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SAS® 9.2 Intelligence Platform

Desktop Application Administration Guide

SAS® Documentation

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What's New

Overview

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

Documentation Enhancements

For SAS 9.2, the *SAS Intelligence Platform: Desktop Application Administration Guide* contains the following enhancements:

- A new Common Elements chapter addresses administrative tasks that are common to all or most of the desktop applications.
- The SAS Data Integration Studio chapter contains new material that addresses data server connections, message queue administration, Web service support, bulk loading of data, and external file wizard configuration.
- The SAS Enterprise Miner chapter contains revised information for the model viewer, the Analytics Platform, and the Tomcat WebDAV server.
- The SAS Management Console chapter introduces new administrative capabilities and describes how to start the client using a symbolic link.
- In the second maintenance release for SAS 9.2, the SAS Enterprise Guide chapter has been updated to document the registration of custom tasks as capabilities.
- In the second maintenance release for SAS 9.2, the chapters for SAS Management Console, SAS Add-In for Microsoft Office, and SAS Enterprise Guide have been updated to document default roles and capabilities.
- In the third maintenance release for SAS 9.2, the following chapters have been updated:
  - the SAS Enterprise Miner chapter, to include SAS Enterprise Miner 6.2
  - the SAS Data Integration Studio chapter, to include SAS Data Integration Studio 4.2

  Other chapters received minor updates, corrections, and additions.

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.

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.

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:

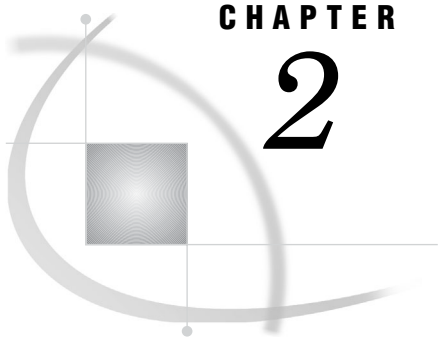
1. On the client machine, locate all copies of the file **sas.java.ext.config**.
2. In each instance of the file, edit the file in a plain text editor, such as Microsoft Notepad.
3. Add the following two lines to the bottom of the file:

