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Configuring and Customizing SAS[®] Enterprise Guide[®] 4.2 in the SAS[®] 9.2 Platform Environment

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ABSTRACT

SAS[®] 9.2 Business Intelligence Platform introduces a new robust, configurable architecture. This paper will cover several administrative topics that illustrate how to configure and customize SAS[®] Enterprise Guide[®] 4.2 to work effectively in the new SAS[®] 9.2 Business Intelligence Platform environment. The following administrative topics are discussed:

- How to configure SAS[®] Enterprise Guide[®] 4.2 with the SAS[®] 9.2 Metadata Server, SAS[®] 9.2 OLAP Server, SAS[®] 9.2 Stored Process Server, and SAS 9.2 Workspace Server.
- How to set up authentication for single sign-on when accessing SAS 9.2 servers on Windows, UNIX, and MVS operating systems.
- How to set up local and remote connections to database libraries for SAS[®] Table Server and how to define DBMS libraries to access databases, such as Oracle, DB2, and Teradata.
- How to define libraries for XML data and WebDAV for publishing and managing content to Web servers.
- How to use role-based configuration to customize the SAS[®] Enterprise Guide[®] user interface and functionality.

INTRODUCTION

There are many new features in the SAS 9.2 Business Intelligence Platform that SAS Enterprise Guide can use. These features include several new options for authentication to SAS servers, role-based configuration of the application, and new SAS/ACCESS[®] library engines to access additional types of data. Many of these features address security needs, improve the user experience, and facilitate integration with other SAS applications. This paper explains each of these new features and provides examples of how to configure them for SAS Enterprise Guide users. The reader is assumed to have familiarity with SAS Enterprise Guide, SAS[®] Management Console, and a general knowledge of the SAS Business Intelligence Platform.

SAS SERVERS

The foundation of the SAS Business Intelligence Platform is the SAS server. There are several types of servers (including the metadata, workspace, OLAP, and stored process servers) that provide specific functionality. This paper will provide examples to show how each type of server is configured for use with SAS Enterprise Guide.

SAS METADATA SERVER

The SAS Metadata Server is the root of the SAS Business Intelligence Platform and contains information about all other servers. One or more metadata servers can be configured in SAS Enterprise Guide by using the Connections dialog box as shown in Figure 1. Each server configuration is called a profile. One profile may be selected as active. There is also a choice to not use a profile. This is useful if you are using SAS Enterprise Guide and a connection to your company's network is not available.

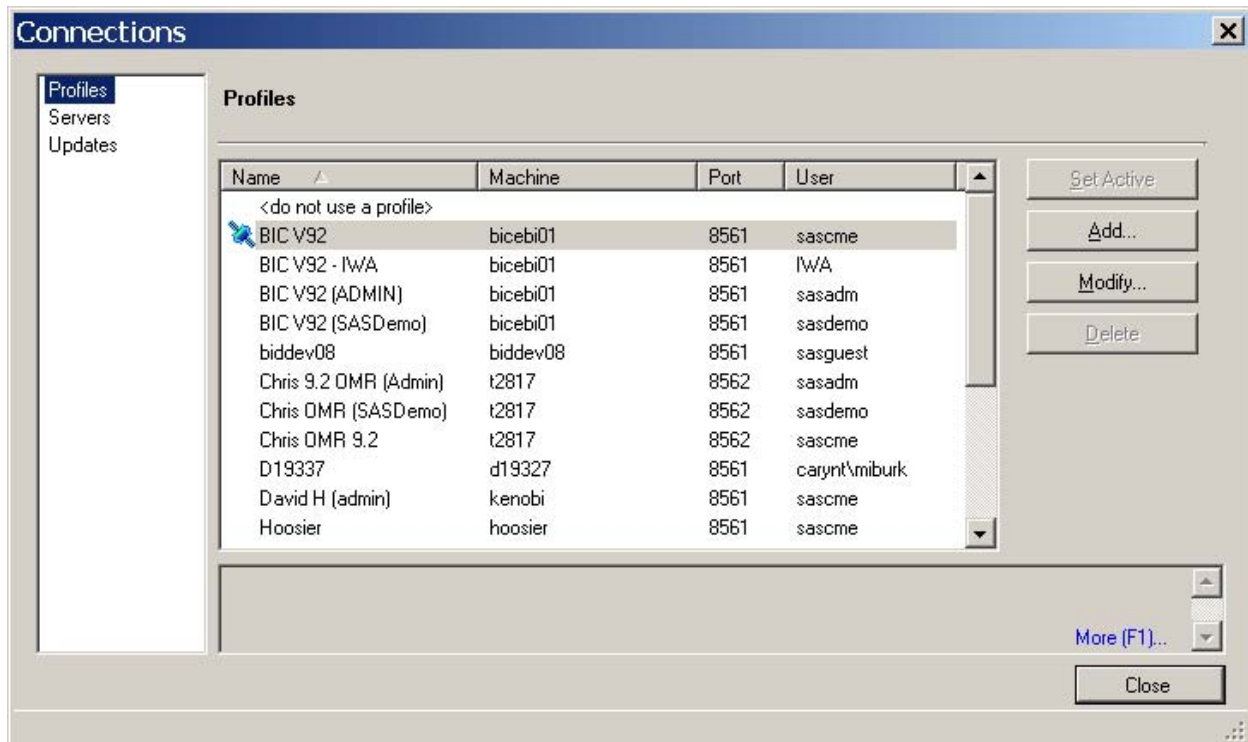


Figure 1. Connections Dialog Box

New in 4.2 is the option to use Integrated Windows Authentication (IWA). You can select this option when you are creating or modifying a profile. When this option is selected, the **User** and **Password** fields are not required and will be disabled. The user is authenticated to the SAS Metadata Server by using a mechanism on the Windows operating system. IWA is often called single sign-on because the user is required only to logon to their workstation and will not be prompted for a user name and password for the SAS Metadata Server connection.

