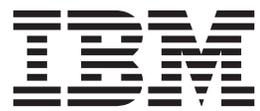


*IBM SPSS Modeler 16 Scoring Adapter
Installation*



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IBM SPSS Modeler Scoring Adapter Installation

IBM SPSS Modeler Scoring Adapter Installation

For some databases it is possible to enable SQL pushback of the majority of the SPSS Modeler model nuggets. In this way, model scoring can be performed within the database, avoiding the need to extract the data before scoring. This pushback can either use the native SQL within SPSS Modeler or, where available, use additional SQL scoring adapters that are tailored for different databases.

The use of scoring adapters that enable data to be scored by the generated models within the database can significantly improve performance. SPSS Modeler enables integration with IBM and non-IBM databases, and enable models to be deployed faster and with greater efficiency. User defined functions (UDFs) can also be used in real time against transactional data such as high volume sales, credit card payment, and customer service and claims transactions.

The basic steps to use a scoring adapter are:

1. Establish a connection to the database
2. When the connection is setup, publish the nugget to the scoring adapter. To do this, select the **Publish for server scoring adapter** option on the **File** menu of the model nugget.
3. When the nugget information is published to the scoring adapter it generates a sample SQL statement. This SQL statement uses UDFs to invoke the SPSS Modeler stream and generates a predictive score which can be used by any decision management system.

Where scoring adapters are installed into the relevant databases the SQL generation option generates scoring adapter SQL by default, unless you specifically choose to override this. The databases for which scoring adapters are available are:

- Netezza
- Teradata
- DB2 LUW
- DB2 for z/OS

About scoring

In IBM® SPSS® Modeler, scoring data is defined as deploying a predictive model on new data with an unknown outcome. This predictive model processes incoming data and gives a predictive score about the likelihood or probability of an event. For example, when an online payment transaction takes place, a predictive model processes the input data and provides a predictive score which gives the probability of a transaction being either genuine or a fraud.

The normal process within SPSS Modeler is that when a predictive model receives incoming data it evaluates the input using historical data from a database and creates an output of a predicted score. This score gives a probability about an event for which a predictive analysis model is built.

The predictive model process using a scoring adapter differs from this in that the scoring adapter enables the evaluation of each record and for producing a score, or prediction, in the database without the need to export the data from database, run it through the model, and import it back again thereby making the whole process quicker.

Installing IBM SPSS Modeler Server Scoring Adapter for Netezza

Depending on the configuration of your database you can install either from the console or by using a graphical user interface (GUI); however, the first step is the same for both methods:

- Run the *install.bin* install script. Ensure that *install.bin* can be executed by *nz user* and run it as that user.

Console Installation

1. Introduction details are displayed. Press Enter to continue.
2. Licensing information is displayed. Read the license, type Y to accept it, and press Enter to continue.
3. You are prompted to type the installation location. The default installation location is shown; however, if your installation is different, type the revised location and press Enter. *Note:* The installation must be under the */nz/export/* path.
4. You are prompted to enter the database name, database user name, and database password. *Note:* The database user must have database access permissions to initialize the database and register the udf modules
5. A pre-installation summary is displayed to confirm your entries so far. Press Enter to continue.
6. A message is displayed to say the installation routine is ready to run. Press Enter to continue.
7. A progress bar is displayed whilst the installation routine runs. When the installation is complete, press Enter to exit from the installer.

GUI Installation

1. Introduction details are displayed. Click **Next** to continue.
2. Licensing information is displayed. Read the license, select the option to accept it, and click **Next** to continue.
3. You are prompted to select the installation location. The default installation location is shown; however, if your installation is different, click **Choose** to browse for the revised location. When the correct location is shown, click **Next**.
4. You are prompted to enter the database name, database user name, and database password. *Note:* The database user must have database access permissions to initialize the database and register the UDF modules.
5. A pre-installation summary is displayed to confirm your entries so far. Click **Install** to continue.
6. A progress bar is displayed whilst the installation routine runs. When the installation is complete, click **Done** to exit from the installer.

When you have completed these steps the scoring adapter is ready to receive work.

Installing IBM SPSS Modeler Server Scoring Adapter for Teradata

Depending on the configuration of your database you can install either from the console or by using a graphical user interface (GUI); however, the first step is the same for both methods:

- Log in as either *root* or *DBA user* and run the *install.bin* install script. *Note:* You must have access permissions for the installation folder to do this.