   ```
   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.



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.

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 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 omaconfig.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 69.

SAS Enterprise Guide
See "Default Roles and Capabilities for SAS Enterprise Guide" on page 47 and "Registering Custom Tasks as Capabilities in SAS Enterprise Guide" on page 54.

SAS Add-In for Microsoft Office
See "Default Roles and Capabilities for the SAS Add-In for Microsoft Office" on page 11 and "Registering Custom Tasks as Capabilities in the SAS Add-In for Microsoft Office" on page 19.

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*.

Administering Logs and Other Local Files

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*applicationName*

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	**Edit** 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*.

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 Excel, Microsoft Word, and Microsoft PowerPoint. To see the power of SAS in Excel, Word, or PowerPoint:

- In Microsoft Office 2000-2003, open the **SAS** menu.
- In Microsoft Office 2007, click the **SAS** tab in the Ribbon. Several groups with related SAS tasks are displayed.

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.

Administrative Task	Purpose of Task
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, see the following:

- In Microsoft Office 2000-2003, click **SAS ▶ Help ▶ SAS Add-In for Microsoft Office Help.**
- In Microsoft Office 2007, click **SAS ▶ Help ▶ SAS Add-In for Microsoft Office Help.**
- The product web page: **`http://support.sas.com/documentation/onlinedoc/addin/index.html`**.

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

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 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 add-in. To access the Connections window, follow these steps:

- In Microsoft Office 2000-2003, select **SAS ▶ Tools ▶ Connections**
- In Microsoft Office 2007, select the **`SAS`** tab in the Ribbon, and select **Tools ▶ Connections**. The Connections appears.

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

- In Microsoft Office 2000-2003, click **SAS ▶ Help ▶ SAS Add-In for Microsoft Office Help.**
- In Microsoft Office 2007, click **SAS ▶ Help ▶ SAS Add-In for Microsoft Office Help.**

Select No-Profile Mode

You can create a second 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** from the list of available profile-related actions. Then select **<do not use profile>** 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. On the client machine, open a Microsoft Office application and click the **SAS** tab.
2. Click **Tools ▶ Connections**.
3. Click **Servers**, click the down arrow, and select a default SAS server.
4. (Optional) Click the check box **Automatically add local SAS server (if installed) to the list**.

For additional information, see "Select a Default SAS Workspace Server in SAS Enterprise Guide" on page 45.

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 Profile Configuration Updates for the SAS Add-In for Microsoft Office

You can create an update configuration file. When used, the connection profiles of specified users are automatically updated according to the contents of the update configuration file. The profiles are updated before the users invoke the profile, during the initialization of a Microsoft Office application.

For more information about update configuration files, see "Administer Connection Profiles in SAS Enterprise Guide" on page 44. See the SAS Add-In for Microsoft Office Help for detailed information about how to automatically update the configuration for your connection.

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. These files are located, by default, in **C:\Documents and Settings\user ID\Application Data\SAS\Add-InForMicrosoftOffice*release-number***.

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 6, 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

		Role		
Capability	**Description**	**Advanced**	**OLAP**	**Analysis**
Open or Import Category				
Open Files from Local Computer	Open files from the local file system. Not a substitute for system security.	X	X	X
Open Cube from OLAP Servers	Open cube source data into a document.	X	X	
Save or Distribute Category				
Modify Output Data Location in SAS Tasks	Change the output location in tasks that have an output location.	X		X
Copy and Paste SAS Server Content	Copy or paste from a server or library. Not a substitute for system security.	X		X
Publish To Distribution Channels	Send content to a channel such as e-mail or Web, modify channel properties.	X		
Content Category				
Add or Modify Custom Code to SAS Tasks	Edit custom code runs before or after SAS tasks.	X		
Options Category				
Modify SAS Server Reference in Project or Document	Enable server reassignment in SAS content.	X		X
Modify Security Options	Change security options for documents.	X		
Modify E-mail Options	Change e-mail options for documents.	X		
Modify All Options	Change all options in the SAS Add-In Options window.	X		
Tools and Help Category				
Access Unregistered Custom Tasks	Edit or run unregistered tasks if security enables access.	X		
Modify Styles	Change ODS output styles.	X		
Create or Modify Schedules	Change document refresh schedules or scheduling options.	X		X
Access SAS Technical Support	Use the Help menu to navigate to SAS technical support.	X		

		Role		
Capability	**Description**	**Advanced**	**OLAP**	**Analysis**
Data Category				
Copy to SAS Server	Copy active data to a SAS server.	X	X	X
Compare Data	Create a report that compares two data sets or two variables across multiple data sets.	X	X	X
Data Set Attributes	Create a report with the data set's creation date, location, number of observations, 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 numeric variables across the observations of a SAS data set and send 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	Create an output data set by standardizing the variables in a data source to a given mean and standard deviation.	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 a Set of Data	Turn the selected columns of a 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 with distribution information for numeric variables. Used to create plots.	X	X	X
