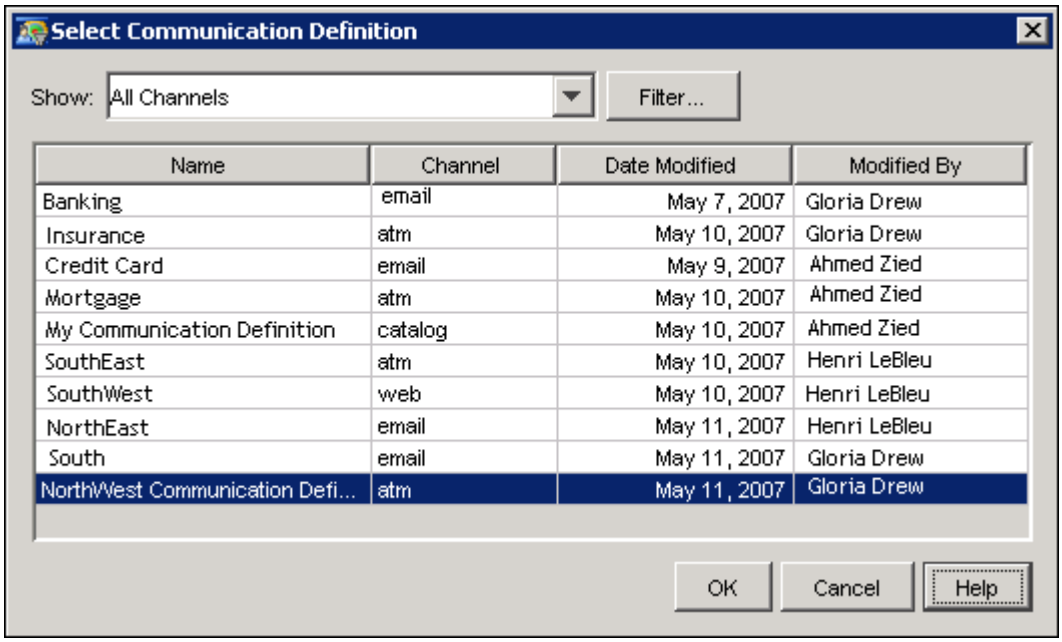
Communication Budget Maximum
maximum budget for all of the offers in this communication.

Communication Budget Unit Cost
cost of each unit of the communication.

If SAS Marketing Optimization is installed at your site, the information in these fields can be used during optimization.

Select Communication Definition Window

The Select Communication Definition window displays a list of communication definitions that have been defined in SAS Management Console. Use this window to specify a communication definition for a Communication node.



To filter the list of communications by channel, select a channel from the **Show** drop-down list. All channels are shown by default.

Click the **Filter** button to select the criteria that are used to filter the list of communication definitions. For more information, see "Filter Window" on page 133.

Each row of the table corresponds to a communication definition. The following properties of a communication definition are displayed in the table:

Name
displays the name of a communication definition.

Channel

displays the channel for which a communication was created.

Date Modified

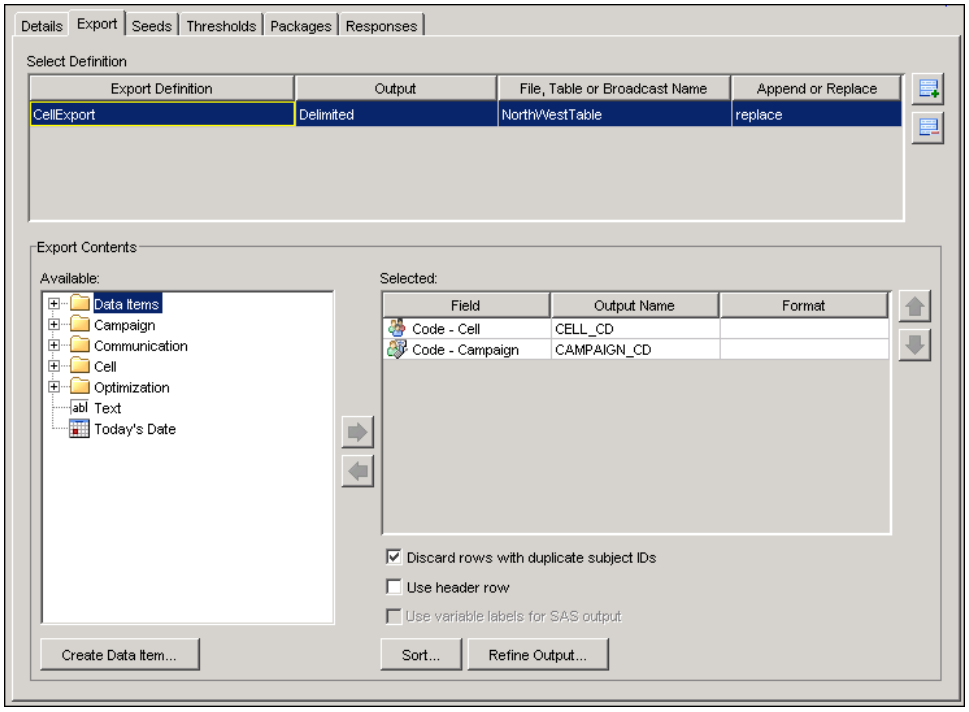
displays the date on which a communication definition was last modified.

Modified By

displays the most recent modifier of the communication definition.

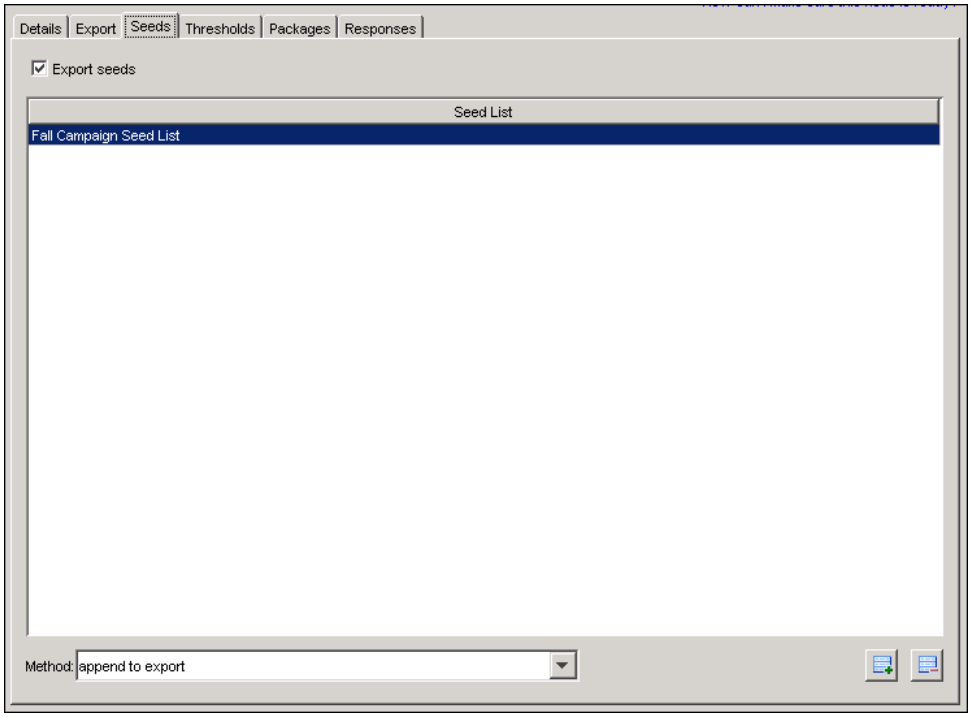
Export Tab

On the Export tab, you can specify whether data is exported when you execute the communication. The layout of the Export tab is the same as the layout of the Export node properties window. For more information, see "Export Node" on page 212.



Seeds Tab

On the Seeds tab, you can specify the seeds that are exported when the communication executes and the data is exported.



To add and export a seed list, follow these steps:

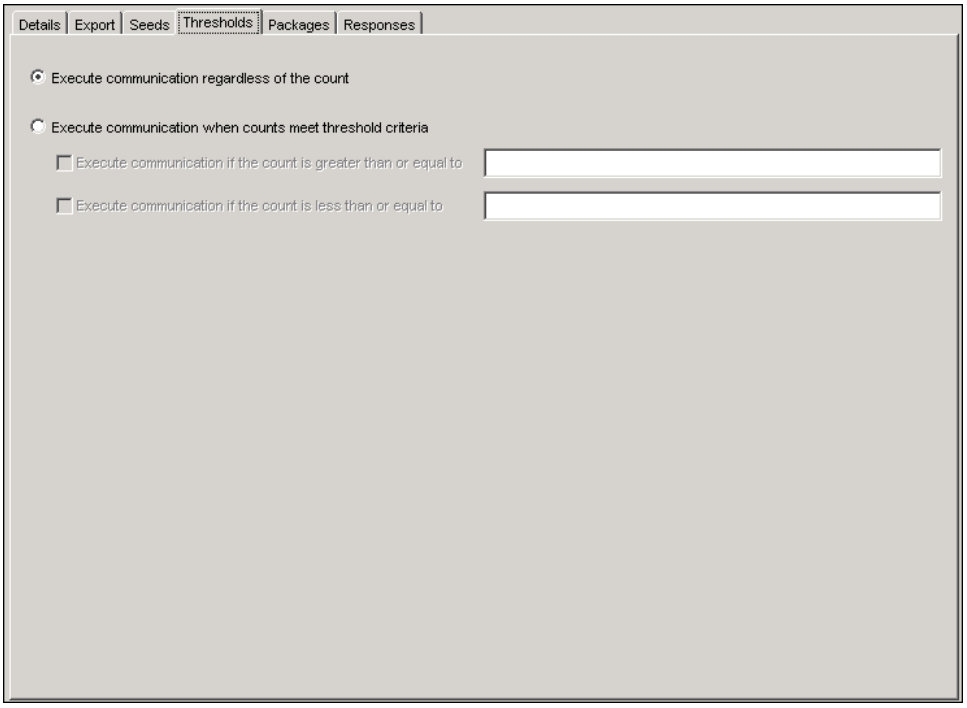
1. Select the **Export seeds** check box. The check box is selected by default.
2. Click to open the Seed Lists window.
3. In the Seed Lists window, select the name of the seed list and click **OK**.
4. Select how the seed lists are exported from the **Method** drop-down list. All of the seed lists in the **Seed List** table are exported using this method. You can choose to append the list to the end of the export file or insert the list items randomly into the export file.

To remove a seed from the table, select the name of the seed list and click .

NOTE: When a seed list has been defined and associated with a communication definition, further changes to the seed list will not be reflected in the campaign in which the communication definition is used.

Thresholds Tab

The Thresholds tab displays information about audience thresholds for the communication.



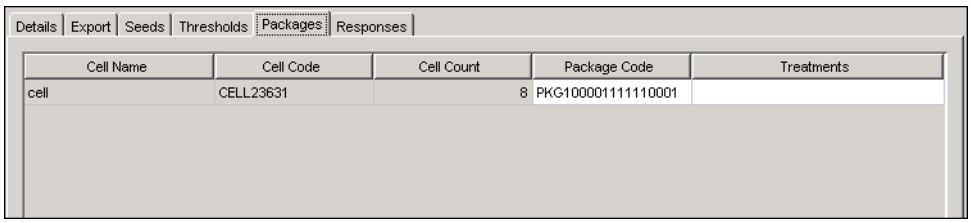
You can choose to execute the communication based on the count information, either regardless of the count or only when the counts meet a cutoff value. If you select **Execute communication when counts meet threshold criteria**, you must specify a maximum or minimum threshold value.

NOTE: If the counts do not meet the threshold criteria while you are executing the communications, the communication status is changed from Not Ready to Executed, and the campaign is locked, but the records are not exported.

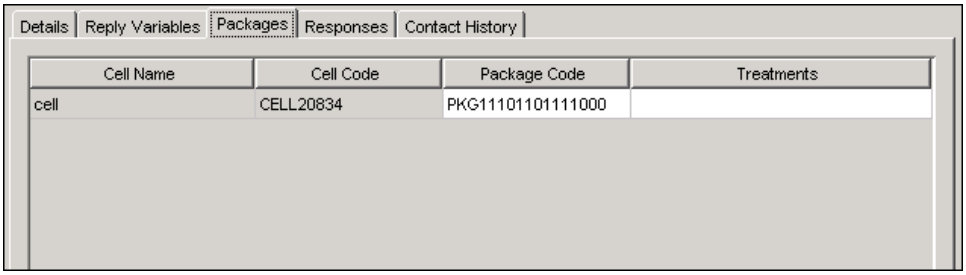
Packages Tab

On the Packages tab, you can assign treatments to marketing cells that are linked to a Communication or Reply node, or that are used with a standard reply. A treatment is a type of offer, such as a coupon for a stay at a hotel. Treatments can be associated with marketing cells in campaigns. For example, a collection of treatments, called a package, might contain three coupons: one coupon for a stay at a hotel, one coupon for a dozen roses, and one coupon for computer software. A marketing cell is the cell that immediately precedes a communication node in a selection diagram, or the cell that immediately precedes a reply node in a decision campaign or decision diagram.

This is an example of the Packages tab in a Communication node properties window:



This is an example of the Packages tab in a Reply node properties window:



The Packages tab displays the following information:

Cell Name
displays the name of the cell.

Cell Code
displays the cell code.

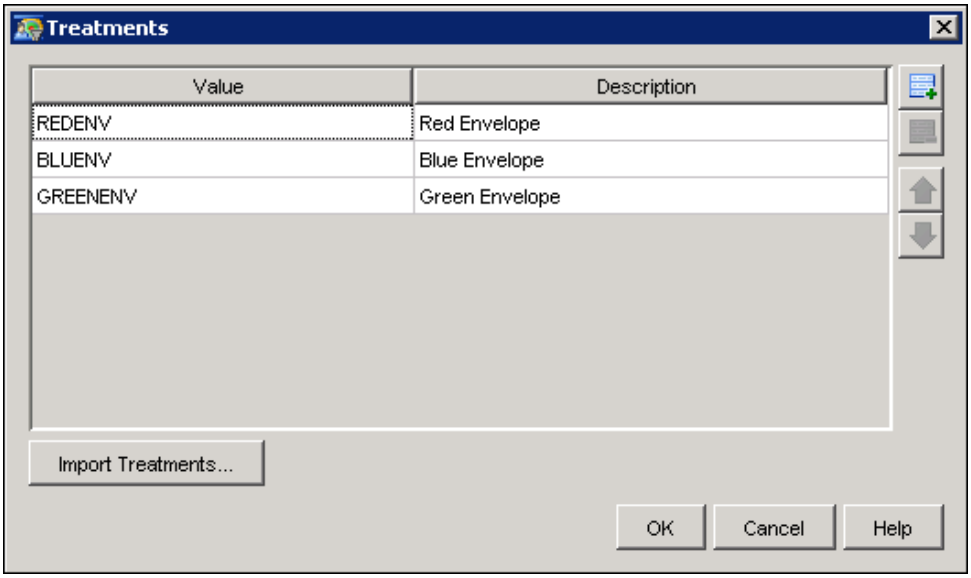
Cell Count
in selection campaigns, displays the count for each of the marketing cells that are linked to the Communications node.

Package Code
displays the package code if the code is set to be automatic for the current business context in the Customer Intelligence plug-ins in SAS Management Console. You can modify the package code if the code is editable. For more information, see "Details Tab" on page 59.

Treatments
displays the treatment value that is associated with the marketing cell. Each package can contain 0 or more treatments. If a package contains several treatments, the list of treatments is displayed in the Treatments column. Type a single value in the cell, or click ... to select one or more treatments from the Treatments window. Use a semi-colon as a separator between treatments. If you type a single value into the cell after you make a selection from the list of treatments, only the value that you typed in will be published. For more information, see "Selecting Treatments" on page 231.

Selecting Treatments

The Treatments window lists the treatments to associate with the selected marketing cell.



To add a treatment to the list, click and type a value and description of the treatment. If an external list of treatments has been defined for the business context, click **Import Treatments**. Importing treatments removes previously selected or typed treatments from the list. You can add treatments both by importing them from an external list and by typing the treatment values. For more information, see "Importing Treatments" on page 232 and "Treatments Tab" on page 103.

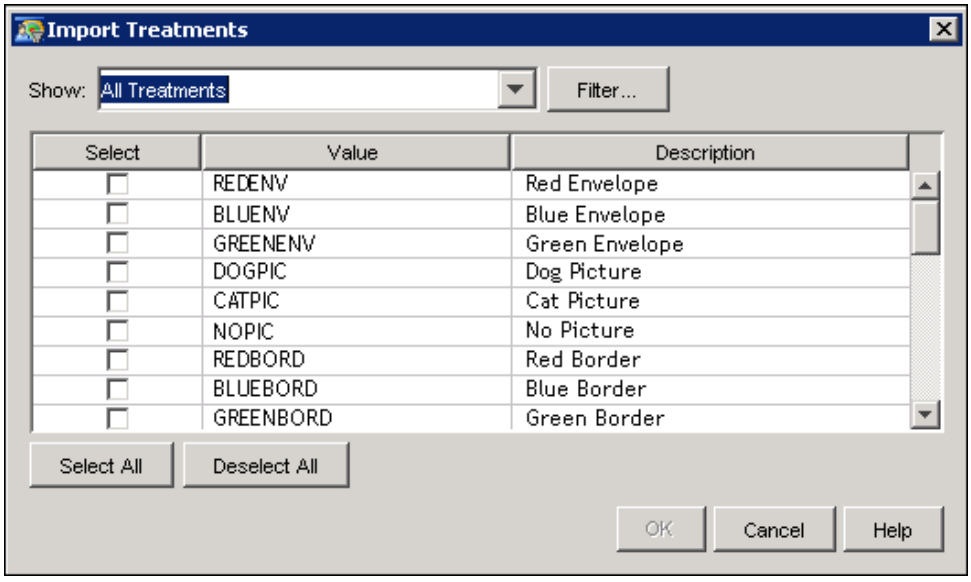
Treatments in separate communications that have the same values but that have different descriptions are recorded as the same treatment for reporting purposes.

To remove a treatment from the list, select the treatment and click .

When you have listed the treatments that you want to associate with the selected marketing cell, click **OK** to close the window and save your changes.

Importing Treatments

In the Import Treatments window, you can select a treatment from an external list and associate the treatment with a marketing cell.



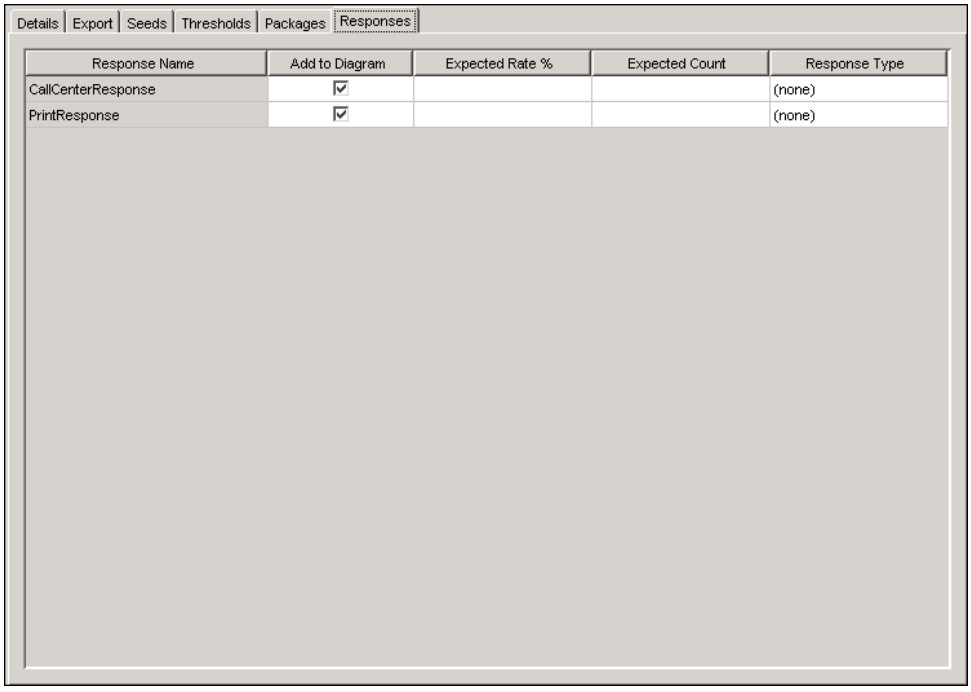
Click the check box next to each treatment that you want to associate with the selected marketing cell. To filter the list of treatments according to value or description, click **Filter**. For more information, see "Filter Window" on page 133.

To check all of the check boxes, click **Select All**. To clear all of the check boxes, click **Deselect All**.

When you have finished selecting treatments from an external list, click **OK** to close the window and save your changes.

Responses Tab

On the Responses tab, you can specify the expected rate of response, expected count, and how the response should be interpreted for each response that is associated with the communication.



To select a response type to be used in the communication, select the check box in the **Add to Diagram** column. Each of the response types that you select here will appear as a Response node in your campaign diagram.

To specify an expected response rate, type a value in the corresponding field in the **Expected Rate %** column. The values in the **Expected Count** field are not updated automatically. You can choose to provide the values for the expected count in this field.

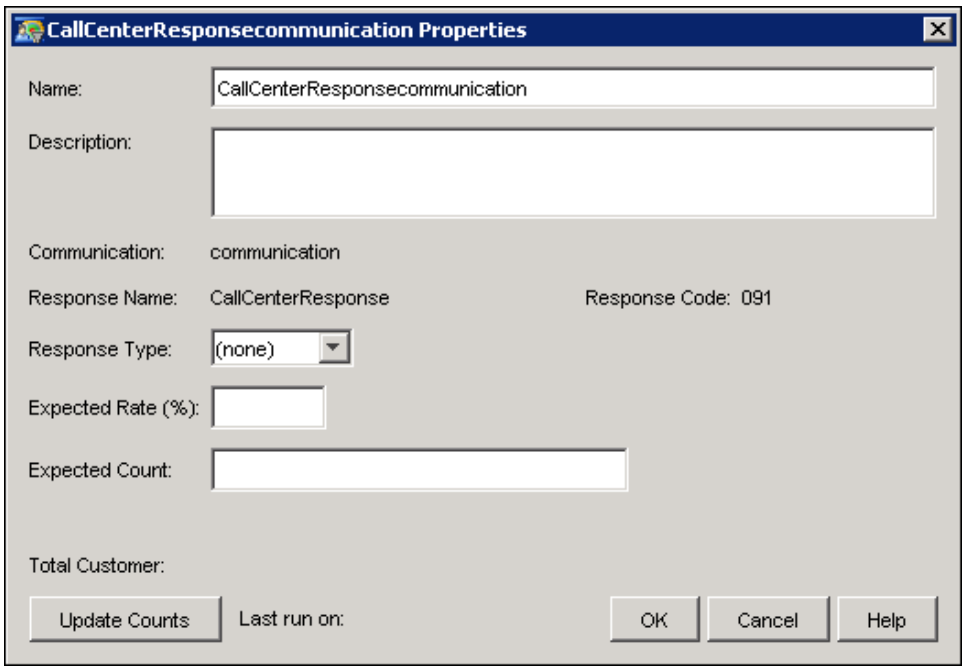
To associate a value with the expected response for reporting purposes, select the value from the **Response Type** drop-down list. The values that you can select are **Converted**, **Responded**, **(none)**. **(none)** is the default value.

Response Node

A Response node is created when you add the node to the diagram on the Responses tab of the Communication Node Properties window. For more information, see “Responses Tab” on page 233. Right-click the Response node to display the Response Node Properties window.

Response Node Properties Window

In the Response Node Properties window, you can specify the name, description, response type, expected response percentage, and expected count for the response.



You can edit the name of the Response in the **Name** field. Optionally, you can add a description to the **Description** field.

Select a value from the **Response Type** drop-down list. The selected value is associated with the response for reporting purposes. You can select one of the following values:

(none)
: indicates that the response type is unknown.

Converted
: indicates that the respondent is a new customer, such as a respondent who was previously the customer of a competitor.

Responded
: indicates that there is a successful response.

Type a percentage value in the **Expected Rate (%)** field The value that you enter for the expected response rate is used as a reference for reporting purposes. A valid value cannot exceed 100.

Type a value in the **Expected Count** field. The value that you enter for the expected count is used as a reference for reporting purposes.

Criteria for Executing a Response Node

A response node will remain in a Not Ready state until all of the following criteria are met:

1. The campaign has a campaign code.

2. The preceding Communication node has a communication code.
3. The preceding Communication node is ready.
4. The preceding Communication node has been executed at least once.
5. The response node has a response code.
6. The response table is defined in the information map so that the response table name and libname can be retrieved.

Defining an Inferred Response

This section describes how you can define an inferred response and update a response table with rules that you have defined. It is not necessary to create a campaign to define an inferred response rule and execute it. This example creates a campaign and sets an inferred response rule. The rule that collects inferred responses based on the targeted audience and on others who responded but who might not have received the campaign communication directly.

1. In the Customer Intelligence plug-ins in SAS Management Console, open the Responses plug-in in the Application Resources folder and select or create a response. Link the response to specific communication definitions.
2. In SAS Management Console, create an export definition for responses.
3. In SAS Customer Intelligence Studio, create the campaign. The campaign should have at least one communication for which you want to have one or more inferred responses. Optionally, include a Response node in your diagram if you want to control behavior based on responses. You can use the responses that you already defined for the communication definition. You will select by communication code, so you must remember the current communication code.
4. Create the diagram that defines an inferred response rule.
   - In a Select node, identify the communication or communications that the response rule applies to. You can build an inferred response rule for just the communication that you previously created, or you can build a response rule for multiple communications. If you include communications at this point, it means that you want to infer responses only for those who were contacted by these communications.
   - Identify other response rule dependencies. For example, if an account was opened in a certain time frame, you could infer a response of "opened new account" response by selecting a "date account opened" data item and specifying a date range.
   - Create an Export node. Choose the response export definition that you created in Step 2.

     In the Export node properties window, ensure that the table that is specified is the appropriate response table. For example, the table might be RESPONSES_CUSTOMER. The **Append** cell should be set to **append** because other responses will go to this same

table. You can set up as many response tables as you want, but each one must be specific to one subject.

To add the response_cd field, add a row to the lower table in the Export Properties window. In the Select Data Item window, click **Create**. The Calculated Data Item window appears.

In the Calculated Data Item window, specify `response_cd` as the **Name**, because this is the column name in the response table. Specify a description, if you want. In **Expression Text**, specify the inferred response code. The inferred response code must match the response that has already been defined, or to be defined, in the Response plug-in. You defined the valid response codes in Step 1, but it does not have to be defined yet to specify it here. As is the case with direct responses, before you can use inferred responses in a campaign's response node that will behave differently based on responses, the response code must be defined for that communication in SAS Management Console. You can create a field for `inferred_response_flg = 'Y'` in the same way. You can also set a value for `response_channel_cd`.

NOTE: Be careful when you run the Export node against the actual response table. For communications which are not in contact history yet, you will get 0 records written for that communication. This is correct since they could not respond if they have not been contacted yet. But if you have saved planned contacts in contact history, there would be customers in contact history that have not been contacted yet. One solution to this problem is to add selection criteria to the data item for the column `COMM_OCCUR_STATUS_CD` that selects only the "exported" status communications, or any statuses at your site that indicate that the contact has been made. Another solution is to perform a test by exporting to a test table instead of the actual response table.

5. Schedule the inferred response diagram to update the response table.

   - Select **Diagram ➧ Schedule** from the main menu. Click **Schedule**.

   Specify when you want to update the schedule. After the inferred response rule runs, if you have a Response node or do reporting from the response table, the table will pick up the latest inferred responses along with the direct responses.

Report Node

Use the Report node to explore characteristics of the customers that are selected at the point where a Report node appears in a diagram.

The maximum number of records that can be displayed in the Report node is 5,000. This number is specified in the Administrative Tools Plug-In in the SAS Management Console. For more information about specifying the maximum number of rows in a report, see "Setting the Environment" on page 89.

NOTE: If there are missing values in the data tables that are linked by an inner join, the report will include the records that contain the missing value. For example, if you select fields both from a

table that contains customer names and also from a table that contains mortgage account balances, a record that includes a missing value for the balance will still be generated in the report.

You must select the **Run Report** pop-up menu item of the Report node before you can view the report. When the status of the Report node becomes Ready, select **View Report** from the pop-up menu of the Report node to display the Report Node Properties window.

The following table lists the tool icons that are displayed in this window.

Tool Icon	Description
	splits the window horizontally.
	splits the window vertically.
	opens the Graph wizard. By using the Graph wizard, you can create graphs or tables on the selected list.

If you choose to split the window horizontally or vertically, enter the number of splits in the How Many Splits window. Click and drag the bar between each split to change the display size.

After you complete the steps in the Graph wizard, the properties window of the Report node displays the plot or table. The report definition is saved and can be used after you close and reopen the diagram, so that you do not have to reselect the type of plot of table. The plot or table does not reflect the sort order that was specified in a Limit, Prioritize, or Split node that precedes the Report node.

Creating Graphs in the Graph Wizard

You use the Graph wizard to create tables or graphs about the subjects that are selected at the point where the Report node appears in a diagram. You can create the following types of graphs, depending on the structure of your data:

- bar charts
- area plots
- histograms
- pie charts
- scatter plots (scatter plot and line plot)
- tables (simple table and graphical table)
- matrix plots (scatter plot and line plot)
- lattice graphs(X-lattice, Y-lattice, 2-D lattice)
- parallel axis graphs
- density graphs

Follow these steps to create a graph by using the Graph wizard.

1. In the Select a Chart Type window, select the type of graph. Depending on the type of your graph, you might need to choose subtype. If you select Table as the graph type, click **Finish** to create a table and to exit the Graph wizard. Otherwise, click **Next** to open the Select Chart Roles window.
2. In the Select Chart Roles window, specify the required roles depending on the type of chart that you are creating. You might want to specify the optional roles.
3. In the Data Where Clause window, subset your data with a WHERE clause that you enter in the Where section of the window. Click **Next**.
4. In the Pick a Color Scheme window, choose the colors that you want to use. If you are creating a matrix plot, click **Finish** to create the plot and to exit the Graph wizard. Otherwise, click **Next**. The Chart Titles window opens.
5. In the Chart Titles window, specify the following information for your graph and click **Next**.
   - Title
   - Footnote
   - Legend Label
   - X Axis Label
   - Y Axis Label
6. In the Chart Legend window, specify the following characteristics:
   - whether a legend is displayed
   - the placement of the legend (top, bottom, left, or right)
   - whether the X and Y axes are displayed.

For more information about the Graph wizard, see `http://support.sas.com/rnd/datavisualization/`.

The following table displays the required and optional roles for each of the graph types that you can create in the Graph wizard.