Another important benefit of using IWA is that passwords are not saved in the profile. Profiles are saved on the user's local computer. Although the profile passwords are encrypted, many sites have policies that prohibit the storage of passwords. Using IWA is a good way to meet this requirement. Note that IWA is available only when the metadata server is running on the Windows operating system. UNIX and z/OS metadata servers require a user and password that must be either stored in the profile or entered by the user when prompted.

Figure 2 shows the dialog box that you can use to edit a profile. The **Authentication Domain** field is usually left blank. The usage of this field will be explained later in the section on workspace servers.

Figure 2. Modify Profile

SAS WORKSPACE SERVER

SAS Enterprise Guide uses the SAS Workspace Server for many functions. This server is where the code created by tasks is executed and many types of data are accessed. To the SAS Enterprise Guide user, these are simply called *servers* because they predate most of the newer servers that are available in the SAS Business Intelligence Platform. SAS Enterprise Guide also provides facilities to save data, projects, and code to the file system on a SAS Workspace Server.

There are several new types of authentication supported for workspace servers:

- Integrated Windows Authentication (IWA)
- SAS Token Authentication

The SAS® 9.1 authentication modes are also available, including user name and password authentication, prompt authentication, and the rarely used value of no authentication required. Setting up a server definition for users can be a difficult task so we will show examples of how to configure each of the major authentication modes.

- User/Password Authentication

This is a very common mode of authentication that is usually delegated to the host operating system where the SAS server is running. Figure 3 shows a SAS Workspace Server configured for user/password authentication. There are several ways this login information can be provided.

1. If the authentication domain of the server is the same as the domain specified in the SAS Metadata Server profile (see Figure 2.), then SAS Enterprise Guide will use the SAS Metadata Server login for the SAS Workspace Server. Usually this field is left blank in the SAS Metadata Server profile, which equates to a value of DefaultAuth. This value is also the default for a SAS Workspace Server, but can be changed by an administrator using SAS Management Console.
2. When the two servers are not in the same domain, SAS Enterprise Guide will query the metadata for a login that is in the same domain as the SAS Workspace Server.
3. In the case where the user does not have a login for the authentication domain associated with the SAS Workspace Server or the login is invalid, the user will be prompted for a login. SAS Enterprise Guide will update the login in metadata if the connection is successful in order to provide a seamless user experience.

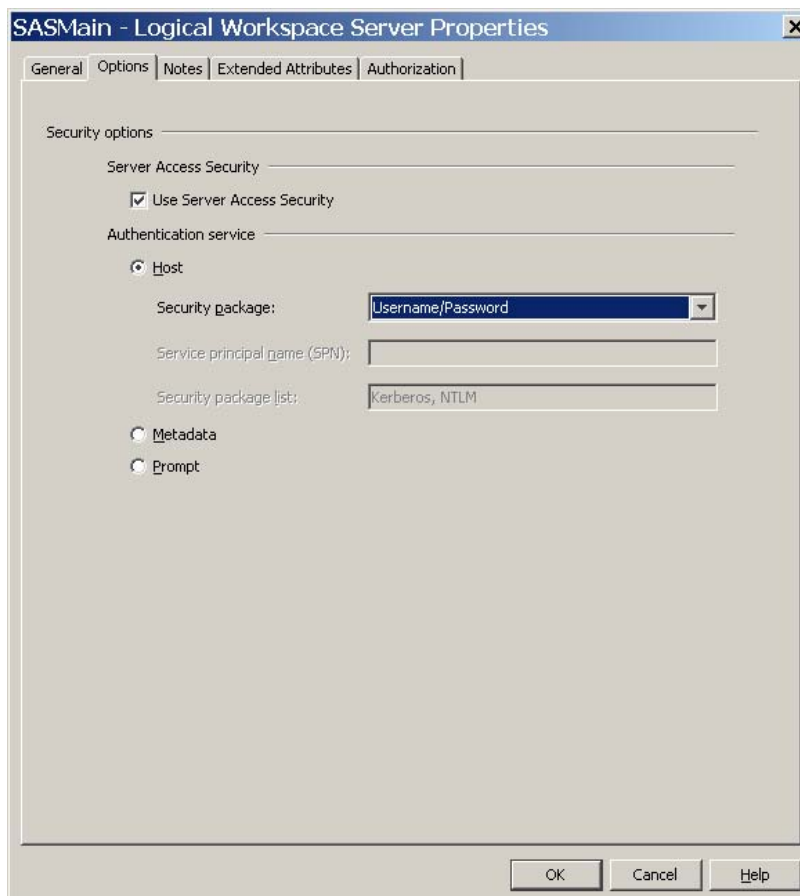


Figure 3. User/Password Authentication

- Prompt Authentication

The user might be prompted when a login is not available, or if the login is rejected by the authentication mechanism. However, it is possible to configure a server to always prompt for login information. This mode of authentication is very useful to comply with site policies that require that a user login whenever a secure resource is accessed. Note in this mode of authentication a successful login will **not** be saved in metadata in order to comply with a site policy that might prohibit any storage of passwords. Figure 4 shows a SAS Workspace Server that is configured for prompting.

