SAS® Decision Manager 2.2
Administrator's Guide

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Part 1

Installation and Configuration

Chapter 1
Pre-Installation Tasks

About the Pre-Installation Tasks

Before you begin to install SAS Decision Manager, be sure to review the Pre-Installation Checklist that is provided with your deployment plan. This checklist provides a detailed list of the pre-installation requirements. It also enables you to record important information that you need when you are installing the software.

Perform the following pre-installation tasks before you install SAS Decision Manager:

1. Verify that your system meets the minimum requirements.

2. Determine the location of the SAS environment file.

3. Determine the database that you want to use.

4. Determine whether you need to synchronize the time zones that are specified in all of your operating environments.

5. Install the prerequisite software.

6. Create standard user accounts in the operating system.

7. Obtain a deployment plan and installation data file.

8. Download your software and create a software depot.

The following topics provide details about each step.

Verify Operating System Requirements

Ensure that you meet the minimum requirements that are described in the appropriate system requirements document for your installation. System requirements are unique for each operating system. They include software requirements, hardware requirements, space requirements, specific product requirements, and graphics hardware and software compatibility. System requirements documentation is available at http://support.sas.com/documentation/installcenter/.

Determine the Location of the SAS Environment File

During deployment of SAS Decision Manager, you are prompted by the SAS Deployment Wizard to specify the location of the SAS environment file (named sas-environment.xml). An example is http://<*server*>:<*port*>/sas/sas-environment.xml). This file defines a set of SAS deployments at your site for client applications to use. The sas-environment.xml file does not need to physically exist at the location that you specify in the SAS Deployment Wizard before beginning the SAS installation. However, knowing the intended location of this file is important because every client installation is prompted for this value. If you do not specify the correct URL for the SAS environment file during deployment, then you must manually specify the URL in a file for every client. The URL is commonly stored in this location: **\<*server*>\<*drive*>: \Program Files\SASHome\sassw.conf**. As a best practice during your planning process, determine a URL and share it with administrators who perform installations.

For more information about the structure of this file, see Appendix 1, "Configuring the SAS Environment File," in *SAS Intelligence Platform: Middle-Tier Administration Guide*.

Determine the Database to Use

You can use either Oracle or the SAS Decision Manager Common Data Server for your database. The SAS Decision Manager Common Data Server is based on PostgreSQL 9.1.9. For more information, see "SAS Web Infrastructure Platform Data Server" in Chapter 2 of *SAS Intelligence Platform: Middle-Tier Administration Guide* at http://support.sas.com/documentation/intellplatform/index.html.

For Oracle, complete the tasks described in "Pre-Installation Tasks for an Oracle Database" on page 7. For SAS Decision Manager Common Data Server, ensure that

you have the information listed in .

Determine Time Zone Requirements

All of your operating environments (on all tiers in a multi-tier environment) must be set to the same time zone only if your site meets both of these conditions:

- You will be deploying rule flows by using SAS Real-Time Decision Manager.

- Those rule flows use terms of type Date or Datetime.

SAS Real-Time Decision Manager uses a custom data type that accounts for differences between time zones when it performs calculations. If the time zones do not match across all of your environments, you should not use Date or Datetime data types in rule flows.

Install the Prerequisite Software

Before you install SAS Decision Manager, install the following prerequisite software:

- Oracle, if you are using Oracle for your database. See for instructions.

- Adobe Flash Player version 10.1.0 or later. This software is required on each client machine that accesses SAS Decision Manager.

Create Standard User Accounts

As a pre-installation task, you must create the following user accounts in the operating system:

- an account for the user who will install and configure the SAS software

- an account to run the spawned SAS servers

You should also create a SAS Server Users group on Windows and a sas group on UNIX.

For important details about setting up these users and groups, see the pre-installation checklist for your deployment. Also see Chapter 2, "Setting Up Users, Groups, and Ports," in *SAS Intelligence Platform: Installation and Configuration Guide* at http://support.sas.com/documentation/onlinedoc/intellplatform/index.html.

Obtain a Deployment Plan and a SAS Installation Data File

Before you can install your SAS software, you must obtain a deployment plan. The deployment plan is an XML file that specifies the software that you will install and configure on each machine in your environment. The plan serves as input to the SAS

Deployment Wizard. A deployment plan can be a custom plan for your specific software installation, or it can be a standard, predefined plan that describes a common configuration. For more information, see "About Deployment Plans" in Chapter 6 of *SAS Intelligence Platform: Installation and Configuration Guide*.

You must also obtain a SAS Installation Data (SID) file. The SID file contains license (SETINIT) information that is required to install SAS.

Download Your Software and Create a SAS Software Depot

Use the SAS Download Manager to download the software that is listed in your SAS Software Order. The SAS Download Manager creates a SAS Software Depot from which you install your software. For more information, see Chapter 3, "Creating a SAS Software Depot," in *SAS Intelligence Platform: Installation and Configuration Guide*. You can then use the SAS Deployment Wizard to install your software.

Pre-Installation Tasks for SAS Decision Manager Common Data Server

During the installation and configuration of SAS Decision Manager, the SAS Deployment Wizard requires information about the database that SAS Decision Manager uses.

The following table describes the information that you need in order to complete the steps in the SAS Deployment Wizard.

Table 1.1 SAS Deployment Wizard Information for SAS Decision Manager Common Data Server

Property	Description
Database Type	Specifies the database type to use for the SAS Decision Manager database. Select **SAS Decision Manager Common Data Server**.
Database User	Specifies the user name for the database administrator. This user owns the database and has superuser privileges.
Database Password	Specifies a password for the user name that is associated with the database account.
Port	Specifies the port that is used by the database. The default port for SAS Decision Manager Common Data Server is 10482.
Host Name	Specifies the fully qualified host name of the server on which the database is installed.
Database Name	Specifies the database name. The default name for the database is `dcmdb`. *Note:* The PostgreSQL database type is case sensitive.

Property	Description
User ID	Specifies the user name for the user whose credentials will be used to access the SAS Decision Manager Common Data Server database.

For database-specific information about configuring a database, see *SAS Intelligence Platform: Installation and Configuration Guide*.

Pre-Installation Tasks for an Oracle Database

About the Oracle Pre-Installation Tasks

If you are using Oracle for your SAS Decision Manager Common Data Server database, perform the following steps before you install SAS Decision Manager:

1. Install the Oracle database server.
2. Install the JDBC drivers.
3. Install a database client application.
4. Determine the required database information.
5. Specify the required database privileges.
6. Test the connection to your database.

Install the Oracle Database Server

If you are using Oracle for your database, then you must install an Oracle database server. You must install this third-party software before you install SAS Decision Manager. For more information, see the system requirements documents listed in "Verify Operating System Requirements" on page 4.

Install JDBC Drivers for Oracle

You must download the following JDBC drivers and place them in a separate directory that does not contain any other files on all middle-tier servers to ensure proper installation and configuration of SAS Decision Manager.

The JDBC drivers for Oracle are located in the Oracle installation directory. You can also download the ojdbc6.jar file for Oracle Database 11g from http://www.oracle.com/us/downloads/index.html. Select **JDBC drivers**. Download the latest Oracle 11.2*x* driver. The JDBC driver version must match the database version.

For more information about supported database drivers, see the system requirements documents listed in "Verify Operating System Requirements" on page 4.

Install the Oracle Client Application

You must install and configure an Oracle client application on all server-tier machines. If you choose to bypass database initialization when you run the SAS Deployment Wizard,

you must run a set of database scripts to prepare and initialize your database. For information about these scripts, see "Create Oracle Database Tables" on page 23.

Also, you must have an entry in the tnsnames.ora file for that Oracle client that corresponds to the database that you have set up.

Determine the Information Required for the Oracle Database

During the installation and configuration of SAS Decision Manager, the SAS Deployment Wizard requires information about the Oracle database that SAS Decision Manager uses.

The following table describes the information that you need in order to complete the steps in the SAS Deployment Wizard.

Table 1.2   SAS Deployment Wizard Information for Oracle

Property	Description
Database Type	Specifies the database type to use for the SAS Decision Manager database. Select **Oracle**.
User Name	Specifies the user name for the database that is used with your SAS Decision Manager installation.
Password	Specifies a valid password for the user name associated with the database account.
Port	Specifies the port that is used by the database. The default port for Oracle is 1521.
Host Name	Specifies the fully qualified host name of the server on which the database is installed.

Database Name	Specifies the Oracle database name. The **Net Service Name** and the **Service Name** fields that are configured in the tnsnames.ora file must be the same. You must use this value for the **Database Name** field in the SAS Deployment Wizard. For example, if you had the following entry in the tnsnames.ora file, you would enter `monitordb` in the **Database Name** field in the SAS Deployment Wizard:
	
	`monitordb =`
	`  (DESCRIPTION =`
	`    (ADDRESS_LIST =`
	`        (ADDRESS =`
	`          (COMMUNITY = TCP_COMM)`
	`          (PROTOCOL = TCP)`
	`          (HOST = hostname.your.company.com)`
	`          (PORT = 1521)`
	`        )`
	`    )`
	`    (CONNECT_DATA =`
	`      (SERVICE_NAME = monitordb)`
	`    )`
	`  )`
	
	The **Net Service Name** and **Service Name** in this example are the same.

Schema	Specifies the schema name for the database. The default schema is the same as the user ID.

Property	Description
DBMS JAR File	Specifies the location of the database vendor's JDBC JAR file. This file must be available on the middle tier and on any machine on which you are deploying SAS Decision Manager in order to configure SAS Decision Manager Common Data Server.
	See "Install JDBC Drivers for Oracle" on page 7 for more information.

Specify the Required Database Privileges for Oracle

Ensure that the users of your database have the required database privileges. The required privileges for Oracle databases are:

- CONNECT
- CREATE SESSION
- RESOURCE
- CREATE TABLE
- CREATE VIEW
- CREATE SEQUENCE
- CREATE TRIGGER

Test the Connection to Your Database

Execute a command from the terminal to verify that your database is set up. For example, to use an Oracle database, you can execute the following command using SQL*Plus:

```
sqlplus USER/PASSWORD@ORACLE_SID
```

You must be able to execute this command from any directory. If you are able to execute a database command such as this only from the database installation directory, then verify that the PATH variable is set up correctly. The database client application must be installed and available on the PATH.

Chapter 2
Installation Tasks

About the SAS Deployment Wizard

You use the SAS Deployment Wizard to install and configure the SAS software and related products that are included in your deployment plan file. When you execute the SAS Deployment Wizard, you select the deployment type that you are performing. You can install and configure the software in a single execution of the wizard, or you can install and configure the software in two separate executions. The latter approach gives you the opportunity to test the SAS license before the configuration step.

The SAS Deployment Wizard prompts you to perform a variety of tasks, including the following items:

- specify the software order, the deployment plan, and the SAS software products that you are installing and configuring

- specify host machine information

- specify information about user accounts that were created in the pre-installation phase

- for multiple-machine configurations, install the server-tier, middle-tier, and client-tier software on the appropriate machines

For more information, see Chapter 6, "Installing and Configuring Your SAS Software," in *SAS Intelligence Platform: Installation and Configuration Guide*.

Single-Machine versus Multiple-Machine Installations

You can install SAS Decision Manager on one or on several machines. This choice is determined when you order SAS Decision Manager and is detailed in the deployment plan XML file.

For multiple-machine installations, you must first install SAS Decision Manager on the server-tier machine. You can then install SAS Decision Manager on other additional machines that are part of a middle tier in your configuration. For guidelines on installing SAS on multiple machines, see "Installation Order Rules for Multiple Machine Deployments" in Chapter 6 of *SAS Intelligence Platform: Installation and Configuration Guide*.

The server tier consists of a set of SAS servers that are installed as a part of the SAS Intelligence Platform. The server tier contains the code generation macro that is necessary for executing rules and integrating SAS Decision Manager with other SAS products.

Products Installed with SAS Decision Manager

Your deployment plan for SAS Decision Manager includes additional SAS products that support and complement SAS Decision Manager functionality. See the software order e-mail or the ordersummery.html file that is in your SAS Software Depot at *software_depot*/install_doc/*order_number*/ordersummary.html. The SAS Deployment Wizard prompts you to install and configure each of the products in your deployment plan.

Running the SAS Deployment Wizard

About Running the SAS Deployment Wizard

To run the SAS Deployment Wizard, follow the instructions in "Install and Configure SAS Interactively" in Chapter 6 of *SAS Intelligence Platform: Installation and Configuration Guide*.

Note: You can run the wizard on operating systems that do not use a windowing environment. For more information, see *SAS Deployment Wizard and SAS Deployment Manager: User's Guide* at http://support.sas.com/documentation/installcenter/en/ikdeploywizug/66034/PDF/default/user.pdf.

The type and number of configuration-related pages that you see depend on the prompt level that you choose, the SAS tier that you are currently deploying, and the contents of your SAS 9.4 custom order. The following topics provide information for prompts that are specific to SAS Decision Manager. For additional information about any of the SAS Deployment Wizard prompts, see the online Help for the wizard page in question.

Select the SAS Application Server

If you are installing SAS Decision Manager as an add-on product and have already defined other SAS application servers, the SAS Deployment Wizard asks you to select which application server you want to use. Select an application server other than SASMETA.

Configure the Database

During deployment of SAS Decision Manager on SAS 9.4, the SAS Deployment Wizard creates and configures the database tables in the SAS Decision Manager Common Data Server database by default. This database uses the PostgresSQL database management system.

You can use a third-party database server with SAS 9.4. In SAS 9.4, Oracle is the only other third-party database management system that is supported for the SAS Decision Manager Common Data Server database. For information about which versions of the alternative databases are supported, see "Reviewing Third-Party Database Requirements" in Chapter 6 of *SAS Intelligence Platform: Installation and Configuration Guide*.

The SAS Deployment Wizard prompts you to enter the information that you gathered when you completed the pre-installation tasks for your database. See "Pre-Installation Tasks for SAS Decision Manager Common Data Server" on page 6 and "Pre-Installation Tasks for an Oracle Database" on page 7 for more information.

For database-specific information about configuring a database, see *SAS Intelligence Platform: Installation and Configuration Guide*.

Create and Load Tables through the SAS Deployment Wizard

If you select **SAS Decision Manager Common Data Server** as the database type, the database tables are automatically created and loaded during the installation and configuration process for the SAS Decision Manager Common Data Server. The default name for the database is `dcmdb`.

If you select **Oracle** as the database type, the **Automatically create tables and load data** check box in SAS Deployment Wizard is enabled. If you want the SAS Decision Manager Common Data Server database tables to be created and loaded automatically, leave this box selected. If you want to create the tables yourself, then clear the check box, and submit the necessary SQL statements after the wizard finishes running. See "Create Oracle Database Tables" on page 23 for more information.

Chapter 3
Post-Installation Tasks

Post-Installation Configuration and Verification Steps

After you install SAS Decision Manager using SAS Software Depot, you must perform additional configuration steps before you can use SAS Decision Manager.

1. Verify that all installation and configuration steps in the Instructions.html file have been completed. For more information, see "Follow Instructions in Instructions.html " on page 17.

2. Create application users and assign permissions. For more information, see "Create Users and Assign Permissions" on page 17.

3. (Optional) SAS Decision Manager supports the use of multiple SAS Application Servers to be used as part of a performance definition, a scoring test, or a model retrain definition. If you want to use a SAS Application Server other than the default **SASApp**, you must configure the other SAS Application Server using SAS Management Console. For more information, see "Configuring a SAS Application Server" on page 21.

4. If the SAS Workspace Server is located in a UNIX environment, you must enable the SAS Workspace Server XCMD option in order to support R model functionality. For more information, see "Enabling the SAS Workspace Server XCMD Option" on page 22.

5. (Optional) Run a database script to create Oracle synonyms in the database.

6. During installation, if you cleared the **Automatically create tables and load data** then you must manually create and load the Oracle database tables for business rules data and modeling project metadata, including history, job definitions and job logs. For more information, see "Create Oracle Database Tables" on page 23.

7. If the SAS Scoring Accelerator or SAS Model Manager In-Database Scoring Scripts products are a part of your SAS 9.4 deployment, additional configuration steps are required to prepare the database for publishing and scoring in SAS Decision Manager. For more information, see "Preparing a Database for Use with SAS Model Manager" in Chapter 11 of *SAS In-Database Products: Administrator's Guide*.

8. Verify that the Certificate Authority certificate is available to the trust store for the browser and Java clients. For more information, see "Verify the Certificate" on page 24.

9. (Optional) Set up the UUID generator daemon.

10. Configure SAS Workflow. For more information, see "Configuring SAS Workflow for Use with SAS Decision Manager" on page 57.

11. Verify the configuration of the dashboard reports directory on the SAS Workspace Server. For more information, see "Configuring the Dashboard Reports Directory" on page 25.

12. Configure the Model Manager Java Services Options. For more information, see "Configuring Model Manager Java Services Options" on page 26.

13. Review the SAS Decision Manager Web properties in SAS Management Console.

14. (Optional) Modify log file settings.

For more information about post-installation tasks, see *SAS Intelligence Platform: Installation and Configuration Guide*.