Table 7.1 Required and Optional Roles by Graph Type

Graph Type	Required Roles	Optional Roles
Bar	Category	None Response Group Subgroup Color Index Tip Error Low Error High

Table 7.1 (Required and Optional Roles, continued)

Graph Type	Required Roles	Optional Roles
Area	X Y	None Group Group Index Tip Size Color Opacity/Transparency Label Shape Error Low Error High
Histogram	X	None Y Response Tip
Pie	Category	None Response Color Index Opacity Transparency
Scatter	X Y	None Group Group Index Tip Size Color Opacity/Transparency Label Shape Error Low Error High
Matrix	MatrixVar	None Group Group Index Tip Size Color Opacity/Transparency Label Shape Error Low Error High

Table 7.1 (Required and Optional Roles, continued)

Graph Type	Required Roles	Optional Roles
Lattice	Lattice X Lattice Y	None Group Group Index Tip Size Color Opacity/Transparency Label Shape Error Low Error High
Parallel Axis	Axis (at least 2 variables required)	Color
Density	XY	None

Chapter 8

Scheduling and Executing Communications

Contents

Approving a Campaign **243**
Approvals Window 244
Scheduling and Executing Campaign Communications **245**
Using SAS Schedule Manager to Schedule a Job 245
Managing Dependencies 246
E-mail Communications **247**
Gathering Data from E-mail Communications 247
Creating an E-mail Communication 247
Executing an E-mail Communication 248
Viewing the Schedules of All Campaigns **249**
Campaign Schedule Window 249
Scheduling Campaign Communications **251**
Scheduling Campaigns Directly from Customer Intelligence Studio 251
Concurrent Processing of Communications 252
Creating a Campaign Schedule 252
Schedule Window 254
Executing Campaign Communications **257**
Execute Window for Your Campaign 257
Changing the Status of a Communication **259**
Creating a Diagram Schedule **260**
Schedule Window for Your Diagram 260

Approving 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 in the Approvals window and in the icon that is displayed next to the Approval link in the campaign checklist. The following icons indicate approval status:

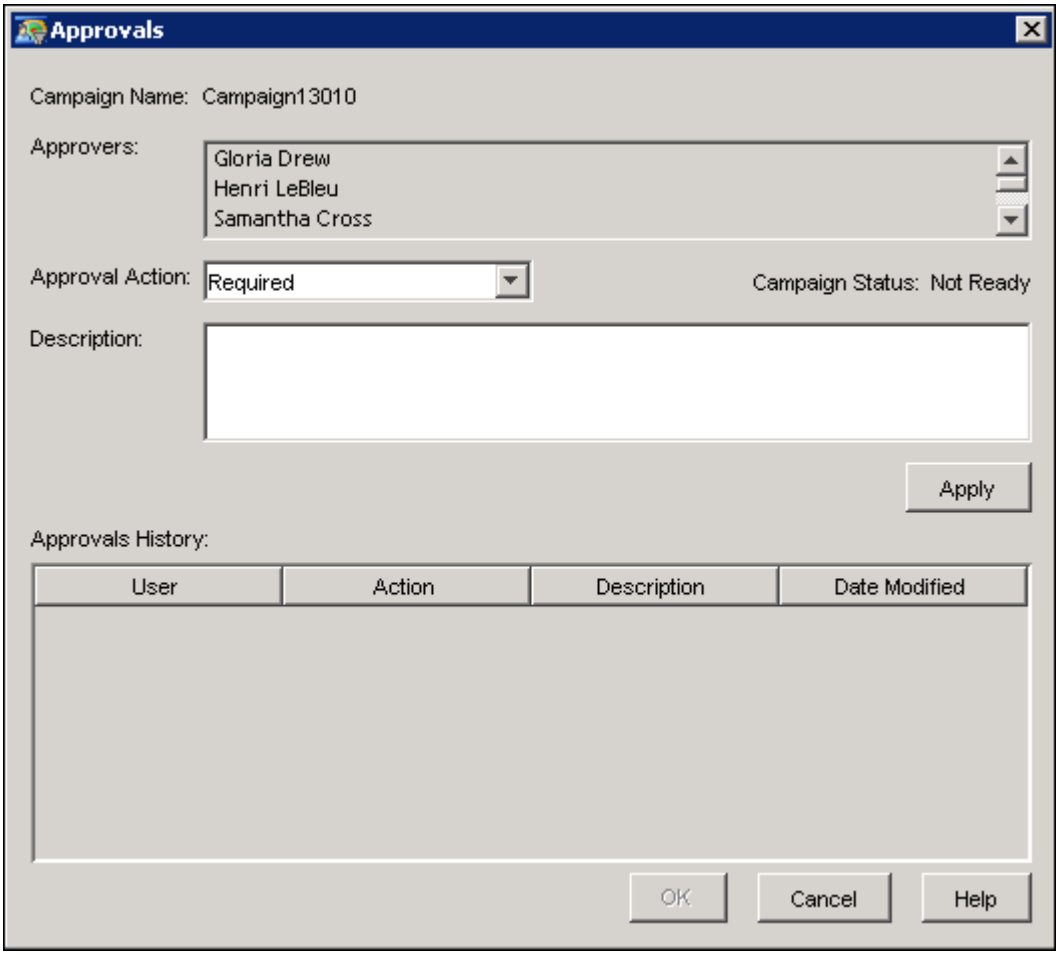
- Required:

- Requested:
- Approved:
- Denied:

The approval requirement and the list of users who have approval permissions is specified in the campaign definition in the SAS Marketing Automation Plug-Ins for SAS Management Console. For more information, see "Approval Configuration Window" on page 44.

Approvals Window

In the Approvals window of the campaign checklist, you can change the approval status of a campaign, view the list of users who have approval permissions, and view the history of changes in approval status.



To change the approval status of a campaign, select an item from the **Approval Action** drop-down list and click **Apply**. You can select one of the following approval actions:

Required
Approval is required for this campaign. This is the default selection.

Requested
The campaign is ready to be approved by one of the users in the list of users who have approval permissions.

Approved
The campaign has been approved. This selection is enabled if you have approval permissions.

Denied
The campaign has been denied. This selection is enabled if you have approval permissions.

You can enter a description of your approval action in the **Description** field.

The Approvals History table displays the name of the approver, the approval action, description, and date modified for every change in the approval status for this campaign.

Click **OK** to close the Approvals window and save the changes to your campaign.

Scheduling and Executing Campaign Communications

Scheduling and executing campaign communications involve a set of applications and several steps.

These are the steps in scheduling and executing campaign communications:

1. In Customer Intelligence Studio, specify the start and end date, and the recurrence of the campaign or communications. For more information, see "Creating a Campaign Schedule" on page 252.
2. In Customer Intelligence Studio, schedule a campaign or a communication for execution by the SAS Schedule Manager. For more information, see "Executing Campaign Communications" on page 257.
3. If your site does not allow you to schedule jobs directly from within Customer Intelligence Studio, use the Schedule Manager in SAS Management Console to create a job flow and schedule the job. For more information, see "Using SAS Schedule Manager to Schedule a Job" on page 245.
4. An export file is created in the location that is specified by the Marketing Automation Export Definition plug-in. The campaign status is not updated to Executed. For more information, see "Creating Export Definitions" on page 49.

Using SAS Schedule Manager to Schedule a Job

If your site does not allow you to schedule jobs directly from within Customer Intelligence Studio, an administrator uses the Schedule Manager in SAS Management Console to define dependencies

and to execute the job that produces the export files for the communication.

In order to use the Schedule Manager, the Load Sharing Facility and the Platform Job Scheduler must be installed and running. For more information about the Load Sharing Facility and the Platform Job Scheduler, contact your server administrator or refer to the online Help for the Schedule Manager.

To use the Schedule Manager to define dependencies and execute the communication, follow these steps:

1. Start SAS Management Console.
2. Click **Schedule Manager** to display the list of jobs that have been scheduled. The folder path of each flow is displayed in the Properties window of the flow.
3. If you want to specify conditions that must be met before the job executes, right-click the job in the Schedule Manager and select **Manage Dependencies**. For more information about dependencies and scheduling, see "Managing Dependencies" on page 246 and the online Help for the Dependencies window. When you have made your changes, click **OK** to close the Dependencies window.
4. Right-click the flow name in the Schedule Manager, and select **Schedule Flow**.
5. The running frequency that was specified in Customer Intelligence Studio is displayed in the **Trigger** field.
6. Click **OK** to schedule the flow according to the conditions that you have specified. The Marketing Automation Launcher executes the communication.

Managing Dependencies

- If you do not set dependencies in the Schedule Manager, communications that have a different number of recurrences will cease after the lower number. For example, if you have a communication that recurs five times and a communication that recurs three times, both communications will cease recurring after three times.
- In Customer Intelligence Studio, campaigns must be either closed or opened in Read Only mode while communications are being executed through the Schedule Manager.
- If a campaign, communication, or diagram is re-sent to the scheduler in Customer Intelligence Studio, a copy is added to the job flow. A confirmation dialog asks if you want to schedule a copy of the same job.
- If you have created a job for a campaign and you delete the campaign in Customer Intelligence Studio, the job for the campaign will still appear in the Schedule Manager.

To manage dependencies in the Schedule Manager, follow these steps:

1. Right-click the job for the campaign or communication in the Schedule Manager and select **Manage Dependencies**. For more information about the Schedule Manager, see "Using SAS Schedule Manager to Schedule a Job" on page 245.
2. In the Dependencies window, click **New** next to the **Job dependencies** field.
3. Select a job from the **Jobs** drop-down list.
4. Select an event type from the **Event type** drop-down list.
5. Select **Schedule this job when any of the conditions occur** or **Schedule this job only when all of the conditions occur**.
6. Click **OK** to close the Dependencies window and save your changes.

E-mail Communications

If SAS Digital Marketing is installed at your site, you can capture responses to e-mails and use this data to refine selection criteria or to monitor the performance of campaign communications. You can use information gathered about failed messages to update contact history; you can update response history when recipients open an e-mail message or click on a Web link.

Gathering Data from E-mail Communications

Beginning with Marketing Automation 5.1, the SAS Digital Marketing output type can be used in any export definition that is assigned to an e-mail communication. The e-mail communication executes a SAS Digital Marketing broadcast that generates a recipient table. The recipient table contains the following three output columns that are used by both SAS Marketing Automation and SAS Digital Marketing:

SUBJECT_ID
: the unique identifier of each recipient.

RESPTRACKING_CD
: a code that associates the particular cell with a communication occurrence.

EMAIL
: the e-mail address of the recipient.

Creating an E-mail Communication

To create a selection campaign that uses SAS Digital Marketing to broadcast e-mail messages and record the responses, take the following steps:

1. In the Customer Intelligence plug-ins in SAS Management Console, configure the SAS Digital Marketing server. For more information, see "Configuring the SAS Digital Marketing Server" on page 107.
2. In the Customer Intelligence plug-ins in SAS Management Console, create an export definition with an output type of SAS Digital Marketing. For more information, see "Creating New Export Definitions" on page 49.
3. In the Customer Intelligence plug-ins in SAS Management Console, create a communication definition that specifies an e-mail channel, and that refers to the export definition that has an output type of SAS Digital Marketing. Select a broadcast for output. For more information, see "Creating a New Communication Definition" on page 57.
4. In Customer Intelligence Studio, create a communication node that is based on the preceding communication definition. For more information, see "Communication Node" on page 225.

Executing an E-mail Communication

Afte you have created a communication node that specifies a SAS Digital Marketing broadcast, you can schedule or execute the communication. Execution of a communication has the following results:

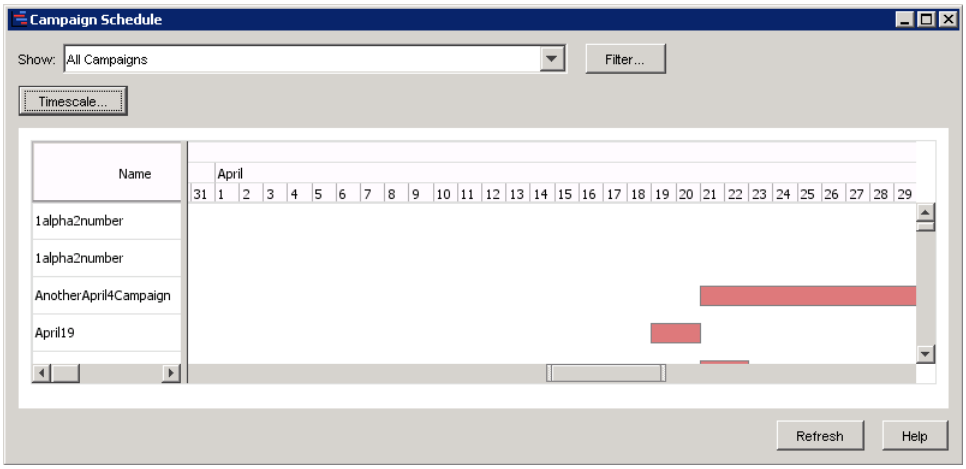
1. The campaign metadata including the cell, communication and treatments information is published by Marketing Automation to the SAS Customer Intelligence Reporting Data Model. For more information, see "Publishing Campaigns" on page 278. Each package of treatments being used is published to the SAS Customer Intelligence Reporting Data Model and is uniquely tied to a cell in the executing diagram by the cell/package/treatment identifier (RESPTRACKING_CD).
2. An export table is created. This table contains the recipient list that is based on the people who are identified in the cells that precede the communication. The fields in the table include the Recipient ID, the e-mail address and the cell/package/treatment identifier. The contact history table is also updated to identify those recipients who will be sent an e-mail mesage.
3. SAS Digital Marketing executes the broadcast that has been selected for the Communication node. Parameters given to SDM include the name of the broadcast and the name of the recipient table.
4. SAS Digital Marketing transmits customized e-mail to the recipient list and updates the contact history within the SAS Customer Intelligence Reporting Data Model.
5. E-mails are received or bounced by the recipients. A recipient may open an e-mail, click on a link to a website, or accept an offer. SAS Digital Marketing tracks these results and updates the SAS Customer Intelligence Reporting Data Model.

Viewing the Schedules of All Campaigns

In SAS Customer Intelligence Studio, you can view the schedules of all campaigns in a table format and in a Gantt chart in the Campaign Schedule window. To open the Campaign Schedule window, select **View** ➧ **Campaign Schedule**.

Campaign Schedule Window

The Campaign Schedule window enables you to view the schedule of campaigns and communications in a table format and in a Gantt chart.



To specify the filter criteria for displaying campaign schedules, select one of the following items from the **Show** drop-down list:

- **All Campaigns**
- **Campaigns I can edit**
- **Campaigns I can view, but not edit**
- **Campaigns I own**
- **Campaigns that need approval**
- **Custom**

NOTE: The **Campaigns that approval** filter displays only campaigns that need approval by the currently logged-in userid.

Select **Custom** to create a customized filter in the Filter window. For more information, see "Filter Window" on page 133.

The window displays the following properties of a campaign in the left panel:

Name
displays the name of a campaign or a communication.

Code
displays the campaign or communication code.

Count
displays the count information for a campaign or communication.

Start
displays the start date of a campaign or communication.

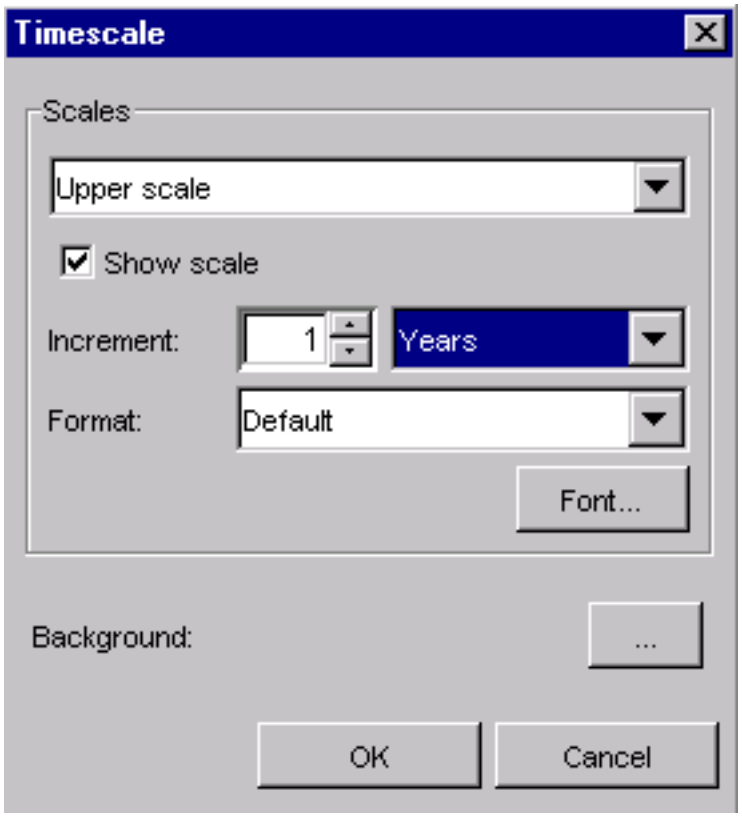
End
displays the end date of a campaign or communication.

In the right panel, the Gantt chart displays a bar for each campaign. It provides a picture of the life span of a campaign. In this example, the length of a bar represents the time in days.

To modify the schedule of a campaign, follow these steps:

1. In the Gantt chart, double-click the bar that corresponds to the campaign. The Campaign Checklist window for that campaign opens.
2. In the Campaign Checklist window, select **Schedule**. For more information, see "Creating a Campaign Schedule" on page 252.

Double-click the bar in the Gantt chart to open the Campaign Checklist window. Three timescales appear at the top of the Gantt chart. To change the timescale of the schedule, click **Timescale**.



In the Timescale window, you can set the appearance and values of the three timescales in the Gantt chart. Choose a timescale to work with by selecting the Upper, Middle, or Lower timescale from the top drop-down list. You can specify the increment of the timescale (Years, Quarters, Months, Weeks, or Days) and the format, font, and background color of the display by selecting the appropriate controls.

Scheduling Campaign Communications

You can create a schedule for the execution of the communications in a campaign.

Scheduling Campaigns Directly from Customer Intelligence Studio

You can schedule and execute campaign communications from within the Campaign Schedule window if you have the appropriate permissions. If you do not have the appropriate permissions, the Marketing Automation administrator at your site can schedule and execute the campaign communications for you.

Concurrent Processing of Communications

If you submit multiple communications to be scheduled or executed, the communications and their upstream nodes are processed concurrently if possible. Processing the communications concurrently, rather than serially, saves time because communication nodes that have common ancestors are processed only once.

When you create a schedule for a campaign, that schedule is associated with all of the communications within the campaign. Any communications that can be executed at the same time will be processed concurrently. Changing the schedule of a campaign is a shortcut to changing the schedules for all of the communications within the campaign.

You can schedule individual communications within a campaign to run at a different time. You cannot schedule an individual occurrence of a communication. If all the communication schedules were created by setting the campaign's schedule, then one job is created and sent to the Schedule Manager. If the communication schedules differ, then one flow per communication is created. For more information about changing the schedules of communications, see "Schedule Window for Your Campaign" on page 252. For more information about job flows and the Schedule Manager, see "Using SAS Schedule Manager to Schedule a Job" on page 245.

NOTE: Concurrent execution of two or more communication nodes that append to the same file or SAS data set will cause all but one of the communications to fail.

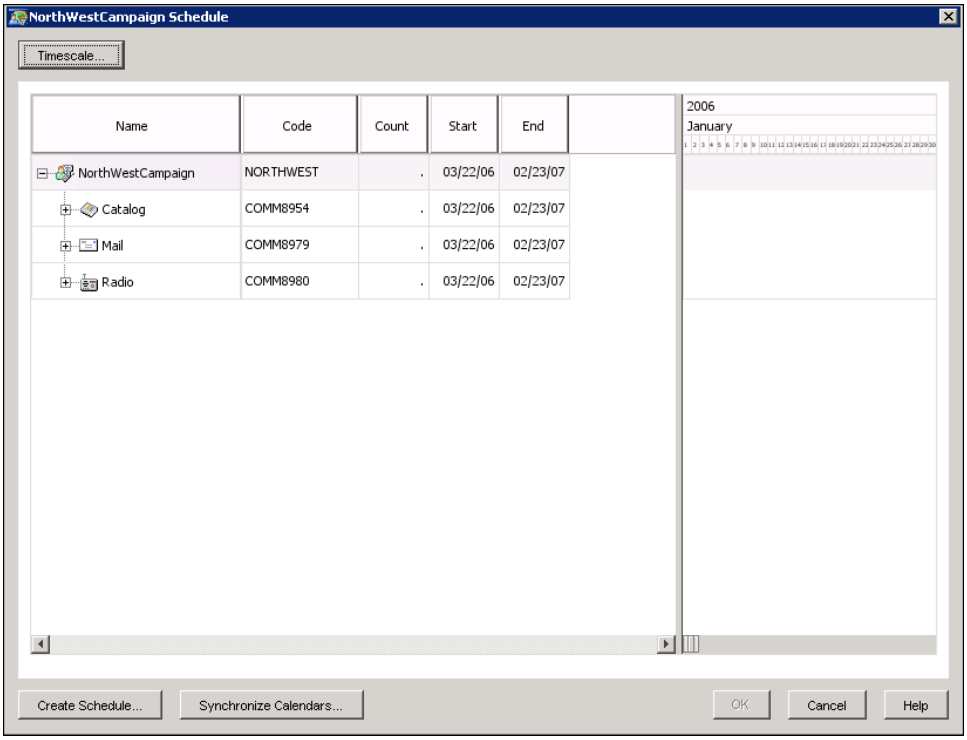
Creating a Campaign Schedule

To create a campaign schedule, follow these steps:

1. Open the campaign.
2. In the Checklist pane, click **Schedule** to open the Schedule window for your campaign.
3. In the Schedule window for your campaign, click **Create Schedule** to set the schedule. For more information, see "Schedule Window for Your Campaign" on page 252.

Schedule Window for Your Campaign

This window enables you to view the schedule of a campaign and all the occurrences of the communications. From this window, you can create or modify the schedule of a campaign or a communication. You cannot schedule an individual occurrence of a communication.



After you have created a schedule, you can send the campaign or communication to the scheduler to be executed, or you can execute the campaign or communication immediately.

In the left pane, the window displays the following properties of a campaign:

Name
: displays the name of a campaign, a communication, or an occurrence of a communication.

Code
: displays the campaign or communication code. This field is empty for occurrences of communications.

Count
: displays the count information for each occurrence of a communication. The count is the sum of the initial communication nodes, not including follow-up communications.

Start
: displays the start date of a campaign, communication, or occurrence of a communication.

End
: displays the end date of a campaign, communication, or occurrence of a communication.

The right pane of this window displays a Gantt chart that contains a bar for each campaign, communication, or occurrence of a communication. The chart provides a picture of the life span of a campaign and its communications and occurrences. The smallest unit of time that can be displayed in the chart is one day. If the start date, end date, and time of a campaign or communication are the same, the chart displays the end date as one day later than the start date. If the start and end date are the same, and the start and end times are different, a bar is displayed for the occurrence, but not for the communication.

NOTE: When you select **File ➧ Save As** to save a campaign, the schedule for the campaign can be modified. If the end date for the original campaign or diagram is in the past, then a new default schedule is created. If only the start date of the schedule is in the past, then the current date is used as the start date and the occurrences are re-created, using the original recurrence details. This can also result in a new end date. If the start date is in the future, then the original schedule is used to re-create the list of occurrences. All schedule flow details are reset. The campaign or diagram is shown as not having been scheduled. The approval status is reset, if appropriate. The Approval history is cleared.

To modify the timescale of the Gantt chart, click **Timescale**. For more information about the timescale, see "Viewing the Schedules of All Campaigns" on page 249.

To create or modify the schedule of the campaign or of individual communications, select the campaign or communication, and click **Create Schedule**. When you select the campaign name, you can enter schedule information for the entire campaign. This schedule will apply to all of the communications within the campaign. When you select an individual communication, you can enter schedule information for that communication. Any subsequent changes that you make to the campaign schedule will override the schedules for the individual communications. For more information, see "Schedule Window" on page 254.

You can create and modify schedules of the campaigns that you own or that you have permission to edit.

If a campaign has been approved, change the approval status to **Required** or **Requested** before you add a new communication. The new communication will have same schedule as the other communications in the campaign. If you change the schedule of the communication and then send the campaign to the scheduling software, one flow is created for each communication.

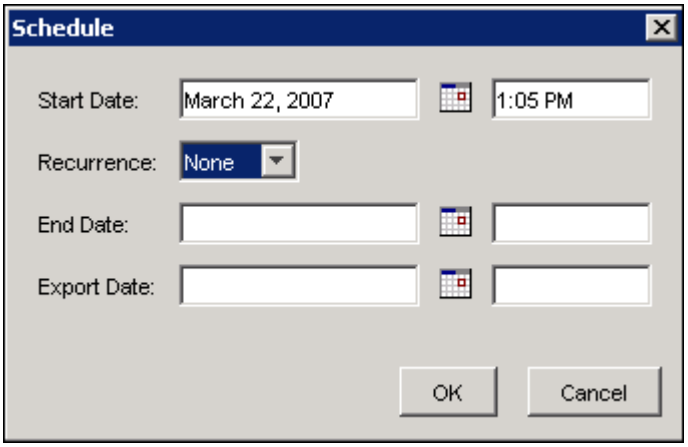
If approvals are not being used and if you add a new communication to the campaign, the new communication will be executed the next time that the campaign is executed. If you send the new communication to the scheduler software, the original campaign's scheduled flow will be removed and a new flow for the communication is created. To reschedule the campaign, re-send the campaign to the scheduling software; the original flow will be deleted and one flow per communication will be created.

After you have created a flow for the SAS Management Console Schedule Manager or after you have sent a campaign to the scheduling software, you can click **Synchronize Calendars** to access and synchronize the scheduling information for the campaign, communication, or occurrences in SAS Management Console. A message will notify you if a schedule has already been saved, or if the schedule has changed. You will be prompted to display the updated scheduling information in Customer Intelligence Studio.

Schedule Window

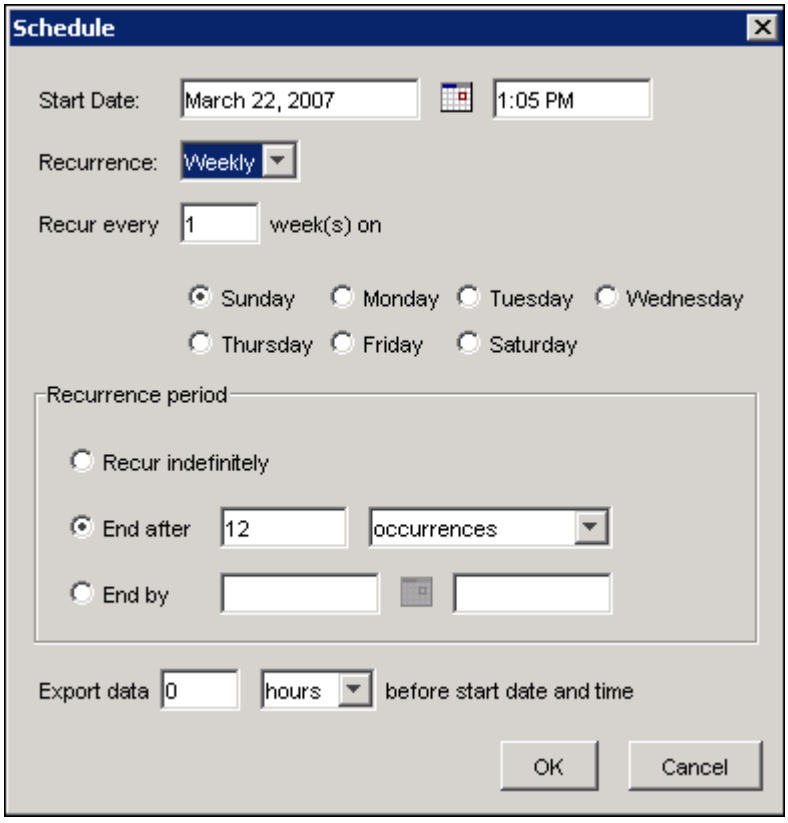
You can use the Schedule window to set the schedule for a campaign or a communication by providing the following information:

- start date and time
- end date and time
- recurrence
- export date and time for a non-recurring campaign or communication. The export date is the first date on which the scheduled job will execute.
- the offset between the export date and the start date for a recurring communication, if you have selected a value other than **None**. The default value for the offset is 0.



You cannot set the schedule if the campaign has already been approved.

To specify the difference between the export date and the start date for a recurring campaign or communication, use the **Export data** box at the bottom of this window.



To specify a date, you can either enter a date in the boxes or use the Calendar icon to select a date from the calendar.

To specify how often and for how long a task is to recur, follow these steps:

1. Choose a value from the **Recurrence** list. The following values are available:

   None
   The task is run only once.

   Hourly
   The task is run according to the number of hours that you specify. By default, the task is run every hour. You cannot specify fractions of hours.

   Daily
   The task is run according to the number of hours that you specify. By default, the task is run every day.

   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. By default, the task is run every week on Sunday.

   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. By default, the task is run every month.

2. Specify the recurrence period by doing one of the following:
   - Select **Recur indefinitely** if you do not want the recurrence to end.
   - Enter the number of occurrences, hours, days, weeks, or months for which the scheduled task is to run, in the **End after** box and select the appropriate item from the drop-down list.
   - Specify an **End by** date on which the scheduled task should stop.

Executing Campaign Communications

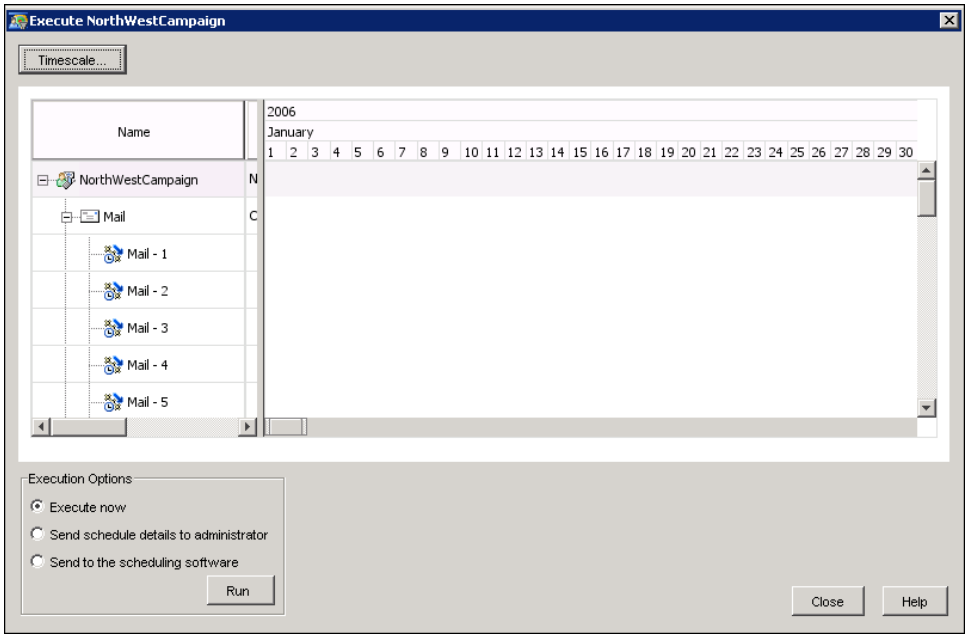
To execute a campaign or an individual communication, follow these steps:

1. Open the campaign.
2. In the Checklist pane, click **Execute** to open the Execute window. The Execute window will not be displayed if there are no communications that can be executed in the campaign or if the campaign has not been approved.
3. In the Execute window, select the campaign or communication and select an execution option. For more information, see "Execute Window for Your Campaign" on page 257.

A campaign report is published when you execute a campaign or a communication. For more information, see "Publishing Campaigns" on page 278.

Execute Window for Your Campaign

In the Execute window, you can execute a campaign, a communication, or a single occurrence of a communication. You can send the schedule details to the Schedule Manager, where an administrator will schedule your submission for execution. If you have the appropriate permission, you can send the campaign, communication, or occurrence directly to the scheduling software.



In the left panel, the window displays the following properties of a campaign or a communication:

Name
: displays the name of a campaign or a communication. The occurrences are listed below the name of the communication.

Code
: displays the campaign or communication code.

Count
: displays the count information for a campaign or communication. The count is the sum of the initial communication nodes, not including follow-up communications. Nodes that do not have subject level items have a count of 1.

Start
: displays the start date of a campaign or communication.

End
: displays the end date of a campaign or communication.

The Gantt chart contains bars that display the duration of each campaign, communication, or communication group. If you select a campaign bar, the execution options apply to the campaign and all of its communications. If you select a communication bar, the campaign bar and any previously selected occurrence bars are cleared. If you select an occurrence bar, the campaign bar and any previously selected communication bars are cleared. You cannot select execution options for future occurrences.

Select **Execute now** and click **Run** to execute the campaign, communication, or occurrence immediately. Click **Yes** in the confirmation message. When you execute a campaign, all of the node counts in the campaign are cleared. For more information, see “Cell Node” on page 195. Nodes that are in a **Not Ready** state will not be executed.

Select **Send schedule details to administrator** and click **Run** to send the selected campaign, communication, or occurrence to the Schedule Manager in SAS Management Console. Click **Yes** in the confirmation message. If you select this option for an occurrence, the flow is scheduled and set to **Run Once**. The flow can then be submitted directly through Customer Intelligence Studio or from the scheduling software in SAS Management Console.

Select **Send to the scheduling software** and click **Run** to create a flow and send it directly to the scheduling software in SAS Management Console. Click **Yes** in the confirmation message.

NOTE: The **Run** button is disabled if your campaign does not have a campaign code or if the selected communication nodes are not ready to execute.

If you send a campaign to the Schedule Manager, all of the communications in the campaign are sent to the Schedule Manager. If you re-send the campaign, the original flow is deleted and a new flow is created. If you add a communication after a campaign has been scheduled, set up a different schedule for the communication, and send the communication to the scheduling software, the schedule for the campaign will be removed and the campaign will not be executed. For more information about job flows and the Schedule Manager, see "Using SAS Schedule Manager to Schedule a Job" on page 245.

When a campaign is executed, all communication nodes and all terminal process nodes are executed and all counts and tables are cleared before execution. If you do not want two or more communication nodes to be executed at the same time, schedule the communications to be executed at different times. In a multi-stage campaign, execute any followup communications separately.

When a communication node is executed through the execution of a campaign or a communication, all nodes that are downstream from the communication node will be executed at the same time as the communication node, unless one of the downstream nodes is also a communication node, including communication nodes that are in other branches. In a multi-stage campaign, there may be a number of branches downstream from the communication node that is being executed. If any of these branches contains a communication node, none of the nodes that are downstream from the first communication node will be executed.

For information about using options to execute diagrams and campaigns, see "Viewing the Properties of a Diagram" on page 148.

Changing the Status of a Communication

To change the status of a communication, follow these steps:

1. View all the communications in a campaign.
2. Select a communication in the Communications window and click **Change Status**.

See "Viewing All Communications in a Selection Campaign" on page 265 for more information.

