

*IBM SPSS Statistics Data File Driver
Guide*



Note

Before using this information and the product it supports, read the information in [“Notices” on page 25.](#)

Product Information

This edition applies to version 29, release 0, modification 2 of IBM® SPSS® Statistics and to all subsequent releases and modifications until otherwise indicated in new editions.

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Chapter 1. Overview

The IBM SPSS Statistics data file driver allows you to read IBM SPSS Statistics (.sav and .zsav) data files in applications that support Open Database Connectivity (ODBC) or Java Database Connectivity (JDBC). IBM SPSS Statistics itself supports ODBC in the Database Wizard, providing you with the ability to leverage the Structured Query Language (SQL) when reading .sav and .zsav data files in IBM SPSS Statistics.

There are three flavors of the IBM SPSS Statistics data file driver, all of which are available for Windows, UNIX, and Linux:

- **Standalone driver.** The standalone driver provides ODBC support without requiring installation of additional components. After the standalone driver is installed, you can immediately set up an ODBC data source and use it to read .sav and .zsav files.
- **Service driver.** The service driver provides both ODBC and JDBC support. The service driver handles data requests from the service client driver, which may be installed on the same computer or on one or more remote computers. Thus you can configure one service driver that may be used by many clients. If you put your data files on the same computer on which the service driver is installed, the service driver can reduce network traffic because all the queries occur on the server. Only the resulting cases are sent to the service client. If the server has a faster processor or more RAM compared to service client machines, there may also be performance improvements.
- **Service client driver.** The service client driver provides an interface between the client application that needs to read the .sav or .zsav data file and the service driver that handles the request for the data. Unlike the standalone driver, it supports both ODBC and JDBC. The operating system of the service client driver does not need to match the operating system of the service driver. For example, you can install the service driver on a UNIX machine and the service client driver on a Windows machine.

Using the standalone and service client drivers is similar to connecting to a database with any other ODBC or JDBC driver. After configuring the driver, creating data sources, and connecting to the IBM SPSS Statistics data file, you will see that the data file is represented as a collection of tables. In other words, the data file looks like a database source. For information about installing and configuring the drivers, see Chapter 2, “Installation and Configuration,” on page 3 . For information about the tables and table relationships, see Chapter 3, “Database Schema Reference,” on page 15 .

Chapter 2. Installation and Configuration

This section provides information for installing the standalone driver, the service driver, and the service client driver.

What Do I Install?

Accessing data files thorough ODBC. If you want to access data files through ODBC, the easiest solution is to install the standalone driver. However, the standalone driver works only with ODBC. If you need to access the data file through JDBC, you must install both the service driver and the service client driver on the same computer.

Accessing data files through JDBC. If you want to access data files through JDBC, you must install the service driver on the remote computer. Then you install the service client driver on the computer that needs to access the data on the remote computer. The service driver also supports ODBC, so it has the added advantage of handling both ODBC and JDBC.

Reducing network traffic and increasing performance. You may also want to install the service driver and the service client driver if you want to reduce network traffic and/or improve performance. If you put your data files on the same computer on which the service driver is installed, the service driver can reduce network traffic because all the queries occur on the server. Only the resulting cases are sent to the service client. If the server has a faster processor or more RAM compared to service client machines, there may also be performance improvements.

For information about installing the standalone driver, see [“Installing and Configuring the Standalone Driver” on page 3](#) . For information about installing the service driver, see [“Installing and Configuring the Service Driver” on page 5](#) . For information about installing the service client driver, see [“Installing and Configuring the Service Client” on page 7](#) .

Installing and Configuring the Standalone Driver

The standalone driver can be installed on Windows or UNIX/Linux. For information about this driver, see Chapter 1, [“Overview,” on page 1](#) .

Installing and Configuring the Standalone Driver on Windows

How to Install the Standalone Driver on Windows

Note: If you plan to use the standalone driver with Excel 2007 or Access 2007, you must always install the 32-bit version of the driver, even if you are running 64-bit Windows. Excel 2007 and Access 2007 do not support 64-bit drivers.

1. Double-click the installer file.
2. Follow the instructions that appear on the screen.
3. If you are installing on Windows Vista, log off and log back on before proceeding.

