THE POWER TO KNOW.

SAS® Model Manager 2.2
Administrator's Guide

SAS® Documentation

The correct bibliographic citation for this manual is as follows: SAS Institute Inc. 2009. *SAS® Model Manager 2.2: Administrator's Guide*. Cary, NC: SAS Institute Inc.

SAS® Model Manager 2.2: Administrator's Guide

Copyright © 2009, 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 electronic book, May 2009

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/publishing** 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

About This Book . . . . . *v*
What's New in SAS Model Manager 2.2 . . . . . *vii*
Recommended Reading . . . . . *ix*

Chapter 1 • Introduction to SAS Model Manager Administrator's Guide **1**
Overview of SAS Model Manager Administration 1
Accessibility Features of SAS Model Manager 1

Chapter 2 • Preparing SAS Model Manager for Use **3**
Overview of Preparing SAS Model Manager for Use 3
Post-Installation Verification and Configuration of SAS Model Manager 3
Preparing Teradata for Use with SAS Model Manager 5

Chapter 3 • Setting Up SAS Management Console for Use **9**
Overview of Setting Up SAS Management Console for Use with SAS Model Manager 9
Configuring a SAS Model Manager Connection Profile for the SAS Metadata Repository 10
Configuring Users, Groups, and Roles 14
Create Model Manager Libraries in SAS Management Console 25
Creating a New Table using SAS 29
Registering a Table Using SAS Management Console 29
Verify Accessibility of Data Tables in SAS Model Manager 32

Chapter 4 • Creating and Configuring Publication Channels **35**
Overview of Creating and Configuring Publication Channels 35
Define an HTTP or HTTPS Server 37
Define Publish Locations for the SAS Content Server 41
Configuring Channels and Subscribers for SAS Model Manager 43
Create a Channel Folder 44
Create a New Channel 46
Create a New Subscriber 49

Chapter 5 • Managing Data Tables, Users, Groups, and Roles in SAS Management Console **55**
Overview of Managing Data Tables, Users, Groups, and Roles in SAS Management Console 55
Modifying a Data Table 55
Deleting a Data Table 56
Managing Users, Groups, and Roles 57

Chapter 6 • Administering User Templates **59**
Overview of Administering User Templates 59
Creating or Modifying XML Template Files 60
Deploying User Templates 64

Appendix 1 • Properties **65**
Life Cycle Template Properties 65
Model Template Properties 68

Glossary **73**
Index **77**

About This Book

Audience

SAS Model Manager Administration is for the following users:

- Those who are responsible for administering SAS Model Manager.
- Those who are responsible for administering the SAS Metadata Repository for use with SAS Model Manager.

You might be assigned to a specific user group or role. That assignment determines which tasks you can perform. For more information, see "Configuring Users, Groups, and Roles" on page 14.

Prerequisites

Prerequisites for Administering SAS Model Manager

Here are the prerequisites for administering SAS Model Manager:

- The following software must be installed on your computer:
  - SAS Management Console 9.2
  - SAS Model Manager Client 2.2
  - Java Runtime Environment v1.5.0_12
- You must have a user ID and password for logging in to SAS Management Console and SAS Content Server Administration Console.

Conventions Used in This Document

The following typographical conventions are used for all text in this document except for syntax:

bold
identifies an item in the SAS Model Manager window or a menu item.

italics
identifies a book title or a value that is supplied by the user.

monospace
identifies SAS code.

UPPERCASE
identifies a SAS language element, such as the SAS statements KEEP or DROP.

The following typographical conventions are used in syntax:

bold
identifies the name of a macro.

italic
identifies an argument that must be supplied by the user.

< >
identifies an optional macro argument.

| (vertical bar)
indicates that you can choose one value from a group. Values that are separated by the vertical bar are mutually exclusive.

UPPERCASE
indicates a keyword that can be used as a value for an argument.

What's New in SAS Model Manager 2.2

Overview

The *SAS Model Manager: Administrator's Guide* contains new and updated administrative tasks that are associated with SAS Model Manager.

SAS Model Manager Administration has the following new features and enhancements:

- SAS Content Server
- SAS Management Console Metadata Administration
- SAS Model Manager In-Database Scoring for Teradata

SAS Content Server

The SAS Content Server is a content repository. It stores digital content (such as documents, reports, and images) that is created and used by SAS client applications. The Web-based Distributed Authoring and Versioning (WebDAV) protocol is used to access the SAS Content Server. The SAS Content Server Administration Console enables you to access the SAS Content Server to view directories, change permissions to directories, and create and delete directories.

SAS Management Console Metadata Administration

Content is stored in a hierarchy of SAS folders that are visible on the **Folders** tab of SAS Management Console. The folders separate system information from business information, provide personal folders for individual users, and provide an area for shared data. The **SAS Folders** view is displayed in SAS Model Manager when you are using functionality that accesses the SAS Metadata Repository.

SAS Model Manager In-Database Scoring for Teradata

SAS Model Manager now provides support for both the publishing of projects to your Teradata Enterprise Data Warehouse (EDW) as well as for the execution of the published project's score code. SAS Model Manager enables you to publish classification and prediction models to the Teradata EDW. When you publish your champion model, the SAS Scoring Accelerator for Teradata converts and exports your champion model score code

to scoring functions that you can deploy inside Teradata. A scoring application (for example a call center application that uses the SAS Model Manager Java Scoring API) can then execute the scoring functions in the Teradata EDW. Information about how to prepare Teradata for use with SAS Model Manager is included in this administration guide.

Recommended Reading

- *SAS Model Manager 2.2: User's Guide*
- *Administrator's Guide for SAS Analytics Platform*
- *SAS 9.2 Publishing Framework: Developer's Guide*
- *SAS 9.2 Intelligence Platform: Desktop Application Administration Guide*
- *SAS 9.2 Intelligence Platform: System Application Administration Guide*
- *SAS 9.2 Intelligence Platform: Web Application Administration Guide*

For a complete list of SAS publications, go to support.sas.com/bookstore. If you have questions about which titles you need, please contact a SAS Publishing Sales Representative at:

SAS Publishing Sales
SAS Campus Drive
Cary, NC 27513
Telephone: 1-800-727-3228
Fax: 1-919-531-9439
E-mail: sasbook@sas.com
Web address: support.sas.com/bookstore

Chapter 1

Introduction to SAS Model Manager Administrator's Guide

Overview of SAS Model Manager Administration 1

Accessibility Features of SAS Model Manager 1

Overview of SAS Model Manager Administration

The *SAS Model Manager: Administrator's Guide* explains how to prepare SAS Model Manager for use and how to manage information that is associated with SAS Model Manager. The administrator uses SAS Management Console to access metadata repositories that store information about SAS Model Manager users, libraries, data tables, and the Publishing Framework. Frequently used administrative and configuration tasks are included in this guide to provide guidance after the SAS Model Manager installation process is completed. The high-level tasks include the following:

- Completing installation and configuration verification steps for SAS Model Manager
- Preparing Teradata for use with SAS Model Manager
- Setting up SAS Management Console for use with SAS Model Manager
- Creating and configuring published channels
- Managing data tables, users, groups and roles
- Administering user templates

Accessibility Features of SAS Model Manager

This product has not been tested for compliance with U.S. Section 508 standards. If you have specific questions about the accessibility of SAS products, send them to **accessibility@sas.com** or call SAS Technical Support.

Chapter 2

Preparing SAS Model Manager for Use

Overview of Preparing SAS Model Manager for Use 3

Post-Installation Verification and Configuration of SAS Model Manager 3

Preparing Teradata for Use with SAS Model Manager 5
Overview of Preparing Teradata for Use with SAS Model Manager 5
Locating the Installation Directory 6
Creating Teradata Tables 6
Providing the Java Scoring API to Developers 6

Overview of Preparing SAS Model Manager for Use

After the installation and configuration of SAS Model Manager there are additional tasks that must be performed to prepare SAS Model Manager for use.

- Verify that all installation and configuration steps have been completed, and perform any required additional configuration steps for the installed SAS software solutions.
- (optional) Prepare Teradata for use with SAS Model Manager

  Note: This task needs to be performed only if you have the SAS Accelerator Publishing Agent software solution installed.

For more information about installation and configuration, see the SAS Install Center at **`http://support.sas.com/documentation/installcenter/`**.

Post-Installation Verification and Configuration of SAS Model Manager

After you complete the installation of SAS 9.2 and SAS Model Manager 2.2 using SAS Software Depot, additional configuration steps must be performed before you can use SAS Model Manager:

1. Verify that all installation and configuration steps in the **`instructions.html`** file have been completed. The **`instructions.html`** file can be found in the following directory: **`\`*`sasconfigdir`*`\Lev#\Documents\`**.
2. Verify that all users who were created during the installation process for use with SAS Model Manager are granted the appropriate permissions to the SAS Workspace Server.

In a Windows environment the user rights assignment is **Log on as a batch job** for local security policies. The default user who is created during the installation is the SAS Model Manager Administrator (**mdlmgradmin**).

3. (For Installation with SAS Enterprise Miner Only) If you have installed SAS Model Manager to use in conjunction with SAS Enterprise Miner, you must access SAS Content Server and create a public directory for SAS Enterprise Miner to register a model SPK (SAS package file). To create a SAS Content Server public directory, follow these steps:

   a. Access the SAS Content Server Administration Console by entering this URL **http://*hostname:port*/SASContentServer/dircontents.jsp**. An example of *hostname:port* is **localhost:8080**. Log in using the SAS Administrator (for example, **sasadm**) account that you defined during the SAS installation process.

   b. In the **Add folder** text box enter in a folder name such as **Models**.

   c. Click **Add folder**.

   d. The **Models** folder is displayed in the **Item name** column.

   e. Click the **Permissions** icon that is associated with the *Models* folder.

   f. In the **Add principal** text box enter the value **jcr:all**, and then change all of the permissions to **Yes**.

   g. Click **Save Changes**.

   h. Log out of the SAS Content Server Administration console.

4. (For Installation with SAS Enterprise Miner Only) If you have installed SAS Model Manager to use in conjunction with SAS Enterprise Miner, you must configure the SAS Metadata Repository with the SAS Content Server public directory that you created previously. Follow these steps:

   a. In SAS Management Console, expand **Application Management** on the **Plug-ins** tab. Enterprise Miner should be listed and should contain subfolders.

   b. Expand the **Projects** folder.

   c. Right-click the SAS Workspace Server that is associated with your Enterprise Miner installation and select **Properties**. An example is **SASApp - Logical Workspace Server**.

   d. Select the **Options** tab.

   e. In the **WebDAV URL** field, enter **http://*hostname:port*/SASContentServer/repository/default/*Models*/**

      Note: The WebDAV is used to register a model SPK file from SAS Enterprise Miner.

   f. Click **OK**.

For more information about post-installation tasks, see the SAS 9.2 installation documentation.

Preparing Teradata for Use with SAS Model Manager

Overview of Preparing Teradata for Use with SAS Model Manager

The SAS Model Manager Publish Teradata Scoring Function for Java Scoring API requires additional configuration steps to prepare the Teradata Enterprise Data Warehouse (EDW). Specifically, the process covers how to set up the publishing and scoring aspects of SAS Model Manager. The administrator should provide this information to the Database Administrator (DBA) after installation of SAS Model Manager In-Database Scoring for Teradata. For more information, see the SAS 9.2 installation documentation.

Here is a high-level process to enable the publishing of scoring functions to Teradata from SAS Model Manager and to use the Java Scoring API:

1. The DBA creates a user for the Teradata database, ensuring that the user has the appropriate permissions.

   For more information, see "Creating Teradata Tables" on page 6.

2. The DBA creates the SAS Model Manager metadata tables in the Teradata database.

   For more information, see "Creating Teradata Tables" on page 6.

3. The DBA installs the SAS 9.2 Formats Library for Teradata in the Teradata EDW. This library contains many of the formats that are available in Base SAS.

   For information about how to install and configure the SAS 9.2 Formats Library for Teradata, see the chapter on post-installation configuration for the SAS Accelerator Publishing Agent software in the *Configuration Guide for SAS 9.2 Foundation* for your operating environment.

4. The DBA or administrator downloads the Teradata JDBC Driver jar files (**`terajdbc4.jar`** and **`tdgssconfig.jar`**) and then the administrator places the jar files in the **`\sasconfigdir\Lev#\AnalyticsPlatform\apps\ModelManager\lib`** directory.

   The Teradata JDBC Driver can be found on the Teradata Web site (http://www.teradata.com). Select **Support & Downloads** ⇨ **Downloads** ⇨ **Teradata JDBC Driver**. Select the version of the JDBC driver that supports Teradata version 12. SAS has validated the minimum version requirements of 12.0.0.106 for use with SAS Model Manager 2.2. It is possible to use updated versions of the third-party software. For more information, see the SAS Third Party Software Requirements — Baseline and Higher Support at the URL **`http://support.sas.com/resources/thirdpartysupport/baseline_plus.html#`**.

   Note: The SAS Analytics Platform must be restarted to finish the installation of the Teradata JDBC jar files. For more information, see the *Administrator's Guide for SAS Analytics Platform*.

5. The administrator provides the developer with the Java Scoring API jar file.

   For more information, see "Providing the Java Scoring API to Developers" on page 6.

Locating the Installation Directory

During the installation and configuration of the 9.2 SAS products, the SAS Model Manager In-database Scoring API for Teradata is installed on the middle-tier server.

Note: The middle-tier server is also the location where the SAS Analytics Platform and SAS Model Manager Application Programming Interface products are installed.

The location of the installation directory is customer specified. However, here is the default location for a Microsoft Windows server:

`C:\Program Files\SAS \SASModelManagerInDatabaseScoringForTeradata`.

In the installation directory, you will find the directory that specifies the version of this product, 2.2. The files and subdirectories that are needed to prepare Teradata for use by SAS Model Manager are located in the version directory.

Creating Teradata Tables

The **Utilities** subdirectory of the installation directory contains a pair of SQL files, **createTables.sql** and **dropTables.sql**. The Database Administrator needs these SQL files in order to create the tables needed by the Publish Teradata Scoring Function and Java Scoring API. The DBA then performs the following steps:

1. Creates a separate Teradata database where the tables can reside.
2. Sets the user access permissions for the Teradata database.
   a. Grant Create, Drop, Execute, and Alter permissions for functions and procedures.
   b. Grant Select, Insert, Update, and Delete permissions for the SAS Model Manager metadata tables.

   Note: If scoring input and output tables, or views exist in another database then the user needs the appropriate permissions to those tables.
3. Verifies the statements that are specified in the **createTables.sql** file.
4. Executes the **createTables.sql** script to create the tables.

Providing the Java Scoring API to Developers

The developer needs the **sas.modelmanager.td.jar** file in order to access the Java Scoring API.

SAS stores all the jar files in an Eclipse plug-in format. The Windows platform top-level directory for the SAS Version Jar Repository is **`C:\Program Files\SAS \SASVersionedJarRepository`**. This directory contains the subdirectory path **`\9.2\eclipse\plugins\sas.modelmanager.td_<buildDate>_<track>`**.

Multiple versions of this plug-in might exist. The **`buildDate`** and **`track`** distinguish the version of the plug-in. You should select the **sas.modelmanager.td** plug-in subdirectory that has the most recent build date.

Within that directory is the **sas.modelmanager.td.jar** file. Developers need that file in order to use the Java Scoring API. Provide this jar file to developers who are creating an application that requires access to the Java Scoring API.

For more information about Using the Java Scoring API, see the *SAS Model Manager: User's Guide*.

Chapter 3

Setting Up SAS Management Console for Use

Overview of Setting Up SAS Management Console for Use with SAS Model Manager **9**

Configuring a SAS Model Manager Connection Profile for the SAS Metadata Repository **10**
Overview of Configuring a Connection Profile 10
Creating a New Metadata Profile 10
Connect to an Existing Metadata Profile 13

Configuring Users, Groups, and Roles **14**
Overview of Configuring Users, Groups, and Roles 14
SAS Model Manager Users, Groups, and Roles 14
Create a New User 16
Create a New User Group 19
Create a New Role 21

Create Model Manager Libraries in SAS Management Console **25**

Creating a New Table using SAS **29**

Registering a Table Using SAS Management Console **29**
Overview of Registering a Table 29
How to Register a Table 29

Verify Accessibility of Data Tables in SAS Model Manager **32**

Overview of Setting Up SAS Management Console for Use with SAS Model Manager

SAS Management Console acts as the user interface to the SAS Metadata Repository. In order for SAS Model Manager to read data tables, the metadata for those tables must also exist within the SAS Metadata Repository. The metadata for the data tables is stored in libraries within the SAS Metadata Repository. SAS Management Console also enables administrators to configure users, groups, roles and to create publication channels.

You can determine how you want to organize your SAS libraries. For example, you can put all of the tables that are needed by a given project, version, model, scoring task, and report in one library. Or, you can create seven libraries that correspond to the structure of the Data Sources folders that SAS Model Manager uses. In most cases, users already have model tables grouped in project-related SAS libraries. Most of the time, your SAS Model Manager Data Sources folders contain tables from different SAS libraries.

Configuring a SAS Model Manager Connection Profile for the SAS Metadata Repository

Overview of Configuring a Connection Profile

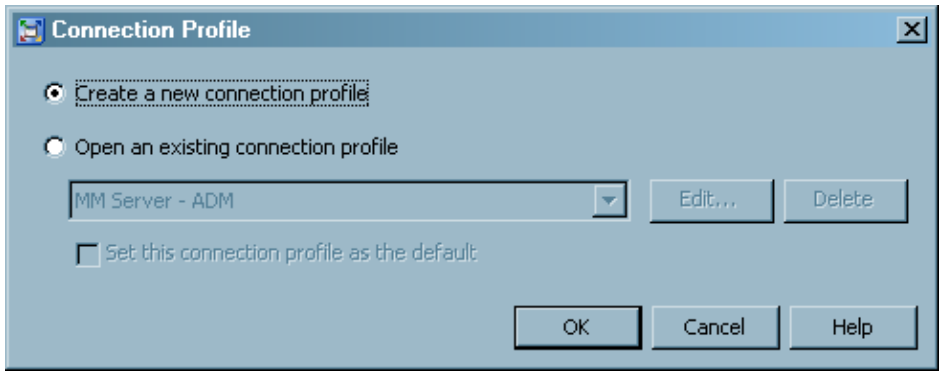
A connection profile enables you to communicate with the SAS Metadata Repository from SAS Management Console. Before you can define SAS Model Manager libraries, users, groups, roles, and publication channels in SAS Management Console, you must create a connection profile.

The Publication Channels Connection Profile wizard guides you through the process of creating the profile for your server. For more information, see the Help.

Creating a New Metadata Profile

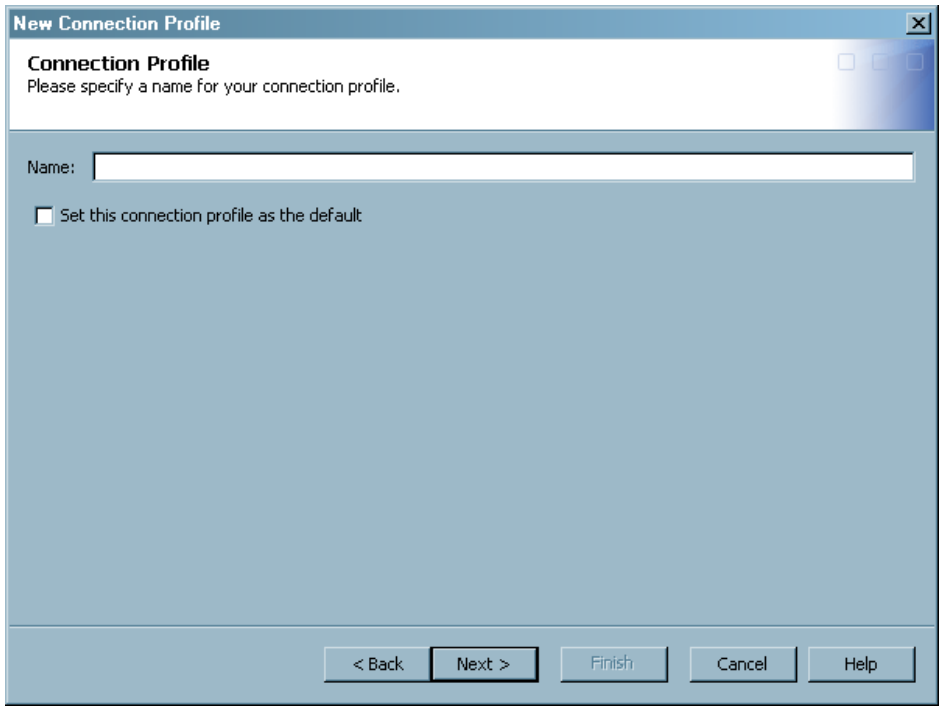
To create a new metadata profile, follow these steps:

1. Start SAS Management Console. The Connection Profile dialog box appears.

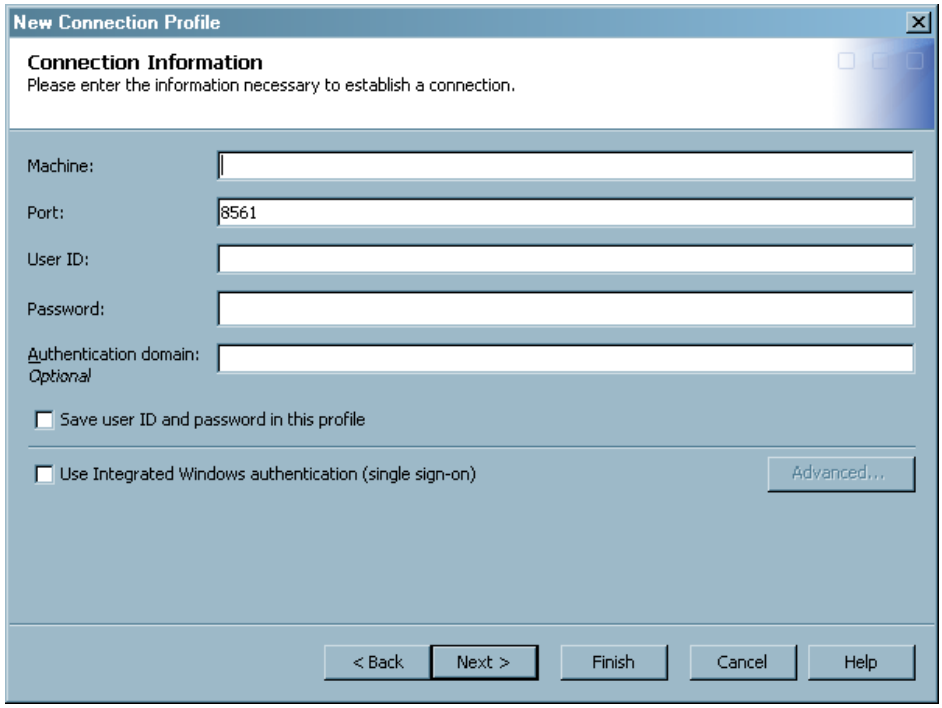


2. Select **Create a new connection profile**, and click **OK**. The Connection Profile wizard window opens.

3. Click **Next**.



4. Enter the name of your connection profile. Select the check box if you want to open this connection profile by default. Click **Next**.