Here is a list of the possible values for communication status. The communication definition that you created in SAS Management Console determines which statuses are valid and whether the

status of a communication is set by the user or by the system. For more information, see "Defining Communications" on page 57

- Not Ready
- Planned
- Approved
- Scheduled
- Executed
- Exported
- other user-defined statuses.

The communication statuses (Scheduled, Executed, and Exported) can be set to either automatic or manual in the Communication Definition plug-in of SAS Management Console. Locking of the diagram and the appearance of check marks in the Campaign Checklist window are not based on communication status, but rather on whether the Communication node has been run and has generated output. In this case, it is recommended that you manually change the status of a communication accordingly after a scheduling, execution, or exporting task is performed.

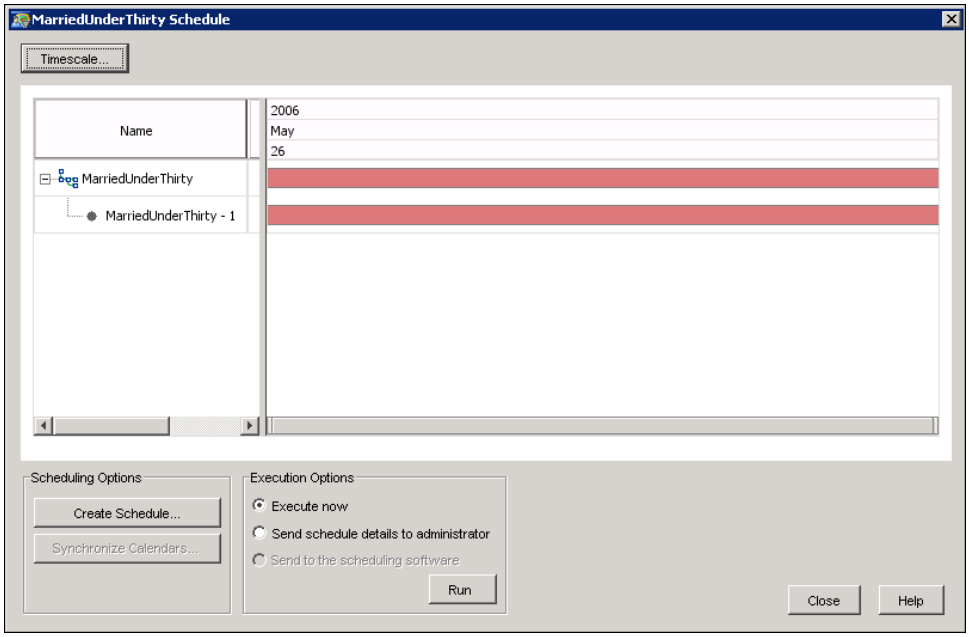
Creating a Diagram Schedule

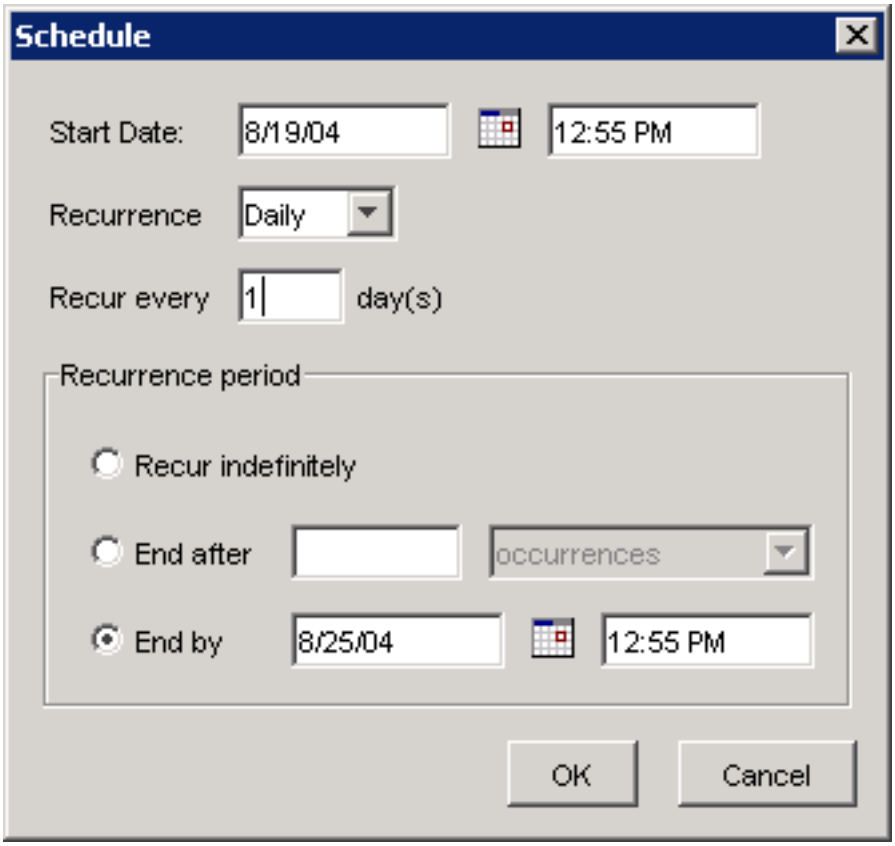
You can schedule diagrams to be updated at pre-determined days and times. For example, you might want to update the counts in nodes, or run an export at a certain time.

To create a diagram schedule, open the diagram and select **Diagram** ➧ **Schedule** from the menu to display the schedule window for your diagram.

Schedule Window for Your Diagram

This window enables you to view, create, and modify the schedule of a diagram.





After you have created a schedule, you can send the diagram to the scheduler to be executed or you can execute the diagram immediately.

In the left pane, the window displays the following properties of a diagram:

Name
displays the name of the diagram.

Start
displays the start date of the diagram.

End
displays the end date of the diagram.

The right pane of this window displays a Gantt chart that contains a bar for the diagram. The chart provides a picture of the life span of the diagram. The smallest unit of time that can be displayed in the chart is one day. If the start date, end date, and time are the same, the chart displays the end date as one day later than the start date. If the start and end date are the same, and the start and end times are different, a bar is displayed for the occurrence, but not for the communication.

To modify the timescale of the Gantt chart, click **Timescale**. For more information about the timescale, see "Viewing the Schedules of All Campaigns" on page 249.

To create or modify the schedule, click **Create Schedule** to display the Schedule window. For more information, see "Schedule Window" on page 254. You can create and modify schedules of the diagrams that you own or that you have permission to edit.

Click **Synchronize Calendars** to access and synchronize the scheduling information for the diagram in SAS Management Console. A message will notify you if a schedule has already been saved, or if the schedule has changed. You will be prompted to display the updated scheduling information in Customer Intelligence Studio.

Scheduling and Executing a Diagram

If you have the appropriate permissions, you can execute a diagram or send it directly to the scheduling software. You can also create a flow that can be submitted to the scheduling software by an administrator.

Select **Execute now** and click **Yes** in the confirmation message to execute the diagram immediately.

Select **Send schedule details to administrator** and click **Yes** in the confirmation message to send the diagram to the Schedule Manager in SAS Management Console. The flow can then be submitted directly through Customer Intelligence Studio or from the scheduling software in SAS Management Console.

Select **Send to the scheduling software** and click **Yes** in the confirmation dialog box to create a flow and send it directly to the scheduling software in SAS Management Console.

If you re-send the diagram, the original flow is deleted and a new flow is created. For more information about job flows and the Schedule Manager, see "Using SAS Schedule Manager to Schedule a Job" on page 245.

Chapter 9

Displaying Information About Campaigns

Contents

Viewing All Tasks and Logs in SAS Customer Intelligence Studio **263**
Tasks and Logs Window 264
Viewing All Communications in a Selection Campaign **265**
Communications Window 265
Change Communication Status Window 267
Update Contact History Window 268
Viewing Diagrams **269**
Diagrams Window 269
Working with Documents **270**
Creating a Summary 271
Creating a Diagram Picture 272
Creating a Node Details Document 273
Creating a Cell Sizing Document 274
Creating a Test Case Document 275
Refreshing and Exporting Diagram Documents 276
Audit Log Window 276
Viewing Documents 277
Publishing Campaigns **278**
Creating Reporting Versions 279
Viewing Reporting Versions 279
The Treatment Performance Report 280

Viewing All Tasks and Logs in SAS Customer Intelligence Studio

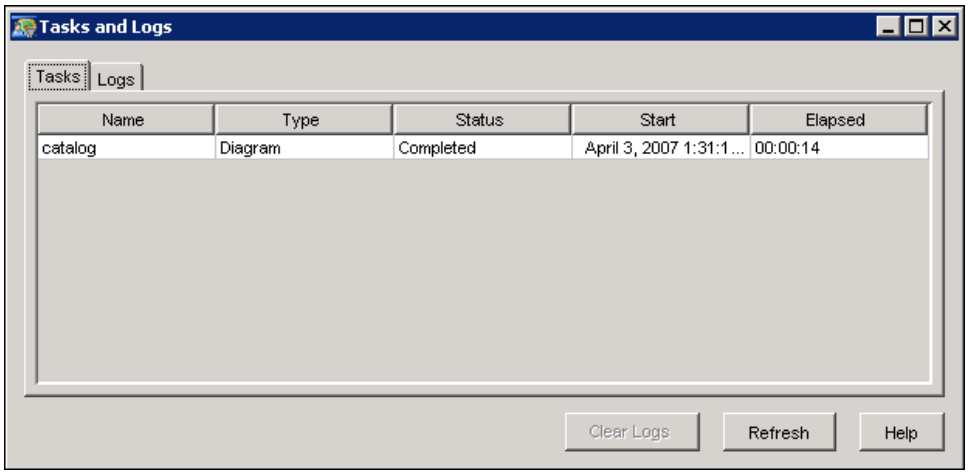
To view all the tasks and logs for a campaign, select **View** ➧ **Tasks and Logs** from the main menu. The Tasks and Logs window opens.

Tasks and Logs Window

The Tasks and Logs window contains the Tasks tab and the Logs tab.

Tasks tab

displays information about tasks that have been run during the current SAS Customer Intelligence Studio session. Each row in the Tasks tab corresponds to a task. Examples of running tasks are updating count, creating splits, and exporting data. If a task fails, it will appear as a link in the table. If you click the link, you will see a message that provides details about why the task failed.



The following information is displayed in the window:

Name

displays the name of the node that is run.

Type

displays the type of task.

Status

displays the status of a task, such as starting, executing, completed, or failed.

Start

displays the start date and time of a task.

Elapsed

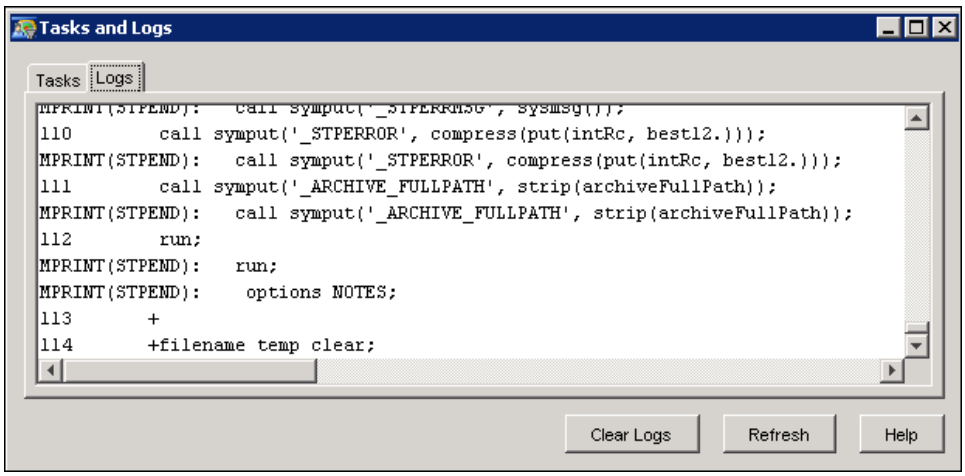
displays the elapsed time of a task.

When a task is performed on multiple nodes, only one task is created. The status of this task will not be marked as completed unless **all** nodes are completed.

If an asynchronous task fails, you can click a link in the **Status** column to display a detailed error message.

NOTE: No task is created when you execute communications.

Logs tab



The Logs tab displays the SAS log for any SAS code that is run by SAS Campaign Studio. You can also use this tab to verify that code you have inserted in the Process node has run successfully.

Click **Refresh** to refresh the list of tasks and all of the logs regardless of which tab is currently selected.

Click **Clear Logs** to clear the logs that are currently displayed in the window.

Viewing All Communications in a Selection Campaign

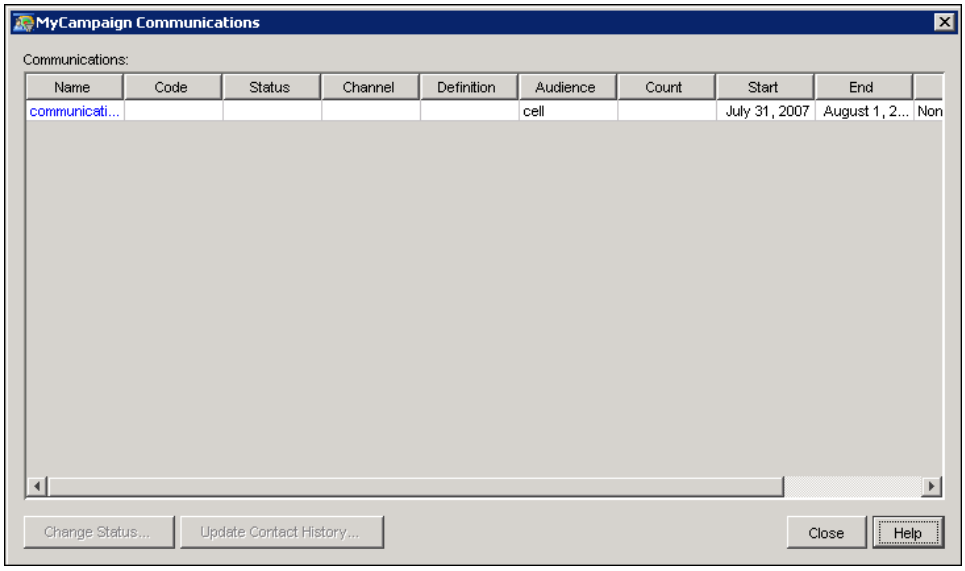
To view the communications that are defined in a selection campaign, follow these steps:

1. Open a selection campaign.
2. Select from the menu **View ➧ Communications** to open the Communications window.

Communications Window

The Communications window displays a list of communications that are available in a campaign and their properties.

Each row in the table corresponds to a communication.



The table contains the following columns:

Name
: the name of a communication.

Code
: the communication code.

Status
: the status of a communication.

Channel
: the channel that is used to target customers for a communication.

Definition
: the definition of a communication.

Audience
: the name of the cell that is connected to a communication.

Count
: the count of the audience of a communication. The count is the sum of the initial communication nodes, not including follow-up communications.

Start
: the start date and time of a communication.

End
: the end date and time of a communication.

Recur
: the recurrence frequency.

Export
: whether to export data for a communication.

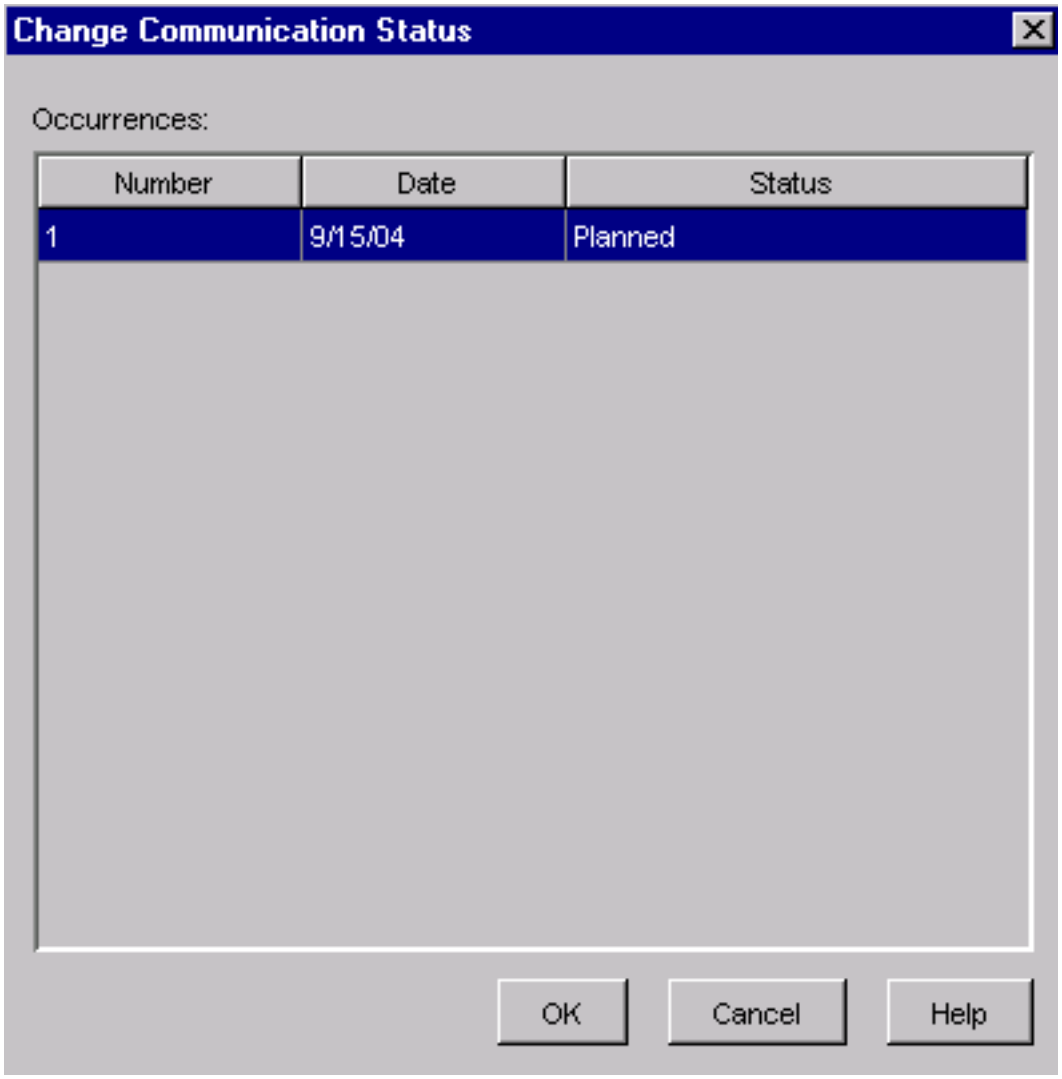
To open the properties window of a communication, click the communication name.

To change the status of a communication, select the communication and click **Change Status** to open the Change Communication Status window. See "Change Communication Status Window" on page 267.

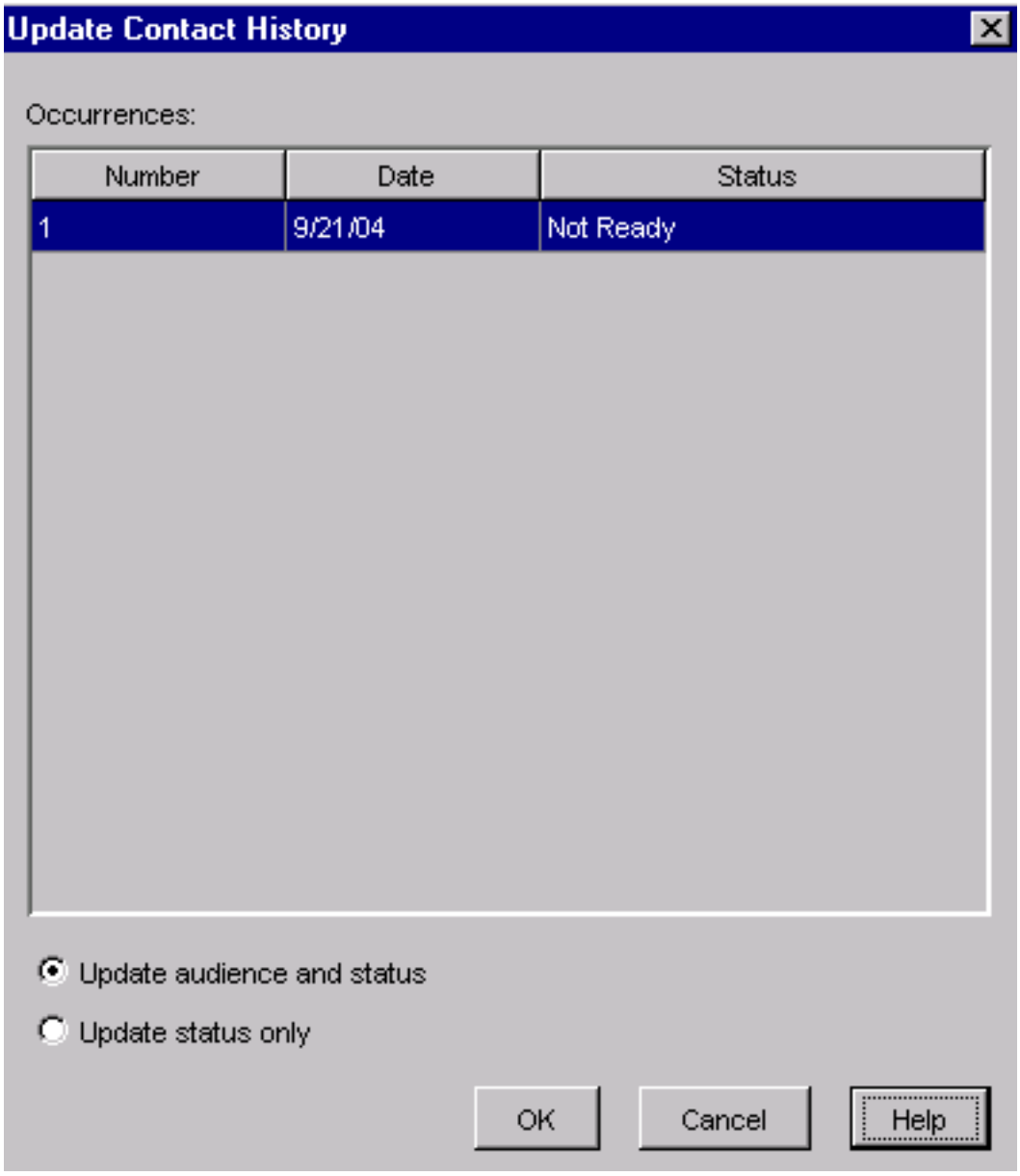
To update the contact history for a communication, select the communication and click **Update Contact History**. The Update Contact History window appears. See "Update Contact History Window" on page 268. This option is greyed out if there are no subject level items in the communication.

Change Communication Status Window

The Change Communication Status window displays the occurrence number, date, and the current status of the communication. You can change the status by using the Status list.



Update Contact History Window



The Update Contact History window displays the contact history events for the selected communication.

Number
the number that identifies the contact history entry.

Date
displays the communication date.

Status

displays the communication status. The values are predetermined in communication definitions.

Update audience and status
updates contact history with new subject IDs.

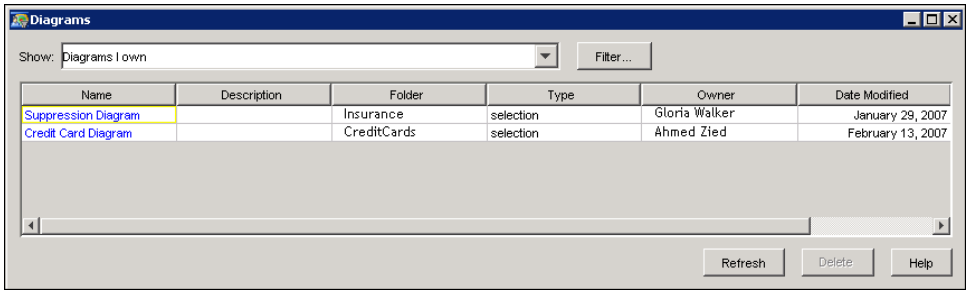
Update status only
updates the status of those customers who are currently in the contact history list.

Viewing Diagrams

In SAS Customer Intelligence Studio, a campaign must have a diagram, but a diagram does not have to be part of any campaign. To view a list of the diagrams that are not part of any campaign, select **View** ➧ **Diagrams** from the main menu. The Diagrams window opens.

Diagrams Window

The Diagrams window displays a list of diagrams that are not part of any campaign.



To specify the filter criteria for displaying diagrams, select one of the following items from the **Show** drop-down list.

- **All Diagrams**
- **Diagrams I can edit**
- **Diagrams I can view, but not edit**
- **Diagrams I own**
- **Custom**

Select **Custom** to create a customized filter in the Filter window.

The following information about the diagrams is displayed:

Name
the name of a diagram.

Folder
the location where the diagram is saved.

Date Modified and **Date Run**
the dates that a diagram was modified and run.

Owner
the owner of a diagram.

Number of Nodes
the number of times that each type of node appears in a diagram.

Click **Filter** to open the Filter window.

To refresh the list of diagrams, click **Refresh**. To delete a diagram, select the diagram and click **Delete**. This button is not available unless you are the owner of the selected diagram.

Working with Documents

Documents are reports that summarize the information in your campaign diagrams. You can create the following types of documents in Customer Intelligence Studio:

Summary
displays diagram or campaign details. For more information, see "Creating a Summary" on page 271.

Diagram Picture
contains an image of the diagram. For more information, see "Creating a Diagram Picture" on page 272.

Node Details
contains the properties of the nodes. For more information, see "Creating a Node Details Document" on page 273.

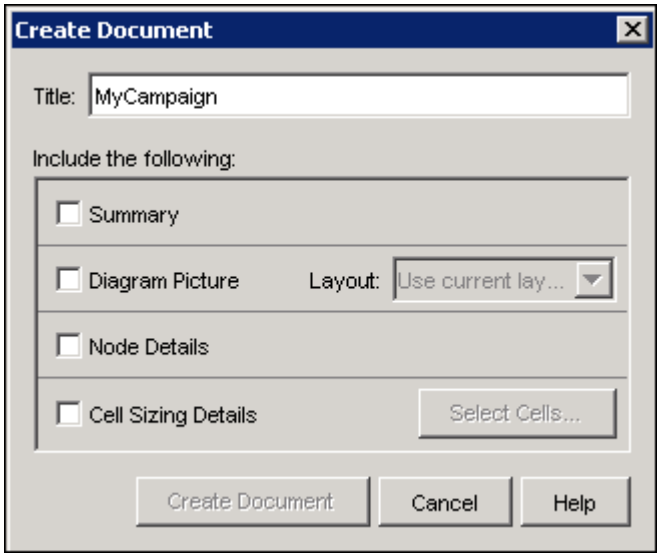
Cell Sizing Details
displays the counts information for the cells that you selected. Cell sizing detail documents are available only in selection campaigns and diagrams. For more information, see "Creating a Cell Sizing Document" on page 274.

Test Cases
are available only in decision campaigns and diagrams. For more information about these documents, see "Creating a Test Case Document" on page 275.

Audit Logs
display SAS and SQL code, both code that has run and code that has not run. Audit logs are

available only in selection campaigns and diagrams. For more information, see "Audit Log Window" on page 276.

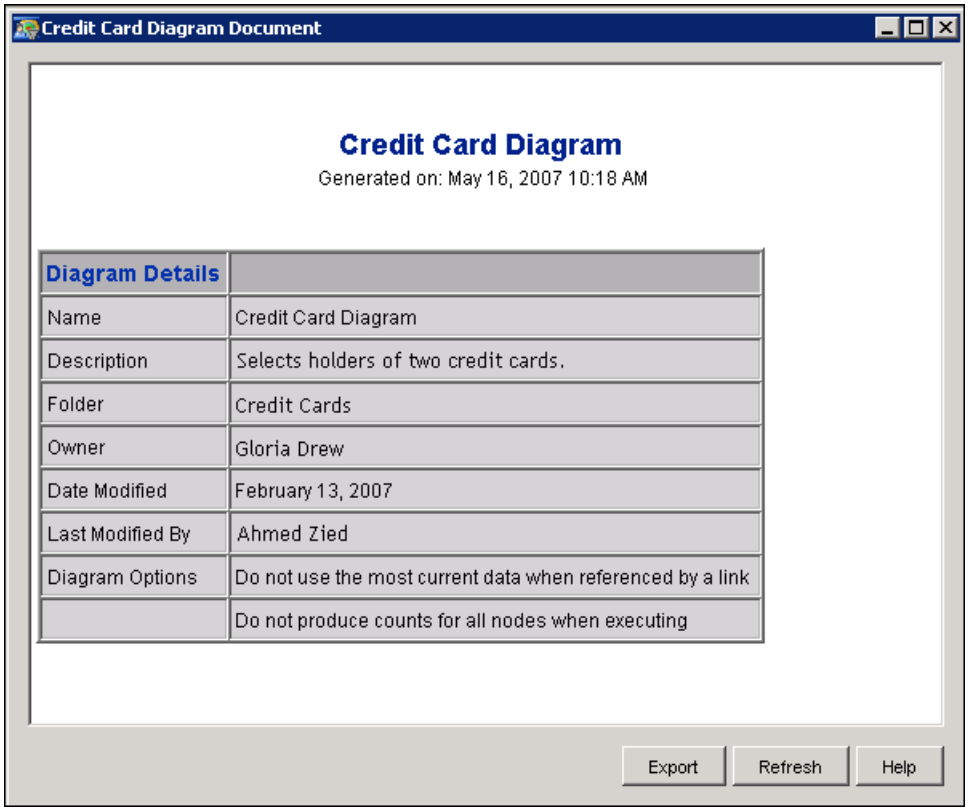
To create documents, open a diagram or campaign and select **Actions ➧ Create Document ➧ Diagram** from the drop-down menu.



In the Create Document window, you select the content that you want to include in a document. The documents that you create are listed in the Documents window. For more information, see "Viewing Documents" on page 277.

Creating a Summary

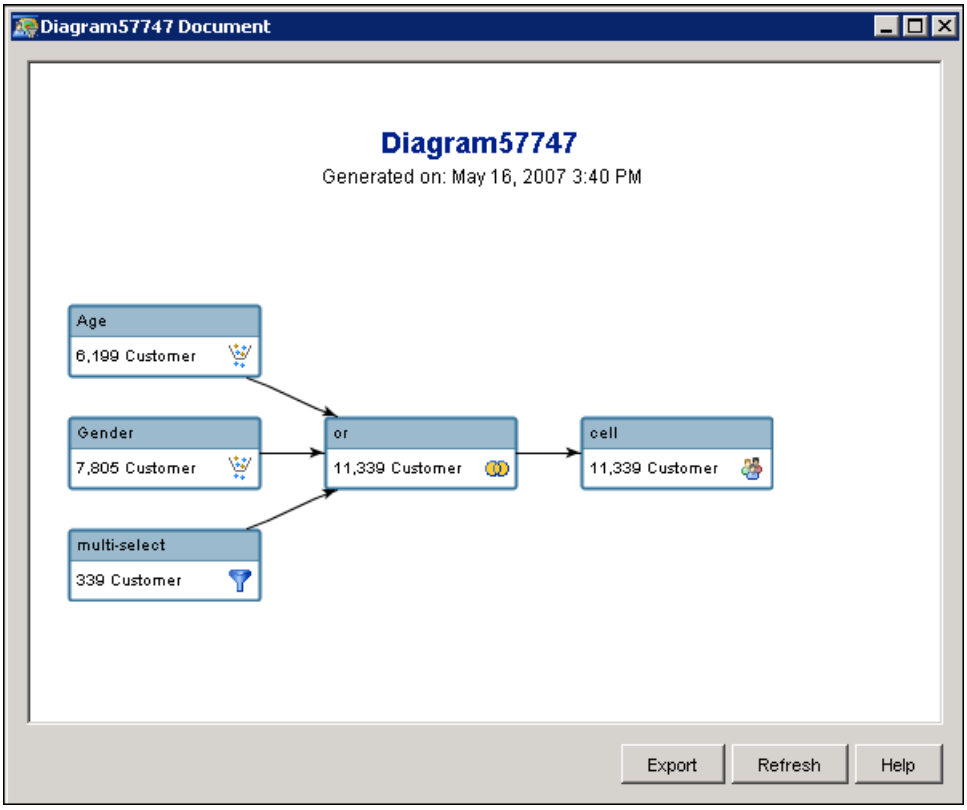
For both campaigns and diagrams, the summary displays the name, description, folder location, owner, most recent modification date, name of the person who made the modification, and diagram options. For campaigns, the summary also displays the statuses of the campaign brief, diagram, schedule, optimization, and execution. If the campaign definition has user-defined fields for items in the checklist, tables appear in the report for those items.



To create a summary for a diagram or campaign, select **Summary** in the Create Document window and click **Create Document**.

Creating a Diagram Picture

You can specify the orientation of diagram nodes in a diagram picture.

