

# **SAS<sup>®</sup> 9.3 Intelligence Platform**

## **Desktop Application Administration Guide**



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# What's New in Desktop Application Administration for the SAS 9.3 Intelligence Platform

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## Overview

The *SAS Intelligence Platform: Desktop Application Administration Guide* contains new and updated administrative tasks that are associated with seven client applications.

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## Documentation Enhancements

For SAS 9.3, the *SAS Intelligence Platform: Desktop Application Administration Guide* contains enhancements for the following applications.

### **SAS Add-In for Microsoft Office**

The chapter for the SAS Add-In for Microsoft Office now addresses the following administrative topics:

- Migrate SAS content between releases, either automatically, or using a migration wizard. See [“Migrate SAS Content” on page 13](#).
- Maintain multiple versions of the SAS Add-in on a single host. You select the release that you want to run by selecting a utility. See [“Manage Multiple Instances On a Single Host” on page 17](#).
- Administer the use of SAS content in Outlook instant messages. See [“Administer Publishing by Instant Message” on page 15](#).
- Use a SAS grid for parallel processing. See [“Configure the SAS Add-In for Microsoft Office for Grid Computing” on page 18](#).
- Use capabilities to configure access to SAS comments, dashboards, and OLAP cubes in Outlook. See [“Administer SAS Functionality in Microsoft Outlook” on page 16](#).
- Set options to govern refresh rates for SAS functionality in Outlook. See [“Set Refresh Options for SAS Functionality in Outlook” on page 17](#).
- Roles and capabilities have been added and changed. See [“Default Roles and Capabilities for the SAS Add-In for Microsoft Office” on page 18](#).

### **SAS Enterprise Guide**

The chapter for SAS Enterprise Guide now addresses the following administrative topics:

- The SAS Enterprise Guide chapter now documents all of the administrative tasks that are performed with SAS Enterprise Guide Explorer. Included are all tasks that apply to the use of local repositories, when you are not using a SAS Metadata Server. This chapter now supersedes and replaces the document *Administering SAS Enterprise Guide*.
- Roles and capabilities have been added and changed. See “[Default Roles and Capabilities for SAS Enterprise Guide](#)” on page 73.

### ***SAS Data Integration Studio***

The SAS Data Integration Studio chapter now documents administrative tasks associated with the DataFlux Data Management Platform. The chapter now includes updates to the data quality configuration topics. See [Setting Up the SAS Data Quality Server Software on page 51](#).

### ***SAS Enterprise Miner***

The technical content in the SAS Enterprise Miner chapter is now provided in the document *SAS Enterprise Miner: Administration and Configuration*.

# Recommended Reading

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- *SAS Intelligence Platform: System Administration Guide*
- *SAS Intelligence Platform: Web Application Administration Guide*
- *SAS Intelligence Platform: Application Server Administration Guide*
- *SAS Intelligence Platform: Security Administration Guide*
- *SAS Intelligence Platform: Data Administration Guide*
- *SAS Intelligence Platform: Installation and Configuration Guide*
- *SAS Enterprise Miner: Administrator's Guide*
- *SAS Intelligence Platform: Overview*
- *SAS Data Integration Studio: User's Guide*
- *SAS OLAP Server: User's Guide*
- *Scheduling in SAS.*
- *Application Messaging with SAS*

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## Chapter 1

# Introduction to Desktop Application Administration

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## About the Desktop Applications

The SAS Intelligence Platform includes the following desktop applications:

### SAS Add-In for Microsoft Office

brings the power of SAS to Microsoft Excel, Word, and PowerPoint.

### SAS Data Integration Studio

enables enterprise data collection, analysis, reporting, and publishing using a graphical process designer and numerous data transformation templates.

### SAS Enterprise Guide

provides a point-and-click interface for data querying, reporting, analysis, and SAS programming.

### SAS Enterprise Miner

provides a point-and-click interface for creating predictive models that identify trends, opportunities, and threats based on the analysis of data from across your enterprise.

### SAS Information Map Studio

provides a point-and-click interface for the creation and maintenance of information maps. Information maps are metadata definitions of enterprise data that provide a basis for querying and reporting.

### SAS Management Console

provides the primary administrative interface for the SAS Intelligence Platform.

### SAS OLAP Cube Studio

provides a straightforward wizard interface for building, updating, and tuning SAS OLAP cubes.

Administrative information for client applications that run in a Web browser is provided in the *SAS Intelligence Platform: Web Application Administration Guide*, at <http://support.sas.com/documentation/onlinedoc/sas9doc.html>. The Web applications include SAS Web Report Studio, SAS Web OLAP Viewer, and the SAS Information Delivery Portal.

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## Installation Notes for Desktop Applications

You initially install desktop applications as part of your overall deployment plan, as described in the *SAS Intelligence Platform: Installation and Configuration Guide*.

After you install a desktop application, it is important for you to know that the configuration process might not end at that point. Check the chapter in this document for each desktop application to ensure that you complete the configuration process. You might need to configure libraries, update user permissions, or change memory allocations.

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## Accessibility Features in the SAS Desktop Clients

For information about accessibility for any of the products mentioned in this book, see the documentation for that product.

For assistive technologies based on Windows, you need to download the Java Access Bridge (JAB) from Sun Microsystems at this URL: <http://www.java.sun.com/products/accessbridge/>. The SAS Java applications that run on Windows are listed under “Clients” in the “Architecture of the SAS Intelligence Platform” chapter of the *SAS Intelligence Platform: Overview*.

After downloading the JAB, you need to customize the standard installation procedure to facilitate access to it. This setup assumes that Java is already installed on the machine. A known risk is that SAS applications can be corrupted by JAR files that might be installed in the `jre/lib/ext` directory. To solve this problem, SAS has implemented a custom class loader to replace the system class loader. The custom class loader loads only approved extensions that SAS configures based on the JRE the vendor provides. A consequence of hiding the existing directory is that it disables installed accessibility-related applications. To configure SAS Java applications to permit access to the Java Access Bridge:

1. On the client machine, locate all copies of the file `sas.java.ext.config`.
2. In each instance of the file, edit the file in a plain text editor, such as Microsoft Notepad.
3. Add the following two lines to the bottom of the file:

```
access-bridge.jar
jaccess-1_4.jar
```

Note: The filename of the `jaccess*.jar` file depends on the version of the JRE. Listed here is the filename for Version 1.4. If you are using a different version, your filename varies.

4. Save the changes and close the file.

*Note:* If your site runs desktop applications on remote hosts, assistive technologies, such as JAWS screen reader, might require additional licensing and configuration to be fully functional. This situation has been observed when applications are executed with Citrix software.

If you have questions or concerns about the accessibility of SAS products, send e-mail to [accessibility@sas.com](mailto:accessibility@sas.com).



## Chapter 2

# Common Elements

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## Overview

The common elements in the administration of desktop applications include logging and local files, heap (memory) management, connection profiles, and roles and capabilities. The common elements apply to the group of desktop applications that are unique to the SAS Intelligence Platform: SAS Management Console, SAS Data Integration Studio, SAS OLAP Cube Studio, and SAS Information Map Studio.

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## Migrating Desktop Applications

The desktop applications do not have an explicit migration path. You simply remove the previous version and install the new version in its place. When you start the desktop applications for the first time, the application makes whatever migrations are necessary.

**CAUTION:**

**Do not run the SAS Migration Utility on hosts that run desktop applications.**

For a description of application changes, refer to the What's New and Special Considerations documents.

---

## Administering Connection Profiles for Desktop Applications

### Overview of Connection Profiles

During initialization, SAS desktop applications use a connection profile to connect to a SAS Metadata Server. A successful connection enables secure access to the enterprise resources that are defined in metadata.

Connection profiles are stored on the hosts of the desktop applications at `C:\Documents and Settings\user-name\Application Data\SAS\MetadataServerProfiles`. In the Windows Vista operating environment, the path is `C:\Users\user-name\AppData\Roaming\SAS\MetadataServerProfiles`. The names of the profiles use the file extension `.swa`.

Selecting a different profile closes all server connections and terminates any active jobs.

Connections depend on the version of the SAS Metadata Server. Older desktop applications that were delivered with the SAS 9.1.3 connect only to the SAS 9.1.3 Metadata Server. Newer applications that were delivered with SAS 9.2 connect only to the SAS 9.2 Metadata Server.

Users can change, edit, or delete connection profiles at any time.

A successful connection to a metadata server is required to fully initialize the following desktop applications:

- SAS Data Integration Studio
- SAS Information Map Studio
- SAS Management Console
- SAS OLAP Cube Studio

The preceding applications use a common interface for connection profiles, as described in this section.

The following desktop applications do not require a connection to a SAS Metadata Server, and they use a different interface for connection profiles:

- SAS Enterprise Guide
- SAS Add-In for Microsoft Office
- SAS Enterprise Miner

Connection profile information for the preceding applications is provided in the chapters of this book that are dedicated to those applications.

### About Integrated Windows Authentication

Connection profiles enable users to specify that authentication be performed using Integrated Windows authentication. This type of authentication enables users to connect to SAS Metadata Servers and SAS Workspace Servers without transmitting a name and password over the network. The client and server transmit authentication tokens to a host, and that host confirms or denies the authentication.

Integrated Windows authentication applies only to servers that are installed on a Windows host. For more information about Integrated Windows authentication, see the *SAS Intelligence Platform: Security Administration Guide*.

### **About Default Connection Profiles**

At installation time, most of the desktop applications create a default connection profile. For all of these applications other than SAS Management Console, the default connection profile prompts users to authenticate using credentials from the operating environment. The resulting connection provides information that enables the assignment of permissions.

After you install a desktop application, users should be directed to create new connection profiles. The new profile implements the users, groups, and roles that are defined at your site.

### **Disable the Option to Store Credentials in Profiles**

When you create a connection profile, the Connection Profile Wizard provides, by default, a check box named **Save user ID and password in this profile**. If a user selects this check box, then the user's ID and password are stored in the user's connection profile on the local file system. Saving the ID and password in the profile allows users to reconnect in the future without entering these values again.

Follow these steps to remove the **Save user ID and password in this profile** check box from the Connection Profile Wizard and require the manual entry of credentials:

1. On the host of the SAS Metadata Server, open in a text editor the file `omacnfig.xml`.
2. Change the value of the option `SASSEC_LOCAL_PW_SAVE` from **1** (or **Y** or **T**) to **0** (or **N** or **F**).
3. Save and close the file.
4. Restart the SAS Metadata Server as directed in the *SAS Intelligence Platform: System Administration Guide*.

After you change the setting for this option and restart the metadata server, each client uses the previous setting for its first connection. The client then discovers the revised setting and conforms to that revised setting for subsequent connections.

If you change the setting to disallow saved credentials, and credentials are already present in a user's connection profile, those credentials must be manually removed.

### **Change, Create, Delete, or Edit a Connection Profile**

To create, change, delete, or edit a connection profile, follow these steps:

1. Open the desktop application. If you specified a connection profile previously, then the application uses that profile.
2. If directed to do so, enter your user ID and password.
3. Select **File** ⇒ **Connection Profile** and click **Yes** to display the Connection Profile window.
4. To change from the current profile to another profile, click the down arrow, select the other profile, and click **OK**.

5. To delete an existing profile, click **Delete** and **Yes**. Deletion removes all of the connection information in that profile. Select another profile to continue using the application.
6. To edit an existing connection profile, click the down arrow to select the profile, and then click **Edit** to open the Edit Connection Profile wizard. Add profile information as directed by the wizard, and then click **Finish**. In the Connection Profile window, click **OK** to connect to the specified SAS Metadata Server using the edited profile.
7. To create a new connection profile, click **Create a New Connection Profile** and click **OK** to display the Connection Profile Wizard. Add profile information as directed by the wizard, and then click **Finish**. In the Connection Profile window, click **OK** to connect to the specified SAS Metadata Server using the new profile.

---

## Administering Roles and Capabilities

When users are assigned to roles, they gain access to certain capabilities in certain applications. Roles are implemented in the following desktop applications:

SAS Management Console

See “[Administering Roles](#)” on page 98 .

SAS Enterprise Guide

See “[Default Roles and Capabilities for SAS Enterprise Guide](#)” on page 73 .

SAS Add-In for Microsoft Office

See “[Default Roles and Capabilities for the SAS Add-In for Microsoft Office](#)” on page 18 .

Roles and capabilities are also implemented in SAS Web Report Studio, as described in the *SAS Intelligence Platform: Web Application Administration Guide*.

Roles are added, deleted, and changed in the User Manager in SAS Management Console.

For more information about roles and capabilities, see the *SAS Intelligence Platform: Security Administration Guide*.

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## Administering Logs and Other Local Files

### **Default Directories**

The desktop applications maintain local files on the C: drives of their respective hosts. Local files contain information that is specific to users.

By default, in the Windows operating environment, local files are stored in the **Documents and Settings** directory.

Windows path to local files:**C:\Documents and Settings\user-name  
\Application Data\SAS\application-name**

Connection profiles:**C:\Documents and Settings\user-name\Application  
Data\SAS\MetadataServerProfiles**



Log files: `C:\Documents and Settings\user-name\Application Data\SAS\Logs`

The Windows Vista operating environment uses the following path: `C:\Users\user-name\AppData\Roaming\SAS\`

## About the Desktop Application Log Files

The **Logs** directory contains the following log files for the following desktop applications: SAS Management Console, SAS Data Integration Studio, SAS OLAP Cube Studio, and SAS Information Map Studio.

**Table 2.1** Log Files Created by Desktop Applications

Action	Source	Filename
Import package	SAS Import Package Wizard	Import_yyMMddHHmmss.log
Export package	SAS Export Package Wizard	Export_yyMMddHHmmss.log
Batch import	Import Package Tool	Import_yyMMddHHmmss.log
Batch export	Export Package Tool	Export_yyMMddHHmmss.log
Copy, paste, and paste special	<b>Edit</b> menu	CopyPaste.log

For information about importing and exporting, see the chapter “Creating, Registering, Moving, Copying, Renaming, and Deleting SAS Metadata Repositories” in the *SAS Intelligence Platform: System Administration Guide*. For information about logging, see the chapter “System Monitoring and Logging” in the *SAS Intelligence Platform: System Administration Guide*.

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## Managing the Java Heap Used By Desktop Applications

The Java heap is a segment of host memory that certain desktop applications use to manage their graphical user interface. The size of the Java heap is 512 megabytes for SAS Management Console, SAS Data Integration Studio, and SAS OLAP Cube Studio. SAS Information Map Studio dynamically allocates heap memory, using a minimum of 500 megabytes and a maximum of 1024 megabytes.

Follow these steps if you need to increase the size of the Java heap for one of the preceding desktop applications:

1. Open the application's INI file using the path **SAS-installation-directory\SAS\application-name\release-number**. Note that your site might use a different installation directory for SAS.
2. Increase the default value **Xmx512m** to something higher, such as **Xmx1024m**.
3. Save and close the INI file.
4. Restart the desktop application.

If your desktop applications run in the Citrix application delivery environment, then you can increase the size of your Java heap to the Citrix limit. Although some versions of Citrix support higher limits, all versions support a maximum Java heap size of 512 megabytes.

## Chapter 3

# Administering the SAS Add-In for Microsoft Office

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## SAS Add-In for Microsoft Office Overview

The SAS Add-In for Microsoft Office is a Component Object Model (COM) add-in. It extends Microsoft Office to use the power of SAS data access, analysis, and reporting directly from Microsoft Outlook, Excel, Word, and PowerPoint. To see the power of SAS in these applications, open the **SAS** tab or menu.

The SAS Add-In 4.3 and 4.305 for Microsoft Office supports the following products:

- Microsoft Excel, Word, and PowerPoint 2003, 2007, and 2010
- Microsoft Outlook 2007 and 2010

The SAS Add-In 5.1 for Microsoft Office supports the following products:

- Microsoft Excel, Word, and PowerPoint 2007 and 2010
- Microsoft Outlook 2007 and 2010

After you install the SAS Add-In for Microsoft Office, certain administrative tasks need to be completed. The administrative tasks are summarized in the following table.

**Table 3.1** Administrative Tasks for SAS Add-In for Microsoft Office

Administrative Task	Purpose of Task
Administer a connection profile	Add, modify, or delete a profile. Set the active profile.
Select a default server	Specify which server you want to access by default.
Administer profile configuration updates	Create a configuration update file that can be modified and used each time the Microsoft applications are initialized.
Administer files	Specify the location of the add-in administration files.
Administer roles	Limit access to certain features for certain users.
Grant library access	Administer access to registered libraries.

For additional information about using the SAS Add-In for Microsoft Office, right-click the **SAS** tab or menu in the Microsoft software and select **Help**. See also the product Web page: <http://support.sas.com/software/products/addin/index.html>.

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## Files Created by the SAS Add-In for Microsoft Office

By default, the SAS Add-In for Microsoft Office generates various files, including configuration files and log files. On Windows 7, these files are located, by default, in `C:\Users\user-ID\AppData\Roaming\SAS\Add-InForMicrosoftOffice\version`. On Windows XP, the files are located in `C:\Documents and Settings\user-ID\Application Data\SAS\Add-InForMicrosoftOffice\version`. A path that applies to all supported versions of Windows is `%APPDATA%\SAS\Add-InForMicrosoftOffice\version`.

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## Migrate SAS Content

In the SAS Add-In 5.1 for Microsoft Office, you can open documents that contain SAS content that was generated with prior releases 2.1, 4.2, or 4.3.

For documents that were generated with the 2.1 release of the SAS add-in, refreshing the SAS content changes that content to the 5.1 format. Thereafter, the SAS content cannot be refreshed in the 2.1 release of the SAS add-in.

For documents that were generated with the 4.2 or 4.3 release of the SAS add-in, you can refresh the SAS content to the 5.1 format and then open the documents in the 4.2 or 4.3 version of the SAS add-in.

If you refresh a document from any previous release, and if you add new content in the 5.1 release, do not open the 5.1 document in any previous release.

Content that was generated in the 4.2 or 2.1 release must be refreshed before you can use the restore content functionality.

If you open content from the 4.2 release and the **Show Preview Changes dialog box** check box is selected on the **Results** tab in the SAS Options dialog box, then you can select what content to include in the results and what content to hide. However, because this is migrated content, the SAS add-in might not find the original results to know which content to hide. If the SAS add-in cannot find the original results, then all of the results are displayed.

To ensure that you are using the latest version of the data, refresh any data sources in your document before you use this data in the SAS Add-In 5.1 for Microsoft Office. For example, measures that were available to a PivotTable in the 4.3 release might not be available in the 5.1 release because you are connecting to a different server for the 5.1 release. When you refresh your data, any measures that no longer exist are removed from the PivotTable.

When you refresh a document from a previous release in the 5.1 release, you might notice that the style for the output has changed. To work around this problem:

1. Before you refresh the content in 5.1, select the content in Microsoft Excel, Microsoft Word, or Microsoft PowerPoint, and then click **Properties**.
2. In the Properties dialog box, select the style that you want to use, and then refresh the content in 5.1.

To migrate multiple files or to remap references to metadata objects (such as servers, libraries, information maps, and stored processes), use the migration wizard. To run this wizard, double-click MigrationWizard.exe in the directory where you installed the SAS Add-In for Microsoft Office. After you open the wizard, click **Help** for more information about the migration options.

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## Administer a Connection Profile for the SAS Add-In for Microsoft Office

### Create a Connection Profile

A connection profile defines the connection between the SAS Add-In for Microsoft Office and a SAS Metadata Server. The SAS Metadata Server contains metadata definitions for objects such as workspace servers, libraries, and users. These definitions are used by the SAS add-in and other SAS applications. The SAS Metadata Server connection provides secure access to enterprise servers and data sources.