Characterize Data	Create a summary report with graphs of frequency and univariate statistics for SAS data sets.	X	X	X
List Data	Print the observations in a SAS data set, using all or some of the variables, from a variety of reports.	X	X	X

		Role		
Capability	**Description**	**Advanced**	**OLAP**	**Analysis**
One-Way Frequencies	Generate frequency tables or perform binomial and chi-square tests.	X	X	X
Summary Statistics	Compute descriptive statistics for variables across all or groups of observations, or summarize data in a graphical display.	X	X	X
Summary Tables	Display descriptive statistics for selected variables in a variety of tables.	X	X	X
Table Analysis	Generate crosstabulation tables, also known as contingency tables.	X	X	X
Graph Category				
Contour Plot	Create line, filled, pattern, or smooth plots that show the mathematical relationships between three numeric variables.	X	X	X
Bubble Plot	Create a bubble plot that displays up to five dimensions (X, Y, size, color, and time).	X	X	X
Radar Chart	Create radar or star charts that show the relative frequency of data measures.	X	X	X
Box Plot	Create box plots, hi-lo charts, or hi-lo-close charts that display multiple summary statistics for a numeric variable across the 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.	X	X	X
Area Plot	Create area, spline, step, or overlay plots.	X	X	X
Pie Chart	Create simple or group charts that show the relative contribution of the parts to the whole.	X	X	X
Line Plot	Create line, scatter, spline, needle, step, regression, smooth, STD, Lagrange interpolation, or overlay plots.	X	X	X
Bar Chart	Create vertical, horizontal, or three-dimensional bar charts.	X	X	X
Create Map Feature Table	Create a feature table for map data sets and convert spherical coordinates to Cartesian coordinates.	X	X	X
Surface Plot	Create three-dimensional wireframe plots, smooth plots, or gradient plots.	X	X	X

		Role		
Capability	**Description**	**Advanced**	**OLAP**	**Analysis**
Map Graph	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 a variable.	X	X	X
Scatter Plot	Create two-dimensional scatter plots, three-dimensional scatter plots, or three-dimensional needle plots.	X	X	X
ANOVA Category				
Linear Models	Analyze data using the least squares to fit general linear models.	X	X	X
Mixed Models	Fit a variety of mixed linear models to data and use these fitted models to make statistical inferences about the data.	X	X	X
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 these 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. Also model data for which the mean has been restricted to a range of values. Also model 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

Capability	Description	Role		
		Advanced	**OLAP**	**Analysis**
Multivariate Category				
Canonical Correlation	Examine the relationship between linear combinations of X and Y variables.	X	X	X
Cluster Analysis	Create hierarchical clusters of coordinate data or distance data.	X	X	X
Correlations	Determine the relationship between numeric variables by calculating correlation coefficients.	X	X	X
Discriminant Analysis	Develop a discriminant criterion that can be used to classify 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
Principal Components	Examine relationships among several 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		

		Role		
Capability	**Description**	**Advanced**	**OLAP**	**Analysis**
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	X	X
c Chart	Create c charts for the numbers of nonconformities (defects) in the subgroup samples.	X	X	X
Individual Measurements Chart	Create control charts for the individual measurements and the moving ranges.	X	X	X
np Chart	Create np charts for the numbers of nonconformities (defects) in the subgroup samples.	X	X	X
p Chart	Create p charts for the proportions of nonconforming (defective) items in the subgroup samples.	X	X	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	X	X
Mean and Range Chart	Create mean and range charts for the subgroup means and the subgroup ranges.	X	X	X
Mean and Standard Deviation Chart	Create mean and standard deviation charts for the subgroup means and the subgroup standard deviations.	X	X	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		

Capability	Description	Role		
		Advanced	**OLAP**	**Analysis**
Time Series Category				
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	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	X
Forecast Studio Override Project	Submit overrides for the forecast data in an existing SAS Forecast Studio project.	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
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
Regression Analysis of Panel Data	Analyze panel data sets that consist of time series observations on each of several cross-sectional units. The task uses a class of linear econometric models to analyze the data.	X	X	X
Prepare Time Series Data	Prepare data for analysis by time series tasks or other tasks.	X	X	X
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
Model Scoring Category				
Model Scoring	Score a data set against an existing SAS Enterprise Miner predictive model.	X	X	X

		Role		
Capability	**Description**	**Advanced**	**OLAP**	**Analysis**
SAS Management Console 9.2 Category				
Access Unregistered Plug-ins	Access plug-ins that are not registered in metadata.	X		

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 first register custom tasks as capabilities. You then 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, see *Administering SAS Enterprise Guide*, at **`http://support.sas.com/documentation/onlinedoc/guide/`**.

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*release-number*\Custom**
   - *%appdata%*\SAS\Add-InForMicrosoftOffice*release-number*\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*release-number*\Custom
     Use this location to deploy custom tasks to specified user accounts, using a shared directory that is accessed by 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 from which you want to import task definitions. You can choose to have the wizard search standard locations for task definitions or you can specify a task-definition XML file.
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 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 affected users initialize a Microsoft Office application.