Follow Instructions in Instructions.html

At the end of the installation process for SAS Decision Manager, the SAS Deployment Wizard produces an HTML document named Instructions.html. If your server tier and middle tier are hosted on separate machines, there is an Instructions.html file for each machine.

The Instructions.html file is located in ***sasconfigdir*\\Lev#\\Documents**. Follow the instructions that are provided in the HTML documents.

Create Users and Assign Permissions

The SAS Deployment Wizard does not create application users by default. The SAS Administrator must create users in SAS Management Console with the appropriate group and role permissions. Make sure that all users are granted the appropriate permissions to the SAS Workspace Server.

In a Windows environment, each user or group must be granted permission to the **Log on as a batch job** local security policy. This permission is required in order to access functionality in the Data category. For more information, see "Create Windows Operating System Accounts and Groups for Users" on page 18.

In a UNIX environment, all SAS Decision Manager users must be part of a group that has the appropriate group permissions.

For more information, see "Creating Operating System Accounts in UNIX Environments" on page 19 and Chapter 5, "Configuring Users, Groups, and Roles," on page 43.

Create an Operating System Account for Product Administrators and Users

About the User Accounts for SAS Decision Manager

SAS Decision Manager provides two types of user accounts:

Product administrator
    A SAS Decision Manager administrative user is specific to SAS Decision Manager. A product administrator account is not the same as a general administrator account, such as the SAS Administrator (sasadm@saspw). These users must have a valid host operating system account, and you must associate that account with a metadata user.

    You must create the operating system account for the administrator as post-installation task. For more information, see "Create Windows Operating System Accounts and Groups for Users" on page 18.

Users of SAS Decision Manager

These users must have a valid host operating system account, and you must associate that account with a metadata user through SAS Management Console.

You can create regular user accounts for SAS Decision Manager as a post-installation task. For more information, see Chapter 5, "Configuring Users, Groups, and Roles," on page 43.

Create Windows Operating System Accounts and Groups for Users

On the SAS Workspace Server, create an operating system account for the administrator of SAS Decision Manager (for example, mdlmgradmin) and all SAS Decision Manager users.

If the SAS Workspace Server is running Windows, use one of the following methods to create this operating system account:

- If you are working on a local machine, complete these steps to create this user account:

  1. If you are running in a Windows operating system environment, right-click the Computer icon on your desktop and select **Manage**. The Computer Management window appears.

     Note: If you are creating users on a server, you can use the Server Manager.

  2. In the left navigation pane, expand the **Local Users and Groups** node. The **Users** and **Groups** nodes appear.

  3. Right-click the **Users** node and select **New User**. The New User window appears.

  4. In the New User window, complete these tasks:

     - Specify a user name and password.

     Note: In Windows, you cannot enter *<domain>\username* (you enter the user name only), but you must enter *<domain>\username* in the SAS Deployment Wizard and SAS Management Console.

     - Clear the **User must change password at next logon** check box.

     - Select the **User cannot change password** check box.

     - Select the **Password never expires** check box.

     Click **Create**.

  5. Click **Close** to close the New User dialog box.

  6. If you want to add the users that you created to a group, perform the following steps:

     a. Right-click the **Groups** node in the Computer Management window, and select **New Group**.

     b. Click **Add**. Enter the user names, separated by semicolons, and click **Check Names**.

     c. Click **OK**.

  7. Assign the security policy of **Log on as batch job** for each user or group.

     a. Select **Start** ⇨ **Control Panel** ⇨ **System and Security** ⇨ **Administrative Tools** ⇨ **Local Security Policy**.

      b.   From the Local Security Policy window, expand the **Local Policies** node and select **User Rights Assignment**. Then double-click the **Log on as batch job** policy.

      c.   Click **Add user or Group**. Enter the user names or group names, separated by semicolons, and click **Check Names**.

      d.   Click **OK**.

- Define the user (for example, *<domain>\username*) on the Active Directory server.

Create UNIX Operating System Accounts and Groups for Users

You can create the SAS Decision Manager UNIX user group as a pre-installation or post-installation task. For more information, see "Creating Operating System Accounts in UNIX Environments" on page 19.

Creating Operating System Accounts in UNIX Environments

Using Operating System Groups to Assign Permissions

Users have different operating system privileges on the SAS Workspace Server. By defining a user group for SAS Decision Manager, you can assign all users to the same group and grant the same permissions to all users at one time. All SAS Decision Manager users must have Read, Write, and Execute permissions for each environment directory that a user is permitted to use. Users also need permissions to all of the files and directories in an environment directory. The operating system must be configured to grant these permissions when new files and directories are created. The steps that you follow to do this depend on which operating system groups are defined and your site's security policies.

Conditions for the User Group

If you are working in a UNIX operating environment, the following conditions must be met:

- A group of users is created for the UNIX operating environment. The logon IDs for each user must be in this group. The group must also include any user who might run code that is created by SAS Decision Manager in a SAS session.

- Users can be members of multiple groups, but the SAS Decision Manager group is the primary group for each user.

- The SAS scripts are updated to grant permissions to the SAS Decision Manager users on the SAS Workspace Server. For more information, see "Update the SAS Scripts to Grant Permissions to the User Group" on page 20.

- Each environment directory has the correct ownership, and the user group has Read, Write, and Execute permissions.

Update the SAS Scripts to Grant Permissions to the User Group

Using the **umask** option, you can grant permissions to users on a conditional basis if the user is part of the SAS Decision Manager user group.

Note: This example might require changes to fit your server configuration. In particular, this example could result in changed permissions on other SAS files, such as OLAP cubes. For example, if you are working with multiple UNIX groups and have a SAS OLAP Server, you must ensure that the account under which the SAS OLAP Server runs has Read and Execute permissions to OLAP files.

To set these permissions:

1. On each SAS Workspace Server, open **/sasconfigdir/Lev1/SASApp/ appservercontext_env.sh**.

2. Enter the configuration information for your operating environment. Here is the general format of this code:

   Note: The following code uses grave accents and not quotation marks.

   ```
   CMD=<your-operating-system-path>
   CURR_GID=`eval $CMD -g`
   GID=<solution-group-id>
   if [$CURR_GID -eq $GID]; then umask 002 fi
   ```

   a In the **CMD=<your-operating-system-path>**, specify the full path on your server where the ID command is stored. You can get this information by entering a **which id** or **whence id** command on your console.

   b In the **GID=<solution-group-id>**, specify the group ID. Type **id** on your console to get the GID and UID information.

   c A value of 002 is recommended for the **umask** option.

   Here are code examples for each UNIX environment where SAS Decision Manager is supported:

Operating Environment	Sample Code
AIX	```CMD=/usr/bin/id``` ```CURR_GID=`eval $CMD -g` ``` ```GID=201``` ```if [$CURR_GID -eq $GID]; then umask 002``` ```fi```
H64I (HP-Itanium)	```CMD=/usr/bin/id``` ```CURR_GID=`eval $CMD -g` ``` ```GID=201 if [$CURR_GID -eq $GID] ; then umask 002``` ```fi```
S64 (Solaris)	```CMD=/usr/xpg4/bin/id``` ```CURR_GID=`eval $CMD -g` ``` ```GID=201 if [$CURR_GID -eq $GID] ; then umask 002``` ```fi```

Operating Environment	Sample Code
SAX (Solaris for X64)	```CMD=/usr/xpg4/bin/id CURR_GID=`eval $CMD -g` GID=201 if [$CURR_GID -eq $GID] ; then umask 002 fi```
LNX (Linux)	``` #!/bin/bash CMD=/usr/bin/id CURR_GID=`eval $CMD -g` GID=500 if ["$CURR_GID" -eq "$GID"] ; then umask 002 fi```

Configuring a SAS Application Server

SAS Decision Manager on SAS 9.4 provides support for multiple SAS Application Servers that can be used when specifying a performance definition, a scoring test, or a model retrain definition.

To add a new SAS Application Server:

1. From SAS Management Console, expand the **Application Management** node on the **Plug-ins** tab.

2. Right-click **Server Manager** and select **New Server**.

3. Select **Resource Templates** ⇨ **Servers** ⇨ **SAS Servers** ⇨ **SAS Application Server**, and then click **Next**.

4. Enter the name and the description of your SAS Application Server. Click **Next**.

5. Accept the default values for the server properties and click **Next**.

6. Select **Workspace Server** and click **Next**.

7. Enter the full server name for the **Host Name** and click **Next**.

8. Click **Finish**.

9. Right-click **Object Spawner** and select **Properties**. Click the **Servers** tab, and then click the right-arrow to move the new server to the selected servers.

   Click **OK**.

10. To make the new server available to the JobExecutionService:

    a. Expand **Application Management** ⇨ **Configuration Manager** ⇨ **SAS Application Infrastructure** ⇨ **Web Infra Platform Services 9.4**.

    b. Right-click **JobExecutionService**, and then select **Properties**.

    c. Select the **Settings** tab and move the new server from the **Available** servers list to the **Selected** servers list.

    d. Clear the check box for the **Enable for Interactive execution** setting.

    e. Click **OK**.

11. Restart the SAS servers and the web application server.

For more information, see Chapter 10, "Managing SAS Application Servers," in *SAS Intelligence Platform: Application Server Administration Guide*.

Enabling the SAS Workspace Server XCMD Option

When you are running the SAS Workspace Server in a UNIX environment for SAS Decision Manager 2.2 on a SAS 9.4 deployment, the XCMD option is turned off by default. Therefore, you cannot use the SYSTEM function, the X command, or the PIPE option in a FILENAME statement. You must enable the SAS Workspace Server XCMD option in order to support R model functionality.

To enable the XCMD option:

1. From SAS Management Console, expand the **Server Manager** node on the **Plug-ins** tab.

2. Select and expand **SASApp ⇨ SASApp – Logical Workspace Server**.

3. Right-click **SASApp - Workspace Server** and select **Properties**.

4. Select **Options ⇨ Advanced Options ⇨ Launch Properties** and then select the **Allow XCMD** check box.

5. Click **OK** to save the setting.

6. (Optional) If you have multiple SAS Application Servers with the server type of Workspace Server, repeat steps 2 through 5.

7. Stop and restart your SAS Object Spawner.

Create Oracle Database Synonyms

If you use Oracle for your SAS Decision Manager Common Data Server database and you do not want to use the default schema, you can run two SQL scripts to create synonyms for the database tables. These scripts are in **SAS_HOME\SASDecisionManagerCommonMidTierforDecisionManager\2.2 \Config\Deployment\dbscript\Oracle\optional**. Use your preferred Oracle tool to run these scripts. One of these scripts, **brm_oracle_grant_priv_synonym.sql**, uses substitution variables. If your Oracle tool does not support substitution variables, then you need to manually replace the variable with its value, as described in Step 2.

To run these scripts:

1. In the script named **brm_oracle_grant_priv_synonym.sql**, find the following line:

   ```
   def usernm='YOUR_USER_NAME';
   ```

   Replace **YOUR_USER_NAME** with the user ID that you are using to access the SAS Decision Manager database.

   If your Oracle tool supports substitution variables, skip to Step 3. If not, continue with Step 2.

2. If your Oracle tool does not support substitution variables, in the script named **brm_oracle_grant_priv_synonym.sql**, replace all occurrences of **&usernm** with the user ID that you are using to access the database.

3. Run the script named **brm_oracle_create_synonym.sql** using your preferred Oracle tool. This script does not require substitution variables.

4. Run **brm_oracle_grant_priv_synonym.sql** using your preferred Oracle tool.

Create Oracle Database Tables

When you ran the SAS Deployment Wizard, the **Automatically create tables and load data** check box was selected by default for the SAS Decision Manager Common Data Server. (See "Create and Load Tables through the SAS Deployment Wizard" on page 13.) If you cleared the **Automatically create tables and load data** check box and you do not have an existing database instance, you must run the SQL scripts to create and load the tables.

Run the CreateMMTables.sql script in order to create and load the model tables. The script is located in *SAS-installationdirectory*\SASModelManagerMidTier\13.1\Config\Deployment\Content\dbscript*database-type*\.

Run the following scripts to create the business rules tables with a compatible database client for your installation. These scripts are located in **SAS_HOME\SASDecisionManagerCommonMidTierforDecisionManager\2.2\Config\Deployment\dbscript\Oracle**.

Before you run these scripts, replace **@schema.name@** in each file with the schema name for your database.

1. brm_create_table.sql

2. brm_create_sequence.sql

3. brm_create_constraint.sql

4. brm_create_view.sql

5. brm_required_inserts.sql

6. edm_workflow_interface_create_table.sql

7. edm_workflow_interface_create_sequence.sql

8. edm_workflow_interface_create_constraint.sql

9. edm_workflow_interface_create_trigger.sql

10. edm_workflow_interface_required_inserts.sql

11. edm_create_table.sql

12. edm_create_constraint.sql

13. edm_create_sequence.sql

14. edm_required_inserts.sql

Verify the Certificate

During installation and configuration of SAS 9.4, the SAS Deployment Wizard enables you to configure the SAS Web Server to use HTTPS and Secure Sockets Layer (SSL) certificates automatically. Verify that the Certificate Authority certificate is available to the trust store for the browser and Java clients such as SAS Workflow Studio and SAS Management Console. For more information, see the Instructions.html file in the directory ***SASConfigDir*\\Lev1\\Documents**, and Chapter 5, "Setting Up Certificates for SAS Deployment," in *SAS Intelligence Platform: Installation and Configuration Guide*.

If you did not use the SAS Deployment Wizard to configure the SAS Web Server to use HTTPS and SSL certificates, you can configure it manually. For more information, see "Configuring SAS Web Server Manually for HTTPS" in Chapter 19 of *SAS Intelligence Platform: Middle-Tier Administration Guide*.

The communication path between SAS Web Server and SAS Web Application Server uses HTTP by default. If you configured the SAS Web Server to use HTTPS using the SAS Deployment Wizard, additional steps are required in order to use HTTPS between SAS Web Server and SAS Web Application Server. For more information, see "Configuring SAS Web Application Server to Use HTTPS" in Chapter 19 of *SAS Intelligence Platform: Middle-Tier Administration Guide*.

Set Up the UUID Generator Daemon

The business rules engine uses the UUIDGEN function to create unique identifiers for rule-fired records. Unique identifiers are necessary for merging rule-fired data sets. If you are executing rules in a UNIX operating environment, you need to set up the object spawner to be a UUID Generator Daemon (UUIDGEND). For information, see "Universal Unique Identifiers and the Object Spawner " in Chapter 39 of *SAS Language Reference: Concepts*.

In addition, you should specify the UUIDGENHOST system option for any jobs that run code that was generated by the business rules engine. For more information, see "UUIDGENDHOST= System Option" in *SAS System Options: Reference*.

Review Business Rules Manager Web Properties

Review the Business Rules Manager Web 2.2 properties in SAS Management Console to ensure that the values are appropriate for your environment. Complete the following steps in SAS Management Console:

1. On the **Plug-ins** tab, select **Application Management** ⇨ **Configuration Manager**.

2. Right-click **Business Rules Manager Web 2.2** and select **Properties**. The **Business Rules Manager Web 2.2 Properties** dialog box appears.

3. Click the **Settings** tab.

Review the following properties:

Location of Code generation macro
> the location of the macro that generates the SAS code for rule sets and rule flows. This property applies only to SAS Decision Manager 2.1. It is not used by SAS Decision Manager 2.2.

Max row count per table
> the maximum number of rows per rule flow test table. This property applies only to SAS Decision Manager 2.1. It is not used by SAS Decision Manager 2.2.

Temporary test code generation directory
> a temporary directory that SAS Decision Manager uses while it generates SAS code for rule flow tests.

Largest allowed uploaded lookup table row count
> the maximum number of rows that can be uploaded for a lookup table.

Maximum Testing Log Length (in lines) of SAS log displayed within User Interface
> the maximum number of lines from the SAS log that are displayed on the SAS log section on the **Results** tab for the rule flow.

Support macros in rule expressions
> determines whether macros are allowed in rule expressions. Macros are not supported in decision flows that are deployed by SAS Real-Time Decision Manager.

Temporary Location used in Rule Generation
> a temporary directory that SAS Decision Manager uses while it generates the SAS code for rule sets and rule flows.

Test Library Root File System Directory
> the directory where rule flow tests and test results are saved. As users create additional rule flow tests, administrators might need to delete old test results, or ask users to delete old test cases.

Test Metadata Library Root Directory
> the directory in which rule flow test metadata is stored.

Configuring the Dashboard Reports Directory

In SAS Decision Manager, the dashboard reports directory is configured during installation. The default directory is ***SASConfigDir*\Lev#\AppData \SASModelManager13.1\Dashboard**.

Note: When the SAS Application Server and the SAS Workspace Server are located on different physical machines, the Software Deployment Wizard creates a directory on the Application Server machine and uses that value for the **App.DashboardDir** property value. You must create a directory that is accessible by the SAS Workspace server, and the SAS Decision Manager users must have permissions to the directory.

To configure a different directory to store the SAS Decision Manager dashboard reports:

1. Connect to the SAS Workspace Server.

2. Create a new directory (for example, **C:\Dashboard**).

   Note: The directory must be located on the SAS Workspace Server or on a network drive that is accessible by the SAS Workspace Server. Do not include special characters or spaces in the name of the directory.