How to Configure the Standalone Driver on Windows

The standalone IBM SPSS Statistics File Driver is configured like any other ODBC data source on Windows. You create a data source for each IBM SPSS Statistics data file that you want to use. Following are the general steps for configuring an ODBC DSN. You can also use the driver without a DSN. See the topic [“Using ODBC Without Using a Data Source Name” on page 11](#) for more information.

1. In the Windows Control Panel, open **Data Sources (ODBC)** from the Administrative Tools group.
2. In the ODBC Data Source Administrator, click **Add**.

3. In the Create New Data Source dialog box, select IBM SPSS Statistics <version> Data File Driver - Standalone.
4. In the IBM SPSS Statistics Data File Driver - Standalone Setup dialog box, enter the following information. Do not change the other entries.

Data Source Name

The name of the specific data source. This entry is required. To help identify the data file that the data source uses, enter a data source name that refers to the IBM SPSS Statistics data file.

Description

A description of the specific data source. This entry is optional.

Server Data Source

The type of data source.

SAVDB

A SAV file that is not password protected.

PASSWORD-PROTECTED-SAVDB

A SAV file that is password protected.

Statistics Data File Name

The full path to the IBM SPSS Statistics data file. This path cannot contain an equals sign (=) or semicolon (;).

User Missing Values Show as Nulls

A value of 0 or 1 to indicate whether user missing values are displayed as blanks (nulls) when the data file is read through the driver. 0 indicates that user missing values are displayed with the original value in the data file. 1 indicates that user missing values are displayed as blanks (nulls).

How to Remove the Standalone Driver

1. Use the Windows Control Panel to remove IBM SPSS Statistics <version> Data File Driver - Standalone.

Installing and Configuring the Standalone Driver on UNIX and Linux

How to Install the Standalone Driver on UNIX and Linux

Note: If you are installing the service driver on AIX or HP-UX, you cannot install from an NFS-formatted mount directory. Copy the installer file to a local disk before proceeding.

1. Open a terminal application.
2. Uncompress and untar the installer file. For example:

```
tar -xvzf statistics_datadriv_standalone_linux32.tar.Z
```

-OR-

```
gunzip statistics_datadriv_standalone_linux32.tar.Z  
tar -xvf statistics_datadriv_standalone_linux32.tar
```

3. For Red Hat Linux 7.x or 8.x, run the following commands to download and install required libraries:

```
wget http://mirror.centos.org/centos/7/os/x86_64/Packages/compat-libstdc++-33-3.2.3-72.el7.x86_64.rpm  
yum localinstall compat-libstdc++-33-3.2.3-72.el7.x86_64.rpm  
yum install libnsl  
yum install libquadmath.x86_64
```

4. Run the *install_standalone.sh* script. For example:

```
./install_standalone.sh
```

5. Answer the prompts. Press Enter to accept the default for any of the prompts.

How to Configure the Standalone Driver on UNIX and Linux

For use with an ODBC DSN, configuration of the driver on UNIX and Linux requires updating the *odbc.ini* file and setting environment variables. You can also use the driver without a DSN. See the topic [“Using ODBC Without Using a Data Source Name”](#) on page 11 for more information.

In the installation directory, you can find an example *odbc.ini* file with a default data source. You will also find a shell script named *savodbc.sh*. The shell script includes the commands for setting up your environment correctly. You can run the file directly (for example, `. savodbc.sh`) or you can copy the contents of the shell script for use elsewhere. For example, you could copy the contents of the shell script and paste them into the *statistics* shell script located in the *bin* subdirectory of the IBM SPSS Statistics installation directory. Doing so will allow IBM SPSS Statistics to take advantage of the configured ODBC data sources.

See the *odbc.ini* file for an example of how you can add IBM SPSS Statistics Data File ODBC sources. Following are descriptions of the fields for each data source.

Driver

This points to the *ivoal22.so* file located in the *lib* subdirectory of the installation directory.

Host

This points to the *oadm.ini* file located in the *cfg* subdirectory of the installation directory.

Port

This is always set to `StatisticsSAVDriverStandalone`.

ServerDataSource

This specifies the type of data source.

SAVDB

A SAV file that is not password protected.

PASSWORD-PROTECTED-SAVDB

A SAV file that is password protected.

CustomProperties

For SAVDB data sources, this is always set to `CONNECT_STRING=/path/to/sav/file;UserMissingIsNull=<0|1>`. For PASSWORD-PROTECTED-SAVDB data sources, this string can also include `;DBUID=<user_name>;DBPWD=<password>` to specify the user name and password for the password-protected SAV file.