Note: To access unregistered custom tasks, you need the capability Access Unregistered Custom Tasks, which is available in the Tools and Help category, as described in "Default Roles and Capabilities for the SAS Add-In for Microsoft Office" on page 11. △

Library Access for the SAS Add-In for Microsoft Office

If the 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 45.

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 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 4.1 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.
Administer message queues	Install third-party message queue software, define queues, and register queues for inter-process communication.

Administrative Task	Purpose of Task
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 4.

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 enable 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 that 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 follows 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 Chapter 8, "Administering SAS Management Console," on page 65.
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 Chapter 8, “Administering SAS Management Console,” on page 65. 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 in. For more information about these tasks, see “Administering Connection Profiles for Desktop Applications” on page 4.

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

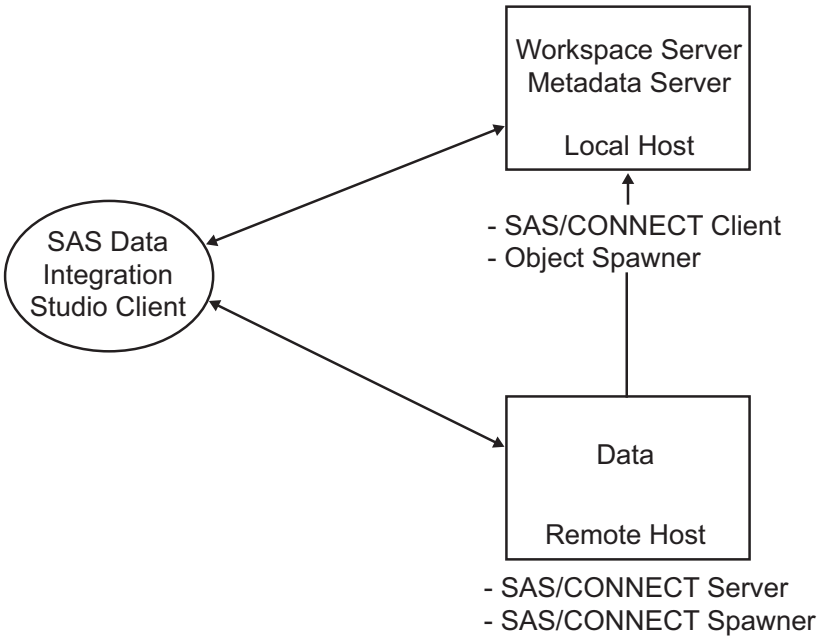
Access Remote Data

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-data 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 25.
- 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*\Lev1*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 that 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:

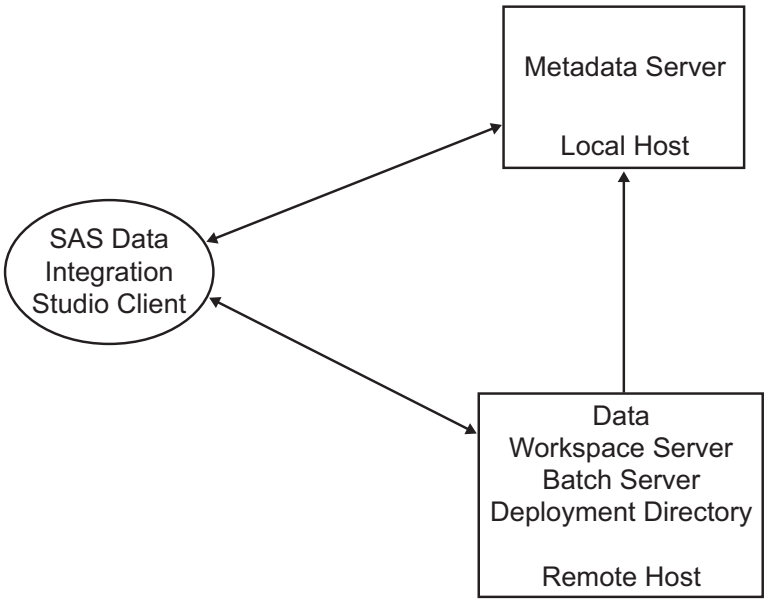
1 In SAS Data Integration Studio, select the **Inventory** tab.
2 In the **Inventory** tab, expand the **Library** node.
3 Right-click a table in the library and select **View Data**.

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.



- SAS Integration Technologies

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 35.
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 Chapter 4, "Administering SAS Data Integration Studio," on page 23.

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 34.

   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 that 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.

Set ALLOWXCMD to Enable Bulk Loading or to Run UNIX Scripts

Set the ALLOWXCMD option as follows on your SAS Workspace Server or SAS Batch Server so that your jobs can use the bulk-loading capabilities of the native DBMS software. Also set the ALLOWXCMD option so that your jobs can run shell or PERL scripts in UNIX.

1. In SAS Management Console, expand the **Server Manager**.
2. Right-click the SAS Workspace Server and select **Properties**.
3. In the Properties dialog box, click the **Options** tab.
4. In the **Options** tab, click **Advanced Options**.
5. In the **Advanced Options** tab, click the **Launch Properties** tab.
6. In the **Launch Properties** tab, select the **Allow XCMD** check box.
7. Click **OK** twice to save changes and close the Properties window.

All new sessions on that particular SAS Workspace Server will run with the option ALLOWXCMD. Restart your current instance of SAS Data Integration Studio to run jobs with the ALLOWXCMD option on that server.

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. This enables data integration developers to use the data quality transformations Create Match Code and Apply Lookup Standardization. Those developers can also make use of the data quality functions that are provided in the Expression Builder, which is available in many of the data integration transformations.

Enterprise implementations of the SAS Intelligence Platform make use of the dfPower Studio software and DataFlux Integration Servers from DataFlux, a SAS company. The dfPower Studio software enables you to customize your Quality Knowledge Base. The dfPower Architect and dfPower Profile software enable you to create jobs and real-time services that run on DataFlux Integration Servers. After you register DataFlux Integration Servers in SAS metadata, you can write jobs in SAS Data Integration Studio that execute DataFlux jobs and real-time services on the DataFlux Integration Servers. The transformations that execute DataFlux jobs and real-time services are called DataFlux IS Job and DataFlux IS Service.

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 Integration 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 and the terminology used in this section, see the *SAS Data Quality Server: Reference*. △

About the Data Quality Configuration

If the SAS Foundation software and the SAS Data Quality Server software are installed, and the SAS Deployment Wizard has been run, this completes the setup. Your data integration developers can use the data quality transformations and functions. This automatic setup is convenient. However, you need to understand the setup in case you need to make changes.

During installation, the SAS Data Quality Server software is installed in **..\dquality**. A typical default path might be ***SAS-configuration-directory*\Lev1\dquality**.

Locales and schemes are located in directories subordinate to **dquality**: **sasmisc\content\locale** and **sasmisc\content\scheme**.

A data quality configuration file is used to specify the location of the Quality Knowledge Base. When you start a local interactive SAS session, the data quality configuration is referenced by default at **\dquality\sasmisc\dqsetup.txt**.

When you use SAS Data Integration Studio to start a SAS Workspace server on a SAS Application Server, the data quality configuration file is ***SAS-configuration-directory*\Lev1*appServer*\dqsetup.txt**. A typical default path is **C:\SAS\EGServers\Lev1\SASApp\dqsetup.txt**, where SASApp is the name of the SAS Application Server.

On SAS Application Servers, the location of the data quality configuration file is specified in the SAS configuration files ***SAS-configuration-directory*\Lev1*appServer*\sasv9.cfg** and **sasv9_usermods.cfg**. In the SAS configuration files, the line that specifies the location of the setup file (by default) is as follows:

```
-dqsetuploc "dqsetup.txt"
```

In that same SAS configuration file, the server's default data quality locale is specified as:

```
-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, which needs to remain unchanged to retain default settings. Instead, edit sasv9_usermods.cfg, which includes and overrides sasv9.cfg. △

You can use the Properties windows of the data quality transformations to override the server defaults for data quality. You can also use the **Data Quality** tab of the Options dialog box in SAS Data Integration Studio to override server defaults in connection profiles. To display the Options dialog box, select **Tools ▶ Options**.

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 appears, 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 DataFlux Integration Servers

DataFlux Integration Servers run jobs and real-time services that are created with the dfPower Architect and dfPower Profile software from DataFlux, a SAS company. When you install a DataFlux Integration Server, and register the server in SAS metadata, you can execute DataFlux jobs and service from other jobs that you create in SAS Data Integration Studio.

To register a 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 Integration Server**, and then click **Next**.
7. Select authentication and protocol options.
8. Specify the name of the host.
9. Accept the default port number 21036.
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, a SAS company, at the

following Web address: **http://www.dataflux.com/QKB**. DataFlux regularly adds new locales for various regions and national languages.

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 also provided in *SAS Data Quality Server: Reference*.

You can also create new locales (and edit existing ones) using the dfPower Customize software from DataFlux, a SAS company.

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

When you execute Data Integration Studio jobs, you generate and execute SAS code. When you execute SAS code, you generate log information and perhaps other output. To route the log information to a non-default location, set options on the SAS Workspace Server that runs your jobs, as described in the logging chapter of *SAS Intelligence Platform: System Administration Guide*.

To route other SAS output to a file, you can modify the start command of the SAS Workspace Server, as follows:

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. Add the **--print** option in the **Command** text box, as follows:

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

5. 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:

- e-mailed to a person.
- written to a file.
- 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

5

Administering SAS Enterprise Guide

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Overview of Administering SAS Enterprise Guide

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

You can also use SAS Enterprise Guide to register libraries in metadata. The only other desktop application that registers libraries is SAS Management Console.

As part of the SAS Intelligence Platform, SAS Enterprise Guide is frequently used to query OLAP cubes and generate stored processes.

After you, the administrator, install SAS Enterprise Guide, you need to help SAS Enterprise Guide users create connection profiles that enable them to connect to SAS Metadata Servers. Users might also need your assistance with the selection of SAS Workspace Servers for data access and remote execution of SAS jobs and programs.

Based on client data access requirements, you also need to ensure that SAS Enterprise Guide users have permission to access the appropriate libraries, servers, and data tables.

Additional installation and configuration steps are required to use an ESRI server to integrate your SAS OLAP cube data with geographic maps using SAS Enterprise Guide. For information about the ESRI Map Component, see "Configuring the ESRI Map Component" in the *SAS Intelligence Platform: Web Application Administration Guide*.

To learn more about SAS Enterprise Guide, see the usage information in the online Help. Also see *Administering SAS Enterprise Guide*.

Administer Connection Profiles in SAS Enterprise Guide

After you install SAS Enterprise Guide, you can create a connection profile for that user. When selected, the profile connects the user to the specified SAS Metadata Server. The connection to the metadata server provides secure access to other enterprise servers and data sources.

The selected profile remains active in subsequent sessions. A connection is made to the specified server each time the user initializes SAS Enterprise Guide.

Note: Connections depend on the version of the SAS Metadata Server. SAS Enterprise Guide 4.1 connects only to the SAS 9.1.3 Metadata Server. Similarly, SAS Enterprise Guide 4.2 and later connect only to the SAS 9.2 Metadata Server. △

SAS Enterprise Guide users might need multiple connection profiles to connect to multiple SAS Metadata Servers, including the SAS Metadata Servers that might be installed on their local hosts.

You can administer connection profiles collectively using update configuration files. When you define and apply an update configuration file, applicable connection profiles are automatically updated according to the contents of the file. Profiles are updated when users choose automatic update, and when they select the appropriate update configuration file. The profiles are updated before the users invoke the profile. For more information about update configuration files, see *Administering SAS Enterprise Guide*.

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 window, select **`Profiles`** to add, modify, or delete connection profiles, or select **`Updates`** to specify and invoke an update 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 window, 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 window 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.

About No-Profile Mode

SAS Enterprise Guide users can choose not to use a profile and not to connect to a SAS Metadata Server. No-profile mode is intended for single-machine configurations. To invoke no-profile mode, display the Connections window and select **`Profiles`**, and then select **`<do not use a profile>`**.

Select a Default SAS Workspace Server in SAS Enterprise Guide

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 the **`Automatically add local SAS server (if installed) to the list`** check box. The server does not need to be registered on the SAS Metadata Server for this feature.

Create and Manage Libraries in SAS Enterprise Guide

With the Administer permission, you can use SAS Enterprise Guide to create, modify, and delete libraries. (This is also the case with SAS Management Console.) Select **Tools ▸ Assign Project Library**. For information about library management, see *Administering SAS Enterprise 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 window 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 METAAUTOINIT 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 Chapter 3, "Administering the SAS Add-In for Microsoft Office," on page 9.

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*.

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.

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 69, 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 OLAP, Advanced, Analysis, and Programming. The following table defines the capabilities that are assigned by default to the four roles.