The Connections window provides the interface to Profiles, Servers, and Updates. Any changes made to the connections are applied to SAS Enterprise Guide and to all Microsoft applications that use the SAS add-in. To access the Connections window, follow these steps:

- In Microsoft Office 2007 and later, select the **SAS** tab in the Ribbon, and select **Tools** ⇒ **Connections**. The Connections window appears.
- In Microsoft Office 2003 (not supported starting with 5.1), select **SAS** ⇒ **Tools** ⇒ **Connections**.
- In Microsoft Outlook 2010, click the **SAS** tab in the Ribbon. In the **Tools** group, click **Connections**.
- In Microsoft Outlook 2007, select **SAS Central Options**. In the Options dialog box, click the **SAS** tab, and then click **Connections**.

To configure the Profiles, Servers and Updates, refer to the online Help.

- In Microsoft Office 2003 (not supported starting with 5.1), click **SAS** ⇒ **Help** ⇒ **SAS Add-In for Microsoft Office Help**.
- In Microsoft Office 2007 and later, click **SAS** ⇒ **Help** ⇒ **Help for SAS Add-In for Microsoft Office**.

### Select No-Profile Mode

You can create a profile that connects you to the metadata repository that is installed on the local host. This type of profile supports single-machine configurations. You can also use the add-in without a profile, although you can access only a SAS server installed on your local machine.

To invoke no-profile mode, open the Connections window by selecting **SAS** ⇒ **Tools** ⇒ **Connections**. The Connections window is displayed. Select **Profiles** ⇒ **<do not use profile>** from the list of available profile-related actions. Then select from the list of profiles that have been defined. An icon identifies the active profile.

---

## Select a Default Server for the SAS Add-In for Microsoft Office

Using the Connections window, you can specify which server you want to access. You connect to a server to access data sources and to run SAS tasks. To select a server for the active profile, follow these steps:

1. Open the Connections window as described in [Create a Connection Profile on page 14](#).
2. Click **Servers**, click the down arrow, and select a default SAS server.
3. (Optional) Select **Automatically add local SAS server (if installed) to the list**.

*Note:* Performance improvements can be achieved when groups of users select a load-balancing cluster of SAS Workspace Servers. For information about load-balancing, see the *SAS Intelligence Platform: Application Server Administration Guide*.

---

## Administer Profiles for the SAS Add-In for Microsoft Office

You can configure profiles so that they are updated from a central location before users open a Microsoft Office application. See [“Create a Shared Profile Deployment with Automatic Updates” on page 63](#).

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## Administer Publishing by Instant Message

After you run a report in Microsoft Outlook, you can share the results in an instant messaging tool, such as Microsoft Office Communicator or Microsoft Lync. The options that are available depend on your version of Microsoft Outlook and the communicator tool that you are using.

In order for you to appear as a contact for a report, your name in Microsoft Office Communicator or Lync must match the name in SAS Management Console. Update your name accordingly in SAS Management Console. For example, if your name in Office Communicator appears as John Smith, and if your name is listed as Smith, John in SAS, then you do not appear as a contact when you create a report. Update your name accordingly in the User Manager in SAS Management Console.

## Administer SAS Functionality in Microsoft Outlook

### ***Configure the Distribution of SAS Content***

Outlook capabilities govern the distribution of SAS content (e-mail, save, print, and send.) For details on these capabilities, see [“Default Roles and Capabilities for the SAS Add-In for Microsoft Office”](#) on page 18.

### ***Configure the Addition of Comments to Reports***

To use the commenting functionality in Microsoft Outlook, you must also run SAS Web Report Studio 4.31 M1 or later.

To read and create messages using the SAS Comment Server, your role needs to be granted the Comments capability. Without the Comments capability, the Comment icon in the Ribbon is hidden, as is the Comment pane in the Preview, Inspector View, and Gadget panes.

To edit and delete comments, you need to be a member of the group Comments:Administrator.

### ***Configure Access to Indicators and Dashboards***

To view dashboards in Microsoft Outlook, your site must be running SAS BI Dashboard 4.31 M1 or later.

The Open BID Content capability in the Open or Import category enables users to open indicators and dashboard content in Outlook. This capability is not granted by default to any role.

The dashboard functionality is identified as EXPERIMENTAL in the SAS Add-In 5.1 for Microsoft Office.

### ***Configure Access to OLAP Cubes in Outlook***

To open OLAP cubes in Microsoft Outlook, select the Open Time Series capability, in the Open or Import category. This capability is granted by default to the Advanced role.

The display of cubes in Outlook is labeled PREPRODUCTION in the SAS Add-In 5.1 for Microsoft Office.

### ***About Menus in Outlook 2007***

In Microsoft Outlook 2007, menus and menu options cannot be disabled by add-ins. This means that users of the SAS add-in can select menu options that are disabled by SAS capabilities. If you select a disabled menu option, an error message is displayed, to indicate that the menu option has been disabled by a capability.



---

## Set Refresh Options for SAS Functionality in Outlook

The following options govern refresh rates for SAS functionality in Microsoft Outlook:

### CommentPaneRefreshRate

specifies the frequency at which the Comment Pane is updated with new data from the SAS Comment Server. The default value of this option is 5 (minutes). Valid values range from 0 (no refresh) to 1440 (24 hours). Settings remain valid for the duration of a connection. Restart Outlook to verify a change in the refresh rate.

### GadgetPaneRefreshRate

specifies the frequency of updates for the Gadget Pane. The default value of this option is 60 (minutes). Valid values range from 0 (no refresh) to 1440 (24 hours). Settings remain valid for the duration of a connection. Restart Outlook to verify a change in the refresh rate.

To display or change the values of the refresh options, follow these steps:

1. Open SAS Management Console.
2. In the **Plug-ins** tab, expand **Applications Management**.
3. Right-click **Add-in 5.1 for Microsoft Office** and select **Properties**.
4. In the Properties dialog box, click the **Advanced** tab.

---

## Manage Multiple Instances On a Single Host

You can now use different versions of the SAS Add-In for Microsoft Office to access different versions of SAS content:

- SAS Add-In 5.1 for Microsoft Office provides access to SAS 9.2 or 9.3 content.
- SAS Add-In 4.2 and 4.3 for Microsoft Office provide access to SAS 9.2 content.
- SAS Add-In 2.1 for Microsoft Office provides access to SAS 9.1.3 content.

Use the SAS Add-In for Microsoft Office Utility to select a release of the SAS add-in. Administrative permissions are required. You can use only one release at a time, and that release must be installed on the local host.

To access the SAS Add-In for Microsoft Office Utility, open Windows Explorer and double-click SwitcherUtility.exe in the directory **C:\Program Files\SAS\Add-inForMicrosoftOffice\5.1**. You must use only one release of the SAS add-in for all Microsoft Office applications.

To access the SAS Add-In for Microsoft Office Utility from a command line, enter the following command into a DOS prompt:

```
cd C:\Program Files\SAS\Add-inForMicrosoftOffice\5.1
```

Now enter the following command, using your choice of arguments:

```
SwitcherUtility.exe <version> <application> <silent>
```

The arguments are defined as follows:

*version*

specifies the release of the SAS add-in that will be enabled or disabled for specified Microsoft Office applications. Valid values for this argument are **2.1**, **4.2**, **4.3**, or **5.1**.

*application*

enables or disables the SAS add-In in specified Microsoft Office applications. Use **+application** to enable, and **-application** to disable. Valid values of *application* are **Excel**, **PowerPoint**, **Word**, and **Outlook**. In a single command, you can enable certain applications and disable others for the specified release of the SAS add-in, as shown in the following example:

```
SwitcherUtility.exe 5.1 +Excel +PowerPoint +Outlook -Word
```

*silent*

specifies that no output from the utility is to be displayed in the DOS window.

All arguments are optional. Specifying the command with no arguments opens the SAS Add-In for Microsoft Office Utility.

## Configure the SAS Add-In for Microsoft Office for Grid Computing

To configure a SAS grid to distribute the workload from the SAS Add-In for Microsoft Office, use the SAS Grid Manager. For assistance, refer to *Grid Computing in SAS*.

To configure a Microsoft Office application to use a SAS grid, select **SAS** ⇒ **Tools** ⇒ **Options**. In the SAS Options dialog box, click the **Tasks** tab and select **Use grid when available**.

## Tasks that Require Other SAS Software

The SAS Add-In for Microsoft Office includes tasks that require the use of other SAS software. The SAS Forecast Studio tasks require the installation of the SAS Forecast Server software. The Rapid Predictive Modeler task requires the installation of the SAS Enterprise Miner software.

To run the tasks that use SAS Forecast Server or SAS Enterprise Miner, your role requires certain capabilities. The capabilities are defined in “[Default Roles and Capabilities for the SAS Add-In for Microsoft Office](#)” on page 18. Refer to the Time Series and Data Mining categories. Note that the Rapid Predictive Modeler task runs only on SAS 9.3 servers. The SAS Forecast Studio tasks run on SAS 9.2 or 9.3 servers.

## Default Roles and Capabilities for the SAS Add-In for Microsoft Office

As described in the *SAS Intelligence Platform: Security Administration Guide*, you can assign users to roles to provide access to selected capabilities in the SAS Add-In for Microsoft Office.

Using SAS Management Console, as described in “[Administering Roles and Capabilities](#)” on page 8, you can assign users to roles, change the capabilities that are enabled by each role, and create new roles with unique sets of capabilities.

The User Manager in SAS Management Console provides three default roles for the SAS Add-In for Microsoft Office: Advanced, OLAP, and Analysis. The following table describes the capabilities that are assigned by default to these roles.

**Table 3.2** Default Capabilities Assigned to Roles for the SAS Add-In for Microsoft Office

Capability	Description	Role		
		Advanced	OLAP	Analysis
Open or Import Category				
Open Files from Local Computer	Open a file from the local file system. This is not a substitute for system security.	X	X	X
Open Cube from OLAP Server	Open an OLAP cube source into a document.	X	X	
*Open BID Content	Open BID indicators and dashboards in Microsoft Outlook only (EXPERIMENTAL in 5.1).			
*Open Time Series Data	Open OLAP cubes in Microsoft Outlook only (PREPRODUCTION in 5.1).	X		
Save or Distribute Category				
Modify Output Data Location in SAS Tasks	Change the output data location for the SAS tasks that allow the user to specify an output location.	X		X
Copy and Paste SAS Server Content	Copy and paste from a file on a SAS server or in a SAS library. This is not a substitute for system security.	X		X
Save to SAS Folder	Save content to a SAS folder.	X	X	X
*Email SAS Content	Send SAS content in a mail message, schedule a meeting, or assign a task from Microsoft Outlook only.	X		
*Save SAS Content	Save SAS content to a file from Microsoft Outlook only.	X		
*Print SAS Content	Print SAS content from Microsoft Outlook only.	X		
*Send SAS Content to Microsoft Office.	Send SAS content to Microsoft Office applications.	X		
Content Category				

Capability	Description	Role		
		Advanced	OLAP	Analysis
Add or Modify Custom Code to SAS Tasks	Add or modify the custom code that runs before or after a SAS task.	X		
Comments	Add or modify comments.	X		
Options Category				
Modify SAS Server Reference in Project or Document	Change the SAS server for all SAS content in the document.	X		X
Modify Security Options	Modify the current security options for new and existing documents.	X		
Modify E-mail Options	Modify the current e-mail options for new and existing documents.	X	X	X
Modify All Options	Modify the options in the SAS Add-In Options dialog box.	X	X	X
*Modify Metadata Authorizations	Modify the metadata authorization settings for folders.	X		
*Reset Login	Remove the login from metadata associated with a server or library.	X	X	X
Tools and Help Category				
Access Unregistered Custom Tasks	Use custom tasks that are not registered in the metadata. By default, these custom tasks will work unless the task is restricted by an administrator.	X	X	X
Modify Styles	Modify the style of the SAS output.	X	X	X
Create or Modify Schedules	Schedule when the SAS content in a document is refreshed. The user can also modify the scheduling options for a document.	X		X
Access SAS Technical Support	Schedule when the SAS content in a document is refreshed. The user can also modify the scheduling options for a document.	X	X	X
Data Category				
*Quick Stats	Show Quick Stats.	X		
Edit Data Sets	Change the values and column properties of a data set in Microsoft Excel.	X		

Capability	Description	Role		
		Advanced	OLAP	Analysis
Copy to SAS Server	Copy an active data source to SAS servers.	X	X	X
Compare Data	Create a report that compares two data sets or compares two variables within or across data sets.	X	X	X
Data Set Attributes	Create a report with the data set's creation date, location, and number of observations as well as the variable names, labels, types, and formats.	X	X	X
Random Sample	Create an output data set that contains a random sample of the rows in the input data set.	X	X	X
Rank	Compute ranks for one or more numeric variables across the observations of a SAS data set and sends the ranks as output to a new SAS data set.	X	X	X
Sort Data	Sort a data source by any of its columns.	X	X	X
Standardize Data	Standardize variables in a data source to a given mean and standard deviation. This task creates a new SAS data set that contains the standardized values.	X	X	X
Split Columns	Create an output data set by splitting the unique combination of values of the selected columns in the input data set into multiple columns.	X	X	X
Stack Columns	Create an output data set by restructuring selected columns in the input data set so that these columns are transposed into observations.	X	X	X
Transpose	Turn the selected columns of an input data source into the rows of an output data set.	X	X	X
Describe Category				
List Report Wizard	Create detail or summary reports.	X	X	X
Distribution Analysis	Create a data summary. This task also provides information about the distribution of numeric variables and can be used to create a variety of plots.	X	X	X
Characterize Data	Create a summary report, graphs, and frequency and univariate SAS data sets that describe the main characteristics of the data.	X	X	X
List Data	Print the observations in a SAS data set, using all or some of the variables. The user can create a variety of reports.	X	X	X

Capability	Description	Role		
		Advanced	OLAP	Analysis
One-Way Frequencies	Generate frequency tables from the data. The user can also use this task to perform binomial and chi-square tests.	X	X	X
Summary Statistics	Compute descriptive statistics for variables across all observations and within groups of observations. The user can also summarize data in a graphical display.	X	X	X
Summary Tables	Display descriptive statistics in tabular format, using some or all of the variables in a data set. The user can create a variety of tables.	X	X	X
Table Analysis	Generate crosstabulation tables, also known as contingency tables, from the data.	X	X	X
Graph Category				
*Automatic Chart	Enables the Automatic Chart task.	X		
Contour Plot	Create line, filled, pattern, or smooth plots that show the mathematical relationships between three numeric variables.	X	X	X
Bubble Plot	Create simple bubble plots. The bubbles are circles of varying proportions at data points that are plotted on the vertical and the horizontal axes.	X	X	X
Radar Chart	Create radar (or star) charts that show the relative frequency of data measures in quality control or market research problems.	X	X	X
Box Plot	Create box plots, hi-lo charts, or hi-lo-close charts that display multiple summary statistics for some numeric variable across different values of a chart variable.	X	X	X
Donut Chart	Create simple or group charts that show the relative contribution of the parts to the whole. The data appears as wedge-shaped slices of a circle.	X	X	X
Area Plot	Create area, spline, step, or overlay plots that show the mathematical relationship between two variables.	X	X	X
Pie Chart	Create simple, group, or stacked charts that represent the relative contribution of the parts to the whole. The data appears as wedge-shaped slices of a circle.	X	X	X

Capability	Description	Role		
		Advanced	OLAP	Analysis
Line Plot	Create line, scatter, spline, needle, step, regression, smooth, STD, Lagrange interpolation, or overlay plots that show the mathematical relationships between variables.	X	X	X
Bar Chart	Create vertical, horizontal, or three-dimensional bar charts that compare numeric values or statistics between different values of a chart variable.	X	X	X
Surface Plot	Create three-dimensional wireframe plots, smooth plots, or gradient plots that show the mathematical relationships between three numeric variables.	X	X	X
Map Chart	Create a two-dimensional (choropleth) or three-dimensional (block and prism) color map that shows the variation in the value of a response variable for different geographical areas.	X	X	X
Bar-Line Chart	Create a vertical bar chart with a line plot overlay. The line plot represents the value of a statistic that is calculated for one of the variables in the input data set.	X	X	X
Scatter Plot	Create two-dimensional scatter plots, three-dimensional scatter plots, or three-dimensional needle plots that show the relationships between two or three variables.	X	X	X
Scatter Plot Matrix	Create a matrix of scatter plots.	X	X	X
Tile Chart	Create a tile chart. Each unique category combination is represented by a rectangular tile whose size and color are determined by the response variables.	X	X	X
*Show ODS Statistical Graph	Show ODS Statistical Graph from an SGD file.	X	X	X
ANOVA Category				
Linear Models	Analyze data within the framework of general linear models. This task uses the method of least squares to fit general linear models.	X	X	X
Mixed Models	Fit a variety of mixed linear models to data and to use these fitted models to make statistical inferences about the data.	X	X	X

Capability	Description	Role		
		Advanced	OLAP	Analysis
Nonparametric One-Way ANOVA	Run nonparametric tests for location. The task also scales differences across a one-way classification and provides a standard analysis of variance on the raw data.	X	X	X
One-Way ANOVA	Test for differences among the means of the levels and quantify the differences.	X	X	X
t Test	Perform t-tests for one sample, two samples, and paired observations.	X	X	X
Regression Category				
Generalized Linear Models	Model data that is not normally distributed. This task can also model data for which the mean has been restricted to a range of values or data for which the variance is not constant.	X	X	X
Linear Regression	Perform linear regression analysis on multiple dependent and independent variables.	X	X	X
Logistic Regression	Investigate the relationship between discrete responses and a set of explanatory variables.	X	X	X
Nonlinear Regression	Produce least squares or weighted least squares estimates of the parameters of a nonlinear model.	X	X	X
Multivariate Category				
Canonical Correlation	Examine the relationship between a linear combination of a set of X variables and a linear combination of a set of Y variables.	X	X	X
Cluster Analysis	Create hierarchical clusters of the observations in a SAS data set that contains either coordinate data or distance data.	X	X	X
Correlations	Determine the relationship between numeric variables. The relationship is described by calculating correlation coefficients for the variables.	X	X	X
Discriminant Analysis	Develop a discriminant criterion that can be used to classify the values of the quantitative variables into the groups defined by the classification variable.	X	X	X
Factor Analysis	Perform a variety of common factor and component analyses and rotations.	X	X	X



Capability	Description	Role		
		Advanced	OLAP	Analysis
Principal Components	Examine relationships among several quantitative variables. This task can be used for summarizing data and detecting linear relationships.	X	X	X
Survival Analysis Category				
Life Tables	Compute nonparametric estimates of the survival distribution of data that may be right-censored due either to withdrawals or to termination of the study.	X	X	X
Proportional Hazards	Perform regression analysis of survival data based on the Cox proportional hazards model.	X	X	X
Capability Category				
CDF Plots	Plot the observed cumulative distribution function (CDF) of a variable.	X		
Histograms	Compare the distribution of measurements from a process in statistical control to its specification limits.	X		
Q-Q Plots	Compare ordered values of a variable to the quantiles of a specified theoretical distribution, such as the normal distribution.	X		
Probability Plots	Compare ordered values of a variable to the percentiles of a specified theoretical distribution, such as the normal distribution.	X		
P-P Plots	Compare the empirical cumulative distribution function (ECDF) of a variable to a specified theoretical cumulative distribution function, such as the normal distribution.	X		
Control Charts Category				
Box Chart	Create a mean chart for the subgroup means. The task superimposes the box-and-whisker plots of the measurements for each subgroup onto the mean chart.	X		
c Chart	Create c charts for the numbers of nonconformities (defects) in the subgroup samples.	X		
Individual Measurements Chart	Create control charts for the individual measurements and the moving ranges.	X		

Capability	Description	Role		
		Advanced	OLAP	Analysis
np Chart	Create np charts for the numbers of nonconformities (defects) in the subgroup samples.	X		
p Chart	Create p charts for the proportions of nonconforming (defective) items in the subgroup samples.	X		
u Chart	Create u charts for the numbers of nonconformities (defects) per inspection unit in the subgroup samples that contain arbitrary numbers of units.	X		
Mean and Range Chart	Create mean and range charts for the subgroup means and the subgroup ranges.	X		
Mean and Standard Deviation Chart	Create mean and standard deviation charts for the subgroup means and the subgroup standard deviations.	X		
Pareto Category				
Pareto Chart	Create a chart that displays the relative frequency of problems in a process as bars. Pareto charts help the user identify the problems that deserve the most attention.	X		
Time Series Category				
Prepare Time Series Data	Prepare data for analysis by other time series tasks. It can also be used to perform generic transformations on data that is intended for use in any other tasks.	X	X	X
Basic Forecasting	Generate forecasts for many time series in one step. This task uses extrapolative forecasting methods where the forecasts for a series are functions only of time and past values.	X	X	X
ARIMA Modeling and Forecasting	Analyze and forecast equally spaced univariate time series data, transfer function data, and intervention data by using the ARIMA or ARMA model.	X	X	X
Regression Analysis with Autoregressive Errors	Estimate and forecast linear regression models for time series data when the errors are not independent through time or the error variance is not constant.	X	X	X
Regression Analysis of Panel Data	Estimate and forecast linear regression models for time series data when the errors are not independent through time or the error variance is not constant.	X	X	X

Capability	Description	Role		
		Advanced	OLAP	Analysis
Create Time Series Data	Convert transactional data into fixed-interval time series. Transactional data is time-stamped data that is collected over time with irregular or varied frequency.	X	X	X
Forecast Studio Create Project	Specify the forecasting variables, choose whether to forecast your data hierarchically, and specify the forecast horizon for a new SAS Forecast Studio project.	X		X
Forecast Studio Open Project	Open the selected series from an existing SAS Forecast Studio project and specify how to display the results.	X		X
Forecast Studio Override Project	Submit overrides for the forecast data in an existing SAS Forecast Studio project.	X		X
Data Mining Category				
Model Scoring	Score a data set against an existing SAS Enterprise Miner predictive model.	X		X
Rapid Predictive Modeler	Create a predictive model using SAS Enterprise Miner procedures.	X		X

\* These capabilities were added for the second edition of the SAS 9.3 version of this document. The second edition applies to the 5.1 release for the majority of the desktop applications.

