Configuration Guide

SAS® Decision Services 6.2

Overview

The *SAS Decision Services: Configuration Guide* explains how to install and configure SAS Decision Services. The SAS Decision Manager software offering of the Customer intelligence solution uses SAS Decision Services. You will need to refer to the Customer Intelligence documentation for specific information on SAS Decision Manager 6.2.

The additional software offerings used by SAS Decision Services are SAS Metadata Server and SAS Integration Technologies. The SAS Intelligence Platform library provides information for these two platform offerings. See **http://support.sas.com/94administration** for more information about these two software offerings and their components.

What Is Covered in This Document?

This document is for SAS installers who want to configure SAS Decision Services 6.2. See **http://support.sas.com/documentation/onlinedoc/intellplatform/index.html** for more information on how to install and configure the SAS Intelligence Platform.

Recommended Reading

As of June 2013:

- SAS Institute, Inc, 2013. *SAS 9.4 Intelligence Platform: Installation and Configuration Guide*. Cary, NC. Available at http://support.sas.com/documentation/onlinedoc/intellplatform/index.html
- SAS Institute, Inc, 2013. *DataFlux Federation Server Administrator's Guide.* Cary, NC. Available at http://support.sas.com/documentation/onlinedoc/dffedserver/index.html.

Assumptions

The installation and configuration of SAS Decision Services supports the following assumptions:

- Multiple instances of the design and engine server for the development, test, and production environments should use separate SAS Metadata Servers.
- Separate SAS Metadata Servers on the same hardware machine should be configured with different ports and different configuration directories.
- The Oracle service names and ODBC data source names for DB2 and SQL Server should be configured to use the same name on the SAS Server and the SAS Federation Server.
- During the execution of the SAS Deployment Wizard, you must select to configure the Web Anonymous User ID, if you plan on using BI Web Services to write SAS activities that use SAS procedures.

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Pre-Installation Step for SAS Deployment Wizard

Below are excerpts from the SAS *9.4 Intelligence Platform: Installation and Configuration Guide,* http://support.sas.com/documentation/onlinedoc/intellplatform/index.html.

1. Create the standard SAS users and groups. (sas, sassrv, and sasdemo).
2. Download the SAS Software Depot.
3. Install required third party software, such as the Java Development Kit for Java 7. (http://support.sas.com/resources/thirdpartysupport/v94/jdks.html) This is required to install the Data Flux Federation Server Manager.
4. Obtain JUnit. JUnit is an open-source software testing framework for Java, and the standard for writing unit and regression tests. Some of the validation tests shipped with SAS products run under the SAS Deployment Tester framework and require JUnit. For more information about JUnit version requirements, go to http://support.sas.com/resources/thirdpartysupport/v94/othersw.html.
5. Create a folder and copy all sid_files from the depot to this new location. This is specifically for the DataFlux products so that you can reference the sid location from the install.

Pre-Installation Steps

Before running the SAS Deployment Wizard to install and configure SAS Decision Services, there are pre-installation steps that need to be performed. You will need to complete these pre-installation steps prior to configuring SAS Decision Services 6.2.

Step 1: Define System User and SAS Federation Server Administrator User IDs

1. Define a system user ID as a host account that will be used to install, configure, and administer the SAS Federation Server and DataFlux Authentication Server. This user is required to bootstrap the system. This user can be the SAS installer user.
2. Define an administrative user ID as a host account that will be used to administer and access the SAS Federation Server through its data source. This user should be unique from the system user ID.

Step 2: Create a Folder on your SAS Federation Server for SAS Data

1. Create the folder on your SAS Federation Server machine where SAS data will be stored. Set read permissions on the path. Record the location in your checklist.

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Pre-Installation Steps for Oracle, DB2, Teradata, Greenplum, or SQL Server

Complete these pre-installation steps prior to configuring SAS Decision Services 6.2, if you plan on using a database to store your user and audit log tables. If you select SAS as your database type, then you can skip these steps.

Step 1: Install the Database Client and Server Software

It is recommended that you configure the SAS Federation Server to use the native database drivers for improved performance.

Therefore, install the required DBMS client software on the SAS Federation Server and the SAS Server. Refer to the installation documentation for the specific database.

Prior to starting the SAS Deployment Wizard to configure SAS Decision Services, you must be able to connect to the database server if you want to complete the automated creation of user and audit log tables during the SAS Decision Services server configuration. Therefore, install the required DBMS server software on a designated database server machine. Then, configure your database server. Refer to the installation documentation for the specific database.

For Oracle only. Add an entry into your TNSNAMES.ORA file and change the values shown in brackets to suit your environment. SAS uses the <*addressname*> to connect to the database and the SAS Federation Server and the JDBC connection system resources uses the <*sid*> to connect to the database. When defining this entry, define the <*addressname*> and the <*sid*> as the same value.

```
<addressname>=
 (DESCRIPTION=
   (ADDRESS_LIST=
     (ADDRESS= (PROTOCOL=TCP) (Host=<hostname>)
(Port=<port>)))
 (CONNECT_DATA=
  (SERVICE_NAME=<sid>)
 ))
```

Step 2: Define Database Users

Define a database user ID with create, alter, and delete table permissions that will be used to create the user and audit log tables. This user ID is also used by the engine and design server as the Java Access user ID that writes to the user and audit log tables.

Step 3: Obtain Your Database JDBC Driver Information for Customer Data Access

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Prior to starting the SAS Deployment Wizard to configure SAS Decision Services, you will need to obtain the JDBC driver name and JAR file for your specific database. Refer to the installation documentation for the specific database.

Downloads for JDBC Drivers

As of April 2013:

- DB2 drivers are available at https://www-304.ibm.com/support/docview.wss?uid=swg21363866
- Microsoft SQL Server drivers are available at http://msdn.microsoft.com/en-us/sqlserver/aa937724
- Teradata drivers are available at http://downloads.teradata.com/download/connectivity/jdbc-driver
- Oracle drivers are available at http://www.oracle.com/technetwork/database/features/jdbc/index-091264.html
- Greenplum drivers are available at http://jdbc.postgresql.org/download.html

1. Download the JDBC driver for your specific database version, along with all dependent files including license files.
2. Copy the database JDBC JAR files, along with the correct license files, where applicable (such as DB2), to the machine where the SAS Decision Services design, engine, and monitor middle tiers will be installed. Only the JAR files for a single version of the JDBC JARs should reside in this directory.
3. Record the location for use during the SAS Deployment Wizard.

Step 4: Create the ODBC Data Source Name (SQL Server and DB2 Only)

If you are using SQL Server or DB2, you will need to create the ODBC data source names before you run the SAS Deployment Wizard configuration, if you want to run the automated configuration of the user and audit log tables.

1. Create the data source name on the SAS Federation Server and the SAS Server.
2. Create the ODBC data source name as an administrative user and use the native database driver.

Windows

1. From the Microsoft® Windows® Start menu, navigate to **Start** > **Control Panel** > **Administrative Tools** > **Data Sources (ODBC)**.
2. On the **System DSN** tab, click **Add**.
3. Select the driver that corresponds to your database and click **Finish**.
4. Complete the options below based on the database type.

SQL Server

a. Data Source Name***: <Enter the data source name>***
b. Description: ***<Optional>***
c. Server: ***<Enter the host for the SQL server database>***
d. With SQLServer Authentication ***<Enter the user ID and Password>***
e. You can change default database ***<Optional>***
f. You can change the log location ***<Optional>***
g. Select test data source

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DB2

a. Data Source Name: **: <*Enter the data source name*>**
b. Description:**<*optional*>**
c. Database Alias: **<*select ADD*>**
   Data Source Tab : **<*Enter the user ID and Password*>**
   TCP/IP Tab:
   i. Database Name:**<*Enter the database name*>**
   ii. Database Alias: **<*Enter the database alias (schema)*>**
   iii. Host Name: **<*Enter the database host name*>**
   iv. Port: **<*Enter the database port*>**

5. Test the connection on each DSN and click **Finish**.

UNIX® or Linux®

Interactive ODBC Configuration Tool

Use the interactive ODBC Configuration Tool, dfdbconf, to add new data sources to the ODBC configuration.

1. From the root directory of the SAS Federation Server installation, run:
   ./bin/dfdbconf
2. Select **A** to add a data source. You can also use dfdbconf to delete a data source if it is no longer needed.
3. Select a template for the new data source by choosing a number from the list of available drivers.
4. You are prompted to set the appropriate parameters for that driver. The new data source is then added to your odbc.ini file.

Test Data Source Connections on UNIX from the SAS Federation Server

Once you have added all of your data sources, the interactive ODBC Viewer application, dfdbview, can be used to test your connection.

Example ./bin/dfdbview my_odbcdsn

For non-ODBC connections, use the vendor supplied client configuration utility. You may be prompted for a user name and password. If the connection succeeds, you will see a prompt from which you can enter SQL commands and query the database. If the connection fails, SAS Federation Server displays error messages describing one or more reasons for the failure.

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Step 4: Pre-Verification for Auto-Configuration

If you select to auto configure your SAS Decision Services Server Configuration user and audit log tables in the database, you need to test that you are able to connect to the database that you have created for all database accounts, prior to running the SAS Deployment Wizard. Auto configuration will fail, if you are unable to connect to the database.

Oracle
Verify that your tnsnames.ora file is configured correctly on the machines where the SAS Server and the SAS Federation Server are installed.

The configuration of SAS Decision Services assumes that the Oracle tnsnames.ora file is configured, or that the SQL Server data source names are the same on the SAS Server and SAS Federation Server.

SQL Server
Verify that your ODBC data source name for SQL Server is configured correctly on the machines where the SAS Server and the SAS Federation Server is installed.

DB2
Verify that the DB2 database is setup correctly, you will need this information when running the SAS Deployment Wizard.

Teradata
Verify that the Teradata database is setup correctly, you will need this information when running the SAS Deployment Wizard.

Greenplum
Verify that the Greenplum database is setup correctly, you will need this information when running the SAS Deployment Wizard.

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SAS Decision Services Checklist

The table below describes the information that must be obtained prior to running the SAS Deployment Wizard.

SAS Decision Services Checklist		
Description	**Default Value**	**Actual Value**
Database Information		
Database Type:		Choose one: __DB2 v9.5 or later __MS SQL 2008 or later __Oracle 10g or later __Teradata 12.0 or later __SAS __Greenplum
Database Host:		
Database Port:		
Database Name:		
Database User ID:		
Database Password:		
Oracle Only		
Oracle Service Name:		
Oracle Default Schema Name:		
Oracle Service Name:		
Oracle Default Schema Name:		
Oracle Schema Name for Audit Log Tables: (Optional – Default Schema is assumed)		
Oracle Schema Name for User Log Tables: (Optional – Default Schema is assumed)		
SQL Server Only		
SQL Server ODBC Data Source Name:		
Greenplum Only		
Greenplum Database Name:		
DB2 Only		
DB2 Database Name:		
Teradata Only		
Teradata Database Name:		
DS2 Information		
SAS Library/Catalog Name: (This library is used to reference the DS2 packages that are stored in a SAS data set.)	**SASDS**	
DataFlux Authentication Server Information		
DataFlux Authentication Server Host:		
DataFlux Authentication Server Port:	**21030**	

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SAS Decision Services Checklist		
Description	**Default Value**	**Actual Value**
DataFlux Authentication Server System User ID:		
DataFlux Authentication Server System user password:		
Domain Names		
DataFlux Authentication Server Host Domain Name:		
DataFlux Authentication Server Database Domain Name:	<databasetype>_Domain	
SAS Federation Server **and** SAS Federation Server **Manager Information**		
SAS Federation Server Host:		
SAS Federation Server Port:	21032	
SAS Federation Server Administrative User ID:		
SAS Federation Server Administrative Password:		
SAS Federation Server Manager Host:		
SAS Federation Server Manager Port:		
SAS Federation Server Manager Administrative User ID:	admin	
SAS Federation Server Manager Administrative Password:	fsmAdmin1	
Database Data Service and Data Source Names		
SAS Federation Server Database Data Service Name:	<databasetype>_ds	
SAS Federation Server Database Data Source Name:	<databasetype>_dsn	
SAS DataService, Data Source, Catalog and Schema Names		
SAS Federation Server Base Data Service Name:	**BASE**	**BASE**
SAS Federation Server Base Data Source Name:	BASE_dsn	
SAS Federation Server Base Schema Name:	Baselib	
SAS Federation Server Base Catalog Name:	Basecat	
SAS Federation Server path to SAS datasets:		
JDBC Information		
JDBC Class Name		
Directory containing JDBC .jar files: (This directory should preferably contain all required .jar files for the JDBC driver and no additional .jar files.)		