Table 5.1 Default Capabilities Assigned to Roles for SAS Enterprise Guide

		Role			
Capability	**Description**	**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			

		Role			
Capability	**Description**	**Advanced**	**OLAP**	**Analysis**	**Programming**
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			
Import Data	Enables the Import Data task.	X	X	X	X
Save or Distribute Category					
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	Change the output location in tasks and wizards.	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 **Publish** 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 **Publish** menu options **E-Mail Recipient** and **E-Mail Recipient as a Step in Project** to modify a wizard that distributes files using e-mail.	X	X	X	
Content Category					
Create or Modify Advanced Query	Use the **Query Builder** menu option to create or modify advanced queries.	X		X	X
Create or Modify Data Join in Advanced Query	Use the **Add Table** and **Join** menu options to create or modify table joins in advanced queries.	X		X	X

		Role			
Capability	**Description**	**Advanced**	**OLAP**	**Analysis**	**Programming**
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
Create or Modify SAS Stored Process	Use the menu options **`Create Stored Process`** and **`Write TaskCode to Stored Process`** to create or modify stored processes in SAS Enterprise Guide projects.	X			X
Options Category					
Modify SAS Server Reference in Project or Document	Use the **`Select Server`** 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 **`Style Manager`** menu option to modify the styles that are used to create reports.	X	X	X	X
Create or Modify Schedules	Use the **`Schedule Project`** and **`Schedule Process Flow`** menu options to create and modify schedule projects. When not granted, users can view schedules.	X		X	X

		Role			
Capability	**Description**	**Advanced**	**OLAP**	**Analysis**	**Programming**
Access SAS Enterprise Guide Explorer	Use the **Enterprise Guide Explorer** 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 **SAS on the Web** to navigate to the SAS Technical Support Web site from SAS Enterprise Guide.	X	X	X	X
Data Category					
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
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

		Role			
Capability	**Description**	**Advanced**	**OLAP**	**Analysis**	**Programming**
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					
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
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

Capability	Description	Role			
		Advanced	OLAP	Analysis	Programming
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
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

		Role			
Capability	**Description**	**Advanced**	**OLAP**	**Analysis**	**Programming**
np Chart	Enables the np Chart task.	X	X	X	X
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

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

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 them from the SAS Enterprise Guide task list or Add-In menu.

To provide access to custom tasks, you can register custom tasks as capabilities, assign the 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 *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:\ProgramFiles\SAS\EnterpriseGuide*release-number*\Custom**
- *%appdata%***\SAS\EnterpriseGuide*release-number*\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 SAS Enterprise Guide on the same host.

- *%appdata%*`\SAS\SharedSettings\`*`release-number`*`\Custom`
  Use this location to deploy custom tasks to specified user accounts, using a directory that is accessed by 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 in SAS Enterprise Guide. 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**, then start the Task Import Wizard.

4 In the second page of the Task Import Wizard, specify the location from which you want to import task definitions. You can choose to have the wizard search standard locations for task definitions or you can specify a task-definition XML file.

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 a **Enterprise Guide** role.

4 In the role properties window, 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.

Note: To access unregistered custom tasks, you need the capability Access Unregistered Custom Tasks, which is available in the Tools and Help category, as described in "Default Roles and Capabilities for SAS Enterprise Guide" on page 47. △

CHAPTER

6

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. SAS Enterprise Miner also includes a batch facility to train and score models in batch. SAS Enterprise Miner can be installed in as distributable client server or as a personal workstation.

Enterprise and Single-Machine Configurations

SAS Enterprise Miner can be installed in a multi-tier client/server configuration, or the software can be installed in its entirety on a single host. Typical enterprise installations use SAS Enterprise Miner client software on desktop hosts. The desktop applications connect to the SAS Metadata Server through a SAS Analytics Platform server. As part of the SAS Analytics Platform, the SAS Enterprise Miner client software can be deployed to desktop hosts using Java Web Start.

Installation information is provided in the *SAS Intelligence Platform: Installation and Configuration Guide*. The installation of SAS Enterprise Miner fits into the overall installation process.

For information on installing SAS Enterprise Miner for use by a single user, or to see any of the latest product documentation, see **http://support.sas.com/documentation/onlinedoc/miner/**.

In the Windows operating environment, the SAS Enterprise Miner server software is installed at ***SAS-configuration-directory*\Lev1\AnalyticsPlatform**. Client software is installed at ***SAS-installation-directory*\SAS\SASAPcore\apps\EnterpriseMiner**.

To collect information in a log file, open the file em.ini in ***SAS-configuration-directory*\Lev1\AnalyticsPlatform\apps\EnterpriseMiner\bin** and specify a path and filename for the option **applogloc**.

The configuration file app.config is located in ***SAS-configuration-directory*\Lev1\AnalyticsPlatform\apps\EnterpriseMiner**.

For information on the contents of the configuration file, see the *SAS Enterprise Miner: Administrator's Guide*.

In an enterprise configuration, you select a workspace server in the **Create Projects** section of the SAS Enterprise Miner client application.

About the Enterprise Miner Plug-in for SAS Management Console

The Enterprise Miner plug-in for SAS Management console provides access to the server attributes, projects, and mining result packages that are defined on the Logical Workspace Server. You can also configure the Model and Projects folders and identify an optional WebDAV URL server to publish model packages.

The plug-in is displayed in SAS Management Console after you install and start the SAS Enterprise Miner client at least once. At that point, you can open the plug-in and access SAS Enterprise Miner metadata.

For additional information on using the Enterprise Miner plug-in, see the *SAS Enterprise Miner: Administrator's Guide*.