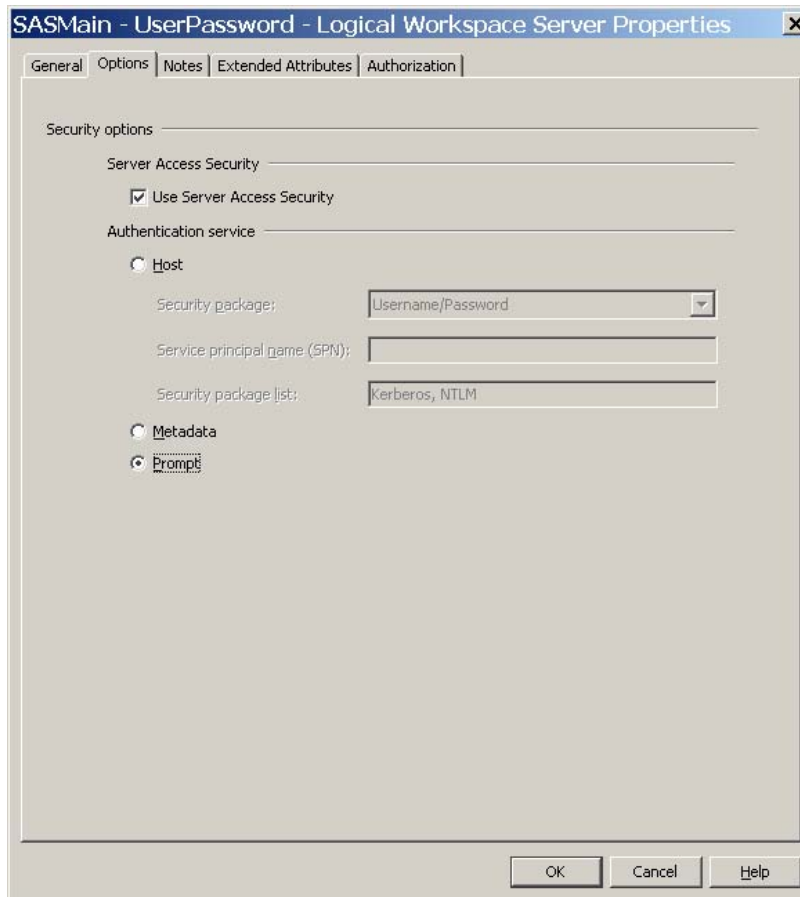


Figure 4. Workspace Server Configured for Prompting

- Integrated Windows Authentication (IWA)

One of the primary forms of single sign-on, IWA, is new in 4.2. It uses the security APIs in the Windows operating system to authenticate to a SAS server that is running on Windows. This is the same mechanism that is used for the SAS Metadata Server. Once a user is logged on to their workstation, no further authentication is required because IWA can pass the identity of the user to the SAS server. There are two key benefits to this approach:

1. No passwords need to be stored in metadata or on a user's computer.
2. Prompting the user to login is no longer necessary.

There is an additional requirement for using IWA to a SAS Workspace Server. The connection to the SAS Metadata Server must also be configured to use IWA. If this is not the case, then the SAS Workspace Server will be authenticated according to the user/password rules. Figure 5 shows a server set up for IWA. Note the security package is set to **Negotiate** rather than **User/Password**.

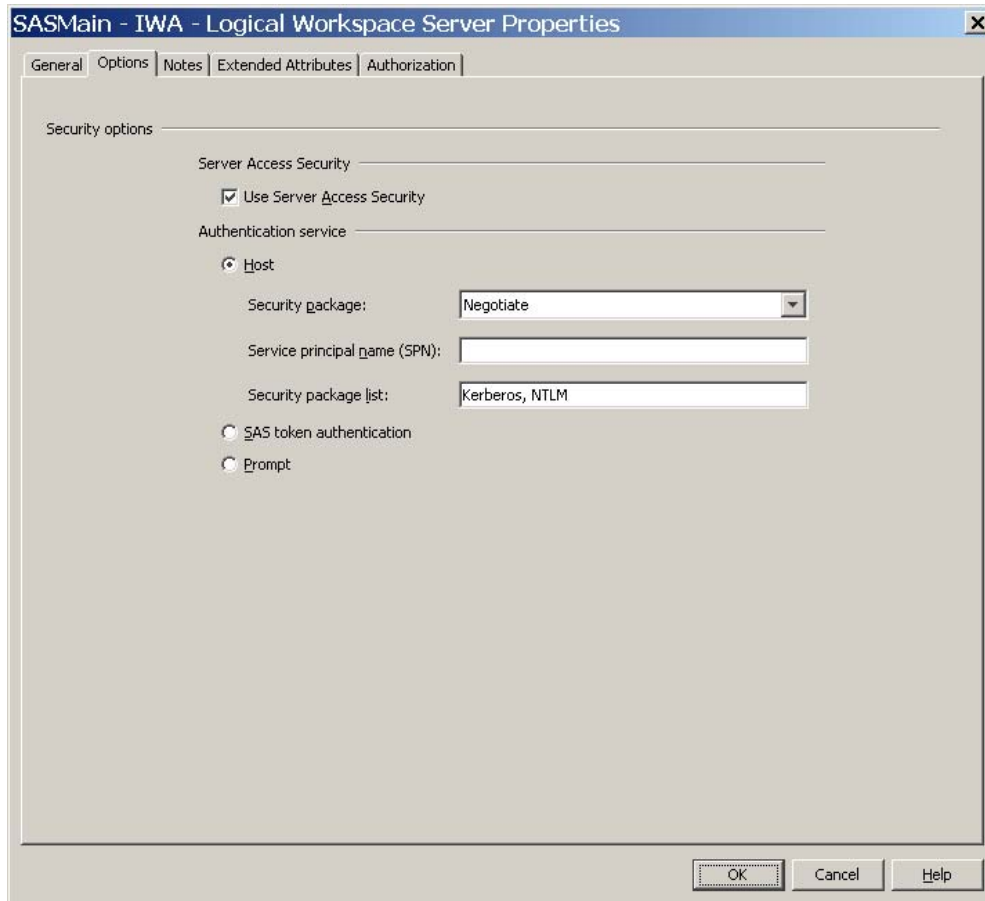


Figure 5. Integrated Windows Authentication

- SAS Token Authentication

This is also new in 4.2 and provides another form of single sign-on that will work in UNIX, z/OS, and Windows operating environments. After connecting to a SAS Metadata Server, SAS Enterprise Guide obtains a token that is used to connect to a SAS Workspace Server. This token is honored only once for security reasons. Because the token is issued by the SAS Metadata Server, your identity is known and will be used for security permissions in calls between the SAS Workspace Server and the SAS Metadata Server.