- The path to the SAV file is relative to the computer on which the service is running.
- The path to the SAV file cannot contain an equals sign (=) or semicolon (;).
- The `UserMissingIsNull` part of the connect string is optional and specifies the treatment of user-defined missing values. 0 indicates that user-defined missing values are read as valid values. 1 indicates user-defined missing values are set to system-missing for numeric variables and blank for string variables. If `UserMissingIsNull` is not specified, it is set to a default value of 1.

How to Remove the Standalone Driver on UNIX and Linux

1. Remove the installation directory. For example:

```
rm -fr /opt/SPSSInc/savdrv/client
```

2. If you modified an existing *odbc.ini* file, be sure to remove the IBM SPSS Statistics data sources.

Installing and Configuring the Service Driver

The service driver can be installed on Windows or UNIX/Linux. For information about this driver, see [Chapter 1, “Overview,”](#) on page 1.

Installing and Configuring the Service Driver on Windows

Upgrading

If you are installing a new version of the service driver on a computer on which an older version of the service driver is installed, you need to do one of the following, depending on whether you want to keep the older version:

- Uninstall the old version of the service driver before installing the new version. Older service clients should be able to connect to the newer service driver. However, users requesting data from a JDBC source will need to ensure that the URL is correct. The URL has changed in some versions.
- or
- If you want to keep the old version, install the new version with a different port number. Be sure to communicate the port number to other users so they know which port number to use with the service client.

How to Install the Service Driver on Windows

1. Double-click the installer file.
2. Follow the instructions that appear on the screen. You will be prompted to enter a host name and port number for the service. The default host name is localhost. If remote users are going to access the service, be sure to change the default to the server computer's network name or IP address. Also, if the default port is in use by another application, be sure to change it.

How to Configure the Service Driver on Windows

1. In the Windows Control Panel, open **Services** from the Administrative Tools group.
2. Locate **Statistics <version> Data Driver Service** in the list. If the service is not started, double-click its name and start it on the dialog box that appears. Note that if the service startup is configured to be Automatic, the service will start automatically whenever the computer is restarted.
3. Click OK to close the dialog box.

The service is now ready to accept connections from the service client driver.

How to Remove the Service Driver on Windows

1. Use the Windows Control Panel to remove IBM SPSS Statistics <version> Data File Driver - Service.

Installing and Configuring the Service Driver on UNIX and Linux

Upgrading

If you are installing a new version of the service driver on a computer on which an older version of the service driver is installed, you need to do one of the following, depending on whether you want to keep the older version:

- Uninstall the old version of the service driver before installing the new version. Older service clients should be able to connect to the newer service driver. However, users requesting data from a JDBC source will need to ensure that the URL is correct. The URL has changed in some versions.
- or
- If you want to keep the old version, install the new version with a different port number. Be sure to communicate the port number to other users so they know which port number to use with the service client.

How to Install the Service Driver on UNIX and Linux

Notes:

- For Red Hat Linux 7+, the following commands must be run to install the correct OpenAccess libraries:

```
yum provides */libstdc++.so.5
yum install compat-libstdc++-33-3.2.3-72.el7.x86_64
```

- If you are installing the service driver on AIX or HP-UX, you cannot install from an NFS-formatted mount directory. Copy the installer file to a local disk before proceeding.

1. Open a terminal application.
2. Uncompress and untar the installer file. For example:

```
tar -xvzf statistics_datadriv_service_linux64.tar.Z
```

-or-

```
gunzip statistics_datadriv_service_linux64.tar.Z
tar -xvf statistics_datadriv_service_linux64.tar
```

3. Run the *install.sh* script. For example:

```
./install.sh
```

4. Answer the displayed prompts. Press Enter to accept the default for a particular prompt. The default host name is localhost. If remote users are going to access the service, be sure to change the default to the server computer's network name or IP address. Also, if the default port is in use by another application, be sure to change it.

How to Configure the Service Driver on UNIX and Linux

1. Check if the driver daemon (*StatisticsDataDriverService*) is running. For example:

```
ps -ef | grep StatisticsDataDriverService
```

2. If the driver daemon is *not* running, open a terminal application and change directories to the *admin* subdirectory within the installation directory.
3. Run the startup script:

```
./startStatisticsDataDriverService.sh
```

The service is now ready to accept connections from the service client driver. Note that the *admin* subdirectory also contains a script for stopping the daemon (*stopStatisticsDataDriverService.sh*).