About HTTP Servers

To publish model packages, SAS Enterprise Miner can use a SAS Content Server or the Apache Tomcat HTTP Server. If your site uses Apache Tomcat, you need to configure that server as described in the SAS Enterprise Miner Help topic entitled "Customizing the Apache Tomcat HTTP Server." You also need to configure SAS Management Console to identify the HTTP server, using the Models folder. The Models folder is located under the Enterprise Miner node and the Application Management node in SAS Management Console.

See also the Help topics under the heading "Preparing SAS Enterprise Miner for Use."

To install and register metadata for a SAS Content Server, see the *SAS Intelligence Platform: Application Server Administration Guide*.

Clearing the Local Cache for Java Web Start

When you use Java Web Start on the SAS Analytics Platform server, the server downloads SAS Enterprise Miner and runs the application on your computer. The downloaded application is stored with other such application in a local cache. Occasionally, it is necessary to clear the cache, particularly after you install a new release. Follow these steps to clear the cache:

1. On the SAS Enterprise Miner client, select **Start** > **Run**.
2. Enter the command **javaws viewer**.
3. In the Java Application Cache Viewer, select **SAS Enterprise Miner**.
4. Click **Remove Selected Application**.
5. To load the new version of SAS Enterprise Miner, open the Web page for the SAS Analytics Platform, and then launch the application from the Web page. Use a Web address such as **http://myhost.mydomain.com:6380/AnalyticsPlatform**.

To learn more about Java Web Start, see the *Administrator's Guide for SAS Analytics Platform*.

CHAPTER

7

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 7.1 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.
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.

Administrative Task	Purpose of Task
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 "Common Elements" in the *SAS Intelligence Platform: Desktop Application Administration Guide*.
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 4.
- “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

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 Chapter 2, "Common Elements," on page 3.

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 *do* 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*release-number*\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 6 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\SASIinformationMapStudio*release-number***.

The Vista Log File location is **C:\Users\User Id\AppData\Roaming\SAS\SASIinformationMapStudio*release-number***.

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 7.

Configuration File

The configuration file for SAS Information Map Studio is located in the default installation directory ***SAS-installation-directory*\SAS\SASInformationMapStudio*release-number***. 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

8 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 8.1 Quick Reference for SAS Management Console

Task	Component	Reference
Security: manage permissions for users and groups	Authorization Manager, Access Control Templates folder	See the *SAS Management Console: Guide to Users and Permissions*.
Security: manage permissions for metadata objects	Authorization Manager, Resource Management folder	See the *SAS Intelligence Platform: Security Administration Guide*
Security: connection profiles, domains, and Integrated Windows authentication	Connection Profile Wizard	See the Help for the Connection Profile Wizard. Select File ▶ Connection Profile and click **Help**.
Libraries: create and register	Data Library Manager	See the *SAS Intelligence Platform: Data Administration Guide*.
Web application logs, connections, discovery, events, sessions, security, stored processes: manage services	Foundation Services	See the Help for Foundation Services in SAS Management Console.
Server control, initialization, log configuration, and options	Server Manager	See the *SAS Intelligence Platform: System Administration Guide*
Users and roles	User Manager	See the *SAS Intelligence Platform: Security Administration Guide* and the *SAS Management Console: Guide to Users and Permissions*.
Create and import packages, transfer data between folders.	Folders tab	See the Help for SAS Management Console.
Metadata objects: register, manage, configure libraries, tables, jobs, stored processes, and so on.	Folders tab	See Help on Folders in SAS Management Console.
SAS Metadata Server: manage resource templates, replicate, backup, and restore	Metadata Manager	See the *SAS Intelligence Platform: System Administration Guide*.
Publishing: manage e-mail accounts, channels, subscribers, message queues	Publishing Framework	See the Help for the Publishing Framework in SAS Management Console.
Scheduling: create and manage flows, execute jobs with available dependencies.	Schedule Manager	See *Scheduling in SAS*.
Servers, spawners, external data connections: define, control, manage	Server Manager SAS OLAP Server Monitor	See the *SAS Intelligence Platform: Application Server Administration Guide* and the Help for SAS OLAP Server Monitor and Server Manager.

Task	Component	Reference
Applications: manage and monitor custom	Foundation Services Manager Application Monitor Configuration Manager	See the Help for these plug-ins.
Manage the Web Infrastructure Platform	Configuration Manager	See the *SAS Intelligence Platform: Web Application Administration Guide*.
Test deployments	Deployment Tester	See "Monitoring Applications" in SAS Management Console Help. Also see "Validating Logical Servers" in SAS Management Console Help.
Geographic maps: define, import services. Under separate license, works with ArcGIS software to embed OLAP data in geographic displays.	Map Service Manager	See the *SAS Intelligence Platform: Web Application Administration Guide*.

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, and *new_path* is a fully qualified path to the new directory. Here is a typical example:

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

4 Start SAS Management Console on the local host.

Starting SAS Management Console

Start Commands

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 8.2 SAS Management Console Startup Commands

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

In the UNIX operating environment, you can use a symbolic link to start SAS Management Console. The following examples of UNIX commands create the symbolic link and start SAS Management Console:

```
> ln -s  /usr/local/SAS/SASManagementConsole/9.3/sasmc  /usr/local/bin/sasmc
> sasmc
```

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 that 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 4.