5. Complete the following connection information:

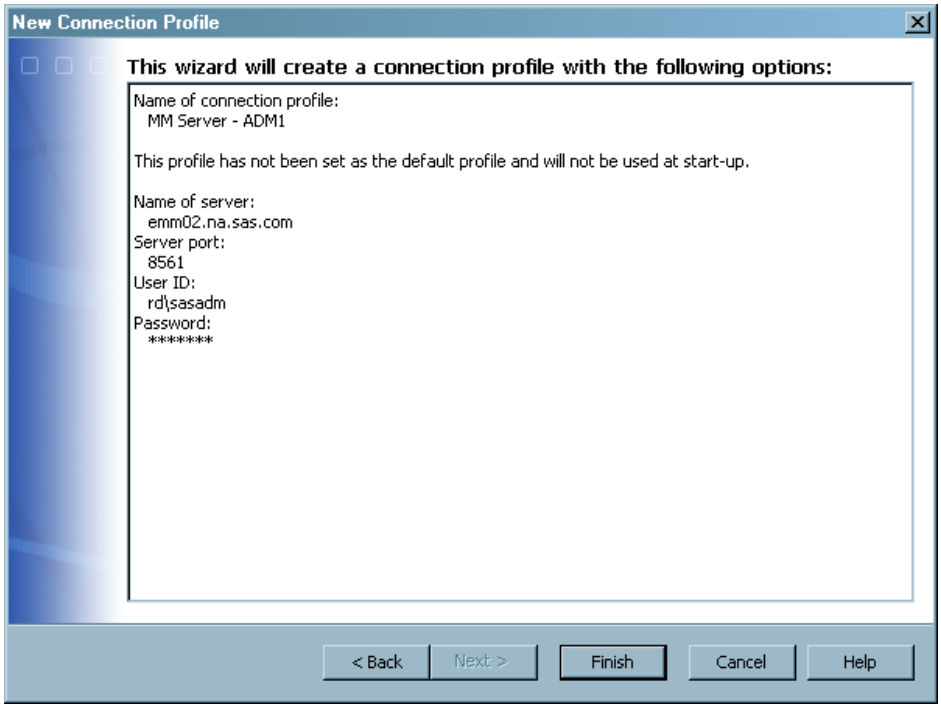
   a. Enter the fully qualified name (or IP address) of the machine on which your metadata server operates. Enter the TCP/IP port number defined at installation. By default the port is 8561.

   b. Enter a valid user ID and a password.

   c. (optional) Select the check box to save the user ID and password for this profile.

      Note: By selecting this option the user ID and password is saved and automatically displayed when this profile is chosen during login.

   d. Click **Next**. A summary of the connection profile options that you defined is displayed.



6. Click **Finish** to save your connection profile.

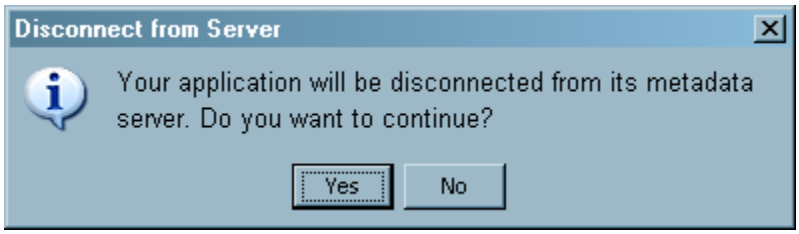
   SAS Management Console is then connected to your active connection profile server as shown on the window title bar.

Note: You need to verify that Publishing Framework plug-ins are available on your SAS Management Console navigation tree. Otherwise you need to install SAS Foundation Services 1.3 or higher so that you can configure your channels and subscribers for SAS Model Manager.

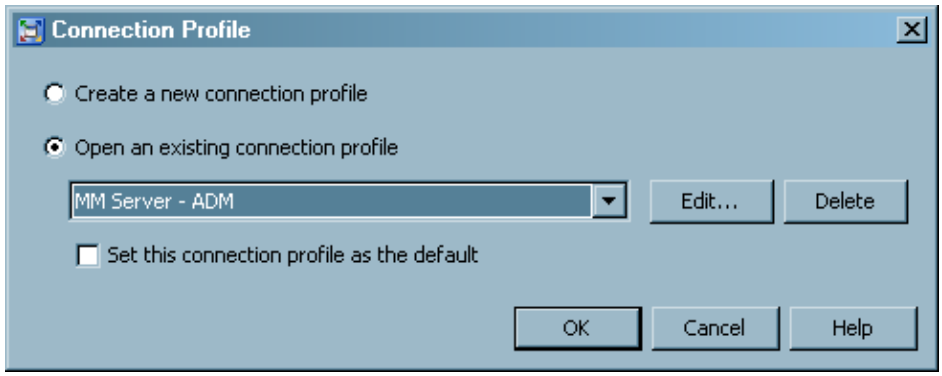
Connect to an Existing Metadata Profile

To connect to or change your SAS Metadata Server connection profile, follow these steps:

1. Select **File** ⇨ **Connection Profile**. The Disconnect from Server dialog box appears.



2. Click **Yes**. The Connection Profile dialog box appears.



3. Select **Open an existing connection profile**.
4. Select the name of your SAS Metadata Server connection profile from the list.
5. Click **OK**.

Now you should see your SAS Metadata Server name in the SAS Management Console status bar (SAS Metadata Server name: port number).

Configuring Users, Groups, and Roles

Overview of Configuring Users, Groups, and Roles

When you use SAS Management Console to configure users, groups, and roles, users from different departments or divisions can collaborate to create, update, and deploy models. They use the SAS Publishing Framework to inform subscribers about model updates.

As an administrator, you need to create users, user groups, and then assign roles in order for users to access the SAS Model Manager repository. The **User Manager** plug-in for SAS Management Console allows a user to define a user or a group. A wizard helps you create the user and groups of users and also to assign roles.

SAS Model Manager Users, Groups, and Roles

The following users, groups, and roles are created as part of the SAS Model Manager installation process:

Table 3.1 *SAS Model Manager Users*

User	Description
SAS Administrator	This user has access to all SAS Management Console capabilities and metadata administrative tasks. SAS 9.2 creates this user during installation.
SAS Model Manager Administrator	This user has administrative permissions for SAS Model Manager.

Table 3.2 *SAS Model Manager Groups*

Group	Description
SAS Administrators	This group performs metadata administrative tasks. SAS 9.2 creates this group during installation.
Model Manager Administrator Users	This group has administrative permissions for SAS Model Manager.
Model Manager Advanced Users	This group has permissions to read, write and delete content.
Model Manager Users	This group has permission to read content.
Model Manager Example Life Cycle Assignee Users	This group is used by the example life cycle templates that are shipped with SAS Model Manager. The group contains those users who can change the status of life cycle tasks, but who cannot approve them.
Model Manager Example Life Cycle Approver User	This group is used by the example life cycles templates that are shipped with SAS Model Manager. The group contains those users who can approve completed life cycle tasks.

Table 3.3 *SAS Model Manager Roles*

Role	Description
Management Console: Advanced	Provides access to all plug-ins in SAS Management Console. This role is assigned to the group SAS Administrators.
Metadata Server: Operation	Supports adding metadata repositories and operating the metadata server. This role is assigned to the group SAS Administrators.
Metadata Server: User Administration	Supports management of users, groups, and roles other than the unrestricted users role. This role is assigned to the group SAS Administrators.
Metadata Server: Unrestricted	Provides all capabilities in SAS Management Console and provides access to all metadata. This role is assigned to the SAS Administrator Users.

Role	Description
Model Manager: Administration Usage	A user who can perform all SAS Model Manager tasks. This role is assigned to the group Model Manager Administrator Users.
Model Manager: Advanced Usage	A user who can perform all SAS Model Manager tasks except for tasks that can be performed only by a SAS Model Manager administrator. This role is assigned to the group Model Manager Advanced Users.
Model Manager: Usage	A SAS Model Manager general user. The general user can perform all tasks except for advanced user tasks and administrator tasks. This role is assigned to the group Model Manager Users.
Model Manager: Life Cycle Assignee Usage	A user or group who can be assigned to complete a life cycle task.
Model Manager: Life Cycle Approval Usage	A user or group who can approve the completion of a life cycle task.
Model Manager: Life Cycle Participant Usage	A user or group that is displayed in the Participant selection list of the Life Cycle Template Editor.

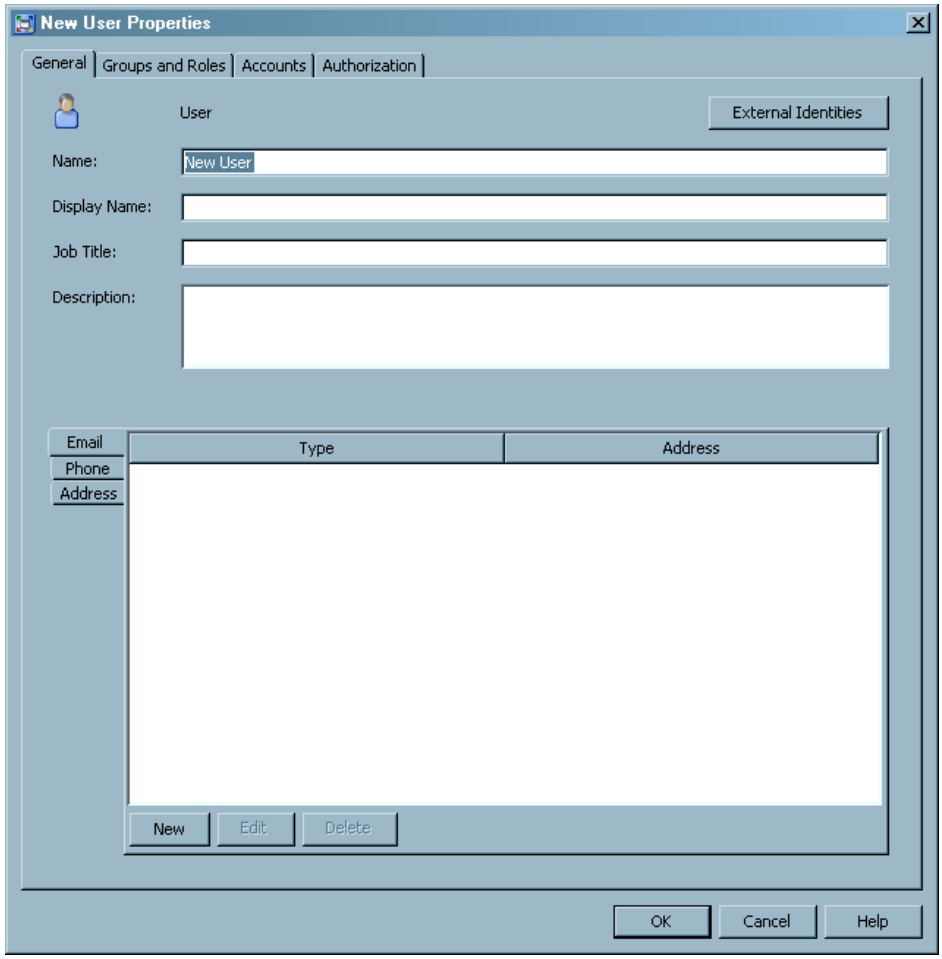
For more information about SAS Model Manager tasks that are associated with each role, see the *SAS Model Manager: User's Guide*

Create a New User

Before creating users for SAS Model Manager, you need to define these users on your network domains with valid user IDs and passwords. SAS Management Console helps you create users by using the New User wizard. You can click **Help** any time to get information about the current window properties.

To create a new user, follow these steps:

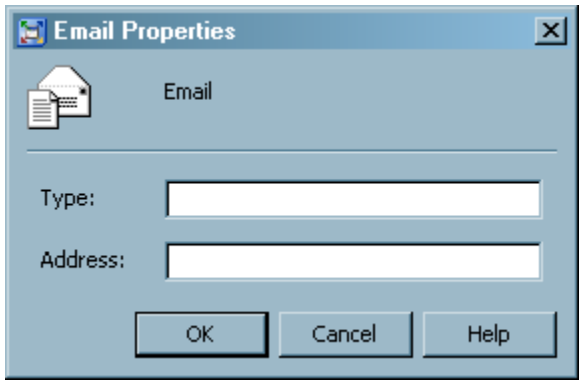
1. Right-click **User Manager** from the SAS Management Console **Plug-ins** tab, and select **New** ⇨ **User**. The New User Properties window opens.



2. Enter the name of the user on the **General** tab.

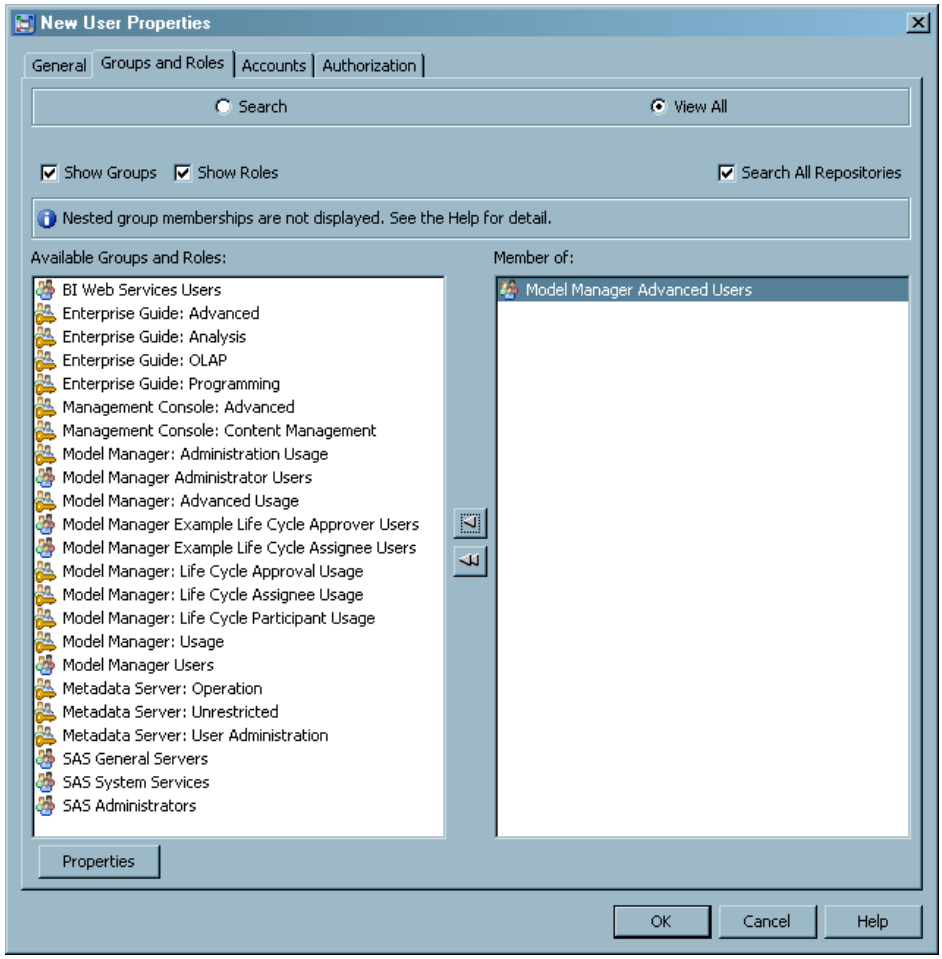
   The **Display Name**, **Job Title**, and **Description** are optional. Provide an e-mail address for the user to receive e-mail notifications from the SAS Publishing Framework.

3. Select the **Email** tab on the lower panel and then click **New**. The Email Properties dialog box appears.

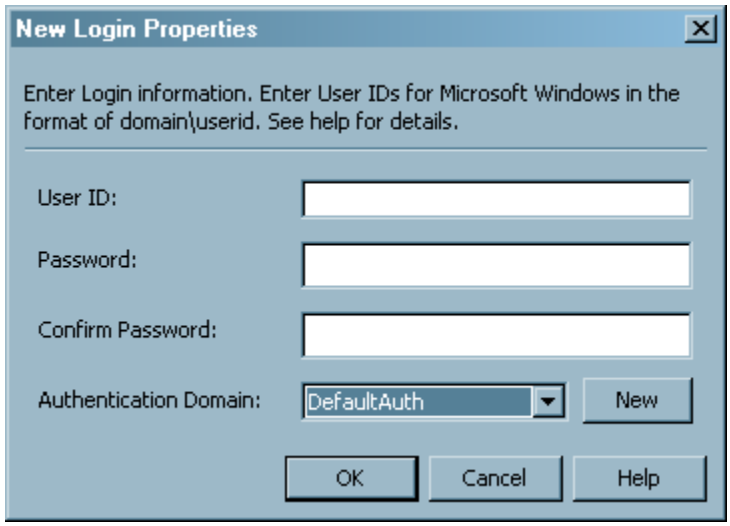


4. Enter SMTP in the **Type** field and the user's e-mail address in the **Address** field. Click **OK**.

5. Select the **Group and Roles** tab if you want this user to be included in a specified group. Use the arrow to add the new user to a group.

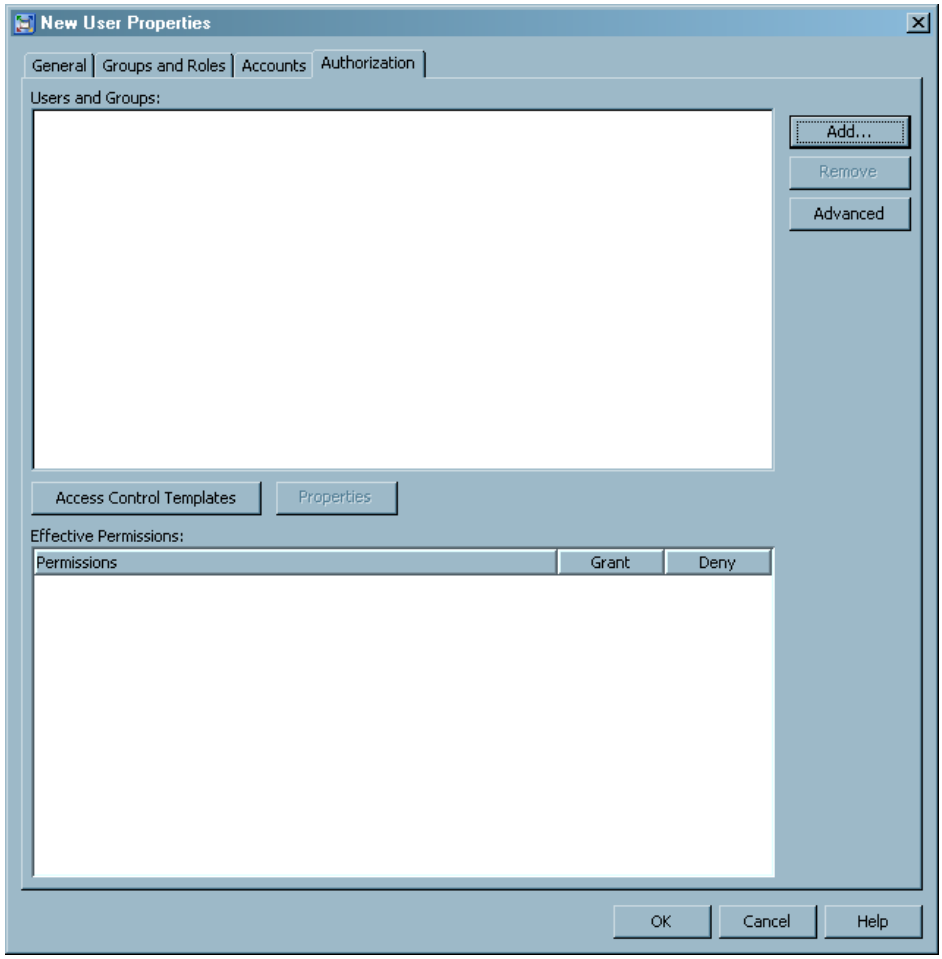


6. Select the **Accounts** tab and select **New**. The New Login Properties dialog box appears.



7. Enter the **User ID**, **Password**, and the **Authentication Domain**. Click **New** to create a new valid domain. Enter a name and description for the new domain, and then click **OK** twice to add the new account.

8. Select the **Authorization** tab to add other users, or to view and modify this user's metadata.



9. Click **OK**.

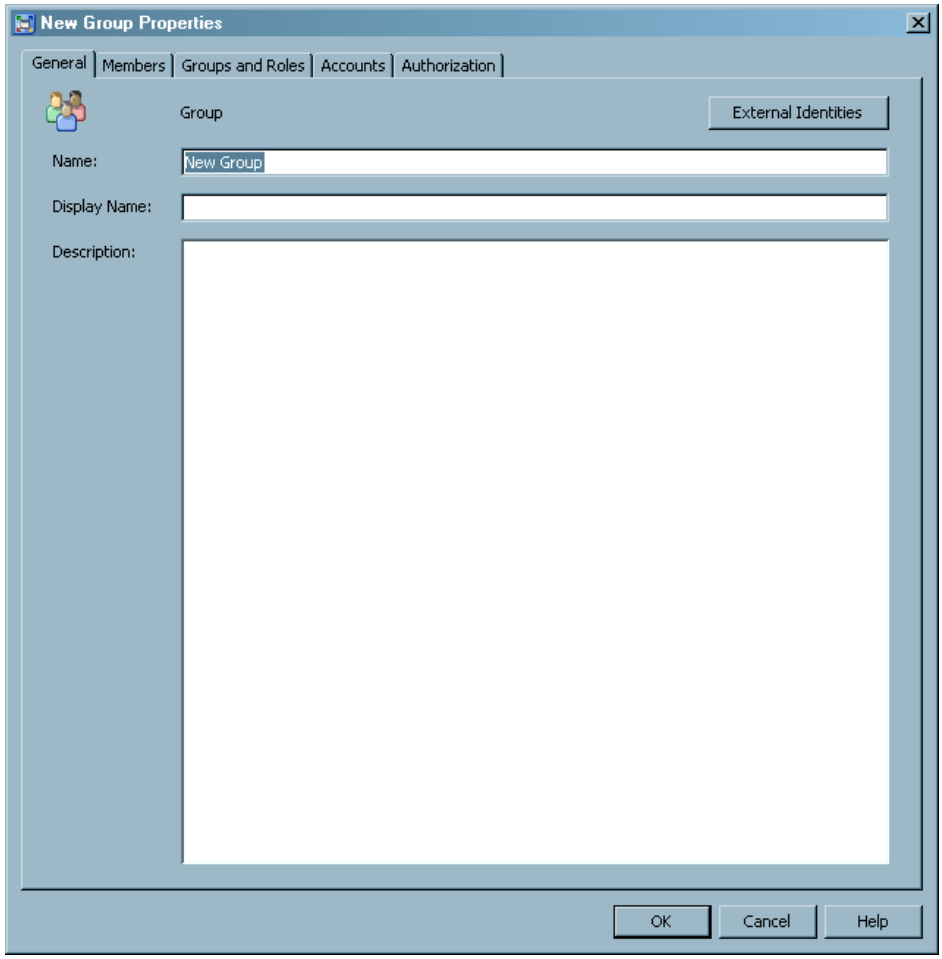
   The newly created user is displayed with all the other users when the User Manager object is selected from the SAS Management Console navigation tree.

10. In a Windows environment grant the new user permissions for the user rights assignment of **Log on as a batch job** for local security policies on the machine that hosts the SAS Workspace Server.