How to Remove the Service Driver on UNIX and Linux

1. Open a terminal application.
2. Change directories to the *admin* subdirectory of the installation directory
3. Stop the driver daemon by running the *stopStatisticsDataDriverService.sh* script :

```
./stopStatisticsDataDriverService.sh
```

4. Remove the installation directory. For example:

```
rm -fr /opt/SPSSInc/savdrv/server
```

Installing and Configuring the Service Client

The service client driver can be installed on Windows or UNIX/Linux. For information about this driver, see Chapter 1, “Overview,” on page 1 .

Installing and Configuring the Service Client Driver on Windows

How to Install the Service Client Driver on Windows

1. Double-click the installer file.
2. Follow the instructions that appear on the screen.

How to Configure the Service Client Driver on Windows for ODBC

The standalone IBM SPSS Statistics File Driver is configured like any other ODBC data source on Windows. You create a data source for each IBM SPSS Statistics data file that you want to use. Following are the general steps for configuring an ODBC DSN. You can also use the driver without a DSN. See the topic [“Using ODBC Without Using a Data Source Name”](#) on page 11 for more information.

1. In the Windows Control Panel, open **Data Sources (ODBC)** from the Administrative Tools group.
2. In the ODBC Data Source Administrator, click **Add**.
3. In the Create New Data Source dialog box, select IBM SPSS Statistics <version> Data File Driver - Standalone.
4. In the IBM SPSS Statistics Data File Driver - Standalone Setup dialog box, enter the following information. Do not change the other entries.

Service Host

The host name or IP address of the computer on which the service driver is running. If the service is running on the same machine as the client, you can use the default setting of localhost.

Service Port

The port number on which the service is listening for connections. The default port number is automatically entered. Unless the port number was explicitly changed, keep the default.

Data Source Name

The name of the specific data source. This entry is required. To help identify the data file that the data source uses, enter a data source name that refers to the IBM SPSS Statistics data file.

Description

A description of the specific data source. This entry is optional.

Server Data Source

The type of data source.

SAVDB

A SAV file that is not password protected.

PASSWORD-PROTECTED-SAVDB

A SAV file that is password protected.

Statistics Data File Name

The full path to the IBM SPSS Statistics data file. This path cannot contain an equals sign (=) or semicolon (;).

User Missing Values Show as Nulls

A value of 0 or 1 to indicate whether user missing values are displayed as blanks (nulls) when the data file is read through the driver. 0 indicates that user missing values are displayed with the original value in the data file. 1 indicates that user missing values are displayed as blanks (nulls).

How to Configure the Service Client on Windows for JDBC

You don't configure JDBC sources in a central location as you do for ODBC sources. Instead, the application that supports JDBC has a specific method for configuring the driver. You will need the following information.

Driver JAR file

The driver JAR file is named *XFjc.jar* and is located in the client installation directory.

Driver class

This is `com.spss.statistics.datafile.jdbc.openaccess.OpenAccessDriver`.

URL

The URL has the following basic format (on one line):

```
jdbc:spssstatistics://<hostname>:<port>;ServerDatasource=SAVDB;  
CustomProperties=(CONNECT_STRING=<path_to_SAV_file>;UserMissingIsNull=<1|0>;  
MissingDoubleValueAsNaN=<1|0>;DBUID=<user_name>;DBPWD=<password>)
```

- `<hostname>` is the host name or IP address of the computer on which the service driver is running.
- `<port>` is the port number on which the service is listening for connections.
- `<path_to_SAV_file>` is the full path to the data file, relative to the computer on which the service driver is running. This path cannot contain an equals sign (=) or semicolon (;).
- The `UserMissingIsNull` part of the connect string is optional and specifies the treatment of user-defined missing values. 0 indicates that user-defined missing values are read as valid values. 1 indicates user-defined missing values are set to system-missing for numeric variables and blank for string variables. If `UserMissingIsNull` is not specified, it is set to a default value of 1.
- The `MissingDoubleValueAsNaN` part of the connect string is optional and specifies the treatment of missing numeric values. 0 indicates that user missing values are displayed with the original missing value in the data file. 1 indicates that user missing values are read as not a number (NaN). For JDBC, `UserMissingIsNull` should always be set to 1.
- `DBUID` and `DBPWD` are optional and specify the user name and password of a password-protected SAV file. If the file is not password protected, these properties are unnecessary.