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

As described in the *SAS Intelligence Platform: Security Administration Guide*, the User Manager in SAS Management Console provides roles and capabilities that can be applied to users. When a user profile is associated with 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 "Registering Custom Tasks as Capabilities in the SAS Add-In for Microsoft Office" on page 19)
- SAS Enterprise Guide (see "Default Roles and Capabilities for SAS Enterprise Guide" on page 47)
- 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 8.3 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	
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

CHAPTER

9

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 Chapter 2, "Common Elements," on page 3.

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*release-number.

CubeStudioDefaults.txt
contains the user properties for SAS OLAP Cube Studio. The default storage location is **C:\Documents and Settings*User ID*\Application Data\SAS\SASOLAPCubeStudio*release-number***.

Log files
C:\Documents and Settings*user name*\Application Data\SAS\SASOLAPCubeStudio

Log files in the Vista operating environment
C:\Users*user name*\AppData\Roaming\SAS\SASOLAPCubeStudio

Administering OLAP Sessions and Queries

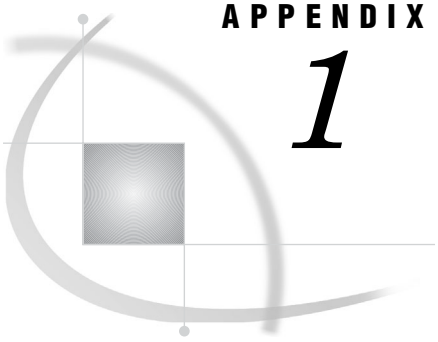
The SAS OLAP Server Monitor plug-in for SAS Management Console displays information about client connections to SAS OLAP Servers. Connecting to one of those servers displays a list of active queries on that server. You can close selected sessions or queries. For more information about the SAS OLAP Server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



APPENDIX

1

Recommended Reading

Recommended Reading **73**

Recommended Reading

Here is the recommended reading list for this title:

- *SAS Intelligence Platform: Overview*
- *SAS Intelligence Platform: System Administration Guide*
- *SAS Intelligence Platform: Web Application Administration Guide*
- *SAS Intelligence Platform: Security Administration Guide*
- *SAS Intelligence Platform: Data Administration Guide*
- *SAS Add-In for Microsoft Office: Adding SAS Content to Your Microsoft Office Documents*
- *SAS Data Integration Studio: User's Guide*
- *Administering SAS Enterprise Guide*
- *Getting Started with SAS Enterprise Miner*
- *SAS Information Map Studio: Tips and Techniques*
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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.

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 (MDDB) tables. Short form: OLAP.

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

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

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

SAS 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. An OLAP schema specifies which group of cubes an OLAP server can access.

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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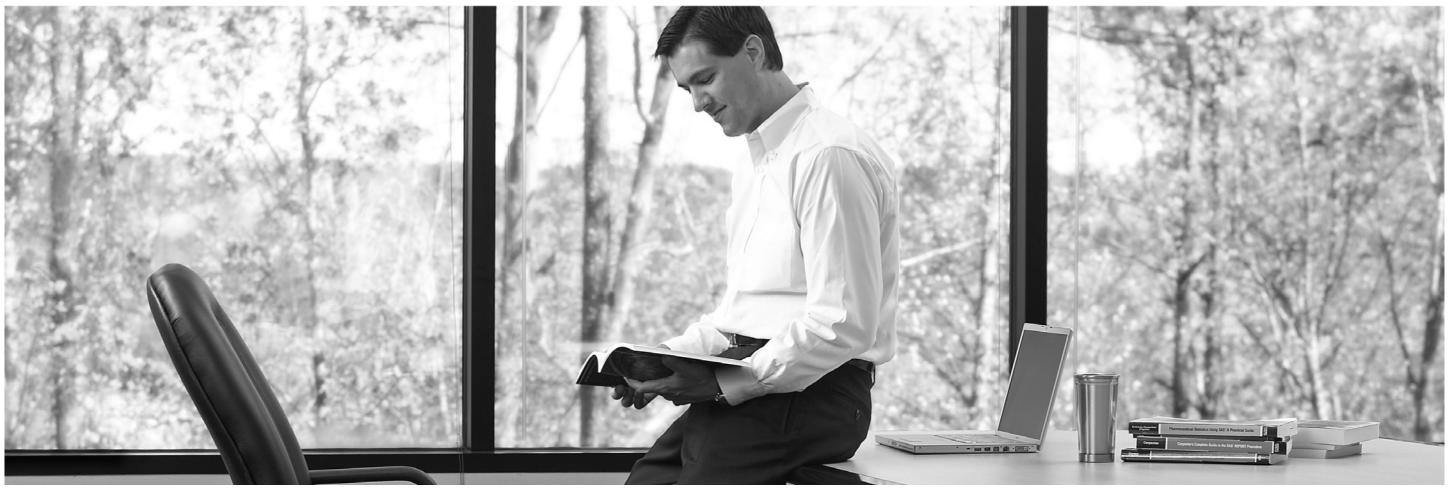

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