---

## Registering Custom Tasks as Capabilities in the SAS Add-In for Microsoft Office

### Overview

Custom add-in tasks are .NET assemblies (DLL files) that you create, deploy, register, and execute from the SAS ribbon in Microsoft Office applications.

To provide access to custom tasks based on the job responsibilities in your organization, you can register custom tasks as capabilities, assign the capabilities to roles, and assign users to roles.

The process of creating, deploying, registering, and executing custom tasks as capabilities in the SAS Add-In for Microsoft Office is similar to the process that is used in SAS Enterprise Guide.

## Create Custom Tasks

To create custom tasks, you develop Windows executables and package them as .NET assemblies. It is convenient to assemble multiple tasks in a single .NET assembly so that you can share code and implementation among the tasks. For additional information, sample DLLs, and sample executable source files, see *Creating Custom Add-In Tasks for SAS Enterprise Guide*, at <http://support.sas.com/documentation/onlinedoc/guide/customtasks/index.htm>. reference.

## Deploy Custom Tasks

You can deploy custom tasks to computers that run the SAS Add-In for Microsoft Office in two ways, using drop-in deployment or add-in deployment. Drop-in deployment copies .NET assemblies into specific local directories that are recognized by the SAS Add-In for Microsoft Office. Custom tasks in drop-in directories are automatically registered (made available for execution) the next time the user starts a Microsoft Office application.

Add-in deployment copies .NET assemblies into any local directory. You then identify those directories for use in the SAS Add-In for Microsoft Office using the Add-In Manager in SAS Enterprise Guide. Deployment registration makes the custom tasks available for execution from the SAS ribbon in Microsoft Office applications.

When you deploy your custom tasks, make sure that you include any dependent assemblies that are referenced by those tasks. At the same time, make sure that you do not include any dependent assemblies that are provided by the SAS Add-In for Microsoft Office or by SAS Enterprise Guide.

Follow these steps to use the Add-In Manager:

1. Copy the .NET assembly into one of the following directories:
  - `C:\ProgramFiles\SAS\Add-InForMicrosoftOffice\version\Custom`
  - `%appdata%\SAS\Add-InForMicrosoftOffice\version\Custom`  
`%appdata%` is the Microsoft Window environment variable that maps to a user account. Repeat the copy in other user accounts if multiple users run the SAS Add-In for Microsoft Office on the same host.
  - `%appdata%\SAS\SharedSettings\version\Custom`  
 Use this method to deploy custom tasks to specified user accounts, using a shared directory that is accessed by both the SAS Add-In for Microsoft Office and SAS Enterprise Guide.
2. Start or restart a Microsoft Office application to register the custom tasks and make them available for testing.

Follow these steps to use add-in deployment:

1. Copy the .NET assembly into any local directory.
2. Start SAS Enterprise Guide and open the Add-In Manager. Select **Tools** ⇒ **Add-In** ⇒ **Add-In Manager**.
3. In the Add-In Manager dialog box, select **Browse**.
4. Navigate to the directory where you stored your .NET assembly.

5. Click **Open** to display the names of the custom tasks in the assembly.
6. Click **OK** to accept the custom tasks and register them in SAS Enterprise Guide.
7. Test the new custom tasks in a Microsoft Office application.

### **Register Custom Tasks As Capabilities**

After you deploy custom tasks, follow these steps to register custom tasks as capabilities:

1. In SAS Enterprise Guide, start SAS Enterprise Guide Explorer. Select **Tools** ⇒ **SAS Enterprise Guide Explorer**.
2. In Explorer, select **Tools** ⇒ **Task Import Wizard**.
3. In the first page of the Task Import Wizard, you see your current metadata profile connection. If you need to connect with a different profile, click **Cancel** to close the wizard and select **File** ⇒ **Manage Profiles**. After you change your profile, click **Close**, then start the Task Import Wizard.
4. In the second page of the Task Import Wizard, specify the location of the directory where you copied your .NET assembly. Note that the directory that you select must be local to your current host.
5. Select tasks to receive metadata, then click **Finish** in the sixth wizard page to create metadata.

If you are unable to create metadata, then you might need to install the package named SAS Add-In for Microsoft Office Server Data on the host that contains your current metadata repository.

### **Apply Custom-Task Capabilities to Roles**

Follow these steps to apply custom-task capabilities to roles:

1. In SAS Management Console, open the **User Manager**.
2. To create a new role for your custom-task capabilities, right-click in the **User Manager** and select **New** ⇒ **Role**.
3. To add a custom-task capability to an existing role, double-click an **Add-In for Microsoft Office** role.
4. In the role properties window, click the **Capabilities** tab.
5. In the **Capabilities** tab, expand the **Plug-Ins** branch in the tree view.
6. Click the custom-task capabilities that you want to add to that role.
7. Click **OK**.

The custom-task capabilities will be applied to the role the next time that affected users initialize a Microsoft Office application.

## Library Access for the SAS Add-In for Microsoft Office

If the SAS add-in attempts to write data to a table on the SAS Metadata Server, and the structure of the updated table is different, the metadata is not updated. For this reason, it is advisable to regulate Write access to registered tables from Excel, Word, and PowerPoint. Read access, for the purposes of querying SAS OLAP cubes using Excel, requires no special consideration.

Access to registered libraries is determined in part by the library access method. By default, all libraries that are registered on the SAS Metadata Server are Read-only. SAS Add-In for Microsoft Office users cannot create, add, or delete tables. The default library access method can be changed, as described in [“Review Library Access in SAS Enterprise Guide”](#) on page 66.

**CAUTION:**

**To maintain referential integrity on the SAS Metadata Server, it is advisable to inform the SAS Add-In for Microsoft Office users about their permissions to access registered libraries.**

## Chapter 4

# Administering SAS OLAP Cube Studio

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## SAS OLAP Cube Studio Overview for Administrators

SAS OLAP Cube Studio is used to build, edit, and tune OLAP cubes. To build a cube, the application generates metadata and a SAS program. It then submits the program for execution on a SAS Workspace Server. The SAS Workspace Server builds the cube and stores the result in a physical location that can be accessed by a SAS OLAP Server.

When a cube becomes available on a SAS OLAP Server, it is queried by users working with OLAP clients. These clients can include SAS Web Report Studio, SAS Web OLAP Viewer, and SAS Enterprise Guide. The cube viewers submit queries to the SAS OLAP Server in the industry-standard MDX query language. The SAS OLAP Server responds to queries by delivering result sets to the cube viewers for display.

To configure your enterprise for SAS OLAP Cube Studio, perform the following tasks:

- Install and register SAS OLAP Servers and SAS Workspace Servers.
- Create libraries for cubes and cube data.
- Set up users, groups, and roles for OLAP cube builds, updates, and queries.
- Use the OLAP Server Monitor and Server Manager plug-ins in SAS Management Console to monitor, control, and tune SAS OLAP Servers.

For information about the administration of SAS OLAP Servers, see the chapter “Administering SAS OLAP Servers” in the *SAS Intelligence Platform: Application Server Administration Guide*.

---

## Setting Up the SAS Intelligence Platform for SAS OLAP Cube Studio

Set up the SAS Intelligence Platform as follows to use SAS OLAP Cube Studio:

1. Install, configure, and start a host that runs both a SAS Workspace Server and a SAS OLAP Server. This step generally occurs at initial deployment, as described in the *SAS Intelligence Platform: Installation and Configuration Guide*.
2. Define libraries and data sources, as described in the *SAS Intelligence Platform: Data Administration Guide*.
3. Define access controls for libraries, users of SAS OLAP Cube Studio, and users of cube viewers. After you build a cube, you can apply access controls within the cube, including member-level access controls, as described in the *SAS Intelligence Platform: Security Administration Guide*.
4. Set up connection profiles and roles for OLAP users, as described in “Common Elements” on page 5 .

---

## Understanding the Configuration of SAS OLAP Cube Studio

The following administrative and configuration files for SAS OLAP Cube Studio are located on each client:

`olapa.ini`

contains configuration settings for SAS OLAP Cube Studio. The default storage location is `SAS-installation-directory\SAS\SASOLAPCubeStudio\version`.

`CubeStudioDefaults.txt`

contains the user properties for SAS OLAP Cube Studio. The default storage location is `C:\Documents and Settings\UserID\Application Data\SAS\SASOLAPCubeStudio\version`.

Log files

`C:\Documents and Settings\userID\Application Data\SAS\SASOLAPCubeStudio`

Log files in the Vista operating environment

`C:\Users\userID\AppData\Roaming\SAS\SASOLAPCubeStudio`

---

## Administering OLAP Sessions and Queries

The SAS OLAP Server Monitor plug-in for SAS Management Console displays information about client connections to SAS OLAP Servers. Connecting to one of those servers displays a list of active queries on that server. You can close selected sessions or queries. For more information about the SAS OLAP Server Monitor, see “Administering



SAS OLAP Servers” in *SAS Intelligence Platform: Application Server Administration Guide*. Also see the SAS OLAP Server Monitor Help.

---

## Administering SAS OLAP Servers

SAS OLAP Server administration takes place in the Server Manager and the SAS OLAP Server Monitor plug-ins in SAS Management Console. Certain server control functions are also available from SAS OLAP Cube Studio.

Use the Server Manager plug-in to set options on SAS OLAP Servers. Open the server's properties window, select **Options**, and select **Advanced Options**.

Use the Server Manager or the SAS OLAP Server Monitor to stop, pause, and quiesce SAS OLAP Servers in support of cube builds and cube updates. For more information about stopping and starting servers, see the *SAS Intelligence Platform: System Administration Guide*.



## Chapter 5

# Administering SAS Data Integration Studio

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## Overview of Administering SAS Data Integration Studio

SAS Data Integration Studio is a visual design tool that enables data integration specialists to consolidate and manage enterprise data from a variety of source systems, applications, and technologies. This software enables these users to create process flows that accomplish the following tasks:

- extract, transform, and load (ETL) data for use in data warehouses and data marts
- cleanse, migrate, synchronize, replicate, and promote data for applications and business services

SAS Data Integration Studio enables users to integrate information from any platform that is accessible to SAS and from any format that is accessible to SAS.

The following table introduces the administrative tasks that are associated with SAS Data Integration Studio:

**Table 5.1** Administrative Tasks for SAS Data Integration Studio

Administrative Task	Purpose of Task
Connect to SAS servers	Make sure that your data integration specialists can connect to the necessary SAS servers. For example, each user must be able to connect to the SAS Metadata Server to register data sources and other objects.
Connect to data servers	Make sure that your data integration specialists can connect to the necessary data servers.
Set up change management	Set up a change-managed folder in the Folders tree, if desired. This enables individual users to check objects out of a foundation repository and place them in a private repository. The private repository, called a project repository, provides a location where the users can test changes.
Set up multi-tier environments	Set up SAS Data Integration Studio to work in a multi-tier configuration. Almost all configurations have multiple tiers.

Administrative Task	Purpose of Task
Administer message queues	Install third-party message queue software, define queues, and register queues for inter-process communication.
Configure stored process servers for the deployment of stored process jobs or Web service jobs	Install SAS Stored Process Servers as needed for jobs that are deployed as stored processes or Web services that generate XML output.
Configure the SAS Workspace Server to enable the bulk loading of data	Enable SAS Workspace Servers to execute external commands so that jobs can rapidly load data into a DBMS.
Test the Platform Computing Scheduling Server	Test the servers (and clients) that enable your users to schedule sets of SAS Data Integration Studio jobs.
Set up the SAS Data Quality Server software	Set up the infrastructure necessary for your users to use data-quality transformations.
Redirect output and logging information to a file	Specify alternative destinations for the SAS log and SAS output.
Configure status code handling	Configure jobs to send status codes via e-mail, to files, or by executing a SAS program.
Use FTP or HTTP servers to access external files	Install a content server to access external files.

---

## Connecting to SAS Servers

### ***Overview of SAS Server Connections in SAS Data Integration Studio***

SAS Data Integration Studio users connect to a SAS Metadata Server and a SAS Workspace Server. The SAS Workspace Server might be part of a load-balancing grid configuration.

#### ***Connect to a SAS Metadata Server***

At initialization time, SAS Data Integration Studio users select a connection profile that connects the desktop application to a SAS Metadata Server. The administrator might need to help users create one or more connection profiles, as described in [“Administering Connection Profiles for Desktop Applications” on page 6](#).

#### ***Connect to a Workspace Server***

When you execute a job in SAS Data Integration Studio, the application submits generated SAS code to a SAS Workspace Server, which executes the code. Therefore, it

is imperative that an object spawner is running and that SAS Data Integration Studio is able to use the spawner to start a SAS Workspace Server. To test a connection to a SAS Workspace Server, follow these steps:

1. Select **Tools** ⇒ **Options**.
2. In the Options dialog box, select the **Server** tab.
3. Select from the list the name of the SAS Application Server to which the SAS Workspace Server belongs.
4. Click **Test Connection**. You might be prompted for a user name and password. If you are, enter credentials that allow you to be authenticated on the host where the SAS Workspace Server is running. If all goes well, you see an Information dialog box that says, “Connection to the server was successful”.

### Set Grid Server Options

Grid computing is implemented in the separately licensed SAS Grid Manager software. SAS Grid Manager runs grid-enabled jobs on multiple servers. The grid configuration consists of a logical SAS grid server that distributes processing tasks. In addition, the configuration includes any number of SAS Workspace Servers that execute distributed tasks, a SAS Grid Monitor server, and a Grid Monitor plug-in for SAS Management Console. The distribution of tasks across the grid is determined by a grid workload specification that you create and register in SAS Management Console.

The following steps are performed on the global **Options** tab in SAS Data Integration Studio. Before you can perform these tasks, a SAS grid server and a grid workload specification must be registered in SAS Management Console. For more information about these tasks, see *Grid Computing in SAS*.

To select a SAS grid server and specify related options for SAS Data Integration Studio jobs, follow these steps:

1. In SAS Data Integration Studio, select **Tools** ⇒ **Options** from the menu bar and select the **SAS Server** tab.
2. In the **Grid workload specification** box, select the specification that you want to apply to your grid jobs.
3. In the **Signon options** box, specify the options that you want to apply at the start of each grid computing session.
4. In the **Number of signon entries** box, enter the number of times you want to reconnect to the grid after errors. The default value is three.
5. Select the **Code Generation** tab.
6. Jobs executed on a grid are executed in parallel. SAS Data Integration Studio uses a set of macros to enable parallel processing. To enable parallel processing for all new jobs, select the **Enable parallel processing macros** check box.

Alternatively, you can enable these macros for individual jobs. You can select **YES** in the **Enable parallel processing macros** option on the **Options** tab of the properties window for an individual job. Also, simply including a Loop transformation in a job enables parallel processing for that job.

7. Consider setting options for concurrent processes based on the hosts that make up your grid.
8. Click **OK** to save your changes.

---

## Connecting to Data Servers

Establish that your users can connect to the SAS Metadata Server and the system's SAS Workspace Servers. Then ensure that users can access the input data sources to SAS Data Integration Studio jobs. Here are some examples of these sources:

- DB2 tables
- Sybase tables
- Teradata tables
- ODBC data sources
- Oracle tables
- SAS data sets
- SAS Scalable Performance Data Engine tables

The general procedure for Following this test is to follow these steps:

- Register your data sources (see the *SAS Intelligence Platform: Data Administration Guide*).
- View data sources in SAS Data Integration Studio.

To determine whether your data integration developers are able to read data from a particular data server, follow these steps:

1. In the Inventory tree, expand the **Table** node.
2. Right-click a data source and select **Open** to display the View Data window.

---

## About Scheduling Servers

Data integration specialists can create flows, which are sets of jobs that have been deployed for scheduling. Each job within a flow can be scheduled to execute as follows:

- at a certain time
- as determined by the state of a file (existence, age, or content)
- as determined by the state of a job or flow (completion)

For information about installing, testing and using scheduling services, refer to *Scheduling in SAS*.

---

## Setting up Change Management

### *Overview of Change Management*

The change management feature enables a team of SAS Data Integration Studio users to work simultaneously with a set of related metadata and avoid overwriting each other's

changes. With change management, most users are restricted from adding or updating the metadata in a change-managed folder in the Folders tree. Authorized users, however, can add new metadata objects and check them in to the change-managed folder. They can also check out metadata objects from the change-managed folder in order to update them. The objects are locked so that no one else can update them as long as the objects are checked out. When the users are ready, they check in the objects to the change-managed folder, and the lock is released.

If a user is authorized to work in a change-managed folder, a Checkouts tree is added to his or her desktop in SAS Data Integration Studio. The Checkouts tree displays metadata in the user's project repository, which is an individual work area or play pen. Typically, each user has his or her own project repository. If more than one user were to connect to the same project repository, the users might overwrite each other's changes.