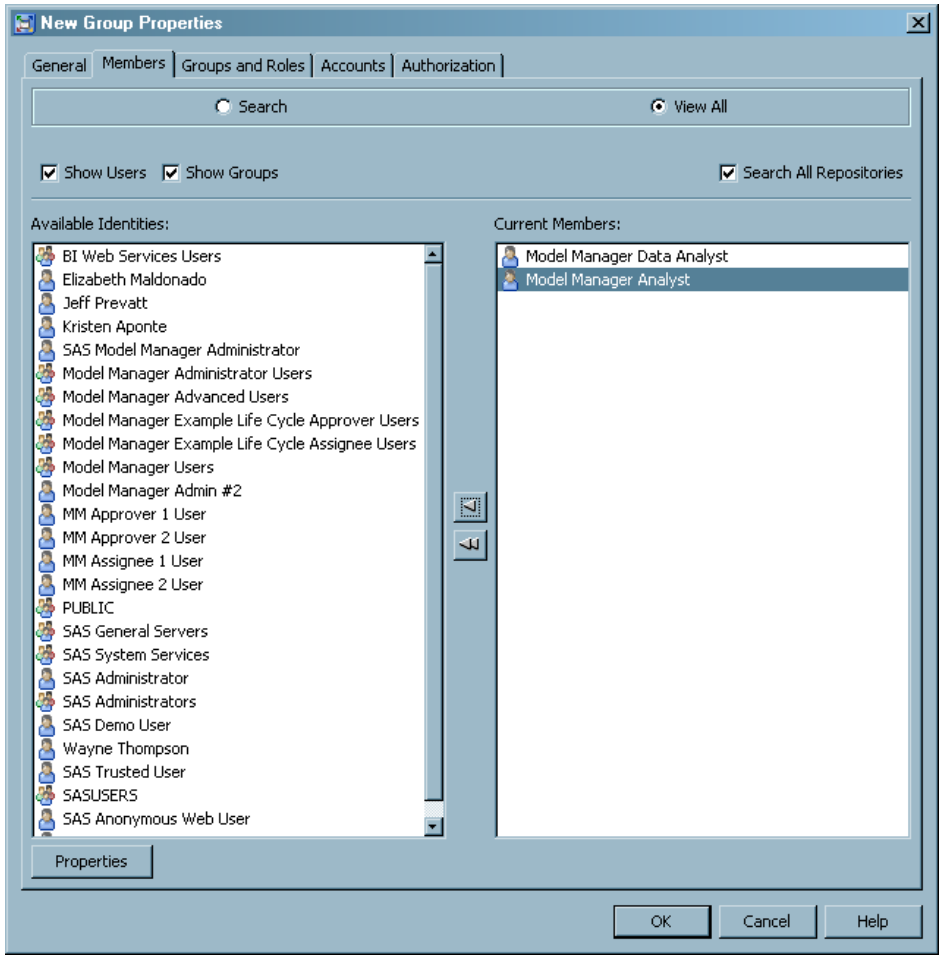
Create a New User Group

To create a user group, follow these steps:

1. Right-click **User Manager** from the SAS Management Console **Plug-ins** tab, and select **New** ⇨ **Group**. The New Group Properties window opens.



2. Enter the name of the group on the **General** tab. The other fields are optional.
3. Select the **Members** tab. From the **Available Identities** list, select the users to be included in this group. Select the user name from the **Available Identities** list and click to add it to the **Current Members** list.



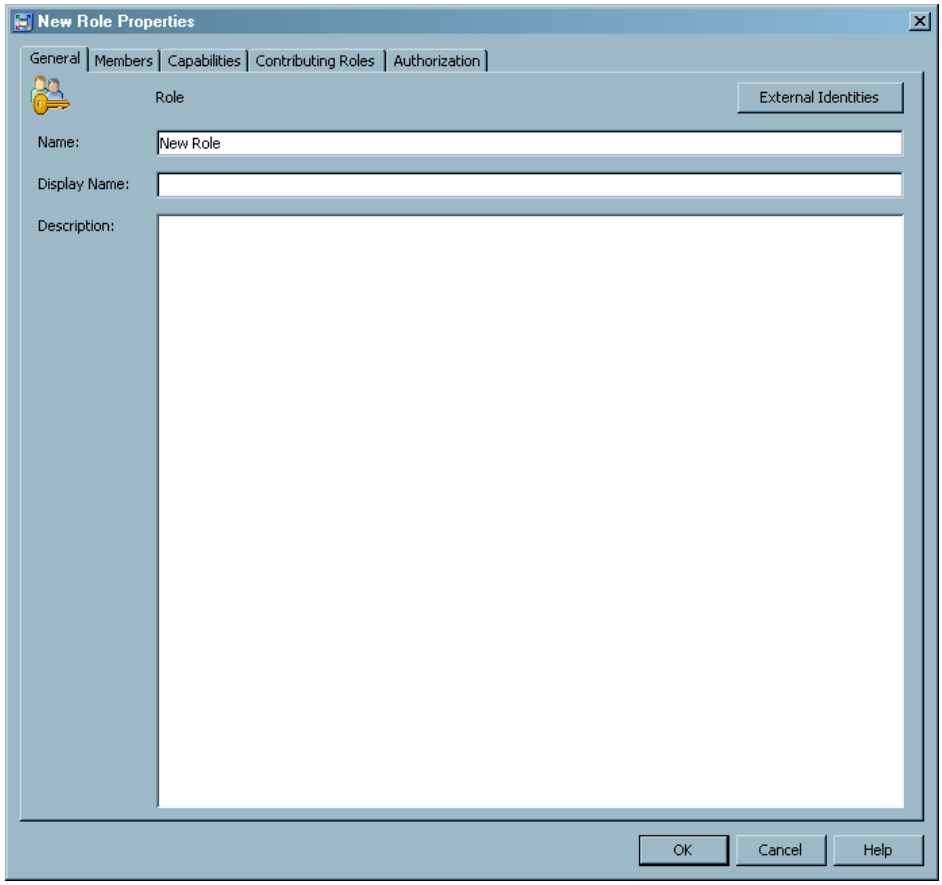
4. (optional) Select the **Groups and Roles** tab if you want this user group to be included in a specified group.
5. (optional) Select the **Accounts** tab. You might need this to create the New Login Properties for users who were not defined previously.
6. (optional) Select the **Authorization** tab if you want members of this group to view and modify the metadata of this group.
7. Click **OK**.

   The newly created group name is displayed with all the other groups when the User Manager object is selected from the SAS Management Console navigation tree.

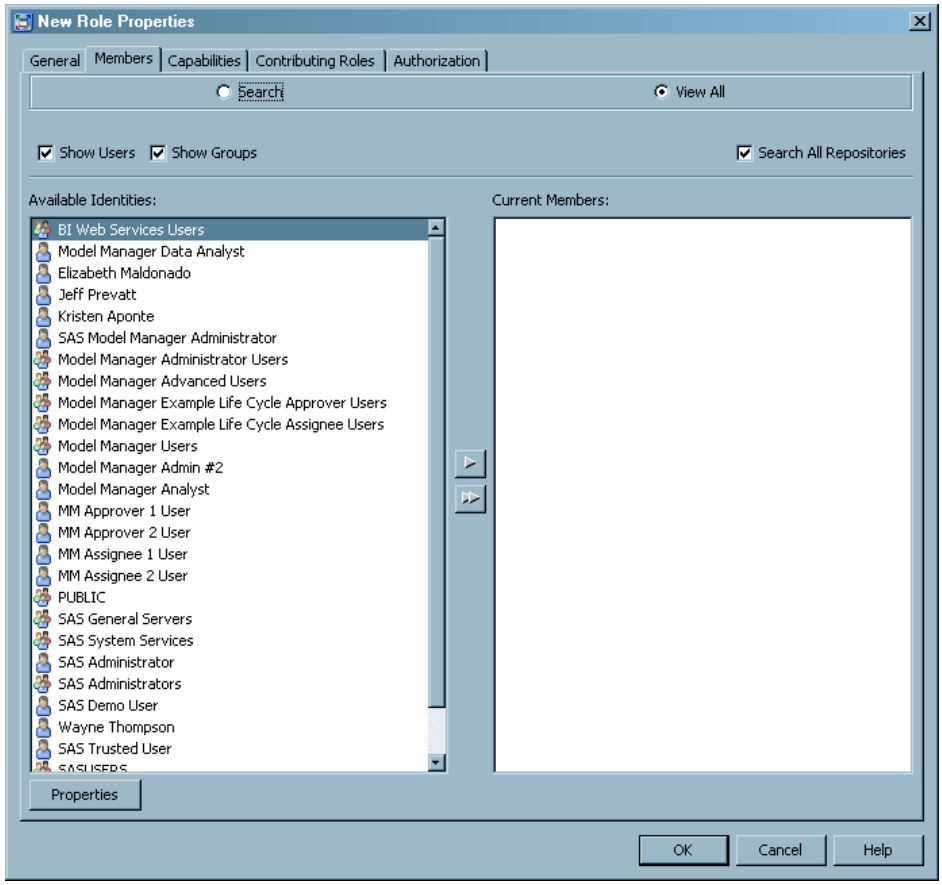
Create a New Role

To create a new role, follow these steps:

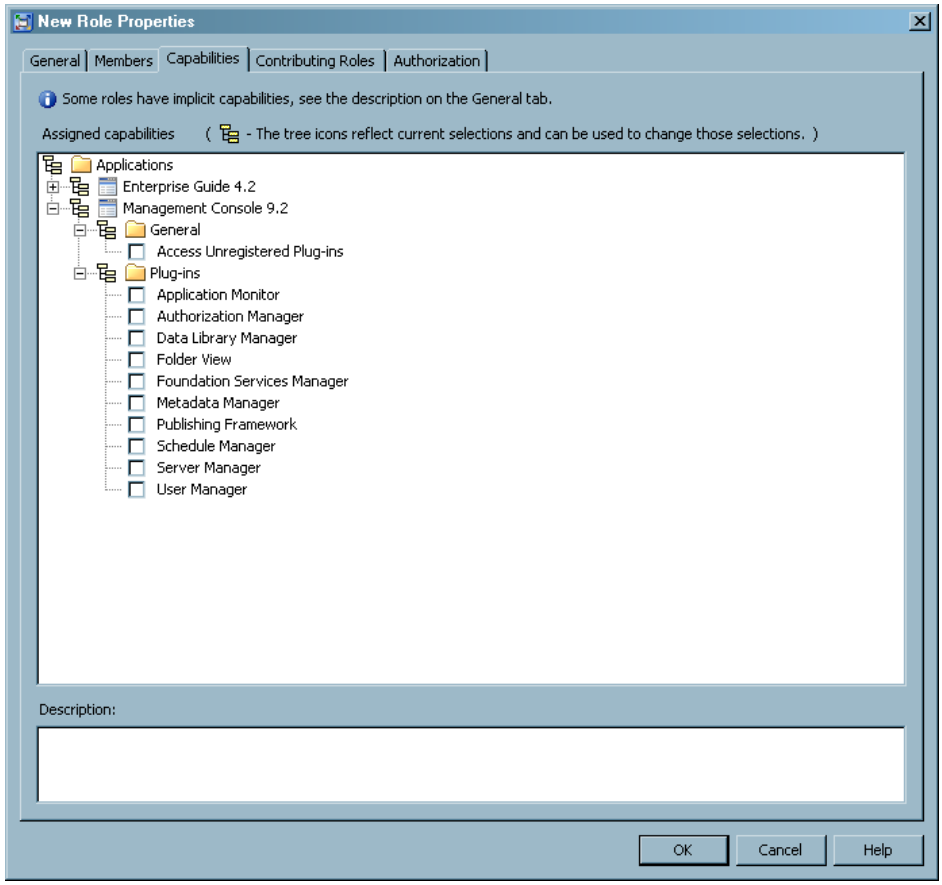
1. Right-click **User Manager** from the SAS Management Console **Plug-ins** tab, and select **New** ⇨ **Role**. The New Role Properties window opens.



2. Enter the name of the role on the **General** tab. The other fields are optional.
3. Select the **Members** tab. From the **Available Identities** list, select the users and groups to assign to this role. Select the user or group name from the **Available Identities** list and click to add it to the **Current Members** list.

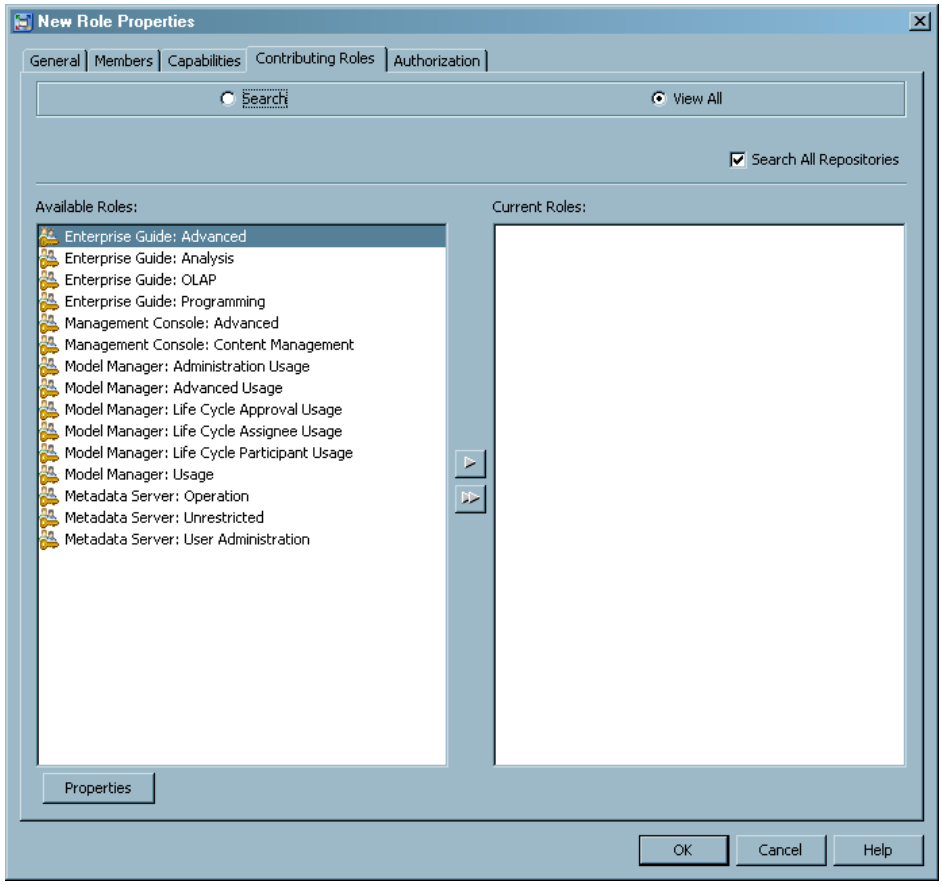


4. Select the **Capabilities** tab. Expand the tree nodes, and then select the check boxes to assign capabilities to the role.



5. Select the **Contributing Roles** tab to give this role all of the capabilities of one or more other roles. Use the arrows to add the new user to a group.

   Note: Changes that you make to a role's capabilities affect any roles with which that role is associated.



6. (optional) Select the **Authorization** tab if you want members of this role to be able to view and modify the metadata of this role.
7. Click **OK**.

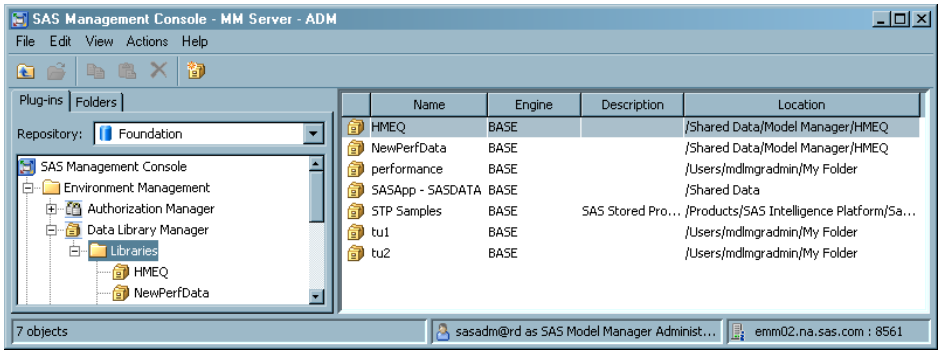
   The newly created role name is displayed with all the other roles when the **User Manager** object is selected from the SAS Management Console navigation tree.

Create Model Manager Libraries in SAS Management Console

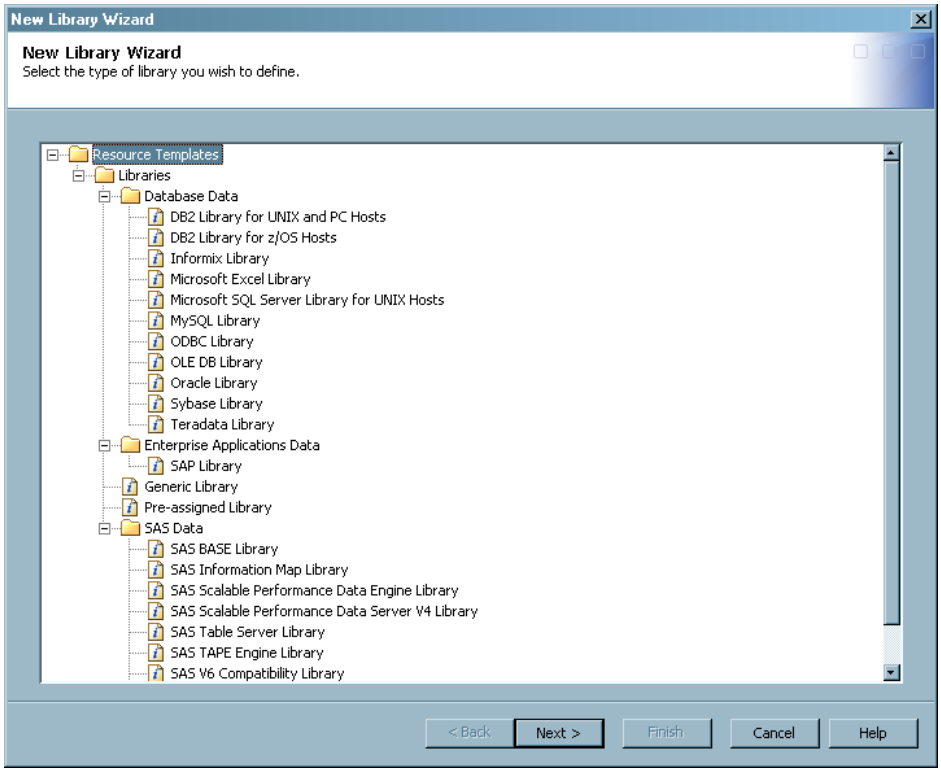
To create a new SAS library in SAS Management Console, follow these steps:

1. Start SAS Management Console and connect to your preferred SAS Metadata Repository.
2. In the SAS Management Console tree, expand the following folders:

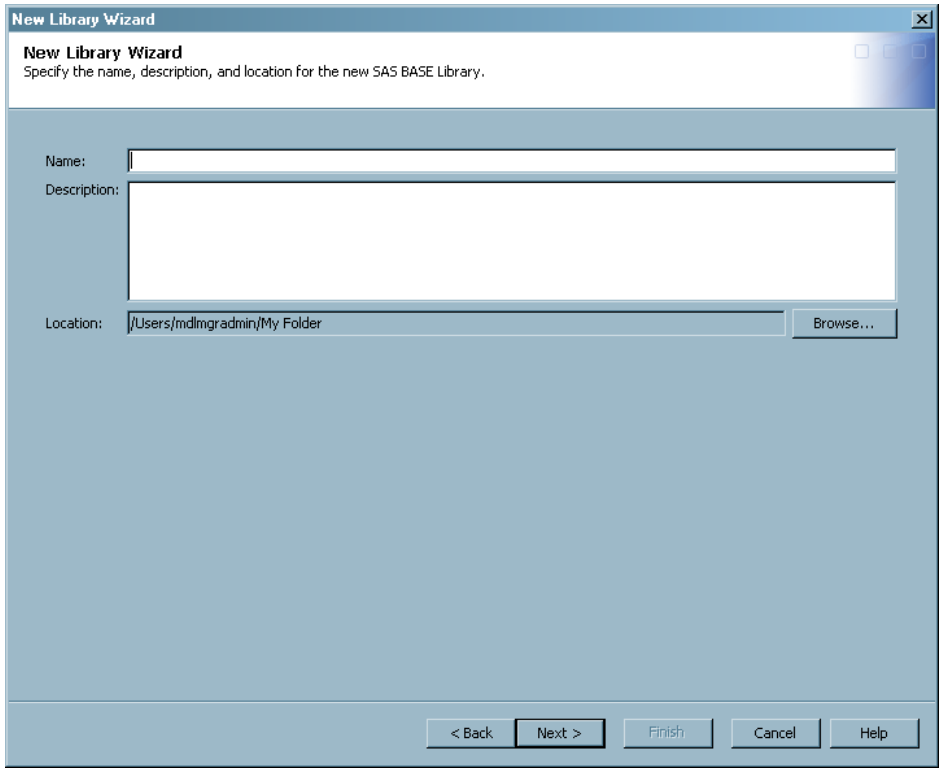
   Environment Management ⇨ **Data Library Manager** ⇨ **Libraries**.



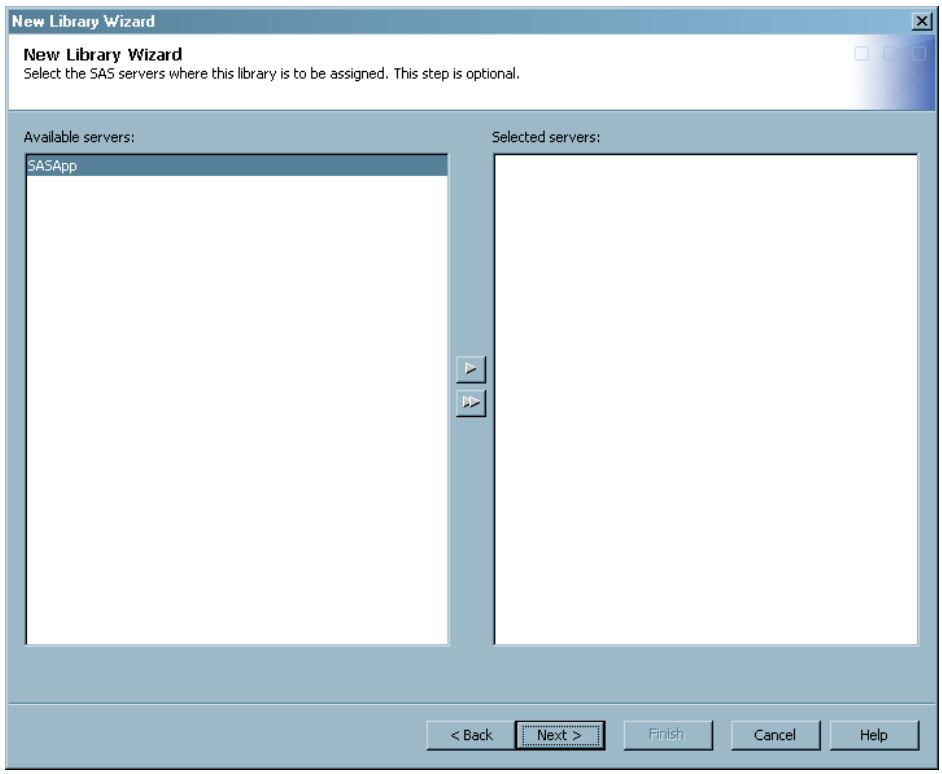
3. Right-click the **Libraries** folder. From the pop-up menu, select **New Library**. The New Library Wizard opens.



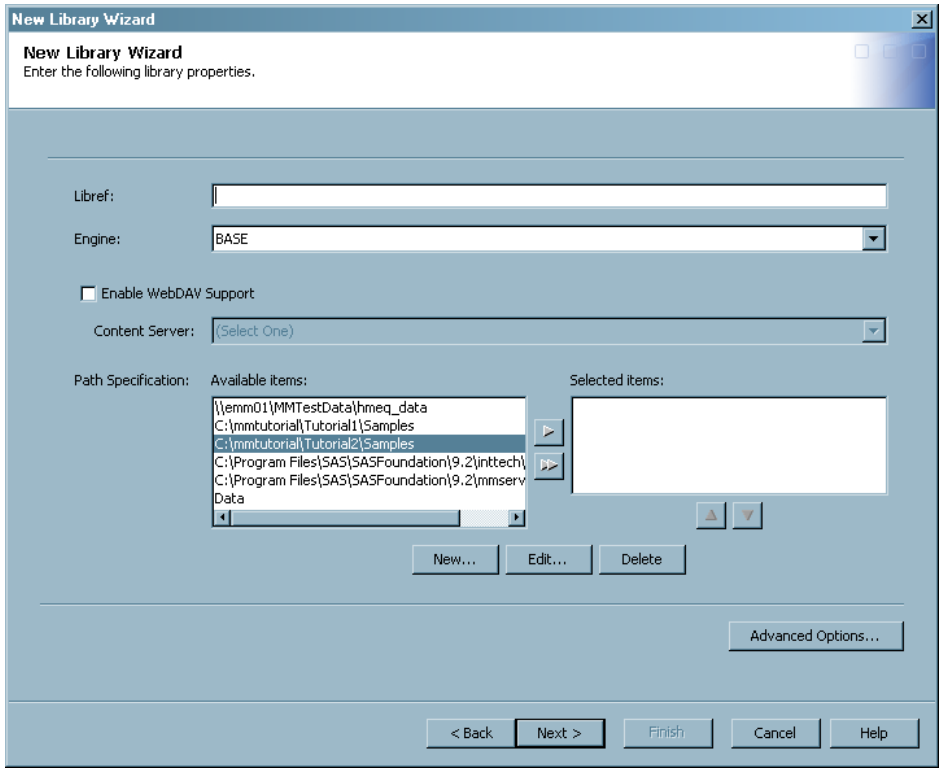
4. In the folder display, ensure that the folders are expanded for **Resource Templates** ⇨ **Libraries** ⇨ **SAS Data**. Select **SAS BASE Library** and then click **Next**.