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SAS Deployment Wizard Configuration

Configuring the Middle Tier with Multiple Steps:

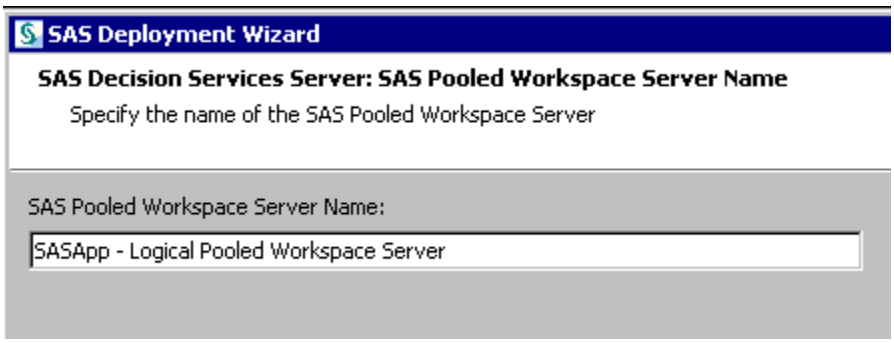
In a multi-tier configuration, a dialog will display requesting that the user stop the SASServer1 web application server before the second execution of the SAS Deployment Wizard.

Decision Services Server Tier

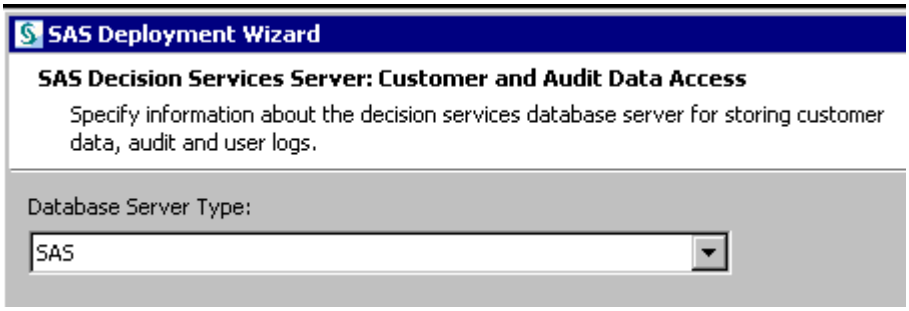
This section describes the dialogs that are associated with the configuration of **SAS Decision Services Server Configuration 6.2.**

Application Server Context

Note: Specify the application server context for SAS Decision Services. SASMeta is the default value; however, you should use a different application server context. Record the selected application server context for future reference, in the event that there have been multiple application server contexts defined. You want to make sure that your application server context is the same for use with the application server context that you select for your stored process server and pooled workspace server.



This dialog allows you to specify the name of the SAS Pooled Workspace Server.



This dialog is used to specify the type of database server that will be used to store the user, audit log, and customer data. The DS2 packages are stored in SAS data sets.

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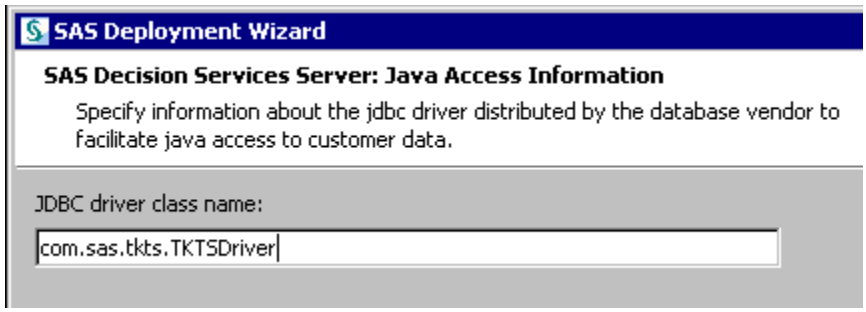
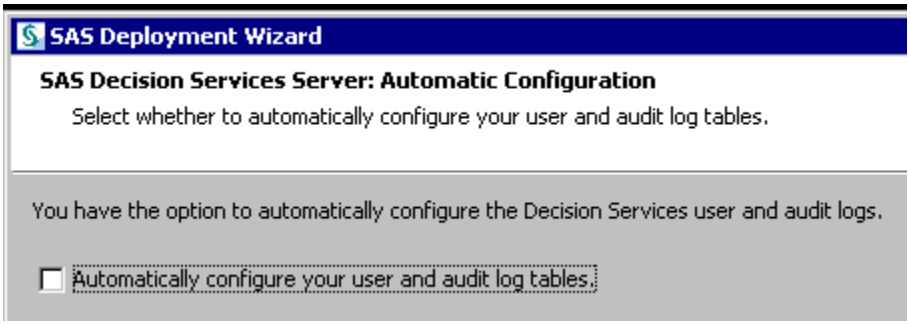


This dialog is used to specify the name for JDBC driver class for access to customer data stored in SAS datasets. It is displayed if SAS is selected as the database type.



This dialog allows you to determine if you would like the SAS Deployment Wizard to automatically configure your user and audit log tables that are defined in the database. For this to run successfully, you need to be able to connect to your database and you need to have defined your SAS Federation Server and DataFlux Authentication Server connection definitions, and be able to test the connection successfully.

Auto-configuration is not available if SAS is selected as the database type. You will need to manually run scripts to configure user and audit log tables for SAS.

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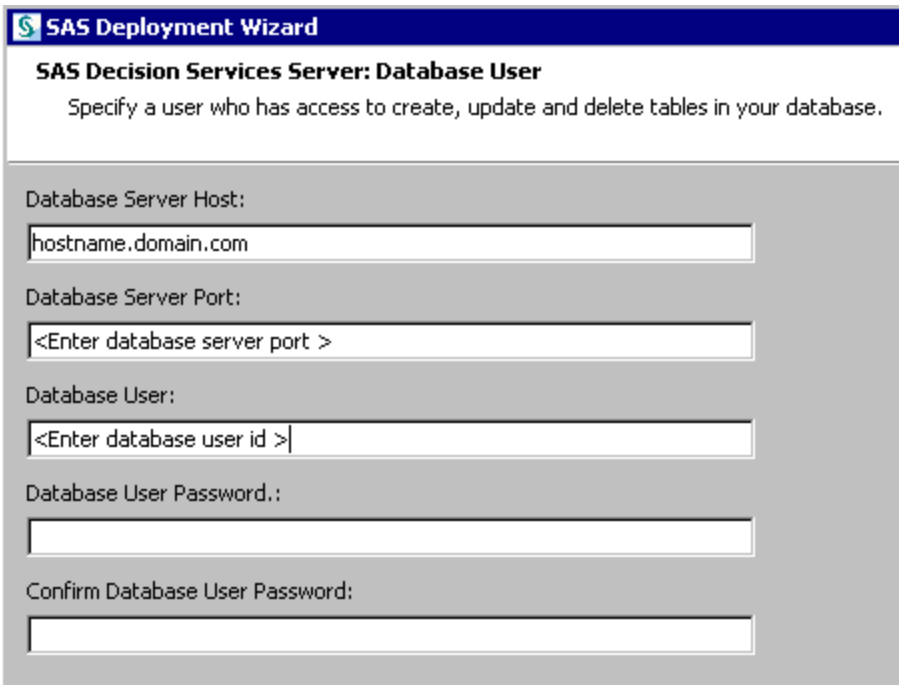
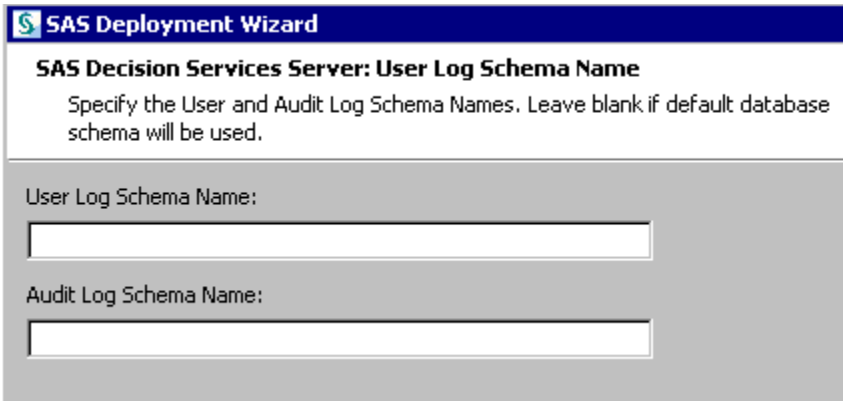


This dialog allows you to specify the database information. Specify the database user who has permission to create, alter, and delete tables in the database where customer data will be accessed and where the audit log and user log tables will be created. It is not displayed if you select SAS as a database type.



This dialog allows you to specify an alternate schema to use to create user and audit log tables. If these options are left blank, then the default schema that is assigned based on the database user ID will be used. If you specify these options, then you will need to modify and run the DDL scripts to manually create the user and audit log tables after the configuration is complete. This dialog is optional.

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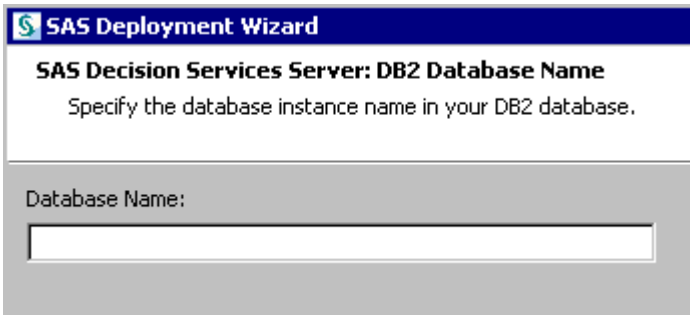
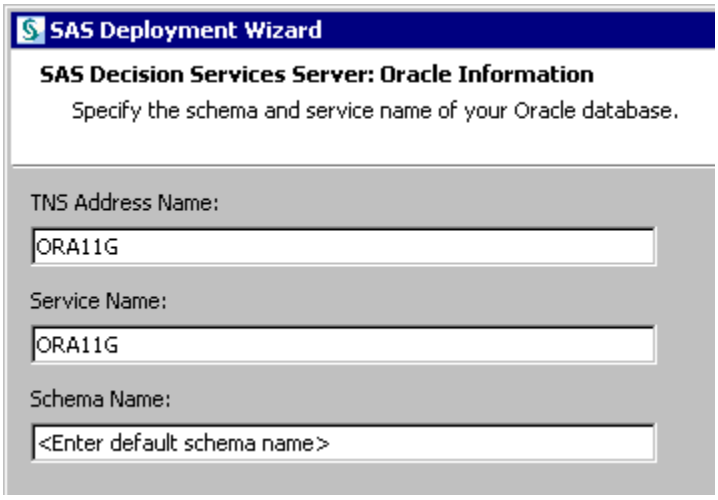
DB2



This dialog allows you to specify the database instance name. There is an eight character limit.

ORACLE



This dialog allows you to specify the value of the path that is defined in the tnsnames.ora file. This file is located in *<Oracle Install Dir>*\product\11.1.0\client_1\NETWORK\ADMIN\tnsnames.ora.

ORA11G =
(DESCRIPTION =
(ADDRESS_LIST =
(ADDRESS = (PROTOCOL = TCP)(HOST = hostname.domain.com)(PORT = 1521)))
(CONNECT_DATA =
(SERVICE_NAME = **ora11g**)))

The ORA11G and ora11g that are bolded above should have the same name. The schema referenced here is the name of the default schema for the Oracle database user where your audit and user logs will be created, and where the customer data is accessed.