Following is a complete example (this should be entered on one line):

```
jdbc:spssstatistics://localhost:18886;ServerDatasource=SAVDB;  
CustomProperties=(CONNECT_STRING=/home/user/data/Employee_data.sav;UserMissingIsNull=1;  
MissingDoubleValueAsNaN=1)
```

How to Remove the Service Client Driver on Windows

1. Use the Windows Control Panel to remove IBM SPSS Statistics <version> Data File Driver - Service Client.

Installing and Configuring the Service Client Driver on UNIX and Linux

How to Install the Service Client Driver on UNIX and Linux

Notes:

- For Red Hat Linux 7+, the following commands must be run to install the correct OpenAccess libraries:

```
yum provides */libstdc++.so.5  
yum install compat-libstdc++-33-3.2.3-72.el7.x86_64
```

- If you are installing the service driver on AIX or HP-UX, you cannot install from an NFS-formatted mount directory. Copy the installer file to a local disk before proceeding.

1. Open a terminal application.
2. Uncompress and untar the installer file. For example:

```
tar -xvzf statistics_datadriv_service_client_linux64.tar.Z
```

-Or-

```
gunzip statistics_datadriv_service_client_linux64.tar.Z  
tar -xvf statistics_datadriv_service_client_linux64.tar
```

3. Run the `install_client.sh` script. For example:

```
./install_client.sh
```

4. Answer the prompts. Press Enter to accept the default for any of the prompts.

How to Configure the Service Client Driver on UNIX and Linux for ODBC

For use with an ODBC DSN, configuration of the driver on UNIX and Linux requires updating the *odbc.ini* file and setting environment variables. You can also use the driver without a DSN. See the topic [“Using ODBC Without Using a Data Source Name”](#) on page 11 for more information.

In the installation directory, you can find an example *odbc.ini* file with a default data source. You will also find a shell script named *savodbc.sh*. The shell script includes the commands for setting up your environment correctly. You can run the file directly (for example, `. savodbc . sh`) or you can copy the contents of the shell script for use elsewhere. For example, you could copy the contents of the shell script and paste them into the *statistics* shell script located in the *bin* subdirectory of the IBM SPSS Statistics installation directory. Doing so will allow IBM SPSS Statistics to take advantage of the configured ODBC data sources.

See the *odbc.ini* file for an example of how you can add IBM SPSS Statistics Data File ODBC sources. Following are descriptions of the fields for each data source.

Driver

This points to the *ivoa22.so* file located in the *lib* subdirectory of the installation directory.

Host

The host name or IP address of the computer on which the service driver is running. If the service is running on the same machine as the client, you can use the default setting of `localhost`.

Port

The port number on which the service is listening for connections. The default port number is automatically entered. Unless the port number was explicitly changed, keep the default.

ServerDataSource

This specifies the type of data source.

SAVDB

A SAV file that is not password protected.

PASSWORD-PROTECTED-SAVDB

A SAV file that is password protected.

CustomProperties

This is always set to `CONNECT_STRING=/path/to/sav/file;UserMissingIsNull=<0|1>;MissingDoubleValueAsNaN=<0|1>`. For PASSWORD-PROTECTED-SAVDB data sources, this string can also include `;DBUID=<user_name>;DBPWD=<password>` to specify the user name and password for the password-protected SAV file.

- The path to the SAV file is relative to the computer on which the service is running.
- The path to the SAV file cannot contain an equals sign (=) or semicolon (;).
- The `UserMissingIsNull` part of the connect string is optional and specifies the treatment of user-defined missing values. `0` indicates that user-defined missing values are read as valid values. `1` indicates user-defined missing values are set to system-missing for numeric variables and blank for string variables.
- The `MissingDoubleValueAsNaN` part of the connect string is optional and specifies the treatment of missing numeric values. `0` indicates that user missing values are displayed with the original missing value in the data file. `1` indicates that user missing values are read as not a number (NaN). For ODBC, `UserMissingIsNull` should always be set to `0`.
- If `UserMissingIsNull` or `MissingDoubleValueAsNaN` is not specified, it is set to a default value of `1`.