5. Enter a name, description and location for your new SAS library, and then click **Next**. Add an optional description.
6. (optional) Select the SAS server where the new library is to be assigned, and then click **Next**.

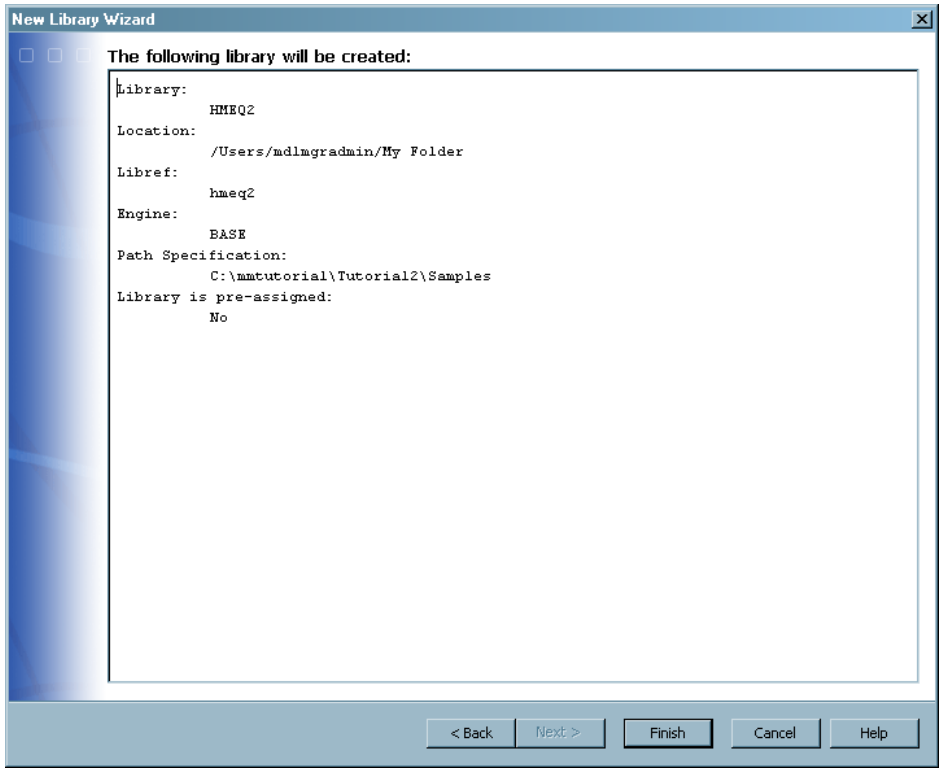


7. Enter a unique SAS library reference name of eight characters or less. You will use the SAS libref to access the table.



8. Use the arrow controls to choose a path from the **Path Specification Available items** box, or click **New** to specify a new path for your library. Afterwards your library path specification appears in the **Path Specification Selected Items** list. Click **Next**.

9. Review the summary of the information that you entered, and if it is correct, click **Finish**.



Your SAS Library appears in the SAS Management Console SAS Libraries list. It has been added to the SAS Metadata Repository. Now you can view your new SAS library in SAS Model Manager. For more information, see "Verify Accessibility of Data Tables in SAS Model Manager" on page 32.

Creating a New Table using SAS

Here are two examples of how to create a new table by submitting SAS code. The first example creates a table based on another existing table. The second example shows how to create a new empty table.

If you submit the example code below to SAS, make sure that the directory path that is specified in the LIBNAME statement exists. Before you submit the code in Example 1, you need to verify that the **appdata.sas7bdat** file exists in the specified LIBNAME directory. Once the code from the examples is submitted to SAS, two new .sas7bdat files will be created on disk at the location **c:\smmwork** .

Example Code 3.1 *Create a New Table from an Existing Table*

```
LIBNAME smmwork 'c:\smmwork';
    data smmwork.PROJECTIN;
      set smmwork.appdata;
      keep age numCards everDefault;
      if _N_>1 then stop;
    run;
```

Example Code 3.2 *Create a New Empty Table*

```
LIBNAME smmwork 'c:\smmwork';
 data smmwork.PROJECTOUT;
 length posterior 8 prediction $1;
 posterior=.; prediction='';
 run;
```

Registering a Table Using SAS Management Console

Overview of Registering a Table

After you create your data tables, you must register them in a SAS Metadata Repository so that the SAS Model Manager can locate them. SAS Model Manager can add data tables from the SAS Metadata Repository that are registered in SAS Management Console. You register tables in SAS Management Console in the Data Library Manager, **Libraries** folder.

How to Register a Table

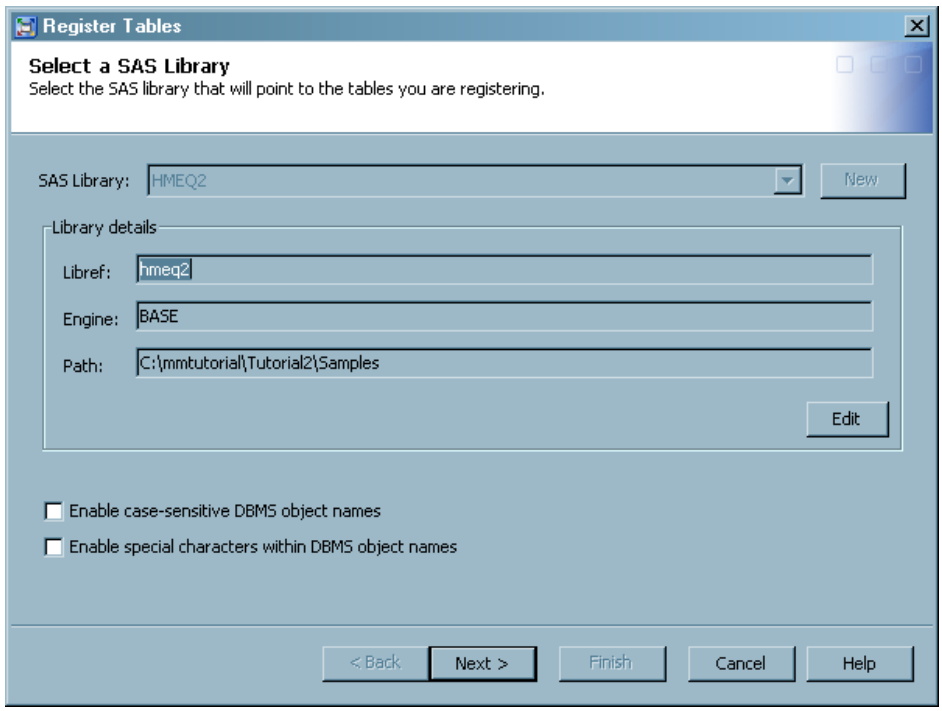
The Register Tables wizard guides you through the process of importing and registering a SAS table in the SAS Metadata Repository. Each library type has a different Register Tables wizard that is called from the Data Library Manager.

Note: The Register Tables wizard is not available on UNIX platforms.

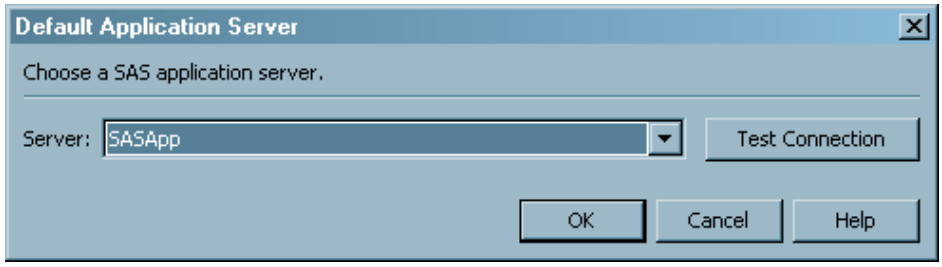
To import and register a table into a SAS Management Console Data Library, follow these steps:

1. Copy the .sas7bdat file for your table into the directory path on the Workspace server that you provided in the **Path Specification** data field of the New Library Wizard. For more information, see "Create Model Manager Libraries in SAS Management Console" on page 25.
2. Start SAS Management Console, and connect to the SAS Metadata Repository that contains your new SAS Library.
3. In the SAS Management Console tree, expand the following folders:

   Environment Management ⇨ Data Library Manager ⇨ Libraries
4. Right-click the SAS Library name that you want to import your table into, and then select **Register Tables** from the pop-up menu. The Register Tables wizard window opens.

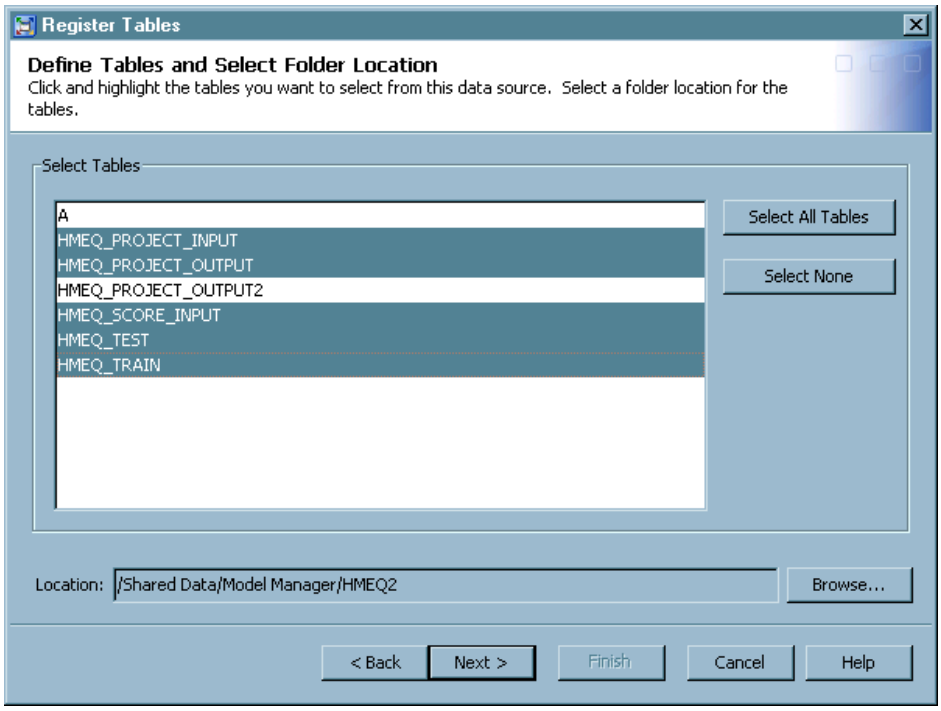


5. Verify that the information that is displayed in the **Select a SAS Library** page is correct, and then click **Next**.
6. The Default Application Server dialog box appears, if a default application server has not been previously selected. Select your SAS server, click **Test Connection** to verify that the connection to the server is successful, and then click **OK**.

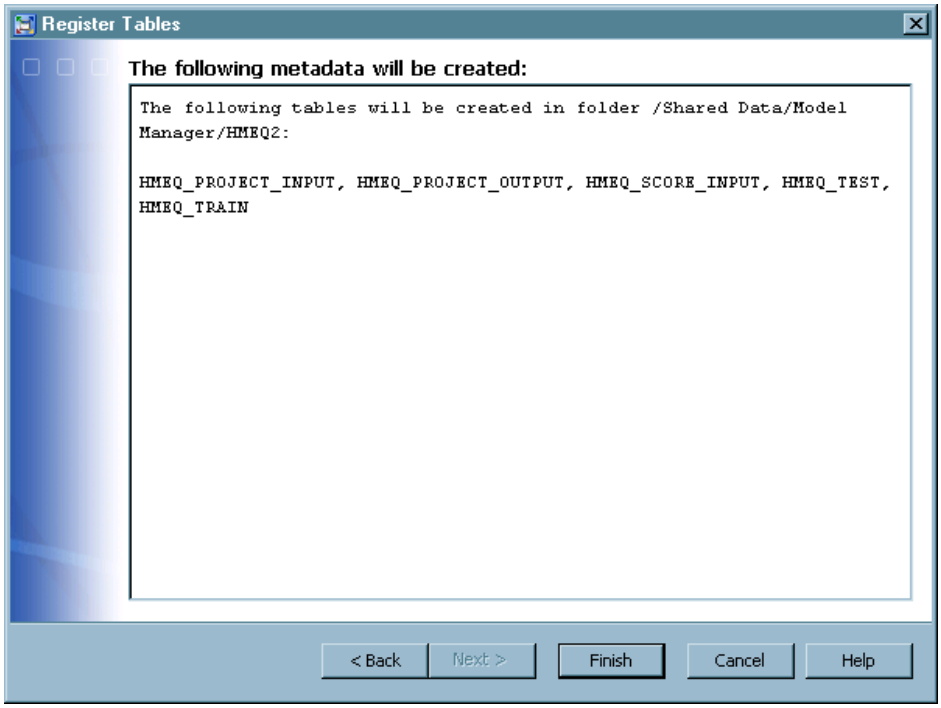


7. If prompted, enter your SAS user ID and password to log on to your SAS server.

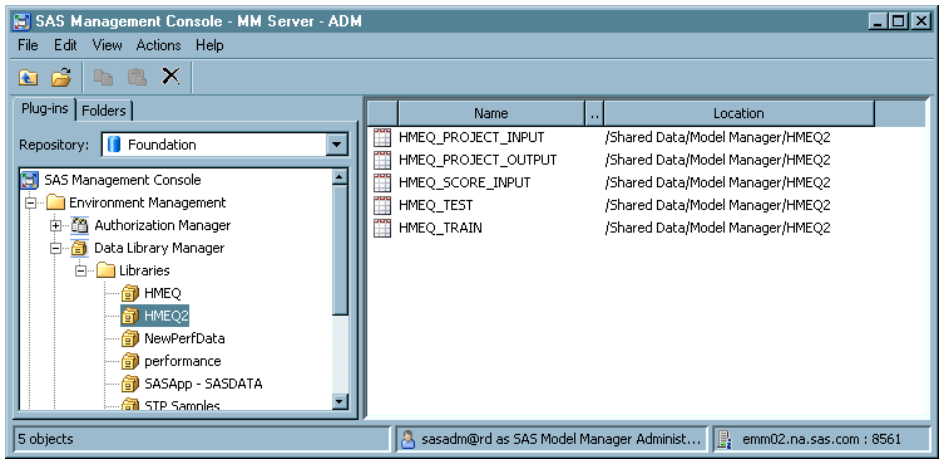
8. The Define Tables and Select Folder Location page is displayed. Select the table or tables that you want to register, and then click **Next**.



9. Click **Finish**.



The metadata for the imported table is written into the SAS Metadata Repository and is associated with the selected SAS Library.



Note: You must create folders with appropriate access permissions so that users can manage their models, create reports, and publish models updates. If a SAS Model Manager user does not have the appropriate permissions to access a folder, then the tables and libraries are not listed in the Data Sources perspective of SAS Model Manager. For more information about creating a folder and setting permissions, see the SAS Management Console Help.

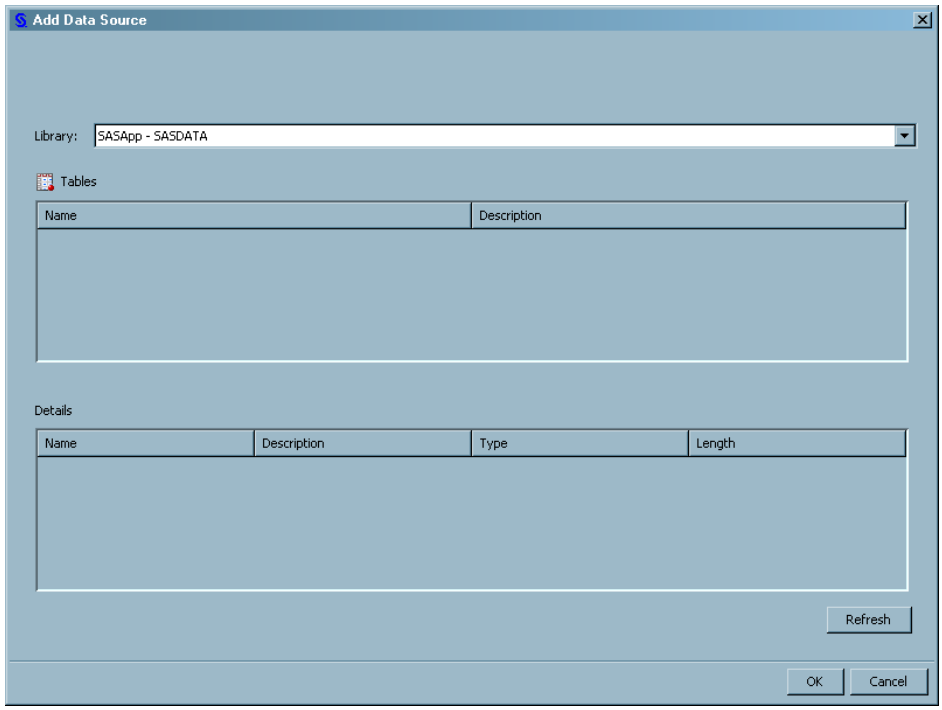
See Also

"Create Model Manager Libraries in SAS Management Console" on page 25

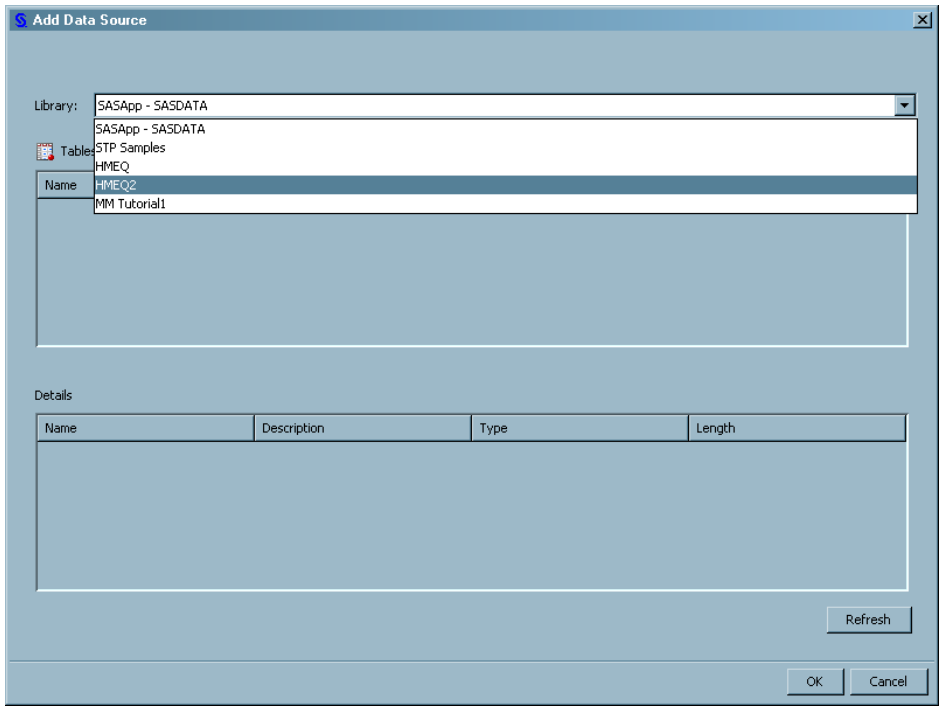
Verify Accessibility of Data Tables in SAS Model Manager

To verify that your new library and associated tables are accessible in SAS Model Manager, follow these steps:

1. Start SAS Model Manager and select the Data Sources perspective.
2. Right-click a Data Sources folder and select **Add Data Source**. The Add Data Source window opens.



3. Click **Refresh**, and then select the **Library** list. Your new library should be in the list.



4. Select your new library, and the list of tables that are associated with your new SAS library is displayed.

For more information about adding a Data Source to SAS Model Manager, see the *SAS Model Manager: User's Guide*.

Chapter 4

Creating and Configuring Publication Channels

Overview of Creating and Configuring Publication Channels **35**

Define an HTTP or HTTPS Server **37**

Define Publish Locations for the SAS Content Server **41**

Configuring Channels and Subscribers for SAS Model Manager **43**
Overview of Configuring Channels and Subscribers 43
Channel to Subscriber Configuration 44
Creating Channels and Subscribers 44

Create a Channel Folder **44**

Create a New Channel **46**

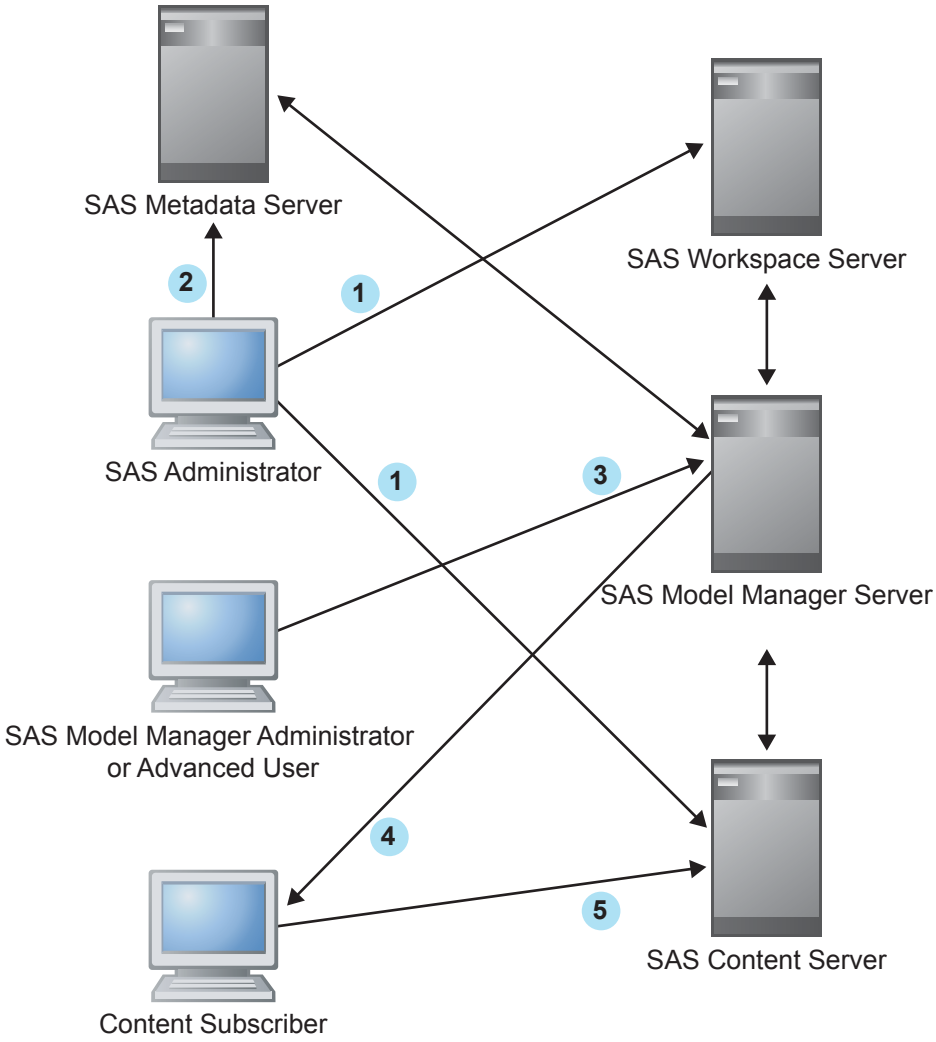
Create a New Subscriber **49**

Overview of Creating and Configuring Publication Channels

SAS Model Manager uses the SAS Publishing Framework to publish model updates to an operational environment for testing and production. The SAS Administrator creates and configures definitions for channels, content subscribers, and group subscribers. Then the user can use the SAS Model Manager model extraction macros or user-written SAS code to retrieve and deploy the updated models to the operational environment.