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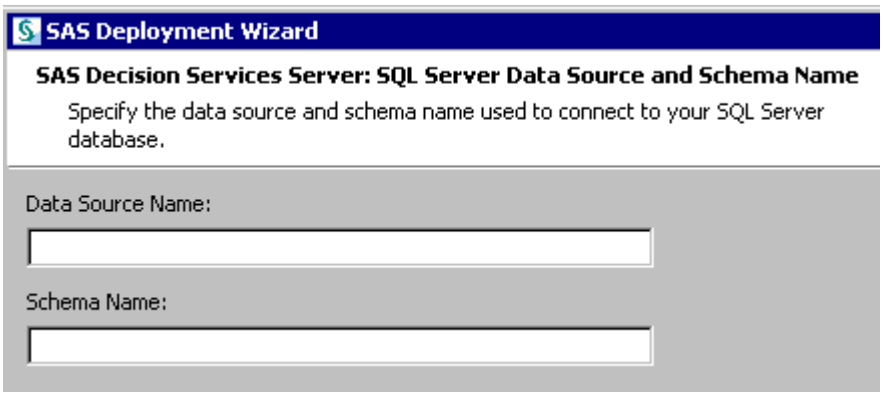
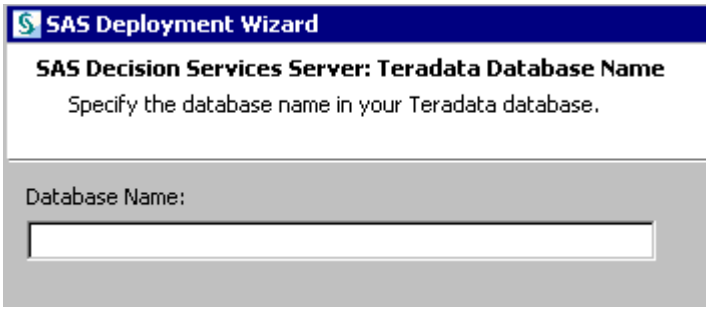
SQL Server



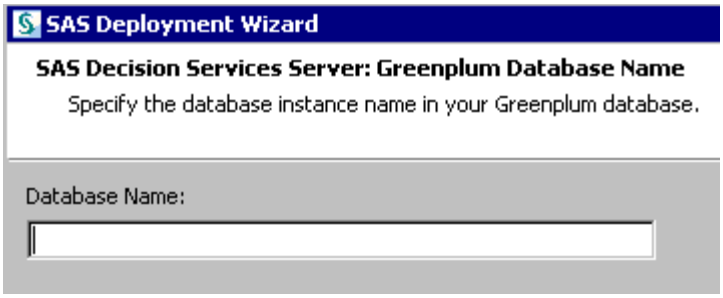
This dialog allows you to specify the SQL Server data source and schema name.

Teradata



This dialog allows you to specify the name of your Teradata database.

Greenplum



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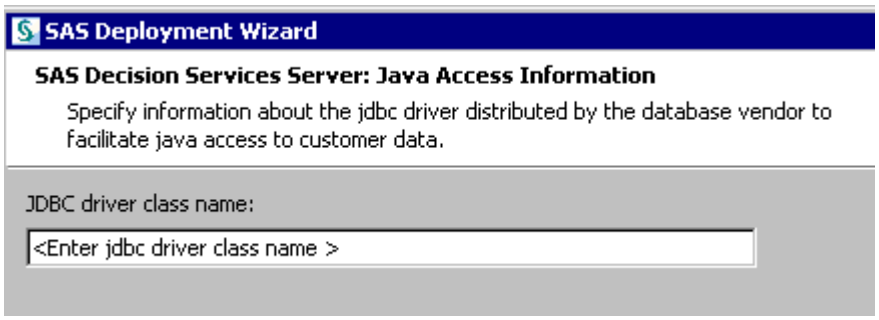
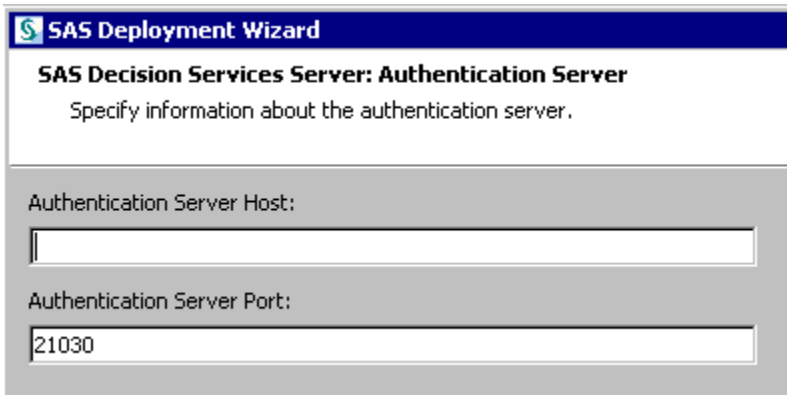
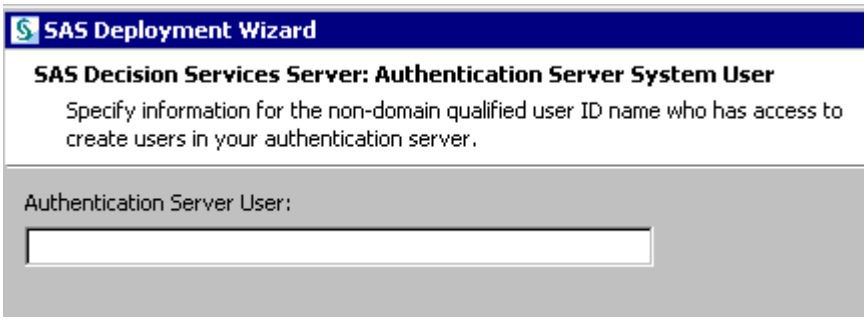


This dialog allows you to specify the JDBC driver name for connecting to your database.



This dialog allows you to specify the host and port information for the DataFlux Authentication Server.



This dialog allows you to specify the user ID for the SAS Authentication Server. This user is called the system user, or the user who was used to install the SAS software. This user can also be the SAS installer user.

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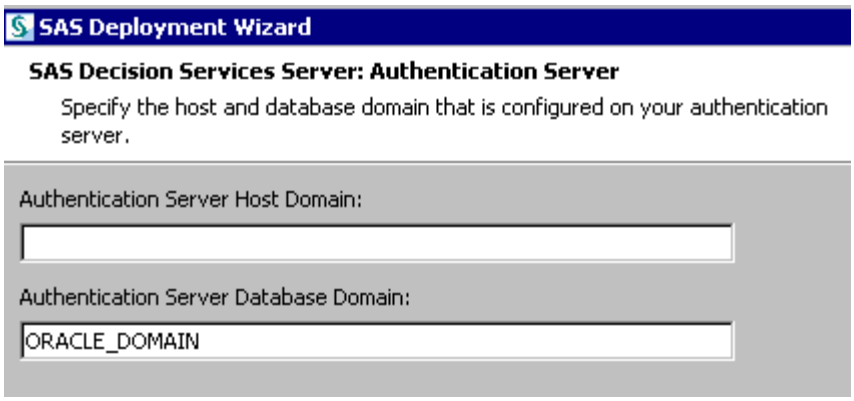
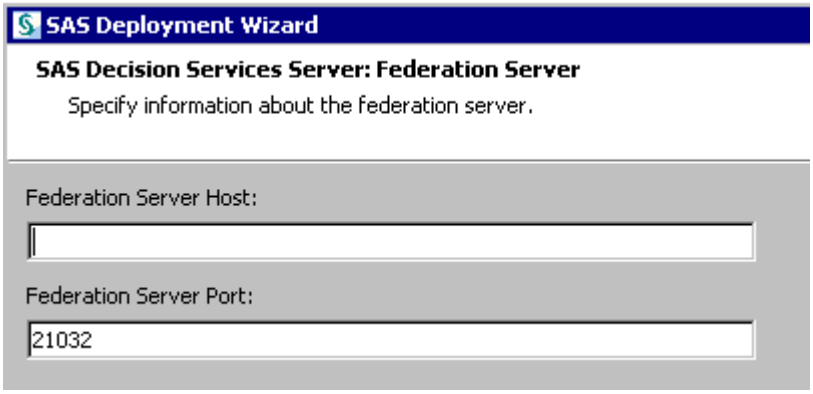
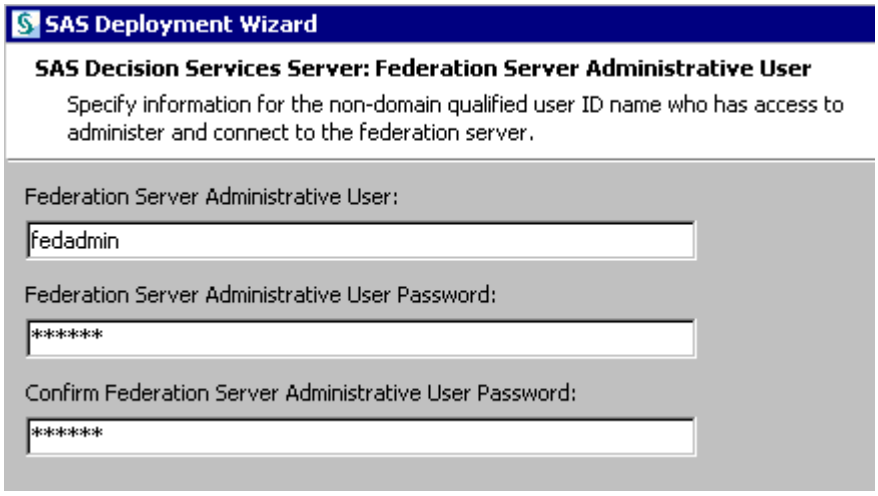


This dialog allows you to specify the host domain and the data domain for the DataFlux Authentication Server. The host domain is used to specify the domain of the system user ID and the administrative user ID for the DataFlux Authentication Server and SAS Federation Server. In a UNIX environment, where SASAUTH has been configured, the value defined in the AuthProviderDomain and PrimaryProviderDomain of the auth server config file ../etc/as_serv_aspsql.xml needs to be used. The default value is UNIXUSER.



This dialog allows you to specify the host and port information for the SAS Federation Server.



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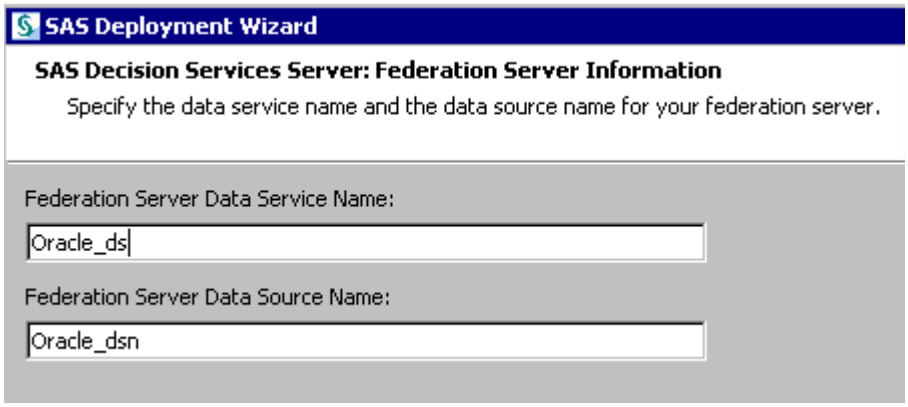
This dialog allows you to specify the administrative user ID that will be used to connect to the SAS Federation Server from the SAS Decision Services engine and design server. It is a best practice that this user ID be different from the user ID that was specified as the system user ID.



This dialog allows you to specify the data service name and the data source name for your database that will be created on the SAS Federation Server machine.

This dialog allows you to specify if the SAS Federation Server is not on the same server as the SAS Decision Services Server.