3. Grant user permissions for the new directory. For example, perform the following tasks:

    • Grant Full Control permission to users who need to create subdirectories, write content, or delete content. This type of user includes a user who you will add (using SAS Management Console) to the Model Manager Administrator Users group or a user who is a SAS administrator.

    • Grant Read, Write, and Execute permissions to users who need to create performance indicators and execute dashboard reports. This type of user includes a user who you will add (using SAS Management Console) to the Model Manager Advanced Users group.

    • Grant Read and Execute permissions to users who need only to view the dashboard reports. This type of user includes a user who you will add (using SAS Management Console) to the Model Manager Users group.

    Note: In a UNIX environment all SAS Decision Manager users must be part of a group that has the appropriate group permissions. For more information, see "Creating Operating System Accounts in UNIX Environments" on page 19 and Chapter 5, "Configuring Users, Groups, and Roles," on page 43.

4. From SAS Management Console, expand the **Application Management** node on the **Plug-ins** tab.

5. Select and expand **Configuration Manager ⇨ SAS Application Infrastructure**.

6. Right-click **Model Manager JavaSvcs 13.1** and select **Properties**.

7. (optional) Click the **Settings** tab and then select **Report Options**. Use this setting to specify the styles that are available when a user generates dashboard reports, and to enable the indicator override option for defining dashboard report indicators. When you use the indicator override configuration, indicators with conditions are available when you add dashboard report indicators using SAS Decision Manager. For more information, see "Report Options" on page 27.

8. Click the **Advanced** tab to modify the application dashboard directory. Change the property value for **App.DashboardDir** to the directory path that was configured.

9. Click **OK**.

10. For changes to take effect, you must restart the web application server.

Configuring Model Manager Java Services Options

Overview of Configuring Model Manager Java Services Options

The **Model Manager Java Services Options** setting in SAS Management Console enables you to modify model management configurations. The configurations can be modified for reporting, for metadata tables usage when publishing a scoring function, for SAS code debugging, SAS system options, In-database connection and publishing options, and performance options for the SAS High-Performance Analytics procedures.

To modify the settings for the report options:

1. Log on to SAS Management Console as a SAS administrator.

2. On the **Plug-ins** tab, navigate to **Application Management ⇨ Configuration Manager ⇨ SAS Application Infrastructure**.

3. Right-click **Model Manager JavaSvcs 13.1** and select **Properties**.

4. Click the **Settings** tab and then select **Model Manager Java Services**.
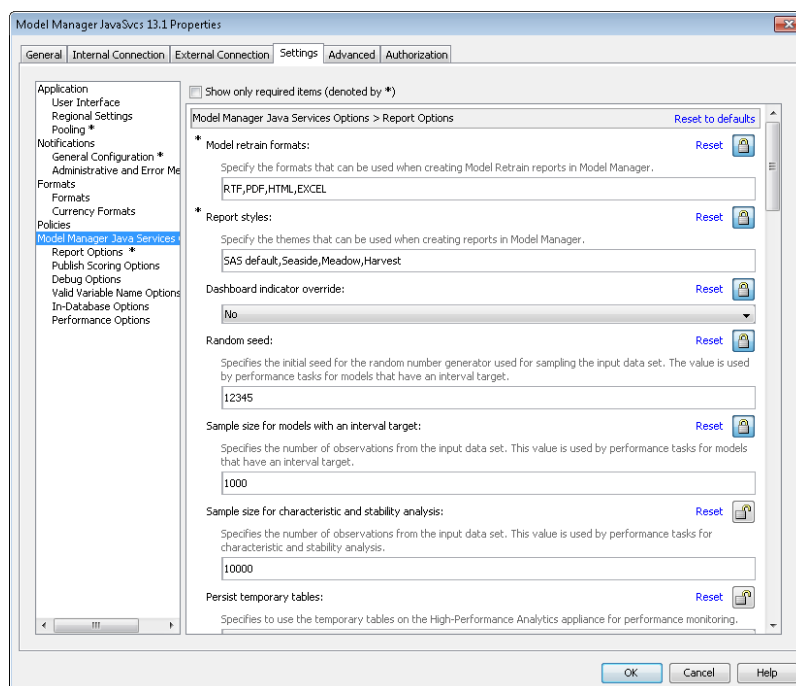
5. Select one of the following options to view and configure the available settings.

   • **Report Options**

   • **Publish Scoring Options**

   • **Debug Options**

   • **Valid Variable Name Options**

   • **In-Database Options**

   • **Performance Options**

6. Click **OK**.

7. For changes to take effect, you must restart the web application server.

Report Options

The **Report Options** setting in SAS Management Console enables you to modify the SAS Decision Manager configurations for the dashboard reports, for model retrain reports, and for performance monitoring. These reports are available on the **Reports** page for a project in SAS Decision Manager.

To modify the report options setting:

1. Specify the formats that are available when a user creates model retrain reports. The default values are RTF, PDF, HTML, and EXCEL. You can remove any of the default values so that they are not available in SAS Decision Manager.

2. Specify the report styles that are available when a user creates the model retrain reports and dashboard reports. You can add or remove SAS styles. The default values are SAS default, Seaside, Meadow, and Harvest. For more information about SAS styles, see Chapter 9, "Style Templates," in *SAS Output Delivery System: User's Guide*.

3. Select **Yes** for the dashboard indicator override. When you do that, indicators with conditions are available when a user adds dashboard report indicators.

4. Specify a value for a random seed to be used by performance definitions for models that have an interval target. The default value is `12345`. The **random seed** is the initial seed for the random number generator used for sampling the input data set.

5. Specify a value for the sample size that is used by performance definitions for models that have an interval target. The default value is `1000`. The **sample size for models with an interval target** is the number of observations from the input data set.

6. Specify a value for the sample size that is used by performance definitions for characteristic and stability analysis. The default value is `10000`. The **sample size for characteristic and stability analysis** is the number of observations from the input data set.

7. Select **Yes** or **No** to specify whether to use the temporary tables on the High-Performance Analytics appliance for performance monitoring. The default is **Yes**.

8. Specify a value for the correlation coefficient (rho) that is used by the binomial test to estimate the probability of default (PD) levels. The default value is `0.04`.

Publish Scoring Options

The **Publish Scoring Options** setting enables you to indicate that the metadata tables be populated in the target database when publishing a scoring function. The default is **Yes**. During the installation and configuration process of the database, the metadata tables must be created in the database if this setting is set to **Yes**. If you plan to use only the SAS Embedded Process publish method to publish scoring model files, this setting can be ignored, and you do not need to create the metadata tables during the database configuration process.

For information about the database configurations, see "Preparing a Database for Use with SAS Model Manager" in Chapter 11 of *SAS In-Database Products: Administrator's Guide*. For more information about publishing models to a database, see "Publishing Models to a Database" in Chapter 23 of *SAS Decision Manager: User's Guide*.

Debug Options

The **Debug Options** setting enables you to use the debug options when executing SAS code within SAS Decision Manager. The default value is **No**.

The **Debug Options** setting does not work for scoring tests, performance definitions, and model retrain definitions. To enable debug options with scoring tests, you must add the following line of code to the **sasv9_usermods.cfg** file in the ***sasconfigdir*\\Lev#\\SASApp\\WorkspaceServer** directory:

```
options mprint symbolgen notes;
```

Note: You can also add this code using the Edit Start-up Code feature in SAS Decision Manager.

Valid Variable Name Options

The **Valid Variable Name Options** setting enables you to set the VALIDVARNAME system option to ANY when executing SAS code. The default value is **No**.

The **Valid Variable Name Options** setting does not work for scoring tasks. To use the VALIDVARNAME system option with scoring tasks, you must add the following line of code to the **sasv9_usermods.cfg** file in the ***sasconfigdir*\\Lev#\\SASApp \\WorkspaceServer** directory:

```
options validvarname='any';
```

Note: You can also add this code using the Edit Start-up Code feature in SAS Decision Manager.

In-Database Options

The **In-Database Options** settings enables you to specify the publish type, database connection settings, and publish settings that are used when publishing models to a database using SAS Decision Manager.

To modify the settings for the in-database options:

1. Select a method to publish models to the database for scoring. The default publish type is the **SAS Embedded Process** publish method.

2. Select a database type.

3. Specify values for database settings that are required to publish to the selected database type.

   Here are the available database settings according to the publish method and database type:

Database Settings	SAS Embedded Process	Scoring Function
Server name	• Teradata • Oracle • Netezza • Greenplum • DB2 • SAP HANA	• Teradata • Netezza • Greenplum • DB2
HDFS directory path	Hadoop	Not applicable
MapReduce server name	Hadoop	Not applicable
Database name or instance number	• Teradata • Oracle • Netezza • Greenplum • DB2 • SAP HANA	• Teradata • Netezza • Greenplum • DB2

Database Settings	SAS Embedded Process	Scoring Function
User ID	• Teradata • Oracle • Netezza • Greenplum • DB2 • Hadoop • SAP HANA	• Teradata • Netezza • Greenplum • DB2
Server user ID	Not applicable	DB2
Schema	• Oracle • Greenplum • DB2 • SAP HANA	• Greenplum • DB2

4. Specify to use the model manager table when publishing. The default value is **No**. When you are publishing the scoring model files to a database using the SAS Embedded Process publish method, the files are by default stored in the table sas_model_table. If the **Use model manager table** value is set to **Yes**, the scoring model files are stored in the table sas_mdlmgr_ep. These tables are located in the target database. This setting enables users to separate the SAS Decision Manager scoring model files from the SAS model scoring files when using the SAS Embedded Process publish method.

5. Specify to force the republish of model scoring files by default when using the SAS Embedded Process publish type. The default value is **No**. If you set this setting to **Yes**, then the **Replace scoring files that have the same publish name** option in the Publish Models to a Database window in SAS Decision Manager is selected by default.

6. Select the default format of the model publish name when using the SAS Embedded Process publish method. The format selected determines the value that appears for the publish name in the Publish Models window in SAS Decision Manager. The scoring function publish method publish name defaults to the model name.

7. Specify a directory path to store the temporary scoring files. If a value is not specified, the SAS work directory is used by default. However, if you select the **Display detailed log messages** option when publishing to a database, the SASUSER directory is used.

For information about the database configurations, see "Preparing a Database for Use with SAS Model Manager" in Chapter 11 of *SAS In-Database Products: Administrator's Guide*. For more information about publishing models to a database, see "Publishing Models to a Database" in Chapter 23 of *SAS Decision Manager: User's Guide*.

Performance Options

The **Performance Options** setting contains the performance parameters for the PERFORMANCE statement to use the SAS High-Performance Analytics procedures.

Currently only the Teradata and Greenplum database types support SAS High-Performance Analytics.

The PERFORMANCE statement defines performance parameters for multithreaded and distributed computing, passes variables about the distributed computing environment, and requests detailed results about the performance characteristics of a high-performance analytics procedure.

The following performance options can be specified for the PERFORMANCE statement.

Option	Description	Default Value
Commit	Specifies an integer to request that the High-Performance Analytics procedure writes periodic updates to the SAS log.	10000
CPU count	Specifies how many processors the procedure should assume are available on each host in the computing environment. You can enter the value of ACTUAL, or enter an integer between 1 and 256.	ACTUAL
Database server	Specifies the name of the server for the database as defined through the hosts file and as used in the LIBNAME statement.	
Details	Requests a table that shows a timing breakdown of the procedure steps.	No
Timeout	Specifies the time-out in seconds for a High-Performance Analytics procedure to wait for a connection to the appliance and establish a connection back to the client.	120
Host name	Specifies the name of the appliance. If a value for the Host option is specified, it overrides the value of the grid host environment variable.	
Installation directory	Specifies the name of the directory in which the High-Performance Analytics shared libraries are installed on the appliance.	

Option	Description	Default Value
Install location	Specifies the name of the directory in which the High-Performance Analytics shared libraries are installed on the appliance. If a value is specified for the Installation directory option, it overrides this option.	
Number of nodes	Specifies the number of nodes in the distributed computing environment, provided that the data is not processed alongside the database. You can enter an integer or you can specify a value of ALL if you want to use all available nodes on the appliance without oversubscribing the system.	
Number of threads	Specifies the number of threads for analytic computations. This option overrides the SAS system option THREADS | NOTHREADS. If you do not specify a value for this option, the number of threads are determined based on the number of CPUs on the host on which the analytic computations execute.	
Grid host	Specifies the host name for the grid. If a value for the Host option is specified, it overrides the value of the grid host environment variable.	
Grid RSH command	Specifies the command to run a remote shell.	
Grid reply host	The host name of the client node to which the grid connects.	
Grid port range	Specifies the range of parts that are permitted by the firewall.	
Grid path	Specifies the local directory path for the grid node.	

Option	Description	Default Value
Grid mode	Specifies whether the HPFORECAST procedure runs in symmetric (SYM) mode or asymmetric (ASYM) mode. The default is symmetric (GRIDMODE=SYM).	Symmetric

For more information about High-Performance Analytics, see *SAS High-Performance Analytics Server: User's Guide*.

Configuring the Limitation for the Number of Observations for a Scoring Result Set

When a scoring test is added on the **Scoring** page of a project in SAS Decision Manager, and the **Type** field is set to **Test**, you can use SAS Management Console to limit the number of observations that a scoring result set can contain.

To configure a limitation for the number of observations:

1. From SAS Management Console, expand the **Application Management** node on the **Plug-ins** tab.

2. Select and expand **Configuration Manager** ⇨ **SAS Application Infrastructure**.

3. Right-click **Model Manager JavaSvcs 13.1** and select **Properties**.

4. Click the **Advanced** tab. Change the property value for **App.TableObsLimitation** to limit the number of observations in the scoring result set. The default value of **0** indicates that there is no limit to the number of observations that a scoring result set can contain.

5. Click **OK**. The value that you specified now appears in the Number of Observations result set property when you create a scoring test using SAS Decision Manager.

Modify Log File Settings

Log4j Configuration File

SAS Decision Manager uses log4j to perform logging. When SAS Decision Manager starts, the log4j configuration files for the application are read from **SAS-config-dir\Lev1\Web\Common\LogConfig**. The filenames are **SASBusinessRulesManagerWeb-log4j.xml** and **SASModelManager-log4j.xml**. These files are standard log4j configuration files.

You should not change the existing categories or root logger in a configuration file unless you are instructed to do so by SAS Technical Support.

Logging Priority Levels

You can change the logging priority levels in a log configuration file if needed.

Table 3.1 *Logging Priority Levels*

Priority	Description
DEBUG	The most verbose logging level. This level displays information that is most useful for debugging an application. SAS Decision Manager should run under this priority only for capturing additional log information. This priority level is not an acceptable priority level for the day-to-day operation of SAS Decision Manager.
INFO	Verbose logging level. This level displays messages that highlight the progress of an application. SAS Decision Manager should run under this priority only for capturing additional log information. This priority level is not an acceptable priority level for the day-to-day operation of SAS Decision Manager.
WARN	Restrictive logging. This level displays information about potentially harmful situations and is an acceptable priority for the day-to-day operation of SAS Decision Manager.
ERROR	The most restrictive logging level. This level displays error events and is an acceptable priority for the day-to-day operation of SAS Decision Manager.

Log Files

SAS Decision Manager writes information to the following log files:

SASBusinessRulesManagerWeb2.2.log
    contains messages from SAS Decision Manager

SASModelManager13.1.log
    contains messages from SAS Decision Manager

SASDecMgrCommon2.2.log
    contains messages from the Workflow and Data plug-ins

SASDecMgrShell2.2.log
    contains general messages from the Shell

By default, the application writes the SAS Decision Manager log files to
`SAS-config-dir\Lev1\Web\Logs\SASServer7_1\`. The
SASModelManager13.1.log file is written to
`SAS-config-dir\Lev1\Web\Logs\SASServer11_1\`. You can change the
location of these log files in the configuration file. Changes to the configuration file take
effect when the middle-tier application server is restarted. See "Administering Logging
for SAS Web Applications" in Chapter 8 of *SAS Intelligence Platform: Middle-Tier
Administration Guide* for more information about this configuration file.

SAS Decision Manager creates new log files each day. For information about logging
configurations, see "Modifying Your Server Logging Configurations" in Chapter 10 of
SAS Intelligence Platform: System Administration Guide.

Turn on SQL Logging

To turn on SQL logging and write SQL parameter values for each query to the log file, add the following categories to the log4j.xml configuration file:

```
<category additivity="false" name="org.hibernate.type">
   <priority value="TRACE"/>
   <appender-ref ref="SAS_FILE"/>
</category>

<category additivity="false" name="org.hibernate.SQL">
   <priority value="DEBUG"/>
   <appender-ref ref="SAS_FILE"/>
</category>
```

Directories for Business Rules Metadata and XML Files

SAS Decision Manager creates two directories for business rules metadata: **Products** and **/System**. These directories are on the content server.

SAS Decision Manager creates a location for published XML files, **sasdav/Products**. The BusinessRuleFlow metadata object does not delete the XML documents stored in this location in order to ensure that an audit trail is maintained. For more information, see "Delete XML Content from the SAS Decision Manager Database" on page 35.

Delete XML Content from the SAS Decision Manager Database

Before you delete any XML content from **sasdav/Products**, you should do the following:

1. Back up all versions of the content. The easiest way to back up the content is to use SAS Management Console to export the BusinessRuleFlow object that refers to the content.