As shown in the following figure, several tasks are necessary to configure and use the SAS Model Manager publishing functionality.

Figure 4.1 *Configuring SAS Model Manager to enable Publishing Models*



Here are the tasks.

1. The SAS Model Manager administrator creates either an archive or a WebDAV persistent storage location for channels that is accessible from the SAS Workspace Server.
2. The SAS Model Manager administrator creates SAS Model Manager users, HTTP servers, content subscribers, and channels using SAS Management Console.
3. The SAS Model Manager administrator or an advanced user publishes models using the SAS Model Manager Client.
4. The content subscriber (for example, Scoring personnel) receives an e-mail notification from the SAS Model Manager Server that contains a channel content update.
5. The content subscriber extracts models from a channel (for example, on a SAS Content Server) to prepare them for scoring.

Note: SAS Management Console Help provides details for your SAS Model Manager publishing configuration options.

It is recommended that at first you use channels that have the type of Archive File type for the persistent storage option. This is the simplest channel definition and configuration to use to publish directly to your operational testing or production scoring servers. A channel

called **MMChannel** is created that has a persistent store Archive File type during the installation of SAS Model Manager. For more information, see "Create a New Channel" on page 46.

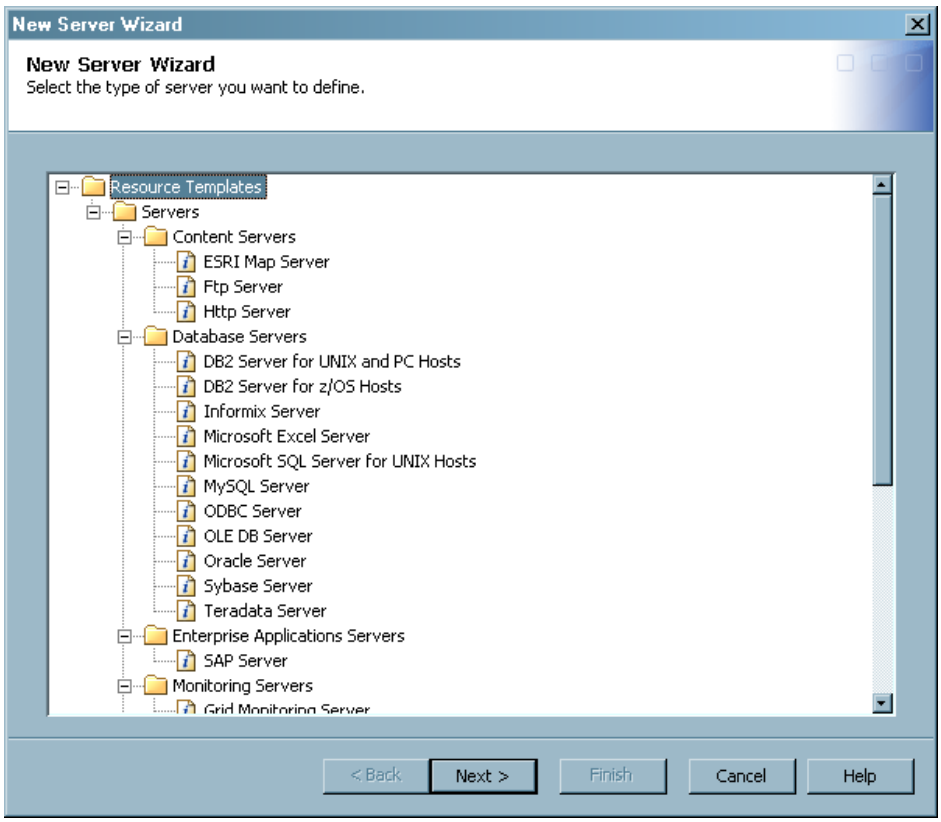
Define an HTTP or HTTPS Server

The SAS Model Manager installation process defines a default SAS Content Server. Use this process to add additional HTTP or HTTPS servers. A WebDAV-enabled HTTP or HTTPS content server must be defined in SAS Management Console before you can publish to channels from SAS Model Manager. The server is usually a third-party server such as Microsoft Internet Information server or an Apache server.

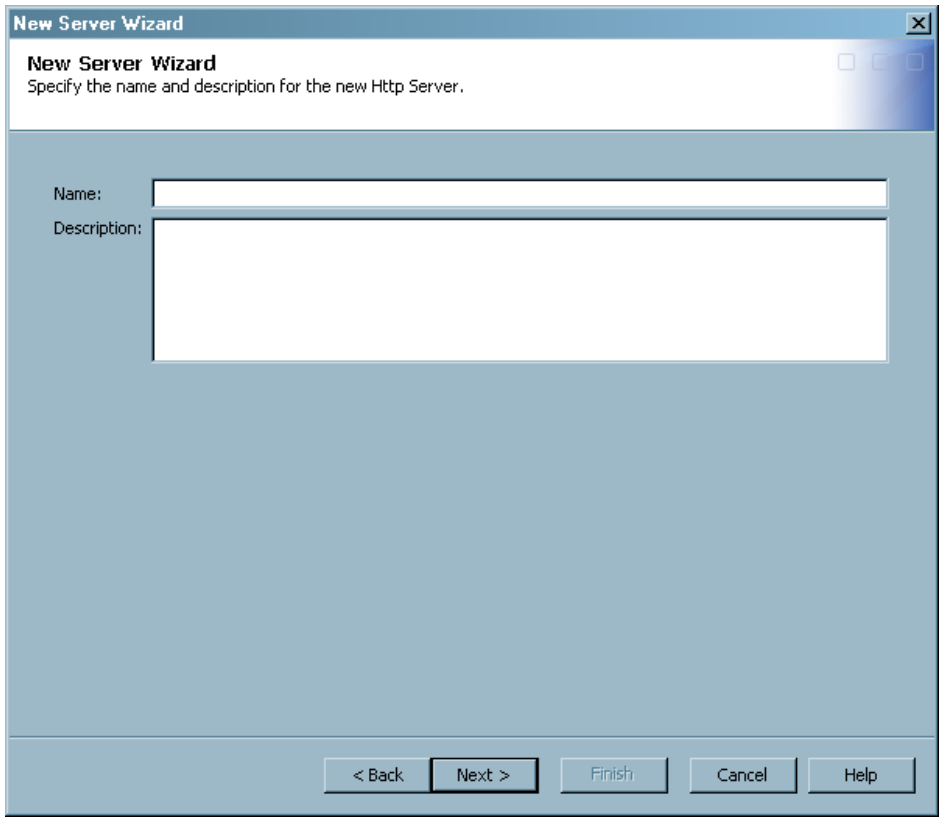
Note: You must have WriteMetadata permission for a repository in order to define an HTTP or HTTPS content server for that repository.

To define your HTTP or HTTPS content server, follow these steps:

1. Start SAS Management Console. Open your existing connection profile for your server. If your connection profile is not available in the list, see "Configuring a SAS Model Manager Connection Profile for the SAS Metadata Repository" on page 10.
2. From the **Plug-ins** tab, right-click **Server Manager**, and then select **New Server**. The New Server Wizard window opens.

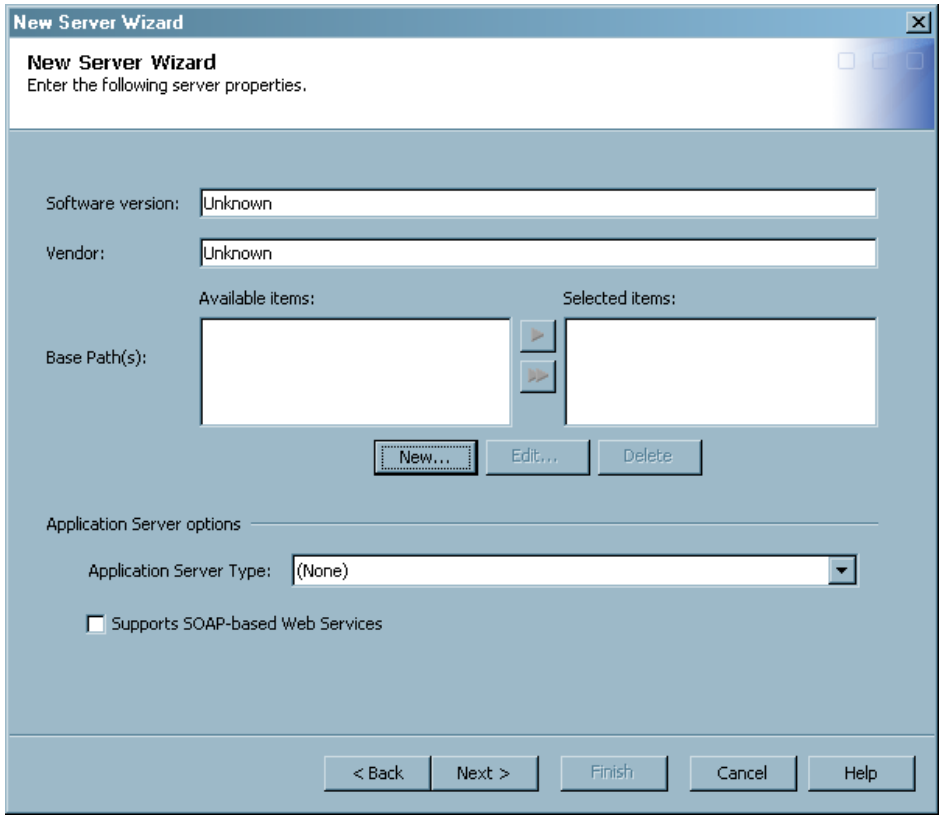


3. Select **Resource Templates** ⇨ **Servers** ⇨ **Content Servers** ⇨ **Http Server**, and then click **Next**.



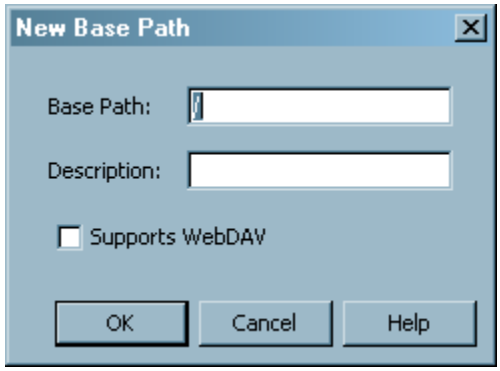
Note: If the HTTP server template is not available, then you must add the resource template. For more information, see the SAS Management Console Help.

4. Enter the name and the description of your HTTP server. Click **Next**.

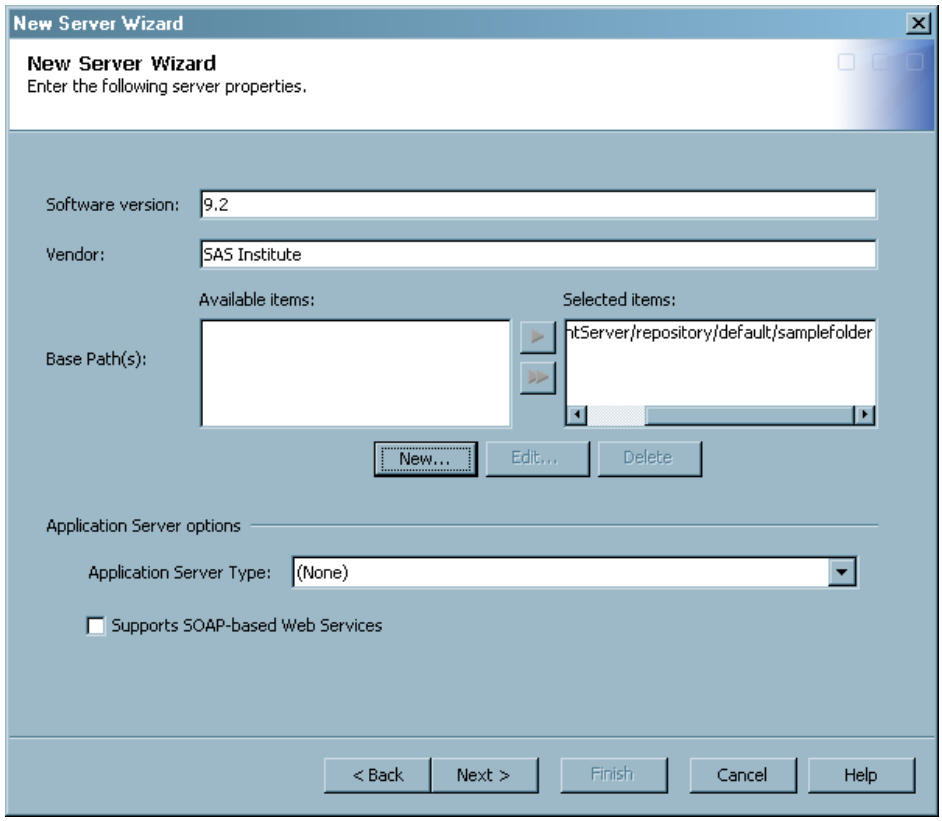


5. (Optional) On the server properties page, enter the software version and vendor information for the third-party HTTP or HTTPS server that you are defining.
6. Click **New** to create base path or paths on your server. The New Base Path dialog box appears.

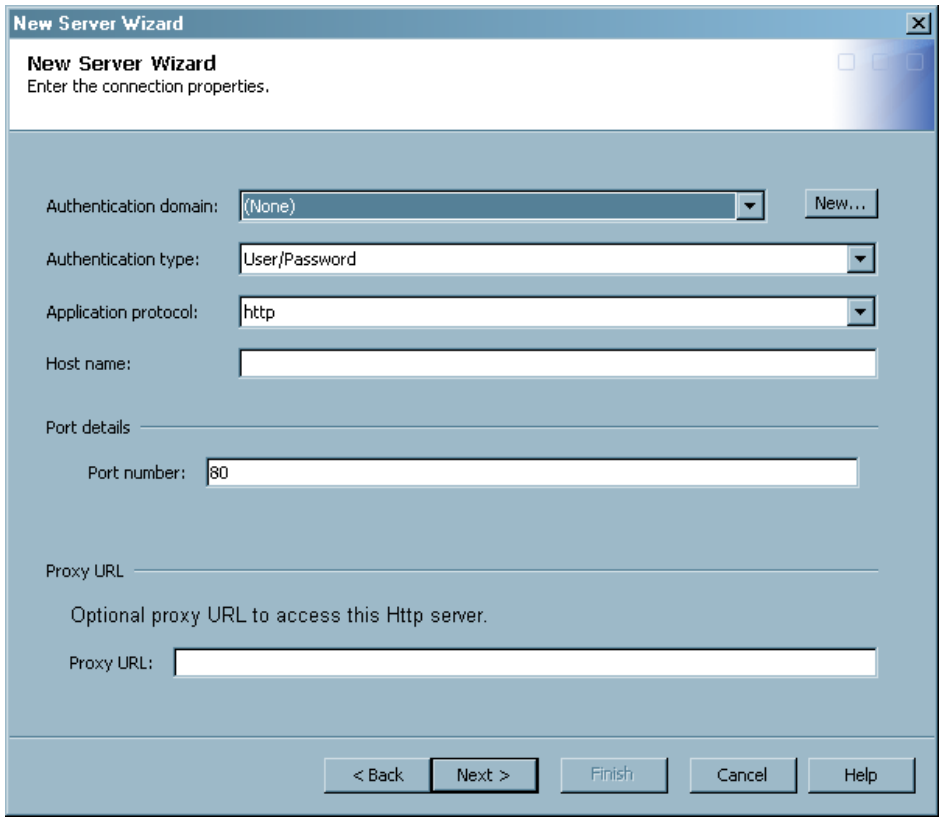
   Note: If you have not defined the base path for your HTTP server, see "Define Publish Locations for the SAS Content Server" on page 41.



7. In the **Base Path** field specify the location of the top-level directory where report content items such as report definitions or image files are stored. (This path must be set up as an alias on the Web server.) The **Description** field is optional.
8. Select the **Supports WebDAV** option and then click **OK** to save your settings. The new base path appears in the **Base Path(s)** field of the server properties page.



9. Click **Next**. The connection properties page opens.



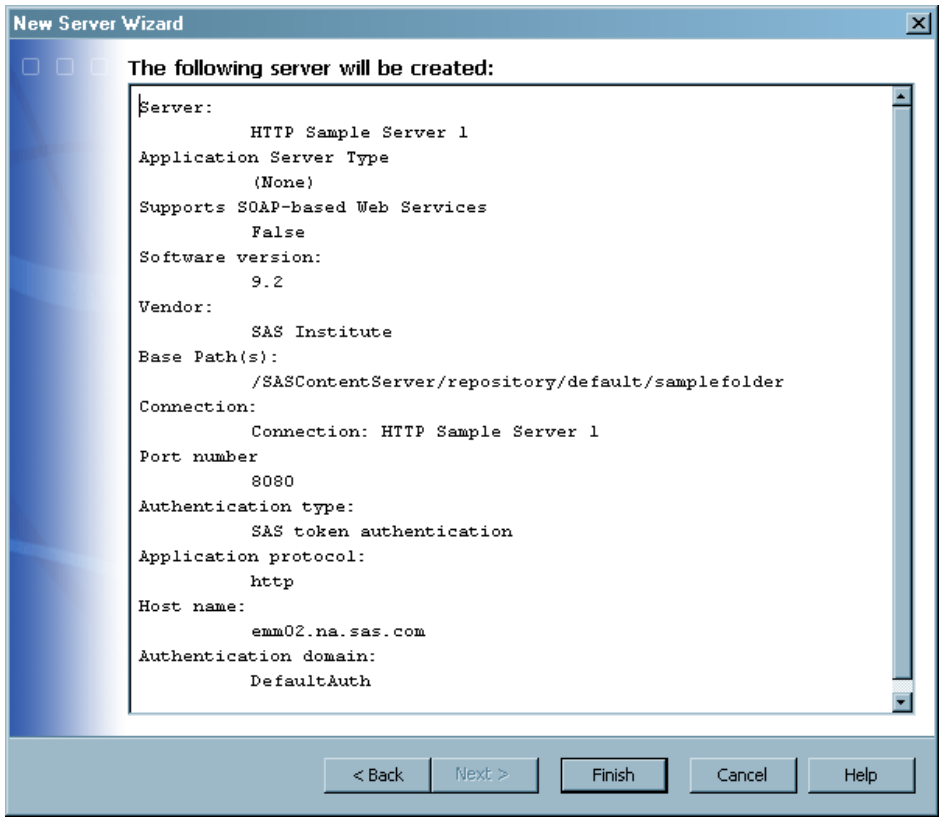
10. Enter the connection properties for your HTTP server:

    a. Select **DefaultAuth** from the list. When you click **New** to create a new domain, a dialog box appears. Enter the name and description of your domain.

    b. Enter the fully qualified name or the IP address of your server.

    c. Enter a port number (for example, 8080 for a Web application server).

11. Click **Next**. The New Server Wizard window displays a summary of the settings for the new server and indicates that you have successfully completed the definition of a new server.



12. Click **Finish**. The wizard window closes and your new server is displayed under the Server Manager node in the SAS Management Console Navigation Tree.

For more information, see the following resources:

1. The SAS Management Console Help.
2. The SAS online documentation about administering HTTP Servers and WebDAV, available at **`http://support.sas.com`**. Search for Administering HTTP Servers and WebDAV.

Define Publish Locations for the SAS Content Server

During the SAS Model Manager installation process the **ModelManager**, **sasfolders**, and **sasdav** WebDAV folders are automatically created on the SAS Content Server. You can use the SAS Content Server Administration Console (SCS Admin Console) to create a new WebDAV folder publishing location or control access to an existing WebDAV folder. If you need to define a new WebDAV-enabled HTTP content server after the initial installation of SAS Model Manager, then you must define a publishing location. For more information, see "Define an HTTP or HTTPS Server" on page 37.

Note: Although you can add a folder to the **sasfolders** location, the folder that you add is not added to the SAS Metadata Server.

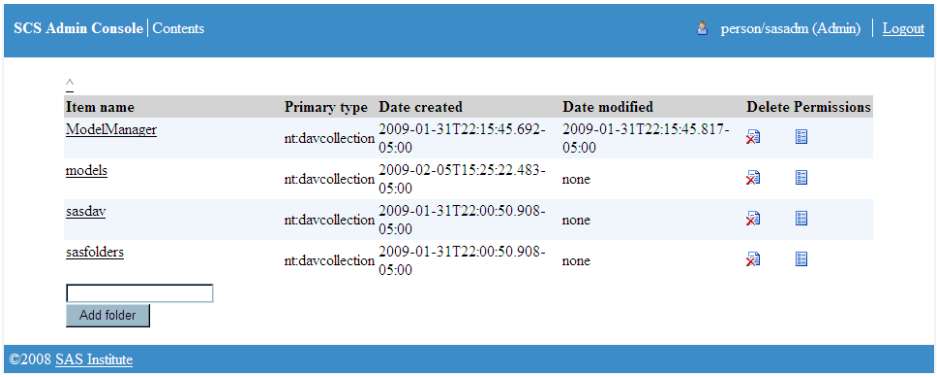
TIP The best practice is to add folders to metadata using SAS Management Console.

To define a new publishing location, follow these steps:

1. Access the SAS Content Server Administration console by entering the following URL in your Web browser and substituting the server name and port number of your SAS Content Server: **`http://`*`server name`*`:port/SASContentServer/dircontents.jsp`**

   Note: The default port number depends on the application server that is being used. For example, the default port for JBOSS is 8080.

2. Log on to the console as an unrestricted user (for example, SAS Administrator). The SCS Admin Console window opens.



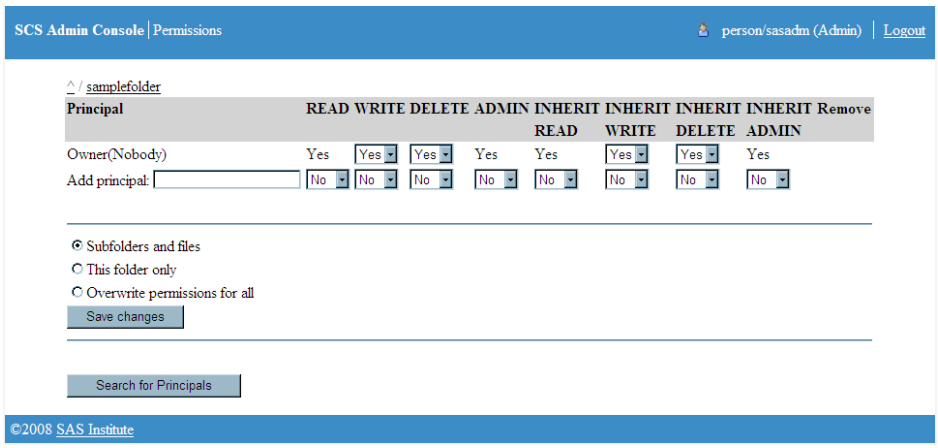
3. Enter a name for the folder in the text box and then click **Add folder** to create a new location for publishing channels.