To set up change management, follow these steps:

1. Register SAS Data Integration Studio users on the metadata server if they are not registered already. For more information, see [“Administering SAS Management Console” on page 93](#).
2. (Optional) Create a custom group and add the SAS Data Integration Studio users who are working with change management as members of this group. For example, you could create a group called **Change Management Group**. For more information, see [“Administering SAS Management Console” on page 93](#). Creating this custom group makes it easier to specify metadata permissions for the change-managed folder. You can specify permissions for the change management group rather than individual users.
3. Create a change-managed folder in the Folders tree. For more information, see the next section.
4. Create a folder structure for project repositories on the file system.
5. Create a project repository for each user who works in the change-managed folder.
6. Have each user create a connection profile, connect to the metadata server, and select his or her project repository. To verify that change management is working, you might want to have each user check out a metadata object and check it back in. For more information about these tasks, see [“Administering Connection Profiles for Desktop Applications” on page 6](#).

### **Create a Change-Managed Folder in the Folders Tree**

Follow these steps to add a new folder in the Folders tree. Specify a special set of metadata permissions for that folder. This task is easier if you have already created a custom group and added the SAS Data Integration Studio users who work with change management as members of this group.

1. In SAS Management Console, right-click a parent folder in the Folders tree, such as **SAS Folders**, and select **New Folder**.
2. Specify a name for the new folder and click **Finish** to add the folder to the Folders tree.
3. Right-click the new folder and select **Properties**.
4. In the properties window, click the **Authorization** tab.
5. For users or groups who should not be authorized to work in the new folder, grant ReadMetadata permission, and deny other permissions.



6. For users or groups who should be authorized to work in the new folder, grant ReadMetadata and CheckInMetadata permissions, and deny other permissions.
7. The standard set of privileges that enable you to work in a change-managed folder do not enable you to perform administrative tasks such as the following:
  - deploy a job for scheduling
  - deploy a job as a stored process
  - create a Web service from a stored process
  - clear a project repository that you do not own

For administrators who need to perform these tasks, grant WriteMetadata and WriteMemberMetadata permissions.

8. When you are finished specifying permissions, click OK to save your changes to the **Authorization** tab.

You have now created a change-managed folder in the Folders tree.

### **Create a Folder Structure for Project Repositories on the File System**

On the computer where the SAS Metadata Server is installed, create a folder structure for project repositories on the file system.

Each sub-folder under **Projects** contains the project repository for a user who is working with change management in SAS Data Integration Studio.

To create a folder structure for project repositories on the file system, follow these steps:

1. On the computer where the SAS Metadata Server is installed, go to the folder **SAS-installation-directory\Lev1\SASMeta\MetadataServer\MetadataRepositories**.
2. In the **MetadataRepositories** folder, a folder for the foundation repository is displayed. On the same level as the foundation folder, add a new folder called **Projects**.
3. Under the **Projects** folder, create a folder for each user who works with change management in SAS Data Integration Studio.

You are now ready to create project repositories for each user.

### **Create a Project Repository for Each User**

Repeat these steps for each user who works in a change-managed folder. It is assumed that you have registered these users and have created an appropriate folder structure for project repositories.

1. In SAS Management Console, expand the **Metadata Manager** folder, and then expand the **Active Server** folder.
2. Right-click the **Project Repositories** folder and select **New Project Repository**.
3. In the Create New Project Repository Wizard, select a SAS Data Integration Studio user who works in a change-managed folder. Click **Next**.
4. Enter a name and an optional description of the project repository. Click **Next**.

5. Specify the full physical path to a project repository folder. Typically you make no other changes. Click **Next**.
6. On the last page of the wizard, click **Finish**.

An icon that represents the new repository is displayed under the **Project Repositories** folder.

After you create a project repository for a user, ask that user to create a connection profile. Use that profile to connect to a SAS Metadata Server, and select his or her project repository. You might have each user check out a metadata object and check it back in. This verifies that change management is operational.

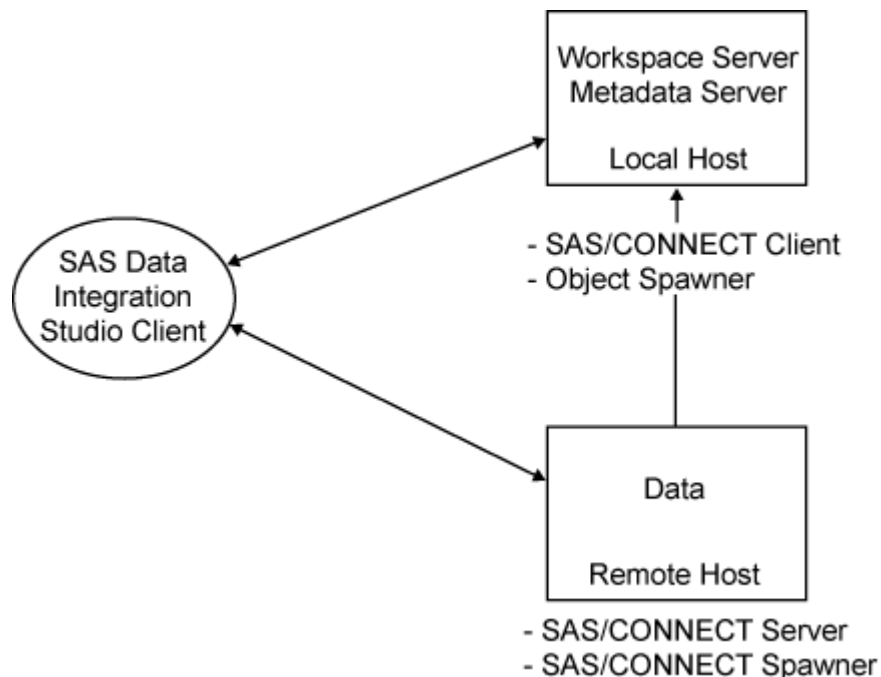
## Setting Up Multi-Tier Environments

### Access Remote Data

#### Overview of Remote Data Access

The procedures in this section explain how to enable your SAS Data Integration Studio users to access data on a host that is remote from the SAS Workspace Server. This is done by installing SAS/CONNECT software on the SAS Workspace Server host and then configuring a SAS/CONNECT server on the remote host.

In order to access data on a host that is remote from your SAS Workspace Server, you must run SAS/CONNECT software. Run SAS/CONNECT on your SAS Workspace Server machine (the local host), and on the machine with your data (the remote host). To understand this setup, consider the following figure:



In this network, we have three machines:

- the machine running the SAS Workspace Server and the SAS Metadata Server (the local host)
- a separate machine with data (the remote host)
- the SAS Data Integration Studio client machine

### **Set Up a Local Host**

These procedures assume that SAS software has been installed on the local host machine. Furthermore, the local host machine needs to be set up as follows:

- The local host runs the SAS Workspace Server.
- The SAS Application Server of which the SAS Workspace Server is a component needs to be set as the default SAS Application Server for SAS Data Integration Studio. This is done from the SAS Data Integration Studio client machine. See [“Connect to a Workspace Server” on page 37](#).
- SAS/CONNECT software needs to be installed on the local host machine. This should have been done at installation time.

### **Set Up a Remote Host**

Install and configure Base SAS and SAS/CONNECT software on the remote host. Follow the instructions in the *SAS Intelligence Platform: Installation and Configuration Guide*.

The installation process creates the server initialization script ConnectServer.bat. Use this script to invoke the SAS/CONNECT spawner as a service. The spawner starts SAS/CONNECT sessions as needed. You can find the files in the **SAS-installation-directory\Levl\appServer\ConnectServer**.

You can make other configuration changes to the remote host from any machine running SAS Management Console.

In the next two sections, you define the SAS/CONNECT server and your SAS library in metadata.

### **Set Up a Remote SAS/CONNECT Server**

On the remote host, use the SAS Deployment Wizard to define a second and new SAS Application Server that contains a SAS/CONNECT server and a SAS Workspace Server. The new servers are necessary because the local SAS Application Server does not have access to the remote library. For information about using the SAS Deployment Wizard to create new a SAS Application Server, see the *SAS Intelligence Platform: Application Server Administration Guide*.

### **Define SAS Libraries**

From SAS Management Console, define one or more SAS libraries on the remote host machine. The libraries contain the tables that are accessed by SAS Data Integration Studio. These instructions are appropriate for SAS data sets:

1. Expand **Data Library Manager**.
2. Right-click **Libraries** and select **New Library**.
3. Use the New Library Wizard to define the library. Assign the new library to the new SAS Application Server on the remote host.

### **Set Up a SAS Data Integration Studio Client Machine**

From the SAS Data Integration Studio client machine, you need to do the following:

1. define a default SAS Application Server
2. define tables in the metadata for the remote host
3. test your setup

In addition, if you have created a new authentication domain for your remote server, you need to create new logins for your SAS Data Integration Studio users. These logins must contain a user ID and password that are valid on the SAS/CONNECT host.

### **Register Source Tables on the Remote Host**

To identify in metadata the tables on the remote host, follow these steps:

1. In SAS Data Integration Studio, select **File** ⇒ **Register Tables**.
2. In the **Sources** folder, select a source, such as **SAS**, and click **Next**.
3. In the **SAS Library** box, select the library you created earlier.
4. Verify or edit the library details.
5. Consider selecting the DBMS check boxes to enable case-sensitivity or special characters for the source tables, and then click **Next**.
6. Select the tables to register in metadata and click **Next**.
7. Review your entries, and then click **Finish**.

### **Test Your Setup Using View Data**

To test your setup, follow these steps:

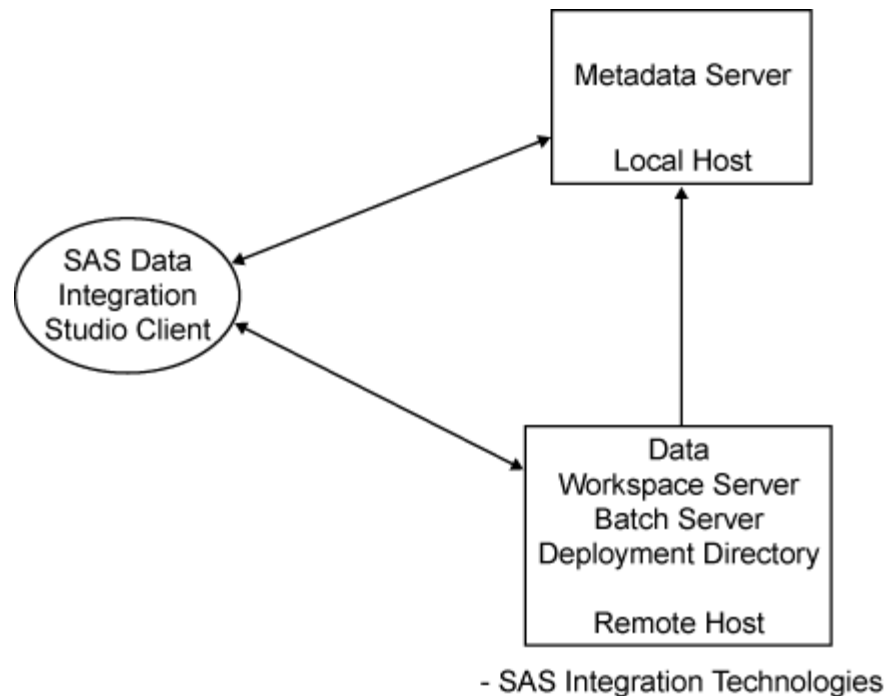
1. In SAS Data Integration Studio, select the **Inventory** tab.
2. In the **Inventory** tab, expand the **Library** node.
3. Right-click a table in the library and select **View Data**.

This test verifies that you can access your remote library.

## **Process Remote Jobs**

### **Overview of Remote Job Processing**

You might want to process one or more SAS Data Integration Studio jobs. There might be a large amount of data on a remote machine to which you save your results. In such an instance, it might be more efficient to move the job itself to the remote machine. A multi-tiered configuration can make that possible.



To move a job to a remote machine, you need to have a SAS Workspace Server on the remote host. The following software must be installed on the remote host machine:

- Base SAS software
- SAS Integration Technologies software

If you have not already installed this software, follow the instructions in the *SAS Intelligence Platform: Installation and Configuration Guide*. After installation, run the SAS Deployment Wizard to configure the following:

- SAS object spawner
- SAS Workspace Server
- SAS DATA step batch server

### **Select Your Application Server and Workspace Server**

To run SAS Data Integration Studio jobs on a remote host, open SAS Data Integration Studio and select **Tools** ⇒ **Options** ⇒ **SAS Server**. Select the remote SAS Application Server, and then click **OK**.

### **Register Your Batch Job Deployment Directory**

Batch jobs run through the Platform Scheduler, as configured through the Schedule Manager.

To register the directory for your batch jobs, follow these steps:

1. Create the directory on the specified host.
2. In SAS Management Console, expand the **Schedule Manager** and select **Deployment Directories**.
3. With the name of the new SAS Application Server selected, select **New**.
4. In the New Directory window, enter a directory name and path, and then click **OK**.

### **Deploy a Job Remotely Using SAS Data Integration Studio**

To test your remote job setup, follow these steps:

1. Start SAS Data Integration Studio.
2. In the **Inventory** tab, expand **Jobs**.
3. Right-click the job you that want to deploy and select **Scheduling** ⇒ **Deploy**.
4. In the Deploy a job for scheduling window, select a batch server and change the name, deployment directory, and job location, as necessary.
5. Click **OK** to deploy the job.

The deployed code is automatically copied to the remote host and is ready for scheduling or running at any time.

## **Set up for HP Neoview Tables and Netezza Tables**

To access HP Neoview tables or Netezza tables in SAS Data Integration Studio, administrators must first register the appropriate servers and libraries. Before registering servers and libraries for Neoview or Netezza, administrators must add resource templates for these databases.

To add resource templates for Neoview and Netezza, follow these steps once per metadata server. Repeat for all metadata servers that SAS Data Integration Studio users access.

1. Open SAS Management Console.
2. In the **Repository** box, select **Foundation**.
3. In the **Plugins** tab, expand the **Metadata Manager**.
4. Right-click the **Resource Templates** folder and select **Add Resource Template**.
5. In the Add Resource Template Wizard, select **Custom**, and then click **Next**.
6. To find the folder that contains the resource templates for HP Neoview and Netezza, click **Add**. A window displays the file system where SAS Management Console 9.2 is installed.
7. Navigate to the folder where SAS Management Console 9.2 is installed. Expand that folder, and then expand the **9.2** subfolder.
8. In the 9.2 subfolder, expand the **Resource Templates** subfolder. You should see the following templates: Neoview\_Library.zip, Neoview\_Server.zip, Netezza\_Library.zip, and Netezza\_Server.zip. Install both the library template and the server template for each new database that you want to access.
9. Select a template (such as Neoview\_Library.zip) and click **OK**. The template is added to the window in the wizard. Repeat Steps 6, 7, and 8 for each template that you want to add. When all of the desired templates have been added to the window, click **Next**.
10. Review the templates to be installed, and then click **Finish**. The templates are installed in the **Resource Templates** folder in SAS Management Console.

---

## Administering Message Queues

### ***What Are Message Queues?***

Message queues are collections of data objects that enable asynchronous communication between processes. One application writes a message to a queue. Another application reads messages from the queue to begin the next step in a process. Verification processes guarantee that all messages are transmitted without error.

Queue managers handle message transmission and verification.

### ***About the Third-Party Messaging Software***

Fundamental message queue technology is provided in the following third-party software:

- Microsoft MSMQ
- IBM WebSphere MQ

You need to install and configure at least one messaging software application before you register metadata and run SAS messaging jobs.

### ***About Message Queues in the SAS Intelligence Platform***

In the SAS Intelligence Platform, you register metadata for queues and queue managers by using SAS Management Console after you install and configure third-party messaging software.

After you register metadata, you use the following transformations to create messaging jobs in SAS Data Integration Studio:

- Microsoft Queue Reader
- Microsoft Queue Writer
- WebSphere Queue Reader
- WebSphere Queue Writer

SAS Data Integration Studio also enables impact analysis and reverse impact analysis on queues, which you can use to track data flow into and out of queues.

The following data can be written to message queues using the queue writer transformation:

- text of length up to 32,767 bytes
- rows from SAS tables, one row per message
- external files

The queue reader transformation can be configured to read a specified number of rows from the message queue.

## Requirements for Message Queues

To implement message queuing, you need to install and configure Microsoft MSMQ or WebSphere MQ. Start the installation process by downloading and installing third-party software on specified SAS Application Servers. In general you can plan to install a queue manager on each host that runs a SAS Workspace Server that runs message queue jobs. If you choose WebSphere MQ, you can install queue managers on hosts other than SAS Workspace Servers.

## Install and Configure the Microsoft MSMQ Message Queue Software

To install the MSMQ software on a SAS Workspace Server host that runs message queue jobs, follow these steps:

1. Ensure that the host meets the requirements for message queues, as described in [“Requirements for Message Queues” on page 48](#).
2. In Windows, select **Add or Remove Programs**.
3. In the shortcut bar of the Add or Remove Programs window, select **Add or Remove Windows Components**, which opens the Windows Components Wizard.
4. In the Windows Components Wizard, select the **Message queuing** check box and click the **Details** button, which displays the Message queuing dialog box.
5. In the Message queuing dialog box, select all four subcomponent check boxes, and then click **OK** to return to the Windows Components Wizard.
6. Click **Next** to install the MSMQ software, and then close the Windows Components Wizard.
7. Use the MSMQ software to create the queues and queue managers that are required on this particular host. You need to create at least one queue for each queue manager. The same object names are used in SAS, so you might want to include the host name as part of the object names.
8. Use the Microsoft MSMQ software to start the queue managers.
9. Use SAS Management Console to register metadata for queues and queue managers, as described in [“Administering SAS Data Integration Studio” on page 36](#).

## Install and Configure the IBM WebSphere MQ Message Queue Software

To install and configure the WebSphere MQ software, follow these steps:

1. Download the software and documentation. Start with the following Web site:  
<http://www-306.ibm.com/software/integration/wmq/index.html>.  
Work with installation representatives from IBM and SAS as needed. At minimum, you need to install the WebSphere MQ Client software on all SAS Workspace Server hosts that run message queue jobs. Make sure that you meet the requirements for message queuing that are specified in [“Administering Message Queues” on page 47](#).

Note that if you install only the WebSphere MQ Client software, then you need to configure the environment variable MQSERVER to communicate with the WebSphere MQ Server software.



2. Use the WebSphere MQ software to create queues and queue managers on their respective hosts. For each queue manager you need to define at least one queue. For reference in SAS, you might want to include the machine name in the names of the queue managers.
3. Use the WebSphere MQ software to start the queue managers on their respective hosts.
4. Use SAS Management Console to register metadata for queues and queue managers, as described in the next section.

### **Create a Message Queue Polling Server for WebSphere MQ Message Queue Software**

If your site uses the WebSphere MQ (MQSeries) or WebSphere MQ Client (MQSeries C) from IBM, you can use SAS Message Queue Polling Servers. The servers can monitor message queues, manage messages, and trigger the execution of SAS programs in response to messages. The implementation process involves the creation of a queue manager, a queue polling server, a queue reader job, and a SAS program that interprets messages. The implementation process is described in detail in *Application Messaging with SAS*.

### **Create a Message Queue Server and Register Queues**

To register metadata for a queue and a queue manager, follow these steps:

1. In SAS Management Console, right-click **Server Manager** and select **New Server**.
2. In the New Server Manager, under **Queue Managers**, select either **MSMQ Queue Manager** or **WebSphere Queue Manager** and click **Next**.
3. Enter the exact name as it is defined in the third-party messaging software for the new queue manager. The names are case-sensitive.
4. Enter a description, and then click **Next**.
5. Select queues and folders, and then click **Next**.
6. Specify an authentication domain, identify the host, and accept the default port number of 1414.
7. Click **Next**, review your entries, and click **Finish**.

Be sure to register metadata for all of the queues and queue managers that are used in SAS jobs.