Console Installation

1. Introduction details are displayed. Press Enter to continue.
2. Licensing information is displayed. Read the license, type Y to accept it, and press Enter to continue.
3. You are prompted to type the installation location. The default installation location is shown; however, if your installation is different, type the revised location and press Enter.
4. Enter the database TDPID. Press Enter to continue.
5. Enter the database name. Press Enter to continue.
6. Enter the database password. Press Enter to continue.
7. A pre-installation summary is displayed to confirm your entries so far. Press Enter to continue.
8. A message is displayed to say the installation routine is ready to run. Press Enter to continue.

9. A progress bar is displayed whilst the installation routine runs. When the installation is complete, press Enter to exit from the installer.
10. If the *Components* table exists in your database a confirmation message is displayed. Either enter Y to continue creating tables and functions in your database, or enter N to skip this step. *Note:* If you skip this step you must manually create tables and functions later using *initdb.sh*, which is stored in the *<installation path>\setup* folder.

GUI Installation

1. Introduction details are displayed. Click **Next** to continue.
2. Licensing information is displayed. Read the license, select the option to accept it, and click **Next** to continue.
3. You are prompted to select the installation location. The default installation location is shown; however, if your installation of is different, click **Choose** to browse for the revised location. When the correct location is shown, click **Next**.
4. Enter the database TDPID, name, and password and click **Next** to continue.
5. A pre-installation summary is displayed to confirm your entries so far. Click **Install** to continue.
6. A progress bar is displayed whilst the installation routine runs. When the installation is complete, click **Done** to exit from the installer.
7. If the *Components* table exists in your database a confirmation message is displayed. Either click **Yes** to continue creating tables and functions in your database, or click **No** to skip this step. *Note:* If you skip this step you must manually create tables and functions later using *initdb.sh*, which is stored in the *<installation path>\setup* folder.

When you have completed these steps the scoring adapter is ready to receive work.

Installing IBM SPSS Modeler Server Scoring Adapter for DB2 LUW

Note: The DB2 LUW scoring adapter is only available on DB2 running on LINUX or AIX.

Note: The IBM SPSS Modeler Server Scoring Adapter may conflict with the DB2 LUW ANALYZE_TABLE embedded process for SAS because they share the same DB2 built in support.

Before installation, you need to shut down the DB2 LUW ANALYZE_TABLE embedded process using the *db2ida_epsps.sh* script provided in the IBM SPSS Modeler Server scoring adapter installation folder. To do this, use the DB2 command: *db2ida_epsps.sh stop*.

After installation, the DB2 LUW ANALYZE_TABLE embedded process should started automatically using *db2start*. However, if you install the adapter while a DB2 instance is active, you can start the DB2 LUW ANALYZE_TABLE embedded process manually by using the command: *db2ida_epsps.sh start*.

Note: The DB2 LUW ANALYZE_TABLE doesn't support the WITH table-expression clause if it contains UNION ALL. This may cause an error if you attempt to use this expression in a IBM SPSS Modeler node which generates UNION or UNION ALL SQL, such as the Append node.

Depending on the configuration of your database you can install either from the console or by using a graphical user interface (GUI); however, the first step is the same for both methods:

- Run the *install.bin* install script. Ensure that *install.bin* can be executed by *db2 user* and run it as that user.

Console Installation

1. Introduction details are displayed. Press Enter to continue.
2. Licensing information is displayed. Read the license, type 1 to accept it and press Enter.

3. You are prompted to type the installation location. The default installation location is shown; however, if your installation is different, type the revised location and press Enter.
4. You are prompted to enter the database name, database user name, and database password.
5. A pre-installation summary is displayed to confirm your entries so far. Press Enter to continue.
6. A message is displayed to say the installation routine is ready to run. Press Enter to continue.
7. A progress bar is displayed whilst the installation routine runs. When the installation is complete, press Enter to exit from the installer.

GUI Installation

1. Introduction details are displayed. Click **Next** to continue.
2. Licensing information is displayed. Read the license, select the option to accept it, and click **Next** to continue.
3. You are prompted to select the installation location. The default installation location is shown; however, if your installation of is different, click **Choose** to browse for the revised location. When the correct location is shown, click **Next**.
4. You are prompted to enter the database name, database user name, and database password.
5. A pre-installation summary is displayed to confirm your entries so far. Click **Install** to continue.
6. A progress bar is displayed whilst the installation routine runs. When the installation is complete, click **Done** to exit from the installer.

When you have completed these steps the scoring adapter is ready to receive work.

Installing IBM SPSS Modeler Server Scoring Adapter for DB2 for z/OS

IBM SPSS Modeler Server, together with IBM SPSS Modeler Server Scoring Adapter for DB2 for z/OS, provides the ability to add predictive analytics to On Line Transaction Processing (OLTP) applications running on z/OS. SPSS Modeler Server is used to create and train the models that are to be used and publishes those models into DB2 z/OS.