Unlike other authentication modes for the SAS Workspace Server, all users run under the same account (the default is SASSERV) on the host machine where the SAS Workspace Server is running. This means that all users will have the same file and system permissions, but will retain their individual identity and security permissions for metadata access. This type of authentication is very useful for sites that run SAS servers on UNIX or z/OS operating systems. If the user workstation accounts are on Windows, Active Directory, or some other system, SAS token authentication alleviates the need for each user to have an account on the system where the SAS server is running. Figure 6 shows a logical SAS Workspace Server set up to use this authentication mode.

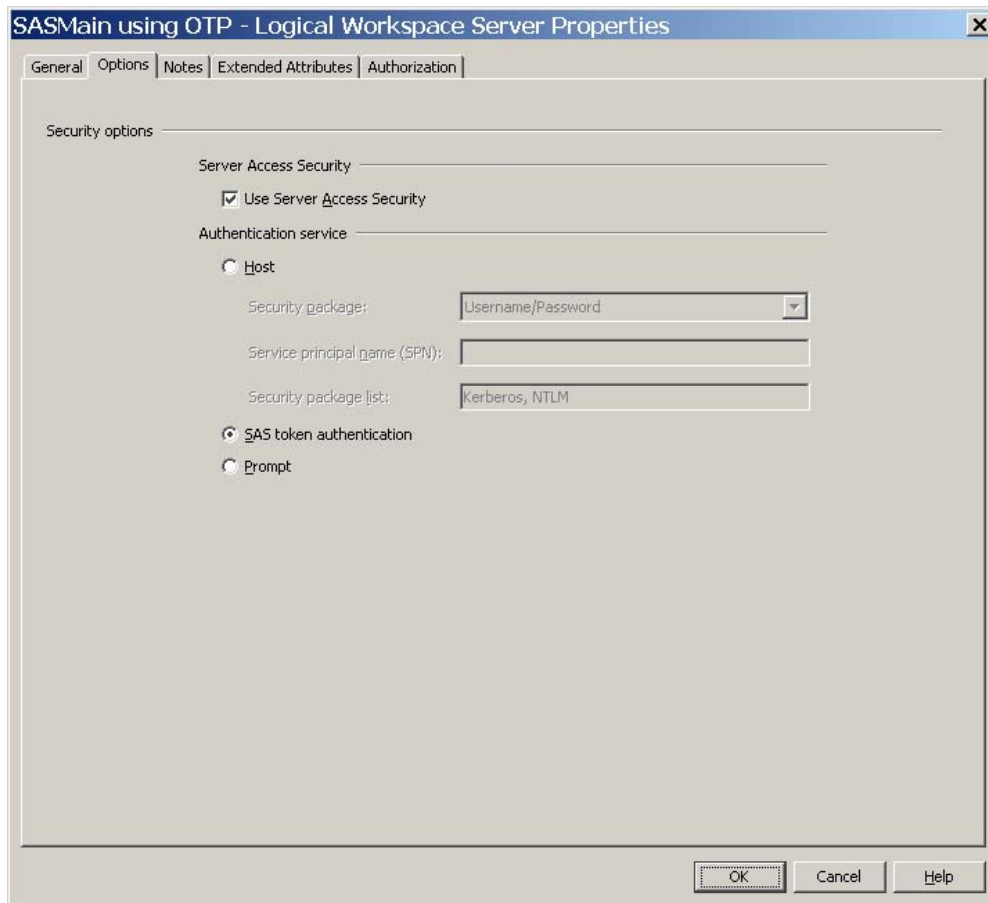


Figure 6. SAS Token Authentication

An additional step is required to use this mode of authentication. You must specify the identity to use to launch the SAS process in the **Launch credentials** field. (See Figure 7.)