2. Ensure that no BusinessRuleFlow objects refer to the content.

Chapter 4
Migration Tasks

Pre-Migration Tasks

For information about the pre-migration tasks that you must perform, see Chapter 3, "Performing Pre-migration Tasks," in *SAS Intelligence Platform: Migration Guide*. Here are the most important steps:

- Back up your SAS system, including servers and desktop clients.

- Back up the SAS Decision Manager Common Server database if you are migrating from SAS Decision Manager 2.2 to 2.2 on a SAS 9.4 system.

- Perform any required maintenance that is required to meet minimum baselines.

- Use a custom deployment plan to install SAS 9.4 and SAS Decision Manager. You must specify the plan file when you use the SAS Deployment Wizard.

- Complete the pre-installation and migration checklists. These checklists can be customized based on the deployment plan that you choose. For more information, see "Completing the Pre-migration Checklists" in Chapter 3 of *SAS Intelligence Platform: Migration Guide*.

- If you are moving to a new system, ensure that the required operating system user accounts that you used for SAS in your current operating system also exist in your new operating system. Examples of these user accounts include `sasadm`, `sastrust`, and `sasdemo`. The migration process requires the same operating system user accounts that you used with your current operating system.

- Before you migrate to SAS Decision Manager 2.2, you should record the database settings in your current environment. You must enter this information in SAS Deployment Wizard.

  - For the SAS Decision Manager Common Data Server, record the database name and the user name for your database. The default database name is `dcmdb`.

- If you are using Oracle for your database, record the following information:

  - fully qualified host name of the database server

  - port number of the database server

  - Oracle Site Identifier (SID)

  - user ID of the database user whose credentials are used to access SAS Decision Manager data on the server

  - password of the database user whose credentials are used to access SAS Decision Manager data on the server

  You can find the Oracle SID in the tnsnames.ora file. You can also determine the SID by running the following query using a database user ID on your Oracle instance:

  ```
  select instance from v$thread
  ```

  You must enter the SID in the **Database name** field in the SAS Decision Manager Database JDBC Properties dialog box in SAS Deployment Wizard.

- Install third-party software. If you are using Oracle for your database, ensure that the Oracle client is installed on your server tier and that there is a matching tnsnames.ora file for the SAS Decision Manager Common Data Server database. See Table 1.2 on page 8 for information about the tnsnames.ora file.

- Create a SAS Software Depot. For more information, see "Creating SAS Software Depots" in Chapter 3 of *SAS Intelligence Platform: Migration Guide*.

- Use the SAS Migration Utility to create a migration package. You must enter the configuration properties for the SAS Model Manager Mid-Tier (MMAPI) database management system in the SAS Migration Utility properties file.

  The values for the SAS Migration Utility properties can be found in SAS Management Console. Select the **Folders** tab and expand **System** ⇨ **Applications** ⇨ **SAS Model Manager Mid-Tier**. Select the **Model Manager Mid-Tier** *<version>* folder, right-click the **Model Manager-Mid-Tier** *<version>* application object, and then select **Properties** ⇨ **Configuration**. The prefix for the configuration properties that are equivalent to the SAS Migration Utility properties is dbms.mmapi.

  Here is the list of configuration properties that should be used to populate the migration properties:

SAS Migration Utility Properties	Configuration Properties in SAS Management Console
mmapi.data.dbms.type	dbms.mmapi.type
mmapi.dbms.data.name	dbms.mmapi.name
SMU.mmapi.dbms.host	dbms.mmapi.host
SMU.mmapi.dbms.port	dbms.mmapi.port
SMU.mmapi.dbms.userid	dbms.mmapi.userid
SMU.mmapi.dbms.password	<not stored here>

For more information, see Appendix 1, "SAS Migration Utility Reference," in *SAS Intelligence Platform: Migration Guide*, and Appendix 3, "SAS Model Manager Properties," in *SAS Intelligence Platform: Migration Guide*.

Post-Migration Tasks

Overview of Post-Migration Tasks

After you have migrated to SAS Decision Manager 2.2 on SAS 9.4, perform the following post-migration manual steps:

1. Copy or move the contents of the channels directories from the source machine to the target machine. See "Publishing Channels" on page 39 for more information.

2. Run post-migration macros if you are migrating from one UNIX operating system to different type of UNIX system, or from a Windows 32-bit server to a Windows 64-bit server. See "Operating System Migration" on page 39 for more information.

3. Migrate the SAS Decision Manager Common Data Server database if you are performing a hardware upgrade. See "Migrate the SAS Decision Manager Data Server 2.2 Database" on page 40 for more information.

Note: All user-defined templates are copied from the source system to the target system by the migration process. This content includes all user-defined life cycle templates, model templates, report templates, and SAS code files. The user-defined templates are located on the SAS Content Server at http://*hostname:port*/SASContentServer/repository/default/ModelManager/ConfigTemplates/ext/.

Publishing Channels

When migrating from a previous release of SAS Decision Manager, you must manually copy the contents of the channels directory from your old system to a directory on the new machine that is running SAS Workspace Server. It is recommended that you use the same directory name when migrating from an existing SAS Decision Manager 2.2 deployment to a new deployment of SAS Decision Manager 2.2. If you use the same directory name, you do not need to copy the contents of the channels directory. The default directory path for channels is ***SASConfigDir*\Lev#\AppData \SASModelManager13.1\Channels**.

For example, in Windows the path might be **C:\SAS\Config\Lev1\AppData \SASModelManager13.1\Channels**.

If you use a different directory name, then you must modify the channel persistent store directory location in the SAS Management Console. For more information, see "Modify an Existing Channel or Channels Node Location" on page 72.

Operating System Migration

If you are migrating from one UNIX operating system to another, or from a Windows 32-bit server to a Windows 64-bit server, then some post-installation tasks are required to complete the migration process. SAS Decision Manager provides post-migration macros to assist with this process. Only SAS files on the WebDAV server in the **\ *ModelManagerDefaultRepository*\Project\Version\Resources**

directory are handled by the post-migration macros. If you have SAS files in another directory location, you must manually migrate them.

Note:

- You must have access to the SAS deployment on the source system and target system to run these macros.

- Two of the macros are available for download at http://ftp.sas.com/techsup/ download/blind/mm_migration.sas.

Perform the following steps to ensure that all data, content, and link and filename references that are used by SAS Decision Manager are accessible by the new SAS 9.4 deployment:

1. Run the %MM_migrationStep1() macro on page 95 on the SAS Workspace Server in your source system.

2. Run the %MM_migrationStep2() macro on page 96 on the SAS Workspace Server in your target system.

Note: For more information about the migration macros, see Chapter 9, "Post-Migration Macros," on page 95.

Migrate the SAS Decision Manager Data Server 2.2 Database

You need to run PostgreSQL commands in order to migrate the SAS Decision Manager Common Data Server database. These commands are located in the following directory:

!SASHOME/SASWebInfrastructurePlatformDataServer/9.4/bin

When you run these commands, substitute the correct values for the host name, port number, and user ID for your database. These commands prompt you to enter a password.

Note: If you are performing the upgrade in a UNIX operating environment and these commands fail, you might need to set environment variables. See "Set Environment Variables for UNIX" on page 41 for more information.

1. On the source machine, run the **pg_dump** command. This command creates a script file that contains the SQL commands that are needed to reconstruct the database:

   ```
   pg_dump --host=host_name --port=nnnn --username=database_owner_userID
   --password -Fp dcmdb > dcmdb.dump
   ```

2. Copy the generated file dcmdb.dump to the target server.

3. Stop SASServer7.

4. On the target server, run the **dropdb** command to drop the database that was created by the SAS Deployment Wizard:

   ```
   dropdb --host=host_name --port=nnnn --username=database_owner_userID
   --password database_name
   ```

5. On the target server, run the **createdb** command to create a new, empty database:

   ```
   createdb --host=host_name --port=nnnn --username=database_owner_userID
   --password database_name
   ```

6. On the target server, restore the exported database:

   ```
   psql --host=host_name --port=nnnn -f dcmdb.dump database_name userID
   ```

Note: Specify the user ID for Decision Manager Common Middle Tier. Do not
specify the user ID of the database owner account.

Note: You might see messages such as **no privileges were granted for
"public"** or **role *userID* does not exist**. These messages mean that
these users are no longer applicable to the upgraded database instance and can be
ignored.

Set Environment Variables for UNIX

If you are upgrading SAS Decision Manager in a UNIX operating environment, you
might need to set environment variables in order for the migrate commands described in
to succeed. If the migrate commands fail, use the following export commands to set the
LD_LIBRARY_PATH and LIBPATH environment variables:

```
export LD_LIBRARY_PATH=/install/cfgsas1/SASHome/
SASWebInfrastructurePlatformDataServer/9.4/lib:$LD_LIBRARY_PATH
```

```
export LIBPATH=/install/cfgsas1/SASHome/
SASWebInfrastructurePlatformDataServer/9.4/lib:$LIBPATH
```

Replace *SASHome* with the value for your site.

Chapter 5
Configuring Users, Groups, and Roles

Security Administration Tasks for SAS Decision Manager

Security administration for SAS Decision Manager consists of the following tasks:

- administering SAS identities for your users by adding account information to the SAS Metadata Server

- administering groups of users in order to simplify the management of roles

- administering roles, which provide users with access to specific application features

The information included here is a brief introduction to the concepts of users, SAS identities, groups, roles, and capabilities. For complete information about security

administration, see *SAS Management Console: Guide to Users and Permissions* and *SAS Intelligence Platform: Security Administration Guide* at http://support.sas.com/documentation/onlinedoc/intellplatform/index.html.

Administering SAS Identities for Users

Overview of SAS Identities

For each SAS Decision Manager user, you must create an individual SAS identity on the SAS Metadata Server. The SAS identity is a copy of the ID with which the user logs on to SAS applications. Based on this identity, the system can determine who can access which application and can audit individual actions in the metadata layer. The SAS identity consists of a name and the user ID for the user's external account. This ID can be any type of account that is known to the metadata server's host, such as an LDAP account, Active Directory account, host account, or other type of account.

When you are entering user IDs for Windows accounts, be sure to qualify the ID (for example, `WIN\myID` or `myID@mycompany.com`).

In a Windows environment, add new users to the **Log on as a batch job** local security policy on the machine that hosts the SAS Workspace Server.

Note: Enter a user ID for Microsoft Windows in the format *domain\userID*. In order for a user to be able to schedule jobs using SAS Decision Manager, you must specify a valid password in their user account. A user must also sign in with the same user ID (*domain\userID*) and password that you specified in their user account.

The following users are created as part of the SAS Decision Manager installation process:

Table 5.1 Types of Users

User	Description
SAS Administrator	This user has access to all SAS Management Console capabilities and metadata administrative tasks.
SAS Demo User	This user is optional. You can choose to create this user during installation. However, this user is not assigned to a group during installation.

Creating SAS Identities

To create SAS identities for your users, manually enter the information for each user through the User Manager plug-in in SAS Management Console. If you have a large number of users, then you can extract user and group information from one or more enterprise identity sources. You can then use SAS bulk-load macros to create the identity metadata from the extracted information.

For more information about creating and managing identities, see *SAS Management Console: Guide to Users and Permissions*. For information about the SAS bulk-load macros, see Appendix 2, "User Import Macros," in *SAS Intelligence Platform: Security*

Administration Guide. These documents are available at http://support.sas.com/
documentation/onlinedoc/intellplatform/index.html.

Groups and Group Membership

About Groups

A group is a set of users. Groups enable you to grant multiple users membership in a role
or permissions to metadata, thus simplifying security administration. You can create as
many groups as are needed in order to manage your installation.

> **TIP** A group's membership can include other groups as well as individual users. This
> enables you to create a nested group structure.

Predefined User Groups in SAS Decision Manager

Table 5.2 *Predefined User Groups*

Group	Description
Public	This group includes everyone who can access the metadata server, either directly or through a trust relationship. If a user is able to log on to a client application but does not have an individual SAS identity, the user is assumed to be in the public group. Because this group has implicit membership, you cannot explicitly add or remove users from this group.
SAS Users	This group includes everyone who can access the metadata server, either directly or through a trust relationship. If a user is able to log on to a client application but does not have an individual SAS identity, the user is assumed to be in the public group. Because this group has implicit membership, you cannot explicitly add or remove users from this group.
SAS Administrators	This is a standard group for metadata administrators. In a standard configuration, members are granted broad access and administrative capabilities, but are not unrestricted.
Decision Manager Common Administrators	This group has administrative permissions. Membership in this group is required to administer workflows. In your initial installation, this group is a member of the Decision Manager Common: Administration, Business Rules Manager: All Capabilities and Model Manager: Administration Usage roles.

Group	Description
Decision Manager Users	This group is created during the installation process. Members of this group have permission to read, add, or delete table summary information in the Data category.
	It is associated with the necessary identity in order to allow users to access the business rules database during rule flow execution. This group is the only group that is granted permission to publish business rules content to the SAS Content Server by default. Unless you make configuration changes, membership in this group is required for business rules users who do not have administrator permission.
Model Manager Administrator Users	This group has administrative permissions in the Projects and Portfolio categories.
Model Manager Advanced Users	This group has permissions to read, write, and delete content in the Projects and Portfolios categories.
Model Manager Users	This group has permission to read content in the Projects category.
SAS System Services	This group enables members to export files on the **Folders** tab of SAS Management Console.

Roles and Capabilities

About Roles and Capabilities

A role manages the availability of application features such as menu items and plug-ins. An application feature that is under role-based management is called a capability.

Certain actions are available only to users or groups that have a particular role. Any user or group who is a member of a role has all of that role's capabilities.

Roles can contribute to one another. A role automatically includes all of the capabilities of a role that contributes to it.

Roles differ from permissions. In general, roles do not affect access to metadata or data.

Predefined Roles and Capabilities for SAS Decision Manager

Your installation includes several predefined roles for administrators and users of SAS Decision Manager. Depending on what software you have installed, you might have other predefined roles.

Note: The ability to access and update metadata is subject to permissions that are placed on that metadata. These roles do not affect permissions.

Table 5.3   *Predefined User Roles and Capabilities*

| Role	Description
Decision Manager Common: Administration	Users in this role can perform all Decision Manager Common tasks, including administering workflows. This role is assigned to the group Decision Manager Common Administrators and has the Decision Manager Common: Workflow category capability.
Business Rules Manager: All Capabilities	Users in this role can view and edit all business rules content, including vocabularies, entities, terms, lookup tables, rule sets, and rule flows.
Business Rules Manager: Rule Flow and Rule Set Designer	Users in this role can create, edit, and delete rule sets and rule flows.
Business Rules Manager: Rule Flow and Rule Set Read-Only	Users in this role can view rule sets and rule flows.
Business Rules Manager: Vocabulary and Lookup Designer	Users in this role can create, edit, and delete vocabularies, entities, terms, and lookup tables.
Business Rules Manager: Vocabulary and Lookup Read-Only	Users in this role can view vocabularies, entities, terms, and lookup tables.
Model Manager: Administration Usage	Users in this role can perform all model management tasks. This role is assigned to the group Model Manager Administrator Users and has the following Model Manager Plug-in capabilities by default: • Model Projects category • Model Portfolios category
Model Manager: Advanced Usage	Users in this role can perform all model management tasks except for tasks that can be performed only by an application administrator. This role is assigned to the group Model Manager Advanced Users and has the following Model Manager Plug-in capabilities by default: • Model Projects category • Model Portfolios category

Role	Description
Model Manager: Usage	Users in this role are general users that can perform all tasks except for advanced user tasks and administrator tasks. This role is assigned to the group Model Manager Users.
Comments: Administrator	Users in this roll can edit or delete comments. The ability to edit and delete comments is controlled by the capabilities under **Applications ⇨ SAS Application Infrastructure ⇨ Comments** in SAS Management Console.
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 group SAS Administrator Users.

Viewing Roles and Capabilities in SAS Management Console

To view details about a role, open the User Manager plug-in in SAS Management Console, right-click the role, and select **Properties**. You can then view tabs that display the role's members, capabilities, and contributing roles.