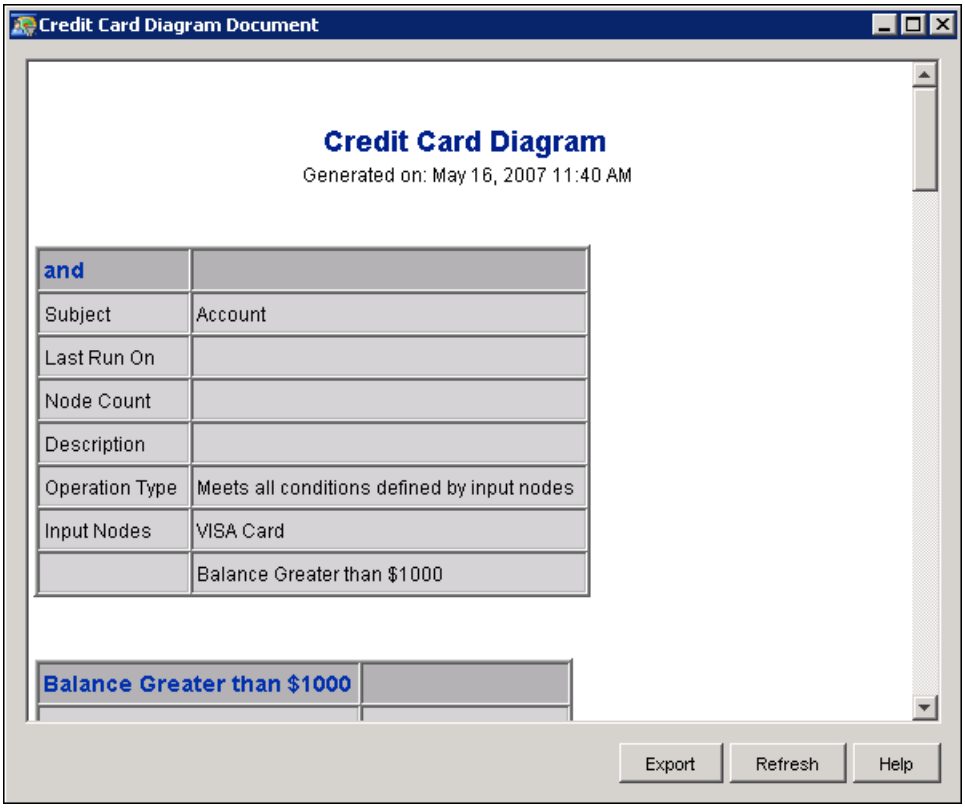


To create a diagram picture, follow these steps:

1. Select **Diagram Picture** in the Create Document window.
2. Select a layout from the **Layout** drop-down list.
3. Click **Create Document**.

Creating a Node Details Document

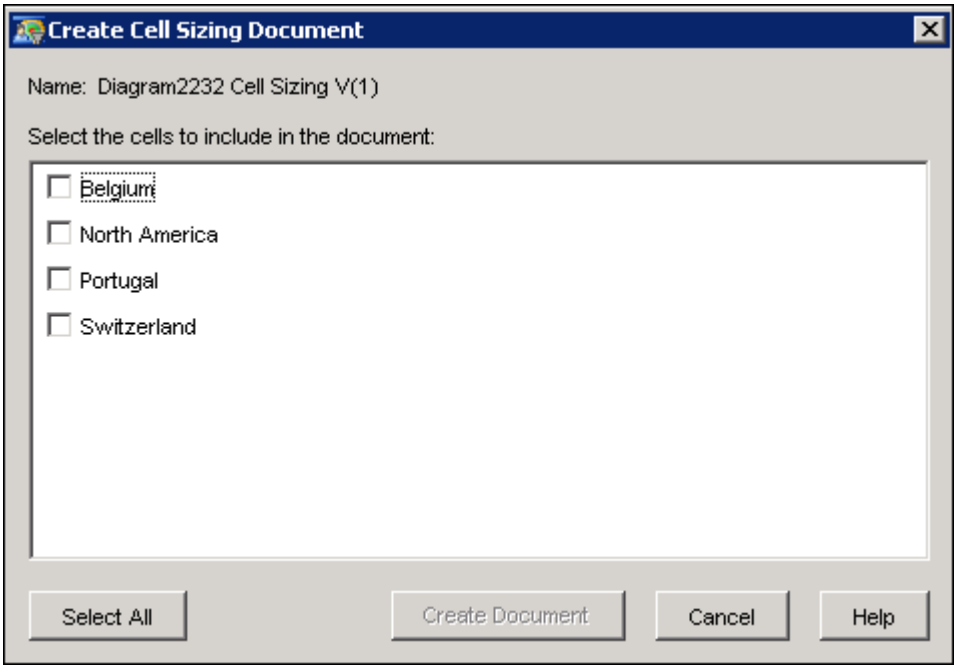
A node details document contains the properties of every node.



To create a node details document, select **Node Details** in the Create Document window and click **Create Document**.

Creating a Cell Sizing Document

A cell sizing document displays the counts for selected cells in a selection diagram.



To create a cell sizing document, follow these steps:

1. Select **Cell Sizing Details** in the Create Document window.
2. Click **Select Cells** and select the cells to include in the document. For more information, see "Selecting Cells" on page 275.
3. In the Create Document window, select **Create Document**.

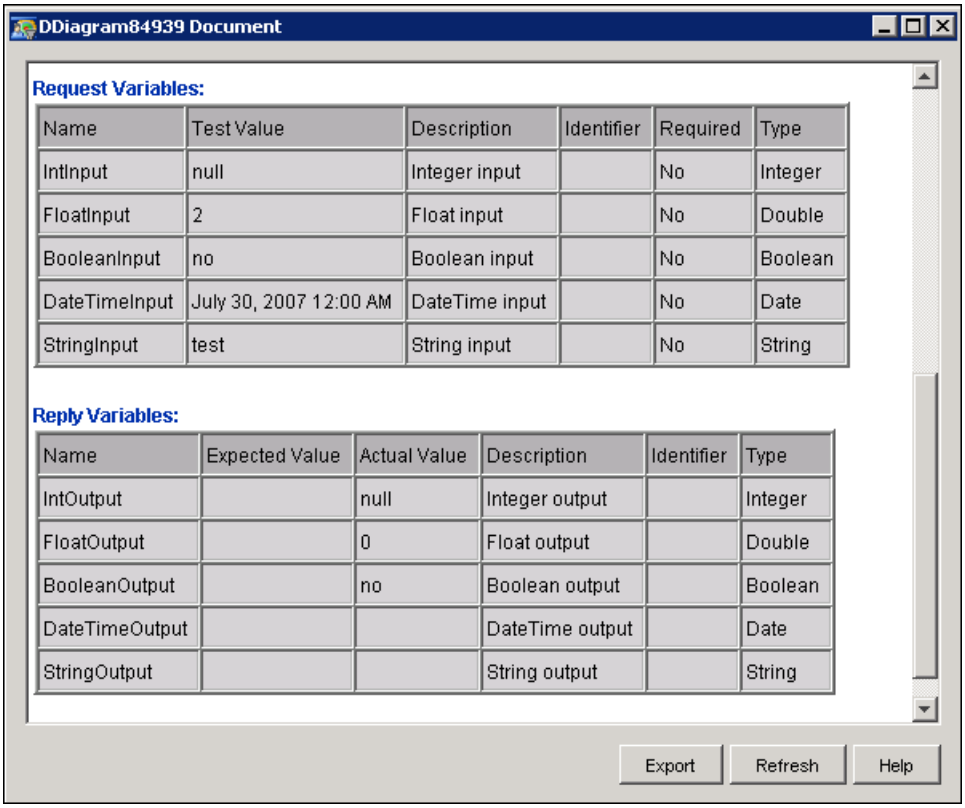
Selecting Cells

In the Cell Sizing window, specify the cells that you want to include in the document. Click **Select All** to select all of the cells.

Click **OK** to save your cell selection and return to the Create Document window.

Creating a Test Case Document

A test case document displays the variables for any test cases that you have created in a decision diagram.



To create a test case document, select **Test Cases** in the Create Document window and click **Create Document**.

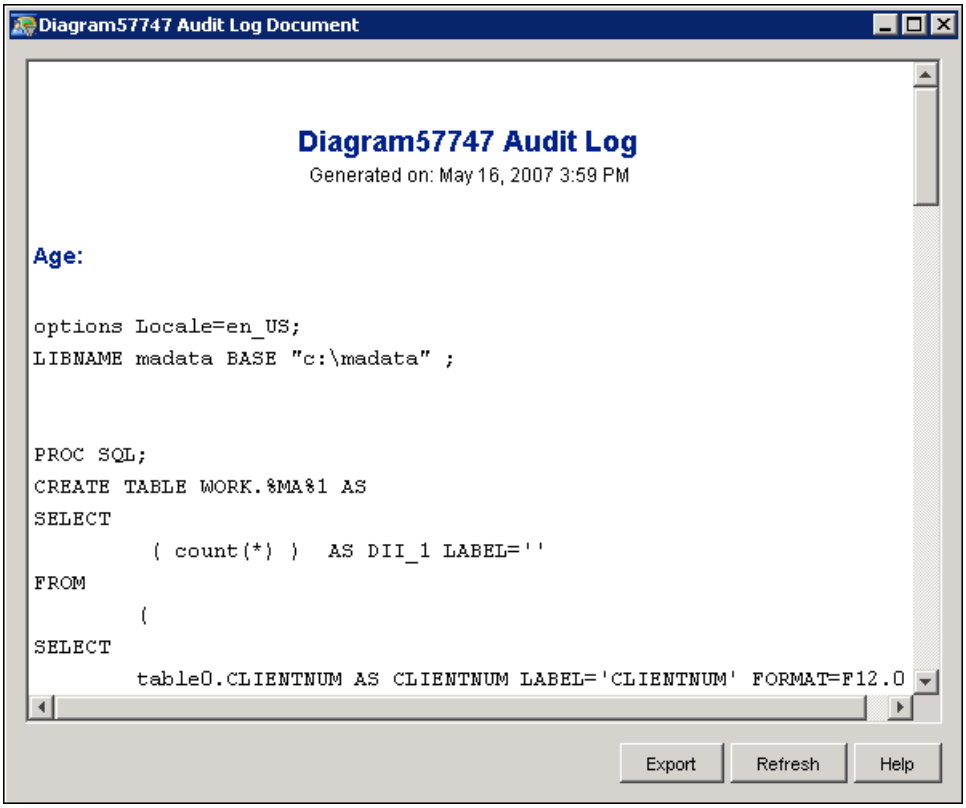
Refreshing and Exporting Diagram Documents

If a document by the same name already exists in the Document window, you can update the contents of the document by clicking **Refresh**. For more information, see "Viewing Documents" on page 277.

To export the contents of the document to an HTML file, click **Export**, select the file location, and click **Save**.

Audit Log Window

The audit log displays the SAS and SQL code for nodes that have been executed in a selection campaign.



To create an audit log, open a diagram or campaign and select **Actions** ➧ **Create Document** ➧ **Audit Log** from the drop-down menu.

If an audit log by the same name already exists in the Document window, you can update the contents of the log by clicking **Refresh**. For more information, see "Viewing Documents" on page 277.

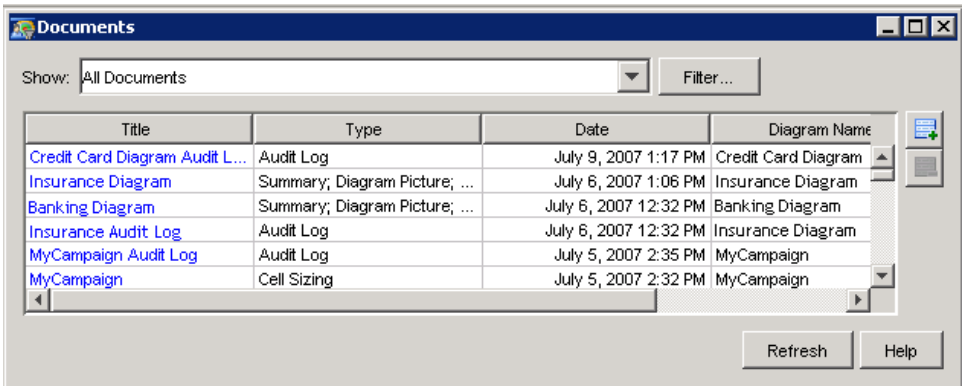
To export the contents of the log to an HTML file, click **Export**, select the file location, and click **Save**.

Viewing Documents

To view documents that you have already created, select **View** ➧ **Documents** from the main menu. The Documents window appears.

Documents Window

The Documents window displays a table that contains the following information about the documents that you create in SAS Campaign Studio.



Show
specifies the filtered list of documents that are displayed in the table. To specify the filter criteria for displaying documents, select one the following items from the **Show** drop-down list.

- **All Documents**
- **Documents I can edit**
- **Documents I can view, but not edit**
- **Documents I own**
- **Documents for Campaigns/Diagrams I have open**
- **Custom**

Filter
enables you to create a customized filtered list of documents.

Refresh
uses the currently selected filter to refresh the list of documents with the name of documents that are currently available.

To open a document, select it from the table.

To add a document to the table, click . Select the name of a diagram in the Select Diagram window, and click **OK**. Select one or more document types in the Create Document window and click **OK** to add the document to the Documents table.

To remove a document from the table, select the document name, click , and click **Yes** in the confirmation dialog. Press the SHIFT and CTRL keys to select more than one document.

Publishing Campaigns

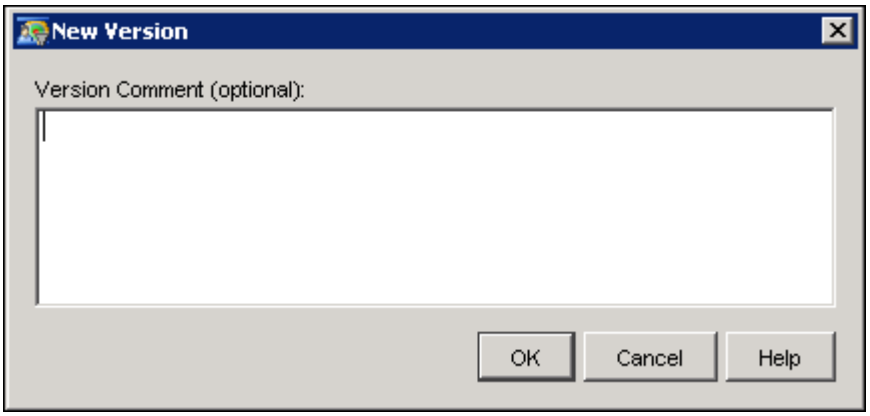
You can publish campaign data to the SAS Customer Intelligence Reporting Data Model. All of the business contexts for your site can share a single version of the reporting model, or you can specify a separate version for each business context. You can then use SAS Web Report Studio

to view the data in customized report, or in the treatment performance report that is supplied with the product. For more information about using the treatment performance report to view data, see "The Treatment Performance Report" on page 280. The location of the SAS Customer Intelligence Reporting Data Model is specified by the reporting libref for the current business context. For more information about specifying the reporting libref, see "Documents Tab" on page 101.

To publish complete campaign information, open a campaign and select **Actions ➧ Publish Reporting Data** from the main menu. If the campaign has never been saved, or if the campaign has been modified, click **OK** in the dialog box. To publish updated campaign information every time that a campaign is saved, select **Automatically publish on subsequent saves** on the Documents tab for the current business context. For more information, see "Documents Tab" on page 101.

Creating Reporting Versions

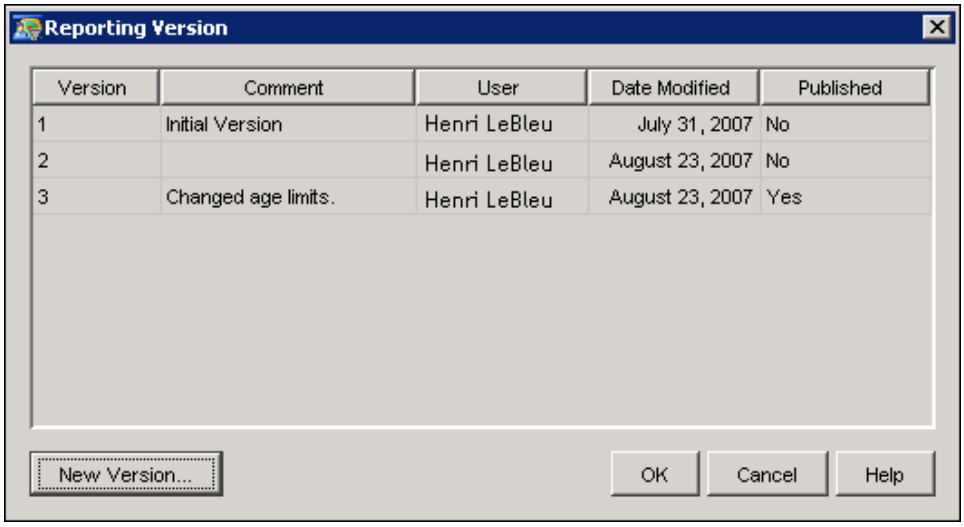
To create a new version of the campaign metadata, select **Actions ➧ Reporting Version** from the main menu to display the Reporting Version window, and click **New Version**.



Optionally, you can type a comment in the **Version Comment** field. Click **OK** to create a new version of the campaign metadata.

Viewing Reporting Versions

To view the reporting versions that have already been created for the selected campaign, select **Actions ➧ Reporting Version** from the main menu.

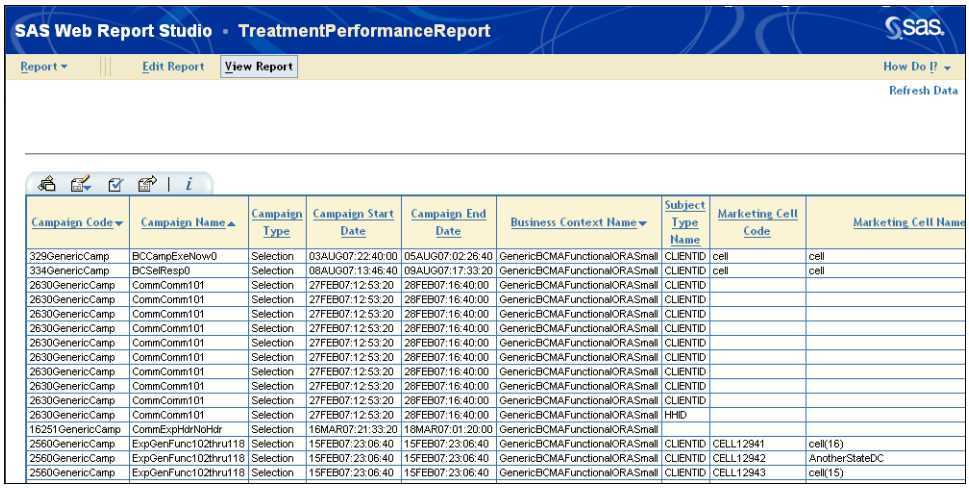


Click **New Version** to create a new version of the report. For more information, see "Creating Reporting Versions" on page 279.

NOTE: Creating a new reporting version does not publish the report. To publish the report, select **Actions ➧ Publish Reporting Data** from the main menu.

The Treatment Performance Report

Beginning with SAS Customer Intelligence 5.1, you can publish campaigns and view the data in a default treatment performance report that is based on data in the SAS Customer Intelligence Reporting Data Model. The treatment performance report displays treatments across several campaigns, and enables you to identify the quality of the responses to a communication. This report can combine data from SAS Marketing Automation, SAS Real-Time Decision Manager, and SAS Digital Marketing. You can use SAS Web Report Studio to view the treatment performance report.



Campaign Code	Campaign Name	Campaign Type	Campaign Start Date	Campaign End Date	Business Context Name	Subject Type Name	Marketing Cell Code	Marketing Cell Name
329GenericCamp	BCCampExeNow0	Selection	03AUG07:22:40:00	05AUG07:02:26:40	GenericBCMAFunctionalORASmall	CLIENTID	cell	cell
334GenericCamp	BCSelResp0	Selection	08AUG07:13:46:40	09AUG07:17:33:20	GenericBCMAFunctionalORASmall	CLIENTID	cell	cell
2630GenericCamp	CommComm101	Selection	27FEB07:12:53:20	28FEB07:16:40:00	GenericBCMAFunctionalORASmall	CLIENTID		
2630GenericCamp	CommComm101	Selection	27FEB07:12:53:20	28FEB07:16:40:00	GenericBCMAFunctionalORASmall	CLIENTID		
2630GenericCamp	CommComm101	Selection	27FEB07:12:53:20	28FEB07:16:40:00	GenericBCMAFunctionalORASmall	CLIENTID		
2630GenericCamp	CommComm101	Selection	27FEB07:12:53:20	28FEB07:16:40:00	GenericBCMAFunctionalORASmall	CLIENTID		
2630GenericCamp	CommComm101	Selection	27FEB07:12:53:20	28FEB07:16:40:00	GenericBCMAFunctionalORASmall	CLIENTID		
2630GenericCamp	CommComm101	Selection	27FEB07:12:53:20	28FEB07:16:40:00	GenericBCMAFunctionalORASmall	CLIENTID		
2630GenericCamp	CommComm101	Selection	27FEB07:12:53:20	28FEB07:16:40:00	GenericBCMAFunctionalORASmall	CLIENTID		
2630GenericCamp	CommComm101	Selection	27FEB07:12:53:20	28FEB07:16:40:00	GenericBCMAFunctionalORASmall	CLIENTID		
2630GenericCamp	CommComm101	Selection	27FEB07:12:53:20	28FEB07:16:40:00	GenericBCMAFunctionalORASmall	HHID		
16251GenericCamp	CommExpHdrNoHdr	Selection	16MAR07:21:33:20	18MAR07:01:20:00	GenericBCMAFunctionalORASmall			
2560GenericCamp	ExpGenFunc102thru118	Selection	15FEB07:23:06:40	15FEB07:23:06:40	GenericBCMAFunctionalORASmall	CLIENTID	CELL12941	cell(16)
2560GenericCamp	ExpGenFunc102thru118	Selection	15FEB07:23:06:40	15FEB07:23:06:40	GenericBCMAFunctionalORASmall	CLIENTID	CELL12942	AnotherStateDC
2560GenericCamp	ExpGenFunc102thru118	Selection	15FEB07:23:06:40	15FEB07:23:06:40	GenericBCMAFunctionalORASmall	CLIENTID	CELL12943	cell(15)

To view data in the treatment performance report, take the following steps:

1. In the Business Contexts plug-in in SAS Management Console, specify a reporting libref of MAREPORT for the business context that you want to use. For more information, see "Documents Tab" on page 101.
2. Using a business context that has a reporting libref of MAREPORT, open a campaign in SAS Customer Intelligence Studio and select **Actions ➧ Publish Reporting Data**.
3. The data is published to a location that is viewable by SAS Web Report Studio. Make a copy of this report. Any further modifications should be made to the copy because future installations of SAS Customer Intelligence Studio will overwrite the original report.
4. In SAS Web Report Studio, if you have the appropriate permissions, you can view, edit, and save the report to another location. You can sort and remove columns from display. You can add and delete fields and modify column headers and footers. You can add tables and graphs. You can schedule the report for distribution to an e-mail list. For more information, see the help for SAS Web Report Studio.

The report contains the following columns:

- Campaign Code
- Campaign Name
- Campaign Type
- Campaign Start Date
- Campaign End Date
- Business Context Name
- Modified By
- Communication or Reply Code
- Communication or Reply Name
- Communication or Reply Status Code
- Communication or Reply Occurrence No
- Communication or Reply Occurrence Date
- Communication or Reply Start Date
- Communication or Reply End Date
- Subject Type Name
- Channel Code

- Package Code
- Marketing Cell Code
- Marketing Cell Name
- Treatment Code
- Attempted Contact Count
- Failed Contact Count
- Marketing Contact Count
- Marketing Response Count
- Marketing Response Rate
- Conversion Response Count
- Conversion Response Rate

Chapter 10

SAS Campaign Web Studio

Contents

Introduction to SAS Campaign Web Studio **284**
Creating a Campaign **284**
Select a Campaign Definition 285
Define the Campaign Brief 285
Specify Folder 287
Specify Sharing Permissions 288
Specify Campaign Budget 289
Specify Select Criteria 290
Add Communications 292
Schedule Communications 293
(CampaignName) Page **294**
Brief Section 295
Schedule Section 295
(User-Defined) Section 296
Documentation Section 296
Select Communication Definition Page **296**
Communications Page **297**
Campaign Brief Page **298**
Campaign Details 299
Campaign Sharing 299
Viewing Campaigns **299**
Copying or Renaming a Campaign **300**
Updating Campaign Approvals **301**
Viewing a Campaign Schedule **302**
Viewing Documentation **303**
Business Contexts **303**
Changing a Business Context 304

Introduction to SAS Campaign Web Studio

SAS Campaign Web Studio is a Web application that you can use to create and manage campaigns. To access SAS Campaign Web Studio, click the Marketing Automation tab in the SAS Portal. The following tasks are available:

Create a campaign
: opens the Campaign wizard. The campaign that you create is executed within SAS Customer Intelligence Studio.

View campaigns
: opens the Campaigns page.

View campaign schedule
: opens the Campaign Schedule page.

View documentation
: opens the Documentation page.

Select business context
: opens the Select Business Context page. For more information about business contexts, see "Business Contexts" in the SAS Customer Intelligence Studio documentation.

At the bottom of several pages in SAS Campaign Web Studio there are links that you can use to navigate to the Campaign wizard (by clicking **Create a campaign**), the View Campaigns page, the View Campaign Schedule page, and the home page.

You can log off the system as well as access Help by using the links on the Marketing Automation page. These links are available throughout SAS Campaign Web Studio.

NOTE: If your Marketing Automation session has been terminated by your administrator, close the Portal and Campaign Web Studio pages in your browser before you log on again.

Creating a Campaign

SAS Campaign Web Studio enables you to create a campaign and its associated communications. The Campaign wizard guides you through the process of creating a campaign. The campaign is then sent to the scheduling software for execution.

When you have completed making entries on the page, click **Next** to advance to the next page. To edit your entries from a previous step, click **Previous**. To cancel creation of the campaign, click **Cancel**. Pages with required entries will not allow you to proceed without making those entries.

NOTE: Do not use the Back and Forward buttons in your browser to move through the Campaign wizard.

Select a Campaign Definition

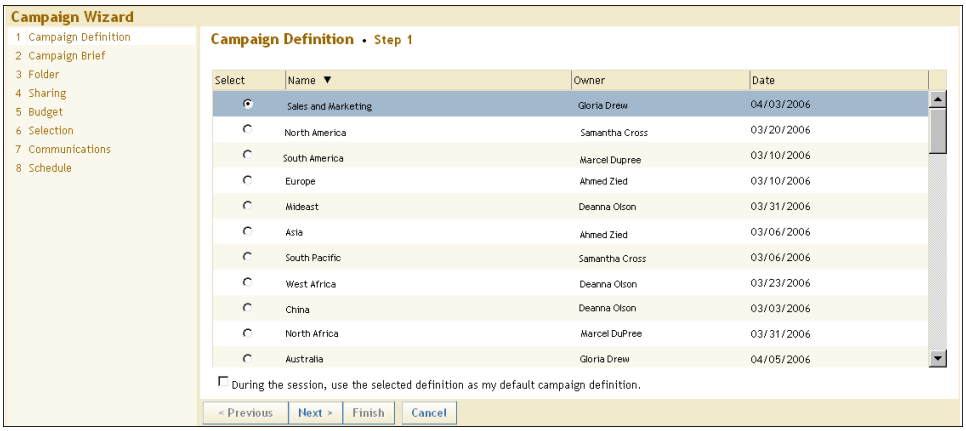
Begin creating your campaign by selecting a campaign definition from the list of available definitions. You create campaign definitions in the Campaign Definition plug-in in SAS Management Console.

NOTE: The **Date** column lists the date that the campaign definition was created or last modified.

You can set your current selection as the default definition for the current SAS Campaign Web Studio session by clicking the check box at the bottom of the page.

You can order the list by clicking on the column header of the column that you want to order by.

To move to the next step, click **Next**. To cancel creation of the campaign, click **Cancel**.

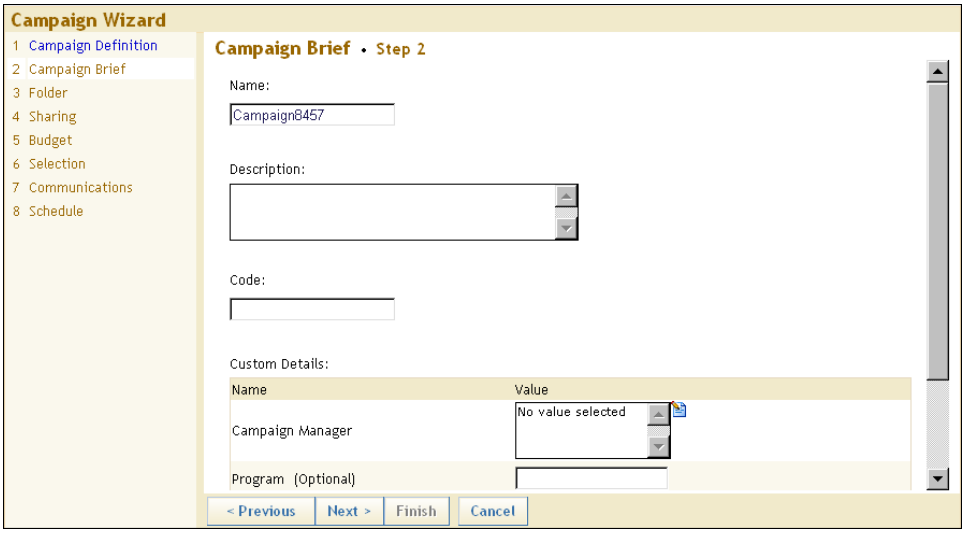


Define the Campaign Brief

After selecting a campaign definition, specify details about the campaign in the Campaign Brief page.

1. Enter the campaign name in the **Name** box.
2. Enter a description of the campaign.
3. Depending on the campaign definition that you selected, enter a value in the **Code** box.

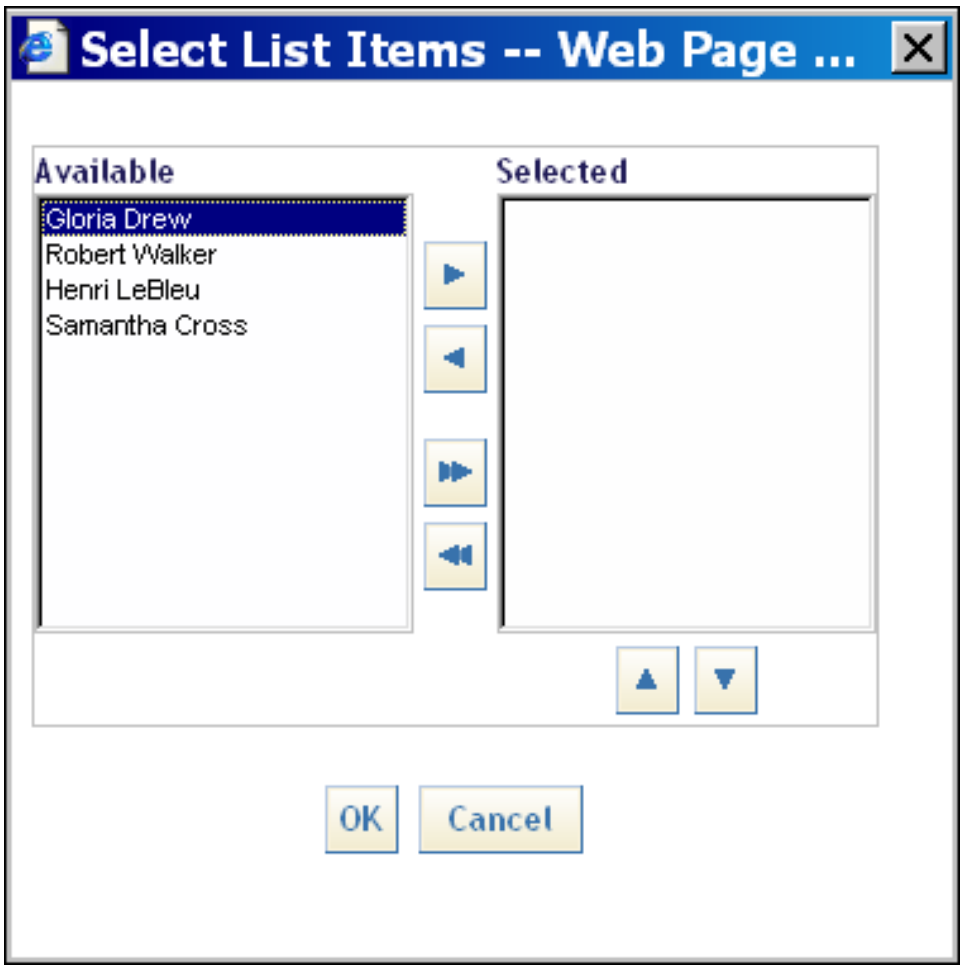
Depending on the campaign definition that you selected, user-defined fields might appear in the bottom of the page. These fields are created by using the Campaign Definition plug-in in SAS Management Console. These fields provide details about the campaign such as the campaign budget, campaign manager, or product group.