To begin running messaging jobs, make sure that the queue managers are running on their respective hosts.

### **Manage Queues and Queue Managers**

To modify the metadata definitions of queues and queue managers, use the New Server Wizard in SAS Management Console to delete the existing definitions and create new definitions.

Before you delete metadata, you might want to run impact analysis and reverse impact analysis to see the jobs that include the queues. To run impact analysis or reverse impact analysis, follow these steps:

1. In SAS Data Integration Technologies, click the **Inventory** tab and expand **Message Queues**.
2. Right-click a message queue and select **Analyze**.
3. In the Analysis window, examine the graphical displays of impact analysis and reverse impact analysis to see how the message queue is used in existing jobs.

You can delete the message queue if the analysis diagrams show no connections to existing jobs or other metadata objects. If the diagrams show connections, edit or remove the metadata objects before you delete the message queue.

To delete metadata for queues and queue managers, right-click the object in the Server Manager of SAS Management Console and select **Delete**. Use the third-party software to delete the physical queue objects.

---

## Configuring the SAS Workspace Server to Enable the Bulk Loading of Data

To improve performance, SAS Data Integration Studio transformations such as the Table Loader can be configured to use the bulk-loading capabilities of native DBMS software.

To enable bulk-loading, you need to set the `-allowxcmd` option in the invocation statement for the object spawner that instantiates SAS sessions on the SAS Workspace Server.

To set `-allowxcmd` in the Windows operating environment, follow these steps:

1. On the SAS Workspace Server host, in a Command Prompt window, change directories to `SAS-configuration-directory\Lev1\ObjectSpawner`.
2. Stop the object spawner by entering the command `ObjectSpawner stop`.
3. If the object spawner is set up to run as a service, remove the service. You can do this by entering the command `ObjectSpawner remove`.
4. Edit `ObjectSpawner.bat`, which is the script that is used to start the object spawner. Add the spawner invocation option `-allowxcmd` to the appropriate line. If you run the object spawner as a service (which is recommended), append the option to the line following the label `:install`. Otherwise, append the option to the line following the label `:start2`.
5. Save your changes.
6. If you want to run the object spawner as a service, install the service. You can do this by entering the command `ObjectSpawner install`.
7. Start the object spawner by entering the command `ObjectSpawner start`.

To set `-allowxcmd` in the UNIX operating environment, follow these steps:

1. Change directories to `../Lev1/appServer/ObjectSpawner`.
2. Stop the object spawner by entering the command `ObjectSpawner.sh stop`.
3. Edit the script `ObjectSpawner.sh` so that the command used to start the object spawner contains the option `-allowxcmd`. Add the option to the line that begins with `$CMD`, just before the first `>` sign.
4. Save your changes.

- Restart the object spawner by entering the command `ObjectSpawner.sh start`.

---

## Setting X Command Options to Run Perl or Shell Scripts

If you intend to include UNIX scripts in your SAS Data Integration Studio jobs, you need to configure the SAS Workspace Server or batch server that runs the job. Specifically, in the server invocation statement, set the option `-allowxcmd` or `-nonoxcmd` to enable the server to execute operating system commands.

In your job or SAS program, set the option `-noxwait` to ensure that the program ends normally.

Another course of action is to select the **Allow XCMD** check box in the server's Advanced Options window. In the server properties window, select **Options** ⇒ **Advanced Options**. Then click the **Launch Properties** tab.

---

## Setting Up the SAS Data Quality Server Software

### Overview of SAS Data Quality Server Software

When you run the SAS Deployment Wizard, you install the SAS Data Quality Server software and configure a SAS Application Server to read a Quality Knowledge Base from DataFlux, a SAS company. Installing a Quality Knowledge Base enables the use of the data quality transformations in the Data Quality folder in SAS Data Integration Studio. You can also use the data quality functions in the Expression Builder. The Expression Builder is available in many data integration transformations.

SAS Data Integration Studio has additional transformations that execute data quality jobs and real-time services on DataFlux Data Management Servers. The DataFlux jobs and real-time services are created using DataFlux Data Management Studio. The DataFlux client allows you to analyze and profile data quality across your enterprise, and create customized Quality Knowledge Bases that enforce your business rules.

This section explains the installed configuration of the SAS Data Quality Server software, and how to perform a simple test to ensure that the system is working. This section also covers several administrative tasks associated with data quality, including the following:

- registering DataFlux Data Management Servers
- downloading new locales
- creating new schemes
- setting data quality options in SAS Data Integration Studio

*Note:* If you are unfamiliar with the subject of data quality technology and terminology, refer to any of the following documents: *SAS Data Quality Server: Reference*, *DataFlux Data Management Studio: User's Guide*, and *DataFlux Data Management Server: Administrator's Guide*.

## About the Data Quality Configuration

When you install the data quality software, the SAS Deployment Wizard installs and configures the SAS Data Quality Server, SAS Foundation, and SAS Data Integration Studio software. If you deploy an enterprise data integration software bundle, the SAS Deployment Wizard also installs the DataFlux client and server and creates metadata for the server. After installation, the data quality software is fully operational. The following information is provided so that you can change the default configuration.

The SAS Data Quality Server software is installed in `!SASROOT\dquality`.

Locales and schemes are located in directories subordinate to `dquality`: `sasmisc\QltyKB\sample\locale` and `sasmisc\QltyKB\sample\scheme`.

During execution, data quality jobs reference a specific Quality Knowledge Base (QKB) at a specific location. The location of the QKB can be specified by the job, by the DI Studio client, or by one of two system defaults.

Data quality jobs can specify the location of a Quality Knowledge Base by specifying a value for the system option `DQSETUPLOC`.

To create jobs that reference non-default QKBs, open SAS Data Integration Studio, select **Tools** ⇒ **Options**, and display the **Data Quality** tab.

To set a default QKB location on a SAS Application Server, open the file `SAS-configuration-directory\Lev1\SASApp\sasv9_usermods.cfg` and specify a new location, as shown in this example:

```
-dqsetuploc "C:\Program Files\DataFlux\QltyKB\CI\2010A"
```

When you install the server, the write-protected system default for `DQSETUPLOC` is specified in the file `SAS-configuration-directory\Lev1\SASApp\sasv9.cfg`. The default entry in that file is as follows:

```
DQSETUPLOC "!SASROOT\dquality\sasmisc\QltyKB\sample"
```

The default locale is set as follows in `sasv9_usermods.cfg`:

```
-dqlocale (ENUSA)
```

You can change values in the SAS configuration file `sasv9_usermods.cfg` without restarting servers. Any SAS Data Integration Studio clients need to be restarted in order to use new values.

*Note:* Do not edit `sasv9.cfg`, so that your system can revert to a known default state.

## Test the SAS Data Quality Server Software

To verify that your SAS Data Quality Server software is working, create a job in SAS Data Integration Studio that contains a Create Match Code transformation.

Follow these steps to create such a job:

1. From the SAS Data Integration Studio desktop, select **Tools** ⇒ **Process Designer** to start the New Job Wizard.
2. In the New Job Wizard, enter a name for the job—such as Create Database Match Codes—in the **Name** box. Then, click **Finish**. A new Process Designer window appears on the right side of your workspace.
3. From the **Process Library** tree, select and drag the Create Match Code template into the Process Designer.

4. From the **Inventory** tree, or another tree view, select and drag the metadata object for any table to the source drop zone.
5. From the **Inventory** tree, or another tree view, select and drag the metadata object for any table to the target drop zone. Both a Loader and the target table are added to the graphical representation of the job.
6. Double-click the **Create Match Code** transformation to display the **Properties** menu.
7. As the Properties window opens, a dialog box indicates that match definitions are being loaded from the Quality Knowledge Base. This indicates that the SAS Data Quality Server software has been properly installed and configured.
8. To see a list of the match definitions that were loaded, specify a source table for the job and display the **Match Code** tab of the Properties window. Double-click the **Match Definitions** column to show the list of match definitions.

### **Register a New DataFlux Data Management Server**

DataFlux Management Servers run jobs and real-time services that are created with DataFlux Data Management Studio. One Data Management Server is installed and registered automatically when you install an enterprise data integration software bundle.

To register another DataFlux Integration Server in SAS metadata, follow these steps:

1. Open SAS Management Console, right-click the **Server Manager**, and select **New Server**.
2. In the New Server Wizard, select **Http server** and click **Next**.
3. Enter a name and optional description and click **Next**.
4. Enter the optional server software version number and vendor name.
5. Select or enter the network path to the DataFlux Integration Server.
6. For the **Application Server Type**, select **DataFlux Data Management Server**, and then click **Next**.
7. Select authentication and protocol options.
8. Specify the name of the host.
9. Accept the default port number 2136.
10. Specify a proxy URL if one is needed.
11. Click **Next**, review your entries, and click **Finish**. The new server appears in the **Plug-Ins** tab.

### **Download Locales**

When initially installed, the Quality Knowledge Base contains a single locale (English/USA). You can obtain additional locales from DataFlux at the following Web address: <http://www.dataflux.com/QKB>. DataFlux regularly updates locales, so it is important that you install the latest versions after you install the data quality software.

If you install additional locales, you need to update your data quality setup file accordingly, as indicated in the documentation that is provided with each locale.

Information about locating and editing the setup file is provided in the *SAS Data Quality Server: Reference*.

Note that you can create new locales and edit existing locales using DataFlux Data Management Studio.

## Create Schemes

A scheme is a reusable collection of match codes and standardization values that is applied to input character values for the purposes of transformation or analysis. Schemes can be created in Blue Fusion Data (BFD) format or SAS format (NOBFD). Before your data integration developers can use the Apply Lookup Standardization template in SAS Data Integration Studio, you must specify a scheme repository and a scheme repository type. You also need to create schemes by using the SAS Data Quality Server or dfPower Studio software. For information about how to create schemes, see the relevant product documentation.

Scheme repositories should be separated based on scheme type. BFD schemes and NOBFD schemes should be stored separately to ensure that standardization jobs use the appropriate schemes. Two scheme repositories are provided in the default installation. On the SAS Application Server, the default scheme directory is *SAS-configuration-directory\Lev1\appServer\SASEnvironment\QltyKB\scheme*. This directory contains a number of BFD schemes that are supplied with the SAS Data Quality Server software.

A second default scheme directory is provided for interactive SAS sessions that are started on the local host: *..\dquality\sasmisc\content\scheme*.

In SAS Data Integration Studio, the scheme repository and the scheme repository type are specified in the **Data Quality** tab of the Options dialog box (select **Tools** ⇒ **Options**). The default scheme repository type is **dfPower Scheme (BFD)**. No default scheme repository is specified. When you specify a scheme repository in SAS Data Integration Studio, a full or explicit path is recommended. Relative paths must be specified relative to the SAS Application Server.

If you change an existing value in the **Scheme Repository Type** or **Scheme Repository** box, then you need to replace any existing instances of the Apply Lookup Standardization transformation. Replacement of the Scheme Repository Type or Repository is required. The scheme metadata is added to these jobs when they are run for the first time.

To update a job to use a different scheme repository:

1. Add a new Apply Lookup Standardization transformation to the job.
2. Configure the new transformation.
3. Delete the old transformation.
4. Move the new transformation into place.

## Set Data Quality Options for SAS Data Integration Studio

You can set several options related to data quality by using the **Data Quality** tab in the Options dialog box in SAS Data Integration Studio (select **Tools** ⇒ **Options**).

---

## Redirecting Output and Logging Information to a File

SAS Data Integration Studio jobs generate SAS code when they are executed. It is sometimes useful to designate destinations for the outputs and logs that are associated with this code. To specify alternative destinations for the SAS log and SAS output, add the following options to the **sas** command that starts the SAS Workspace Server.

1. In SAS Management Console, expand the **Server Manager**, and then expand the node of the logical workspace server that is used by SAS Data Integration Studio clients.
2. Right-click the icon for the physical SAS Workspace Server, and select **Properties** from the pop-up menu.
3. In the Properties window, click the **Options** tab.
4. Edit the text in the **Command** text box. By default, this text is set as follows:

```
sas -config "SAS-configuration-directory\Lev1\appserver\sasv9_usermods.cfg"
```

To route the SAS log to a file, edit the command to make it look something like this:

```
sas -config "C:\SAS\Config\Lev1\SASApp\sasv9_usermods.cfg"
-log DIStudioLog %H%M.log -logparm "rollover=auto"
```

For routing the SAS output to a file, the command should look like this:

```
sas -config "SAS-configuration-directory\Lev1\SASApp\sasv9_usermods.cfg"
-print print-file-name.lst
```

5. If you are redirecting the log, enter the following parameter in the **Object Server Parameters** text box:

```
applevel=2
```

This allows an appropriate level of log information to be routed to the file.

6. Click **OK** in the Workspace Server Properties dialog box.

---

## Enabling Status Code Handling

### Overview of Status Code Handling

When a data integration developer executes a job in SAS Data Integration Studio, notification of the job's success or failure can be handled in many ways:

- It can be e-mailed to a person.
- It can be written to a file.
- It can cause the execution of an autocall macro.

A **Status Handling** tab is included in the property windows for jobs and for some transformations. Users can select options from a list of code conditions and actions on this tab. For example, a user can select a code condition such as **successful** and associate it with an action such as Send e-mail.

Before data integration developers can use some of the actions, you must set up the environment properly. Such setup is required for the following actions:

- E-mail actions: You must set SAS system options for mail for the SAS Application Server that is used to execute jobs.
- Custom actions: You must make a SAS macro autocall library accessible by the SAS Application Server that is used to execute jobs.
- Send Entry to a Data Set: You must pre-assign the library that contains the data set to a SAS Application Server before the job or transformation executes.

For information about how to support the first two actions listed above, see the following subsections. For information about libraries, see the “Assigning Libraries” chapter of the *SAS Intelligence Platform: Data Administration Guide*.

### Support the E-mail Action

Setting up the E-mail action is simple. Just add the appropriate SAS system options for e-mail to the configuration file `.. \Lev1\appServer\sasv9_usermods.cfg`. For example, if you are using the SMTP mail interface, you would add to this file the following options:

```
-emailsys smtp
-emailhost email-server
```

In this case, the value of *email-server* specifies the SMTP server that supports mail access for your site.

*Note:* The mail system options are documented in SAS Help and Documentation.

### Support the Custom Action

Using the Custom action, a data integration developer can execute a macro in a macro autocall library in order to provide user-defined status handling for a job or transformation. On the administrative side, all you need to do is to make sure that the autocall library is known to the SAS Application Server. You do this by editing the file `.. \Lev1\appServer\sasv9_usermods.cfg`. By default, the file contains a line similar to this:

```
-sasautos ("SASEnvironment/sasMacro" SASAUTOS)
```

Add the library to the list of libraries in parentheses. The path to the library can be a full path or a path relative to `.. \Lev1\appServer`.

---

## Using FTP or HTTP Servers to Access External Files

External files are often stored on FTP or HTTP servers. To create a new FTP or HTTP server, follow these steps:



1. In SAS Management Console, right-click the **Server Manager** and select **New Server**.
2. In the New Server window, under Content Servers, select **Ftp Server** or **Http Server**, and then click **Next**.
3. Specify a server name and click **Next**.
4. Specify a base path for the server. Add the software version and vendor to help identify the server.
5. View and select the appropriate application server type, or accept the default value (**None**).
6. Select the **Supports SOAP-Based Web Services** check box if the new server supports those services, and then click **Next**.
7. Enter authentication and host information. For more information about authentication, see the *SAS Intelligence Platform: Security Administration Guide*.
8. Accept the default port number.
9. Enter a proxy URL to hide the direct path to the server.
10. Click **Next**, review your entries, and click **Finish**.

For more information about how to define a server, see the *SAS Intelligence Platform: Application Server Administration Guide*.



## Chapter 6

# Administering SAS Enterprise Guide

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## Overview of SAS Enterprise Guide Administration

### *Introducing SAS Enterprise Guide*

SAS Enterprise Guide provides a graphical interface and a task structure for the SAS programming language. Wizards and menu options enable you to quickly generate projects, tasks, and process flows. The process flows analyze data, create graphs, and generate reports. Behind each process flow is a SAS program that you can execute and edit.

With SAS Enterprise Guide, you can access data in many formats and third-party databases, in operating environments including UNIX, z/OS, and Windows.

If you build and maintain OLAP cubes using SAS OLAP Server, you can query those cubes using SAS Enterprise Guide.

When users connect to a SAS Metadata Server within the SAS Intelligence Platform, the primary administrative application is SAS Management Console. Several additional administrative features are provided by the SAS Enterprise Guide Explorer application. If you run SAS Enterprise Guide without a SAS Metadata Server, then SAS Enterprise Guide Explorer is your administrative application.

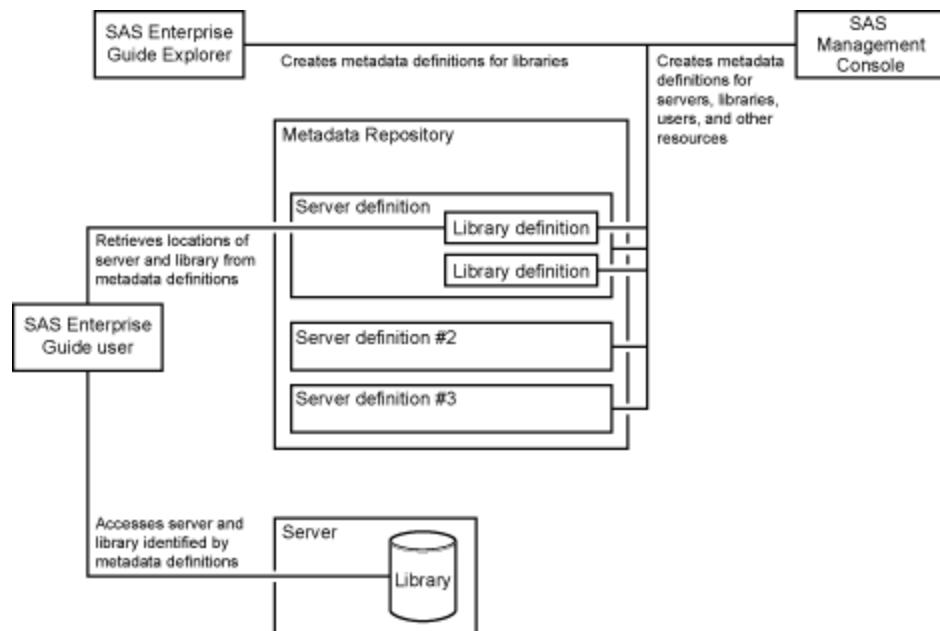
### **Administrative Tasks**

To administer SAS Enterprise Guide, you perform the following tasks:

- create library metadata
- create, manage, and deploy connection profiles
- configure access controls
- monitor log files as needed

The following diagram depicts how you use administrative tools to create and access libraries.

**Figure 6.1** Using SAS Management Console and SAS Enterprise Guide Explorer within the SAS Intelligence Platform



### Unique Features of SAS Enterprise Guide Explorer

SAS Enterprise Guide Explorer adds the following administrative features to those that are provided by SAS Management Console:

- administering a common environment configuration for SAS Enterprise Guide users
- importing tasks created on other instances of SAS Enterprise Guide
- deploying connection profiles between instances of SAS Enterprise Guide

### SAS Enterprise Guide Features Available Only on the SAS Intelligence Platform

Using SAS Enterprise Guide within the SAS Intelligence Platform provides access to the following features:

- stored processes
- information maps
- roles and capabilities
- SAS folders
- publishing

*Note:* When SAS Enterprise Guide runs on the SAS Intelligence Platform, you cannot reference library definitions that were created with SAS Enterprise Guide Explorer.