For example, the following display shows the capabilities for the Business Rules Manager: Rule Flow and Rule Set Designer role. These capabilities correspond to the

description of this role in "Predefined Roles and Capabilities for SAS Decision Manager" on page 46.
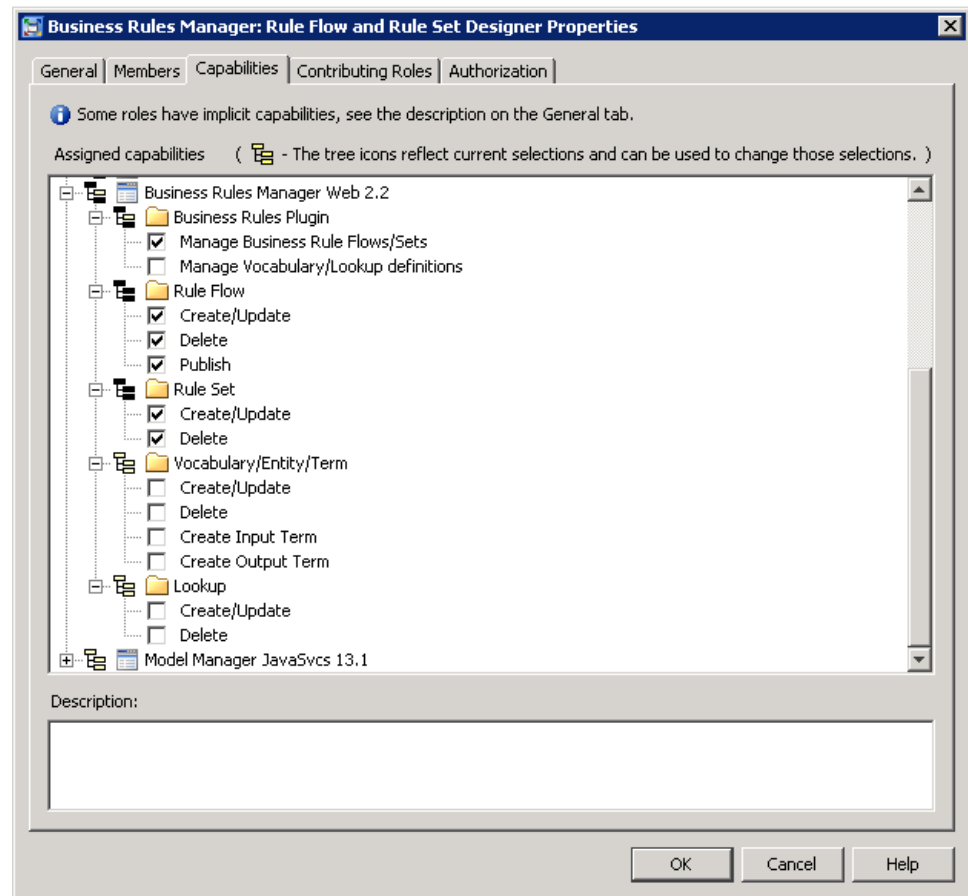
Note: Some roles have implicit capabilities that are not specified on the **Capabilities** tab.

The SAS Decision Manager capabilities control access to categories in the application. For example, the Rule Sets and Rule Flows categories do not appear when a user signs in to SAS Decision Manager if that user is not assigned to either of the following categories:

- Business Rules Manager: Rule Flow and Rule Set Designer

- Business Rules Manager: Rule Flow and Rule Set Read-Only

The Create/Update and Delete capabilities control access to specific object types. You can combine the category capabilities with the object capabilities to control access at whatever level is needed. For example, if you want a user to be able to view and edit rule flows only, the user should have only the following capabilities:

- Manage Business Rule Flows/Sets for the Business Rules Plugin

- Create/Update and Delete capabilities for Rule Flow objects

The following table describes the icons used in the Properties window.

Icon	Description
🗄	None of the capabilities in this category have been specified for this role.

Icon	Description
	Some of the capabilities in this category have been specified for this role, either explicitly or through a contributing role.
	All of the capabilities in this category have been specified for this role, either explicitly or through a contributing role.

Shaded check boxes indicate capabilities that come from contributing roles.

Administering Group and Role Membership

To administer group and role membership, use the User Manager plug-in in SAS Management Console.

Adding a User to a Group or Role

In most cases, the best way to place a user in a role is to add the user to a group that belongs to the role. You can also add users directly to groups or roles.

To place a user in one of the predefined roles, you can add the user to one of the predefined groups. For example, to add a user to the Decision Manager Common: Administration role, add the user to the Decision Manager Common Administrators group.

For more information, see *SAS Management Console: Guide to Users and Permissions* at http://support.sas.com/documentation/onlinedoc/intellplatform/index.html.

Creating New Groups and Roles

The predefined groups and roles might be sufficient for many sites. Other sites might need to make application features available to users on either a broader or more granular basis than the predefined groups or roles allow.

You can use combinations of capabilities to create a new role. However, you can use only the capabilities that already appear in User Manager. You cannot create new capabilities.

For detailed information about roles and how to create them, see *SAS Management Console: Guide to Users and Permissions* at http://support.sas.com/documentation/onlinedoc/intellplatform/index.html.

Modifying Roles

The User Manager plug-in in SAS Management Console enables you to modify roles by selecting or deselecting different capabilities.

CAUTION:
> **No automated method can revert a role to its original set of capabilities.** Instead of adjusting the capabilities of a predefined role, consider creating a new role. This advice is especially important if you need to make major changes.

If you modify a role, then follow these best practices:

- Do not rename the predefined roles. Renaming the predefined roles makes it difficult for SAS Technical Support to help you resolve problems.

- Back up the metadata server before modifying roles, and keep a record of the changes that you make.

When modifying a role, you can use only the capabilities that already appear in User Manager. You cannot create new capabilities.

For more information about roles and how to modify them, see *SAS Management Console: Guide to Users and Permissions* at http://support.sas.com/documentation/onlinedoc/intellplatform/index.html.

Model Management User Tasks

Overview of Model Management User Tasks

When you work in SAS Decision Manager, the application administrator assigns your user ID to one of three SAS Decision Manager groups: Model Manager Administrators, Model Manager Advanced Users, and Model Manager Users. Groups can perform certain tasks within SAS Decision Manager. For example, users in the Model Manager Administrator group are the only users who can lock a version.

Users in the Model Manager Administrator Users group can perform all task in the Models category view. The Model Manager Advanced Users and Model Manager Users groups are more restrictive. See the tables in the subsequent sections for a list of tasks and the groups whose users can perform the task.

An application administrator can create custom groups for your organization as well as assign roles to those groups. The pre–defined roles enable specific users or groups to be assigned in order to complete specific tasks within SAS Decision Manager. In most cases, roles are assigned to groups. Three of the roles are general and correspond to the groups that are supplied by SAS Decision Manager. Contact your application administrator to find out your group and roles.

The following table lists the abbreviations for groups that are used in the task tables below:

Group	Abbreviation
Model Manager Administrator Users	MM Admin
Model Manager Advanced Users	MM Adv User
Model Manager Users	MM User
Decision Manager Users	DCM User
Decision Manager Administrator Users	DCM Admin

The following table describes the roles and lists the role abbreviations that are used in the list of tasks:

Role	Abbreviation
Comments: Administrator	:CAdmin
Decision Manager Common: Administration	:DMAdmin
Model Manager: Administration Usage	:Admin
Model Manager: Advanced Usage	:Adv
Model Manager: Usage	:User

Setting Up SAS Decision Manager

Use the following table to determine the users who can complete the tasks to set up SAS Decision Manager:

Task	Group
Create users in SAS Management Console	SAS Administrator
Create data libraries in SAS Management Console	MM Adv User, MM Admin, SAS Administrator
Create data libraries in the Data category view	DCM Admin, DCM User, MM Adv User, MM Admin, SAS Administrator
Create channel location folders on a SAS server	MM Admin
Create SAS channels in SAS Management Console	SAS Administrator
Define channel subscribers in SAS Management Console	SAS Administrator
Create project tables	MM User, MM Adv User, MM Admin
Register tables	DCM Admin, DCM User, MM Adv User, MM Admin
Configure the SAS Content Server for SAS Decision Manager	MM Admin
Create workflows	MM Admin, MM Adv User, MM User, DCM Admin, DCM User
Manage workflows	DCM Admin

Setting Up Projects and Portfolios

Use the following table to determine the users who can complete the tasks to set up projects and versions in SAS Decision Manager:

Task	Group
Create folders	MM Adv User, MM Admin
Create portfolios	MM Adv User, MM Admin
Create projects	MM Adv User, MM Admin
Create versions	MM Adv User, MM Admin
Delete folders, projects, and portfolios	MM Adv User, MM Admin
Archive and restore folders	MM Admin. MM Adv User
Create and upload model and report templates	MM User, MM Adv User, MM Admin
Create a workflow	MM Admin, MM Adv User, MM User
Assign participants to a workflow	DCM Admin
View workflows that are associated with a version	DCM Admin

Importing and Assessing Models

Use the following table to determine the users who can complete the tasks to import and assess models:

Task	Group
Import models	MM Adv User, MM Admin
Configure model properties	MM Adv User, MM Admin
Map model variables to project variables	MM Adv User, MM Admin
Run model comparison and model validation reports	MM Adv User, MM Admin
Create user reports	MM Adv User, MM Admin
Create aggregated reports	MM Adv User, MM Admin
Create scoring output tables	MM Adv User, MM Admin

Task	Group
Create and run scoring tests	MM Adv User, MM Admin
Schedule a scoring test to execute	MM Adv User, MM Admin

Deploying and Delivering Models

Use the following table to determine the users who can complete the tasks to deploy and deliver models:

Task	Group
Set a champion model	MM Adv User, MM Admin
Flag a challenger model	MM Adv User, MM Admin
Validate the champion model by running a scoring test using test data and reviewing the scoring output	MM Adv User, MM Admin
Lock or unlock versions	MM Admin
Publish a project or model to a SAS channel	MM Adv User, MM Admin
Extract a model	any user who has the appropriate access rights to the SAS Metadata Repository
Publish a model to the SAS Metadata Repository	MM Adv User, MM Admin
Publish a model scoring function or model scoring files to a database	MM Adv User, MM Admin

Monitor Champion Model Performance and Retrain Models

Use the following table to determine the users who can complete the tasks to create and run the reports that are used to monitor the champion model performance and to retrain models:

Task	Group
Set project properties	MM Adv User, MM Admin
Monitor performance of project champion models that are within a portfolio	MM Adv User, MM Admin
Edit a performance definition	MM Adv User, MM Admin

Task	Group
Schedule a performance definition to execute	MM Adv User, MM Admin
Execute the performance definition.	MM Adv User, MM Admin
Run performance monitoring batch jobs	in **Test** mode: MM User, MM Adv User, MM Admin in **Production** mode: MM Adv, MM Admin
View monitoring reports and charts	MM User, MM Adv User, MM Admin
Delete performance data sets	MM Adv User, MM Admin
Create and manage dashboard report definitions	MM Adv User, MM Admin
Generate dashboard reports	MM Adv User, MM Admin
View dashboard reports	MM User, MM Adv User, MM Admin
Edit a model retrain definition	MM Adv User, MM Admin
Execute or schedule a model retrain definition	MM Adv User, MM Admin
View retrained models and the associated model comparison reports	MM User, MM Adv User, MM Admin

General Tasks

Use the following table to determine the users who can complete these general tasks:

Task	Group or Role
Add attachments and comments	MM User, MM Adv User, MM Admin
Search for models	MM User, MM Adv User, MM Admin
Set the status of a project champion model and challenger models	MM Adv User, MM Admin
Replace a champion model	MM Adv User, MM Admin
View workflow tasks	MM User, MM Adv User, MM Admin A user must be the actual owner of a task or assigned the workflow participant role of potential owner or business administrator to view tasks in the My Tasks category

Task	Group or Role
Work with workflow tasks	MM User, MM Adv User, MM Admin
	A user who is a workflow participant can claim, release, and complete tasks.

Task	Group or Role

Chapter 6
Configuring SAS Workflow

Configuring SAS Workflow for Use with SAS Decision Manager

Overview

SAS Workflow provides services that work together to model, automate, integrate, and streamline business processes. It provides a platform for more efficient and productive business solutions.

SAS Workflow is used by SAS solutions that benefit from business process management. SAS Workflow Studio is a desktop client application that is used to design and deploy workflow definitions. The SAS middle tier hosts the workflow engine and the workflow services as part of the SAS Web Infrastructure Platform. SAS Decision Manager is used to manage the workflows that are associated with versions. For more information about SAS Workflow, see "SAS Workflow" in Chapter 1 of *SAS Intelligence Platform: Middle-Tier Administration Guide*.

To use SAS Workflow with SAS Decision Manager, be sure the following prerequisites are met:

1. SAS Workflow Engine, SAS Workflow Services, and SAS Workflow Studio must be installed and configured. For more information, see *SAS Intelligence Platform: Installation and Configuration Guide*

2. Users must be a member of the Decision Manager Common Administrators Group or another user group that is associated with the Decision Manager Common: Administration role.

3. Workflow definitions must be created using SAS Workflow Studio. For more information about creating workflow definitions, see the *SAS Workflow Studio: User's Guide*.

Guidelines for Creating Workflow Definitions

When you create workflow definitions in SAS Workflow Studio to use with SAS Decision Manager, follow these guidelines:

- Participants, and policies must be added to the task level. Statuses added at the task level and the default statuses at the workflow definition level can be used for a task status. Data objects can be added at the workflow definition level or task level. Users can see only the data objects defined at the task level from the Workflows category in SAS Decision Manager.

- Only the Potential Owner and Business Administrator workflow roles are used by SAS Decision Manager and they can be used in either a participant or swimlane definition. The Actual Owner workflow role should not be used as part of a workflow definition.

- In order to assign additional participants to tasks in SAS Decision Manager, the user must have or be in a group that is assigned the workflow role of Business Administrator. Also, in order to manage workflows and assign participants, the user must be in the Decision Manager Common Administrators group, or in a group that is a member of the Decision Manager Common Administrators group or that is associated with the Decision Manager Common: Administration role in SAS Management Console.

  The following groups are created at installation time:

  - Decision Manager Common Administrators Group

  - Decision Manager Users Group

- Only workflow definitions that are activated in the Workflow repository, that are associated with the `mmapi` tag attribute in the file properties, are available toSAS Decision Manager.

How to Add the Approval Attribute to a Status

To add the `Approval` attribute to a status:

1. Expand the **Statuses** folder in the **Workflow Tree**.

2. Right-click a status and select **Edit**.
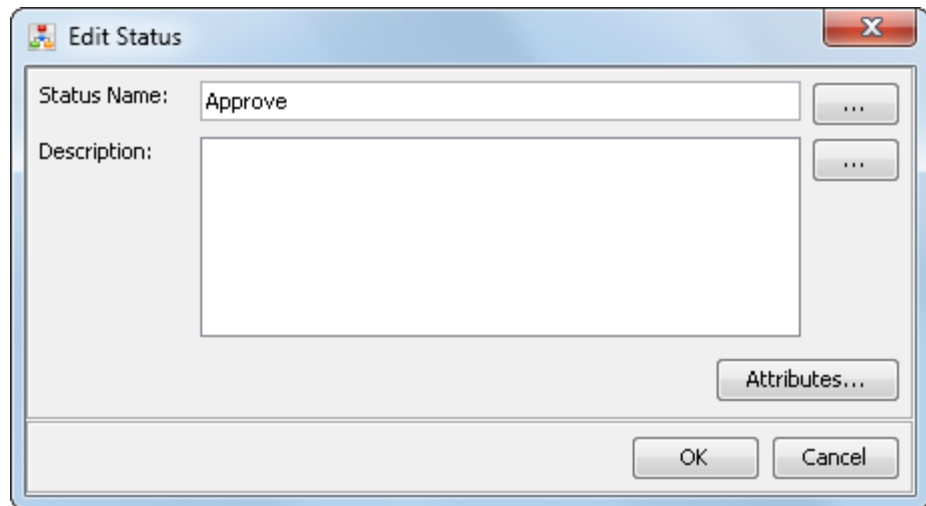
3. Click **Attributes**.

4. Click **Add** and enter the following values for the new attribute.

   Key
   > Approval

   > *Note:* This key is case-sensitive.

   Value
   > true

5. Click **OK** twice to save.

How to Make Workflow Definitions Available to SAS Decision Manager

After you have created a workflow definition in the SAS Workflow Studio, you must make the workflow definition available to SAS Decision Manager.

To save the workflow definition to the Workflow repository:

1. Save the workflow definition to your local drive.

2. Log on to the server.

3. Add the tag attribute of `mmapi` to the workflow definition file properties.

4. Upload the workflow definition.

5. Verify that the workflow definition is available in the Workflows category.

For more information, see "Deploying and Maintaining Workflows" in Chapter 5 of *SAS Workflow Studio: User's Guide*.

Log On to the Server

With SAS Workflow Studio, you are limited to managing locally stored workflow definitions on your system until you have logged on to the SAS Content Server. After you are connected, you can access additional workflow definitions that are stored in the SAS Content Server.

To log on to the server:

1. Select **Server ⇨ Log On**.

2. In the Log On window, select the host-name from the **SAS environment** drop-down list.

   Note: For more information, see Appendix 1, "Configuring the SAS Environment File," in *SAS Intelligence Platform: Middle-Tier Administration Guide.*

3. Enter a user ID and password, and click **Log On**.

4. Click **OK** if a confirmation message appears.

Add Tag Attributes to a Workflow Definition

Only those workflow definitions in the Workflow repository that contain the **mmapi** tag attribute in the file properties are available to SAS Decision Manager.

To add a tag attribute to the file properties of a workflow template in SAS Workflow Studio:

1. Select **File ⇨ Properties** and click **Add**.

2. Enter the tag value of **mmapi**.

   Note: The file properties are case sensitive. This value must be lowercase.

3. Click **OK** twice.

Upload a Workflow Definition

To upload a workflow:

1. From the **Server** menu, select the **Save to Repository** menu option. The Save to Workflow Repository window appears.

2. (Optional) Enter relevant comments to associate with the workflow definition.