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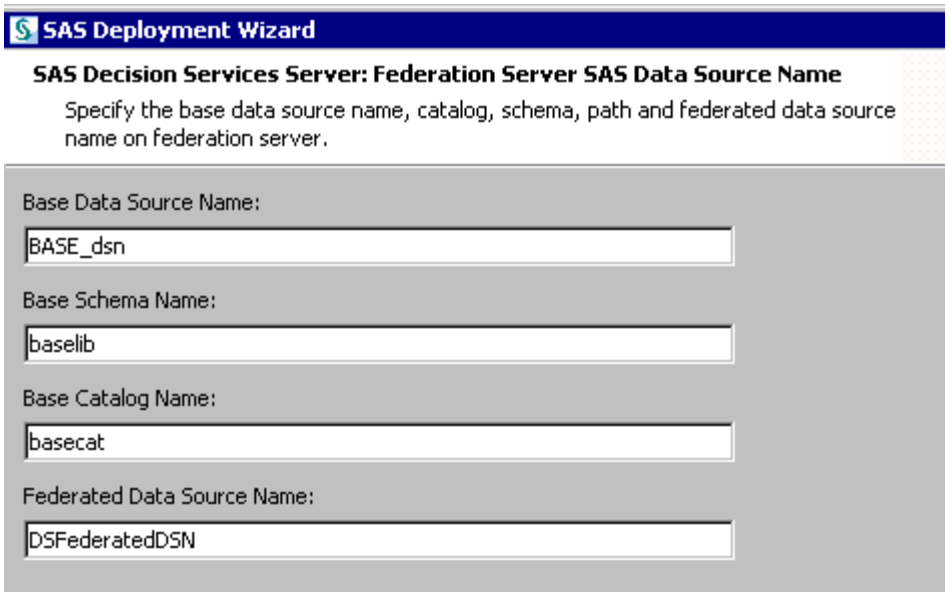
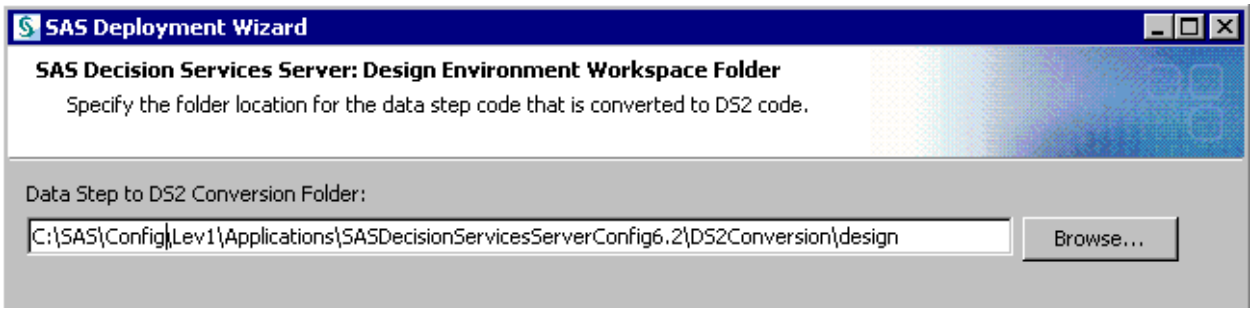
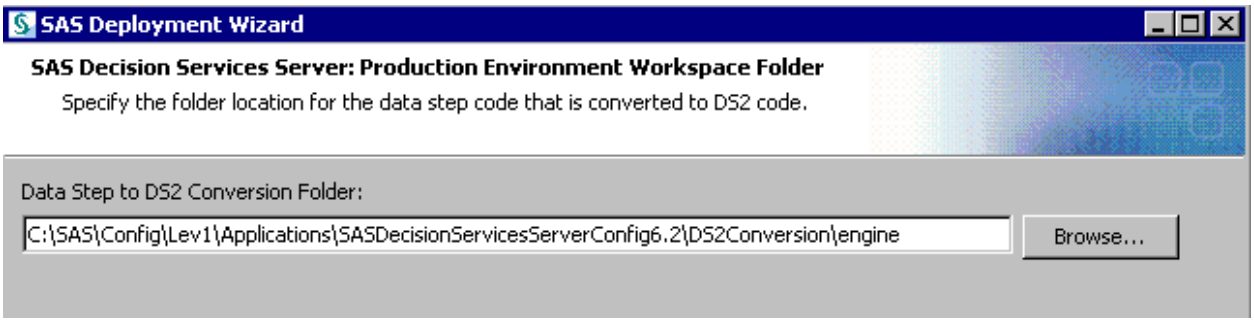


This dialog allows you to specify the data service name and the data source name for your SAS data sets that will be created on the SAS Federation Server machine. The SAS data sets reside on the SAS Federation Server machine, and you are able to access SAS data sets in General IO activities that access SAS data.





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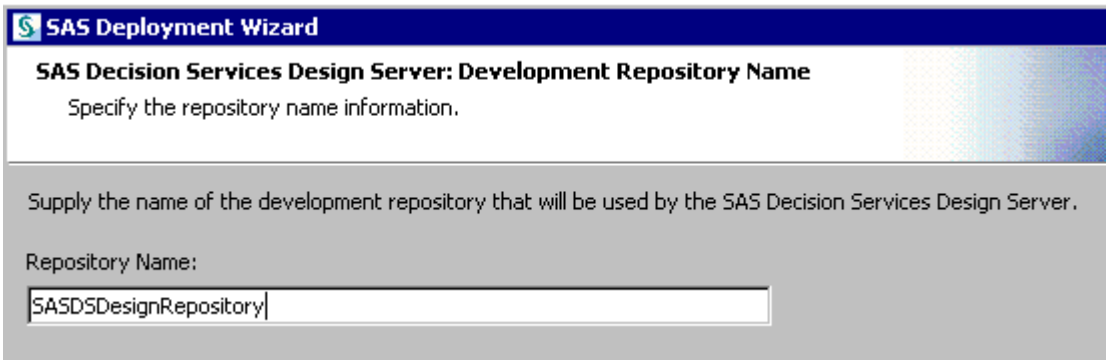
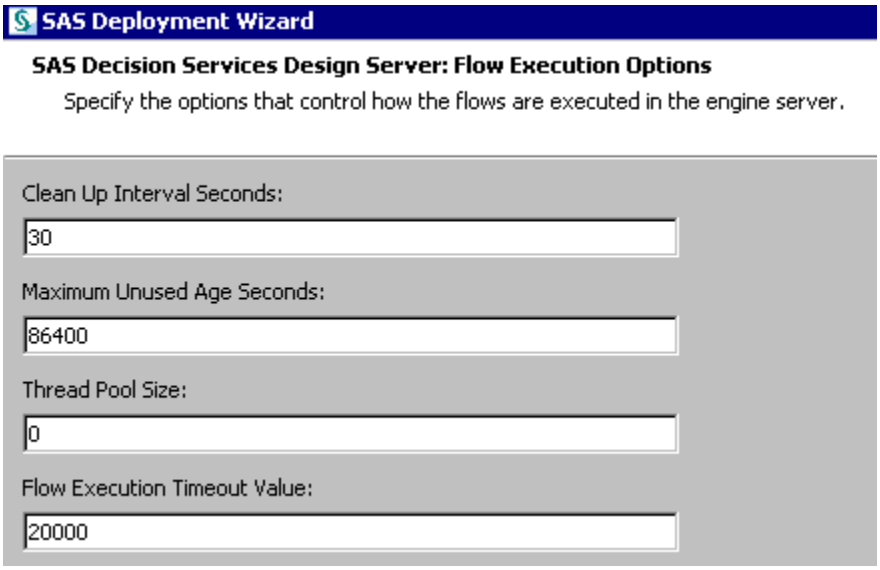
These dialogs allow you specify the name of the working folder where DATA step code is translated to DS2 code. There is a location for the design environment and the production environment.

Decision Services Design Middle Tier

This section describes the dialogs that are associated with the configuration of **SAS Decision Services Design Server 6.2**.



This dialog allows you specify the name of the repository configured for the SAS Decision Services Design Middle-Tier Server.



These options are used to configure how the flows are executed in the SAS Decision Services design server.

Clean Up Interval Seconds Specifies the interval of time to clean up the internal cache.
Maximum Unused Age Seconds Defines how long a session has to be unused for before

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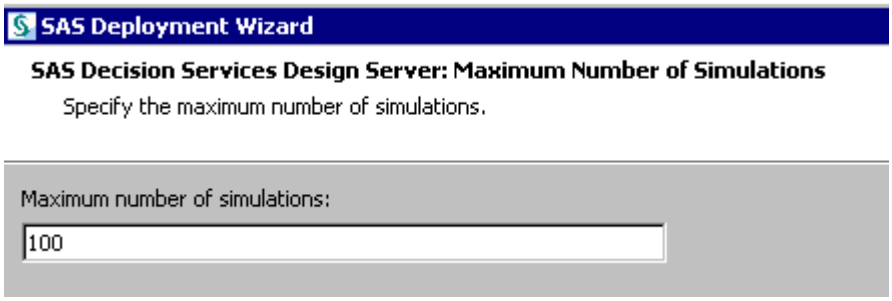
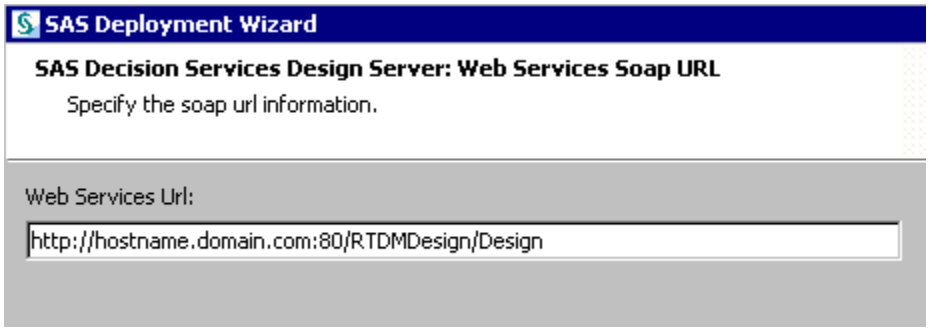
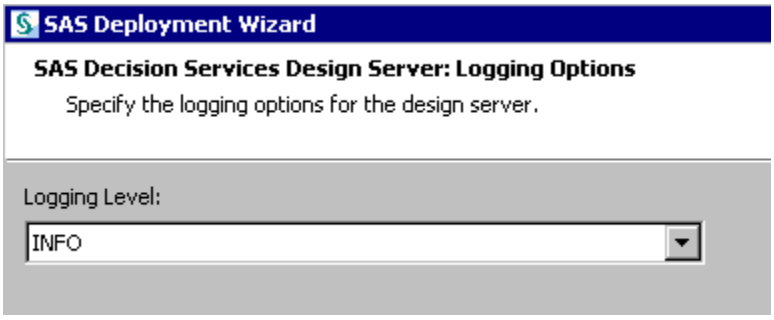
	becoming a candidate for removal.
Thread Pool Size	Specifies the size of the thread pool during flow execution.
Flow Execution Timeout Value	Specifies the time before the flow execution times out. The recommended value is 20000.



The maximum number of simulation results that the design server will hold in memory. Running more simulations causes older results to be dropped from in-memory storage. The number includes results for simulations currently running, as well as those run previously.



This dialog allows you specify the web service URL for the SAS Decision Services design middle-tier server



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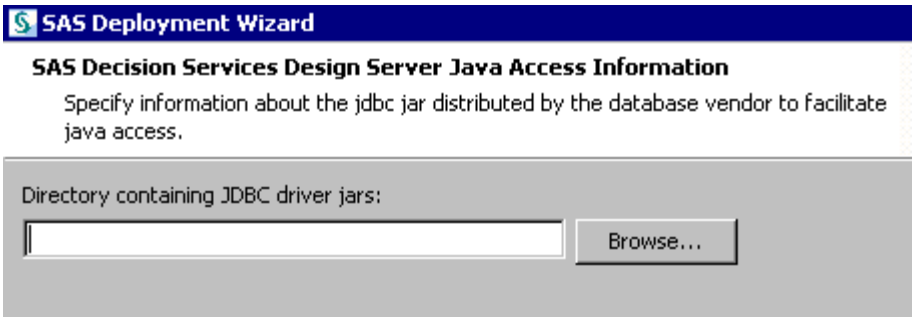
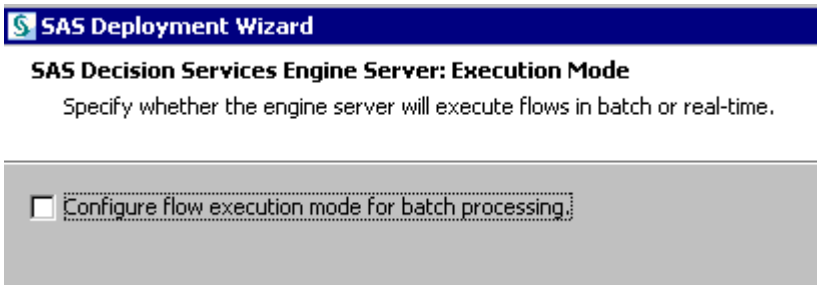
This dialog allows you specify the initial logging level for the SAS Decision Services design middle-tier server.



This dialog allows you specify the path to where your JDBC database driver JAR file is located. The path should only contain the JAR file and its dependencies. This dialog is only displayed if you select a database other than SAS.

Decision Services Engine Server Middle Tier

This section describes the dialogs that are associated with the configuration of **SAS Decision Services Engine Server 6.2**.



This dialog allows you to specify if the flows will be executed in batch mode or real-time. If this check box is not selected, then the default execution mode is real-time.