4. (optional) To create a subfolder, select the folder that you created in the previous step, enter a name for the subfolder in the text box, and click **Add folder**.

   Note: Use the breadcrumb trail above the list to return to a parent folder.

5. To set permissions for a folder, follow these steps:

   a. Click the permission icon next to the item that you want to modify. The Permissions page appears.



   b. For each principal that is listed, modify the permissions by changing each permission to **Yes** or **No**.

   c. To add more principals to the page, do one of the following:

      - If you know the principal's name, enter it in the field and click **Save changes**.
      - Click **Search for Principals** to search for a name. When you find the principal that you want to add, select the check box that is next to the principal's name and then click **Return**.

After the principal's name appears on the permission page, you can set permissions for the principal.

Note: For more information about administering the SAS Content Server, see the *SAS 9.2 Intelligence Platform: Web Application Administration Guide*.

Configuring Channels and Subscribers for SAS Model Manager

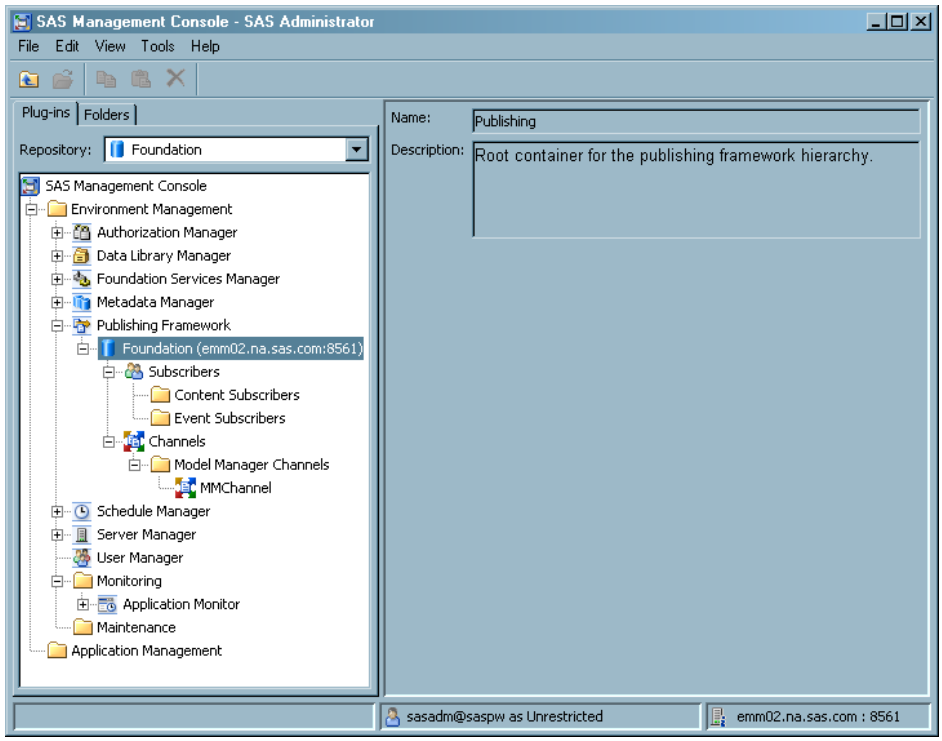
Overview of Configuring Channels and Subscribers

The Publishing Framework plug-in to SAS Management Console enables you to administer the Publishing Framework.

Note: You need to verify that Publishing Framework plug-ins are available in your SAS Management Console navigation tree. If the plug-in is not available, you need to install SAS Foundation Services 1.3 or later so that you can configure your channels and subscribers for SAS Model Manager.

With the Publishing Framework plug-in, you can manage subscribers and channels. For more information, see the Help.

When the Publishing Framework plug-in is available, the SAS Management Console Project Tree should look as follows:



The SAS Metadata Server (for example, **Foundation**) that is shown under the Publishing Framework plug-in contains the **Subscribers** folder and the **Channels** folder.

The Publishing Framework plug-in to SAS Management Console provides wizards that enable you to create subscribers. When you create a subscriber with a wizard, the subscriber object that has the specified attributes is stored on the SAS Metadata Server.

For more information about Publishing Framework, see the *SAS 9.2 Publishing Framework: Developer's Guide*.

Channel to Subscriber Configuration

There are several ways to configure channels to publish your models to the SAS Model Manager channel subscribers.

Choose one of these options to define the method to use for publishing channels:

1. **None** - specifies to publish all content that is published to the channel directly to the subscribers (through e-mail). The content is not persisted.
2. **Archive** - specifies a path and an optional logical server for the location of the persistent storage. The **Archive File** option is recommended for publishing model packages. Publishing Framework publishes the content as an archive (binary) SPK (SAS package) file to the persistent storage location.
3. **WebDAV** - specifies the WebDAV server location.

TIP The best practice is to use the **Archive File** type for channel persistent storage and **e-mail** for subscriber notification.

Before publishing models using SAS Model Manager, you must create channels and subscribers to publish your model updates.

Creating Channels and Subscribers

The channel sends the information from the publishers to the subscribers who want it.

A subscriber is a person or a program that has a need for information that is published. To receive information from a channel, the user must be defined as a subscriber.

The Publishing Framework plug-in provides wizards that enable you to create subscribers. Information about the subscriber is stored on the SAS Metadata Server.

Note: Channel subscribers must be users of the SAS Metadata Server and their e-mail addresses must be specified.

Create a Channel Folder

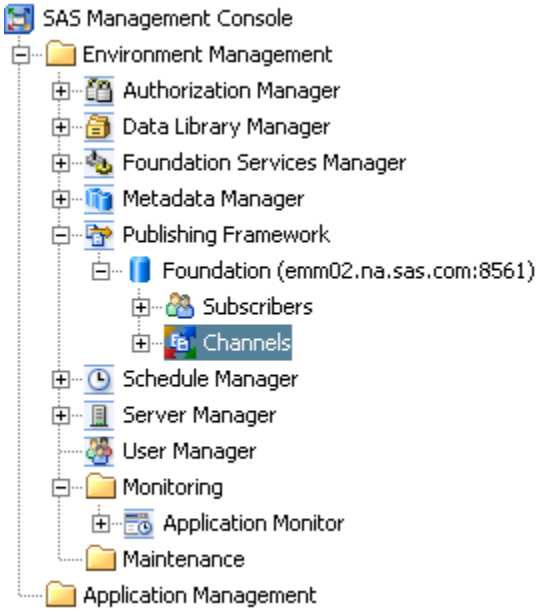
If you expect to create a large number of channels, then consider grouping related channels into channel folders. You can create subfolders within folders, thereby creating a folder hierarchy to which access controls can be applied. For more information, see the SAS Management Console Help.

Note: Currently it is not possible to move an existing channel into a folder or from one folder to another. Plan ahead to avoid having to delete and recreate channels.

To create channel folders, follow these steps:

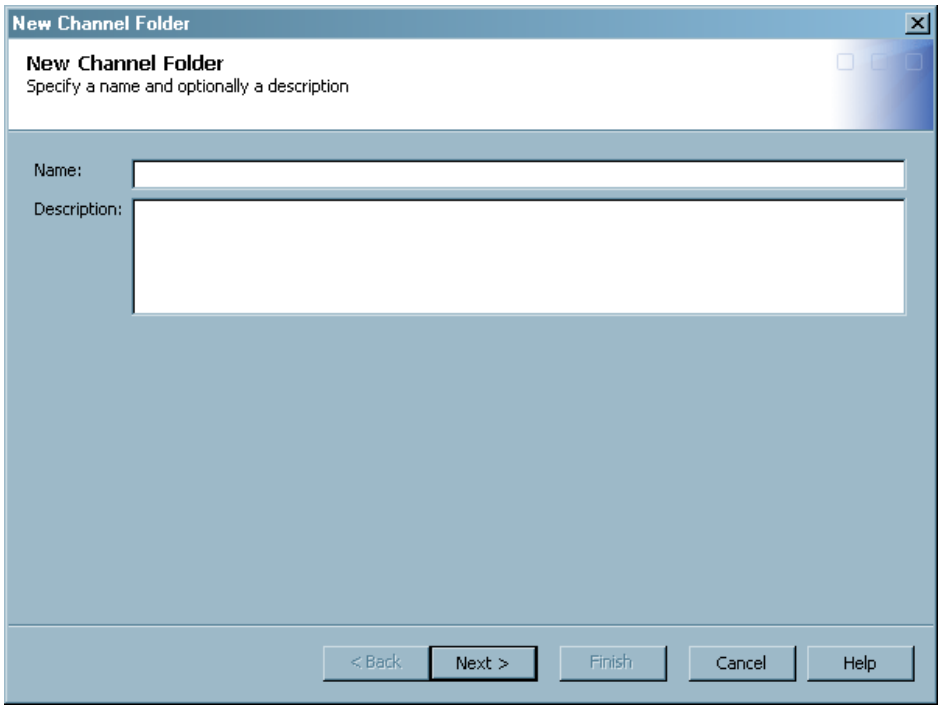
1. From the SAS Management Console navigation tree, expand the **Publishing Framework** node.

2. Select and expand the desired metadata repository node.
3. If you are creating a top-level folder, then select **Channels**. If you are creating a subfolder, then navigate to and select the desired parent folder.

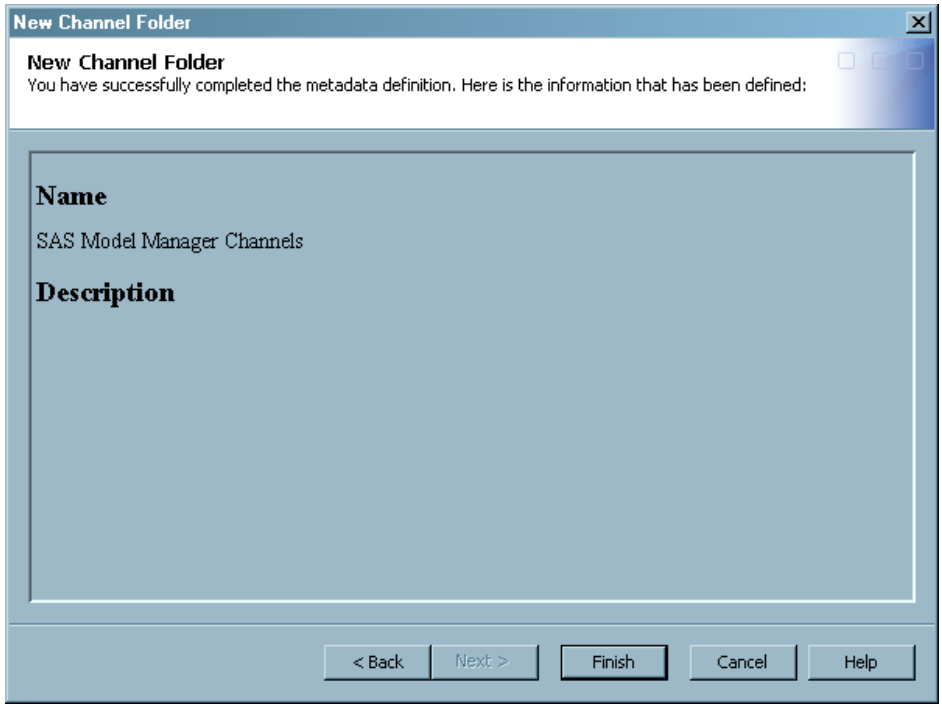


4. Right-click **Channels** and then select **New Folder**.

   The New Channel Folder wizard window opens.



5. Enter a name for the new channel folder and then click **Next**. The new folder is created and the metadata definition information is displayed.

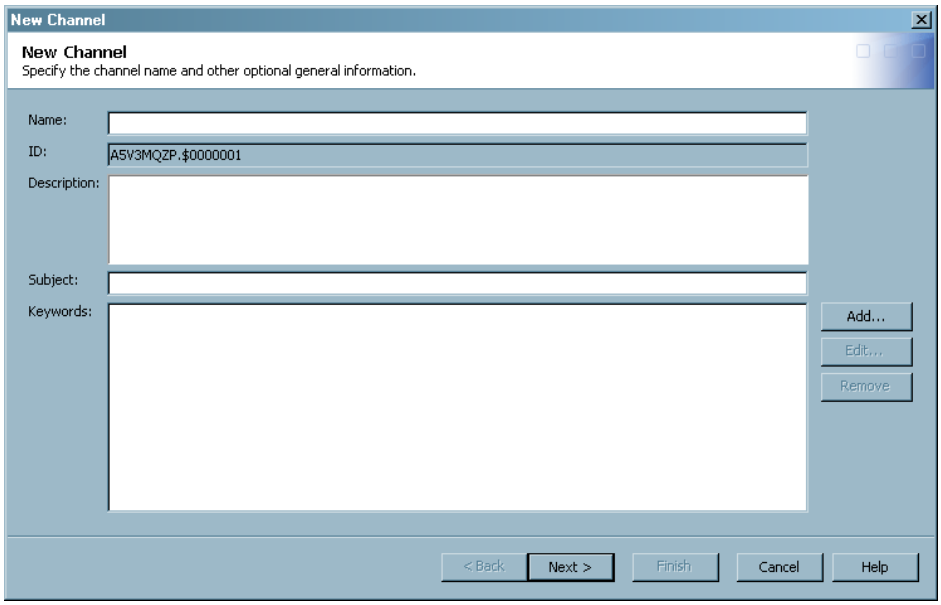


6. Click **Finish**.

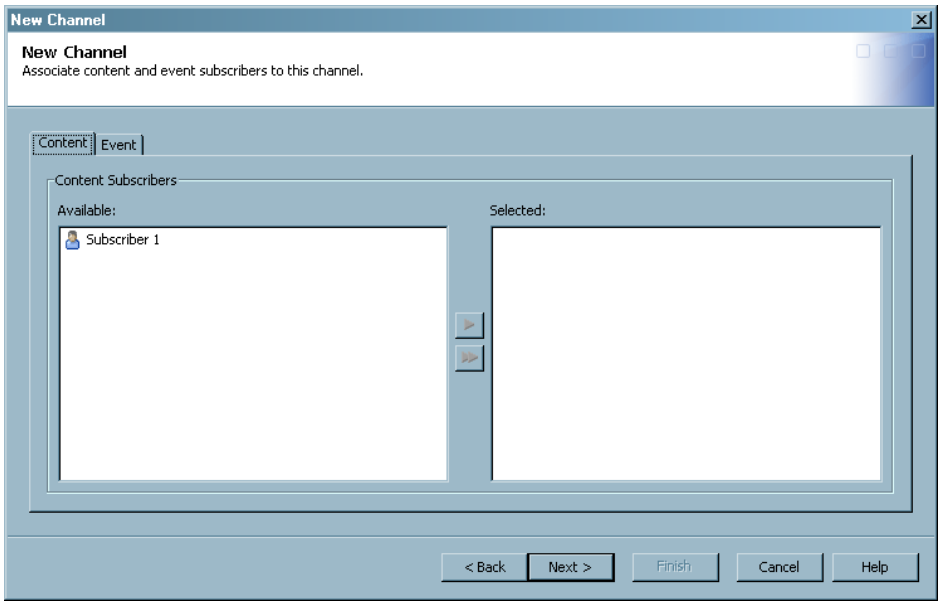
Create a New Channel

To create a new channel, follow these steps:

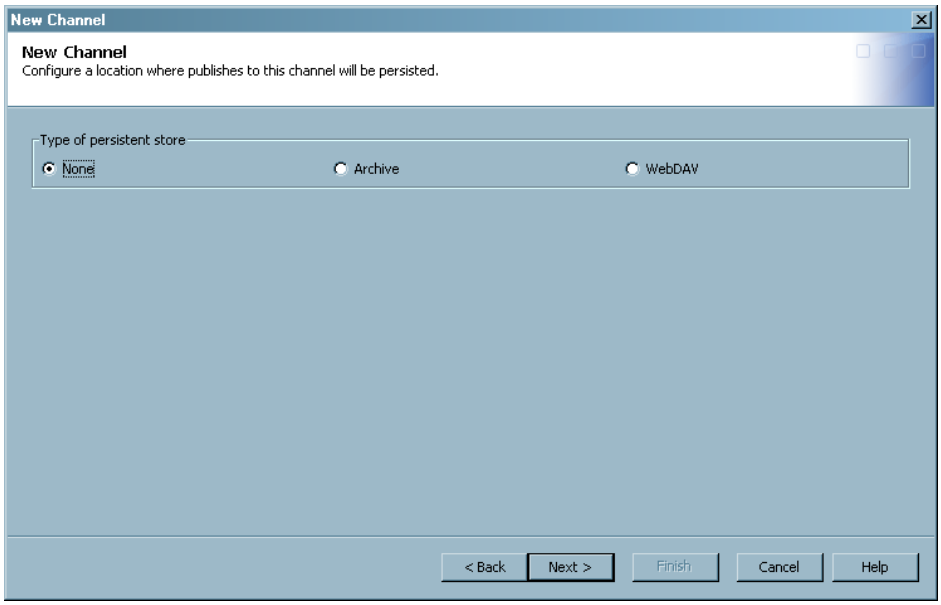
1. From the SAS Management Console navigation tree, expand the **Publishing Framework** node.
2. Select and expand the desired metadata repository node.
3. If you are creating a channel within a folder, select the **Channels** node and navigate to the desired folder.
4. Right-click **Channels** or the desired channel folder and select **New Channel**. The New Channel wizard opens.



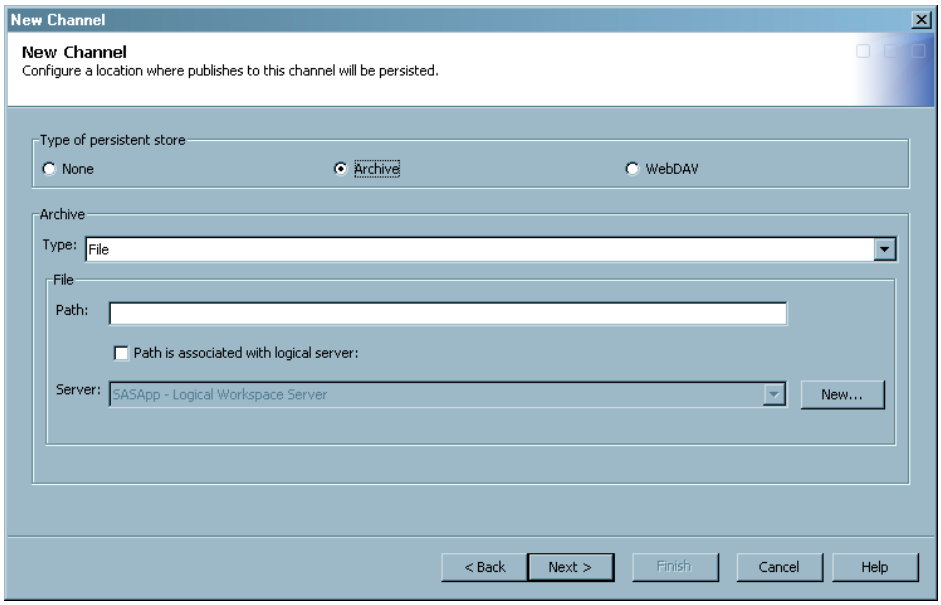
5. Specify the name of your channel and click **Next**.



6. Use the arrow to associate content subscribers with this channel to be notified at publish time. Click **Next**.



7. Select **Archive**. The archive page opens.



8. Select **File** for **Archive Type** and enter the path of your publish location. Click **Next**.

   The information window opens, providing the summary of the input and status of successful completion of the channel creation.

   Note: The Archive storage has two other types: HTTP and FTP that you can select from the list.

9. Click **Finish**. The new channel name is displayed under the **Channels** node of SAS Management Console.

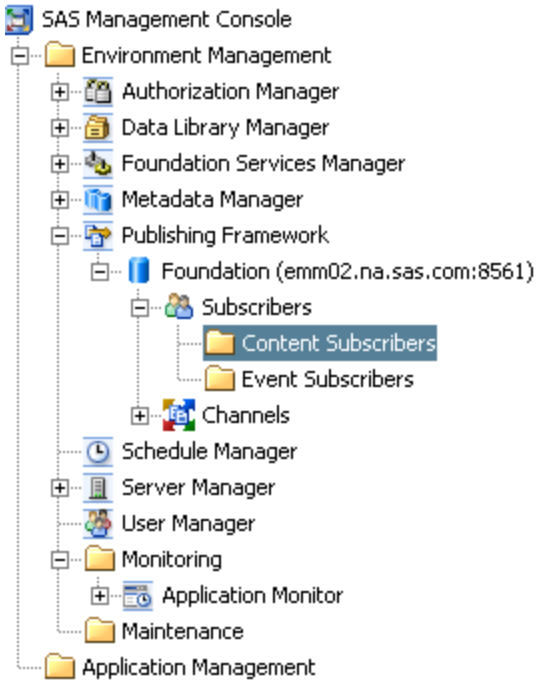
For more information, see the SAS Management Console Help or the *SAS 9.2 Publishing Framework: Developer's Guide*.

Create a New Subscriber

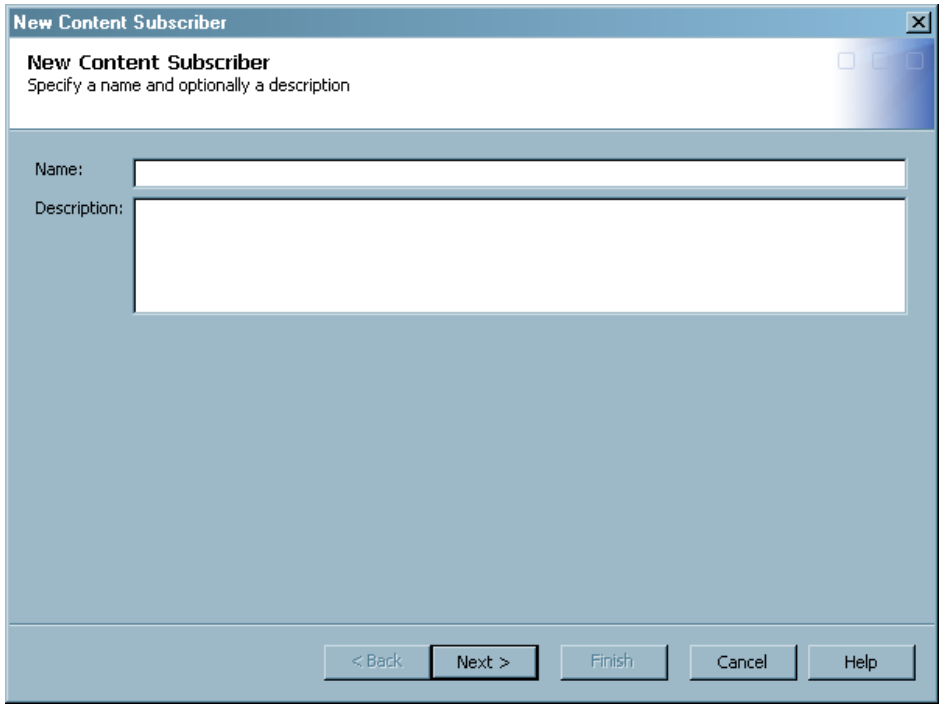
SAS Model Manager supports only the content subscriber and the Name/Value pair filter for filtering. You can publish to a channel even when the channel does not have any associated subscribers. SAS Model Manager users can extract contents from a channel if they are not subscribers of the channel. However, only subscribers of a channel can receive notifications. You can also create a subscriber group that contains individual subscribers or other subscriber groups. For more information, see the SAS Management Console Help.