3. Select the **Activate** option if you want to activate the current version in the Workflow repository.

4. Click **OK**.

5. Click **OK** if confirmation messages appear.

Verify That the Workflow Definitions Are Available In SAS Decision Manager

To verify that the workflow definitions are available in the Workflows category view of SAS Decision Manager:

1. Enter the URL http://*hostname*:*port*/SASDecisionManager in your web browser.

2. Enter the user ID and password for a user that is in the Decision Manager Common Administrators Group or a user group that is associated with the Decision Manager Common: Administration role.

3. Verify that the uploaded workflow definition is available in the Workflows category view. From the Workflows category view, select **Actions ⇨ Set Mappings**. The Set Mappings window appears with a list of the available workflow definitions.

For more information, see "Set Mappings" in Chapter 25 of *SAS Decision Manager: User's Guide*.

Configuring Alert Notifications for SAS Workflow

To enable workflow participants to receive alert notifications from SAS Workflow, you must configure the `E-mail` notification type in SAS Management Console. After you have configured the alert notifications, you can then use the Notify Participant policy and other workflow notification policies for workflow tasks in SAS Workflow Studio. The notifications setting in SAS Management Console is a global setting. Preferences and notifications can also be configured for individual users.

The Send Notification By Data Object policy in SAS Workflow Studio integrates with the SAS Web Infrastructure Platform's Notification Service. Recipients are notified according to their preferences (e-mail or portlets).

1. Log on to SAS Management Console as an administrator.

2. On the **Plug-ins** tab, navigate to **Application Management** ⇨ **Configuration Manager** ⇨ **SAS Application Infrastructure**.

3. Right-click **SAS Application Infrastructure** and select **Properties**.

4. Click the **Settings** tab.

5. Select **Notifications** in the left panel. Use the menus or text fields to set the property.

6. Select the `E-mail` notification type.

7. Click **OK**.

8. To apply this setting and make it available, restart the SAS Web Infrastructure Platform Services, SAS Shared Services, and applications using SAS Workflow.

For more information about the notification properties, see "Setting Global Properties for SAS Applications" in Chapter 7 of *SAS Intelligence Platform: Middle-Tier Administration Guide*. For more information about setting the notification policies for SAS Workflow, see the SAS Workflow Studio Help or *SAS Workflow Studio: User's Guide*.

Chapter 7
Creating and Configuring Publication Channels

Overview of Creating and Configuring Publication Channels

SAS Decision 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 Decision 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 Decision Manager publishing functionality.

Figure 7.1 *Configuring SAS Decision Manager to Enable Publishing Models*
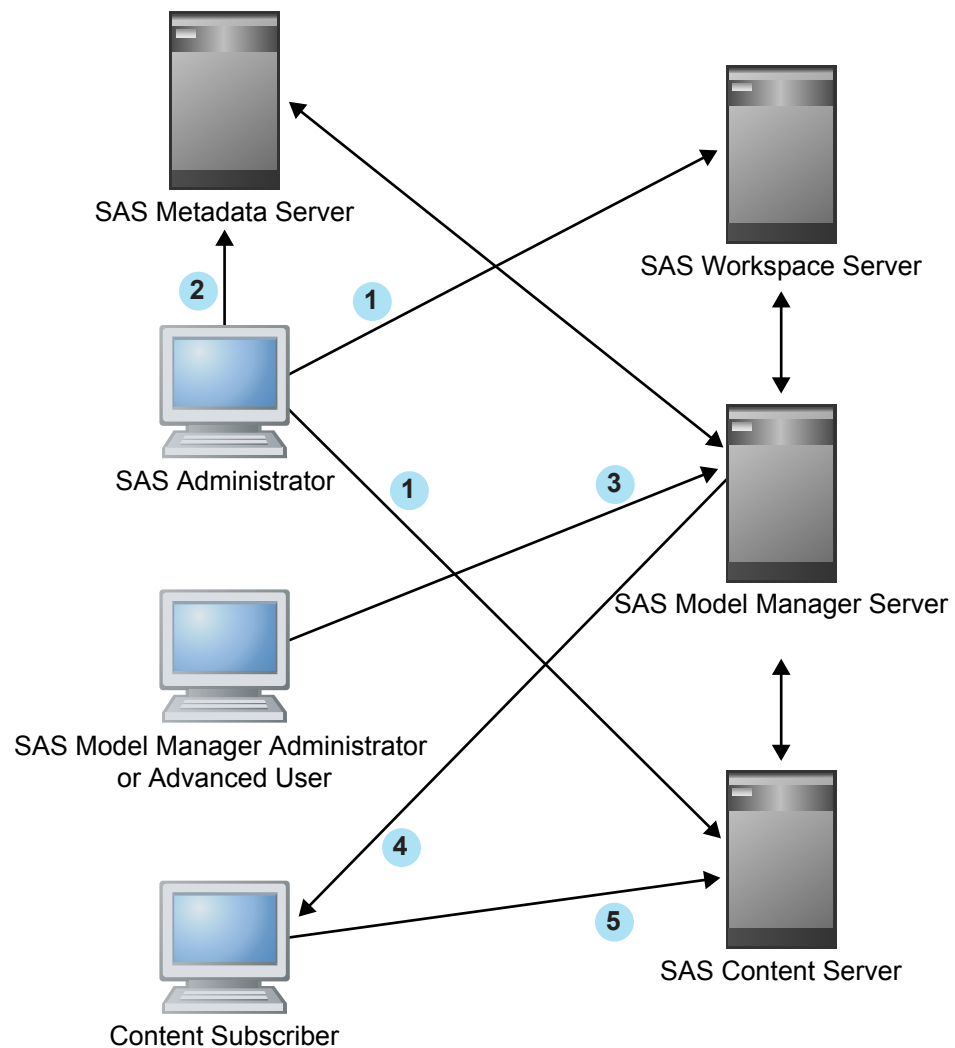
Here are the tasks.

1 The application administrator creates either an archive or a WebDAV persistent storage location for channels that is accessible from the SAS Workspace Server.

2 The application administrator creates users, HTTP servers, content subscribers, and channels using SAS Management Console.

3 The application administrator or an advanced user publishes models using SAS Decision Manager.

4 The content subscriber (for example, Scoring personnel) receives an e-mail notification from the 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 Decision Manager publishing configuration options.

It is recommended that at first you use channels that have the 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. For example, during the installation of SAS Decision Manager, a channel called

MMChannel is created that has a persistent store Archive File type. For more information, see "Create a New Channel" on page 70.

Define an HTTP or HTTPS Server

The SAS Decision Manager installation process by default defines a SAS Web Server and a 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 Decision 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:

1. Start SAS Management Console. Open your existing connection profile for your server. If your connection profile is not available in the list, see SAS Management Console Help.

2. From the **Plug-ins** tab, right-click **Server Manager**, and then select **New Server**.

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 a base path or paths on your server.

    Note: If you have not defined the base path for your HTTP server, see "Define Publish Locations for the SAS Content Server" on page 66.

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**.

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**. Your new server is displayed under the **Server Manager** node in the SAS Management Console Navigation Tree.

- SAS Management Console Help
- *SAS Intelligence Platform: Middle-Tier Administration Guide*

Define Publish Locations for the SAS Content Server

During the SAS Decision 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 publishing location for the WebDAV folder or to 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 Decision Manager, then you must define a publishing location. For more information, see "Define an HTTP or HTTPS Server" on page 65.

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

T I P   The best practice is to add folders to metadata using SAS Management Console.

To define a new publishing location:

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 for the SAS Web Application Server is 80.

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

Item name	Primary type	Date created	Date modified	Delete	Permissions
ModelManager	nt:davcollection	2013-06-17T09:09:21.099-04:00	2013-06-17T09:09:21.157-04:00	☐	▤
sascontent	nt:davcollection	2013-06-17T08:03:18.902-04:00	none	☐	▤
sasdav	nt:davcollection	2013-06-17T08:03:18.887-04:00	none	☐	▤
sasfolders	nt:davcollection	2013-06-17T08:03:18.902-04:00	none	☐	▤

SCS Admin Console — sasadm@saspw | Logout

Add folder

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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:

   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 *SAS 9.4 Intelligence Platform: Web Application Administration Guide*.

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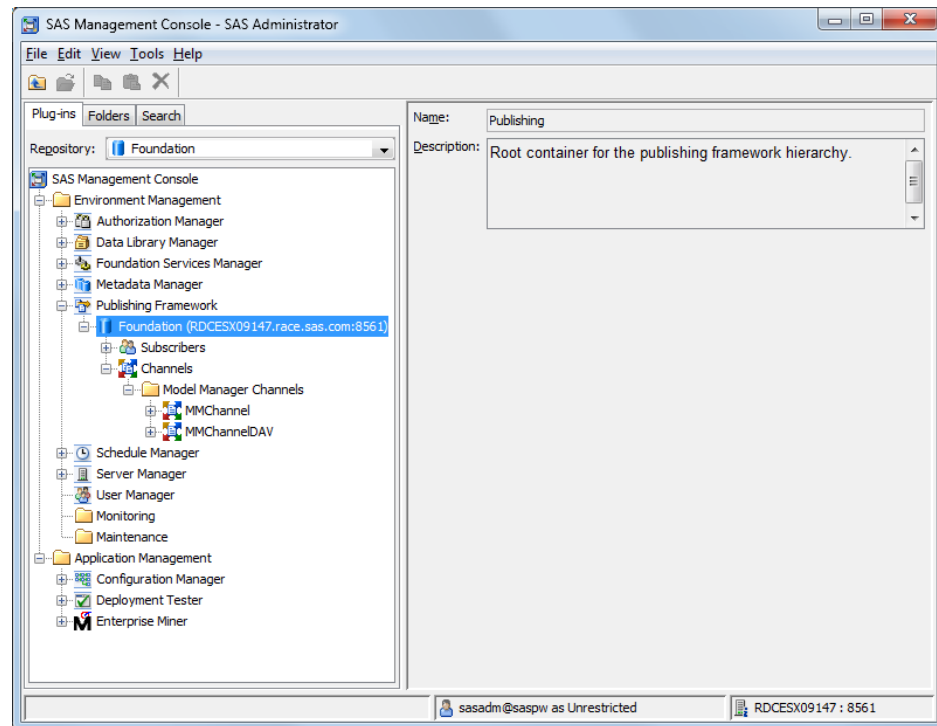
The SAS Metadata Server (for example, **Foundation**) that is shown under the Publishing Framework plug-in contains the **Subscribers** folder and the **Channels** folder.

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 9.4 Publishing Framework: Developer's Guide*.

Channel to Subscriber Configuration

There are several ways to configure channels to publish your models to the 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.

   T I P   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 Decision 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.
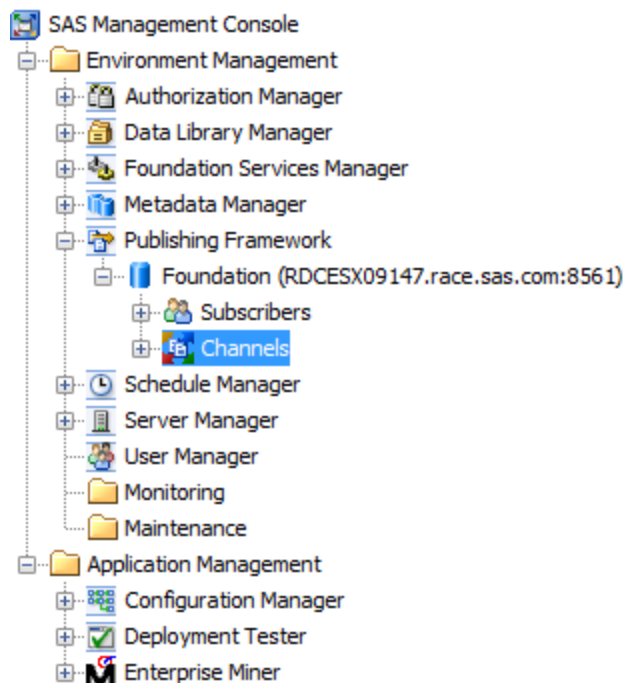
Create a Channel Folder

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 deleting and re-creating channels.

To create channel folders:

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**.

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:

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**.

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

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

7. Select **Archive**.

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

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

   Note: Two other types, HTTP and FTP, are available for you to 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 *SAS 9.4 Publishing Framework: Developer's Guide*.

Create a New Subscriber

SAS Decision 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 Decision 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**.
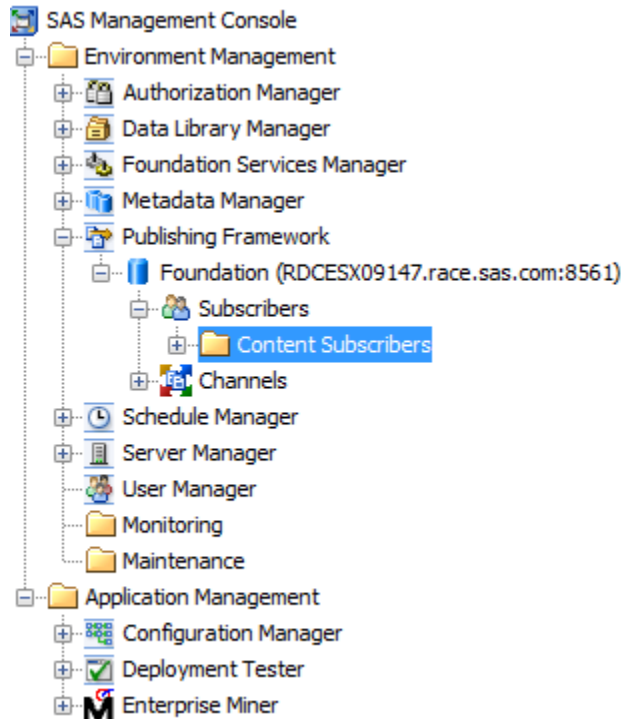
4. Right-click **Content Subscribers** and select **New Content Subscriber**.

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, click 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 *SAS 9.4 Publishing Framework: Developer's Guide*.

Modify an Existing Channel or Channels Node Location

Modify the Directory Location for the Channels Node

To change the location of the application channels directory:

1. From SAS Management Console, expand the **Application Management** node on the **Plug-ins** tab.

2. Select and expand **Configuration Manager** ⇨ **SAS Application Infrastructure** ⇨ **Model Manager JavaSvcs 13.1**.

3. Right-click **Model Manager JavaSvcs 13.1** and select **Properties**.

4. Click the **Advanced** tab to modify the application channels directory. Change the property value for **App.ChannelDir** to a directory that is accessible by the SAS Workspace Server.

5. Click **OK**.

Modify the Persistent Store Directory Location for a Channel

To modify the location of the persistent store directory path for a channel:

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 modifying a channel within a folder, select the **Channels** node and navigate to the desired folder.

4. Right-click the name of the channel that you want to modify, and then select **Properties**.

5. Click the **Persistent Store** tab, and modify the archive file path and server location.

6. Click **OK**.

See Also

SAS Management Console Help

Part 2

Macro Reference

Import And Export Macros

Introduction to the Import and Export Macros

SAS Decision Manager provides the following macros for importing data into the rules database and exporting data from the rules database. These macros must be run on the server tier.

%BRM_CREATE_TEMP_TERM
    reads a CSV file or a SAS data set and produces a SAS data set named WORK.TERM that can be used as input to the %BRM_LOAD_VOCABULARY macro.

%BRM_EXPORT_FOLDER
    exports definitions of business rules folders into a CSV file.

%BRM_EXPORT_LOOKUP
    exports the contents of lookup tables into a CSV file.

%BRM_EXPORT_RULE_FLOW
    exports rule flows from the rules database into a CSV file

%BRM_EXPORT_RULESET
    exports rule sets from the rules database into a CSV file

%BRM_EXPORT_VOCABULARY
    exports vocabularies from the rules database into a CSV file

%BRM_IMPORT_FOLDER
> imports the folder definitions that are in the specified CSV file into the rules database.

%BRM_IMPORT_LOOKUP
> imports lookup tables from the specified CSV file into the rules database.

%BRM_IMPORT_RULE_FLOW
> imports rule flows from a CSV file into the rules database

%BRM_IMPORT_RULESET
> imports rule sets from a CSV file into the rules database

%BRM_IMPORT_VOCABULARY
> imports vocabulary terms from a CSV file into the rules database

%BRM_LOAD_VOCABULARY
> loads the vocabulary terms into the WORK.TERM data set that was created by the %BRM_CREATE_TEMP_TERM macro.

Dictionary

%BRM_CREATE_TEMP_TERM

Reads a CSV file or a SAS data set and produces a SAS data set named WORK.TERM that can be used as input to the %BRM_LOAD_VOCABULARY macro.

Restriction: This macro must be run on the server tier.

Syntax

%BRM_CREATE_TEMP_TERM (DATAFILE=*input_file*<, BRM_USER=*user_ID*>);

Required Argument

DATAFILE=*input_file*
> specifies either a SAS data set name or the full pathname to a CSV file. If the input file is a CSV file, the first row of the file must contain valid SAS column names, and the remaining rows must contain column values. The column values can be numeric or character data only. You cannot specify SAS informats in the column data. The column names must be unique. For example, a simple CSV file that specifies two columns, both with numeric data, might look like the following:

```
patientID,BloodPressure
1,140
2,141
3,142
```

Optional Argument

BRM_USER=*user_ID*
> specifies the user ID that you want to be associated with the data that is imported. This user ID is associated with the imported objects in the rules database and is displayed in the SAS Decision Manager interface.