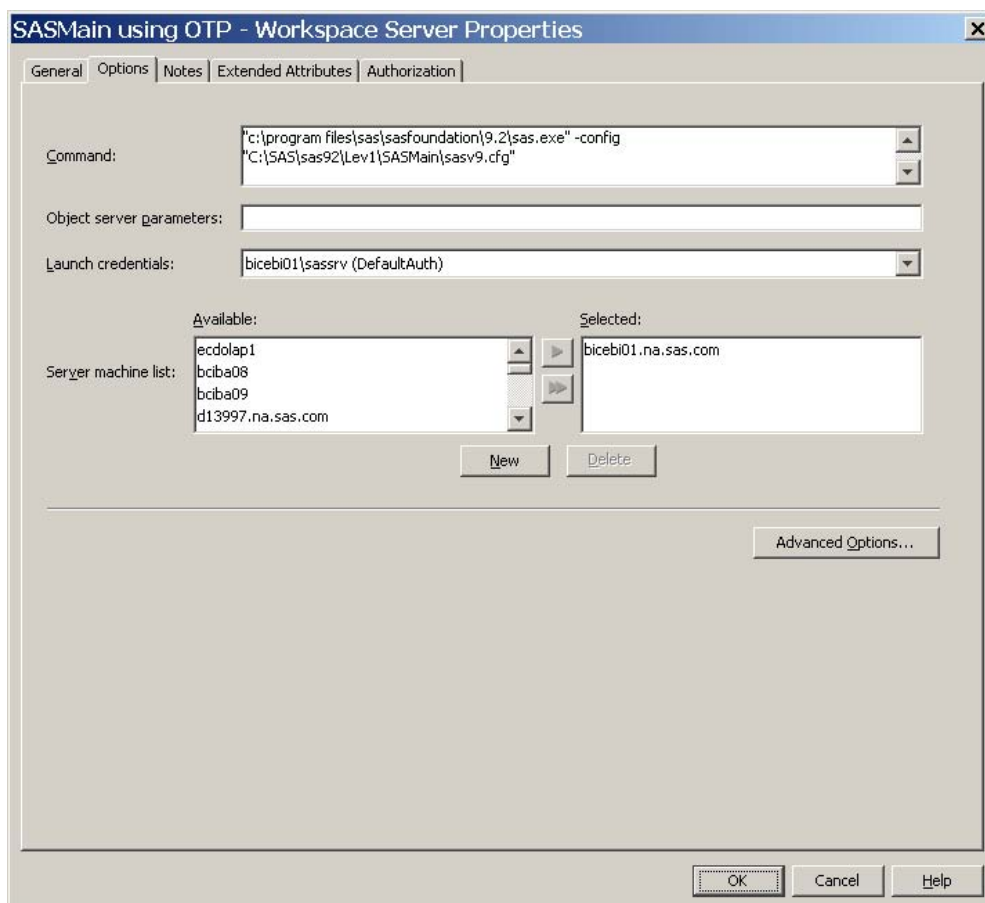


Figure 7. Launch Credentials

SAS OLAP SERVER

The SAS OLAP Server can authenticate by using many mechanisms; however, the SAS 9.2 Business Intelligence Platform supports only a configuration that uses SAS token authentication. This cannot be changed in SAS Management Console. Because the connection is actually made through the SAS data provider, SAS Enterprise Guide builds a connection string that gives the provider all of the necessary information to connect to the SAS Metadata Server and obtain the token.

SAS STORED PROCESS SERVER

Stored process servers are also configured to use SAS token authentication. This cannot be changed in SAS Management Console.

SAS LIBRARIES

The SAS library is the basic container for SAS data sets. Because these should be very familiar to administrators and other readers of this paper, the focus will be on the most commonly used DBMS engines, the new XML engine, and the new SAS Table Server library. A library can be defined or modified by using SAS Management Console or SAS Enterprise Guide Explorer.

DATABASE LIBRARIES

Database libraries require a server definition for the database server. They also might require a schema name, which must be defined in metadata. Some DBMS libraries will use a default schema name if none is supplied. The credentials mode is new in SAS Enterprise Guide 4.2 and controls the login for DBMS. The credentials mode might be set to reflect no login, prompt for each connection, or prompt and save the login in metadata. In SAS Management Console, this setting is found on the connection that is associated with the database server. In SAS Enterprise Guide Explorer, this setting is on the **Engine** page in the Library Properties dialog box.

The **Assignment** page in SAS Enterprise Guide Explorer controls how the library will be assigned. It can be done by SAS Enterprise Guide, the SAS Workspace Server, or the SAS Metadata Library Engine (MLE). There is an option when using MLE that controls whether tables are shown if they are not defined in metadata.

Below is an example of the **Engine** page for an Oracle DBMS library.

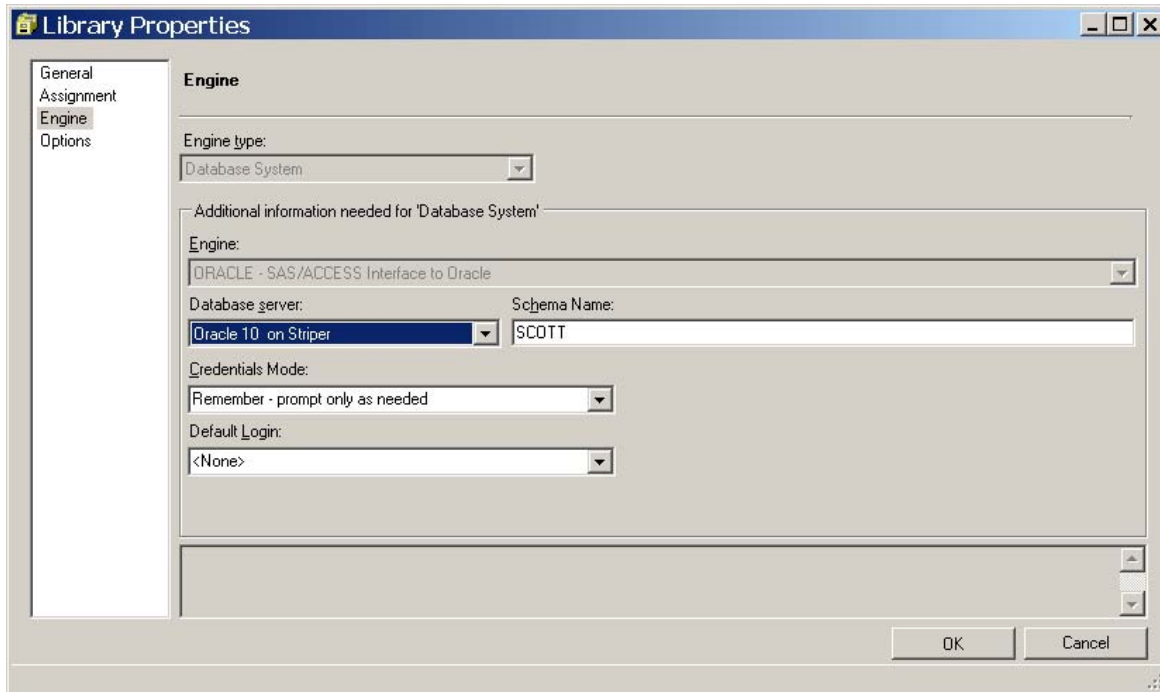


Figure 8. Engine Configuration for an Oracle Library

XML LIBRARY

An XML library requires a path and some additional information specific to the SAS XML engines. There are several types of XML data that are available from the **XML type** drop-down list. If XMLMAP is selected, then the name of the map file must also be specified. It is common to have additional options with an XML library. These options can be specified on the **Options** page as name-value pairs. Figure 9 shows the **Engine** page for an XML library.