## Managing Connection Profiles in SAS Enterprise Guide

### About Connection Profiles

After you install SAS Enterprise Guide, you either create one or more connection profiles for the user or you configure the application to run in no-profile mode, as described in [“Start SAS Enterprise Guide in No-Profile Mode”](#) on page 65.

If you have a profile, you connect to a repository by default when you start SAS Enterprise Guide. You can also select a profile to access a different repository.

Within the SAS Intelligence Platform, the connection to the SAS Metadata Server requires agreement between the installed versions of the software, as defined in the following table.

**Table 6.1** Software Compatibility by Release

SAS Enterprise Guide Release	Compatible SAS Metadata Server Release
4.1	9.1.3
4.2	9.2
4.3	9.2 and 9.3
5.1	9.2 and 9.3

You can deploy and maintain connection profiles from a central location, and you can update profiles automatically from that central location when you start SAS Enterprise Guide. See [“Create a Shared Profile Deployment with Automatic Updates”](#) on page 63.

### Add, Modify, or Delete Connection Profiles in SAS Enterprise Guide Explorer

To administer connection profiles, follow these steps:

1. In SAS Enterprise Guide, select **Tools** ⇒ **SAS Enterprise Guide Explorer**.
2. In the SAS Enterprise Guide Explorer, select **File** ⇒ **Manage Profiles**.
3. In the Connections dialog box, select **Profiles** to add, modify, or delete connection profiles, or select **Updates** to specify and invoke a profile configuration file. Select **Servers** to specify the default SAS Workspace Server, as described in the next section.
4. Click **Add** to create a new profile.
5. In the Create Profile dialog box, specify a server name and optional description.
6. For remote servers, enter a network name in the **Machine** box.

7. To simplify support, accept the default port number.
8. To authenticate users with the user ID and password that are defined in the Windows operating environment, select the **Use integrated Windows authentication** check box.
9. If an authentication domain has been implemented, enter the name of that domain in the **Authentication domain** box. Otherwise, leave the box blank. For information about authentication domains, see *SAS Intelligence Platform: Security Administration Guide*.
10. Click **Save** to add the new profile.
11. To activate the new profile, select it in the **Connections** dialog box and select **Set Active**. If a previous connection was active, it is closed and a new connection is opened. The selected profile is activated each time the user opens SAS Enterprise Guide. The active profile can be changed at any time.

### **Specify the Active Profile**

You can specify one profile as the active profile. To specify an active profile, follow these steps:

1. Select **File** ⇒ **Manage Profiles** to open the Connections dialog box.
2. Select **Profiles** from the selection pane.
3. Select a profile from the list of defined profiles, and then click **Set Active**.

### **Select a Default SAS Workspace Server in Explorer**

SAS Workspace Servers execute SAS programs and stored processes as they are requested by SAS Enterprise Guide. To specify the server that runs SAS for a given instance of SAS Enterprise Guide, follow these steps:

1. In SAS Enterprise Guide, select **Tools** ⇒ **SAS Enterprise Guide Explorer**.
2. In the SAS Enterprise Guide Explorer, select **File** ⇒ **Manage Profiles**.
3. Click **Servers**, and then click the down arrow to select a default SAS server.

*Note:* Performance improvements can be achieved when groups of users select a load-balancing cluster of SAS Workspace Servers. For information about load-balancing, see the *SAS Intelligence Platform: Application Server Administration Guide*.

4. If a SAS Workspace Server exists on the local host, and you want that server to appear in the list of servers, select **Automatically add local SAS server (if installed) to the list**. The server does not need to be registered on the SAS Metadata Server for this feature.

### **Create a Shared Profile Deployment with Automatic Updates**

After you define profiles, you can deploy those profiles across your enterprise. You can also automatically update your profiles when you initialize SAS Enterprise Guide. The automatic update specifies a set of profiles and an active profile.

The SAS Add-In for Microsoft Office shares profile information with SAS Enterprise Guide. When you create a shared profile deployment, the SAS Add-In for Microsoft Office and SAS Enterprise Guide update their profiles automatically. Profiles are updated when you start SAS Enterprise Guide or start a Microsoft Office application.

Follow these steps to create a shared profile deployment and enable the automatic update of profiles:

1. Open SAS Enterprise Guide, and then select **Tools** ⇒ **SAS Enterprise Guide Explorer**.
2. In SAS Enterprise Guide Explorer, select **Tools** ⇒ **Profile Deployment Wizard**.
3. On page 1 of the wizard, read the wizard tasks and click **Next**.
4. On page 2, click **Configure Profiles** to display the Connections dialog box. Click **Add** or **Modify** to specify the profiles that you plan to deploy and automatically update.
5. On page 3, click **Begin Test** to test your profiles. When you have finished the test, click **Next**.
6. On page 4, specify a network-accessible storage location that will receive the configuration file SDSUpdate.xml. The configuration file will contain your profiles, and it will also identify your choice of active profile. Make sure that the storage location can be accessed by all relevant instances of SAS Enterprise Guide and the SAS Add-In for Microsoft Office.
7. On page 5, specify a local storage location for the configuration files. The directory that you specify will receive the file SDSControl.xml. The SDSControl.xml file will contain a statement that enables the automatic update of profiles on the local host, and it will specify the network storage location of SDSUpdate.xml.
8. On page 6, click **Finish** to generate the configuration files and enable automatic profile updates on the local host.
9. Copy or move the file SDSUpdate.xml from your local host to the network storage location that you specified in the wizard.
10. Copy or move the file SDSControl.xml from your local host to your SAS software depot. Locate the file in the top-level directory for SAS Enterprise guide. Here is a typical location:

```
\\depot-host\Depot_date_type\products\eguide_release_win_locale_sp0_1
```

With the configuration files in place, you can now deploy SAS Enterprise Guide to new hosts from your depot with pre-configured profiles and a specified active profile.

11. To enable the automatic update of profiles on other hosts, open SAS Enterprise Guide Explorer, open the **File** menu, and select **Manage Profiles**.
12. In the Connections window, select **Updates**.
13. Select **Update profiles automatically**.
14. In the field **Location of update file**, specify the network storage location of the file SDSUpdate.xml.
15. To update profiles immediately, click **Check for updates now**.



## Deploy Customized Options

Follow these steps to deploy a standardized set of site-specific options:

1. Start the instance of SAS Enterprise Guide in your SAS software depot, and then select **Tools** ⇒ **SAS Enterprise Guide Explorer**.
2. In SAS Enterprise Guide Explorer, select **Tools** ⇒ **Customize SAS Enterprise Guide Options**.
3. In the Options dialog box, review and update each option in each category to suit the needs of your enterprise.
4. Click **Save As** to open the Save File window. Note the default storage location, and then click **Save** to update the file EGOptions.xml.
5. To deploy SAS Enterprise Guide with customized options, copy the file EGOptions.xml from your host into your SAS software depot. Copy the file into the top-level directory for SAS Enterprise Guide. Here is a typical network location:

```
\\depot-host\Depot_date_type\products\eguide__release__win__locale__sp0__1
```

## Create Desktop Shortcuts for Profiles

After you create profiles, you can associate profiles with shortcuts on the Windows desktop. This capability enables you to start SAS Enterprise Guide with a specific profile by clicking on a specific shortcut. You can also start SAS Enterprise Guide without a profile by using a desktop shortcut.

To associate a profile with a desktop shortcut, follow these steps:

1. Create a shortcut for the file SEGUIDE.exe. By default, it will be in the directory **C:\Program Files\SAS\EnterpriseGuide\version**.
2. Right-click on the shortcut that you created and select **Properties**.
3. To start SAS Enterprise Guide by using a specific profile, locate the path in the **Target** box. At the end of the path, add a blank space and type **/profile: profile-name**. If the profile name includes spaces, you must enclose the name in quotation marks:

```
"C:\Program Files\SAS\EnterpriseGuide\x.x\SEGUIDE.exe" /profile:"Cube Query 1"
```

4. To use the shortcut to run SAS Enterprise Guide without a profile, add **/noprofile** to the end of the **Target** box:

```
"C:\Program Files\SAS\EnterpriseGuide\x.x\SEGUIDE.exe" /profile:noprofile
```

5. Click **OK**.

## Start SAS Enterprise Guide in No-Profile Mode

To run SAS Enterprise Guide without a profile, display the Connections dialog box, select **Profiles**, and then select **<do not use a profile>**.

---

## Create and Manage Libraries in SAS Enterprise Guide

With the Administer permission, you can use SAS Enterprise Guide Explorer to create, modify, and delete libraries, as is also the case with SAS Management Console. Select **Tools** ⇒ **Assign Project Library**. For information about library management, see *SAS Intelligence Platform: Data Administration Guide*.

---

## Review Library Access in SAS Enterprise Guide

When you create a library using SAS Management Console, the library is defined on the SAS Metadata Server, and the library assignment is shared across SAS servers. In SAS Enterprise Guide, access to registered libraries is determined in part by the method that is used to assign those libraries.

To ensure appropriate library access for each SAS Enterprise Guide client, follow these steps:

1. Start SAS Enterprise Guide and select **Tools** ⇒ **SAS Enterprise Guide Explorer**.
2. In the left pane, expand **Servers** and select a SAS Application Server such as **SASApp**.
3. After you connect to the server, expand the **Libraries** node to display the libraries that are registered in metadata. Libraries with a white library icon are not pre-assigned to a server in a server initialization command. Libraries that are pre-assigned, such as Work, have a yellow library icon.
4. Right-click one of the libraries that you can access from that client, and select **Properties**.
5. If the library is pre-assigned, review the library's path and LIBNAME statement options, and then click **Close**.
6. If the library is not pre-assigned, the Library Properties dialog box appears. Select **Assignment**.
7. Review the library assignment method based on the access requirements of the SAS Enterprise Guide client and the access controls on the registered libraries. The library assignment methods are defined as follows:

### **SAS Enterprise Guide**

assigns the library based on the engine and LIBNAME statement options that are defined on the SAS Metadata Server. When you choose this library assignment method, SAS Enterprise Guide ignores table and column metadata access control (Read, Write, Create, Delete).

Use this library access method when the client requires Write access to the library, and when the tables in the library are not subject to access control. If Write access to a registered library is not required, use **Metadata Library Engine**.

Write access to registered libraries should be closely monitored because the SAS code that is generated by SAS Enterprise Guide does not automatically

synchronize metadata. Changes to columns are written into the physical table, but are not written into the table metadata.

Note that you can edit the code that is generated by SAS Enterprise Guide to include the METALIB procedure, which can be used to update table metadata.

### **SAS Server**

assigns the library by merging the library definition from the current SAS server with the library metadata that is stored on the SAS Metadata Server. Metadata access control for tables and columns is not enforced. The library is assumed to be pre-assigned on the SAS server using an AUTOEXEC or the METAUTOINIT process that runs when the server is initialized.

Use this library access method to assign a library consistently across clients. The clients include SAS Enterprise Guide, the SAS Add-In for Microsoft Office, and the SAS Stored Process Server.

When you create a new library using SAS Enterprise Guide and select **SAS Server** as the library assignment method, the new library is not registered on the SAS Metadata Server. Use SAS Management Console to register these libraries.

### **Metadata Library Engine**

assigns the library using the metadata LIBNAME engine. By default, the library is Read-Only. You cannot add or create new tables, and SAS Enterprise Guide displays registered tables only. Use this library assignment method to protect the referential integrity of the table metadata. This method is recommended for OLAP cube libraries.

To enable Write access at the library level and enforce metadata access control at the table and column level, deselect the check box labeled **Show only tables with metadata definitions**. With this library access method, SAS Enterprise Guide displays all of the tables in the library, including any tables that are not registered.

Note that when you create a new library and specify the **Metadata Library Engine**, the library is automatically registered on the SAS Metadata Server.

8. If the assignment method for the selected library does not meet the needs of the SAS Enterprise Guide client, use SAS Management Console. SAS Management Console is used to change the library assignment, create new libraries, or change access permissions.
9. At a minimum, make sure that you review the assignment methods for all of the registered libraries that require Write access from SAS Enterprise Guide clients.
10. It might be necessary to ask SAS Enterprise Guide users to contact you before they change a library assignment method.

Note that the library assignment methods that you select in SAS Enterprise Guide also apply to the SAS Add-In for Microsoft Office. For more information about the SAS Add-In for Microsoft Office, see [Administering the SAS Add-In for Microsoft Office on page 12](#).

For information about metadata access control, see the "Authorization Model" chapter of the *SAS Intelligence Platform: Security Administration Guide*.

For information about pre-assigned libraries, see the "Assigning Libraries" chapter in the *SAS Intelligence Platform: Data Administration Guide*.

---

## Managing Libraries with SAS Enterprise Guide Explorer

### Overview

SAS Enterprise Guide Explorer displays metadata objects in a tree. You can expand an element in the tree to view the contained objects. You might be asked to enter a user ID and password to view those objects.

When your user definition connects you to a SAS Metadata Server, you use SAS Management Console to create server definitions. When the server definitions are available, you can use SAS Management Console or SAS Enterprise Guide Explorer to manage libraries, tables, and logins.

For information about creating and managing servers, see the *SAS Intelligence Platform: Application Server Administration Guide*. For additional information about configuring libraries on network servers, see the *SAS Intelligence Platform: Data Administration Guide*.

### About Libraries and Tables

Libraries are collections of files that are stored on servers and accessed from SAS Enterprise Guide. When you add a metadata definition for a library, you make the metadata definition available to all the network SAS Enterprise Guide installations that have access to a specific metadata repository. Access is also granted to all other applications that use the repository. The metadata definition for a library includes the path, engine, and other options for the library. The metadata definition corresponds to the information that is specified in a LIBNAME statement.

The options that are specified in a library definition work like the commands in an AUTOEXEC.BAT file. These LIBNAME statement options are stored on the client and then executed when a SAS Enterprise Guide application connects to the specified SAS server.

Table definitions specify the tables and columns that are available within a library. You can create table definitions by using one of the following functions:

- using the Update Library Metadata function in SAS Enterprise Guide
- using the Register Tables function in SAS Management Console
- running the METALIB procedure in a SAS session (which synchronizes metadata with the physical contents of a library)
- using SAS Data Integration Studio to build a data warehouse

You can include authorization settings for both library and table definitions. The authorizations specify which libraries and tables a user can access and whether the user can change the contents of a library.

### About the Metadata LIBNAME Engine

To understand how SAS Enterprise Guide assigns and accesses libraries, it is helpful to understand the metadata LIBNAME engine. The META engine enables you to use a LIBNAME statement to reference a metadata definition for a library, rather than

specifying a physical location. By default, the META engine provides Read-Only access to a library, which prevents the library contents from being different from the library metadata.

If you use the METAOUT=DATA option in the LIBNAME statement, the META engine can access tables that are not defined in metadata but that exist in the physical library. This option enables you to add and modify tables in the library. However, any metadata authorization settings that have been applied to tables or columns in the library are enforced. If a SAS program changes the contents of a library that uses the METAOUT=DATA option, you must synchronize the physical data and the metadata. To synchronize the data, you can use the Register Tables function in SAS Management Console, the METALIB procedure, or the Update Library Metadata task in SAS Enterprise Guide.

## Add a Library

To add a library in SAS Enterprise Guide Explorer, select **File** ⇨ **New Library** and follow the prompts on each page of the Library Wizard. Use the following information as a guide, because the pages and options that you see will depend on your situation.

On page 1 of the Library Wizard, the eight-character library name must be unique on that server. The library name is entered in uppercase letters.

On page 2 of the wizard, you assign the library using one of the following:

### SAS Enterprise Guide

specifies that SAS Enterprise Guide uses the metadata that is supplied in the wizard to assign the library, using the native engine. No table or column metadata is used.

### SAS Server

specifies that the library is assigned in an AUTOEXEC statement or through the METAAUTOINIT system option. SAS Enterprise Guide does not use the metadata that you specify for the library, but assumes that the library is already assigned.

### Metadata LIBNAME Engine

specifies that SAS Enterprise Guide assigns the library by using the META engine.

If **Show only tables with metadata definitions** is selected, then only tables that have metadata definitions appear when the library is selected. When this option is selected, the library is always Read-Only. This option is equivalent to the default behavior of the META engine. If the library is assigned using the metadata LIBNAME engine and this option is selected, it is equivalent to the METAOUT=ALL option.

If the check box is not selected, then all tables in the library will appear. Tables appear even if you deny ReadMetadata permission or if the table is not registered in the metadata repository. Permissions are enforced if a user tries to open a restricted table. In this mode, the library is not Read-Only. This option is equivalent to the METAOUT=DATA option.

If **Allow tables to be created and deleted** is selected, then you can read, update, create, and delete tables. You can also insert records, create columns, and change column properties in tables. A newly created table must be registered in metadata before it can be read.

On page 4 of the wizard, you specify the engine type for the library (file system, database system, or WebDAV) and specific information for the engine type that you select. If you are defining a file system or database system library, you must choose an engine. Select the SAS engine with which the data was created. For more information about engines, see the SAS documentation for your operating environment. See also the

chapter that corresponds to your database management system in *SAS/ACCESS for Relational Databases: Reference*.

Also, on page 4 of the wizard, you might be asked to specify the physical path where the library resides on the server. Depending on the value of the **Engine Type** field, **Path** might not be present. You can use the following wildcards to substitute values into the specified path:

**<userid>**

substitutes the Windows user ID. For example, using the Windows user ID **ebeacon**, the literal **Path** value in the wizard is **\\librarypath\<userid>** and the actual path is **\\librarypath\ebeacon**.

**<sample>**

substitutes the SAS Enterprise Guide sample directory. For example, **<sample>\data** can become **C:\Program Files\SAS\Enterprise Guide 5.1\Sample\data**.

**<serveruser>**

substitutes the server logon user ID.

**<serverpassword>**

substitutes the server password.

**<libraryuser>**

substitutes the library logon user ID.

**<librarypassword>**

substitutes the library logon password.

*Note:* The libraries that you create with these wildcard substitutions can fail to provide access to those libraries for client applications other than SAS Enterprise Guide and the SAS Add-In for Microsoft Office.

On page 5 of the wizard, you can specify library options and values. If wildcards are valid in the **Path** field, then you can also use them in the **Options** field. Avoid using prompting options such as **DBPROMPT=YES**. For additional options, see the chapter that corresponds to your database management system in *SAS/ACCESS for Relational Databases: Reference*.

On page 6 of the wizard, select the folder to which the library belongs. If you do not select a folder, the library is automatically stored in the **Shared Data** folder.

On page 7, test the library definition. If the library name or libref is not unique on all servers, the conflict is listed in the **Status** column.

After you complete the wizard, the library is created and then displayed in the viewer under the client libraries for the specified servers.

## Create an Output Library

By default, SAS Enterprise Guide stores output data in the Sasuser, Work, or Egtask library, or a user-created output library on a SAS server. To change the default output library, select **Tools** ⇒ **Options** ⇒ **Output Library**. You might want to change the default output directory to create a library that can be accessed by all SAS Enterprise Guide users.

Be sure not to direct output to Sasuser on a UNIX or z/OS server, because that library is temporary in those operating environments.

To change your output directory, open SAS Management Console and select **Data Library Manager**, and then select **New Library**. Choose **Pre-assigned Library** as the

library type to ensure that the library is assigned whenever the server starts. Make sure that the library is defined on all servers that will be used with SAS Enterprise Guide.

Another strategy for changing your output library is to use SAS Management Console to add the LIBNAME statement for the library to all server definitions that are used by SAS Enterprise Guide. For new servers, include the statement in the SAS start-up statements field in the New Server wizard. For servers that have already been defined, include the LIBNAME statement in the Properties dialog box.