The scoring adapter for DB2 for z/OS provides a scoring engine that runs in the DB2 for z/OS User Defined Function (UDF) runtime. The adapter defines a UDF that applications can invoke using SQL to run the scoring models synchronously, in-line within their transactions, using live transaction data as the input for scoring to maximize the effectiveness of scoring results. Because the adapter runs embedded in DB2 z/OS, it provides the same scalability and performance as DB2 for z/OS itself enabling you to handle large loads and meet stringent response time Service Level Agreements (SLAs).

The scoring adapter runs as a USS (Unix System Services) application within A WLM (Work Load Manager) application environment for DB2 defined for exclusive use by the adapter. Do not attempt to share this WLM application environment with any other DB2 stored procedure or UDF.

The scoring adapter for DB2 for z/OS is only available as part of Program Number 5655-AA8 "IBM SPSS Modeler with Scoring Adapter for zEnterprise" as FMID (Function Modification Identifier) HHUMG10.

To install the scoring adapter, the z/OS system administrator must:

1. Order PID 5655-AA8 FMID HHUMG10.
2. Follow the installation instructions in the program directory to install the scoring adapter using SMP/E.

The following table lists the resulting SMP/E installed datasets and their contents:

Table 1. Dataset contents.

Dataset name	Contents
SHUMSAMP	The following configuration samples: HUMBIND - DB2 Bind the scoring adapter packages and plan HUMRACF - Set the required RACF privileges HUMSCFDB - Create the scoring adapter metadata database and tables HUMUDFS - Define scoring adapter UDFs HUMWLMP - PROC for Work Load Manager (WLM) Analytics application environment HUMWLMA - Define Work Load Manager (WLM) Analytics application environment
SHUMLOAD	Shared libraries (DLLs) and UDF executable.
SHUMHFS	Default Mount at path: <code>/usr/lpp/spss/cfscoring_<n.n>..</code> Where <code><n.n></code> is the version number of SPSS Modeler Server. All dynamically loaded and long named DLLs are externally linked from HFS to the HUMLOAD short name member during SMP/E installation.
SHUMDBRM	DB2 package.

To configure the scoring adapter, you must modify the configuration jobs provided in SHUMSAMP. To tailor it for your particular installation of the scoring adapter you need to make the changes specified in the job itself; to do this, follow these steps:

1. Use HUMSCFDB to create the database and tables needed by the scoring adapter and to grant their use.
2. Use HUMWLMP to setup the WLM PROC that the scoring adapter will use.
Note: Ensure that the scoring adapter SHUMLOAD dataset is APF authorized.
3. Use HUMWLMA to define and activate the WLM application environment for the scoring adapter.
Note: Do not share this WLM application environment with any other application.
Note: Do not use a general WLMA application environment.
Note: Ensure you start the WLM Application Environment and the scoring UDF, if not started automatically or if they are stopped for any reason. Sample commands to do that are:
VARY WLM,APPLENV=DB1DWLM_ANALYTICS,RESUME
-START FUNCTION SPECIFIC(HUMSPSS.HUMSCORESPE)
4. Use HUMUDFS to create the scoring adapter UDFs.
5. Use HUMBIND to bind the scoring adapter packages and plan and to grant its use.
Note: The scoring adapter depends on PACK/UNPACK SQL provided by DB2 z/OS v10 in Authorized Program Analysis Reports (APARs) PM55928 and PM56631. In addition, DB2 APAR PM74654 provides a change critical for high performance. Ensure you have them applied to your DB2 subsystem before attempting to use the scoring adapter.
6. Define a very aggressive Work Load Manager Service class for use by the scoring adapter. It is recommended to start with a WLM goal of 95% completion within 70 microseconds and adjust as necessary.
Note: The scoring adapter is designed for performance, high concurrence, and scalability. To achieve that, ensure that the limit for these two z/OS system resources is set high enough to handle the required levels of concurrency. It is recommended you set them at these levels and adjust as necessary after peak workloads. Use DISPLAY OMVS,L to check the limits that are set:
SETOMVS IPCSEMNIDS=680

SETOMVS MAXPROCSYS=32767

When you have completed these steps the scoring adapter is ready to receive work; use IBM SPSS Modeler to create the models and publish them into DB2 z/OS for the scoring adapter. To do this, from the model nugget menu, choose **File > Publish to Server Scoring Adapter**, complete the details, and click **OK**.



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