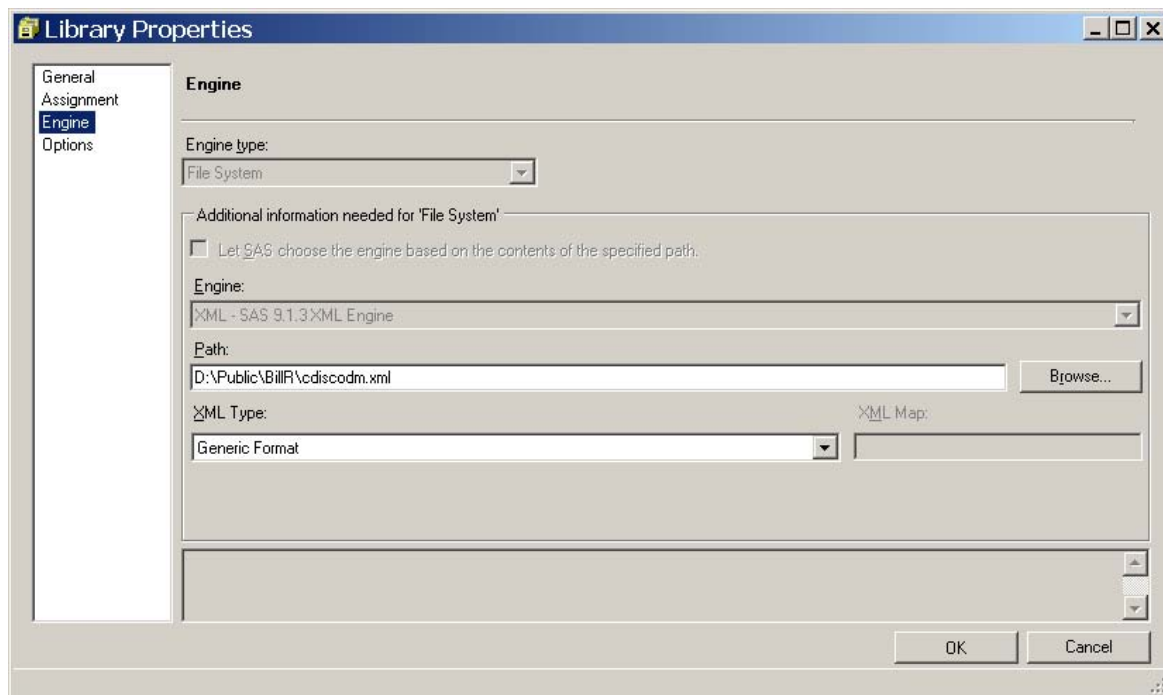


Figure 9. Engine Configuration for an XML Library

WEBDAV LIBRARY

The WebDAV engine is used to define a WebDAV library. This type of library can access a remote folder surfaced by a WebDAV server as a SAS library. A WebDAV library requires a content server definition and a path that is accessible on the remote DAV file system. This type of library might also require a login that is set by the credentials mode. Figure 10 shows the **Engine** page for a WebDAV library.

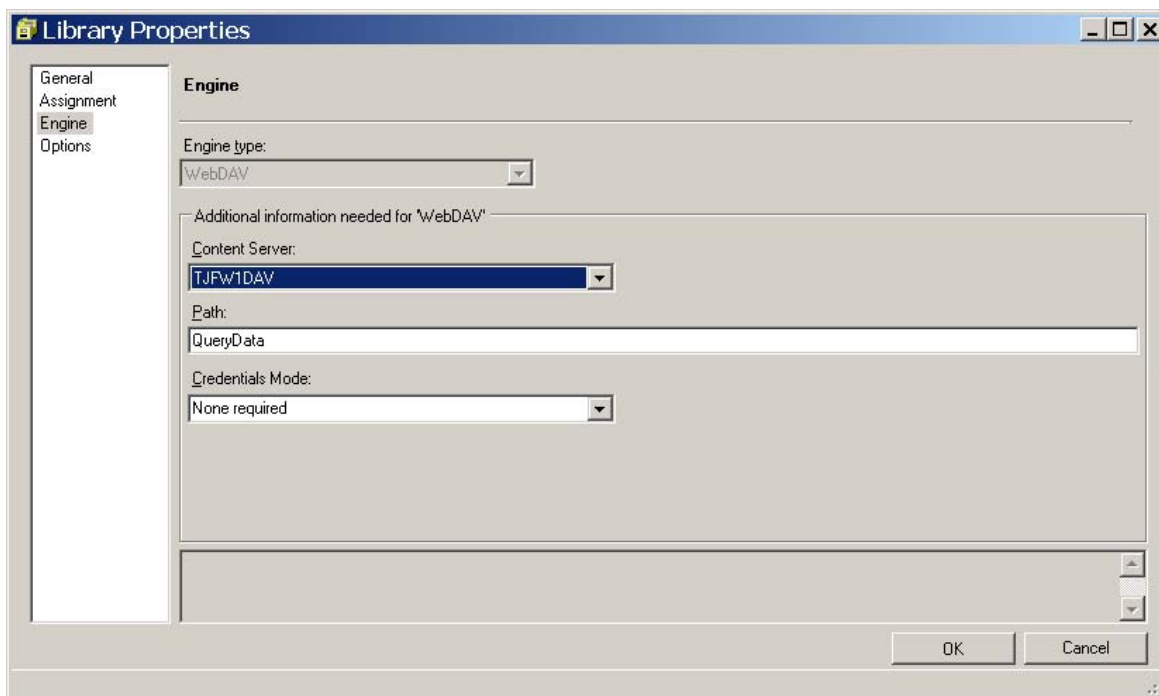


Figure 10. Engine Configuration for a WebDAV Library

SAS TABLE SERVER LIBRARY

A table server library definition uses the SAS Table Services Engine (SASTS). This library definition is similar to the definition for a DBMS library except the **DSN** name-value pair is required on the **Options** page. Additional options can be specified as needed. Below are the **Engine** and the **Option** pages for a SAS Table Server library.