## Assigning Libraries

When you view a SAS server in SAS Enterprise Guide or SAS Enterprise Guide Explorer, you see a list of libraries on the selected server. The list includes both libraries that are assigned (identified with a yellow icon) and libraries that are unassigned (identified with a white icon).

Assigned libraries are libraries that are pre-assigned or assigned in an autoexec program. Unassigned libraries are libraries that have been defined in metadata but have not yet been assigned or accessed. To assign an unassigned library, right-click on the library and select **Assign**. If the library definition was created by SAS Enterprise Guide Explorer, the library is assigned using the method that was specified in the library definition. Otherwise, the library is assigned using the META engine in its default mode, which means that the library is Read-Only. The library contents also match the metadata definition, so physical tables that are not defined in metadata are not displayed. Furthermore, tables and columns are not displayed if the user is not authorized to see that data.

## Update Library Properties

Properties for libraries include information such as names, pathnames, and LIBNAME options. To view or update this information, follow these steps:

1. Select a server, and then locate the library whose properties you want to change.
2. Select the library, and then select **Properties**.
3. Select the item in the selection pane that corresponds to the information that you want to update.

## Reset a Library Login

When you are prompted for credentials when connecting to a library, those credentials are stored in metadata so they can be used later. The **Reset login** option clears these credentials, so you are prompted for credentials the next time you connect to the library.

*Note:* You cannot use this option on libraries that have been assigned using the metadata LIBNAME engine (MLE).

To reset the login for a library, right-click on the library name and select **Reset login**.

## Manage Logins with SAS Enterprise Guide Explorer

To add, modify, or delete your logins, open SAS Enterprise Guide Explorer and select **File** ⇒ **Manage Logins**. The Login Manager dialog box lists your current logins. You can edit an existing login or add a new one.

In the Edit Login dialog box, you select an authentication domain from a list of available domains. These domains are created in SAS Management Console.

---

## Configure SAS Enterprise Guide for Grid Computing

To configure a SAS grid to distribute the workload from SAS Enterprise Guide, use the SAS Grid Manager. For assistance, refer to *Grid Computing in SAS*.

You can use a SAS grid in the following ways:

- Send jobs to a load-balanced SAS Workspace Server, and specify grid as the load-balancing algorithm.
- Specify that a project is to run on a grid, by specifying the option **Use grid if available** in the Project Properties dialog box.
- Specify that a task is to run on a grid, by specifying the option **Use grid if available** in the task's Properties dialog box.
- On the logical grid server, specify a value of Force for the GridPolicy extended attribute to send all output from SAS Enterprise Guide to your grid.

To run project submissions or tasks on separate grid nodes, select the project or task option **Allow parallel execution**. If parallel tasks or project submissions share data, create pre-defined libraries on each grid node, and ensure that all tasks or project submissions write and read data from those libraries.

---

## Generate Diagnostic Logs in SAS Enterprise Guide

Other than the normal SAS log, diagnostic log files are not generated by default in SAS Enterprise Guide. If you would like to generate log files to help solve a problem, contact SAS Technical Support.

---

## Tasks that Require Other SAS Software

SAS Enterprise Guide includes tasks that require the use of other SAS software. The SAS Forecast Studio tasks require the installation of the SAS Forecast Server software. The Rapid Predictive Modeler task requires the installation of the SAS Enterprise Miner software.

To run the tasks that use SAS Forecast Server or SAS Enterprise Miner, your role requires certain capabilities. The capabilities are defined in "[Default Roles and Capabilities for SAS Enterprise Guide](#)" on page 73. Refer to the Time Series and Data Mining categories. Note that the Rapid Predictive Modeler task runs only on SAS 9.3 servers. The other tasks run on SAS 9.2 or 9.3 servers.



## Default Roles and Capabilities for SAS Enterprise Guide

As described in the *SAS Intelligence Platform: Security Administration Guide*, you can assign users to roles to provide access to selected capabilities in the SAS Enterprise Guide.

Using SAS Management Console, as described in “[Administering Roles](#)” on page 98 , you can assign users to roles, change the capabilities that are enabled by each role, and create new roles with unique sets of capabilities. You can also register new capabilities for custom tasks.

SAS Enterprise Guide provides four default roles named Advanced, OLAP, Analysis, and Programming. The following table defines the capabilities that are assigned by default to the four roles.

**Table 6.2** Default Capabilities Assigned to Roles for SAS Enterprise Guide

Capability	Description	Role			
		Advanced	OLAP	Analysis	Programming
Open or Import Category					
Open Files from Local Computer	Use the Open File dialog box to navigate, drag, copy, and paste. Not a substitute for system security.	X	X	X	X
Open Cube from OLAP Server	Navigate to OLAP cubes or open cube source data.	X	X	X	X
Open Files from SAS Server	View the server in the tree, navigate to the server, and open or import files. Not a substitute for system security.	X			X
Open Data from Exchange	Use menus and process flow diagrams to open files in Microsoft Exchange.	X			
Open Data from OLEDB	Use menus and process flow diagrams to open files using an installed OLE DB provider.	X			
Open Data from ODBC	Use menus and process flow diagrams to open data sources using an ODBC provider.	X			
Open Information Map	Enables the Open Information Map task.	X	X	X	X
Import Data	Enables the Import Data task.	X	X	X	X

Capability	Description	Role			
		Advanced	OLAP	Analysis	Programming
Save or Distribute Category					
*Send SAS Content	Send SAS content to Microsoft Office applications.	X			
Save Files to Local Computer	Use the Save File dialog box to navigate, copy, paste, and drag in the local file system. Not a substitute for system security.	X	X	X	X
Save Files to SAS Servers	Use the Save File dialog box to view the server file system tree display, and navigate, copy, paste, and drag in the file systems of SAS servers. Not a substitute for system security.	X	X	X	X
Modify Output Data Location in SAS Tasks	Modify the metadata authorization settings for folders.	X		X	
Copy and Paste SAS Server Content	Use menus to copy and paste or drag and drop from SAS servers and libraries. Not a substitute for system security.	X		X	X
Publish to Distribution Channels	Use the <b>Publish</b> menu to create or modify a publish wizard that sends content to distribution channels such as e-mail or Web.	X			
Send Content to E-Mail Recipient	Use the <b>Publish</b> menu options <b>E-Mail Recipient</b> and <b>E-Mail Recipient as a Step in Project</b> to modify a wizard that distributes files using e-mail.	X	X	X	
Content Category					
Create or Modify Advanced Query	Use the <b>Query Builder</b> menu option to create or modify advanced queries.	X		X	X
Create or Modify Data Join in Advanced Query	Use the <b>Add Table</b> and <b>Join</b> menu options to create or modify table joins in advanced queries.	X		X	X
Create or Modify SAS Program	Open, create, and modify SAS code nodes in projects. If not granted, users can still execute SAS programs.	X			X
Add or Modify Custom Code to SAS Task	Create or modify SAS code in SAS Enterprise Guide tasks.	X			X

Capability	Description	Role			
		Advanced	OLAP	Analysis	Programming
Create or Modify SAS Stored Process	Use the menu options <b>Create Stored Process</b> and <b>Write TaskCode to Stored Process</b> to create or modify stored processes in SAS Enterprise Guide projects.	X			X
Options Category					
*Modify Metadata Authorization	Modify the metadata authorization settings for folders.	X			
*Reset Login	Remove the login from metadata associated with a server or library.	X	X	X	X
Modify SAS Server Reference in Project or Document	Use the <b>Select Server</b> menu option to change the internal server reference for all projects that run on the server.	X		X	X
Modify Security Options	Change security options for projects. When not granted, users can view security options.	X			
Modify E-mail Options	Change e-mail options for projects. When not granted, users can view e-mail options.	X	X	X	X
Modify Performance Options	Change performance options for projects. When not granted, users can view performance options.	X			X
Modify All Options	Modify all options in the Options dialog box. When not granted, users can view options.	X	X	X	X
Tools and Help Category					
Access Unregistered Custom Tasks	Edit or run custom tasks that are not registered in SAS metadata (unless the task is otherwise disallowed).	X	X	X	X
Modify Styles	Use the <b>Style Manager</b> menu option to modify the styles that are used to create reports.	X	X	X	X
Create or Modify Schedules	Use the <b>Schedule Project</b> and <b>Schedule Process Flow</b> menu options to create and modify schedule projects. When not granted, users can view schedules.	X		X	X

Capability	Description	Role			
		Advanced	OLAP	Analysis	Programming
Access SAS Enterprise Guide Explorer	Use the <b>Enterprise Guide Explorer</b> menu option to open the explorer, or run the executable file from the operating environment.	X			
Access Project Library	Enables the Assign Project Library task.	X			
Update Library Metadata	Enables the Update Library Metadata task.	X		X	X
Access Project Maintenance	Open the Project Maintenance dialog box to rename servers and libraries throughout a project.	X			
Access SAS Technical Support	Use the menu options under <b>SAS on the Web</b> to navigate to the SAS Technical Support Web site from SAS Enterprise Guide.	X	X	X	X
Data Category					
*Explore Data	Explore data in the interactive data explorer.	X	X	X	X
*Quick Stats	Show Quick Stats.	X			
Append Tables	Enables the Append Tables task.	X	X	X	X
Delete Data Sets and Formats	Enables the Delete Data Sets and Formats task.	X	X	X	X
Compare Data	Enables the Compare Data task.	X	X	X	X
Data Set Attributes	Enables the Compare Data task.	X	X	X	X
Create Format	Enables the Create Format task.	X	X	X	X
Random Sample	Enables the Random Sample task.	X	X	X	X
Rank	Enables the Rank task.	X	X	X	X
Sort Data	Enables the Sort Data task.	X	X	X	X
Standardize Data	Enables the Standardize Data task.	X	X	X	X
Split Columns	Enables the Split Columns task.	X	X	X	X
Stack Columns	Enables the Stack Columns task.	X	X	X	X

Capability	Description	Role			
		Advanced	OLAP	Analysis	Programming
Transpose a Set of Data	Enables the Transpose task.	X	X	X	X
Download Data Files to PC	Enables the Download Data Files to PC task.	X	X	X	X
Upload Data Files to Server	Enables the Upload Data Files to Server task.	X	X	X	X
Describe Category					
List Report Wizard	Enables the List Report Wizard task.	X	X	X	X
Distribution Analysis	Enables the Distribution Analysis task.	X	X	X	X
Characterize Data	Enables the Characterize Data task.	X	X	X	X
List Data	Enables the List Data task.	X	X	X	X
One-Way Frequencies	Enables the One-Way Frequencies task.	X	X	X	X
Summary Statistics	Enables the Summary Statistics task.	X	X	X	X
Summary Tables	Enables the Summary Tables task.	X	X	X	X
Table Analysis	Enables the Table Analysis task.	X	X	X	X
Graph Category					
*Open ODS Graphics Designer	Open the ODS Graphics Designer.	X		X	X
*Show ODS Statistical Graph	Show ODS Statistical Graph from an SGD file.	X		X	X
Contour Plot	Enables the Contour Plot task.	X	X	X	X
Bubble Plot	Enables the Bubble Plot task.	X	X	X	X
Radar Chart	Enables the Radar Chart task.	X	X	X	X
Box Plot	Enables the Box Plot task.	X	X	X	X
Donut Chart	Enables the Donut Chart task.	X	X	X	X

Capability	Description	Role			
		Advanced	OLAP	Analysis	Programming
Area Plot	Enables the Area Plot task.	X	X	X	X
Pie Chart	Enables the Pie Chart task.	X	X	X	X
Line Plot	Enables the Line Plot task.	X	X	X	X
Bar Chart	Enables the Bar Chart task.	X	X	X	X
Create Map Feature Table	Enables the Create Map Feature Table task.	X	X	X	X
Surface Plot	Enables the Surface Plot task.	X	X	X	X
Map Graph	Enables the Map Graph task.	X	X	X	X
Bar-Line Chart	Enables the Bar-Line Chart task.	X	X	X	X
Tile Chart	Enables the Tile Chart task.	X	X	X	X
Scatter Plot	Enables the Scatter Plot task.	X	X	X	X
ANOVA Category					
Linear Models	Enables the Linear Models task.	X	X	X	X
Mixed Models	Enables the Mixed Models task.	X	X	X	X
Nonparametric One-Way ANOVA	Enables the Nonparametric One-Way ANOVA task.	X	X	X	X
One-Way ANOVA	Enables the One-Way ANOVA task.	X	X	X	X
t Test	Enables the t-Test task.	X	X	X	X
Regression Category					
Generalized Linear Models	Enables the Generalized Linear Models task.	X	X	X	X
Linear Regression	Enables the Linear Regression task.	X	X	X	X
Logistic Regression	Enables the Logistic Regression task.	X	X	X	X
Nonlinear Regression	Enables the Nonlinear Regression task.	X	X	X	X

Capability	Description	Role			
		Advanced	OLAP	Analysis	Programming
Multivariate Category					
Canonical Correlation	Enables the Canonical Correlation task.	X	X	X	X
Cluster Analysis	Enables the Cluster Analysis task.	X	X	X	X
Correlations	Enables the Correlations task.	X	X	X	X
Discriminant Analysis	Enables the Discriminant Analysis task.	X	X	X	X
Factor Analysis	Enables the Factor Analysis task.	X	X	X	X
Principal Components	Enables the Principal Components task.	X	X	X	X
Survival Analysis Category					
Life Tables	Enables the Life Tables task.	X	X	X	X
Proportional Hazards	Enables the Proportional Hazards task.	X	X	X	
Capability Category					
CDF Plots	Enables the CDF Plots task.	X			
Histograms	Enables the Histograms task.	X			
Q-Q Plots	Enables the Q-Q Plots task.	X			
Probability Plots	Enables the Probability Plots task.	X			
P-P Plots	Enables the P-P Plots task.	X			
Control Charts Category					
Box Chart	Enables the Box Chart task.	X	X	X	X
c Chart	Enables the c Chart task.	X	X	X	X
Individual Measurements Chart	Enables the Individual Measurements Chart task.	X	X	X	X
np Chart	Enables the np Chart task.	X	X	X	X

Capability	Description	Role			
		Advanced	OLAP	Analysis	Programming
p Chart	Enables the p Chart task.	X	X	X	X
u Chart	Enables the u Chart task.	X	X	X	X
Mean and Range Chart	Enables the Mean and Range Chart task.	X	X	X	X
Mean and Standard Deviation Chart	Enables the Mean and Standard Deviation Chart task.	X	X	X	X
Pareto Category					
Pareto Chart	Enables the Pareto Chart task.	X			
Time Series Category					
Forecast Studio Create Project	Enables the Forecast Studio Create Project task.	X	X	X	X
Forecast Studio Open Project	Enables the Forecast Studio Open Project task.	X	X	X	X
Forecast Studio Override Project	Enables the Forecast Studio Override Project task.	X	X	X	X
ARIMA Modeling and Forecasting	Enables the ARIMA Modeling and Forecasting task.	X	X	X	X
Regression Analysis with Autoregressive Errors	Enables the Regression Analysis with Autoregressive Errors task.	X	X	X	X
Basic Forecasting	Enables the Basic Forecasting task.	X	X	X	X
Regression Analysis of Panel Data	Enables the Regression Analysis of Panel Data task.	X	X	X	X
Prepare Time Series Data	Enables the Prepare Time Series Data task.	X	X	X	X
Create Time Series Data	Enables the Create Time Series Data task.	X	X	X	X
Data Mining Category					



Capability	Description	Role			
		Advanced	OLAP	Analysis	Programming
Model Scoring	Enables the Model Scoring task.	X	X	X	X

\* These capabilities were added for the second edition of the SAS 9.3 version of this document. The second edition applies to the 5.1 release for the majority of the desktop applications.

---

## Registering Custom Tasks as Capabilities in SAS Enterprise Guide

### Overview

Custom add-in tasks are .NET assemblies (DLL files) that you create, deploy, register in SAS Enterprise Guide, and execute from the SAS Enterprise Guide task list or add-in menu.

To provide access to custom tasks based on the job responsibilities, you can register custom tasks as capabilities, assign capabilities to roles, and assign users to roles.

### Create Custom Tasks

To create custom tasks, you develop Windows executables and package them as .NET assemblies. It is convenient to assemble multiple tasks in a single .NET assembly so that you can share code and implementation among the tasks. For additional information, sample DLLs, and sample executable source files, see the topic Creating Custom Add-In Tasks for SAS Enterprise Guide, at <http://support.sas.com/documentation/onlinedoc/guide/customtasks/index.htm>. **reference.**

### Deploy Custom Tasks

You can deploy custom tasks to SAS Enterprise Guide computers in two ways, using drop-in deployment or add-in deployment. Drop-in deployment copies .NET assemblies into local directories that are recognized by SAS Enterprise Guide. Custom tasks in drop-in directories are automatically registered (made available for execution) the next time the user starts SAS Enterprise Guide.

Add-in deployment copies .NET assemblies into any local directory. You then identify those directories in SAS Enterprise Guide using the Add-In Manager to make those tasks available for execution.

When you deploy, make sure that you include any dependent assemblies that are referenced by your custom tasks. Make sure that you do not include any dependent assemblies that are provided by SAS Enterprise Guide or the SAS Add-In for Microsoft Office.

Follow these steps to use the Add-In Manager:

1. Copy the .NET assembly into one of the following directories:
  - `C:\Program Files\SAS\EnterpriseGuide\version\Custom`
  - `%appdata%\SAS\EnterpriseGuide\version\Custom`

`%appdata%` is the Microsoft Windows environment variable that maps to a user account. Repeat the copy in other user accounts if multiple users run SAS Enterprise Guide on the same host.

- `%appdata%\SAS\SharedSettings\version\Custom`

Use this method to deploy custom tasks to specified user accounts, using a shared directory that is accessed by both SAS Enterprise Guide and the SAS Add-In for Microsoft Office.

2. Restart SAS Enterprise Guide. SAS Enterprise Guide automatically registers the new custom tasks in the specified directories.
3. Test the new custom tasks by selecting **View** ⇒ **Task List** or **Tools** ⇒ **Add-In**.

Follow these steps to use add-in deployment:

1. Copy the .NET assembly into any local directory.
2. In SAS Enterprise , start the Add-In Manager. Select **Tools** ⇒ **Add-In** ⇒ **Add-In Manager**.
3. In the Add-In Manager dialog box, select **Browse**.
4. Navigate to the directory where you stored your .NET assembly.
5. Click **Open** to display the names of the custom tasks in the assembly.
6. Click **OK** to accept the custom tasks and register them in SAS Enterprise Guide.
7. Test the new custom tasks by selecting **View** ⇒ **Task List** or **Tools** ⇒ **Add-In**.

### **Register Custom Tasks as Capabilities**

After you deploy custom tasks, follow these steps to register custom tasks as capabilities:

1. In SAS Enterprise Guide, start SAS Enterprise Guide Explorer. Select **Tools** ⇒ **SAS Enterprise Guide Explorer**.
2. In Explorer, select **Tools** ⇒ **Task Import Wizard**.
3. In the first page of the Task Import Wizard, you see your current metadata profile connection. If you need to connect with a different profile, click **Cancel** to close the wizard and select **File** ⇒ **Manage Profiles**. After you change your profile, click **Close**, and then start the Task Import Wizard.
4. In the second page of the Task Import Wizard, specify the location of the directory where you copied your .NET assembly. Note that the directory that you select must be local to your current host.
5. Select tasks to receive metadata, and then click **Finish** in the sixth wizard page to create metadata.

If you are unable to create metadata, then you might need to install the package named SAS Enterprise Guide Server Data on the host that contains your current metadata repository.