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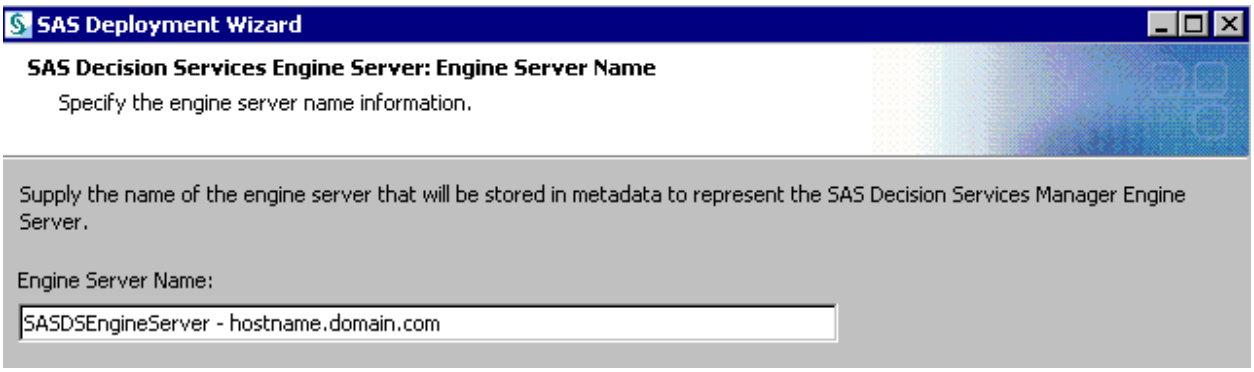
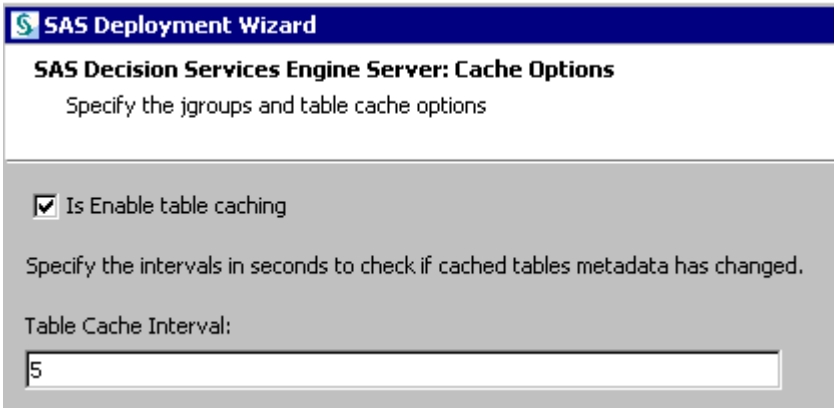


This dialog allows you specify the name of the SAS Decision Services Engine Server definition, created under **Server Manager** in the SAS Management Console.



This property determines whether or not the caching of tables is enabled. Specify the table caching interval in seconds and the jgroups options.

The table access manager checks every so often to see if metadata about cached tables has changed, or if an update command has been received for one or more tables. This property controls the frequency of that check.

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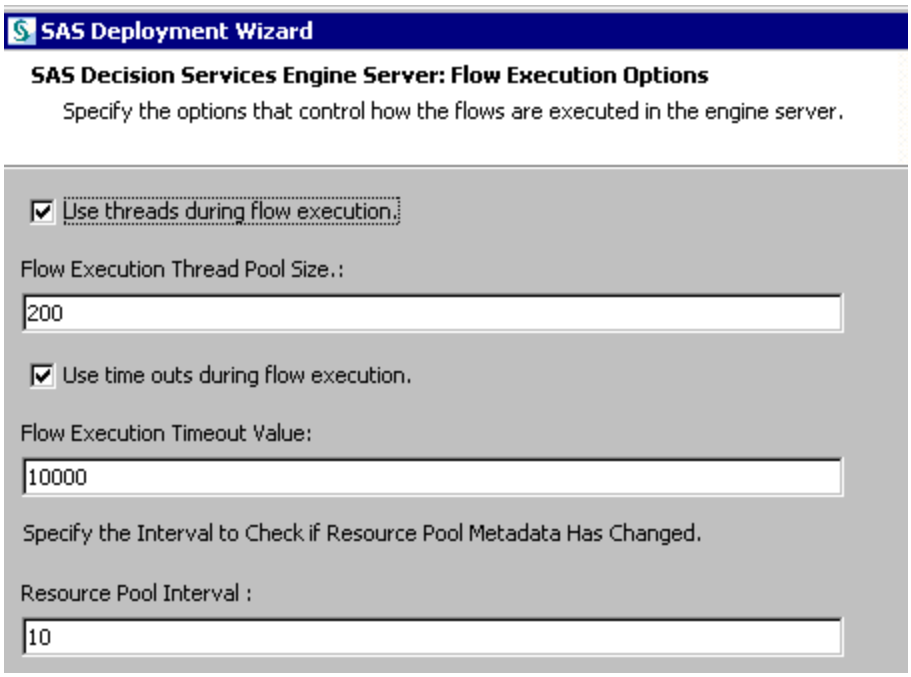
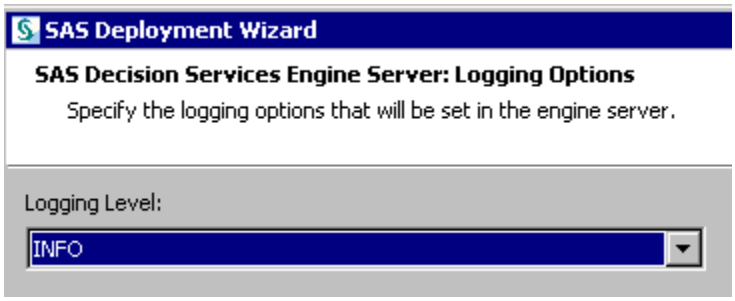
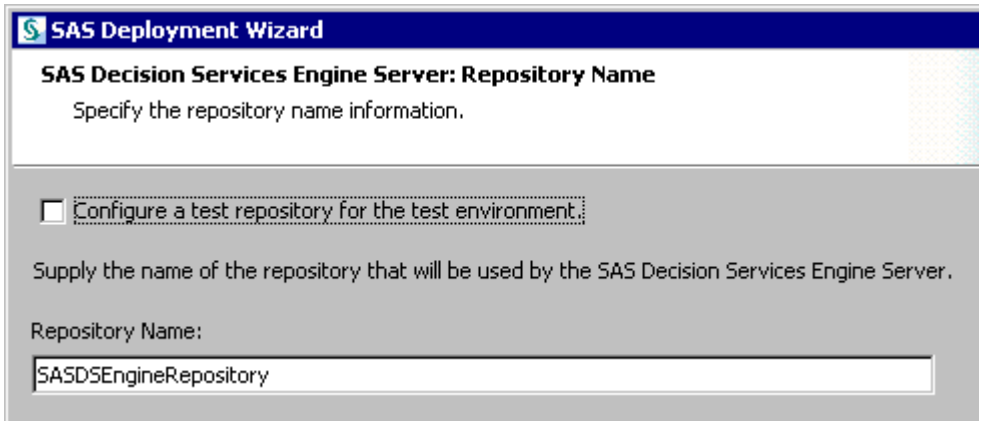


This dialog allows you to specify the flow execution options.



This dialog allows you specify the initial logging level for the SAS Decision Services engine server.



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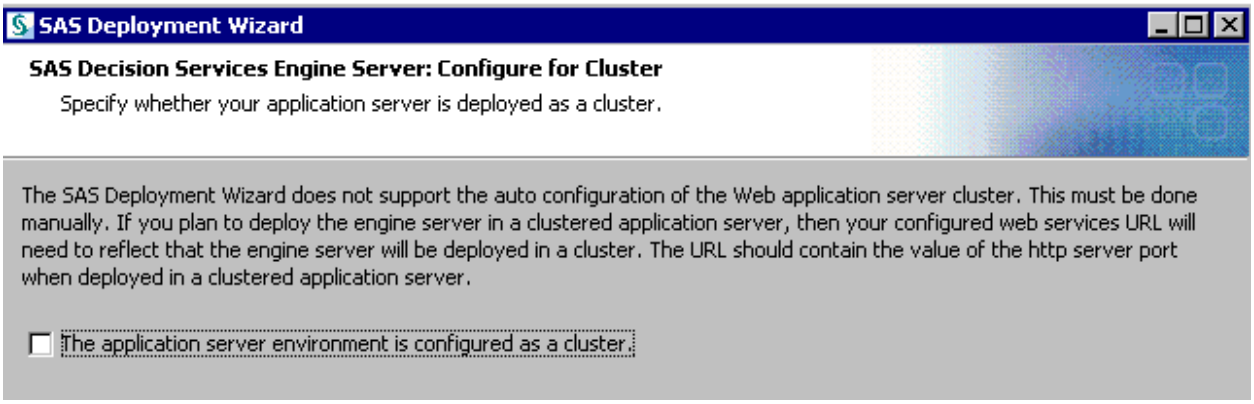
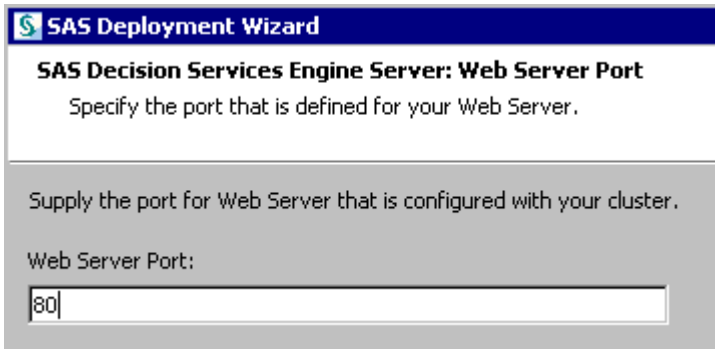
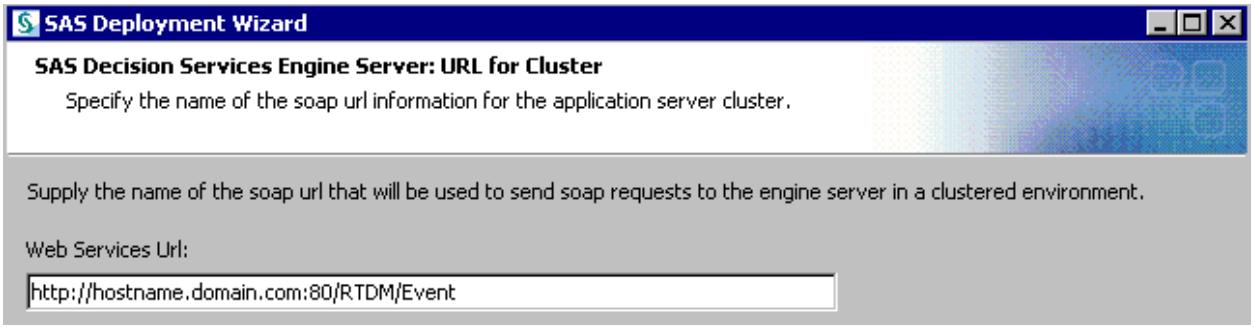
This dialog allows you specify the name of the repository configured for the SAS Decision Services engine server.



This dialog allows you to specify if the engine is deployed in a clustered application server. This dialog is no longer valid for a cluster deployment.



If you selected to configure the engine server for a clustered application server, then you will need to specify the port of the web server providing the load balancing.



This dialog allows you to specify the web service URL for the SAS Decision Services Engine Server.

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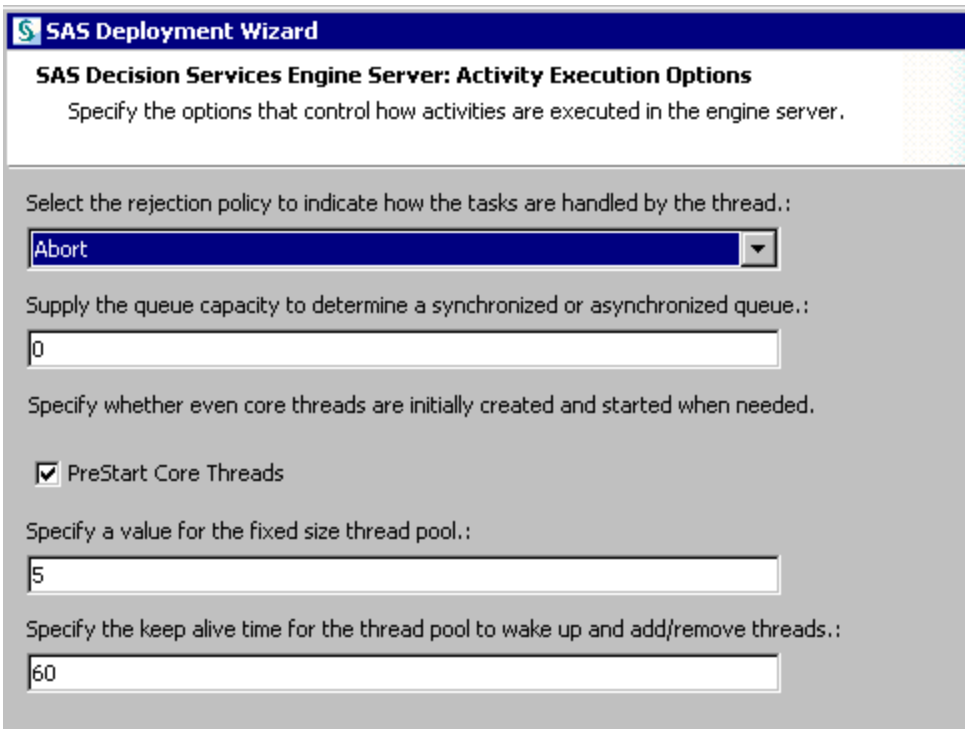
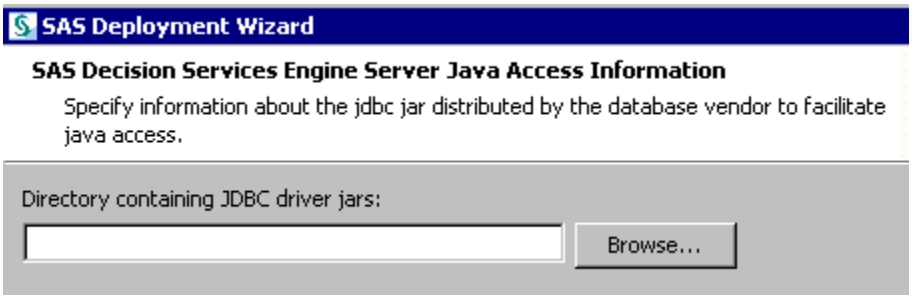


This dialog allows you to specify the activity execution options.