The screenshot shows the 'Library Properties' dialog box with the 'Engine' tab selected. The 'Engine type' is set to 'Database System'. The 'Engine' dropdown is set to 'SASTS - SAS Table Services Engine'. The 'Database server' is set to 'bicebi01_TableServer - Data Service'. The 'Schema Name' field is empty. The 'Credentials Mode' is set to 'Remember - prompt only as needed' and the 'Default Login' is set to '<None>'. The 'OK' and 'Cancel' buttons are visible at the bottom right.

Figure 11. Engine Configuration for a SAS Table Services Library

The screenshot shows the 'Library Properties' dialog box with the 'Options' tab selected. The 'Enter options as name-value pairs:' section contains a table with one row: 'DSN' with the value 'EGBaseData'. A 'Delete' button is to the right of the table. Below the table is an 'Additional Options:' text field. The 'OK' and 'Cancel' buttons are visible at the bottom right.

Name	Value
DSN	EGBaseData

Figure 12. Options for the SAS Table Services Engine

ROLE-BASED CONFIGURATION

The ability to customize SAS Enterprise Guide for various user groups is an exciting new feature in 4.2. The name for this functionality is role-based configuration. There are many capabilities that can be controlled through this mechanism, including access to individual tasks or groups of tasks, data access, access to specific options, access to types of content, the functionality to import and export data, and many more. Note that role-based configuration is not to be considered a security mechanism, but rather a means to customize SAS Enterprise Guide for different groups of users such as analysts and programmers.

A default installation will contain four roles for SAS Enterprise Guide. These roles and their purpose are:

- Enterprise Guide: Analysis basic data analysis, reporting, and other capabilities
- Enterprise Guide: Programming SAS programming, stored process authoring, and other capabilities
- Enterprise Guide: OLAP viewing OLAP cubes in the OLAP Analyzer and other capabilities
- Enterprise Guide: Advanced all capabilities in SAS Enterprise Guide

An administrator can create new roles or modify these roles to meet the needs of the enterprise by using SAS Management Console. Figure 13 illustrates the configuration for the Enterprise Guide: Analysis role. Notice that under the **Options** category that the security and performance options are not checked. Checking one of these options will modify the Enterprise Guide: Analysis role by adding that capability for users in that role. Other capabilities and tasks can be added or removed from the role using the Enterprise Guide: Analysis Properties dialog box in SAS Management Console.

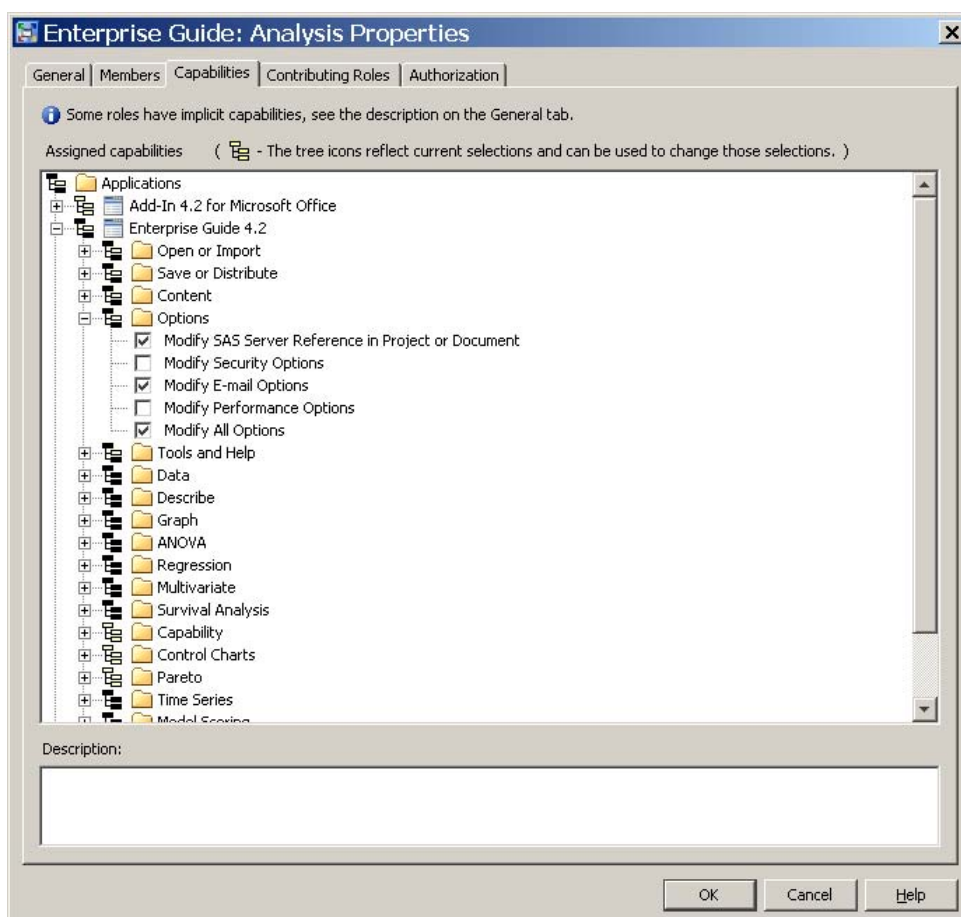


Figure 13. Modifying Role Capabilities

There are two ways to add users and groups to a role. Either of these can be added from the **Available Identities** list on the **Members** tab in the Properties dialog box for the role. The other way to add the role to the user or group is by using the **Roles** tab in the Properties dialog box for the user or group. Figure 14 shows a group called CaryNT User

that is also a member of three other groups. The CaryNT User group is also a member of the Enterprise Guide: Advanced and Web Report Studio: Advanced roles.