If the campaign definition includes a list from which you can select values, select a value from the drop-down list or click the **Edit** icon . For more information, see "Select List Items Window" on page 286.

Select List Items Window

In the Select List Items window, you can select items to add to a campaign brief.



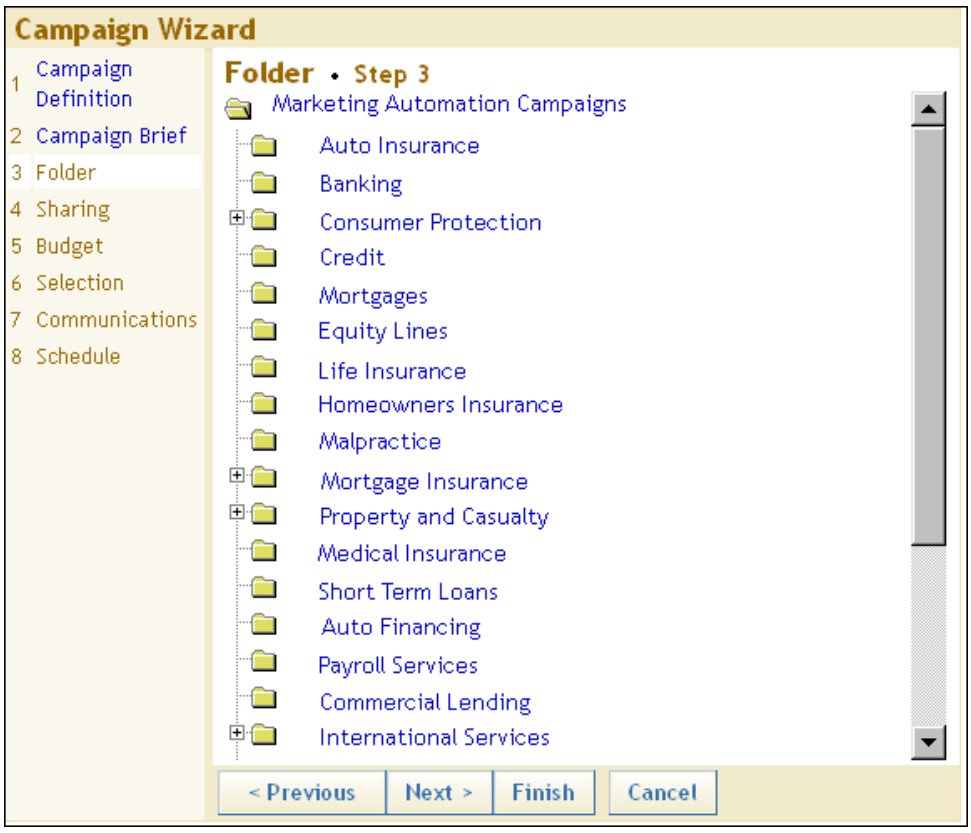
Select an item from the drop-down list, or, if you can select more than one list item, select an item from the **Available** list and click the right arrow to add it to the **Selected** list. Click the double right arrow to add all of the items to the **Selected** list. To remove an item from the **Selected** list, select the item and click the left arrow. Click the double left arrow to remove all of the items from the **Selected** list.

To select more than one item, hold down the Shift or CTRL key.

To change the position of an item in the **Selected** list, select the item and click the up arrow or the down arrow.

Specify Folder

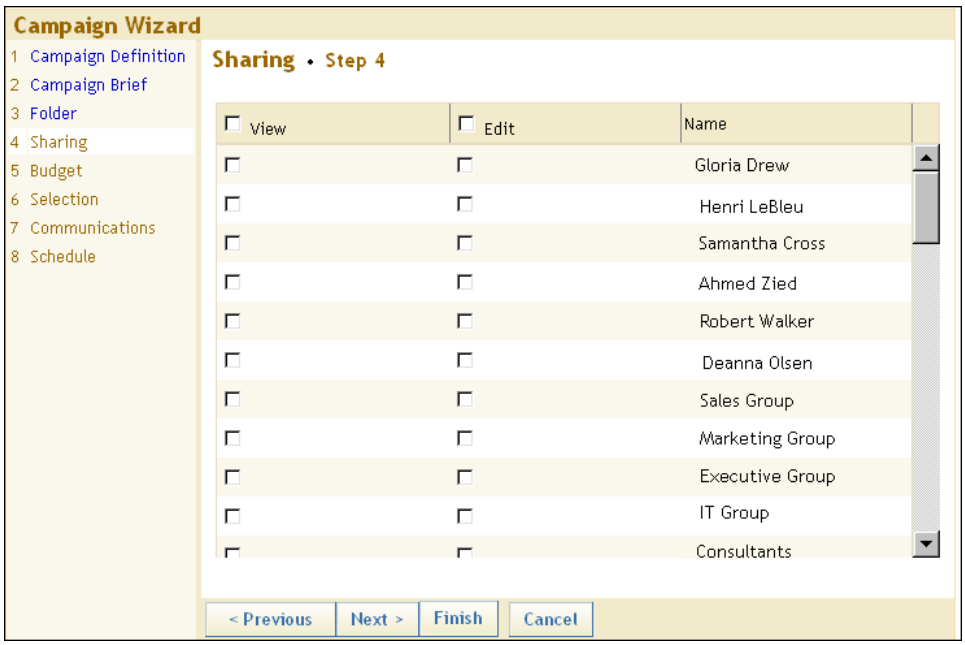
In this step, you specify the folder where you want your campaign to be saved.



After you have specified a folder, you can click **Finish** on any of the following pages of the Campaign Wizard to save the campaign.

Specify Sharing Permissions

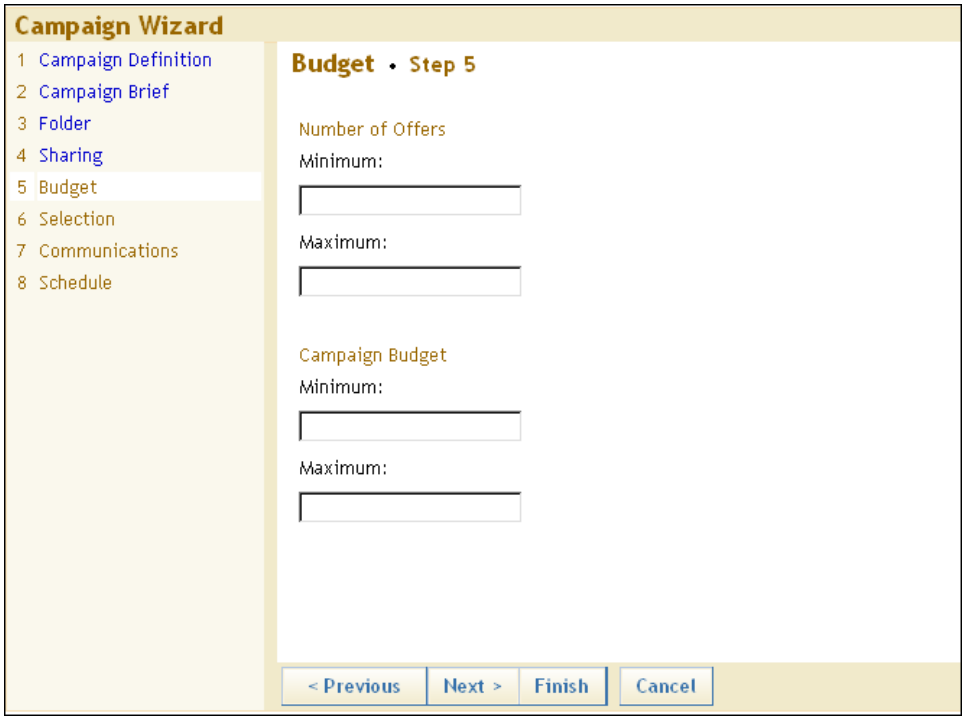
In this step, you specify who can access the campaign. You can assign read access or edit access. Note that assigning edit permissions automatically assigns read permissions. The list of users that appears depends on which users or user groups were defined in the User Manager in SAS Management Console.



From this list, you specify the users who have permission to view or edit the campaign. Grant view permission to everyone in the list by selecting **View** at the top of the column; grant both edit and view permission to everyone in the list by selecting **Edit**.

Specify Campaign Budget

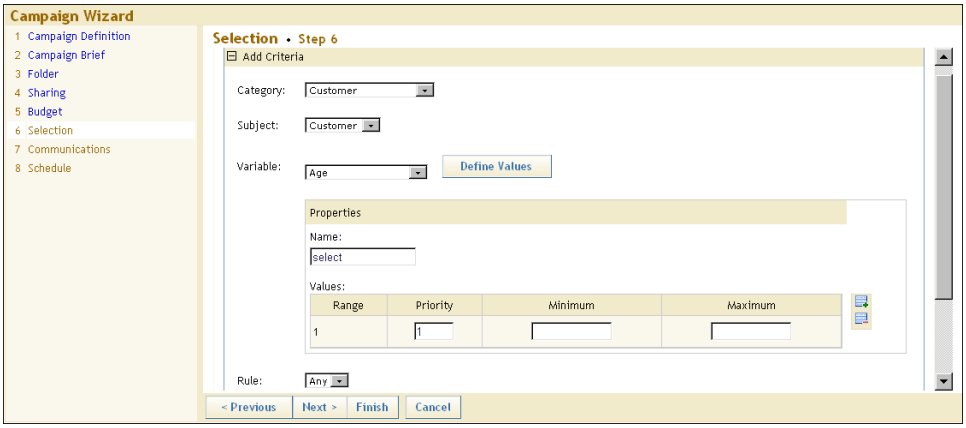
In this step, you specify the number of offers and the budget for the campaign.



Specify Select Criteria

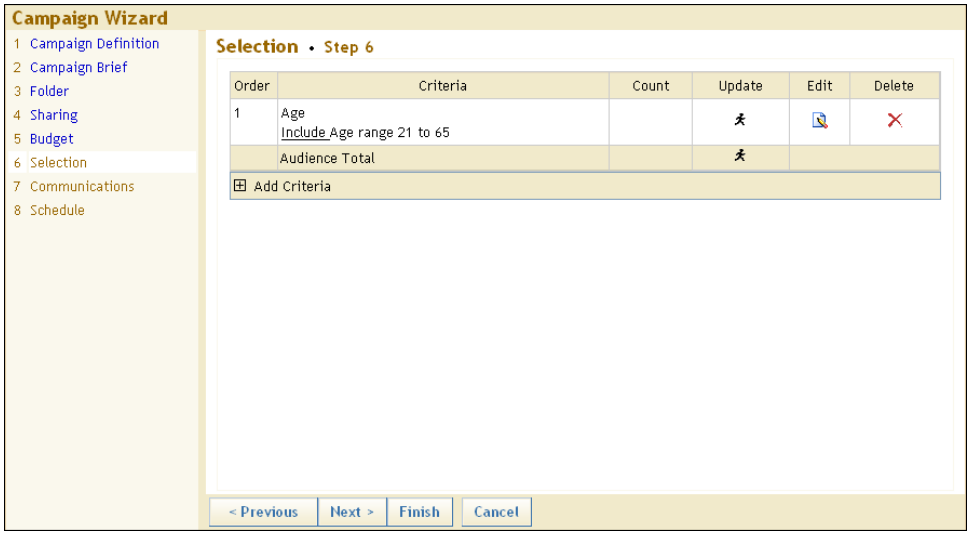
In this step, you specify criteria that define the campaign audience. The campaign audience is used for all communications in the campaign, unless you restrict this audience further when you define a communication. This is similar to adding select nodes to a diagram in Customer Intelligence Studio.

1. Expand the Add Criteria section.
2. Select a Category from the drop-down list.
3. Select a Subject from the drop-down list.
4. Select a Variable from the resulting drop-down list, which is based on your selections of Category and Subject. Click **Define Values**. The Properties section appears.



- Enter a name.
- Depending on the type of variable that you chose, either select the appropriate category or enter a range of values. You can specify infinity by entering an asterisk (*) as a value in the **Minimum** or **Maximum** range fields.
- Assign a priority value to each row that you want to include by typing a value in the **Priority** field, or by clicking the **Select** check box in each row in the order of its priority. Priority values must be in a numeric sequence, beginning with the number 1.
- If more than one row is designated in the definition of your criteria, choose the appropriate rule from the **Rule** drop-down list. To nest adjacent rules, select the **Nested** option. You must select **Nested** for all selection rules that you want to group.
- Click to add a row to the Values table. Click to delete a row that you have added. You cannot delete a pre-existing row.
- Enter a value in the **Value** column. The value must match exactly the value of the data item.
- You can exclude audience members who satisfy the selection criteria by selecting **Exclude audience that meet this criteria**.

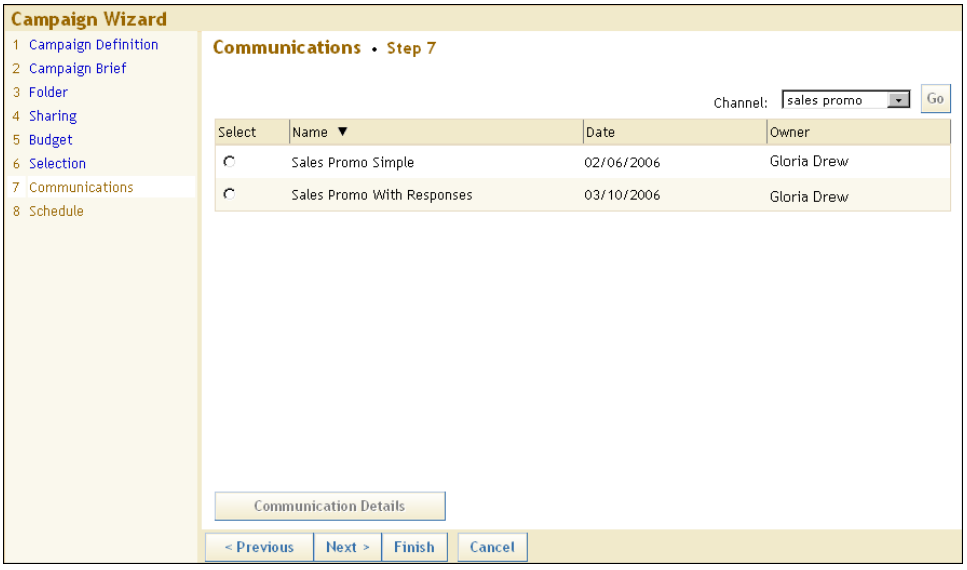
5. Click **Save Criteria** to save the selection criteria.
6. If you define two or more selection criteria, a row appears between each row that shows the operator that connects them. You can select either the **And** or **Or** operator.
7. Click **Run** to update the count. When you click **Run** on the Audience Total row, the total count will appear.



For more information about specifying selection criteria, see "Using the Select Nodes" in the SAS Customer Intelligence Studio documentation.

Add Communications

In this step, you specify communications for the campaign. Click **Add Communication**. A table of available communications definitions appears.



Select a communication definition from the table. To specify details for the communication, click **Communication Details**. When you do, the Communications page opens. For more information about the Communications page, see "Communications Page" on page 297.

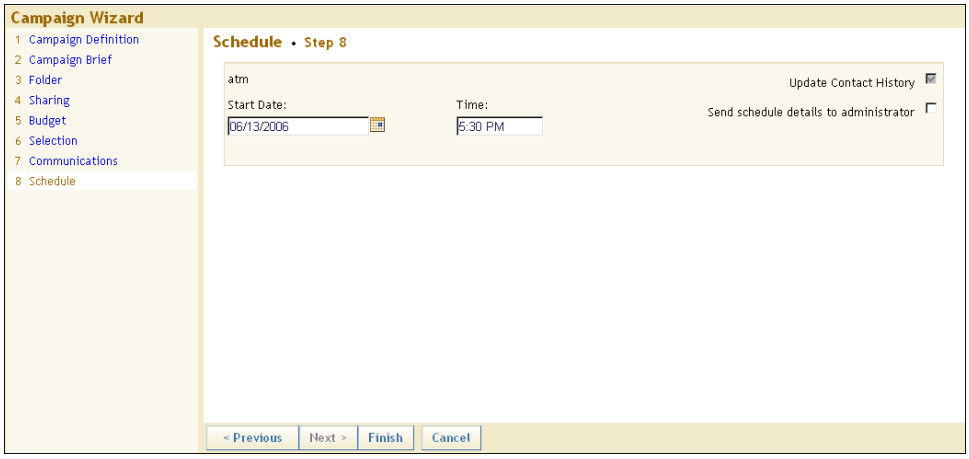
Remember to save the communication by clicking **Save Communication** in the **Communications**

page.

After you have added a communication, you are returned to **Communications - Step 7** in the Campaign Wizard.

Schedule Communications

In this step, you schedule the communication. Specify the start date and time for the communication to execute. If your communication definition contains an export definition, specify the export file or table name and select **Append** if you want the export file or table to be appended to an existing file or table. Select **Send schedule details to administrator**.

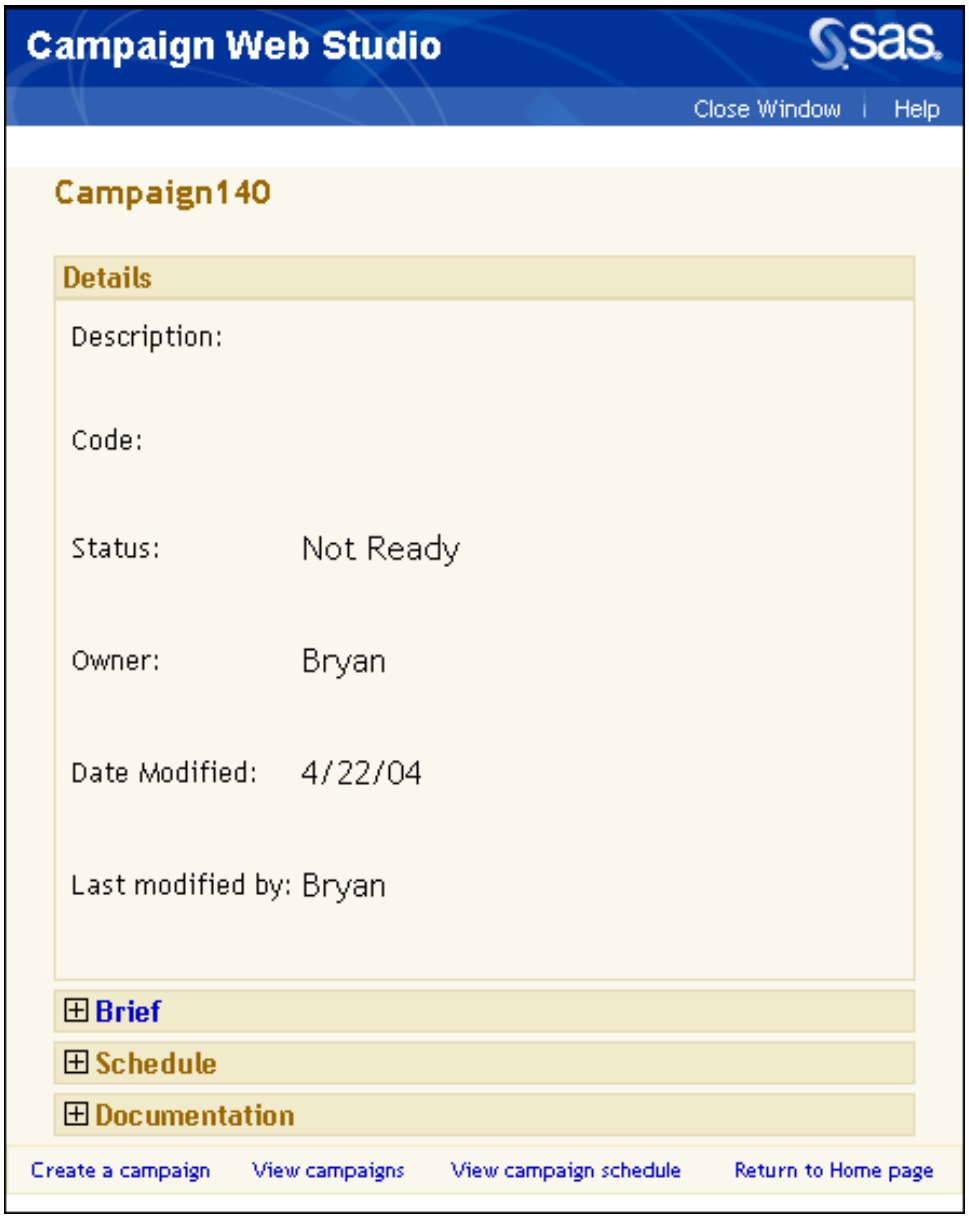


NOTE: If your campaign definition requires approvals, the campaign must be approved by an authorized approver before you can schedule any communications. Click **Finish** to save the campaign. Select **View campaigns** to update the campaign approval status. For more information, see "Viewing Campaigns" on page 299.

When you have finished with this page, click **Finish**. The (CampaignName) page appears. The information you have specified is displayed.

NOTE: Communications can be sent to the scheduler only during the creation of a campaign. You can schedule one occurrence for a communication.

(CampaignName) Page



The (CampaignName) page opens when you have finished creating a campaign with the Campaign wizard. The page can also be opened by selecting **View campaigns** in the portlet and selecting the campaign name or by selecting View campaign schedule in the portlet and double-clicking a campaign link in the Campaign Schedule page.

The **Details** section that is displayed when the page opens contains information that has been entered for a campaign. The last line in the **Details** section displays information about the most recent modifications to the definition. Below the **Details** section, there are additional sections that can be expanded.

Brief Section

Expand the Brief section to display read-only campaign information. Selecting Brief opens the Brief page. For more information, see "Campaign Brief Page" on page 298.

Schedule Section

Expand the Schedule section to display the communication table.

This table displays information about communications in the selected campaign. Each row represents a single communication. The following information about each communication is displayed:

- name
- channel
- audience count
- start date
- end date
- recurrence frequency.

If a communication is recurring, the start and end dates that are displayed refer to the first and last occurrence.

If the campaign is ready to be executed, click **Execute** to create a job flow and send it to the scheduling software. If the campaign is not ready to be executed, click the **Not Executable** link and evaluate the following checklist to ensure that your campaign is ready for execution.

- A least one input node is connected to each communication node.
- A subject is defined for each input node.
- There are no input nodes that are in a "not ready" state.
- Each export definition that is selected has a path or libname that can be accessed from the SAS server.
- Each export definition that is selected has a valid output file or table name.

Click **Add communication** to add a communication to the campaign. For more information, see "Select Communication Definition Page" on page 296.

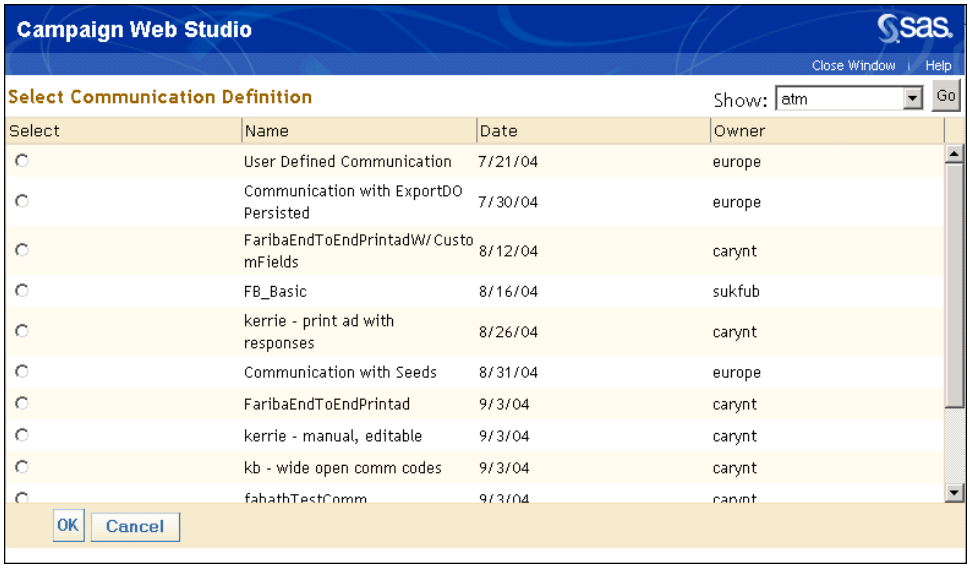
(User-Defined) Section

Expand the User-defined variable section or sections to display any user-defined categories that were set up when the campaign definition was created using SAS Management Console. See “Using the Campaign Definition Plug-In” in the SAS Customer Intelligence Studio Help for more information.

Documentation Section

Expand the Documentation section to display links to documents that you have created in SAS Customer Intelligence Studio for this campaign and the date that the documents were created. For more information about documents, see “Creating Documents” in the SAS Customer Intelligence Studio Help.

Select Communication Definition Page



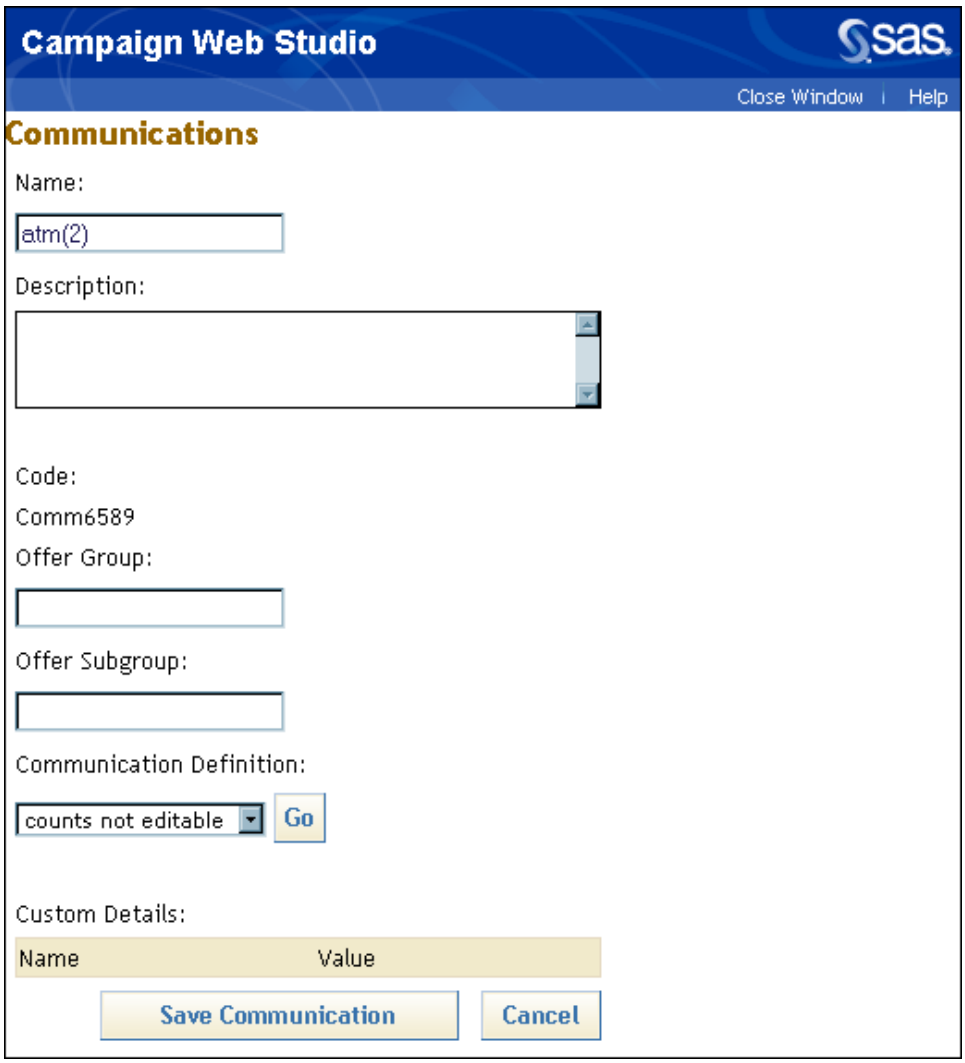
This page opens when you select **Add communication** in the Schedule section of the Campaign page. This page displays the definition name, the date that the communication definition was created or modified, and the owners of communication definitions that have been defined in SAS Management Console. To select a communication definition, select its button and click **Communication Details**. The Communications page opens. Select **Cancel** to close the page.

NOTE: After a seed list has been defined and associated with a communication definition, further changes to the seed list will not be reflected in the campaign in which the communication definition

is used.

For more information about creating campaign definitions, see "Using the Communication Definition Plug-in" in the Marketing Automation Plug-ins for SAS Management Console documentation.

Communications Page



Use this page to add a communication to a campaign.

Name

specifies the name of the communication. The communication definition channel is displayed by default.

Description

enables you to specify a description for the communication.

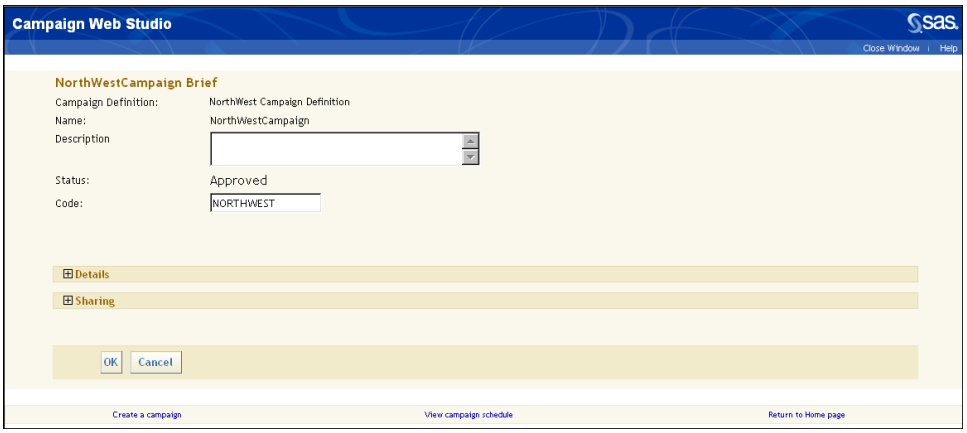
Code
displays the communication code.

Offer Group/Offer Subgroup
Use these fields to enter the names of offer groups. Offer groups are site-specific identifiers that are used to organize communications.

Communication Definition
Use this drop-down list and click **Go** to specify a different communication definition for this communication.

Custom Details
displays the user-defined fields for the selected communication definition.

Campaign Brief Page



The Campaign Brief page opens when you click **Brief** in the (CampaignName) page. This page displays more detailed information about a campaign.

The top section of the page contains the following boxes:

Campaign Definition
displays the campaign definition name.

Name
displays the campaign name.

Description
enables you to enter a description of the campaign.

Status
displays the campaign status.

Code
displays the campaign code. In most cases, this box is read-only.

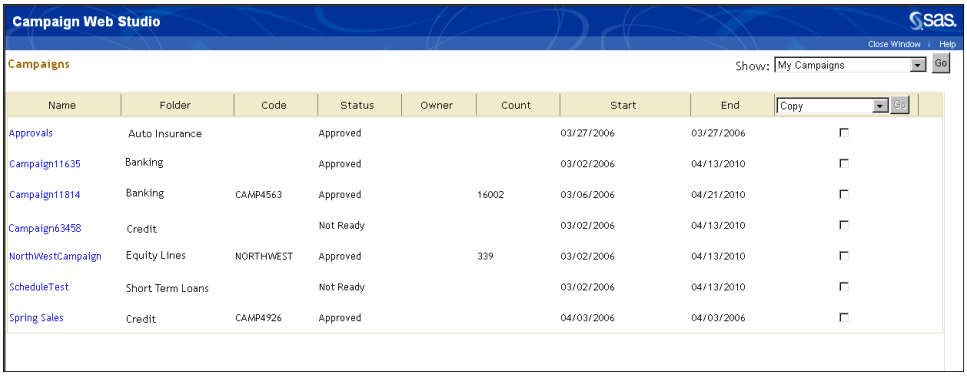
Campaign Details

Expand the Details section of the Campaign Brief page to display any user-defined fields. These fields are created using the Campaign Definition Plug-In in SAS Management Console. User-defined fields provide details about the campaign such as campaign budget, campaign manager, and product group.

Campaign Sharing

Expand the Sharing section to display users or groups and their designated permissions for a campaign. Users and groups are defined with the User Manager in SAS Management Console. You can modify permission to access a campaign in this page by making the appropriate selections. You can grant view permission to everyone in the list by selecting **View All**. Click **Clear All** to clear all selections.

Viewing Campaigns



Selecting the View Campaigns link from the SAS Portal opens the Campaigns page.

You can choose to view your campaigns, all campaigns, or campaigns that need approval by selecting **My Campaigns**, **All Campaigns**, or **Campaigns that Need Approval** from the **Show** drop-down list and selecting **Go**.

NOTE: The **Campaigns that Need Approval** filter displays only campaigns that need approval by the user who is currently logged on.