This dialog allows you to specify the path to where your JDBC database driver JAR file is located. The path should only contain the JAR file and its dependencies. This dialog is only displayed if you select a database other than SAS.

Decision Services Monitor Middle-Tier

This section describes the dialogs that are associated with the configuration of **SAS Decision Services Monitor 6.2.**

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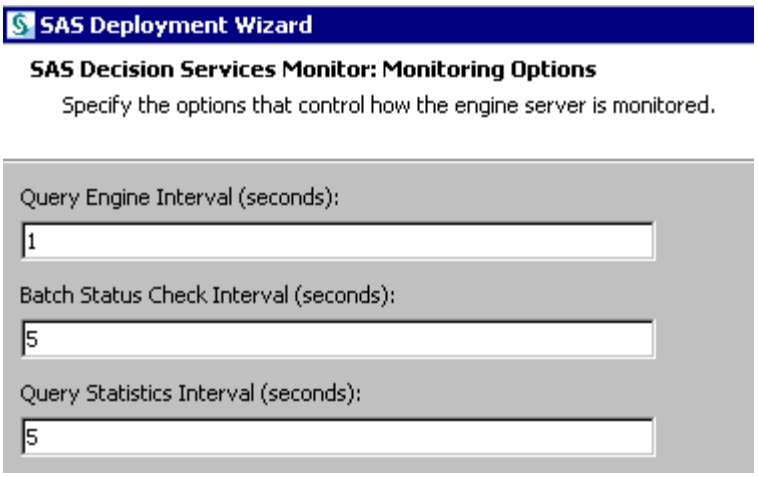

This section describes the dialogs that are associated with configuring the intervals for when the monitor will be querying the engine for flow execution statistics.

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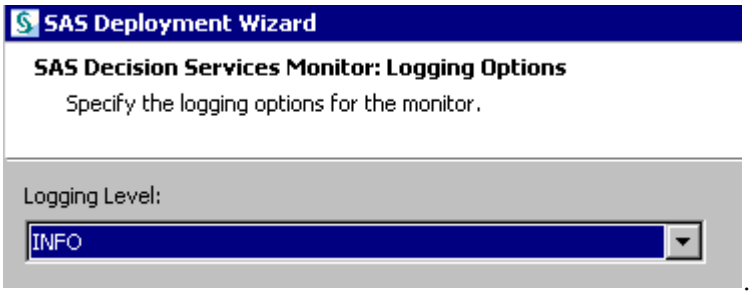
This dialog allows you to specify the URL information for where the monitor and engine server are deployed.



This dialog allows you to specify the initial logging levels for the Decision Services Monitor.

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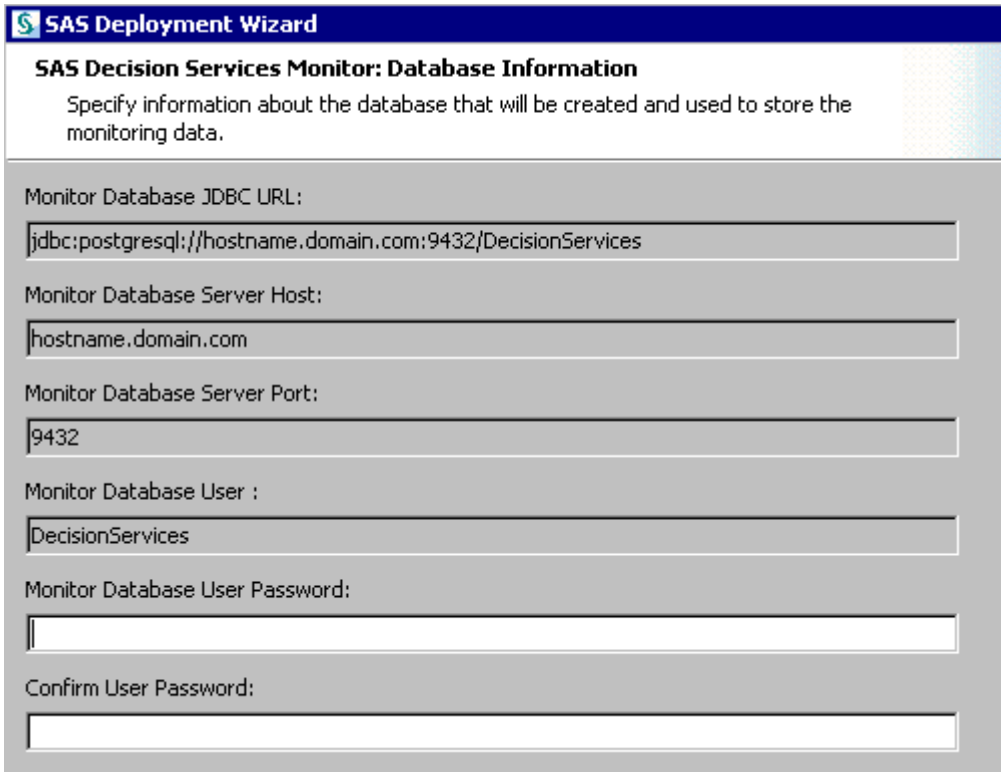
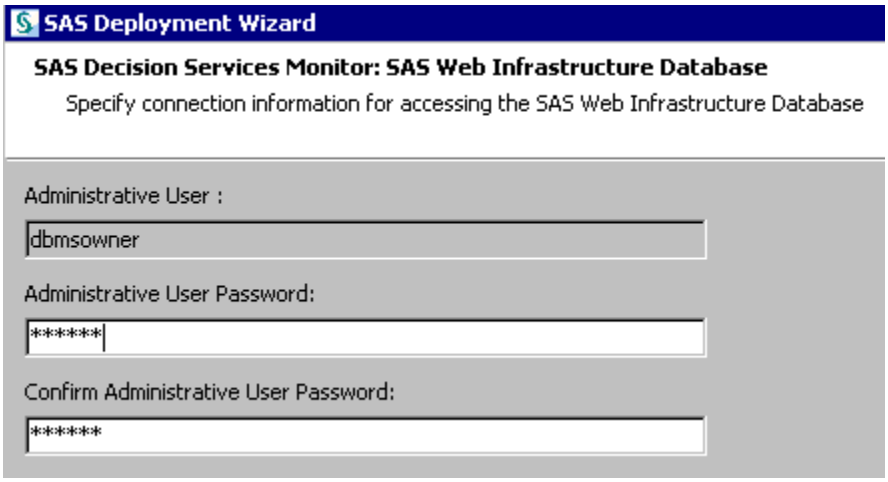


This dialog is used to specify information about your SAS Web Infrastructure Data Server.



This dialog is used to specify information about your PostgreSQL database user ID.

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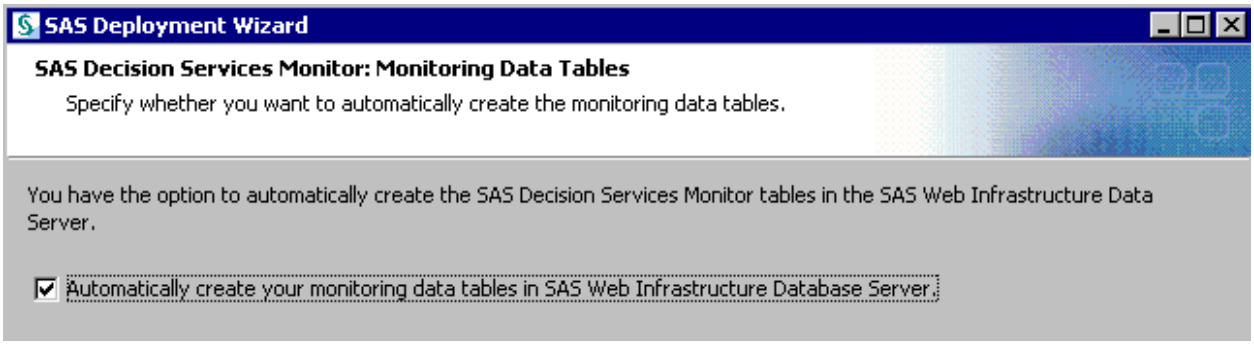
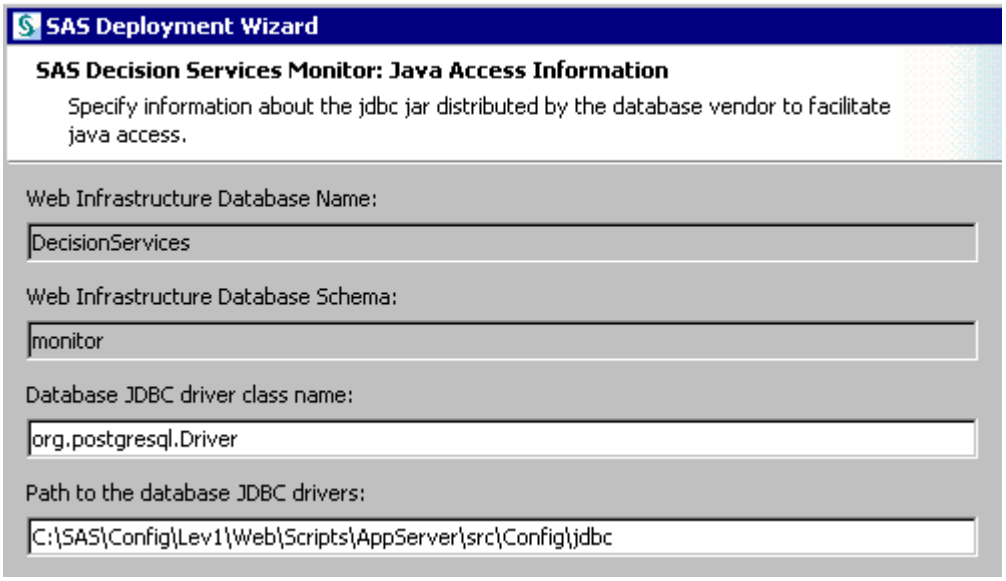


This dialog is used to specify whether you want to automatically create your tables.



This dialog allows you to specify the path to your SAS Web Infrastructure Data Server JDBC driver JARs.

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Decision Services Validation Checklist

SAS Decision Services Validation Checklist		
Decision Services Functionality	**Items to Review and Verify**	**Completed**
Decision Services Design middle-tier	http://hostname.domain.com:port/RTDMDesign/jsp/Diagnostics.jsp	
Verify the SAS Decision Services web services for stored processes are deployed.	Verify that you have completed the Deploy Web Service for Stored Processes step in instuctions.html, for the SAS Decision Services design server.	
Decision Services engine server	http://hostname.domain.com:port/RTDM/Diagnostics.jsp	
Decision Services Monitor	http://hostname.domain.com:port/DCSVMonitor/jsp/Diagnostics.jsp	
Audit and user log tables are created.	Verify that you have executed the **Create Decision Services User and Audit Log Tables** step to create the tables in instructions.html.	
Batch execution and monitor tables are created.	These tables are created automatically in the DecisionServices database residing in the Web Infrastructure Platform Data Server, if you selected to create them automatically during the execution of the SAS Deployment Wizard.	
Ensure the topology table has the correct value for the engine servers that are monitored.	If you select SAS, this value is automatically loaded by the configuration. If you select a database, you will need to load this value by running the Load Monitor Topology Table step in instructions.html.	
Load the utility packages that are loaded out of the box.	You will need to have already run the Load Decision Services Utility DS2 Packages step in instructions.html that loads the utility packages in the SAS data sets configured with the SAS Federation Server. Common errors found when loading packages are: 1. Incorrect SAS Federation Server version. 2. The SAS Federation Server and the metadata server should be set to the same security level. (for instance AES, SAS)	
Integration with SAS Decision Manager has been completed.	Verify that you have completed the Import SAS Decision Services Manager Resources step in instructions.html for the design server.	
Validate that the monitor can connect to the engine	Check the log that is located in this directory:	

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SAS Decision Services Validation Checklist		
Decision Services Functionality	**Items to Review and Verify**	**Completed**
server and obtain a JDBC connection	<*config directory*>/Lev1/Web/Logs/SASDecisionServicesMonitor6.2.log Verify that there are no errors indicated in the log. Common errors with the JDBC connection are usually associated with the following: 1. Wrong database password. 2. The service on the Oracle database server was not configured to use a service name and was configured to use a SID. 3. The wrong JDBC driver or data source class was used for the application server. 4. The wrong version of the JDBC driver or data source class was used for the application server. 5. The name that was specified in the dialog was incorrect. 6. The database server is not running. These can usually be fixed by editing the configured data source.	
Validate that the DSNs, data services, and federated DSN were created.	You should be able to execute the SAS Federation Server Manager to see the configured values. 1. Execute **http://hostname.domain.com:21077/fsmanager/#.** 2. Log in as the SAS Federation Server administrative user. 3. Verify that your DSN and data service has been created. 4. The BASE DSN is created by default. 5. You can log in as the SAS Federation Server administrative user and execute a test connection for the DSN and the data service. SAS Decision Services uses this user to connect to the SAS Federation Server through the DSNs, so if your test connection works then you will be able to connect to the SAS Federation Server from SAS Decision Services. Common errors associated with creating the DSNs or data services are: 1. The SAS Federation Server services were not running. 2. Invalid passwords for the SAS Federation Server were specified, or the user was not configured in the DataFlux Authentication Server.	