How to Configure the Service Client Driver on UNIX and Linux for JDBC

You don't configure JDBC sources in a central location as you do for ODBC sources. Instead, the application that supports JDBC has a specific method for configuring the driver. You will need the following information.

Driver JAR file

The driver JAR file is named *XFjc.jar* and is located in the client installation directory.

Driver class

This is `com.spss.statistics.datafile.jdbc.openaccess.OpenAccessDriver`.

URL

The URL has the following basic format (on one line):

```
jdbc:spssstatistics://<hostname>:<port>;ServerDatasource=SAVDB;  
CustomProperties=(CONNECT_STRING=<path_to_SAV_file>;UserMissingIsNull=<1|0>;  
MissingDoubleValueAsNaN=<1|0>;DBUID=<user_name>;DBPWD=<password>)
```

- `<hostname>` is the host name or IP address of the computer on which the service driver is running.
- `<port>` is the port number on which the service is listening for connections.
- `<path_to_SAV_file>` is the full path to the data file, relative to the computer on which the service driver is running. This path cannot contain an equals sign (=) or semicolon (;).
- The `UserMissingIsNull` part of the connect string is optional and specifies the treatment of user-defined missing values. 0 indicates that user-defined missing values are read as valid values. 1 indicates user-defined missing values are set to system-missing for numeric variables and blank for string variables. If `UserMissingIsNull` is not specified, it is set to a default value of 1.
- The `MissingDoubleValueAsNaN` part of the connect string is optional and specifies the treatment of missing numeric values. 0 indicates that user missing values are displayed with the original missing value in the data file. 1 indicates that user missing values are read as not a number (NaN). For JDBC, `UserMissingIsNull` should always be set to 1.
- `DBUID` and `DBPWD` are optional and specify the user name and password of a password-protected SAV file. If the file is not password protected, these properties are unnecessary.

Following is a complete example (this should be entered on one line):

```
jdbc:spssstatistics://localhost:18886;ServerDatasource=SAVDB;  
CustomProperties=(CONNECT_STRING=/home/user/data/Employee_data.sav;UserMissingIsNull=1;  
MissingDoubleValueAsNaN=1)
```

How to Remove the Service Client Driver on UNIX and Linux

1. Remove the installation directory. For example:

```
rm -fr /opt/SPSSInc/savdrv/client
```

2. If you modified an existing *odbc.ini* file, be sure to remove the IBM SPSS Statistics data sources.

Using ODBC Without Using a Data Source Name

The previous ODBC configuration instructions for Windows and UNIX/Linux assumed that you wanted to create a data source name (DSN) before using the driver. You also have the option of using the driver without a DSN. The advantage of using the driver without a DSN is that you can easily change the data source without editing an existing DSN or creating one for the new data source. Following are examples of using the ODBC standalone and service client drivers in IBM SPSS Statistics.

Using the Standalone ODBC Driver Without a Data Source Name

This example uses the ODBC standalone driver to select a subset of variables and cases when reading a password-protected data file in IBM SPSS Statistics format into IBM SPSS Statistics.

```
GET DATA  
/TYPE=ODBC
```

```

/CONNECT=
"DRIVER=IBM SPSS Statistics 22 Data File Driver - Standalone;"
"SDSN=SAVDB;"
"HST=C:\Program Files\IBM\SPSS\StatisticsDataFileDriver\22"
  "\Standalone\cfg\oadm.ini;"
"PRT=StatisticsSAVDriverStandalone;"
"CP_CONNECT_STRING=C:\examples\data\demo.sav;"
"CP_UserMissingIsNull=0";
"CP_DBUID=Fred";
"CP_DBPWD=Pass1234";
/SQL="SELECT age, marital, inccat, gender FROM demo.Cases "
  "WHERE (age > 40 AND gender = 'm')".
CACHE.
EXECUTE.
APPLY DICTIONARY FROM '/examples/data/demo.sav'.