To create a new content subscriber:

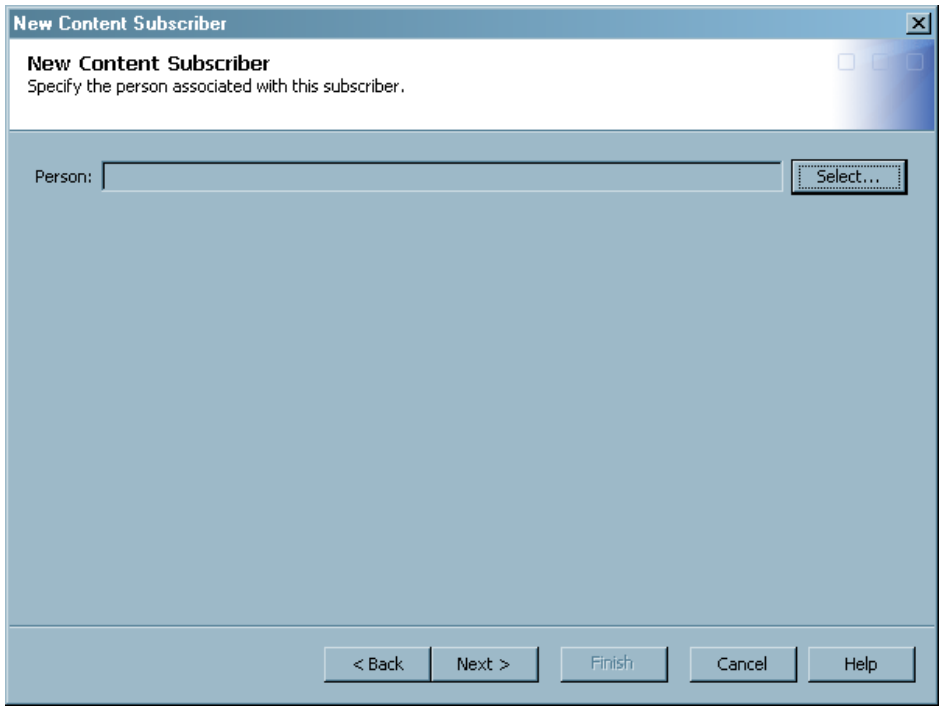
1. Expand the Publishing Framework node in the SAS Management Console navigation tree.
2. Select the desired metadata repository node.
3. Select **Subscribers** ⇨ **Content Subscribers**.



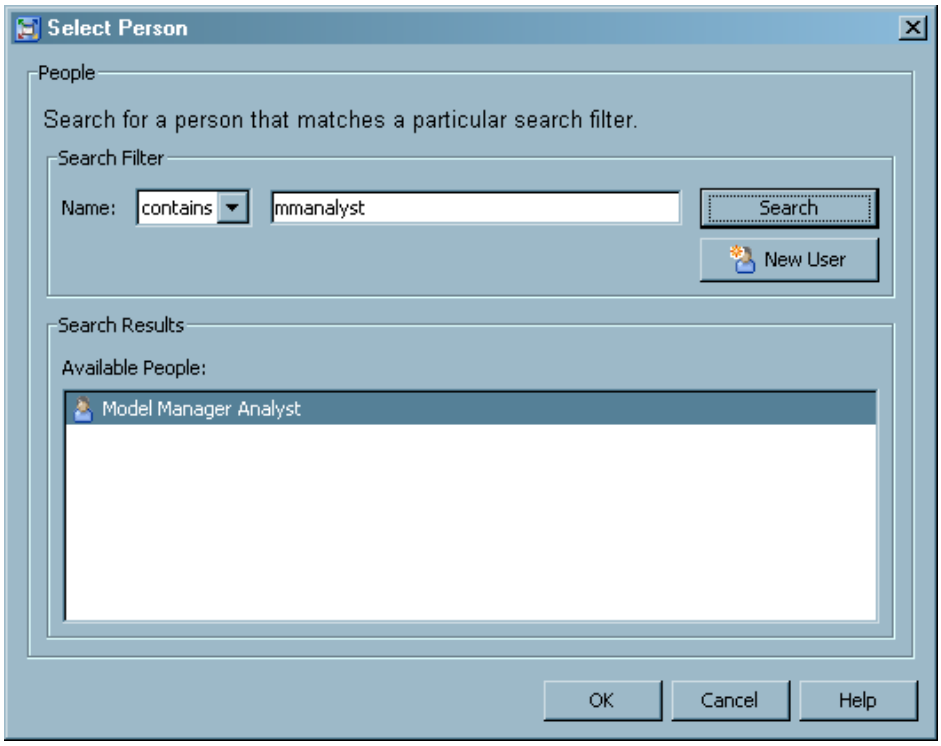
4. Right-click **Content Subscribers** and select **New Content Subscriber**. The New Content Subscriber wizard window opens.



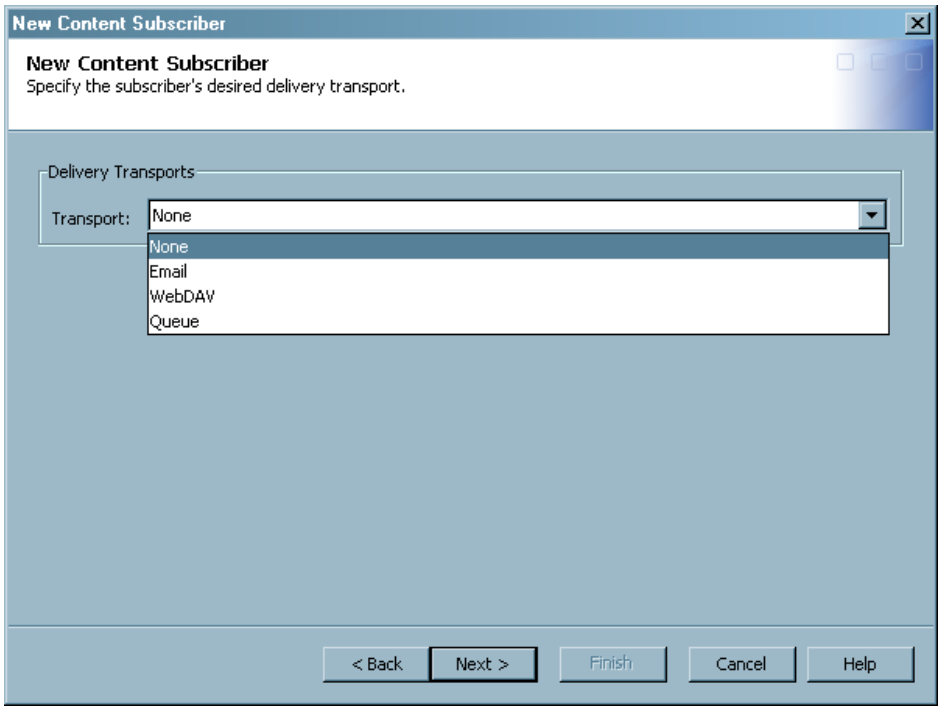
5. Specify a name and a description for this subscriber. The name must be unique within its parent folder. The description is optional. Click **Next**.
6. Click **Select** to associate a person with this subscriber.

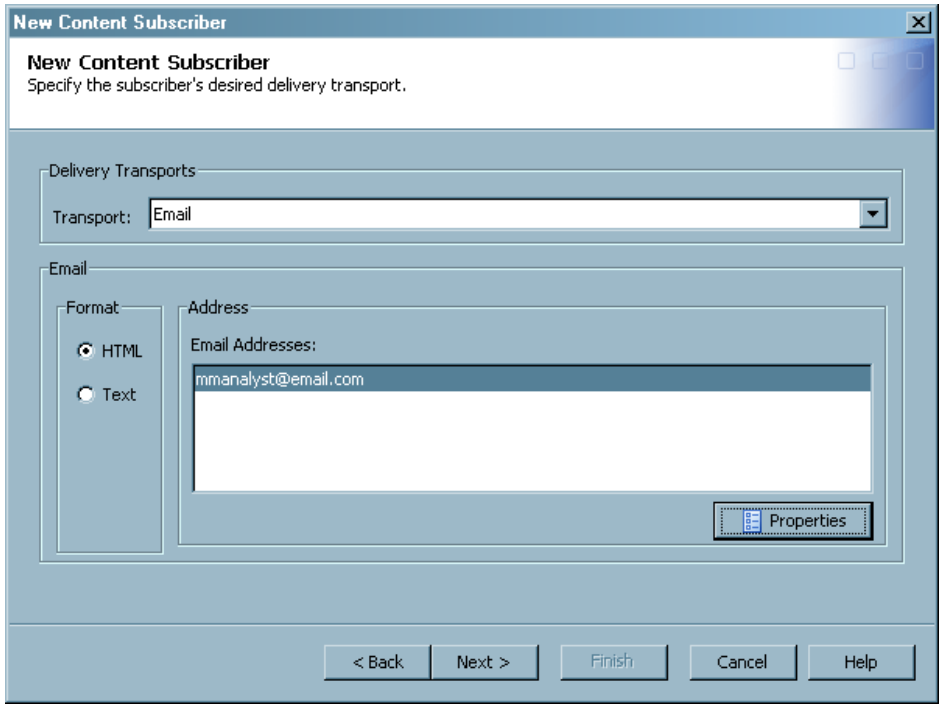


7. The search filter enables you to search the repository for users whose names either contain or are equal to a string that you specify. Enter the string in the text field, select either **contains** or **equals** from the list, and click **Search**. A list of users whose names meet your search criteria appears in the **Available People** list.

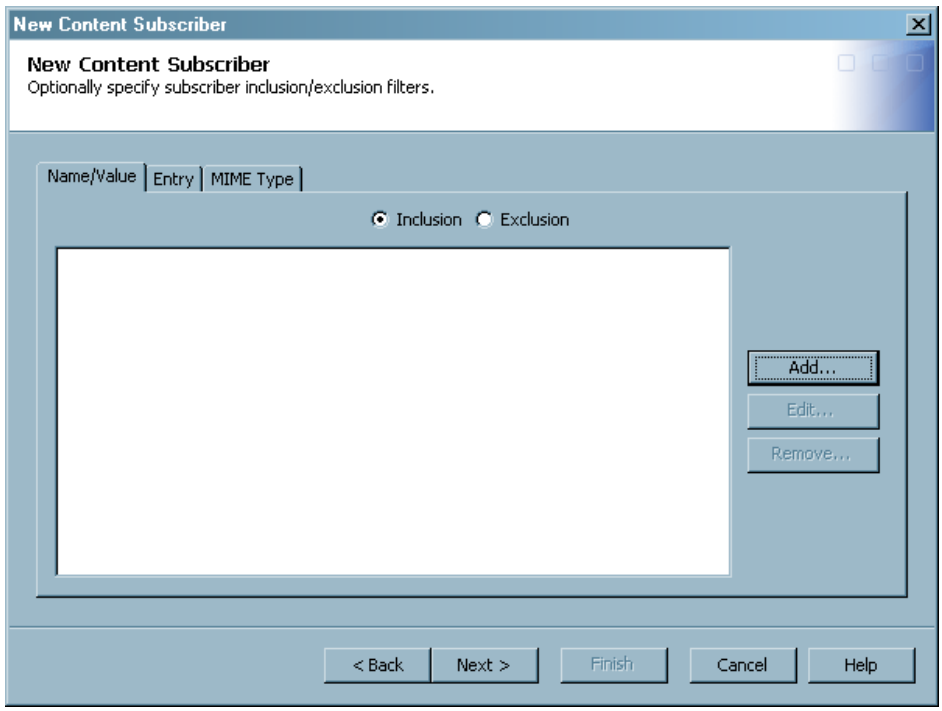


8. If the desired user does not exist in the repository, then click **New User** to define that user. Then, select the desired user from the **Available People** list and click **OK**.
9. Click **Next**.
10. Select the subscriber's delivery transport and then specify the attributes. Click **Next**.



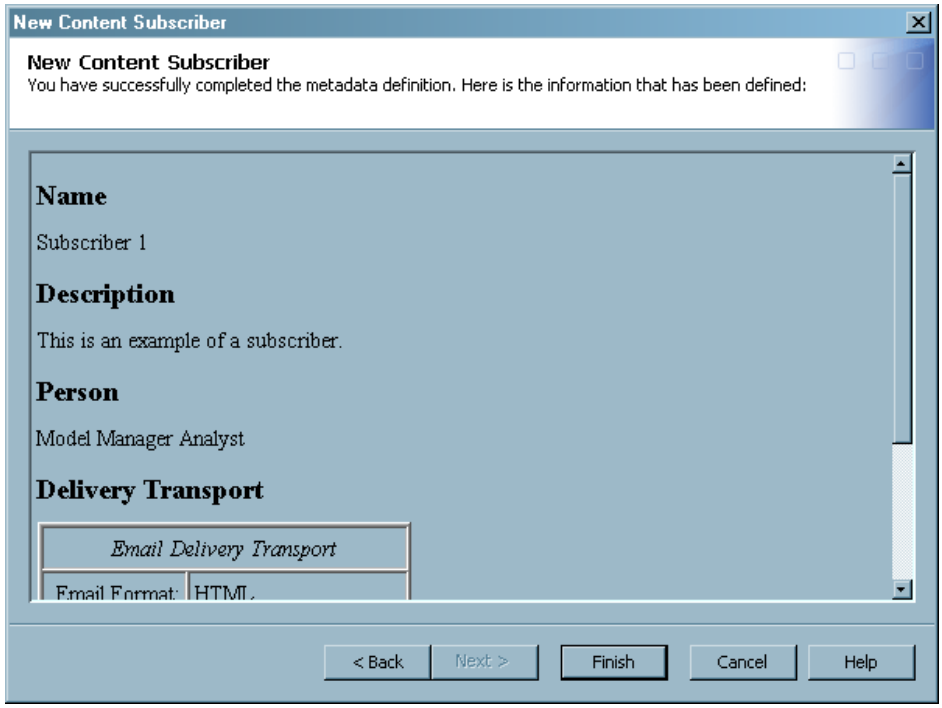


11. Specify one or more filters to eliminate content that the subscriber does not want to receive. To add a filter, select the tab that corresponds to the type of filter (Name/Value, Entry, or MIME Type). Select **Inclusion** or **Exclusion** and then click **Add** to specify the filter criteria.



12. Click **Next**.

13. Review the subscriber specifications. Click **Back** to make any corrections. Click **Finish** when you are satisfied with your selections.



For more information, see the Help or the *SAS 9.2 Publishing Framework: Developer's Guide*.

Chapter 5

Managing Data Tables, Users, Groups, and Roles in SAS Management Console

Overview of Managing Data Tables, Users, Groups, and Roles in SAS Management Console **55**

Modifying a Data Table **55**

Deleting a Data Table **56**
Overview of Deleting a Data Table 56
Deleting a Data Table in SAS Model Manager 56
Deleting a Data Table in SAS Management Console 56

Managing Users, Groups, and Roles **57**

Overview of Managing Data Tables, Users, Groups, and Roles in SAS Management Console

SAS Management Console is the primary tool that is available to administer the SAS Metadata Repository. SAS Management Console is a framework that provides a variety of plug-ins that expand the capability of SAS Management Console. Only certain users can view and use plug-ins. A user's access to plug-ins depends on which roles the user is assigned to and which capabilities are assigned to those roles. SAS Model Manager makes extensive use of the SAS Metadata Repository. Therefore, SAS Management Console is used to perform a number of administrative tasks. Some of those tasks include managing users, groups, roles, and data tables. For information about other administrative tasks such as creating users, groups, roles, and channels, see Chapter 3, "Setting Up SAS Management Console for Use," on page 9.

For information about SAS Management Console and plug-ins, see "Understanding the State of Your System" in the *SAS Intelligence Platform: System Administration Guide*. Also, see the SAS Management Console Help.

Modifying a Data Table

SAS data tables that are being used in SAS Model Manager should be modified before they are added as data source tables in SAS Model Manager. SAS Model Manager does not provide any methods to modify the structure of a data source table. If a data table is somehow modified externally (via SAS Management Console, for example) then the existing SAS Model Manager scoring tasks might stop functioning.

For more information, see the SAS Management Console Help or the *SAS Intelligence Platform: System Administration Guide*.

Deleting a Data Table

Overview of Deleting a Data Table

Users who are members of the **Model Manager Advanced Users** or **Model Manager Administrator Users** groups can delete project or model data tables from the Data Sources perspective. Deleting tables from the SAS Model Manager Data Sources view does not physically remove the actual table or metadata table information. When you delete a data table from a SAS Model Manager **Data Sources** folder, you are removing only the SAS Model Manager's reference to the table's metadata information that resides in a SAS Metadata Repository library.

If a table in the SAS Model Manager Data Sources view was previously assigned to a scoring task, that scoring task can still access the table in its SAS Metadata Repository library even when you delete the table from the view. The reason is that the code in the scoring task retains the table's Metadata Repository ID. If the source table's metadata is deleted from the SAS Metadata Repository via SAS Management Console or the operating system, SAS Model Manager cannot access the table to view data or perform any reporting or scoring task activities, and an error message is issued.

TIP A best practice is to first delete a data table from SAS Model Manager, and then from SAS Management Console.

Deleting a Data Table in SAS Model Manager

To delete a data table in SAS Model Manager, follow these steps:

1. Select the Data Sources perspective button .
2. Expand the data source folder that contains the table that you want to delete.
3. Right-click the table and select **Delete Item**. The delete table dialog box is displayed.
4. Click **Yes** to delete the table. The reference to the data table is deleted in SAS Model Manager.

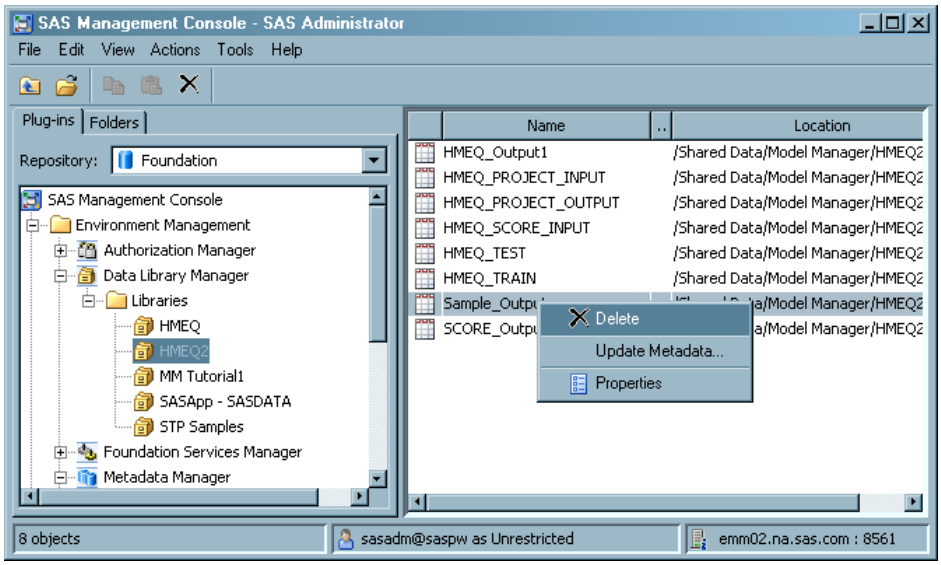
Deleting a Data Table in SAS Management Console

To delete a data table in SAS Management Console, follow these steps:

1. Verify that the table has been removed from the Data Sources view in SAS Model Manager.
2. Start SAS Management Console and connect to your preferred SAS Metadata Repository.
3. From the **Plug-ins** tab expand the following folders:

   Environment Management ⇨ Data Library Manager ⇨ Libraries
4. Select the library that contains the table you want to delete.

5. Right-click the table name in the right pane and then select **Delete** from the pop-up menu. The Delete Table dialog box is displayed.



6. Click **OK** to delete the table. The table is removed from the SAS Metadata Repository library, but is not physically removed from the operating system.

For more information, see the SAS Management Console Help or the *SAS Intelligence Platform: System Administration Guide*.

Managing Users, Groups, and Roles

You use SAS Management Console to set up users, groups, and roles to define which actions a user can perform when using SAS Model Manager. For information about setting up a user, group, or role, see "Configuring Users, Groups, and Roles" on page 14.

In order to make access distinctions and track user activity, security systems must know who is making each request. The primary purpose of user administration is to provide information that helps systems make this determination. The SAS environment requires one external account ID for each user. The SAS environment then uses its copy of these IDs to establish a unique SAS metadata identity for each connecting user. All of a user's group memberships, role memberships, and permission assignments are ultimately tied to their SAS metadata identity.

To access user administration features in SAS Management Console, select the **User Manager** node on the **Plug-ins** tab. Your roles and permissions determine which user administration tasks you can perform.

Note: The **User Manager** node is the only location from which you can manage identities.

For more information, see the SAS Management Console Help or the *SAS Intelligence Platform: System Administration Guide*.

Chapter 6
Administering User Templates

Overview of Administering User Templates **59**

Creating or Modifying XML Template Files **60**
Creating or Modifying a Model Template XML File 60
Creating or Modifying a Life Cycle Template XML File 61

Deploying User Templates **64**

Overview of Administering User Templates

Members of only two user groups can deploy templates after they have been created: Model Manager Advanced Users and Model Manager Administrator Users who have Write access to the middle-tier server where the SAS Model Manager Application Programming Interface is installed.

SAS Model Manager provides the following sample user templates:

- User Life Cycle Template (UserLifecycleTemplate.xml)
- User Model Template (UserModelTemplate.xml)
- User-Defined Report Template (UserReportTemplate.xml)

Use SAS Model Manager Template Editor instead of manually editing the XML files for model and life cycle user templates. An existing template XML file must be manually edited if the participants list needs to be changed. For more information, see "Creating or Modifying XML Template Files" on page 60.

Note: User-defined report templates cannot be modified using the SAS Model Manager Template Editor. For more information, see the User-Defined Reports section of the *SAS Model Manager: User's Guide*.

For more information, see "Deploying User Templates" on page 64 and the *SAS Model Manager: User's Guide*.

Creating or Modifying XML Template Files

Creating or Modifying a Model Template XML File

SAS Model Manager supplies a sample XML file for you to use as an example when you create a user model template. You can copy this template and modify the attribute values. This file is located in the user template directory ***sasconfigdir*\Lev#\AnalyticsPlatform\apps\ModelManager\ext**.

Here is a typical user model template. For a description of the file attributes, see "Model Template Properties" on page 68.

```
<?xml version="1.0" encoding="UTF-8" ?>
<ModelTemplate
    name="User Model Template"
    description="Analytical Model"
    type="AnalyticalModel"
    tool="Base SAS"
    validate="N"
    displayName="Analytical Model"
    scoreCodeType="SAS Program"
    modelMetaMacro="genVarMacro.sas"
    function="analytical">

    <FileList libRef="SMMmodel">
        <File name="score.sas" required="Y" report="Y" type="text"
             description="file.score.desc.txt" fileRef="ScoreCod" />
        <File name="modelinput.sas7bdat" required="Y" report="N" type="binary"
             description="file.inputdataset.desc.txt" fileRef="" />
        <File name="modeloutput.sas7bdat" required="Y" report="N" type="binary"
             description="file.outputdataset.desc.txt" fileRef="" />
    </FileList>

    <Properties type="System"
         resource="com.sas.analytics.modelmanager.metadata.model.Resources">
        <Property name="Algorithm" type="String" editAllowed="Y" required="N"
            initial="" displayName="algorithm.name.txt"
            description="algorithm.desc.txt"/>
        <Property name="Modeler" type="String" editAllowed="Y" required="N"
            initial="" displayName="Modeler" description="modeler.desc.txt"/>
    </Properties>

    <Properties type="User">
        <Property name="User1" type="String" editAllowed="Y" required="N"
            initial="" displayName="User1"
            description="User defined name/value pair."/>
    </Properties>
</ModelTemplate>
```

The following table provides information about updating an XML model template:

Template Editor Item	XML Element or Attribute	XML File Usage Information
Model Template Properties	<ModelTemplate name="" description="" type="" tool="" validate="" displayName="" scoreCodeType="">	For a description of the attributes, see"Template Properties" on page 68.
FileList Properties	<FileList libRef=""> <File name="" required="" report="" type="" description="" fileRef="" />	For each file assign a name, type, and description. For more information, see "FileList Properties" on page 70.
System Properties	<Properties type="System" resource="com.sas.analytics.modelmanager.metadata.model.Resources"> <Property name="" type="" editAllowed="" required="" initial="" displayName="" description="" />	For each system property assign a name, type, and description. For more information, see "System and User Properties" on page 71.
User Properties	<Properties type="User"> <Property name="" type="" editAllowed="" required="" initial="" displayName="" description=""/>	For each user property assign a name, type, and description. For more information, see "System and User Properties" on page 71.