Default User ID of the user that is running the macro

Details

This macro reads a CSV file or SAS data set that defines vocabulary terms and that creates a SAS data set named WORK.TERM. You can use the WORK.TERM data set as input to the %BRM_LOAD_VOCABULARY macro. The %BRM_LOAD_VOCABULARY macro loads the vocabulary terms into the rules database. See "%BRM_LOAD_VOCABULARY" on page 92 for more information.

The %BRM_CREATE_TEMP_TERM macro derives domain types and domain values for the vocabulary terms based on the data type of the term as described in Table 8.1.

Table 8.1 Domain Types and Values for Input Terms

Term Data Type	Derived Domain Type	Derived Domain Values
Character	Discrete	If there are ten or fewer distinct values in the input data, all of the values are included in the list of domain values. If there are greater than ten distinct values in the input data, individual values are not listed in the domain values.
Date	Continuous	No input values are included in the list of domain values.
Datetime	Continuous	No input values are included in the list of domain values.
Boolean	Boolean	True and False
Numeric	If there are ten or fewer distinct values in the input data, the domain type is Discrete. If there are greater than ten distinct values, the domain type is Continuous.	For Discrete domain types, all of the values in the input data are included in the list of domain values. For Continuous domain types, only the minimum and maximum values are included in the list of domain values.

%BRM_EXPORT_FOLDER

Exports definitions of business rules folders into a CSV file. You can modify the CSV file and use it as input to the %BRM_IMPORT_FOLDER macro.

Restriction: This macro must be run on the server tier.

Syntax

%BRM_EXPORT_FOLDER (CSV=*output_filename*.CSV<, FOLDER_PATH=*path_name*>);

Required Argument

CSV=*output_filename*
specifies the full pathname to the CSV file where you want to export the data.

Optional Argument

FOLDER_PATH=<*path_name***>**
specifies a business rules folder that you want to export. By default,
%BRM_EXPORT_FOLDER exports all folders. You do not need to specify the
FOLDER_PATH= option unless you want to export a specific folder.

Example   FOLDER_PATH=Loans/Retail/Applications

%BRM_EXPORT_LOOKUP

Exports the contents of lookup tables into a CSV file.

Restriction: This macro must be run on the server tier.

Syntax

%BRM_EXPORT_LOOKUP (CSV=*output_filename*.CSV<, FOLDER_PATH=*path-name*>
<, LOOKUP='*lookup_table_1*'<, '*lookup_table_2*'>...>);

Required Argument

CSV=*output_filename*
specifies the full pathname to the CSV file where you want to export the data.

Optional Arguments

FOLDER_PATH=*path_name*
specifies a business rules folder pathname in SAS Decision Manager that you want
to filter the output by. If you specify a folder pathname, then only the objects in that
path are exported.

Use a forward slash to separate folder names.

Example   FOLDER_PATH=Loans/Retail/Applications

LOOKUP=%STR('*lookup_table_1***'<, '***lookup_table_2***'>...)**
specifies the lookup tables that you want to export. Specify the names of the lookup
tables, enclosed in single quotation marks. Separate multiple names with commas.

By default, %BRM_EXPORT_LOOKUP exports all lookup tables. You do not need
to specify the LOOKUP= option unless you want to export specific tables.

Tip   You can filter the lookup tables that are exported by specifying the
FOLDER_PATH= option.

Example   lookup=%str('BadVINSTates','StateCodes')

%BRM_EXPORT_RULE_FLOW

Exports rule flows into a CSV file.

Restriction: This macro must be run on the server tier.

Syntax

%BRM_EXPORT_RULE_FLOW (
RULEFLOWS=ALL | %STR(*rule_flow_1<,rule_flow_2>...*),
CSV=*output_filename*.CSV<, FOLDER_PATH=*path_name*>);

Required Arguments

CSV=*output_filename*
  specifies the full pathname to the CSV file where you want to export the data.

RULEFLOWS=ALL | %STR(*rule_flow_1<, rule_flow_2>...*)
  specifies the rule flows that you want to export. Specify ALL to export all rule flows. To export only selected rule flows, specify the identification numbers of the rule flows enclosed in quotation marks. Separate multiple identification numbers with commas.

  Tip   You can filter the rule flows that are exported by specifying the FOLDER_PATH= option.

  Example `ruleflows=%str(10168,10043)`

Optional Argument

FOLDER_PATH=*path_name*
  specifies a business rules folder pathname in SAS Decision Manager that you want to filter the output by. If you specify a folder pathname, then only the objects in that path are exported. For example, if you specify RULEFLOWS=ALL and FOLDER_PATH=RetailLoans, then only the rule flows in the folder RetailLoans are exported. If you specify RULEFLOWS=%STR(10045,10572) and FOLDER_PATH=RetailLoans, but neither of the specified rule flows are in the RetailLoans folder, then no rule flows are exported.

  Use a forward slash to separate folder names.

  Example   FOLDER_PATH=Loans/Retail/Applications

%BRM_EXPORT_RULESET

Exports rule sets from the rules database into a CSV file.

Restriction: This macro must be run on the server tier.

Syntax

%BRM_EXPORT_RULESET (RULESETS=ALL | %STR(*rule_set_1*<, *rule_set_2*>...),
CSV=*output_filename*.CSV)<, FOLDER_PATH=*path_name*)>);

Required Arguments

CSV=*output_filename*
>   specifies the full pathname to the CSV file where you want to export the data.

RULESETS=ALL | %STR(*rule_set_1*<, *rule_set_2*>...)
>   specifies the rule sets that you want to export. Specify ALL to export all rule sets. To
>   export only selected rule sets, specify the identification numbers of the rule sets
>   enclosed in quotation marks. Separate multiple identification numbers with commas.
>
> | Tip | You can filter the rule sets that are exported by specifying the FOLDER_PATH= option. |
> |---|---|
> | Example | `rulesets=%str(168,43)` |

Optional Argument

FOLDER_PATH=*path_name*
>   specifies a business rules folder pathname in SAS Decision Manager that you want
>   to filter the output by. If you specify a folder pathname, then only the objects in that
>   path are exported. For example, if you specify RULESETS=ALL and
>   FOLDER_PATH=RetailLoans, then only the rule sets in the folder RetailLoans are
>   exported. If you specify RULESETS=%STR(10045,10572) and
>   FOLDER_PATH=RetailLoans, but neither of the specified rule sets are in the
>   RetailLoans folder, then no rule sets are exported.
>
>   Use a forward slash to separate folder names.
>
> | Example | FOLDER_PATH=Loans/Retail/Applications |
> |---|---|

%BRM_EXPORT_VOCABULARY

Exports vocabularies from the rules database into a CSV file.

>   **Restriction:** This macro must be run on the server tier.

Syntax

%BRM_EXPORT_VOCABULARY (
VOCAB=ALL| %STR('*vocabulary_1*'<, '*vocabulary_2*'>...),
CSV=*output_filename*.CSV)<, FOLDER_PATH=*path_name*>);

Required Arguments

CSV=*output_filename*
>   specifies the full pathname to the CSV file where you want to export the data.

VOCAB=ALL | %STR('*vocabulary_1*'<, '*vocabulary_2*'>...)
>   specifies vocabularies that you want to export. Specify ALL to export all
>   vocabularies. To export only selected vocabularies, specify the names of the

vocabularies enclosed in quotation marks. Separate multiple identification numbers with commas.

Tip	You can filter the vocabularies that are exported by specifying the FOLDER_PATH= option.

Example	`vocab=%str('LRAutoVocab','AcmeAuto')`

Optional Argument

FOLDER_PATH=*path_name*
specifies a business rules folder pathname in SAS Decision Manager that you want to filter the output by. If you specify a folder pathname, then only the objects in that path are exported. For example, if you specify VOCAB=ALL and FOLDER_PATH=RetailLoans, then only the vocabularies in the folder RetailLoans are exported. If you specify VOCAB=%STR('loanVocab','riskVocabulary') and FOLDER_PATH=RetailLoans, but neither of the specified vocabularies are in the RetailLoans folder, then no vocabularies are exported.

Use a forward slash to separate folder names.

Example	FOLDER_PATH=Loans/Retail/Applications

%BRM_IMPORT_FOLDER

Imports the folder definitions that are in the specified CSV file into the rules database.

Restrictions:	This macro must be run on the server tier.
	The same user can run any of import macros at the same time. However, different users cannot run the same import macro simultaneously.

Syntax

%BRM_IMPORT_FOLDER (CSV=*input_filename*.CSV, REJECT=*reject_filename*.CSV<, BRM_USER=*user_ID*>);

Required Arguments

CSV=*input_filename*
specifies the full pathname to the CSV file where you want to import the data from.

REJECT=*reject_filename*
specifies the full pathname to the CSV file where you want the macro to write any records that were not imported to the rules database. See "Using the %BRM_IMPORT_FOLDER Macro" on page 82 for more information.

Optional Argument

BRM_USER=*user_ID*
specifies the user ID that you want to be associated with the data that is imported. This user ID is associated with the imported objects in the rules database and is displayed in the SAS Decision Manager interface.

Default	User ID of the user that is running the macro

Details

Using the %BRM_IMPORT_FOLDER Macro

The %BRM_IMPORT_FOLDER macro enables you to create new folders. You cannot update the content in existing folders with this macro. The macro uses the pathname to determine whether a folder already exists. If the pathname already exists, then the folder is rejected.

The %BRM_IMPORT_FOLDER macro runs several validation checks as it imports the folders. For example, it checks whether each folder path begins with a top-level folder and verifies that individual folder names are not longer than 100 characters. If the macro finds an invalid folder definition in the CSV file, it writes a message to the SAS log, and the folder is rejected. The macro writes the input records for the rejected folder to the CSV file that was specified in the REJECT= option.

Format of the Folder CSV Input File

Each row of the CSV input file identifies a folder. The CSV file must contain all of the columns listed in the following table, in the order listed. You must specify values for all columns, except as noted in the following table. To create a blank column in the CSV file, specify two comma separators without any content between them. For example, to import data to a folder named Applications and to specify a blank column for the folder description and default folder flag, specify the following in the CSV file:

```
Applications,,Y,,Loans/Retail
```

Table 8.2 *Format of the Folder CSV Input File*

Column	Description	Can Column Be Blank
FOLDER_NM	The name of the folder where you want to import the contents of the CSV file.	No
FOLDER_DESC	The description of the folder.	Yes
TOP_LEVEL_FOLDER_FLG	Specifies whether the folder is a top-level folder. Specify **Y** or **N**.	No
DEFAULT_FOLDER_FLG	Specifies whether the folder is the default folder. Specify **Y** or **N**.	Yes
FOLDER_PATH	The pathname to the business rules folder where you want to import the contents of the CSV file. This path must exist. Separate folder names with forward slashes.	No

%BRM_IMPORT_LOOKUP

Imports lookup tables from the specified CSV file into the rules database.

Restrictions: This macro must be run on the server tier.

The same user can run any of import macros at the same time. However, different users cannot run the same import macro simultaneously.

Syntax

%BRM_IMPORT_LOOKUP (CSV=*input_filename*.CSV,
REJECT=*reject_filename*.CSV<, *options*>);

Required Arguments

CSV=*input_filename*
   specifies the full pathname to the CSV file where you want to import the data from.

REJECT=*reject_filename*
   specifies the full pathname to the CSV file where you want the macro to write any records that were not imported to the rules database. See "Using the %BRM_IMPORT_LOOKUP Macro" on page 83 for more information.

Optional Arguments

BRM_USER=*user_ID*
   specifies the user ID that you want to be associated with the data that is imported. This user ID is associated with the imported objects in the rules database and is displayed in the SAS Decision Manager interface.

   Default   User ID of the user that is running the macro

BYPASSLOCK=Y|N
   enables you to override the lock that another user has on the importing process. See "Using the %BRM_IMPORT_LOOKUP Macro" on page 83 for more information.

   Default   N

Details

Using the %BRM_IMPORT_LOOKUP Macro

The %BRM_IMPORT_LOOKUP macro enables you to do the following tasks:

- add new lookup tables

- add new key-value pairs to existing lookup tables

- update (refresh) existing key-value pairs in existing lookup tables

The macro uses the lookup table name and path to determine whether a lookup table already exists. If the lookup table already exists, then it is updated. If the path exists but the lookup table does not exist, the lookup table is created. If the path does not exist, then the lookup table is rejected.

The %BRM_IMPORT_LOOKUP macro runs several validation checks as it imports the lookup tables. For example, the macro checks whether the LOOKUP_NM or NAME columns in the input file are empty or whether the LOOKUP_NM column specifies an invalid lookup name. All valid key-value pairs are imported. If the macro finds an invalid key-value pair in the CSV file, it writes a message to the SAS log, and the key-value pair is rejected. The macro writes the input records for the rejected key-value pairs to the CSV file that was specified in the REJECT= option.

When you run the %BRM_IMPORT_LOOKUP macro, it creates a lock table in the rules database named lock_import_lookup table. The SAS log states which user holds the lock and the time at which the lock started. This lock might remain in place after the macro has finished. If this happens, you can override the lock by specifying the BYPASSLOCK=Y option when you run the macro.

Format of the Lookup CSV Input File

Each row of the CSV input file identifies a key-value pair and the lookup table in which it belongs. The CSV file must contain all of the columns listed in the following table, in the order listed. You must specify values for all columns, except as noted in the table. To create a blank column in the CSV file, specify two comma separators without any content between them. For example, to import the key **AU** and the value **Australia** into the lookup table **Country_Codes** and to specify a blank column for the description, specify the following in the CSV file:

```
Country_Codes,,AU,Australia,Loans/Retail
```

Table 8.3   *Format of the Lookup CSV Input File*

Column	Description	Can Column Be Blank
FOLDER_PATH	The pathname to the business rules folder where you want to import the lookup table. This path must exist. Separate folder names with forward slashes.	No
LOOKUP_NM	The name of the lookup table.	No
DESCRIPTION	The description of the lookup table.	Yes
NAME	The lookup key.	No
VALUE	The lookup value.	Yes

%BRM_IMPORT_RULE_FLOW

Imports rule flows from the specified CSV file into the rules database.

Restrictions: This macro must be run on the server tier.

The same user can run any of import macros at the same time. However, multiple users cannot run the same import macro simultaneously.

Syntax

%BRM_IMPORT_RULE_FLOW(CSV=*input_filename*.CSV, REJECT=*reject_filename*.CSV*<, options>*);

Required Arguments

CSV=*input_filename*
specifies the full pathname to the CSV file where you want to import the data from. For more information, see "Format of the Rule Flow CSV Input File" on page 85.

REJECT=*reject_filename*
specifies the full pathname to the CSV file where you want the macro to write any records that were not imported to the rules database. See "Using the %BRM_IMPORT_RULE_FLOW Macro" on page 85 for more information.

Optional Arguments

BRM_USER=*user_ID*

> specifies the user ID that you want to be associated with the data that is imported. This user ID is associated with the imported objects in the rules database and is displayed in the SAS Decision Manager interface.

> **Default**   User ID of the user that is running the macro

BYPASSLOCK=Y|N

> enables you to override the lock that another user has on the importing process. See "Using the %BRM_IMPORT_RULE_FLOW Macro" on page 85 for more information.

> **Default**   N

Details

Using the %BRM_IMPORT_RULE_FLOW Macro

The %BRM_IMPORT_RULE_FLOW macro enables you to add new rule flows and to update existing rule flows. The macro uses the rule flow name and rule flow path to determine whether a rule flow already exists. If the rule flow path and name already exist, then the rule flow is updated. If the rule flow path exists but the rule flow name does not exist, the rule flow is created. If the rule flow path does not exist, then the rule flow is rejected.

The %BRM_IMPORT_RULE_FLOW macro runs several validation checks as it imports the rule flows. For example, it checks whether a rule set is referenced in a given rule flow more than once and whether section codes are correct. If the macro finds a validation error in a rule flow, it writes a message to the SAS log, and the rule flow is rejected. The macro writes the input records for the rejected rule flow to the CSV file that was specified in the REJECT= option.

When you run the %BRM_IMPORT_RULE_FLOW macro, it creates a lock table in the rules database named lock_import_rule_flow. The SAS log states which user holds the lock and the time at which the lock started. This lock might remain in place after the macro has finished. If this happens, you can override the lock by specifying the BYPASSLOCK=Y option when you run the macro.