```

- **DRIVER.** Instead of specifying a DSN (data source name), the CONNECT statement specifies the driver name. You could define DSNs for each IBM SPSS Statistics data file that you want to access with the ODBC driver (using the ODBC Data Source Administrator on Windows), but specifying the driver and all other parameters on the CONNECT statement makes it easier to reuse and modify the same basic syntax for different data files. The driver name is always IBM SPSS Statistics <version> Data File Driver - Standalone, where <version> is the product version number.
- **SDSN.** This is set to PASSWORD-PROTECTED-SAVDB to indicate a password-protected data file. If the file were not password protected, this would be set to SAVDB.
- **HST.** This specifies the location of the *oadm.ini* file. It is located in the *cfg* sub-directory of the driver installation directory.
- **PRT.** This is always set to StatisticsSAVDriverStandalone.
- **CP_CONNECT_STRING.** The full path and name of the IBM SPSS Statistics data file. This path cannot contain an equals sign (=) or semicolon (;).
- **CP_UserMissingIsNull.** This specifies the treatment of user-defined missing values. If it is set to 0, user-defined missing values are read as valid values. If it is set to 1, user-defined missing values are set to system-missing for numeric variables and blank for string variables. In this example, the user-defined missing values will be read as valid values and then the original user-missing definitions will be reapplied with APPLY DICTIONARY.
- **CP_DBUID.** The user name for the password-protected data file.
- **CP_DBPWD.** The password for data file.
- **SQL.** The SQL subcommand uses standard SQL syntax to specify the variables (fields) to include, the name of the database table, and the case (record) selection rules.
- **SELECT** specifies the subset of variables (fields) to read. In this example, the variables *age*, *marital*, *inccat*, and *gender*.
- **FROM** specifies the database table to read. The prefix is the name of the IBM SPSS Statistics data file. The *Cases* table contains the case data values.
- **WHERE** specifies the criteria for selecting cases (records). In this example, males over 40 years of age.
- **APPLY DICTIONARY** applies the dictionary information (variable labels, value labels, missing value definitions, and so forth) from the original IBM SPSS Statistics data file. When you use GET DATA / TYPE=ODBC to read IBM SPSS Statistics data files, the dictionary information is not included, but this is easily restored with APPLY DICTIONARY.

Using the Service Client ODBC Driver Without a Data Source Name

This example uses the service client ODBC driver to select a subset of variables and cases when reading a data file in IBM SPSS Statistics format into IBM SPSS Statistics.

```

GET DATA
/TYPE=ODBC
/CONNECT=
"DRIVER=IBM SPSS Statistics 19 Data File Driver - Service Client;"
"SDSN=SAVDB;"
"HST=myserver;"
"PRT=18886;"
"CP_CONNECT_STRING=C:\examples\data\demo.sav;"
"CP_UserMissingIsNull=0"
/SQL="SELECT age, marital, inccat, gender FROM demo.Cases "
  "WHERE (age > 40 AND gender = 'm')".
CACHE.
EXECUTE.
APPLY DICTIONARY FROM '/examples/data/demo.sav'.

```


- **DRIVER.** Instead of specifying a DSN (data source name), the CONNECT statement specifies the driver name. You could define DSNs for each IBM SPSS Statistics data file that you want to access with the ODBC driver (using the ODBC Data Source Administrator on Windows), but specifying the driver and all other parameters on the CONNECT statement makes it easier to reuse and modify the same basic syntax for different data files. The driver name is always IBM SPSS Statistics <version> Data File Driver - Service Client, where <version> is the product version number.
- **SDSN.** This is set to SAVDB because the data file is not password protected.
- **HST.** The host name or IP address of the computer on which the service driver is running. If the service is running on the same machine as the client, you can use the default setting of localhost.
- **PRT.** The port number on which the service is listening for connections. The default is shown in the example.

The rest of the example is that same as it was for the standalone driver. The only difference is that file paths are relative to the computer on which the service driver is running.

Chapter 3. Database Schema Reference

This section describes the database schema for the IBM SPSS Statistics data file.

Tables

There are several tables that may be associated with the IBM SPSS Statistics data file. The tables provide detailed information about variables, cases, attributes, multiple response sets, and variable sets. In many situations, you can use the CasesView table by itself. This table retrieves all cases and displays data value labels if available.

Properties Table

The Properties table specifies the general properties for the IBM SPSS Statistics data file.

<i>Table 1. Properties Table</i>		
Column Name	Type	Description
Encoding	VARCHAR(*)	The encoding format of the data file. The size is set to the maximum string length of the encoding format.