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Configuring DataFlux Products for SAS Decision Services 6.2

These instructions have been included as a reference for configuring the DataFlux Authentication Server and SAS Federation Server. You will need to log in as the system user ID that was used to install the SAS software. This user could also be the SAS installer, if you installed the software using the SAS Deployment Wizard.

Prior to completing this section, make sure your DataFlux Authentication Server, SAS Federation Server, and SAS Federation Server Manager are started.

Configure SASAuth Authentication Utility (UNIX Only)

Refer to the "Configure the SASAuth Authentication Utility" section of the *DataFlux Authentication Server Administrator's Guide* for more details.

Configure the SAS Federation Server Manager

For additional information on configuring the SAS Federation Server Manager, refer to the "Configuring SAS Federation Server Manager" section of the *SAS Federation Server 3.2 Administrator's Guide*.

1. Open the following URL in a web browser:
   http://fs_manager_server_hostname:21077/fsmanager/

2. Log in to SAS Federation Server Manager using the administrator user **admin** and password **fsmAdmin1** that was set during installation. The administrator credentials are also located in **fsmanager.cfg**, which is located at <*SASHome*>\SASFederationServerManager\etc.

3. Specify the DataFlux Authentication Server host and port in the initial setup dialog.
4. Select **Log off** in the upper right corner.
5. Refer to the *SAS Federation Server 3.2 Administrator's Guide* for information on how to update the default JVM.

Migrating SAS Federation Server

If you are migrating the SAS Federation Server from an earlier release, refer to the "Migrating Federation Server" chapter of the *SAS Federation Server 3.2 Administrator's Guide*.

NOTE: For the following steps, entries for the required user IDs, host, ports, and domain values should be the same as the values used during the SAS Deployment Wizard prompting for the SAS Decision Services server tier configuration.

Create a DataFlux Authentication Server Definition

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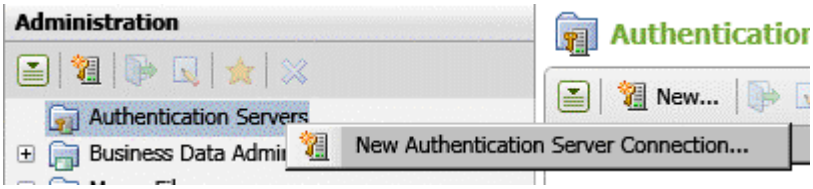
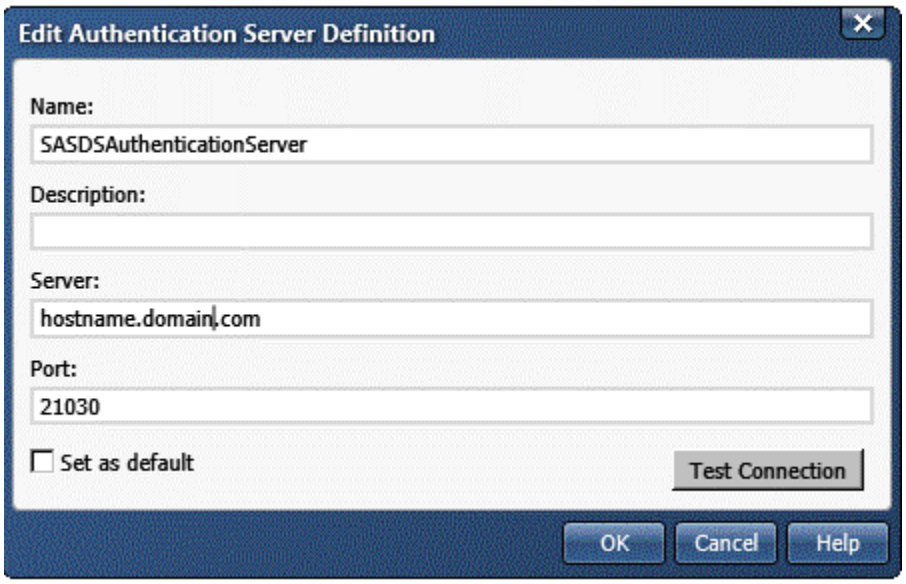
To create a DataFlux Authentication Server definition, perform the following steps:

1. Open Data Management Studio on the client tier machine.
2. Log in as ***<System User Id>.***

3. Double-click the **Administration** menu bar.
4. Right-click DataFlux Authentication Servers, and select **New Authentication Server Connection.**



5. Enter the host information for the DataFlux Authentication Servers, and select **Test Connection**.



6. Enter the name for the DataFlux Authentication Server definition.
7. Enter the description (optional).
8. Enter the server ***<Hostname of DataFlux Authentication Server>***.
9. Enter the port ***<Port of DataFlux Authentication Server>***.
10. Select **Test Connection**.
11. Log in as the System user ID. On Windows, use the fully qualified domain/user ID.
12. Click **OK**.

Create the DataFlux Authentication Server Domains

To create the DataFlux Authentication Server domains, perform the following steps:

1. Double-click the **Administration** menu bar.

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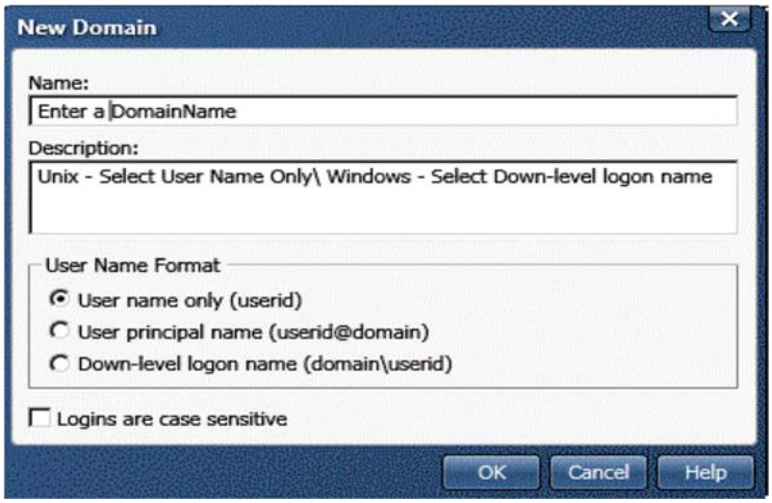
2. Click the **+** to expand the DataFlux Authentication Server menu.
3. Double-click your DataFlux Authentication Server definition.

4. Log in as <system_user ID>. *On Windows use the fully qualified domain/user ID.*

5. Enter the user ID <system_user ID>. *On Windows use the fully qualified domain/user ID.*
6. Enter the password.
7. Click **Log On**.
8. Right-click **All Domains**.
10. Select **New Domain**.



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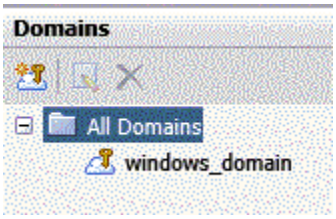
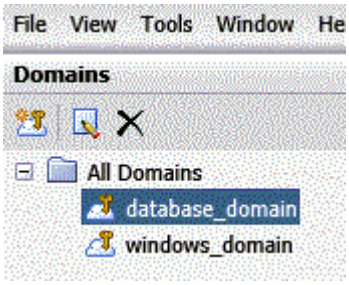
11. Enter the login domain for the authentication server administrative user *<user_login_domain>*.



Note: In a Unix deployment, it is possible that the UNIXUSER will already be defined in the Data Management Studio.

12. Enter a description (optional).
13. Enter a user name format.
    - For Windows, select the radio button down-level log-in name.
    - For UNIX, select the radio button user name only.
16. Select **OK**.
17. Right-click **All Domains**.
18. Select **New Domain**.
19. (Optional) Enter the database user's login domain name, if a database other than SAS was selected in SAS Decision Services Server Configuration. (i.e. Oracle, Greenplum, Teradata, SQL Server, or DB2).



20. Enter a description (optional).
21. Enter a user name format for the database user. Select the radio button based on the database server platform.
    - For Windows users, select the radio button down-level log-in name.
    - For UNIX users, select the radio button user name only.

24. Select **OK**.
25. Repeat Steps 10-16 to add an additional domain, if the SAS Federation Server administrative user has a different domain other than the domain specified in the dialogs.

Create DataFlux Authentication Server Users

To create users in the DataFlux Authentication Server, perform the following steps:

1. Double-click the **Users** menu bar.
2. Right-click **All Users**.
3. Select **New User**.

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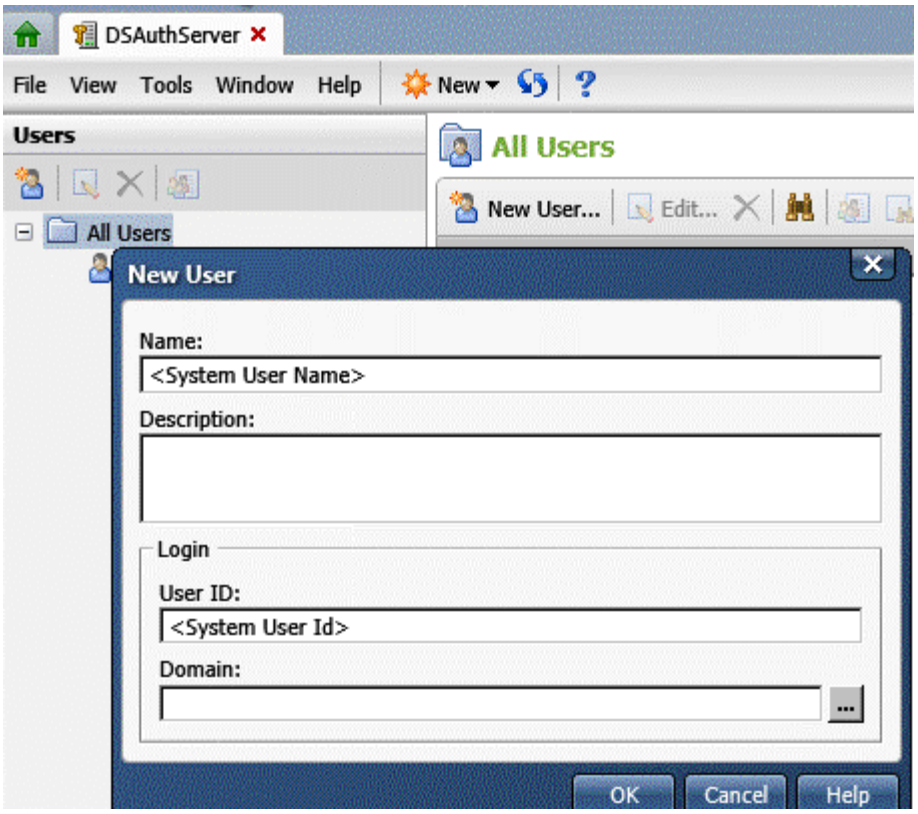

4. Enter the ***<system_user ID>***

Note: This user will be used in the SAS Decision Services server dialog as the DataFlux Authentication Server system user. Specifying this user allows you to reference this user on dialogs without specifying the domain to log into the DataFlux Authentication Server definition, for example SAS installer user.

5. Enter a description. (optional)
6. Enter log-in information:
   - For Windows, enter the non-domain qualified user ID and select the host domain from the domain list.
   - For UNIX, enter the user ID and select the host domain from the domain list.
7. Select **OK**.
8. Right-click **All Users**.
9. Select **New User**.