### **Apply Custom-Task Capabilities to Roles**

Follow these steps to apply custom-task capabilities to roles:

1. In SAS Management Console, open the **User Manager**.
2. To create a new role for your custom-task capabilities, right-click in the **User Manager** and select **New ⇒ Role**.
3. To add a custom-task capability to an existing role, double-click an **Enterprise Guide** role.
4. In the role properties dialog box, click the **Capabilities** tab.
5. Expand the **Plug-Ins** branch in the tree view.
6. Click the custom-task capabilities that you want to add to that role.
7. Click **OK**.

The custom-task capabilities will be applied to the role the next time affected users initialize SAS Enterprise Guide.



## Chapter 7

# Administering SAS Enterprise Miner

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---

## **SAS Enterprise Miner Overview for Administrators**

SAS Enterprise Miner uses process flows to analyze enterprise data, create predictive and descriptive models, and interpret the models. The process flows are generated in a graphical user interface that enables interaction between statistical analysts, IT professionals, and business analysts.

---

## **Administrative Tasks in SAS Enterprise Miner**

SAS Enterprise Miner can require the following administrative tasks:

- install and configure desktop applications
- install and configure a mid-tier SAS analytics server
- create and administer connection profiles
- define server connections
- configure an HTTP server to distribute model packages
- use the SAS Enterprise Miner plug-in for SAS Management Console
- monitor log files on the SAS analytics server

Information about these and all other administrative tasks for SAS Enterprise Miner are described in *SAS Enterprise Miner: Administration and Configuration*.



## Chapter 8

# Administering SAS Information Map Studio

---

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---

## SAS Information Map Studio Overview for Administrators

SAS Information Map Studio provides a point-and-click interface for the creation and maintenance of information maps. Information maps are metadata definitions of enterprise data that provide a basis for querying and reporting.

After you install SAS Information Map Studio, certain administrative tasks need to be completed. The administrative tasks are summarized in the following table.

**Table 8.1** Administrative Tasks for SAS Information Map Studio

Administrative Task	Purpose of Task
Add users	Create a SAS identity for each person who uses the SAS environment.

---

Administrative Task	Purpose of Task
Register resources	Make tables, SAS OLAP cubes, and stored processes available for the creation of SAS Information Maps.
Administer access control	Restrict access to resources in accordance with your security goals
Introduce pooled workspace servers	Enable server-side pooling for relational databases.
Administer log files	Specify the name and location of log files, how to modify the information that is recorded, and how to change the name and the location of the log file.
Allocate memory	See <a href="#">“Common Elements” on page 5</a> .
Change or view the application properties	Specify the name and location of the file.

---

## Add Users to SAS Information Map Studio

The tasks for adding regular users are specific to SAS Information Map Studio. To access data through an information map, the user must have Read permission and ReadMetadata permission on the information map. Users must have an individual identity other than PUBLIC to log on to SAS Information Map Studio.

For considerations and instructions about setting-up information map users, refer to the following topics:

- [“Administering Connection Profiles for Desktop Applications” on page 6](#).
- [“Add Regular Users” in the \*SAS Intelligence Platform: Security Administration Guide\*](#).

---

## Register Resources as Input to SAS Information Maps

### *Tables, Cubes, and Stored Processes*

SAS Information Map Studio accesses tables, cubes, and stored processes through the SAS Metadata Server. These resources are available only if they are registered in the metadata.

The following restrictions apply to these resources:

- Tables must be uniquely named and must be associated with a library that is assigned to a SAS Application Server. The tables can be any combination of SAS data sets and third-party relational database tables.



- SAS OLAP cubes must be uniquely named and must be associated with an OLAP schema that is assigned to a SAS Application Server.
- Stored processes must be on the same SAS Application Server as the tables that are used by the information map. The stored process must be hosted by a SAS Workspace Server.

### User-Defined Formats

If you have existing SAS data sets, you might also have a catalog of user-defined formats and informats. You have two options for making these formats available to applications such as SAS Information Map Studio:

- Give the format catalog a standard name and place it in an expected location. This is the preferred method.
- Create a user-defined formats configuration file, and use the FMTSEARCH system option to point to the format catalog.

For detailed instructions about both options, see “Connecting to Common Data Sources” in the *SAS Intelligence Platform: Data Administration Guide*.

---

## Access Control for SAS Information Maps

### Overview

Information maps inherit permissions from their folders. The folders in turn inherit permissions from their parent folders. Folder permissions are not set in SAS Information Map Studio. Permissions can be applied in SAS Information Map Studio to SAS Information Maps within a folder.

WriteMetadata permission is needed on the information map to modify permissions or view any authorization-based prefilter assignments.

You can also apply BI row-level permissions through information maps. For details, see “BI Row-Level Permissions” in the *SAS Intelligence Platform: Security Administration Guide*.

To define access to an information map from within SAS Information Map Studio:

1. Open an information map or, if working with an unsaved information map, save it.
2. Select **Tools** ⇒ **Authorization**.
3. Modify the permission settings as necessary.
4. Close the dialog box.
5. Save the information map for the changes take effect.

For additional information, see the SAS Information Map Studio Help and “[Common Elements](#)” on page 5 .

### Access Control for Sets of Information Maps

Proper storage of information maps enables you to easily do the following:

- manage the access controls for sets of information maps
- ensure that the information maps are available as resources for queries and report writing

To manage the access controls for sets of information maps, create subfolders under **SAS Folders** in the **Folders** tab of SAS Management Console. For example, you can add a folder for Human Resources and set access controls so the Human Resources user group has exclusive access to the Human Resources information map folder. The folder's access controls are inherited by all of the information maps within that folder.

---

## Pooled Workspace Server

You can use SAS Information Map Studio to support server-side pooling for relational databases. The use of this server pool is governed by the authentication rules that are set in the SAS Metadata Server. A pooled workspace server is configured in the library's information maps that include queries of relational databases.

Information maps that include queries of relational databases are intended to run on a SAS Pooled Workspace Server.

If a pooled workspace server is not defined or available, the query attempts to use a SAS Workspace Server.

*Note:* OLAP-defined information maps and the queries are always run on the OLAP server.

For detailed information about workspace server pooling, see “Load Balancing and Pooling” in the *SAS Intelligence Platform: Application Server Administration Guide*.

---

## Log Files

### *Application Log*

SAS Information Map Studio records selected events that occur while running the application. Error data for specific components or Java packages are recorded. In order to record diagnostic information, your application must have Write access to the log file on the operating system's file system.

To change the information that is recorded, or to change the name or location of the log file, follow these steps:

1. Exit the application.
2. Open *SAS-installation-directory\SAS\SASInformationMapStudio\4.2\mapstudio.ini*
3. Add `-loggingSetupDialog` to the end of the `MainClass` statement, save, and close the file.
4. Start the application. The Diagnostic Settings dialog box is displayed.
5. In the **Severity level** drop-down list, select the severity level for recording information for the entire application.

6. (Optional) Record a different level of information for a particular component or Java package. Select the **Component** or **Java package** to specify the **Severity level**.
7. The **Log file** box specifies the output log file that stores the error data. Set a new file or location, as needed.
8. Select **OK** to begin using the new diagnostic settings.

In general, it is best to modify this file under the direction of SAS Technical Support.

For additional information, see [“Administering Logs and Other Local Files” on page 8](#) and the SAS Information Map Studio Help.

*Note:* If you run your application on a Citrix server, then the log file is located on the Citrix server machine.

### Resource Replacement Log

Information map resources can be replaced after an information map is created. The Resource Replacement dialog box is used to replace external metadata resources that are referenced by the information map. The application records to the log file the replacement tasks that were performed, and any issues that were encountered.

For additional information, see SAS Information Map Studio Help.

### Copy to Folder Log

When the Copy to Folder feature in the resource pane is used, a copy-paste log file is generated to record the events.

The Windows Log File location is `C:\Documents and Settings\User Id\Application Data\SAS\SASInformationMapStudio\4.2`.

The Vista Log File location is `C:\Users\User Id\AppData\Roaming\SAS\SASInformationMapStudio\4.2`.

---

## Memory Allocation

SAS Information Map Studio dynamically allocates memory to support its user interface. For additional information, see [“Managing the Java Heap Used By Desktop Applications” on page 9](#).

---

## Configuration File

The configuration file for SAS Information Map Studio is located in the default installation directory `SAS\SASInformationMapStudio\4.2\`. The name of the file is `mapstudio.ini`. Each installation of the SAS Information Map Studio application has its own configuration file.

*Note:* In general, it is best to modify this file under the direction of SAS Technical Support.



## Chapter 9

# Administering SAS Management Console

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## SAS Management Console Overview for Administrators

SAS Management Console is the primary administrative interface for the SAS Intelligence Platform. Use it to manage servers, libraries, security, metadata objects, roles, logs, backup and recovery, scheduling, and message queues.

Because of its powerful capabilities, you should limit the number of clients that receive SAS Management Console. Grant administrative permissions only to trusted and experienced individuals. Also consider the use of roles to prevent users from seeing plug-ins that do not apply to their jobs. For example, a user can be given a role that displays the Library Manager without displaying the Server Manager or the User Manager.

SAS Management Console is structured as a series of Java plug-ins, each of which provide a specific administrative function. A number of plug-ins are delivered to all customers, such as the Server Manager plug-in. Other plug-ins are delivered based on your site license, such as the administrative plug-in for SAS Enterprise Miner.

## Quick Reference for SAS Management Console

Each plug-in in SAS Management Console has its own set of Help information. To access plug-in Help, either click a Help button in a window or select the plug-in in the **Plug-ins** tab and choose the Help from the **Help** menu.

The following table lists tasks and related components in SAS Management Console:

**Table 9.1** Quick Reference for SAS Management Console

Task	Component	Reference
Manage permissions for users and groups.	Authorization Manager, Access Control Templates folder	See the <i>SAS Management Console: Guide to Users and Permissions</i> .
Manage permissions for metadata objects.	Authorization Manager, Resource Management folder	See the <i>SAS Intelligence Platform: Security Administration Guide</i> .
Manage connection profiles, domains, and Integrated Windows authentication.	Connection Profile Wizard	See the Help for the Connection Profile Wizard. Select <b>File</b> ⇒ <b>Connection Profile</b> and click <b>Help</b> .
Create and register libraries.	Data Library Manager	See the <i>SAS Intelligence Platform: Data Administration Guide</i> .
Manage services, including Web application logs, connections, discovery, events, sessions, security, and stored processes.	Foundation Services	See the Help for Foundation Services in SAS Management Console.
Control servers and manage initialization, log configuration, and options.	Server Manager	See the <i>SAS Intelligence Platform: System Administration Guide</i> .
Manage users and roles.	User Manager	See the <i>SAS Intelligence Platform: Security Administration Guide</i> and the <i>SAS Management Console: Guide to Users and Permissions</i> .
Create and import packages, transfer data between folders.	Folders tab	See the Help for SAS Management Console.
Register and manage metadata objects, configure libraries, tables, jobs, stored processes, and so on.	Folders tab	See Help on Folders in SAS Management Console.

Task	Component	Reference
Manage, replicate, backup, and restore the SAS Metadata Server and resource templates.	Metadata Manager	See the <i>SAS Intelligence Platform: System Administration Guide</i> .
Manage e-mail accounts, channels, subscribers, message queues.	Publishing Framework	See the Help for the Publishing Framework in SAS Management Console.
Create and manage flows, execute jobs with available dependencies.	Schedule Manager	See <i>Scheduling in SAS</i> .
Define, control, and manage servers, spawners, and external data connections.	Server Manager SAS OLAP Server Monitor	See the <i>SAS Intelligence Platform: Application Server Administration Guide</i> and the Help for SAS OLAP Server Monitor and Server Manager.
Manage and monitor custom applications.	Foundation Services Manager Application Monitor Configuration Manager	See the Help for these plug-ins.
Manage the Web Infrastructure Platform.	Configuration Manager	See the <i>SAS Intelligence Platform: Web Application Administration Guide</i> .
Test deployments.	Deployment Tester	See "Monitoring Applications" in SAS Management Console Help. Also see "Validating Logical Servers" in SAS Management Console Help.
Define geographic maps and import services. Under separate license, works with ArcGIS software to embed OLAP data in geographic displays.	Map Service Manager	See the <i>SAS Intelligence Platform: Web Application Administration Guide</i> .

---

## Understanding the Configuration of SAS Management Console

The following administrative and configuration files for SAS Management Console are located on each client:

sasmc.ini

contains configuration settings for SAS Management Console. The default storage location is *SAS-installation-directory\SAS\SASManagementConsole\9.x*.

app.smc

contains the user profile for SAS Management Console. The default storage location for Windows is `C:\Documents and Settings\user-name\Application Data\SAS\SASManagementConsole\9.x`. The default storage location for the Vista operating environment begins with `C:\Users\user-name\AppData\Roaming\SAS\9.x`.

---

## Redirecting Local Files Created by SAS Management Console

By default, SAS Management Console stores the log files, application default files, and connection profiles on the local host. To change the default storage location, follow these steps:

1. Close SAS Management Console on the local host.
2. Create the path and directory for the client files.
3. Open the file `sasmc.ini` and add the following Java argument:

```
JavaArgs_xx=-Dsas.appdatapath="new-path"
```

*xx*

is the next available Java argument number.

*new-path*

is a fully qualified path to the new directory. Here is a typical example:

```
JavaArgs_12=-Dsas.appdatapath="\\adminServer02\SMCCClientFiles\Hostd17362"
```

4. Start SAS Management Console on the local host.

---

## Starting SAS Management Console

### Overview

In the Windows operating environment, you can start SAS Management Console by selecting **Start** ⇒ **Programs** ⇒ **SAS** ⇒ **SAS Management Console**. You can also start the application from a command line. Navigate to the SAS Management Console installation directory and issue the command for your platform, as listed in the following table.

**Table 9.2** SAS Management Console Startup Commands

Platform	Command
Windows	<code>sasmc.exe</code>
64-bit enabled Solaris	<code>./sasmc</code>
64-bit enabled AIX	<code>./sasmc</code>



If you do not specify any options, SAS Management Console uses the parameters specified in the `sasmc.ini` file. The following sections contain information about options you can specify on the command line or add to the `sasmc.ini` file.

### Specify Java Options

To specify Java options when you start SAS Management Console, use the `-javaopts` option and enclose the Java options in single quotation marks. For example, the following command starts SAS Management Console on Windows and contains Java options that specify the locale as Japanese.

```
sasmc -javaopts '-Duser.language=ja -Duser.country=JP'
```

### Specify the Plug-in Location

By default, SAS Management Console looks for plug-ins in a `plugins` directory under the directory in which the application was installed. If you are starting SAS Management Console from another location, you must specify the location of the directory by using the `-pluginsDir` option. The syntax of the option is as follows:

```
sasmc -pluginsdir <plugin path>
```

---

## Administering Connection Profiles in SAS Management Console

During initialization, SAS Management Console connects to a SAS Metadata Server that is identified in a connection profile. You need to create one profile for each SAS Metadata Server if you have more than one. You might also need to create separate profiles if you want to connect as an administrator or as the unrestricted user. For information about the creation of connection profiles, see [“Administering Connection Profiles for Desktop Applications” on page 6](#).

---

## About the Folders Tab

The **Folders** tab provides a categorized folder tree that displays the objects that have been registered in metadata on the currently connected SAS Metadata Server. In the **Folders** tab you can do the following:

- create new stored processes
- import and export folders and metadata objects
- delete folders and metadata objects
- display and modify the properties and permissions of folders and metadata objects

These actions are made available depending on your current set of permissions.

Some of the top-level folders have Content Mapping properties. These properties determine whether additions and deletions relate to metadata definitions only, or to metadata definitions and their respective physical files. By default, additions and deletions affect metadata objects only. Administrators can set Content Mapping properties as needed to synchronize metadata changes and physical changes.

## Administering Roles

The User Manager in SAS Management Console provides roles and capabilities that you can assign to users. When a user profile is assigned to a role, that user has access to the capabilities that are selected for that role in the User Manager.

Opening the User Manager displays roles for the following desktop applications:

- SAS Management Console
- SAS Add-In for Microsoft Office (see “Default Roles and Capabilities for the SAS Add-In for Microsoft Office” on page 18)
- SAS Enterprise Guide (see “Default Roles and Capabilities for SAS Enterprise Guide” on page 73)
- SAS Web Report Studio (see the *SAS Intelligence Platform: Web Application Administration Guide*)

SAS Management Console provides two default roles: Advanced and Content Management. The following table describes the capabilities that are assigned to those roles by default. In the User Manager, you can change the capabilities of a role or add new roles with unique sets of capabilities.

**Table 9.3** Default Capabilities Assigned to Roles for SAS Management Console

Capability	Description	Role	
		Advanced	Content Management
General Category			
Access Unregistered Plug-ins	Access plug-ins that are not registered in metadata.	X	
Plug-ins Category			
Application Monitor	Monitor the activities of applications, subsystems and services.	X	
Authorization Manager	Manage resource access control policies.	X	X
Data Library Manager	Manage the definitions of data libraries and database schemas.	X	X
Folder View	Manage public and user folders used to store metadata objects.	X	X
Foundation Services Manager	Manage Foundation Services components.	X	

			Role	
Capability	Description	Advanced	Content Management	
Metadata Manager	Create and manage metadata repositories, manage the current SAS Metadata Server, and run metadata utilities.	X		
Publishing Framework	Manage publishing framework subscribers and content channels.	X		
Schedule Manager	Manage SAS jobs to be scheduled, create conditional events for schedules, and submit jobs for scheduling.	X		
Server Manager	Create and manage server definitions (such as for SAS servers, database servers, and spawners).			
User Manager	Create and manage users, groups, roles, and capabilities.	X		X



# Glossary

---

**connection profile**

a client-side definition of where a metadata server is located. The definition includes a computer name and a port number. In addition, the connection profile can also contain user connection information.

**flow**

a set of jobs and associated dependencies that is scheduled in the Schedule Manager plug-in in SAS Management Console.

**metadata repository**

a collection of related metadata objects, such as the metadata for a set of tables and columns that are maintained by an application. A SAS Metadata Repository is an example.

**metadata server**

a server that provides metadata management services to one or more client applications. A SAS Metadata Server is an example.

**OLAP**

See online analytical processing

**online analytical processing**

a software technology that enables users to dynamically analyze data that is stored in multidimensional database tables (cubes).

**SAS Management Console**

a Java application that provides a single user interface for performing SAS administrative tasks.

**SAS Metadata Repository**

a container for metadata that is managed by the SAS Metadata Server.

**SAS Metadata Server**

a multi-user server that enables users to read metadata from or write metadata to one or more SAS Metadata Repositories.

**SAS OLAP Cube Studio**

a Java interface for defining and building OLAP cubes in SAS System 9 or later. Its main feature is the Cube Designer wizard, which guides you through the process of registering and creating cubes.

**SAS OLAP Server**

a SAS server that provides access to multidimensional data. The data is queried using the multidimensional expressions (MDX) language.

**schema**

a map or model of the overall data structure of a database. A schema consists of schema records that are organized in a hierarchical tree structure. Schema records contain schema items.

**star schema**

tables in a database in which a single fact table is connected to multiple dimension tables. This is visually represented in a star pattern. SAS OLAP cubes can be created from a star schema.

**tuple**

a data object that contains two or more components. In OLAP, a tuple is a slice of data from a cube. It is a selection of members (or cells) across dimensions in a cube. It can also be viewed as a cross-section of member data in a cube. For example, ([time].[all time].[2003], [geography].[all geography].[u.s.a.], [measures].[actualsum]) is a tuple that contains data from the Time, Geography, and Measures dimensions.

**wizard**

an interactive utility program that consists of a series of dialog boxes, windows, or pages. Users supply information in each dialog box, window, or page, and the wizard uses that information to perform a task.

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