Either selection will display the same type of campaign information in the table. Here is an explanation of the columns in the table.

Name
displays the campaign name. Click on the name to display the Campaign page for this campaign.

Folder
displays the folder in which the campaign is located.

Code
displays the campaign code.

Status
displays the campaign status. For recurring campaigns, this column is empty.

Owner
displays the name of the user who created the campaign definition.

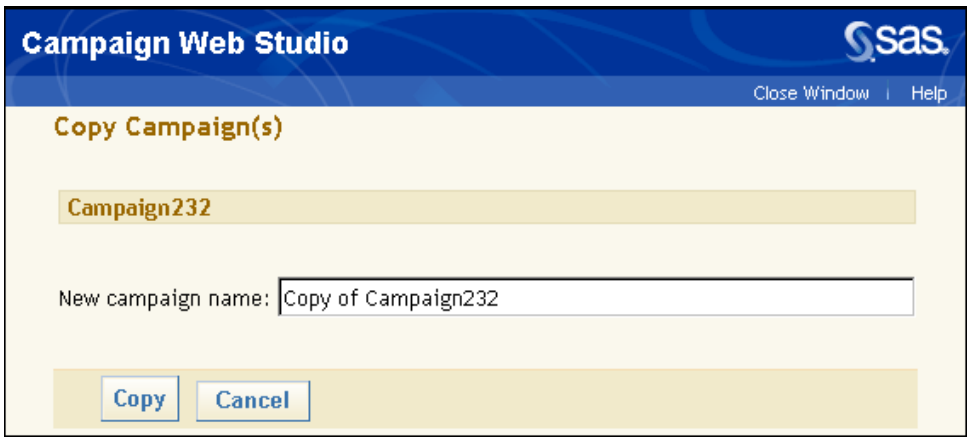
Count
displays the number of unique accounts for the communication.

Start
displays the start date. For recurring campaigns, this column displays the start date of the first occurrence.

End
displays the end date. For recurring campaigns, this column displays the end date of the last occurrence.

To apply an action to a campaign, select the check box for the campaign and select an action from the drop-down list. Click **Go**. If the action is **Add to Portlet** or **Remove from Portlet**, a message is displayed when the action is complete. You cannot delete or rename a campaign that you do not own.

Copying or Renaming a Campaign



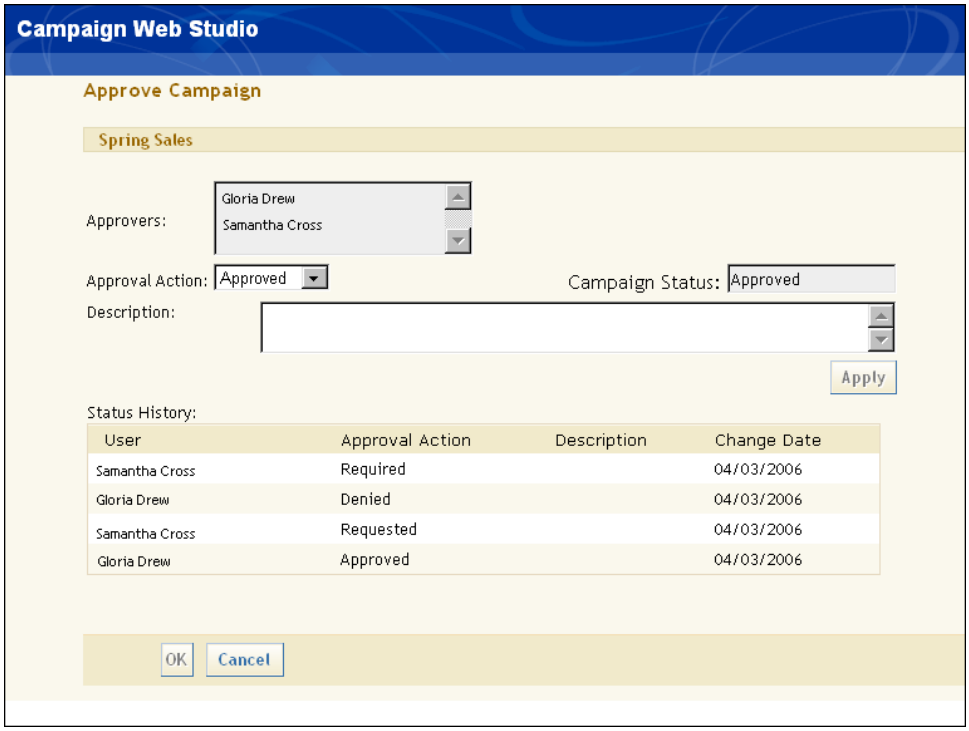
This page appears when you select **Copy** or **Rename** from the drop-down list in the Campaigns page. The title of this page reflects the name of the action that you selected in the Campaigns page, either **Copy** or **Rename**. Below the title is the name of the campaign that you selected to be copied or renamed. The **New campaign name** field enables you to enter a new name for the campaign that you are creating.

The new name that you enter is validated when you select **Copy** or **Rename** and the Campaigns page is displayed. The copy of the campaign is saved in the Marketing Automation folder. For both situations, the new name cannot be the same as the name of an existing campaign.

Select **Cancel** in both cases to close the page without making any changes. For more information about the Campaigns page, see "Viewing Campaigns" on page 299.

Updating Campaign Approvals

When you select **Update Approvals** from the drop-down list on the Campaigns page and click **Go**, the Approvals window opens.



You can change the approval status of a campaign, view the list of users who have approval permissions for the campaign, and view the history of changes in approval status.

To change the approval status of a campaign, select an item from the **Approval Action** drop-down list and click **Apply**. You can select one of the following approval actions:

Required
Approval is required for this campaign. This is the default selection.

Requested
The campaign is ready to be approved by one of the users who have approval permissions for the campaign.

Approved
The campaign has been approved. This selection is enabled if you have approval permissions.

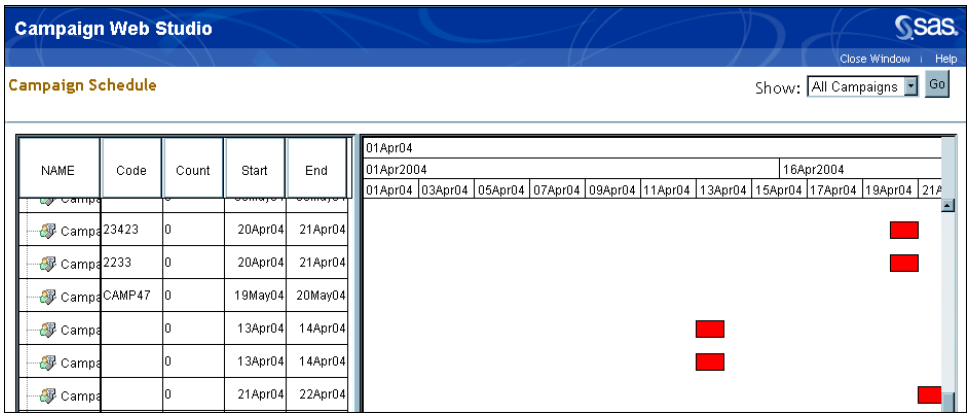
Denied
The campaign has been denied. This selection is enabled if you have approval permissions.

You can enter a description of your approval action in the **Description** field.

The Status History table displays the name of the approver, the approval action, description, and date modified for every change in the approval status for this campaign.

Click **OK** to close the Approvals window and save the changes to your campaign.

Viewing a Campaign Schedule



Select **View campaign schedule** to open the Campaign Schedule page.

The Campaign Schedule page displays a table of campaigns that have been created. The table can be filtered to view only campaigns that you created or to view all campaigns. Select your criteria in the **Show** drop-down list and select **Go**.

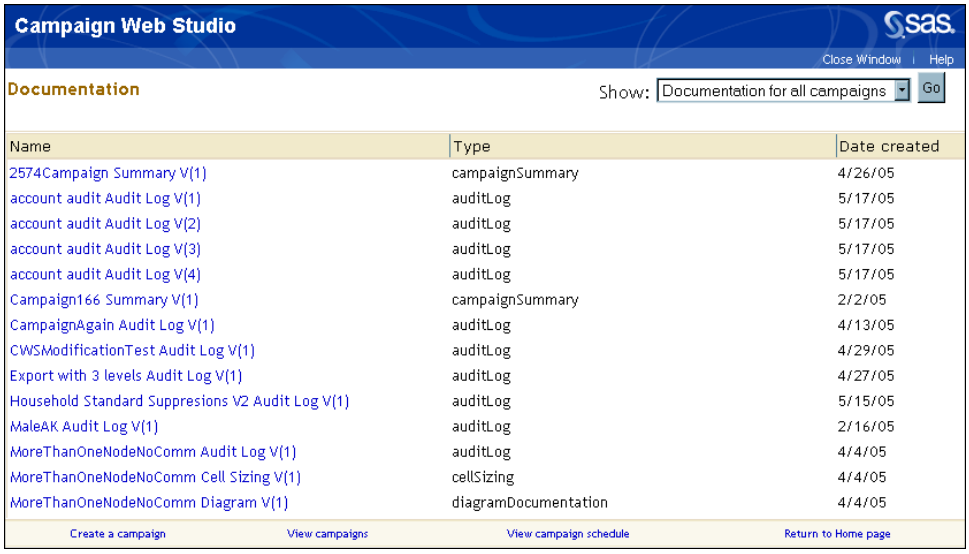
The first part of the table contains information about a campaign, including the campaign code, audience count, and start and end dates.

The area to the right of the table contains a Gantt chart. A Gantt chart displays a bar for each campaign that provides a picture of the life span of a campaign by highlighting the time frame of the campaign activity. To make more or less of the Gantt chart visible, click the small section to the right or left of the scroll box in the horizontal scroll bar and drag it right or left. Dragging the

scroll box will also enlarge the date text at the top of the chart if it is too small to read. Selecting a campaign opens the Campaign page. For more information about this page, see "(CampaignName) Page" on page 294.

Viewing Documentation

Selecting **View documentation** opens the Documentation page. This page displays links to all documents that were created with SAS Customer Intelligence Studio, the type of document, and the date the documents were created. You can choose to view all documents or just the documents that you created by choosing **Documentation for all campaigns** or **Documentation for my campaigns**, respectively, from the **Show** drop-down list. For more information about documents, see "Creating Documents" in the SAS Customer Intelligence Studio Help.



Business Contexts

A business context defines the data, definitions, and environment settings that an individual user can access. Different business users within the same company can access different sets of data, templates, and definitions, depending on the business contexts that have been configured for them. One business context might access a flat database structure that is designed for customer-based marketing, while another business context might access a complex database structure that is designed for prospect-based marketing.

Business contexts are configured in the Marketing Automation Administration plug-in in SAS Management Console. A user can be assigned access to one or more business contexts.

Changing a Business Context

If you have been assigned access to more than one context in the SAS Management Console, you can change the business context that you are using in Campaign Web Studio.

To change a business context:

1. Close any Campaign Web Studio pages that are open.
2. On the Marketing Automation Tasks tab, select **Select business context**.
3. In the Select Business Context page, select a different context and click **OK**.

Depending on the configuration of business contexts at your site, a Master Business Context might be displayed in the list. This business context contains all campaign definitions and communication definitions that have been created for your site.

As you work in Campaign Web Studio, you will be able to select only those campaigns that have been assigned to your business context. All campaigns, diagrams, and other information are saved as part of the current business context. Other business contexts do not have access to this information.

Chapter 11

Examples

Contents

Using And Node Options **305**
Select Data for Customers and Purchases 306
Selecting Data Based on Contact History 307
Using Or Node Options **307**
Using Or Node Options with Inner Joins 307
Using Or Node Options with Measures 308
Calculating Relative Dates **310**
Create a Calculated Data Item 310
Create a Select Node 312
Creating a Suppression **313**
Using a Multi-select Node to Specify Age Restrictions 314
Using Select Nodes to Exclude Customers 314
Using an Or Node to Combine Criteria 316
Creating a Cell Node for Use by Other Diagrams 317
Using the Map Node to Combine Subjects from Different Categories **318**
Selecting a Credit Card Account 318
Specifying a Minimum Account Balance 320
Mapping Accounts to Customers 322
Targeting Customers Who Want to Be Contacted 324
Using the Process Node with Predecessor Nodes **326**
Using the Process Node with No Predecessor Nodes **326**
Using the Process Node with Multiple Input Nodes **327**
Using the Process Node as the Only Node in a Diagram **329**
Exporting Across Subjects **329**
Example 1 332
Example 2 333

Using And Node Options

You can use And node options to differentiate between groups of customers based on their contact history. The option that you select depends on the structure of your information map. For example,

if the relationship between two data tables is one-to-many, the different options will yield different results.

Select Data for Customers and Purchases

These examples use both a Customer table and a Purchases table. Both tables are in the Customer category. The relationship of the Customer table to the Purchases table is one-to-many. That is, one customer might have many purchases.

The Customer table contains **CustKey** and **Name** fields:

A - John
B - Mary
C - Peter

The Purchases table contains **Custkey**, **Item**, and **Price** fields:

A - Shoes - 70€
A - Shirts - 20€
B - Shirts - 50€
C - Shoes - 40€
C - Shirts - 60€

To select all of the customers who bought shirts for EUR 50 or more, follow these steps:

1. In the diagram workspace, create a Select node that selects **Shirts** from the Purchases table.
2. Create a second Select node that selects **Price** from the Purchases table and specifies that the minimum price equals EUR 50.
3. Connect the two Select nodes with an And node. In the Properties window for the And node, select **meets all conditions defined by input nodes**. The resulting group will contain Customers B and C, who each bought a shirt for EUR 50 or more.

To select all of the customers who bought shirts and who spent EURO 50 or more on a purchase, follow these steps:

1. In the diagram workspace, create a Select node that selects **Shirts** from the Purchases table.
2. Create a second Select node that selects **Price** from the Purchases table and specifies that the minimum price equals EURO 50.
3. Connect the two Select nodes with an And node. In the Properties window for the And node, select **is a member of each group defined by input nodes**. Because the item and the price are not directly related, the resulting group will contain C ustomers A, B, and C, who each bought a shirt and who each spent EURO 50 or more, whether or not that purchase was a shirt.

Selecting Data Based on Contact History

This example uses both a Contact History table and a Customer table.

To select only those customers who were contacted in a specified campaign in the past six months, follow these steps:

1. In the diagram workspace, create a Select node that uses the Contact History table to select customers who were contacted in Campaign X.
2. Create a second Select node that uses the Contact History table to select customers who have been contacted in the last six months.
3. Connect the two Select nodes with an And node. In the Properties window for the And node, select **meets all conditions defined by input nodes**. The resulting group will contain only those customers who were contacted in the last six months b y Campaign X.

Using Or Node Options

In many cases, either of the two Or node options (**meets any conditions defined by input nodes** and **is a member of any of the groups defined by input nodes**) will produce the same results. However, in cases that involve the use of inner jo ins or aggregate functions such as Sum or Max, each Or node option can yield a different result.

Using Or Node Options with Inner Joins

This example uses both a Customer table and an Orders table. In the information map on which the campaign definition is based, the relationship between the two tables is defined as an inner join. The goal is to identify new customers and customers who ha ve made an order within the last month.

The diagram contains two Select nodes:

- A Select node that identifies customers who have made orders within the last month.
- A Select node that identifies customers who have been acquired within the last month. Some of these new customers do not have any orders.

The two Select nodes are joined by an Or node. To identify all of the customers who have been acquired within the last month and all the customers who have made an order within the last month, select **is a member of any of the groups defined by in put nodes**. This option creates a union of

the customer IDs that qualify for each of the individual Select nodes that are connected to the Or node.

If the **meets any conditions defined by input nodes** option is selected, the inner join effectively adds another set of criteria that applies to all customers, so that each customer that is selected must have made an order. Customers who have not made any orders will be excluded.

Using Or Node Options with Measures

This example uses a Customer subject, an Order subject, and an Order_item subject, each of which is represented by a table of the same name. The Order table contains an Order_Date data item. The Order_Item table contains a Product_Category data item. A measure named Order_Cnt has been created at the Customer subject level; it is represented in the underlying SQL as `count(distinct o.orderid)`. Each of the tables supports the Customer subject level.

The purpose of the diagram is to identify all customers who have purchased at least three orders of the **Sports** Product_Category in January 2007, or have at least five orders of the **Children** Product_Category in December 2006.

The diagram contains two sets of Select nodes. The nodes in each set are joined by an And node. The **meets all conditions defined by input nodes** option has been selected for both And nodes.

The first set consists of the following Select nodes:

- Order.Order_Date between 1/1/2007 and 1/31/2007
- Order_Item.Product_Category = 'Sports'
- Order_Cnt > 3.

The second set consists of the following Select nodes:

- Order.Order_Date between 12/1/2006 and 12/31/2006
- Order_Item.Product_Category = 'Childrens'
- Order_Cnt > 5.

Connect the And nodes with an Or node. To identify all customers who have purchased at least three orders of the **Sports** Product_Category in January 2007, or have at least five orders of the **Children** Product_Category in December 2006, select the Or node option **is a member of any of the groups defined by input nodes**.

This is the underlying SQL for the first And node:

```
Select distinct customer.customerid
from customers c join orders o on c.customerid=o.customerid
```

```
join order_items oi on o.orderid = oi.orderid
Where o.order_date between 1/1/2007 and 1/31/2007
and oi.product_category = 'Sports'
Group by 1
Having count(distinct o.orderid) > 3
```

This is the underlying SQL for the second And node:

```
Select distinct customer.customerid
from customers c join orders o on c.customerid=o.customerid
join order_items oi on o.orderid = oi.orderid
Where o.order_date between 12/1/2006 and 12/31/2006
and oi.product_category = 'Children'
Group by 1
Having count(distinct o.orderid) > 5
```

The Or node that has the **is a member of any of the groups defined by input nodes** option selected generates the correct result. The following SQL combines the customers that meet either of the And criteria:

```
Select distinct customer.customerid
from customers c join orders o on c.customerid=o.customerid
join order_items oi on o.orderid = oi.orderid
Where o.order_date between 1/1/2007 and 1/31/2007
and oi.product_category = 'Sports'
Group by 1
Having count(distinct o.orderid) > 3
Union
Select distinct customer.customerid
from customers c join orders o on c.customerid=o.customerid
join order_items oi on o.orderid = oi.orderid
Where o.order_date between 12/1/2006 and 12/31/2006
and oi.product_category = 'Children'
Group by 1
Having count(distinct o.orderid) > 5
```

NOTE: : You can produce the same results regardless of which Or node option you select if you link a Cell node to each of the And nodes and link the two Cell nodes to the Or node.

If the Or node option were **meets any conditions defined by input nodes**, the Or node would generate the following SQL:

```
Select distinct customer.customerid
from customers c join orders o on c.customerid=o.customerid
join order_items oi on o.orderid = oi.orderid
Where (o.order_date between 1/1/2007 and 1/31/2007
and oi.product_category = 'Sports')
Or (o.order_date between 12/1/2006 and 12/31/2006
and oi.product_category = 'Children')
Group by 1
Having count(distinct o.orderid) > 3 or count(distinct o.orderid) > 5
```

Instead of the desired result, this SQL identifies all customers with more than three orders of either children's items in December or sports items in January. The **Meets any conditions defined by input nodes** option combines the criteria from the preceding Select or Multi-select nodes into the SQL Where clause or the Having clause for aggregates and measures. The Where clause criteria are evaluated in SQL on a row-by-row basis against the denormalized results of the From clause. When you selec t the **Meets any conditions defined by input nodes** option, the category criteria must be satisfied within one particular order or order item. Measure criteria are evaluated in aggregate across all qualifying rows within a grouping that is defined by the subject ID.

Calculating Relative Dates

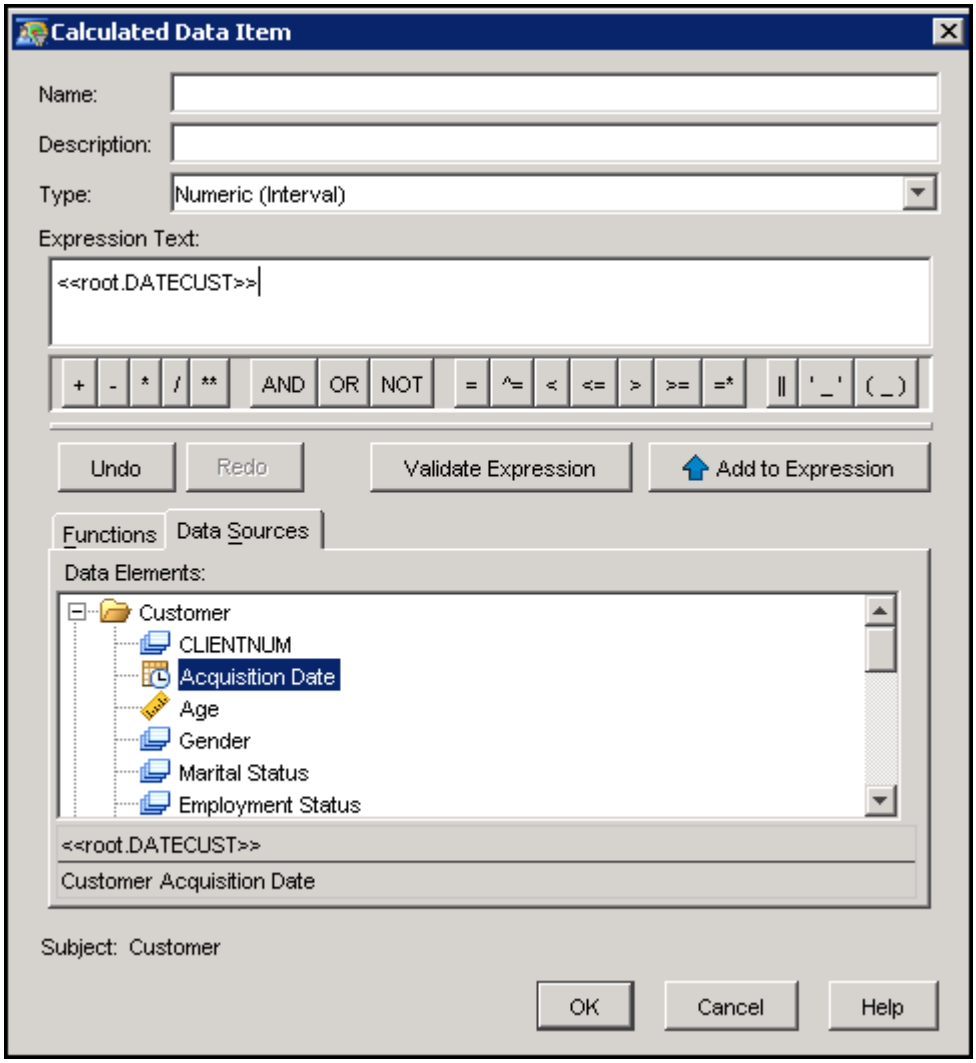
You can use calculated data items to produce data for relative dates, such as lists of customers whose payment date is in the last seven days or who have had an account for five years.

This example uses a calculated data item to identify customers who have had an account for five years.

Create a Calculated Data Item

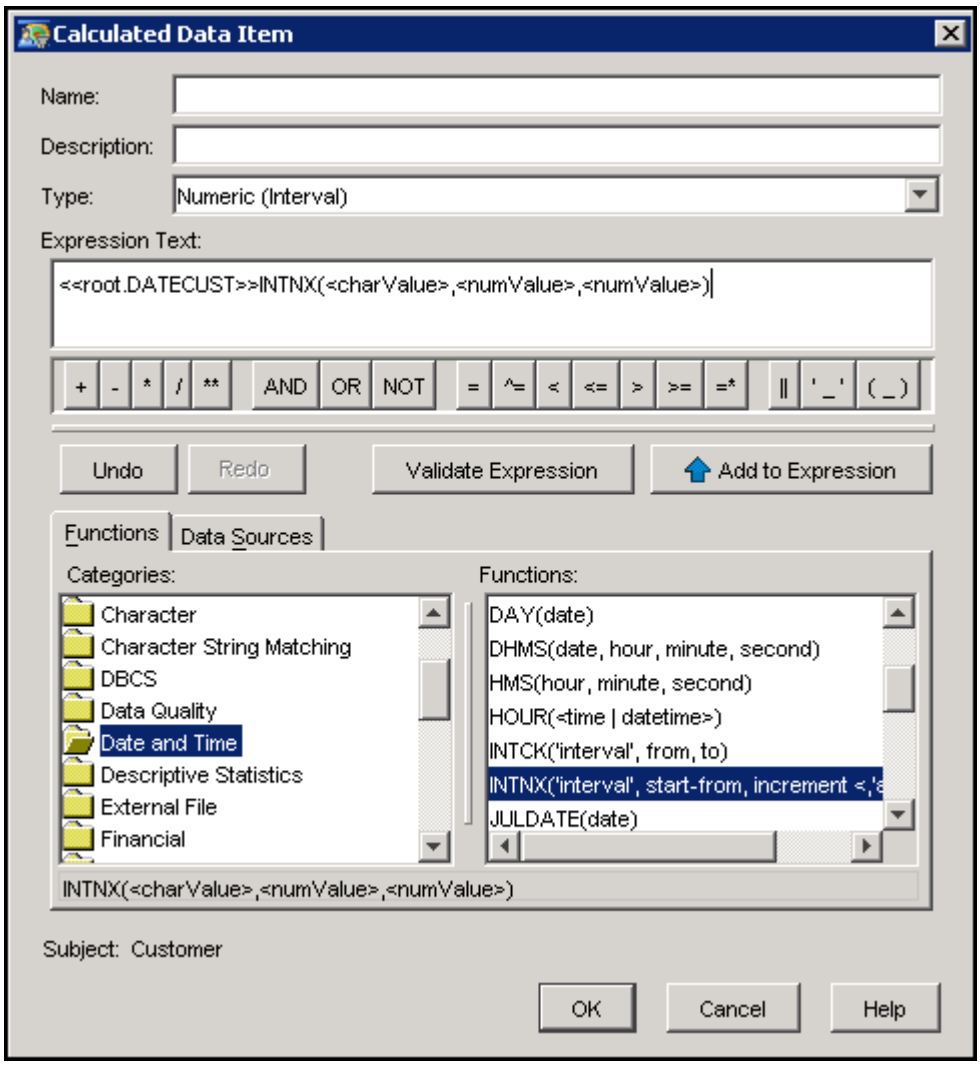
To create a calculated data item, follow these steps:

1. Within SAS Customer Intelligence Studio, select **File** ➧ **New** ➧ **Selection Diagram**.
2. Drag a Select node onto the diagram workspace.
3. Right-click the node and select **Properties**.
4. In the Properties window, click **Create**.
5. Select the **Data Sources** tab.
6. In this example, the customer acquisition date is stored in the **Customer** subject of the **Customer** category. Expand the **Customer** folder and double-click **Acquisition Date**. `«root.DATECUST»` is displayed in t he **Expression Text** field.



7. Select the **Functions** tab.

8. The INTNX function advances a date value by a given interval and returns a date value. Expand the **Date and Time** category in the **Categories** list and double-click **INTNX**. **`INTNX(<charValue>,<numValue>,<numValue>)`** is ad ded to the expression text.



9. Edit the expression text so that it reads as follows:

   ```
   «root.DATECUST» > INTNX('YEAR',today(),-5)
   ```

   The expression will search for any customers whose acquisition date is five years earlier than the current year.

10. Type **Customer for Five Years** in the **Name** field and click **OK**. The calculated data item is saved and can be selected later for use in a Select node.

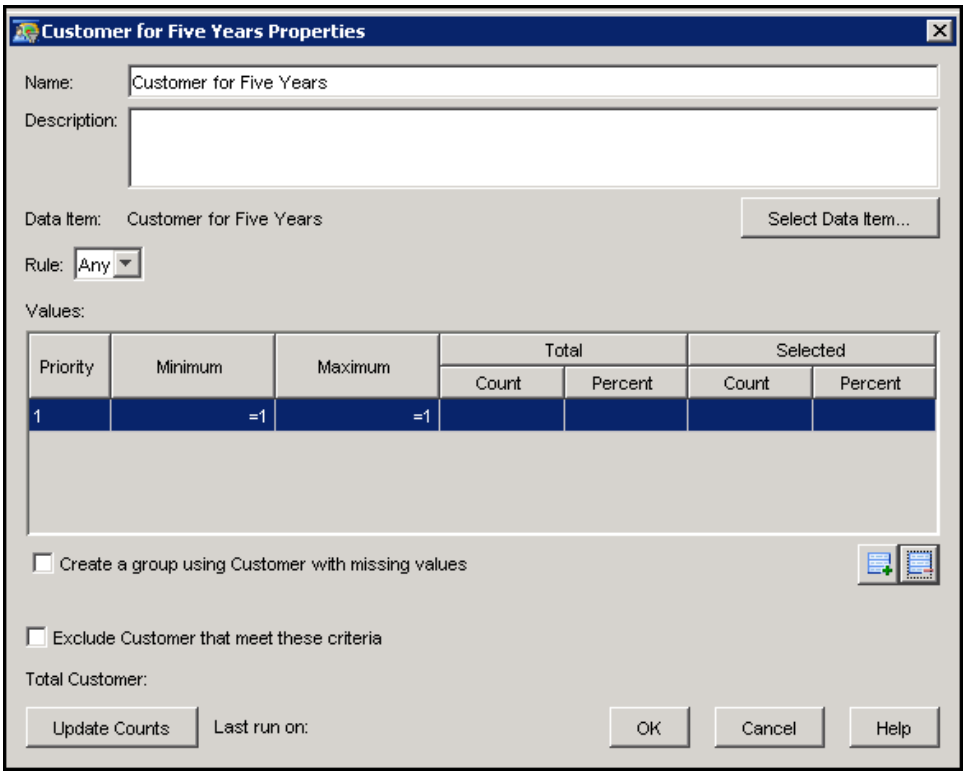
Create a Select Node

You can now create a Select node that identifies customers who have had an account for five years. To create the Select node, follow these steps:

1. Double-click **Customer for Five Years** in the Select Data Item window.

2. Click in the Properties window.

3. Enter a value of **1** (true) in the **Minimum** cell and in the **Maximum** cell. This action will select all of the customers who meet the requirements of the expression. Entering a value of **0** (false) would select all of t he customers who do not meet the requirements of the expression.



4. Click **OK** to close the window and save your changes to the Select node.

Creating a Suppression

You can create separate diagrams that contain groups that can be used in other campaigns and diagrams.

Suppression diagrams identify groups of customers who should not be contacted in marketing campaigns. For example, some customers may have asked that they not be contacted, some may have poor credit ratings, and some may not fall within the age restrict ions for the campaign.

Because these criteria can affect more than one marketing campaign, it is most efficient to create a separate suppression diagram and then reuse the data in multiple campaigns.

This example identifies customers who are under 18 years old or are 70 years old or older, who are a high credit risk, or who are not contactable. Because these customers will be used in other diagrams as a standard exclusion group, the cell node is avail able for linking.

This suppression diagram contains one Multi-select node, two Select nodes, an Or node, and a Cell node. The data is selected from the Customer category, which contains a Customer subject level.

Using a Multi-select Node to Specify Age Restrictions

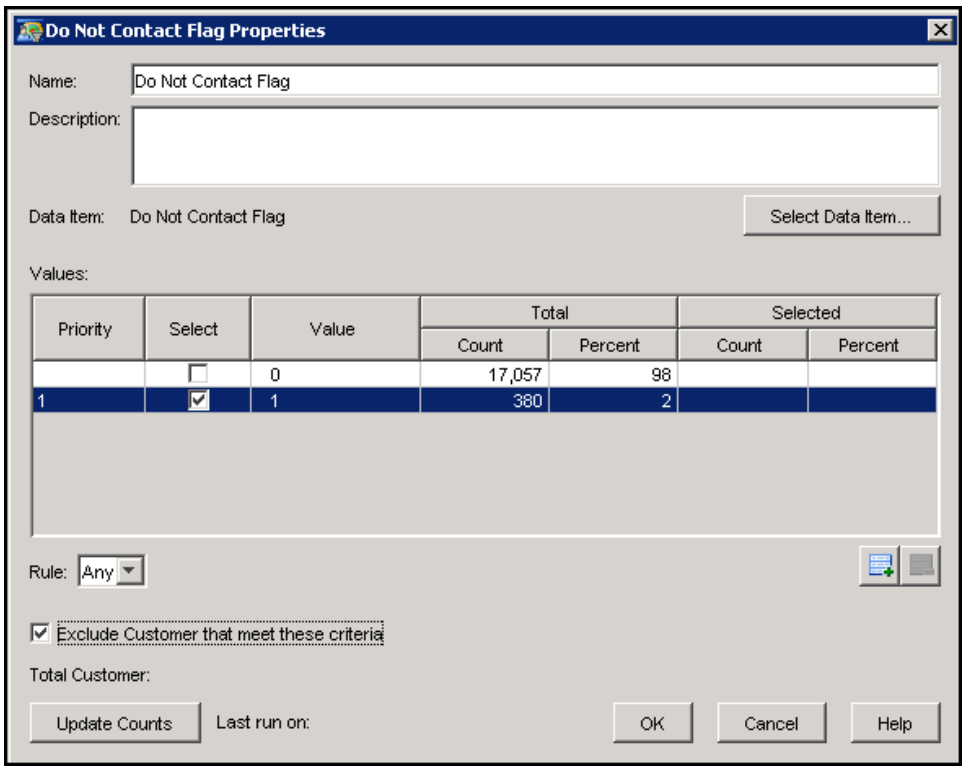
To create a Multi-select node that excludes customers who are under 18 years old or are 70 years old or older, follow these steps:

1. Within SAS Customer Intelligence Studio, select **File** ➧ **New** ➧ **Selection Diagram**.
2. You can use a multi-select node to identify customers who fall outside the age range. Drag a multi-select node onto the diagram workspace.
3. Right-click the node and select **Properties**.
4. In the Properties window, select **Data item** from the drop-down list.
5. Double-click **Age** in the Select Data Item window.
6. Select **<** from the drop-down list.
7. Type **18** in place of **<Select or enter a value>**.
8. Click **Add** to add customers whose age is under 18 to the Filter Combinations table.
9. In the same way, select customers whose age is greater than or equal to 70 and add them to the Filter Combinations table.
10. In the Filter Combinations table, select **Age < 18** and click **Not**. Select **Age >= 70** and click **Not** to exclude customers whose age is outside the 18 - 69 age range.
11. Type **Outside of Age Range** in the **Name** field and click **OK** to close the window and save your changes.