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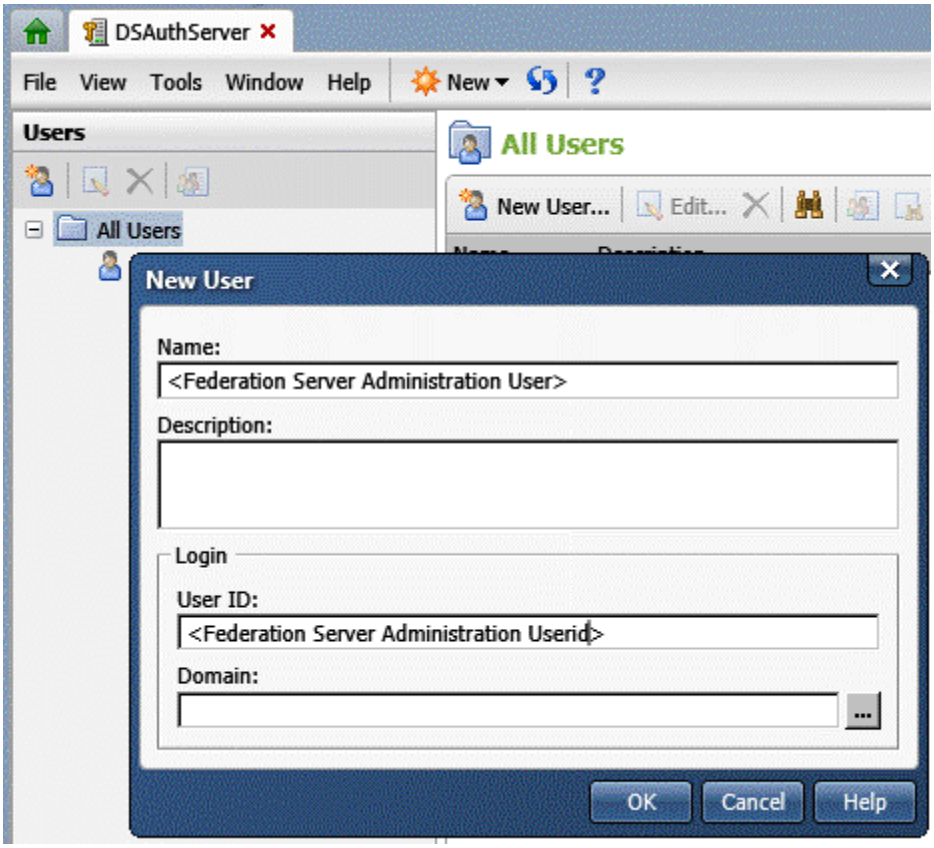
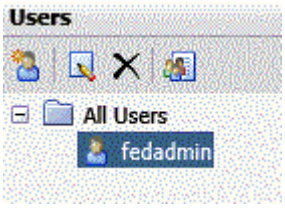


10. Enter the ***<federationserveradmin_user ID>.***

Note: This user is specified in the SAS Decision Services server dialog as the SAS Federation Server administrative user, for example fedadmin.



11. Enter a description. (optional)
12. Enter log-in information:
    - For Windows, enter the non-domain qualified user ID and select the host domain from the domain list.
    - For UNIX, enter the user ID and select the host domain from the domain list.

Create DataFlux Authentication Server Groups

To create DataFlux Authentication Server groups, perform the following steps:

1. Double-click the **Groups** menu bar.
2. Right-click **All Groups**.

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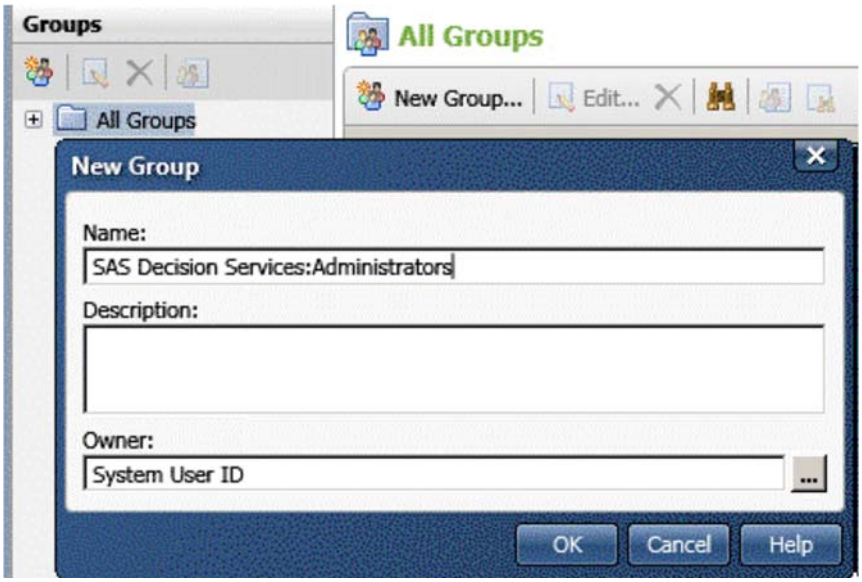
3. Select **New Group**.



4. Enter the name **SAS Decision Services:Administrators**,
5. Enter the description **SAS Decision Services:Administrators**.
6. Enter an owner, such as the SAS Federation Server system user.
7. Select **OK**.
8. Select **New Group**.
9. Enter the name **SAS Decision Services:Data Access**
10. Enter the description **SAS Decision Services:Data Access**
11. Enter an owner**, *<system_user ID>*.**
12. Select **OK**.

Add Users to Groups

To add a user to a group, perform the following steps:
1. Click the **Members** tab.
2. Select **Add Members**.

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3. Locate the ***<federationserveradmin_user ID>.***
4. Add the ***<federationserveradmin_user ID>*** to SAS Decision Services: Administrators.
5. Select **Add**.
6. Click the red **x** of the DataFlux Authentication Server definition to disconnect.

Create a Database User Log-in (if applicable)

If you selected in the Decision Services server rier for the customer, user, and audit log tables data access to be Oracle, then you will need to create a database user login.

Log in as the ***<federationserveradmin_user ID>.***

Note: This user will be used in the SAS Decision Services Server Dialog as the SAS Federation Server administrative user, for example fedadmin.

To create new log-ins for a user, perform the following steps:
1. Click the red **x** of the DataFlux Authentication Server definition to disconnect.
2. Double-click your DataFlux Authentication Server definition.
3. Enter the SAS Federation Server administrative user ID.
4. Enter the password.
5. Select **Log On**.
6. Double-click the **Users** menu bar.
7. Double-click **All Users** to expand menu item.
8. Locate and highlight the SAS Federation Server administrative user.
9. Select **New login**.

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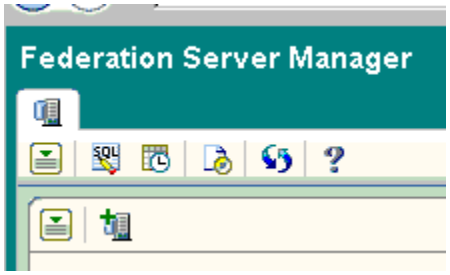
Create the SAS Federation Server Definition

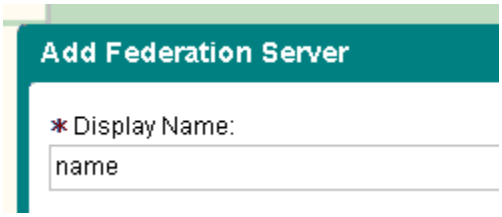
1. Open the following URL in a web browser:
   http://fs_manager_server_hostname:21077/fsmanager/

2. Log in as the ***<federationserveradmin_user ID>*** (for example, fedadmin).

3. Click on the **+** sign to add a SAS Federation Server.



4. Enter name for the SAS Federation Server definition and hostname.



5. Select **Test Connection** and log in as the ***<system_user ID>*.**

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Configuring SAS Federation Server for SAS mode versus ANSI mode

By default, the SAS Federation Server executes in ANSI mode, and not SAS missing mode. An environment variable has been added to enable the SAS Federation Server 3.2 to either run in SAS mode or in ANSI mode. However, if a DS2 package has been published with 'ds2_options sas' within the PROC DS2 code, the 'ds2_options sas' takes precedence over the environment variable setting. If a DS2 package is published without 'ds2_options sas', setting the SAS Federation Server uses the environment variable to determine whether to run in SAS mode or ANSI mode. When the SAS Federation Server runs in SAS mode, JAVA NULLs are converted to SAS missing values.

To apply the environment variable, perform the following steps:

1. Stop the SAS Federation Server

   UNIX: Execute *SASHome*/SASFederationServer/3.2/fedserver/bin/dfsadmin stop
   Windows: Stop the Windows service.

2. Add the environment variable to the dfs_serv.xml file.

   To add the environment variable functionality, modify the dfs_serv.xml to include the OptionSet as defined below. The default and recommended value is TRUE. The dfs_serv.xml file is located under *SASHome*/SASFederationServer/3.2/fedserver/etc

   Edit the dfs_serv.xml file and add the following OptionSet:

```
 <OptionSet name="SetEnv">
   <Option name="DS2_SASMISSING">TRUE</Option>
</OptionSet>
```

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3. Turn on Additional Logging

   Add an appender to dfs_log.xml if you require additional logging information. The dfs_log.xml file is located under *SASHome*/SASFederationServer/3.2/fedserver/etc and a sample path to the dfs_serv.log file is *SASHome*/SASFederationServer/3.2/fedserver/var/log/dfs_serv.log

   Add the following code to the dfs_log.xml

```
<appender name="LOG" class="FileAppender">
<param name="File" value=''<path to the dfs_serv.log>"/>
<param name="ImmediateFlush" value="true"/>
<param name="Append" value="false"/>
<layout>
<param name="ConversionPattern" value="%d %-5p [%t] %u %c - %m (%F@%L)"/>
</layout>
</appender> <!-- DS2 Application message logger -->
<logger name="App.TableServices.tkeds.parms.initload">
<level value="Trace"/>
<appender-ref ref="LOG"/>
</logger>
```

4. Start the SAS Federation Server

   UNIX: Execute *SASHome*/SASFederationServer/3.2/fedserver/bin/dfsadmin start
   Windows: Stop the Windows service.

5. Verify that logging is turned on.
   - Verify that the file dfs_serv.log is created under *SASHome*/SASFederationServer/3.2/fedserver/var/log.
   - The log displays the current value for the mode setting (ANSI vs SAS) that is being used by the SAS Federation Server.

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Manual Instruction for Creating Monitor Tables

The following are generic instructions that allow you to execute the SQL statements for creating your monitor tables, if you selected to create your tables manually. These instructions only apply if you have not selected to automatically create your monitor tables.

The SQL statements are located in the following files that are created in the <*SASConfigDir*>\Lev1\Web\Applications\DecisionServicesMonitor directory.
A sample program structure has been provided.

You can write Proc SQL code to execute the SQL statements in the following order:

1. Execute SQL statements in create-dcsv-data-manual.sql.
2. Execute SQL statements in schema-dcsv-batch.sql
3. Execute SQL statements in schema-dcsv-monitor.sql

```
PROC SQL NOERRORSTOP;

CONNECT TO POSTGRES
(SERVER=<SAS_Web_Infrastructure_Data_Server_Hostname>
PORT=<SAS_Web_Infrastructure_Data_Server_Port>  USER=DecisionServices
PASSWORD=<DecisionServices_User_Password> DATABASE=DecisionServices);

EXECUTE (<Insert SQL statement>) BY POSTGRES;

DISCONNECT FROM POSTGRES;

QUIT;
```

Best Practices for Removing Configuration

- Stop all application servers prior to running the SAS Deployment Wizard to remove SAS Decision Services components.
- Create a backup spk file for all of the SAS Decision Services flows, events, variables, activities, and system resources.

SAS Decision Services Log Locations

SAS Decision Services Design Middle Tier

The Decision Services Design middle-tier log location:
<*SAS Config Directory*>\Web\Log\ SASDecisionServicesDesignServer 6.2.log

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SAS Decision Services Engine Server

The Decision Services engine server log location:
<*SAS Config Directory*>\Web\Log\ SASDecisionServicesEngineServer 6.2.log

SAS Decision Services Monitor

The Decision Services monitor log location:
<*SAS Config Directory*>\Web\Log\ SASDecisionServicesMonitor 6.2.log

SAS Federation Server and DataFlux Authentication Server

The SAS Federation Server log location: <*Federation Server Installation Directory*>\var\log
The DataFlux Authentication Server logs location: <*Authentication Server Installation Directory*>\var\log

SAS Decision Services Data Backup Locations

The configured engine and design repositories are backed up after a unconfigure of SAS Decision Services.
<*configdir*>\Lev1\Web\Applications\SASDecisionServicesDesignServer6.2\Data\Backup

<*configdir*>\Lev1\Web\Applications\SASDecisionServicesEngineServer6.2\Data\Backup

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