Creating or Modifying a Life Cycle Template XML File

SAS Model Manager supplies a sample XML file for you to use as an example when you create a user life cycle template. You can copy this template and modify the attribute values. This file is located in the user template directory ***sasconfigdir*\Lev#\AnalyticsPlatform\apps\ModelManager\ext**.

Here is a typical life cycle template.

```
<?xml version="1.0" encoding="UTF-8" ?>
<LifecycleTemplate
    name="User Lifecycle Template"
    version="5"
    isDefault="false"
    description="A lifecycle template for the users to experiment with."
    >
    <Participants>
        <Participant id="1" name="mdlmgrexampleassignees"/>
        <Participant id="2" name="mdlmgrexampleapprovers"/>
    </Participants>
    <Lifecycle>
        <Milestone id="1" type="Develop" name="Development"
            desc="The development milestone">
            <Action id="1" type="SetChampion" name="Select Champion"
              dependsOn="" assignees="1" approvers="2"
              weight="100" duration="1"
              desc="Specify which is the champion model." />
```

```
            </Milestone>
            <Milestone id="2" type="Production" name="Production"
                desc="The production milestone">
                <Action id="2" type="DeclareProduction"
                  name="Declare Ready For Production"
                  dependsOn="1"  assignees="1" approvers="2"
                  weight="100" duration="10"
                  desc="Declare this version ready to be put into production."/>
            </Milestone>
            <Milestone id="3" type="Retire" name="Retire"
                desc="The retire milestone">
                <Action id="3" type="RetireChampion" name="End Production Scoring"
                  dependsOn="2" assignees="1" approvers="2"
                  weight="100" duration="1"
                  desc="De-activate the champion model and stop scoring with it."/>
            </Milestone>
        </Lifecycle>
    </LifecycleTemplate>
```

Most of the XML elements and element attributes match the property names that are described in "Life Cycle Template Properties" on page 65. One of the most notable differences between creating a life cycle template using the SAS Model Manager Template Editor and modifying an XML template file using a text editor is that the template editor generates milestone, task, and dependency identifiers, and provides a list of users and groups who can be participants. When you create a life cycle template using a text editor, you must assign identifiers, increment the number for the version property, and know the names of SAS Model Manager users and groups. You can obtain the user and group names from SAS Management Console.

The following table provides information about updating an XML life cycle template:

Template Editor Item	XML Element or Attribute	XML File Usage Information
Life Cycle Template Properties	<LifecycleTemplate name="" version="" isDefault="" description="">	For a description of the attributes, see "Template Properties" on page 65.
Participants List	<Participant id="" name=""	For each SAS Model Manager user, create a <Participant> element. Assign each participant an ID. In the name attribute, supply a SAS Model Manager user name or a group name. For more information, see the *SAS Model Manager: User's Guide*.

Template Editor Item	XML Element or Attribute	XML File Usage Information
Milestone	<Milestone id="" type="" name="" desc="">	For each milestone, assign a milestone ID, type, name, and description. The ID is an integer number. For each successive milestone, increment the ID by 1. In the type attribute, enter a milestone phase. Valid values are Develop, Test, Staging, Production, Retire, and UserDefined. For more information, see "Milestone Properties" on page 66.
Task	<Action id="" type="" name="" dependsOn="" assignees="" approvers="" weight="" duration="" desc="">	In an XML life cycle template file, a task is defined by the <Action> element. For a description of the attributes, see "Task Properties" on page 66. When you create a life cycle template using an XML file, you assign the task IDs in the form *milestoneID.taskID*. *milestoneID* is the milestone ID for this task. *taskID* is an integer. For each successive task, increment *taskID* by 1. Enter any task dependencies using the form *milestoneID.taskID*. Separate multiple dependencies using a comma. Valid task type values are UserDefined, Signoff, DeclareProduction, SetChampion, and RetireChampion. Enter one or more assignees as a SAS Model Manager user or group. Separate multiple assignees using a comma. Enter one or more approvers as a SAS Model Manager user or group. Separate multiple approvers using a comma. For more information about assignees and approvers, see the *SAS Model Manager: User's Guide*.

Deploying User Templates

A user template defines what a life cycle, model or report is to SAS Model Manager. Users can create and edit user templates. Only users that have Write access to the middle-tier server where SAS Model Manager is installed, can deploy the user templates. The middle-tier server access is granted by your System Administrator and is not part of the SAS Model Manager user access privileges.

To deploy a user template, follow these steps:

1. Navigate to the location of the user template XML file.
2. Copy the user-defined template file into the **`\sasconfigdir\Lev# \AnalyticsPlatform\apps\ModelManager\ext`** directory.
3. (optional) For user-defined report templates, copy the SAS programs into the **SAS Code** folder, which is located in the same directory as the user templates.
4. Stop the SAS Analytics Platform server. Which will stop all SAS Analytics Platform clients, including SAS Model Manager. For more information, see the Administrator's Guide for SAS Analytics Platform ().
5. Restart the SAS Analytics Platform server.
6. Verify that the new user template is available in SAS Model Manager.
   a. A new user life cycle template should be displayed in the Life Cycle perspective.
   b. A new user model template should be displayed in the **Choose a model template** list when you import a model from local files for a project.
   c. A new user-defined report template should be displayed in the New Reports Wizard **Reports** list.

For more information, see "Creating or Modifying XML Template Files" on page 60 or the *SAS Model Manager: User's Guide*.

Appendix 1
Properties

Life Cycle Template Properties **65**
Template Properties 65
Milestone Properties 66
Task Properties 66

Model Template Properties **68**
Template Properties 68
FileList Properties 70
System and User Properties 71

Life Cycle Template Properties

Template Properties

Here is a list of the life cycle template properties.

Property Name	Description
Name	Identifies the name of the life cycle template. This property is required.
Description	Specifies user-defined information about the life cycle template.
Version	Specifies a life cycle version number. A version number is an integer. Each time that you create a new version of a template, increment the version number by 1. The version number for each life cycle template is unique to that template. This property is required. SAS Model Manager checks for new versions each time it starts. If a new life cycle version is detected, SAS Model Manager uses the updated life cycle template for new versions that specify that template.
Default	Specifies whether the life cycle template is the default template that is used when you create a new version in a project. Only one life cycle template in the middle-tier server user-template directory can be the default template. Valid values are TRUE and FALSE. In the template editor, select the check box to set the value to TRUE. This property is required.

Milestone Properties

Here is a list of the milestone properties for the life cycle template.

Property Name	Description
Name	Identifies the name of the milestone. This property is required.
Display ID	Displays a system-supplied milestone identifier that is an integer greater than 0. A milestone identifier is based on the order in which the identifier appears in the life cycle definition. For example, the first milestone in the life cycle template has an identifier of 1. The second milestone has an identifier of 2.
Description	Specifies user-defined information about the milestone.
Milestone Phase or **Type**	Specifies the phase for the milestone. Here is a list of valid milestone phases: **Develop** specifies that the milestone has development tasks such as registering models and ensuring that a version has all of the required resources for validating candidate models. **Test** specifies that the milestone has testing tasks such as validating a model's input and output variable data structure and creating reports to compare the scores of candidate models. **Staging** specifies that the milestone has staging tasks such as exporting a champion model to a SAS metadata repository, publishing a model to a channel, and publishing In-Database scoring functions to a database. **Production** specifies that the milestone has production tasks such as scoring a champion model in a production environment, and monitoring a champion model's performance. **Retire** specifies that the milestone has retirement tasks such as removing a model from a production environment. **UserDefined** specifies a custom milestone for your organization, such as indicating that a champion model is in compliance with government regulations or industry process standards.

Task Properties

Here is a list of the task properties for the life cycle template.

Property Name	Description
Name	Identifies the name of the task. This property is required.

Property Name	Description
Display ID	Displays a system-supplied milestone and task identifier in the form **`milestone#.task#`** (for example, **`1.1`**) that identifies the milestone that the task is a part of as well as the task. Each milestone and task identifier is based on the order in which it appears in the life cycle definition. For example, the first milestone in the life cycle template has an identifier of 1. The second milestone has an identifier of 2. The identifier for the first task in milestone 1 is 1.1. The second task in milestone 1 has an identifier of 1.2.
Dependencies	Identifies a **DisplayID** for a task that must be completed before this task can be completed. If a **DisplayID** has a dependency on more than one other task, those DisplayIDs are separated by a comma.
Description	Displays user-defined information about the task.
Task Type	Specifies a type for the task. Here is a list of valid task types: **UserDefined** identifies the task as a custom task for your organization. A user-defined task represents a step in your organization's model life cycle that you would like to track using SAS Model Manager. SAS Model Manager does not perform any tests or verify that any project or version tasks have been performed for any user-defined tasks. **Signoff** specifies that all of the milestone tasks are complete and have been approved. **DeclareProduction** specifies that the champion model is ready to be exported to the production environment. **SetChampion** specifies that the task is to determine a champion model. Before this task can be completed, a champion model must be set for a version in the Project Tree. **RetireChampion** specifies that the champion model is retired.
Assignees	Specifies a user or group name from the **Participants** list. The specified user or any member of the specified group is the user who is assigned to complete the task. The specified user or group members are the only users who are authorized to set the task **Status** field to **Not Started**, **Started**, or **Completed**. **Assignees** can be unassigned. If this field is unassigned, the following rules apply: • Updates to the task status are not required. • Only those users and groups that are in the life cycle **Participants** list can modify the task status.

Property Name	Description
Approvers	Specifies a user or a group from the **Participants** list. The specified user or any member of the specified group is the user who is assigned to complete the task. The specified user or any member of the group is authorized to set the task **Status** field to **Approved**. **Approvers** can be unassigned. If this field is unassigned, the following rules apply: • The task approval status is not required to be updated. • Only those users and groups who are on the life cycle's **Participants** list can modify the task approval status.
Weight	Specifies a percentage as an integer. The integer indicates the relative work effort that is required by the task to complete the milestone. SAS Model Manager uses weight values to calculate the percentage that is complete for a milestone. The weight displays as a property for a version's **Life Cycle** folder. If you use the **Weight** property, the weight values for all tasks in a milestone should add up to 100. When weights for a milestone do not add up to 100, SAS Model Manager performs a weight proportion adjustment so that the sum of those weights within a milestone adds up to 100. Note: user-defined weights are not explicitly adjusted. Weights remain as entered and are not adjusted.
Duration	Specifies a number either as an integer or a fractional number that indicates the amount of time that is allocated to complete the task. The default duration unit is the number of days.

Model Template Properties

Template Properties

Here is a list of the general properties that define the model template.

Property Name	Description
Name	Identifies the name of the template. This is a required field. The following characters cannot be used in the template name: @, \\, /, *, %, #, &, $, (,), !, ?, <, >, ^, +, \.
Description	Specifies user-defined information about the template.

Property Name	Description
Type	Specifies the type of the model. SAS Model Manager supports only the following model types: **AnalyticalModel** specifies the type of model that is associated with the Analytical model function. **ClassificationModel** specifies the type of model that is associated with the Classification model function. **PredictionModel** specifies the type of model that is associated with the Prediction model function. **ClusteringModel** specifies the type of model that is associated with the Segmentation model function. For more information about the model function types, see the *SAS Model Manager: User's Guide*
Tool	Specifies a text value that describes what tool is used to produce this type of model.
Validate	Indicates, when selected, that SAS Model Manager verifies that all of the required files are present when users try to import a model into SAS Model Manager. If validation fails, the model will not be successfully imported.
Display Name	Specifies a text value that is displayed as the name of the model template.
Score Code Type	Specifies whether the imported model score code runs using a DATA step fragment or SAS program code.
modelMetaMacro	Specifies the model meta macro that is used either to generate model input or to output XML based on modelinput.sas7bdat and modeloutput.sas7bdat in the file section. This property is auto-populated in the user model template XML file with the value **genVarMaro.sas** and is not displayed in the SAS Model Manager Template Editor properties.

Property Name	Description
Function	The model function is related to the type of model. This value appears as a model function option when a user creates a project. When a user imports a model, the model template options are filtered based on the model function that was selected when the project was created. This property is not displayed in the SAS Model Manager Template Editor properties. SAS Model Manager provides the following values: • analytical • classification • prediction • segmentation • any Note: If the **Function** property has a value of **any**, then all types of models can be imported into a SAS Model Manager project.

FileList Properties

Here is a list of the FileList properties that specify the files that are contained in a model.

Property Name	Definition
Name	Identifies the name of the file. This is a required field.
Description	Specifies user-defined information about the file.
Required	Indicates, when selected, that the file is a required component file of the model to be imported.
Report	Indicates, when selected, that the file is to be included in a SAS package file when a model is published to a channel.
Type	Specifies a file whose type is text or binary.
Fileref	Specifies an eight-character (or less) SAS file reference for users to refer to this file in their score.sas code. The fileref is assigned by SAS Model Manager when a SAS job is submitted.

Note: All user-defined models are required to have three files.

- score.sas is the model's score code.
- modelinput.sas7bdat is a SAS data set whose variables are used by the model score code. The contents of the data set is not used by SAS Model Manager.
- modeloutput.sas7bdat is a resulting data set when a user runs score.sas against modelinput.sas7bdat. The data set provides output variables that the model creates after a scoring task is executed. The contents of the data set is not used by SAS Model Manager.

System and User Properties

Here is a list of the system-defined and user-defined properties for a model template. Users can set these properties when they import a model.

Property Name	Description
Name	Identifies the name of the property. This is a required field.
Description	Specifies user-defined information about the property.
Type	Specifies a property whose type is String or Date.
Edit	Indicates, when selected, that the property can be modified when importing a model or after the model is imported to SAS Model Manager.
Required	Indicates, when selected, that the property is required.
Initial Value	Specifies a text string for the initial value for the property.
Display Name	Specifies a text value that is displayed as the name of the property.

Glossary

candidate model
a predictive model that evaluates a model's predictive power as compared with the champion model's predictive power.

champion model
the best predictive model that is chosen from a pool of candidate models in a data mining environment.

channel
a virtual communication path for distributing information. In SAS, a channel is identified with a particular topic (just as a television channel is identified with a particular radio frequency). Using the features of the Publishing Framework, authorized users or applications can publish digital content to the channel, and authorized users and applications can subscribe to the channel in order to receive the content. See also publish and subscribe.

classification model
a predictive model that has a categorical, ordinal, or binary target.

data source
a data object that represents a SAS data set or a DBMS table. SAS Model Manager has seven types of data sources: project input and output tables, test tables, scoring task input and output tables, performance tables, and training tables.

DATA step
in a SAS program, a group of statements that begins with a DATA statement and that ends with either a RUN statement, another DATA statement, a PROC statement, the end of the job, or the semicolon that immediately follows lines of data. The DATA step enables you to read raw data or other SAS data sets and to use programming logic to create a SAS data set, to write a report, or to write to an external file.

DATA step fragment
a block of SAS code that does not begin with a DATA statement. In SAS Model Manager, all SAS Enterprise Miner models use DATA step fragments in their score code.

fileref
a short name (or alias) for the full physical name of an external file. A SAS FILENAME statement maps the fileref to the full physical name.

folder
an object that contains other container objects and files.

format
a pattern or set of instructions that SAS uses to determine how the values of a variable (or column) should be written or displayed. SAS provides a set of standard formats and also enables you to define your own formats.

input variable
a variable that is used in a data mining process to predict the value of one or more target variables.

libref
a short name (or alias) for the full physical name of a SAS library. A SAS LIBNAME statement maps the libref to the full physical name. A libref is the first part of a multi-level SAS filename and indicates the SAS library in which a SAS file is stored. For example, in the name SASUSER.ACCTS, SASUSER is the libref, and ACCTS is a file in the library that the SASUSER libref refers to. See also SAS library.

metadata
a description or definition of data or information.

metadata identity
a metadata object that represents an individual user or a group of users in a SAS metadata environment. Each individual and group that accesses secured resources on a SAS Metadata Server should have a unique metadata identity within that server.

milestone
a collection of tasks that complete a significant event. The significant event can occur either in the process of selecting a champion model, or in the process of monitoring a champion model that is in a production environment.

model function
the type of statistical model, such as classification, prediction, or segmentation.

output variable
in a data mining process, a variable that is computed from the input variables as a prediction of the value of a target variable.

package file
a container for data that has been generated or collected for delivery to consumers by the SAS Publishing Framework. Packages can contain SAS files (SAS catalogs; SAS data sets; various types of SAS databases, including cubes; and SAS SQL views), binary files (such as Excel, GIF, JPG, PDF, PowerPoint and Word files), HTML files (including ODS output), reference strings (such as URLs), text files (such as SAS programs), and viewer files (HTML templates that format SAS file items for viewing).

prediction model
a model that predicts the outcome of an interval target.

project
a collection of models, SAS programs, data tables, scoring tasks, life cycle data, and reporting documents.

Project Tree
a hierarchical structure made up of folders and nodes that are related to a single folder or node one level above it and to zero, one, or more folders or nodes one level below it.

publication channel
an information repository that has been established using the SAS Publishing Framework and that can be used to publish information to users and applications. See also publish.

publish
to deliver electronic information, such as SAS files (including SAS data sets, SAS catalogs, and SAS data views), other digital content, and system-generated events to one or more destinations. These destinations can include e-mail addresses, message queues, publication channels and subscribers, WebDAV-compliant servers, and archive locations.

Publishing Framework
a component of SAS Integration Technologies that enables both users and applications to publish SAS files (including data sets, catalogs, and database views), other digital content, and system- generated events to a variety of destinations. The Publishing Framework also provides tools that enable both users and applications to receive and process published information.

SAS Content Server
a server that stores digital content (such as documents, reports, and images) that is created and used by SAS client applications. To interact with the server, clients use WebDAV-based protocols for access, versioning, collaboration, security, and searching.

SAS data set
a file whose contents are in one of the native SAS file formats. There are two types of SAS data sets: SAS data files and SAS data views. SAS data files contain data values in addition to descriptor information that is associated with the data. SAS data views contain only the descriptor information plus other information that is required for retrieving data values from other SAS data sets or from files whose contents are in other software vendors' file formats. See also descriptor information.

SAS Metadata Repository
a repository that is used by the SAS Metadata Server to store and retrieve metadata. See also SAS Metadata Server.

SAS Metadata Server
a multi-user server that enables users to read metadata from or write metadata to one or more SAS Metadata Repositories. The SAS Metadata Server uses the Integrated Object Model (IOM), which is provided with SAS Integration Technologies, to communicate with clients and with other servers.

SAS package file
See package file

scoring
the process of applying a model to new data in order to compute outputs.

scoring function
a user-defined function that is created by the SAS Scoring Accelerator for Teradata from a scoring model and that is deployed inside the Teradata Enterprise Data Warehouse (EDW).

scoring task
a process that executes a model's score code.

segmentation model
a model that identifies and forms segments, or clusters, of individual observations that is associated with an attribute of interest.

subscriber
a recipient of information that is published to a SAS publication channel.

variable
a column in a SAS data set or in a SAS data view. The data values for each variable describe a single characteristic for all observations. Each SAS variable can have the following attributes: name, data type (character or numeric), length, format, informat, and label.

version
a folder in the Project tree that typically represents a time phase and that contains models, scoring tasks, life cycle data, reports, documents, resources, and model performance output.

WebDAV server
an HTTP server that supports the collaborative authoring of documents that are located on the server. The server supports the locking of documents, so that multiple authors cannot make changes to a document at the same time. It also associates metadata with documents in order to facilitate searching. The SAS business intelligence applications use this type of server primarily as a report repository. Common WebDAV servers include the Apache HTTP Server (with its WebDAV modules enabled), Xythos Software's WebFile Server, and Microsoft Corporation's Internet Information Server (IIS).

Index

A
accessibility features 1
administration overview 1
Archive File type channels 36

C
channel folders, creating 44
channels
  See publication channels
configuration
  connection profiles 10
  publication channels 35
  SAS Metadata Repository 4
  SAS Model Manager 3
  SAS Model Manager channels and subscribers 43
  users, groups, and roles 14
connection profiles
  connecting to 13
  creating 10

D
data tables
  See tables
defining HTTP or HTTPS servers 37
defining publish locations for SAS Content Server 41
deleting tables 56

F
FileList properties
  model templates 70

G
groups
  configuring 14
  creating new groups 19
  managing 55, 57

H
HTTP or HTTPS servers
  defining 37

I
In-Database Scoring for Teradata 5
installation directories
  for In-Database Scoring for Teradata 6
instructions.html file 3

J
Java Scoring API 6
JDBC Driver for Teradata 5

L
libraries
  creating in SAS Management Console 25
  organizing 9
life cycle templates
  creating or modifying 61
  milestone properties 66
  properties 65
  task properties 66
Log on as a batch job user right 3

M

milestone properties
  life cycle templates 66
MMchannel 36
model SPK files, registering 4
model templates
  creating or modifying 60
  FileList properties 70
  properties 68
  system and user properties 71

P

plug-ins, access to 55
preparing SAS Model Manager for use 3
properties
  life cycle templates 65
  model templates 68
public directories
  creating on SAS Content Server 4
publication channels
  Archive File type 36
  configuring 35
  creating channel folders 44
  creating new channels 46
  creating new subscribers 49
  MMChannel 36
Publishing Framework plug-ins 13, 43

R

registration
  of model SPK files 4
  of tables 29
roles
  configuring 14
  creating new roles 21
  managing 55, 57

S

SAS Content Server
  accessing the Administration Console 4
  creating a public directory 4
  defining publish locations 41
SAS Enterprise Miner
  using SAS Model Manager with 4
SAS Management Console 55
  access to plug-ins 55
  creating libraries in 25
  managing tables, users, groups, and roles 55
  Publishing Framework plug-ins 13, 43
  registering tables 29
  setting up for SAS Model Manager use 9
  User Manager plug-in 57
SAS Metadata Repository
  configuring 4
  connection profiles 10
  storing table metadata 9
SAS Model Manager Template Editor 59, 62
SAS package files
  See SPK files
SAS Publishing Framework 35
  See also Publishing Framework plug-ins
scoring functions in SAS Model Manager 5
SPK files
  registering a model SPK file 4
subscribers to channels, creating 49
system and user properties
  model templates 71

T

tables
  creating for Teradata 6
  creating with SAS code 29
  deleting 56
  managing 55
  modifying 55
  registering 29
  verifying accessibility 32
task properties
  life cycle templates 66
templates, user
  administering 59
  deploying 64
  properties 65
Teradata
  creating tables 6
  Java Scoring API 6
  JDBC Driver 5
  preparing for SAS Model Manager use 5

U

User Manager plug-in 57
user templates
  administering 59
  deploying 64
  properties 65
users
  configuring 14
  creating new users 16
  managing 55, 57

V

verification
  SAS Model Manager 3
  table accessibility 32

W

WebDAV folders
  creating as publishing locations 41
Windows
  Log on as a batch job user right 3

Your Turn

We welcome 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 Delivers!

Whether you are new to the work force 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. Visit us online at support.sas.com/bookstore.

SAS® Press

Need to learn the basics? Struggling with a programming problem? You'll find the expert answers that you need in example-rich books from SAS Press. Written by experienced SAS professionals from around the world, SAS Press 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 to improve your work experience:

- 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.
- Hard-copy books.

support.sas.com/publishing

SAS® Publishing News

Subscribe to SAS Publishing News to receive up-to-date information about all new SAS titles, author podcasts, and new Web site features via e-mail. Complete instructions on how to subscribe, as well as access to past issues, are available at our Web site.

support.sas.com/spn

sas® 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. © 2009 SAS Institute Inc. All rights reserved. 518177_1US.0109