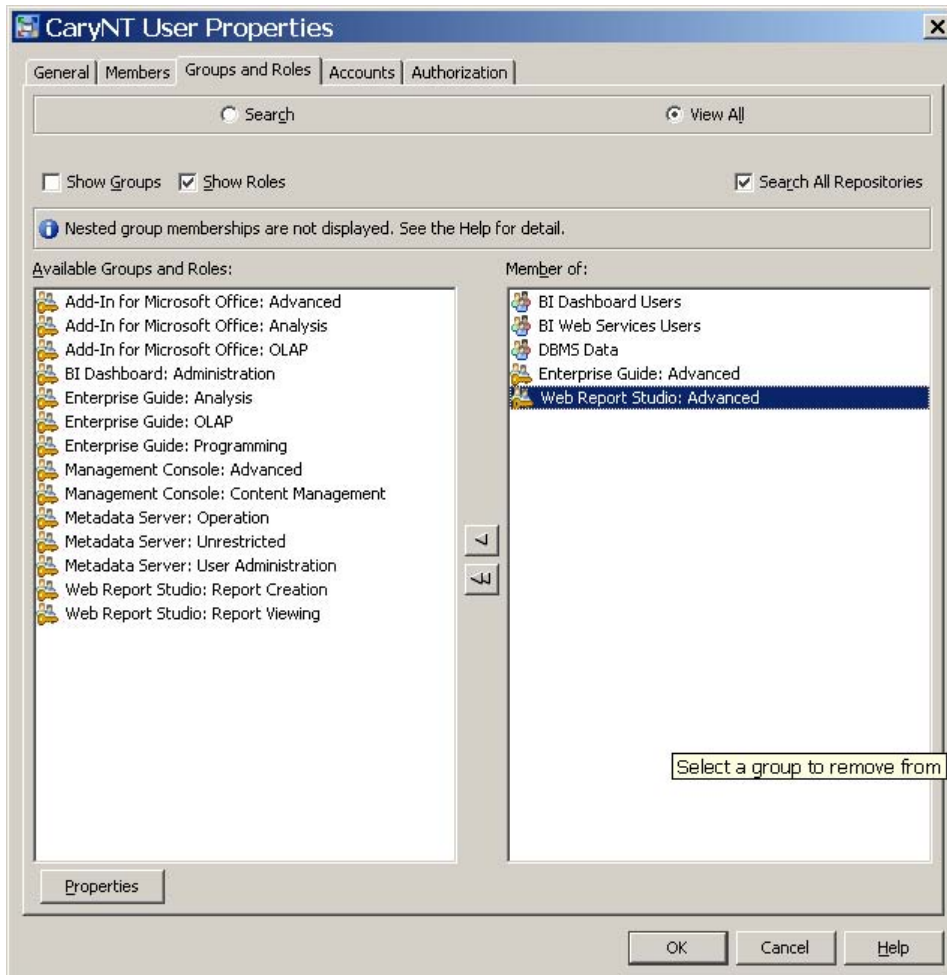


Figure 14. Example of Groups and Roles for the CaryNT User Group

When a user has any restricted capabilities based on role membership, a link labeled **Functions** will appear in the status bar in SAS Enterprise Guide. Clicking this link will produce the dialog box shown in Figure 15. This dialog box lists every task and capability that is controlled through the role-based mechanism in SAS Management Console. This dialog box also shows whether the user is authorized to use that task or capability.

Name	Authorized	Category	Description
t Test	No	ANOVA	Enables a user to perform t-
CDF Plots	No	Capability	Enables a user to plot the o
Histograms	No	Capability	Enables a user to compare
P-P Plots	No	Capability	Enables a user to compare
Probability Plots	No	Capability	Enables a user to compare
Q-Q Plots	No	Capability	Enables a user to compare
Add or Modify Custom Code to SAS Task	No	Content	Enables a user to add and r
Create or Modify Advanced Query	No	Content	Enables a user to create a r
Create or Modify Data Join in Advanced Query	No	Content	Enables a user to create a t
Create or Modify SAS Program	No	Content	Enables a user to create an
Create or Modify SAS Stored Process	No	Content	Enables a user to create a r
Box Chart	No	Control Charts	Enables a user to create a r
c Chart	No	Control Charts	Enables a user to create c c
Individual Measurements Chart	No	Control Charts	Enables a user to create co
Mean and Range Chart	No	Control Charts	Enables a user to create me
Mean and Standard Deviation Chart	No	Control Charts	Enables a user to create me

Contact your SAS Enterprise Guide administrator if you need to change the settings.

OK

Figure 15. Display of Capabilities for a User

CONCLUSION

SAS Enterprise Guide 4.2 has many exciting new features. Many of these features leverage new functionality in the SAS 9.2 Business Intelligence Platform. In 4.2, there are more options for security and authentication as well as the new role-based configuration that allow a site to customize SAS Enterprise Guide.

Single sign-on authentication is very desirable in many cases and can be achieved using IWA or SAS token authentication. Sites that prohibit the saving of passwords will now have viable options other than prompting the user to login. SAS Enterprise Guide 4.2 also supports several new library engines including XML and WebDAV. These libraries can be defined by using SAS Management Console or SAS Enterprise Guide Explorer.

CONTACT INFORMATION

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