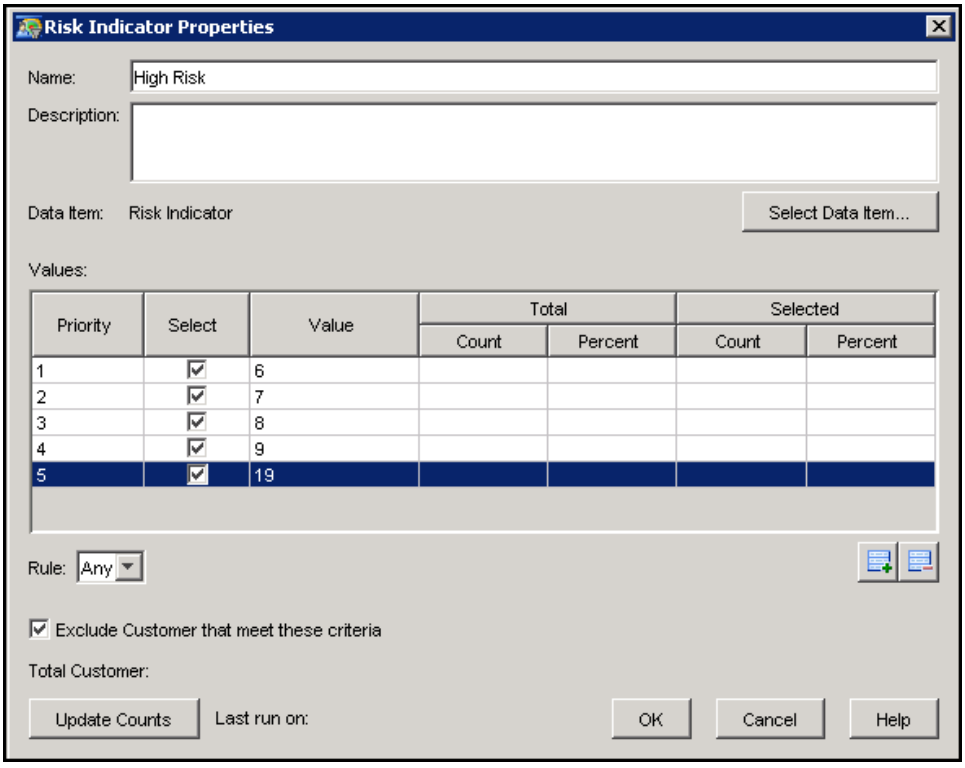
Using Select Nodes to Exclude Customers

To create Select nodes that exclude customers who do not want to be contacted or who are high credit risks, follow these steps:

1. Drag a Select node onto the diagram workspace.
2. Right-click the node and select **Properties**.
3. In the Properties window, double-click **Do Not Contact Flag**.
4. In the Values table, select the row whose **Value** field contains 1 to identify the customers who do not want to be contacted.
5. Select **Exclude Customer that meet these criteria**.



6. Click **OK** to close the window and save your changes.
7. Drag another Select node onto the diagram.
8. In the Properties window for that node, double-click **Risk Indicator**.
9. In the Risk Indicator Properties window, click to add a row to the Values table.
10. This example excludes customers who have a risk value that is greater than five. Type **6** in the **Value** field.
11. Add four more rows, with values of **7**, **8**, **9**, and **10**.
12. Type **High Risk** in the **Name** field.
13. Select **Exclude Customer that meet these criteria**.

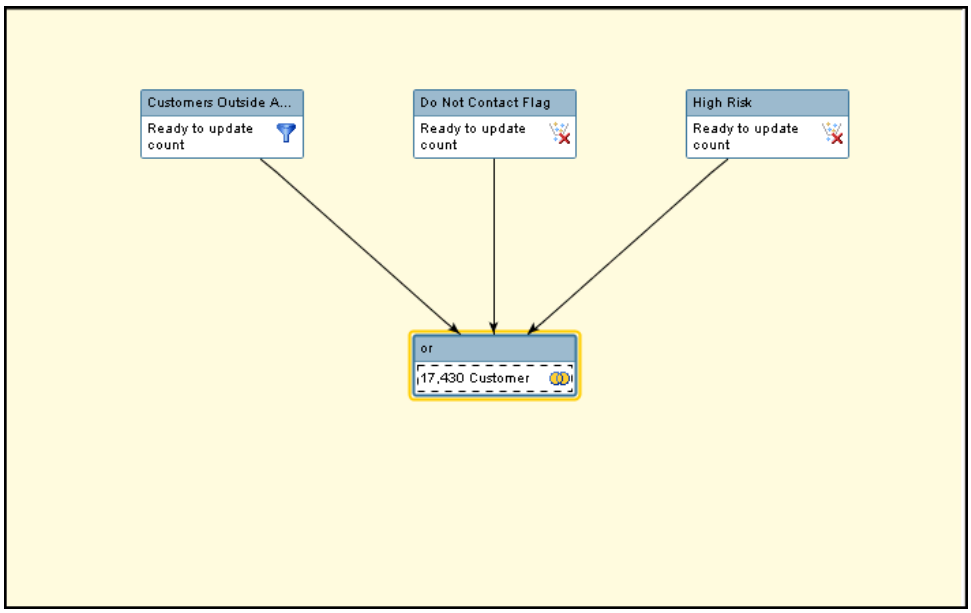


14. Click **OK** to close the window and save your changes.

Using an Or Node to Combine Criteria

To use an Or node to combine the criteria that you have specified, follow these steps:

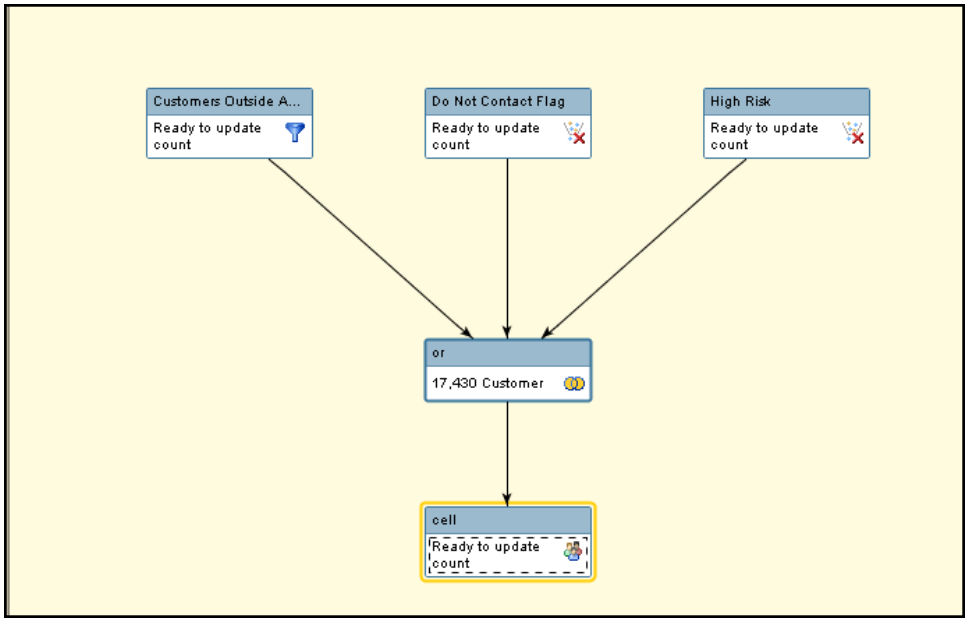
1. Drag an Or node onto the diagram workspace.
2. Connect the Multi-select node and the Select nodes to the Or node.
3. Right-click the Or node and select **Update counts** to display the total count of customers who are outside the age range, or who are high risk, or who do not want to be contacted.



Creating a Cell Node for Use by Other Diagrams

To create a Cell node that other diagrams can link to, follow these steps:

1. Drag a Cell node onto the diagram workspace.
2. Connect the Cell node to the Or node.
3. Right-click the Cell node and select **Properties**.
4. Select **Make cell available for linking**.
5. Type **Excluded Groups** in the **Name** field and click **OK** to close the window and save your changes.



6. Select **File** ➧ **Save as**.
7. In the Save As window, type **Excluded Groups** in the **Name** field and click **OK** to close the window and save your diagram.

Using the Map Node to Combine Subjects from Different Categories

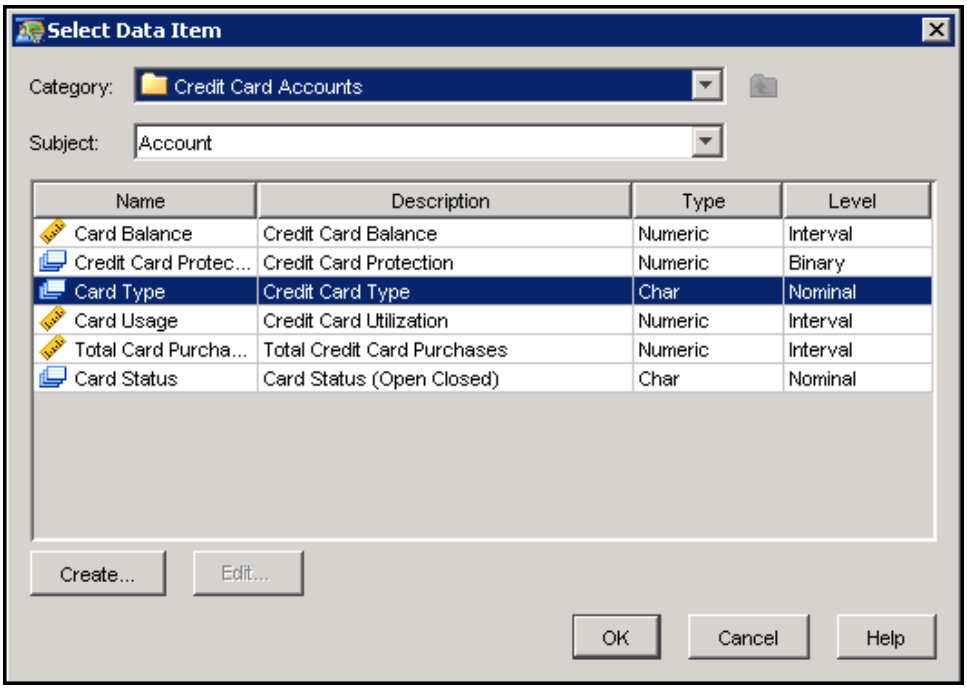
You can use the Map node to create relationships between subjects from different categories. This example reveals customers who can be contacted and who have a VISA account with a balance greater than $1,000.

Selecting a Credit Card Account

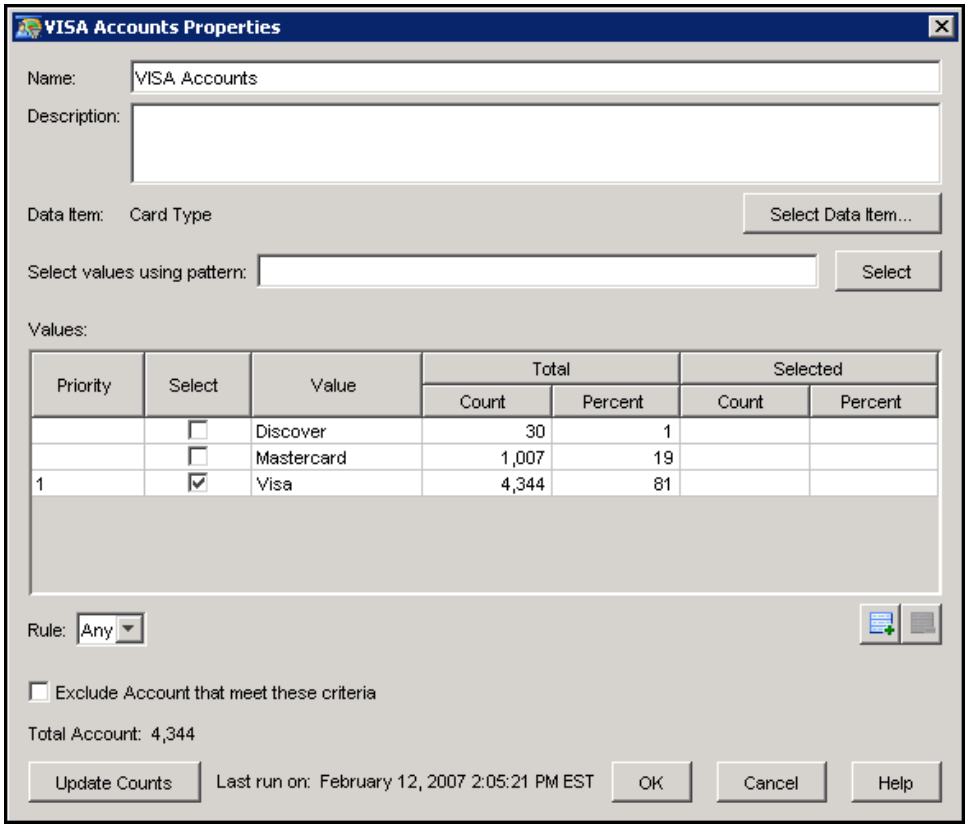
To select customers who have a VISA account, follow these steps:

1. Within SAS Customer Intelligence Studio, select **File** ➧ **New** ➧ **Selection Diagram**.
2. Drag a Select node onto the diagram workspace.
3. Right-click the Select node and select **Properties**.
4. In this example, credit card information is contained in the Accounts subject of the Credit Card Accounts category. Select **Credit Card Accounts** from the **Category** drop-down list.

5. Select **Account** from the **Subject** drop-down list.
6. Double-click **Card Type**.



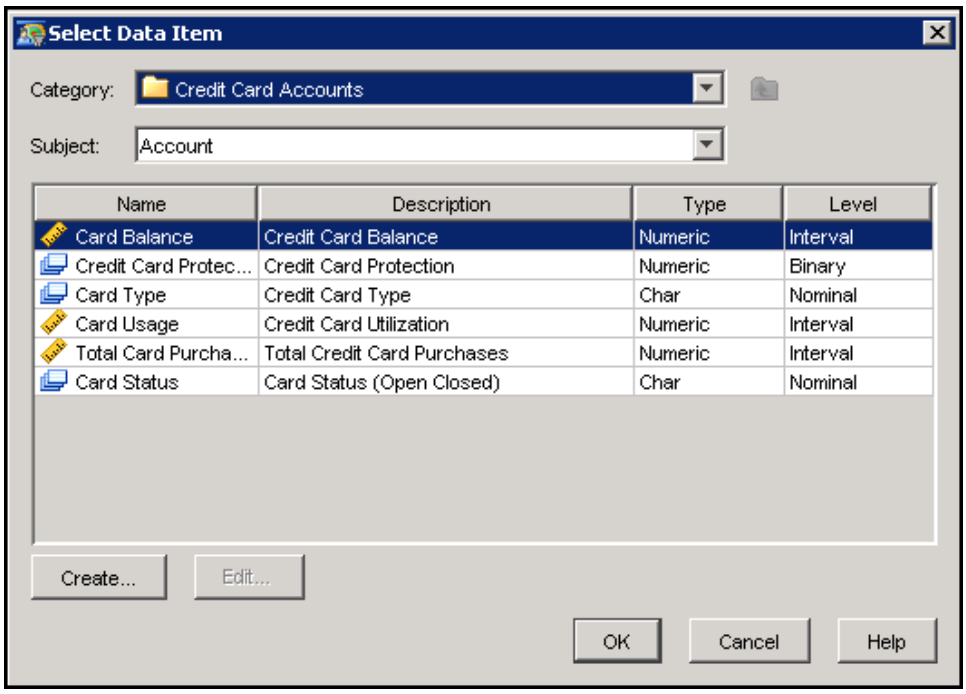
7. Select **VISA**.
8. Type **VISA Accounts** in the **Name** field and click **OK**.



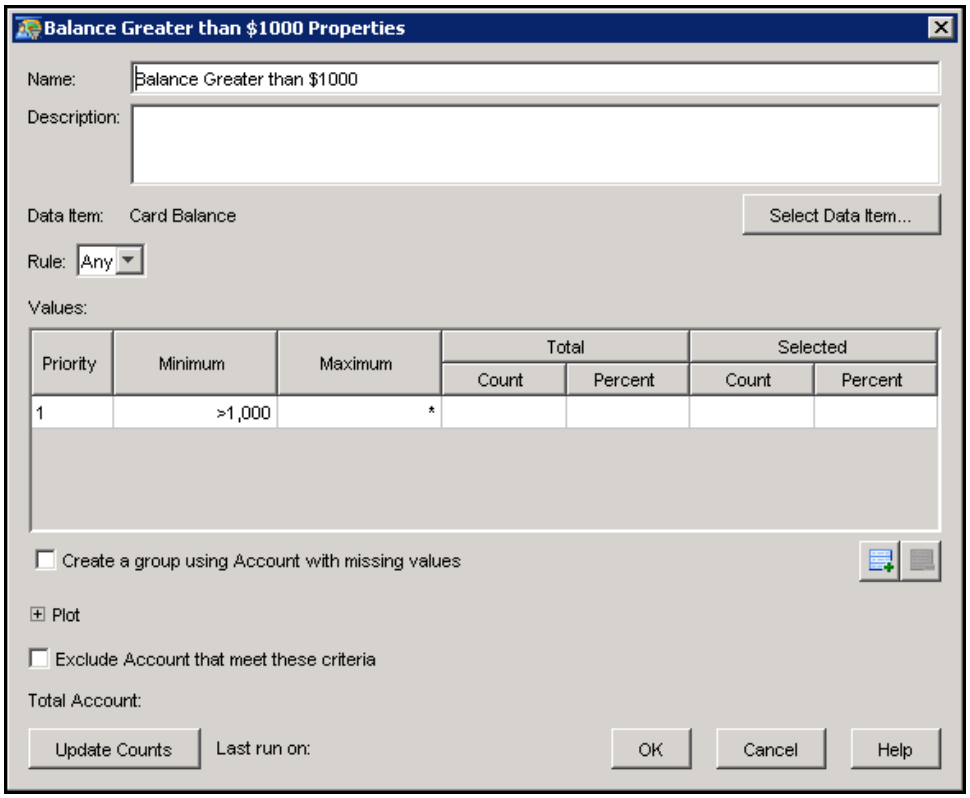
Specifying a Minimum Account Balance

To specify a minimum account balance for the VISA accounts, follow these steps:

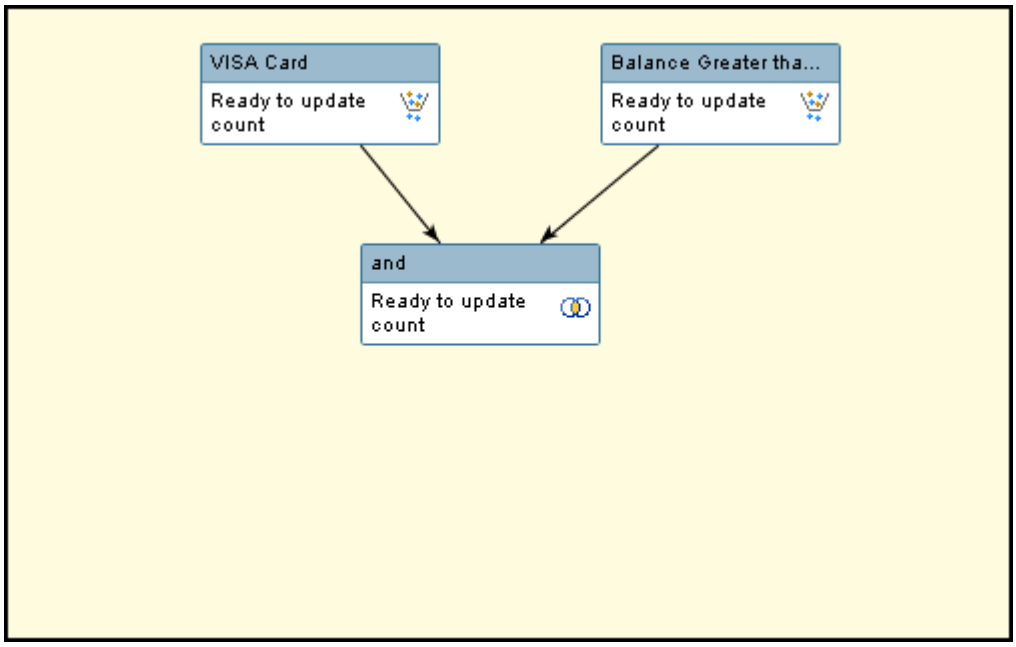
1. Drag another Select node onto the diagram workspace.
2. Right-click the Select node and select **Properties**.
3. From the **Account** subject of the **Credit Card** category, double-click **Card Balance**.



4. In the Properties window, select .
5. Select **>** from the drop-down list in the **Minimum** cell and type **1000**.
6. Type **Balance Greater than $1000** in the **Name** field and click **OK**.



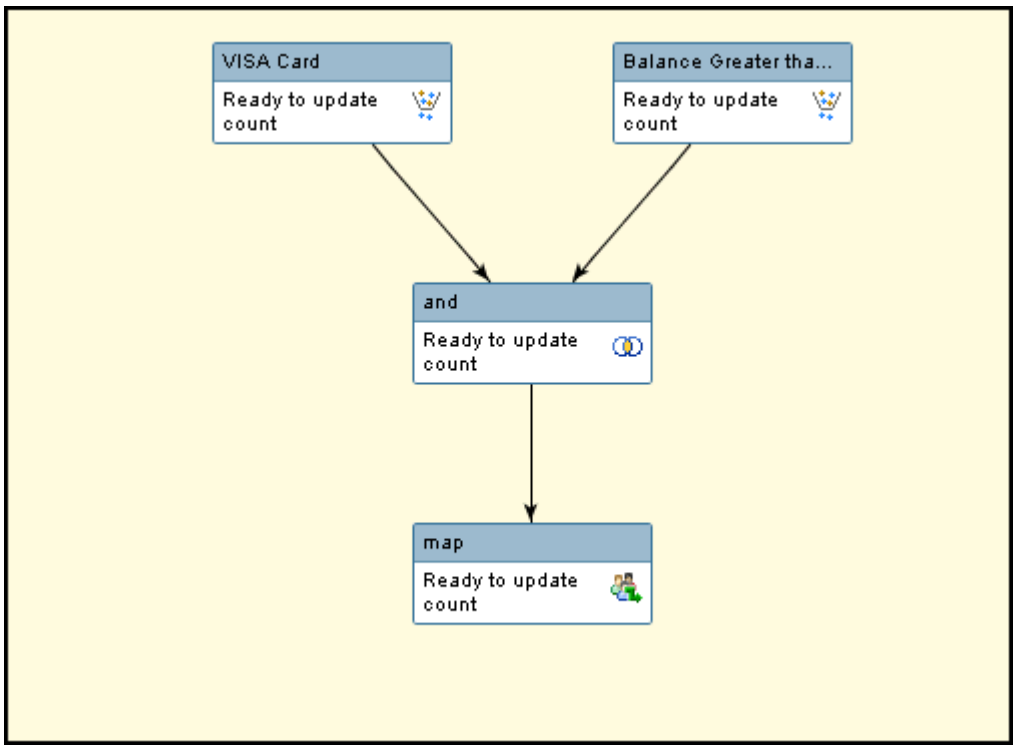
7. Drag an And node onto the diagram workspace.
8. Connect the And node to the two Select nodes.



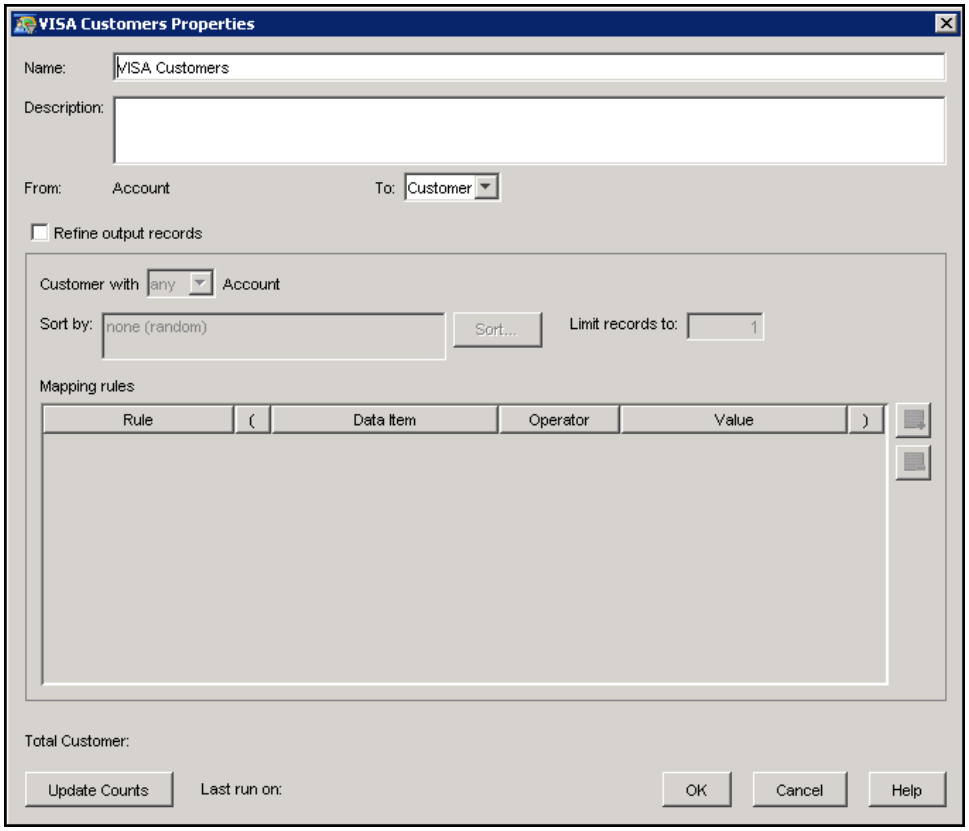
Mapping Accounts to Customers

In this example, customer information is contained in the **Customer** subject of the **Customer** category. To use the Map node to combine the VISA account information with customer information, follow these steps:

1. Drag a Map node onto the diagram workspace.
2. Connect the Map node to the And node.



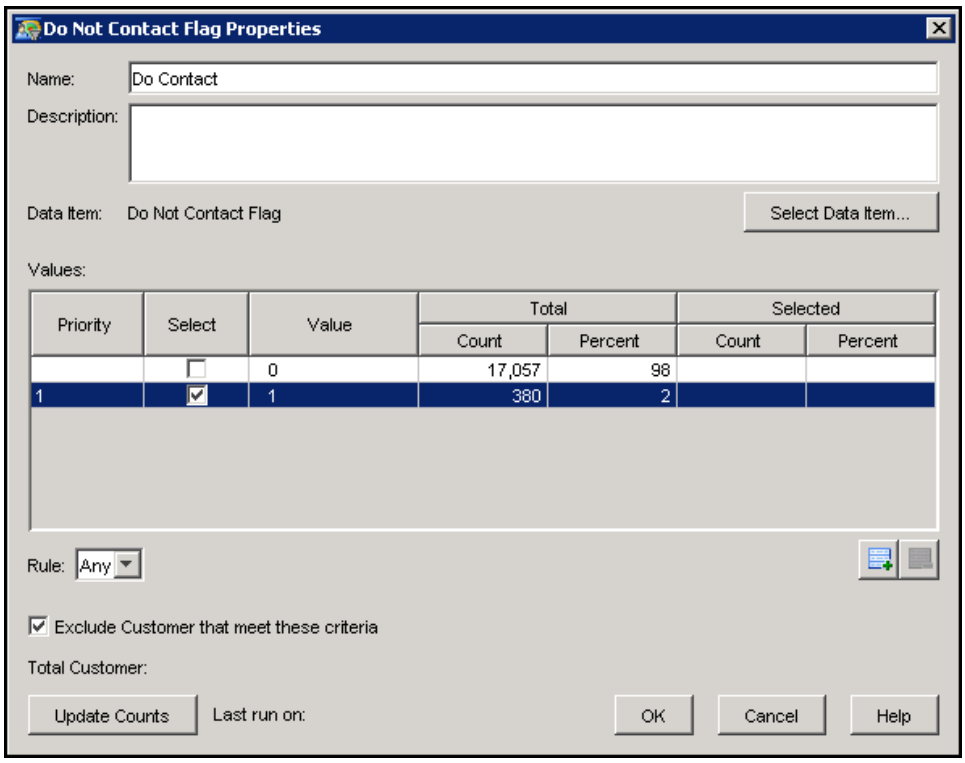
3. Right-click the Map node and select **Properties**.
4. To add customer information to the **Account** category results, select **Customer** from the **To** drop-down list.
5. Type **VISA Customers** in the **Name** field and click **OK**.



Targeting Customers Who Want to Be Contacted

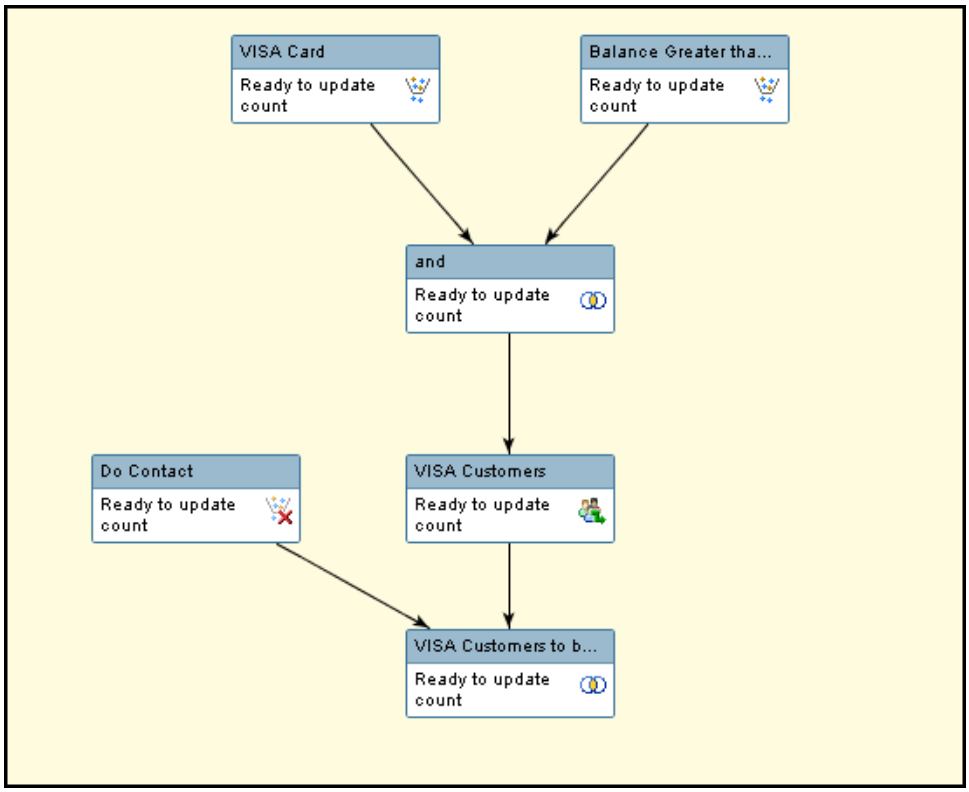
To include only those customers who want to be contacted, follow these steps:

1. Drag an And node onto the diagram workspace.
2. Connect the And node to the Map node.
3. Drag a Select node onto the diagram workspace.
4. Connect the Select node to the And node.
5. Right-click the Select node and select **Properties**.
6. Select the **Customer** subject and the **Customer** category.
7. Double-click **Do Not Contact Flag**.
8. Select the **1** value.
9. Select **Exclude Customer that meet these criteria**.
10. Type **Do Contact** in the **Name** field and click **OK**.