Format of the Rule Flow CSV Input File

Each row of the CSV input file identifies a rule set and a rule flow, and each row provides the information about how that rule set fits into the rule flow. The CSV file must contain all of the columns that are listed in the following table, in the order listed. You must specify values for all columns, except as noted in the table. To create a blank column in the CSV file, specify two comma separators without any content between them. For example, to add a rule set to the main section of the rule flow named assignRisk and to specify a blank column for the rule flow description, specify the following in the CSV file:

```
assignRisk,,main
```

Table 8.4 *Format of the Rule Flow CSV Input File*

Column	Description	Can Column Be Blank
RULE_FLOW_SK	The identification number of the rule flow.	Yes
RULE_FLOW_NM	The name of the rule flow where you want to add the rule set that is specified in RULE_SET_NM.	No
RULE_FLOW_SHORT_DESC	The description of the rule flow.	Yes
RULE_FIRED_OUTPUT_FLG	Specifies whether to create output only for records that fire rules. Specify **Y** or **N**. For some types of applications, only the output records for which at least one rule has fired are of interest. Limiting output is useful for applications that detect outliers, such as applications that detect fraud.	No
RULE_SET_SECTION_CODE	The section of the rule flow to which the rule set that is specified in RULE_SET_NM belongs. Specify **init**, **groupstart**, **main**, **groupend**, or **final**. The codes **groupstart** and **groupend** are valid only if you also specify at least one term for BY_TERM. See "Simple Rule Flows, Complex Rule Flows, and BY Groups" in Chapter 9 of *SAS Decision Manager: User's Guide* for more information.	No
INCLUDE_NODE_OBJECT_FLG	Specifies whether the rule set specified in the RULE_SET_NM field is run when the rule flow executes. Specify **Y** or **N**. Selectively running certain rule sets is useful during rule flow development and testing.	No
RULE_FLOW_PATH	The pathname to the business rules folder for the rule flow. This path must exist. Separate folder names with forward slashes.	No
RULE_SET_NM	The name of the rule set to be added to the rule flow. A rule set can be added to the same rule flow only once.	No
RULE_SET_PATH	The pathname to the business rules folder to the rule set that is specified by RULE_SET_NM. The rule set must exist at the specified location. Separate folder names with forward slashes.	No
VOCAB_NM	The name of the vocabulary that the rule set uses. All rule sets in the same rule flow must use the same vocabulary.	No
BY_TERM	The list of BY-group terms that the rule set uses. Separate multiple BY-group terms with commas. The BY-group terms must be the same for all rule sets that are in the same rule flow. All of the BY-group terms must belong to the same vocabulary. See "Simple Rule Flows, Complex Rule Flows, and BY Groups" in Chapter 9 of *SAS Decision Manager: User's Guide* for more information.	Yes

Column	Description	Can Column Be Blank
ORDER	The order number for the rule set that is in the rule flow. Order numbers must start with 1 and be continuous through the entire rule flow. Do not restart order numbers at section boundaries.	No

%BRM_IMPORT_RULESET

Imports rule sets from the specified CSV file into the rules database.

Restrictions: This macro must be run on the server tier.

The same user can run any of import macros at the same time. However, multiple users cannot run the same import macro simultaneously.

Syntax

%BRM_IMPORT_RULESET (CSV=*input_filename*.CSV, REJECT=*reject_filename*.CSV*<, options>*);

Required Arguments

CSV=*input_filename*
  specifies the full pathname to the CSV file where you want to import the data from. For more information, see "Format of Rule Set CSV Input File" on page 88.

REJECT=*reject_filename*
  specifies the full pathname to the CSV file where you want the macro to write any records that were not imported to the rules database. See "Using the %BRM_IMPORT_RULESET Macro" on page 88 for more information.

Optional Arguments

BRM_USER=*user_ID*
  specifies the user ID that you want to be associated with the data that is imported. This user ID is associated with the imported objects in the rules database and is displayed in the SAS Decision Manager interface.

  Default User ID of the user that is running the macro

BYPASSLOCK=Y|N
  enables you to override the lock that another user has on the importing process. See "Using the %BRM_IMPORT_RULESET Macro" on page 88 for more information.

  Default N

Details

Using the %BRM_IMPORT_RULESET Macro

The %BRM_IMPORT_RULESET macro enables you to add new rule sets and to update existing rule sets. The macro uses the rule set name and rule set path to determine whether a rule set already exists. If the rule set path and name already exist, then the rule set is updated. If the rule set path exists but the rule set name does not exist, the rule set is created. If the rule set path does not exist, then the rule set is rejected.

The %BRM_IMPORT_RULESET macro runs several validation checks as it imports the rule sets. For example, it verifies that the expressions are valid, ensures that the first rule in each rule set uses the IF operator, and verifies that the specified vocabularies exist. If the macro finds a validation error in a rule set, it writes a message to the SAS log, and the rule set is rejected. The macro writes the input records for the rejected rule set and the reason that the record was rejected to the CSV file that was specified in the REJECT= option.

When you run the %BRM_IMPORT_RULESET macro, it creates a lock table in the rules database named lock_import_rule_set. The SAS log states which user holds the lock and the time at which the lock started. This lock might remain in place after the macro has finished. If this happens, you can override the lock by specifying the BYPASSLOCK=Y option when you run the macro.

Format of Rule Set CSV Input File

Each row of the CSV input file specifies a rule, rule set, term, and an expression for that term. The row also specifies whether the expression is a condition expression or an action expression. Each row of the input file can specify only one condition expression or one action expression for a given rule. The CSV file must contain all of the columns that are listed in the following table, in the order listed. You must specify values for all columns, except as noted in the table. To create a blank column in the CSV file, specify two comma separators without any content between them. For example, to add a rule to the rule set named assignRisk that uses the loanVocab vocabulary and to specify a blank column for the rule set description, specify the following in the CSV file:

```
assignRisk,,loanVocab
```

Table 8.5 *Format of the Rule Set CSV Input File*

Column	Description	Can Column Be Blank
RULE_SET_SK	The identification number of the rule set.	Yes
RULE_SET_NM	The name of the rule set where you want to add the rule that is specified in RULE_NM.	No
RULE_SET_DESC	The description of the rule set.	Yes
VOCAB_NM	The name of the vocabulary that the rule set uses. All rules in the same rule set must use the same vocabulary.	No
RULE_SET_PATH	The pathname to the business rules folder for the rule set. This path must exist. Separate folder names with forward slashes.	No

Column	Description	Can Column Be Blank
RULE_NM	The name of the rule to be added to the rule set.	No
RULE_DESC	The description of the rule.	Yes
RULE_SEQ_NO	The order number for the rule that is in the rule set. Order numbers in a rule set start with 1.	No
CONDITIONAL_NM	The operator for the rule. Specify **if**, **elseif**, or **or**. The first rule in a rule set must use the **if** operator.For information about these operators, see "Controlling Which Conditions Are Evaluated" in Chapter 8 of *SAS Decision Manager: User's Guide*.	No
RECORD_RULE_ FIRED_FLG	Specifies whether a rule-fired record is created when the condition for the rule identified in the RULE_NM field evaluates to **True**. Specify **Y** or **N**. If you specify **N**, a rule-fired record is not created regardless of what the condition evaluates to.	No
LHS_TERM	The term for the expression specified in the EXPRESSION column. Terms that are specified in the LHS_TERM column are the terms that SAS Decision Manager displays at the top or left side of the decision table. These terms appear in the column headings of the decision table when you are viewing the decision table in the horizontal format. They appear in the row headings of the decision table when you are viewing the decision table in the vertical format.	No
EXPRESSION	A single condition or action expression for the term specified in the LHS_TERM column. This expression is the expression that you would enter into a cell in the decision table. See "Defining New Rules in the Rule Set" in Chapter 8 of *SAS Decision Manager: User's Guide* for more information about expressions.	Yes
EXPRESSION_ORDER	The order number of the rule's condition or action expressions. A rule's condition and action expressions are numbered beginning with 1. For example, a rule might have two condition expressions that are numbered 1 and 2, and it might have three action expressions that are numbered 1, 2, and 3.	No
EXPRESSION_TYPE	The type of expression. Specify **condition** or **action**.	No

%BRM_IMPORT_VOCABULARY

Imports vocabulary terms from the specified CSV file into the rules database.

Restrictions: This macro must be run on the server tier.

The same user can run any of import macros at the same time. However, the same import macro cannot be run simultaneously by different users.

Syntax

%BRM_IMPORT_VOCABULARY (CSV=*input_filename*.CSV,
REJECT=*reject_filename*.CSV<, *options*>);

Required Arguments

CSV=*input_filename*
specifies the full pathname to the CSV file where you want to import the data from. For more information, see "Format of the Vocabulary CSV Input File" on page 91.

REJECT=*reject_filename*
specifies the full pathname to the CSV file where you want the macro to write any records that were not imported to the rules database. See "Using the %BRM_IMPORT_VOCABULARY Macro" on page 90 for more information.

Optional Arguments

BRM_USER=*user_ID*
specifies the user ID that you want to be associated with the data that is imported. This user ID is associated with the imported objects in the rules database and is displayed in the SAS Decision Manager interface.

Default   User ID of the user that is running the macro

BYPASSLOCK=Y|N
enables you to override the lock that another user has on the importing process. See "Using the %BRM_IMPORT_VOCABULARY Macro" on page 90 for more information.

Default   N

Details

Using the %BRM_IMPORT_VOCABULARY Macro
The %BRM_IMPORT_VOCABULARY macro enables you to add new vocabulary terms. You cannot use the macro to update existing terms.

The %BRM_IMPORT_VOCABULARY macro runs several validation checks as it imports the vocabulary terms. For example, it verifies that term, entity, and vocabulary names are valid, and ensures that a term is not duplicated in a vocabulary. If the macro finds a validation error, it writes a message to the SAS log, and the term is rejected. The macro writes the input records for the rejected term to the CSV file that was specified in the REJECT= option.

When you run the %BRM_IMPORT_VOCABULARY macro, it creates a lock table in the rules database named lock_import_vocabulary. The SAS log states which user holds the lock and the time at which the lock started. It is possible for this lock to remain in place after the macro has finished. If this happens, you can override the lock by specifying the BYPASSLOCK=Y option when you run the macro.

Format of the Vocabulary CSV Input File

Each row of the CSV input file defines a term, including the term data type, domain type, and the entity and vocabulary that contains the term. The CSV file must contain all of the columns listed in the following table, in the order listed. You must specify values for all columns, except as noted in the table. To create a blank column in the CSV file, specify two comma separators without any content between them. For example, to add a term to the entity named Customer in the vocabulary named loanVocab and to specify a blank column for the vocabulary description, specify the following in the CSV file:

```
loanVocab,,Customer
```

Table 8.6 *Format of the Vocabulary CSV Input File*

Column	Description	Can Column Be Blank
VOCAB_NM	The name of the vocabulary where you want to add entity and term specified by VOCAB_ENTITY_NM and VOCAB_TERM_NM.	No
VOCAB_SHORT_ DESC	The description of the vocabulary.	Yes
VOCAB_ENTITY_NM	The name of the entity that the term in the VOCAB_TERM_NM column belongs to.	No
VOCAB_ENTITY_ SHORT_DESC	The description of the entity.	Yes
VOCAB_TERM_NM	The name of the term.	No
VOCAB_TERM_ SHORT_DESC	The description of the term.	Yes
VOCAB_TERM_DATA _TYPE_TXT	The data type of the term. Specify **Character**, **Decimal**, **Integer**, **Boolean**, **Date**, or **Datetime**.	No
VOCAB_TERM_ DOMAIN_TYPE_TXT	The domain type for the term. Specify **discrete**, **continuous**, or **Boolean**. A domain value is discrete if it is just an individual value such as **5.3** or **18JUL2012:10:25:00**. A domain value is continuous if it specifies a range such as **>5** or **<18JUL2012:10:25:00**. Terms that are assigned the data type **Character** can have discrete domain values only. Boolean terms can have Boolean domain values only.	No
VOCAB_TERM_ DOMAIN_TXT	The set of expected values for a term. Separate individual domain values with a semi-colon (;). See "Specify Domain Values" in Chapter 6 of *SAS Decision Manager: User's Guide* for more information.	Yes

Column	Description	Can Column Be Blank
VOCAB_TERM_ INPUT_EXCLUDE_ FLG	Specifies whether the term must be mapped to a column in an input data set. Specify **Y** or **N**.	No
VOCAB_TERM_ OUTPUT_EXCLUDE_ FLG	Specifies whether to exclude the term from the output data sets created by rule flows. Specify **Y** or **N**.	No
FOLDER_PATH	The pathname to the business rules folder for the rule flow. This path must exist. Separate folder names with forward slashes.	No

%BRM_LOAD_VOCABULARY

Loads the vocabulary terms in the WORK.TERM data set that was created by the %BRM_CREATE_TEMP_TERM macro.

Syntax

%BRM_LOAD_VOCABULARY (FOLDER_PATH=*path*,
VOCAB_NM=*vocabulary-name*,
VOCAB_ENTITY_NM=*entity-name<, options>*);

Required Arguments

FOLDER_PATH=*path-name*
    specifies the pathname to the business rules folder where you want to import the vocabulary terms. Separate folder names with forward slashes.

Requirement	The path must exist. If the path does not exist, the macro terminates and writes an error message to the SAS log.
Example	FOLDER_PATH=Loans/Retail/Applications

VOCAB_NM=*vocabulary-name*
    specifies the name of the vocabulary to which the terms in the WORK.TERM file will be added.

Requirement	The vocabulary must not exist. If it already exists, the macro terminates and writes an error message to the SAS log.

VOCAB_ENTITY_NM=*entity-name*
    specifies the name of the entity to which the terms in the WORK.TERM file will be added.

Requirement	This entity must not exist. If it already exists, the macro terminates and writes an error message to the SAS log.

Optional Arguments

BRM_USER=*user_ID*

> specifies the user ID that you want to be associated with the data that is imported. This user ID is associated with the imported objects in the rules database and is displayed in the SAS Decision Manager interface.

> **Default** User ID of the user that is running the macro

BYPASSLOCK=Y|N

> enables you to override the lock that another user has on the importing process.

> **Default** N

Details

When you run the %BRM_LOAD_VOCABULARY macro, it creates a lock table in the rules database named lock_import_vocabulary. The SAS log states which user holds the lock and the time at which the lock started. It is possible for this lock to remain in place after the macro has finished. If this happens, you can override the lock by specifying the BYPASSLOCK=Y option when you run the macro.

Chapter 9
Post-Migration Macros

Overview

After migrating a SAS deployment from one UNIX operating system to another, or from a Windows 32-bit server to a Windows 64-bit server, use the SAS Decision Manager post-migration macros. The macros ensure that all data, content, and link and filename references that are used by SAS Decision Manager are accessible by the new SAS 9.4 deployment. This section describes what action each macro performs and the syntax that is used by the macros. For more information, see "Operating System Migration" on page 39.

Dictionary

%MM_migrationStep1() Macro

%MM_migrationStep1 macro ports all catalogs and SAS data sets from the source server into .cpo and .dpo files, and then places them in a user-specified directory.

Requirement: You must run this macro if you are migrating from one UNIX system to a different type of UNIX system, or if you are migrating from a Windows 32-bit server to a Windows 64-bit server. SAS 9.4 does not support Windows 32-bit systems. This macro does not need to be run when migrating from SAS Decision Manager 2.2 to SAS Decision Manager 2.2 on a Windows 64-Bit server.

Syntax

%MM_migrationStep1(
Server = *mySourceServer*,
PortNumber = *port*,
ServiceRegistryURL=*SAS-service-registry-URL,*
User = *mmUser*,
Password = *mmPassword*,
TargetDir= *\\network\port*);

Required Arguments

Server
> specifies the server name or multicast address for the migration source server that hosts the model repository. This argument is ignored for a SAS Decision Manager 2.2 to 2.2 migration, which uses the ServiceRegistryURL argument.
>
> **Example**   Server=myserver.com

PortNumber
> specifies the port number for the migration source server that hosts the model repository.
>
> **Example**   PortNumber=*6411*

ServiceRegistryURL
> specifies the service registry URL. The host is the server name where the middle-tier is installed and the port is the port number of the SAS Web Application Server.

User
> specifies a valid SAS Decision Manager user to access migration source server.

Password
> specifies the password for the SAS Decision Manager user to access migration source server.

TargetDir
> specifies the directory of where all of the portable files will be saved.
>
> **Example**   TargetDir=\\network1\transfer

%MM_migrationStep2() Macro

%MM_migrationStep2 macro imports all of .cpo and .dpo files into the target server.

Requirement: You must run this macro if you are migrating from one UNIX system to a different type of UNIX system, or if you are migrating from a Windows 32-bit server to a Windows 64-bit server. SAS 9.4 does not support Windows 32-bit systems. This macro does not need to be run when migrating from SAS Decision Manager 2.2 to SAS Decision Manager 2.2 on a Windows 64-bit server.

Syntax

%MM_migrationStep2(ServiceRegistryURL=*service-registry-URL*,
User = *mmUser*,
Password = *mmPassword*,
SourceDir=*network**port*,
TargetDir= *myTargetDIR*);

Required Arguments

ServiceRegistryURL
    specifies the service registry URL. The host is the server name where the middle-tier
    is installed and the port is the port number of the SAS Web Application Server.

Restriction	This argument is valid only for SAS Decision Manager 2.2.
Example	`ServiceRegistryURL=` `nrstr(http://myServer:80/SASWIPClientAccess/remote/ServiceRegistry)`

User
    specifies a valid SAS Decision Manager user to access migration target server.

Password
    specifies the password for the SAS Decision Manager user to access migration target
    server.

SourceDir
    specifies the directory where all portable files are saved.

Example	`SourceDir=\\network\transfer`

TargetDir
    specifies the directory where the migration result table will be saved. Here is an
    example:

`TargetDir=\\network1\migration`

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