11. Right-click the And node and select **Properties**.

12. Type **VISA Customers to be Contacted** in the **Name** field and click **OK**.



Using the Process Node with Predecessor Nodes

This example shows you how to use the Process node in a very simple diagram with predecessor nodes.

1. Create a new diagram and add a Select node. In this example the Select node is used to select customers whose gender is equal to Female.
2. Add and attach a Limit node to the diagram. In this example the Limit node limits the number of female customers to 1,000.
3. Add and attach a Process node to the diagram. Right-click the Code node and select **Properties**. Specify the following code:

```
data &OutTable;
set &InTable
run;
```

4. Click **Run**. The Select node runs first. Next, the Limit node runs and creates the input table to the Process node (&InTable). Finally, the Process node runs, which creates the output table (&OutTable). The result is a copy of the Limit node output table, which in this example contains 1000 records.

Using the Process Node with No Predecessor Nodes

This example shows you how to use the Process node in a very simple diagram with no predecessor nodes.

1. Create a new diagram and add a Process node. Right-click the Code node and select **Properties**. Specify code that is similar to the following:

```
%let InTable = {\ttobl libref.table-name};
%let inSubjectId ={\ttobl subjectId};
data &OutTable
set &InTable
run;
%MACount(&OutTable);
```

   Note that this code could be contained in a stored process and run in stored process mode.

2. Add a Cell node and attach the Process node to it.

3. Update the counts on both nodes.

In this example, the input table is specified with `%let InTable`. This makes it necessary to use `%let inSubjectId` to specify which subject the input table is based on. The code then creates a copy of this table (&OutTable) which will be passed onto the downstream cell node.

This example can be extended as follows:

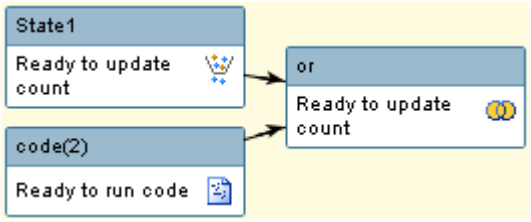
```
LIBNAME libref {\ttobl user connection arguments };
%let inSubjectId =PTY_ID;


PROC SQL;
  create table &outTable as SELECT  DISTINCT
        table0.PTY_ID AS PTY_ID LABEL='Party ID' FORMAT=F12.0
  FROM
        libref.PTY_RB table0
  WHERE
         (table0.GENDER = 'F' OR table0.GENDER = 'M') ;
quit;

%MACount(&outTable);
```

In this example no input table (&InTable) is specified. SAS PROC SQL is used to select the required records from a database and output them to the output table (&OutTable). Since no input table is specified it is necessary to assign the input subjectId by specifying `%let inSubjectId`. This code enables nodes that are downstream from the Process node to know what subject the Process node is based on.

This diagram shows how to use the Process node together with the And and Or nodes to join with other nodes. This diagram will select all clients who are male and female (Process node), or clients who belong to a given State (Select node).



Using the Process Node with Multiple Input Nodes

A user can connect multiple input nodes to the Process node. For example, you might want to create your own version of the Prioritize node or Limit node.

The Process node can be joined only with input tables of the same subject. You cannot join an input

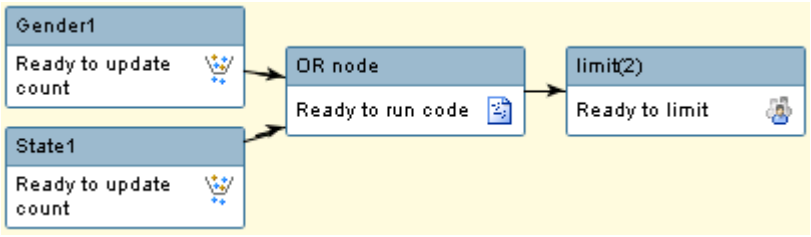
node to the Process node based on one subject and then join another input node to the Process node based on another subject.

Each input node member table is referenced by using the inTable variable. For example, three input nodes are referenced by &inTable1, &inTable2, and &inTable3.

The inTable variables are assigned in the order that the predecessor nodes were connected to the Process node. If a user adds nodes B, C, and A to the Process node (in that order) then the following macro variables will be assigned:

inTable1 - node B
inTable2 - node C
inTable3 - node A

The example below illustrates the use of multiple input nodes.



This example references the member table of each input node by using &inTable1 and &inTable2. The SAS code selects records that exist in either of the input nodes member tables.

```
LIBNAME libref {\ttobl user connection arguments };

PROC SQL;
  create table &outTable as SELECT  DISTINCT
        table0.PTY_ID AS PTY_ID LABEL='Party ID' FORMAT=F12.0
  FROM
        libref.PTY_RB table0
  WHERE
         table0.PTY_ID IN
          (SELECT table1.PTY_ID FROM &inTable1 table1)
         OR
         table0.PTY_ID IN
          (SELECT table2.PTY_ID FROM &inTable2 table2)
;
quit;

 % MACount(&outTable);
```

The next example shows a simple way to concatenate input node member tables. In this example the &inTable variable holds the value of the member tables of all input nodes. The result is an output table that contains all the records from both input nodes member tables.

```
data &OutTable;
```

```
set &InTable;
run;
```

The code could also have been written as follows:

```
data &OutTable;
set &InTable1, &inTable2;
run;
```

Using the Process Node as the Only Node in a Diagram

It is not necessary to link the Process node to any other nodes. The Process node can provide a variety of functions when it is the only node in a diagram. In this example, PROC MEANS is used to generate a report that displays the variables. The report is then sent via e-mail to another user.

```
ods pdf file='profile.pdf';
proc means
 data=profileView(drop=PTY_ID) n nmiss min max mean sum maxdec=2;
run;
ods pdf close;

filename email
 email to=({\ttobl user e-mail addresses}) subject='Campaign Profile';
data _null_;
file email;
put '!em_attach! profile.pdf';
put 'Attached is the profile report from the campaign.';
run;
```

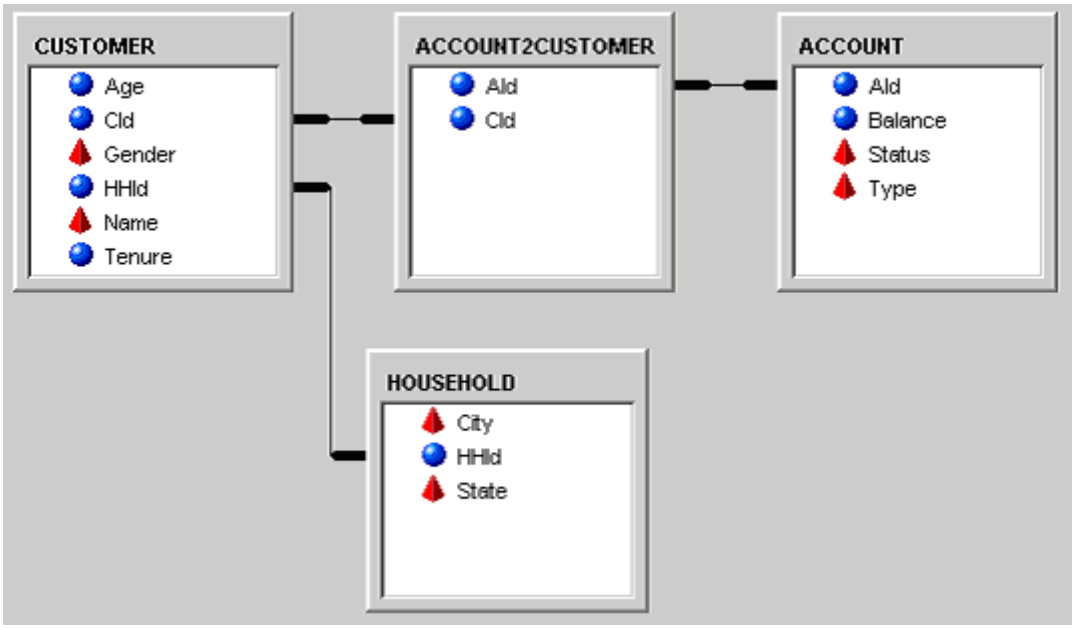
Exporting Across Subjects

When an export definition includes a data item that is in a table with a many-to-one or many-to-many relationship to the subject being exported, it is necessary to choose the appropriate row to export.

The Map node is used to determine which row to choose. The desired row normally corresponds to a different subject selection in the diagram. By remembering the previous subject ID or IDs in the Map node, SAS Marketing Automation can choose the correct row for export.

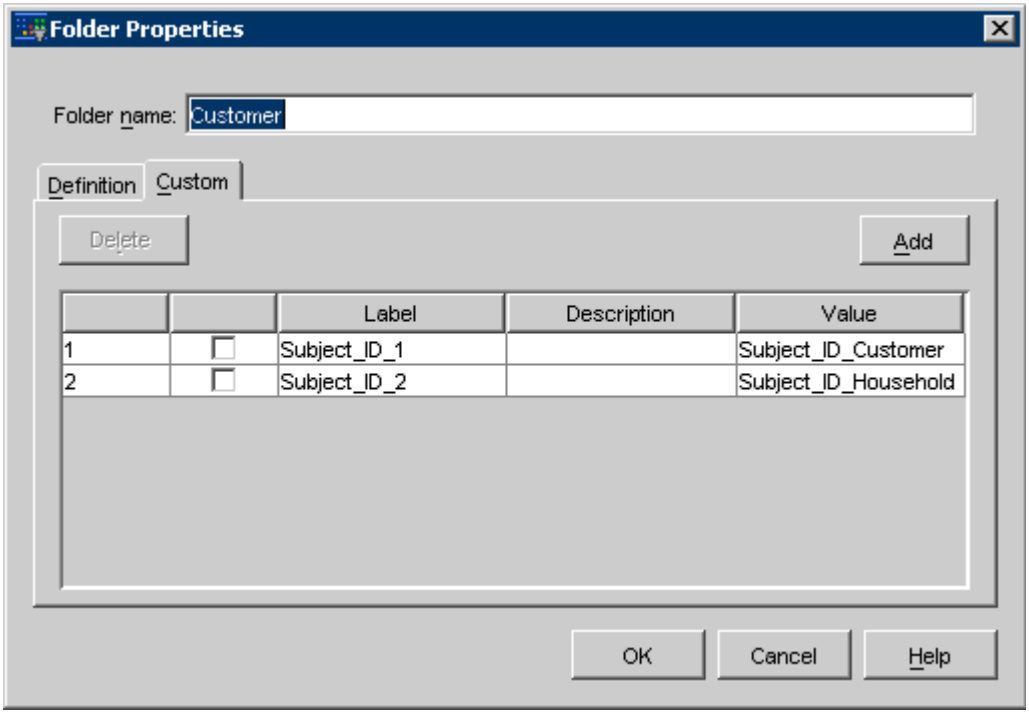
In order to be able to export the appropriate data items, be sure your information map is configured correctly. The following figure displays the table relationships for a very simple information map that contains customer, household, and accounts subjects. Notice that there is a many-to-one

relationship between customer and household, and there is a many-to-many relationship between customer and account. The following examples are based on this information map.



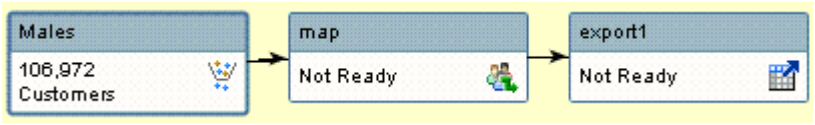
You should associate data items with the proper subjects when configuring the information map. In Example 1, you export Households and include the Gender data item. So the Gender data item must be associated with the Household subject.

To associate a subject with a data item, you need to define custom attributes either directly on the data item or on a folder that contains the data item. The following figure shows the dialog box where you associate both the Customer and Household subjects with the Customer folder. This action enables you to export the customer data items for both Customer and Household subjects.



Example 1

This example shows how to export households that have male customers. In the following diagram, a Select node selects all of the male customers. Then a Map node maps from customers to households. Finally, an Export node exports the household data to a file.



In the Export node, the Gender field is exported from the Customer table.

Remember that you can add only those export fields that are valid for the subject that is associated with the export definition. The **Subject** drop-down list in the Select Data Item dialog box will be disabled. This is why it is important to configure the data items properly in the information map, as mentioned earlier.

The contents of the export file are as follows:

```
"HHId","City","State","Gender"
1,"Raleigh","NC","M"
2,"Raleigh","NC","M"
```

To fully understand this process, it is helpful to look at the underlying data.

Table 11.1 Customer Data:

CId	HHId	Name	Gender
1	1	George Washington	M
2	1	Thomas Jefferson	F
3	2	Benjamin Franklin	M
4	3	John Adams	F

Table 11.2 Household Data:

HHId	City	State
1	Raleigh	NC
2	Raleigh	NC
3	Charlotte	NC
4	Wilmington	NC

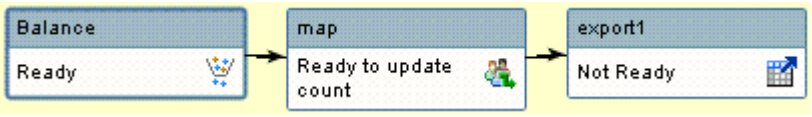
First, customers 1 and 3 are selected and mapped to households 1 and 2, which results in the export of household records 1 and 2. The next step is to determine what value to export for Gender. For household 2, there is no problem since there is only one customer (3) in that household. But household 1 contains two customers: George Washington (1) and Thomas Jefferson (2). Which one is exported?

Since there is a Map node in the diagram that maps from customers to households, the software knows that George Washington (1) had originally been selected in the Select node. That information is used to export the Gender value for George Washington (1) rather than Thomas Jefferson (2).

This technique does not work in all cases. For example, if the original Select node used criteria that selected both George Washington (1) and Thomas Jefferson (2), then the first record found would be exported.

Example 2

This example shows how to export customers who have an account balance of at least 10,000. In the following diagram, the Select node selects all of the accounts with a balance >= 10,000. The Map node maps from accounts to customers. Finally, the Export node exports the customer data.



In the Export node, the Balance field is exported from the Account table. The contents of the export file are as follows:

```
"CId","Name","Balance"
1,"George Washington",10000
3,"Benjamin Franklin",12000
```

Here is what the underlying data looks like.

Table 11.3 Customer Data:

CId	Name
1	George Washington
2	Thomas Jefferson
3	Benjamin Franklin
4	John Adams

Table 11.4 Account2Customer Data:

AId	Balance
1	10000
2	1000
3	5500
4	0
5	12000
6	1234

Table 11.5 Account Data:

AId	CId
1	1
2	2
3	3
4	4
5	3
6	1

First, accounts are selected that have a balance >= 10,000. These are accounts 1 and 5. Then, the accounts are mapped to customers 1 and 3. This means that data for George Washington and Benjamin Franklin will be exported. Both customers have multiple accounts. George Washington has two accounts 1 and 6, but only the first account has a balance >= 10,000. Benjamin Franklin also has two accounts 3 and 5, but only the second account has a balance >= 10,000.

The export uses the information from the Map node to determine that accounts 1 and 5 had originally been selected. So, the account balance that is used for George Washington is 10,000, and the balance used for Benjamin Franklin is 12,000.

Chapter 12

Glossary

Contents

List of Terms 335

List of Terms

audience
: a target group for a campaign.

broadcast
: a communication that is distributed by SAS Digital Marketing software through e-mail or through another electronic medium.

campaign
: a planned set of one or more communications that are directed at a selected group of customers or potential customers.

campaign brief
: a list of details about a campaign. A campaign brief typically includes a definition, a code, and a business objective, as well as other details.

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. See also export definition.

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 group or a subgroup that a campaign is targeting. The most important cells are marketing cells, which appear immediately before communications and selection campaigns and immediately before replies in decision campaigns. See also cell splitting.

cell splitting
: the process of dividing a selection group into cells. For example, if you are sending an e-mail

message to a particular group of people, you might want to split this group into cells, and send each cell a slightly different e-mail. Cell splitting enables you to compare the potential success of different communications. See also cell, control group.

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. See also control group, hold-out control group.

channel
: a mode of communication such as an e-mail message or a print mailing.

communication
: a specific marketing activity or communication with the consumer, such as an e-mail 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. See also campaign, 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. See also champion/challenger control group, hold-out control group.

customer database
: a datamart 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. See also inferred response.

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 e-mail messages.

export
: to produce a results list from SAS Campaign Studio 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. See also communication definition.

hold-out control group
: a type of control group. Members of a hold-out control group do not receive a communication. After a communication has been sent, the actions of the hold-out control group can be compared with the actions of groups that received a communication. See also champion/challenger control group, control group, hold-out control group.

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 e-mail message that was sent about an upcoming holiday, although there might be no way to verify that. See also direct response.

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. Each time a communication is either executed or scheduled to be executed, it is called an occurrence.

predecessor node
: a node that precedes another node in a diagram. A predecessor node is also called an upstream node.

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 e-mail 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 criteria
: the attributes by which customers have been selected from a customer database. Selection criteria are used to identify customers for a specific communication or set of communications.

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. See also campaign, cell, communication, diagram.

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.

upstream node
: See predecessor node.

Index

Administration Resources
  Optimization plug-in, 105
And and Or nodes properties windows, 193
Approval Configuration window, 44
approvals
  and campaign communication schedules, 252
  assigning permissions, 44
  Campaign Web Studio, 301
  of campaigns, 243
Approvals window, 244, 301
audience
  criteria for, 290
Audit Log window, 276
audit logs, 270, 276

Brief section
  (CampaignName) page, 295
Browse window, 47
Bubble tab, 183
budget
  specifying campaign budget, 289
Budget tab, 128
Business Context plug-in, 95
Business Context window
  Codes tab, 100
  Documents tab, 101
  Information Map tab, 97
  Options tab, 102
  Resources tab, 98
  Users tab, 99
business contexts, 110, 303
  changing, 111, 304
  creating, 96
  editing, 96
  selecting, 110
  viewing, 96

Calculated Data Item window, 171
Campaign Brief Configuration window, 42
Campaign Brief page, 298
  Details section, 299
  Sharing section, 299
Campaign Brief window, 126
  Budget tab, 128
  Custom Details tab, 128
campaign briefs
  configuring, 42
  defining, 285
campaign budget
  specifying, 289
Campaign Checklist, 124
Campaign Checklist window, 120
Campaign Definition Configuration window, 41
campaign definitions
  configuring, 41
  creating, 41
  duplicating, 41
  editing, 41
  selecting, 285
  viewing, 41
Campaign Definitions plug-in, 40
  Browse window, 47
  creating campaign definitions, 41
  duplicating campaign definitions, 41
  Edit Link window, 48
  Edit List window, 45
  editing campaign definitions, 41
  fields, 45
  viewing campaign definitions, 41
Campaign Schedule window, 249
Campaign wizard, 284
(CampaignName) page, 294
  Brief section, 295
  Details section, 294
  Documentation section, 296
  Schedule section, 295
campaigns
  adding communications to, 292, 297
  approving, 243
  budget, 289
  changing the status of, 128
  Choose Campaign Definition window, 124
  concurrent processing of communications, 252
  copying, 300
  creating, 123, 284
  creating schedule, 252
  criteria for audience, 290
  cross-campaign prioritization, 173
  editing user-defined links, 129
  executing, 257
  modifying the description of, 128
  opening, 130
  optimizing, 138
  permissions in Campaign Web Studio, 288
  publishing, 278

renaming, 300
reporting versions, 279
Schedule window for, 252
scheduling and executing campaign communications, 245
scheduling communications, 251, 293
Select List Items window, 130
specifying folder for saving, 287
synchronizing calendars, 252
testing decision, 134
treatment performance report, 280
viewing, 131, 299
viewing all communications in, 265
viewing schedules, 302
viewing schedules of all campaigns, 249
Campaigns window, 131
cell codes, 196
Cell node properties window, 195
Cell nodes properties window
cell codes, 196
cell sizing documents, 270
creating, 274
cells
creating from clusters, 184
excluding from diagrams, 176
exclusion cells, 175
Change Communications Status window, 267
Choose Campaign Definition window, 124
Choose Data Item window, 56
Cluster node properties window, 181
Bubble tab, 183
creating cells from clusters, 184
Pie tab, 182
Table tab, 181
clusters
creating cells from, 184
Codes tab, 100
collapsing nodes, 157
columns
in plug-ins, 39
selecting for export, 216
Communication Definition window, 57
Details tab, 59
Export tab, 60
Responses tab, 65
Thresholds tab, 64
communication definitions
creating, 57
deleting, 57
editing, 57
Select Communication Definition page, 296
Communication Definitions plug-in, 57
Select Export Definition window, 65
Select Seeds List window, 66
Communication node
properties window, 225
Communication nodes
copying and pasting, 155
communications
adding to campaigns, 292, 297
Change Communications Status window, 267
changing the status of, 259
concurrent processing, 252
contact history events, 268
creating schedule, 252
defining, 227
executing, 257
scheduling and executing campaign communications, 245
scheduling for campaigns, 251, 293
Select Communication Definition window, 227
synchronizing calendars, 252
viewing all, 265
Communications page, 297
Communications window, 265
configuring
campaign briefs, 42
campaign definitions, 41
connecting nodes, 156
contact history, 174, 268
context
business contexts, 110
copying campaigns, 300
counts
creating splits by using, 187
criteria for audience, 290
cross-campaign prioritization, 173
Custom Details tab
Campaign Brief window, 128
Edit Reply window, 70
Custom Details window, 125
Custom node properties window, 207
Customer Intelligence plug-ins, *see See* plug-ins
Customer Intelligence Studio windows, 122

data items
Choose Data Item window, 56
combining subsets from, 178
creating splits by using values from, 189
patterns for selecting data from, 165
date values, 159
de-duplicating subjects, 221
dependencies, 246
deployment
marking decision diagrams, 138
Details section

Campaign Brief page, 299
(CampaignName) page, 294
Details tab, 149, 226
Communication Definition window, 59
Details window, 98
Diagram Nodes table, 219
diagram picture documents, 270
creating, 272
Diagram Properties window, 148
Details tab, 149
Sharing tab, 151
Diagram Tools plug-in, 73
Diagram Workspace, 121
Customer Intelligence Studio windows, 122
node pop-up menus, 122
Overview window, 121
diagrams, 143
connecting nodes in, 156
creating, 146
excluding cells from, 176
executing, 262
features of, 143
marking for deployment, 138
moving nodes in, 156
permissions, 148
Process node as only node in, 329
properties of, 148
scheduling, 260, 262
testing decision, 134
validating decision, 134
viewing, 147, 269
Diagrams window, 147, 269
documentation
viewing, 303
Documentation section
(CampaignName) page, 296
documents, 270
viewing, 277
Documents tab, 101
Documents window, 277
drop-down menus, 115
duplicating
campaign definitions, 41

Edit Link window, 129
Campaign Definitions plug-in, 48
Edit List window, 45
Edit Reply window, 68
Custom Details tab, 70
Responses tab, 70
Edit Response window, 73
editing
business contexts, 96
campaign definitions, 41
communication definitions, 57
links, 48
reply definitions, 68
user-defined links, 129
user-defined lists, 45
Environment Settings plug-in, 89
error checking
stored processes, 206
Events and Processes plug-in, 82
examples
exporting across subjects, 332, 333
Process node with multiple input nodes, 327
Process node with no predecessor nodes, 326
Process node with predecessor nodes, 326
exclusion cells
creating, 175
Execute window, 257
executing
campaign communications, 245
campaigns, 257
communications, 257
diagrams, 262
expanding nodes, 157
Export Definition window, 50
export definitions
creating, 49
deleting, 49
duplicating, 49
modifying, 49
Export Definitions plug-in, 49
Sort Order window, 53
Export node properties window, 212
changing sort order, 217
creating data items, 217
naming export nodes, 214
Refine Output window, 218
refining output, 217
Select Export Definition window, 221
selecting columns for export, 216
selecting export definitions, 214, 221
Sort Export Line Items window, 217
Export nodes
copying and pasting, 155
Export tab, 228
Communication Definition window, 60
exporting
across subjects, 329
columns, 216
expressions, 217

fields
in Campaign Definitions plug-in, 45
Filter window, 133
folders

for saving campaigns, 287

Global Variables plug-in, 80
Graph wizard
creating graphs, 238
graphs
creating in Graph wizard, 238
roles for, 239
grouping splits, 190
Groups table, 169

histogram, 168
history
contact history, 268

inferred responses
defining, 236
Information Map Metadata plug-in, 92
Information Map Metadata window, 93
Information Map tab, 97
Details window, 98
input nodes
Process node with multiple, 327

Limit Criteria window, 224
Limit node properties window, 191
Sort Criteria window, 192
Link node properties window, 207
Select Cell window, 208
links
Edit Link window, 48
editing user-defined links, 129
lists
editing user-defined lists, 45
logs
size of, 89
Tasks and Logs window, 264

macro variables
Process node, 202
macros
Process node, 203
Map node properties window, 209
Master Template Data window, 54
menus
drop-down menus, 115
node pop-up menus, 122
metadata cache
clearing, 93
metadata tables
creating, 92
deleting, 92
modifying, 92
viewing, 92
missing values
in reports, 237
Multi-filter node
Select Values window, 180
Multi-select node, 178
Select Values window, 180
Multi-select node properties window, 178
combining subsets from data items, 178

node properties window, 156
nodes, 143
adding, 155
collapsing and expanding, 157
connecting in a diagram, 156
copying and pasting, 155
deleting, 155
entering date and time values, 159
functionality of, 144
list of, 144
moving in a diagram, 156
opening the properties window of, 156
Report nodes, 237
rules and tips for, 158

Optimization plug-in, 105
Optimize window, 139
optimizing campaigns, 138
Options tab, 102
Or nodes properties window, 193
output
refining, 217, 218
Overview window, 121

percentages
creating splits by using, 187
performance, 89
permissions
approvals, 44
Campaign Web Studio, 288
sharing, 148, 151, 288
Pie tab, 182
plug-ins
Business Context, 95
Campaign Definitions plug-in, 40
Campaign Utilities, 94
Communication Definitions plug-in, 57
Diagram Tools plug-in, 73
Environment Settings plug-in, 89
Events and Processes plug-in, 82
Export Definitions plug-in, 49
Global Variables plug-in, 80
Information Map Metadata plug-in, 92
Responses plug-in, 71
rows and columns, 39
SAS Digital Marketing plug-in, 107
Seeds plug-in, 54

User Sessions plug-in, 104
pop-up menus
node pop-up menus, 122
predecessor nodes
Process node with, 326
Process node without, 326
preferences
changing, 114
Prioritize node properties window, 221
Limit Criteria window, 224
prioritizing subjects, 221
Process node
as only node in a diagram, 329
macro variables, 202
macros, 203
with multiple input nodes, 327
with no predecessor nodes, 326
with predecessor nodes, 326
Process node properties window, 198
defining stored processes, 204
examples, 326, 327
macro variables, 202
macros, 203
manual mode, 199
Process node as only node in a diagram, 329
Select Stored Process window, 200
processes
viewing all, 263
properties
And and Or nodes, 193
Cell node, 195
Cluster node, 181
Custom node, 207
diagram properties, 148
Export node, 212
Limit node, 191
Link node, 207
Map node, 209
node properties, 156
Process node, 198
Report node properties, 237
Select node, 160
Split node, 185
Properties Pane, 121
Properties window of a communication
Details tab, 226
Export tab, 228
Seeds tab, 228
Thresholds tab, 229
Properties window of a Communication node, 225
Properties window of a response, 234
publishing
treatment performance report, 280
publishing campaigns, 278
ranking subjects, 221
records
maximum number displayed in Report nodes, 237
Refine Output window, 218
renaming campaigns, 300
reply definitions
creating, 68
deleting, 68
editing, 68
Report node properties window, 237
Report nodes, 237
maximum number of records displayed, 237
reporting
missing values in reports, 237
rows in reports, 89
reporting versions of campaigns, 279
Resources tab, 98
responses
creating, 71
defining inferred responses, 236
deleting, 73
editing, 73
Properties window of, 234
Responses plug-in, 71
Edit Response window, 73
Responses tab
Communication Definition window, 65
Edit Reply window, 70
roles
for graphs, 239
rows
in plug-ins, 39
in reports, 89

SAS Campaign Web Studio, 284
SAS Customer Intelligence Studio, 112
user interface, 112
viewing all tasks in, 263
Welcome window, 112
SAS Digital Marketing plug-in, 107
SAS Management Console, *see See* plug-ins
Schedule Manager
scheduling and executing campaign communications, 245
Schedule section
(CampaignName) page, 295
Schedule window
campaign, 254
communication, 254
diagram, 260
scheduling
and approvals, 252
and concurrent processing, 252

and synchronizing calendars, 252
campaign communications, 245, 251
creating campaign schedule, 252
creating diagram schedule, 260
diagrams, 262
schedule dependencies, 246
viewing campaign schedules, 302
viewing schedules of all campaigns, 249
Seed Data window, 55
seeds lists, 54
Seeds plug-in, 54
Choose Data Item window, 56
Master Template Data window, 54
Seeds tab, 228
Select Cell window, 208
Select Communication Definition page, 296
Select Communication Definition window, 227
Select Data Item window, 162
Select Export Definition window, 65, 221
Select List Items window, 130
Select node
selection criteria, 165
Select node properties window, 160
cross-campaign prioritization, 173
Groups table, 169
histogram, 168
specifying selection criteria, 165
Values table, 167
Select nodes
exporting across subjects, 329
Select Seeds List window, 66
Select Stored Process window, 200
Select Values window, 180
selection criteria, 165
selection diagram
Details tab, 149
sessions
starting, 109
sharing permissions
Campaign Web Studio, 288
Customer Intelligence Studio, 151
diagrams, 148
Sharing section
Campaign Brief page, 299
Sharing tab, 151
Sort Criteria window, 192
Sort Export Line Items window, 217
sort order, 217
Sort Order window, 53
Split node properties window, 185
creating splits by using counts or percentages, 187
creating splits by using values from a data item, 189
creating splits by using values from a previous node, 188
grouping splits, 190
splits, 185
creating by using counts or percentages, 187
creating by using values from a data item, 189
creating by using values from a previous node, 188
grouping, 190
stored processes
defining, 204
error checking, 206
making available from stored process mode, 205
Select Stored Process window, 200
summary documents, 270
synchronizing calendars, 252

Table tab, 181
Tasks and Logs window, 264
testing decision campaigns and diagrams, 134
Thresholds tab, 229
Communication Definition window, 64
time values, 159
Timescale window, 251
Tool Palette, 121
Toolbar, 119
tools
Diagram Tools plug-in, 73

Update Contact History window, 268
user interface, 112
Campaign Checklist window, 120
changing preferences, 114
Diagram Workspace, 121
drop-down menus, 115
Properties Pane, 121
Tool Palette, 121
Toolbar, 119
User Sessions plug-in, 104
user-defined links
editing, 129
user-defined lists
editing, 45
users
assigning, 99
Users tab, 99

validating decision diagrams, 134
values
patterns for selecting, 180
Values table, 167
View Tasks and Logs, 263

Welcome window, 112

Your Turn

We want your feedback.

- If you have comments about this book, please send them to **yourturn@sas.com**. Include the full title and page numbers (if applicable).
- If you have comments about the software, please send them to **suggest@sas.com**.

SAS® Publishing gives you the tools to flourish in any environment with SAS!

Whether you are new to the workforce or an experienced professional, you need to distinguish yourself in this rapidly changing and competitive job market. SAS® Publishing provides you with a wide range of resources to help you set yourself apart.

SAS® Press Series

Need to learn the basics? Struggling with a programming problem? You'll find the expert answers that you need in example-rich books from the SAS Press Series. Written by experienced SAS professionals from around the world, these books deliver real-world insights on a broad range of topics for all skill levels.

support.sas.com/saspress

SAS® Documentation

To successfully implement applications using SAS software, companies in every industry and on every continent all turn to the one source for accurate, timely, and reliable information—SAS documentation. We currently produce the following types of reference documentation: online help that is built into the software, tutorials that are integrated into the product, reference documentation delivered in HTML and PDF—free on the Web, and hard-copy books.

support.sas.com/publishing

SAS® Learning Edition 4.1

Get a workplace advantage, perform analytics in less time, and prepare for the SAS Base Programming exam and SAS Advanced Programming exam with SAS® Learning Edition 4.1. This inexpensive, intuitive personal learning version of SAS includes Base SAS® 9.1.3, SAS/STAT®, SAS/GRAPH®, SAS/QC®, SAS/ETS®, and SAS® Enterprise Guide® 4.1. Whether you are a professor, student, or business professional, this is a great way to learn SAS.

support.sas.com/LE

sas Publishing

THE POWER TO KNOW®

SAS and all other SAS Institute Inc. product or service names are registered trademarks or trademarks of SAS Institute Inc. in the USA and other countries. ® indicates USA registration. Other brand and product names are trademarks of their respective companies. © 2007 SAS Institute Inc. All rights reserved. 428713_1US.0307