Variables Table

The Variables table defines the variables in the IBM SPSS Statistics data file. If a specific variable has any defined value labels, the Variables table is linked to one or more VLVAR<var_name> tables. The ValueLabelTableName column identifies the specific VLVAR<var_name> table for each variable with defined value labels.

<i>Table 2. Variables Table</i>		
Column Name	Type	Description
VarName	VARCHAR(*)	The unique name for the variable. The size depends on the maximum variable name string length for all variables in the data file.
Label	VARCHAR(*)	The variable label. The size depends on the maximum variable label string length for all variables in the data file.
IsWeightVar	BINARY(1)	A binary value indicating whether the variable is a weight variable. 0 - This is not a weight variable. 1 - This is a weight variable.

Table 2. Variables Table (continued)

Column Name	Type	Description
Format	SMALLINT	<p>A number indicating the format of the variable. Refer to the Universals section of the <i>Command Syntax Reference</i> for information about the specific formats.</p> <p>1 - A 2 - AHEX 3 - COMMA 4 - DOLLAR 5 - F 6 - IB 7 - IBHEX 8 - P 9 - PIB 10 - PK 11 - RB 12 - RBHEX 15 - Z 16 - N 17 - E 20 - DATE 21 - TIME 22 - DATETIME 23 - ADATE 24 - JDATE 25 - DTIME 26 - WKDAY 27 - MONTH 28 - MOYR 29 - QYR 30 - WKYR 31 - PERCENT 32 - DOT 33 - CCA 34 - CCB 35 - CCC 36 - CCD 37 - CCE 38 - EDATE 39 - SDATE</p>
Width	INTEGER	The width of the variable.
Decimals	INTEGER	The number of decimal places for the variable.
WriteFormat	SMALLINT	A number indicating the write format of the variable. See the description of Format for the code keys.
WriteWidth	INTEGER	The write width of the variable.
WriteDecimals	INTEGER	The number of write decimal places for the variable.
Alignment	SMALLINT	<p>A number indicating the alignment of the variable.</p> <p>0 - Left 1 - Right 2 - Center</p>

Table 2. Variables Table (continued)

Column Name	Type	Description
MeasLevel	SMALLINT	A number indicating the variable's measurement level. 0 - Unknown 1 - Nominal 2 - Ordinal 3 - Scale 4 - Flag 5 - Typeless
MvCode	SMALLINT	A number indicating which missing value codes and values are used for this variable. -3 - Missing value 3 and the range between missing values 1 and 2 -2 - The range between missing values 1 and 2 0 - No missing values 1 - Missing value 1 2 - Missing values 1 and 2 3 - Missing values 1, 2, and 3
Role	SMALLINT	A number indicating the predefined role for the variable. 0 - Input 1 - Target 2 - Both 3 - None 4 - Partition 5 - Split 6 - Frequency 7 - Record ID
NMissingValue1	DOUBLE	The numeric missing value 1.
NMissingValue2	DOUBLE	The numeric missing value 2.
NMissingValue3	DOUBLE	The numeric missing value 3.
SMissingValue1	VARCHAR(8)	The string type missing value 1.
SMissingValue2	VARCHAR(8)	The string type missing value 2.
SMissingValue3	VARCHAR(8)	The string type missing value 3.
DMissingValue1	DATE	The date type missing value 1.
DMissingValue2	DATE	The date type missing value 2.
DMissingValue3	DATE	The date type missing value 3.
Position	INTEGER	The sequence number of the variable in the data file. This is the order in which the variable appears in the data file.
Type	INTEGER	A number indicating whether the variable is a numeric or the length of the string if the variable is a string. 0 - Variable is a numeric value type. 1-32767 - The variable is a string value type and its length is the specified number.

<i>Table 2. Variables Table (continued)</i>		
Column Name	Type	Description
ValueLabelTableName	VARCHAR(*)	The name of the value label table associated with the variable. The value label tables are named VLVAR<var_name>. If this field is NULL, there are no value labels defined for this variable. The size of this field depends on the maximum variable name length.

VLVAR<var_name> Table

There can be more than one VLVAR<var_name> table. Each VLVAR<var_name> table defines value labels for a specific variable. The ValueLabelTableName column in the Variables table identifies the associated VLVAR<var_name> table for each variable with defined value labels.

<i>Table 3. VLVAR<var_name> Table</i>		
Column Name	Type	Description
<var_name>	Same as the referenced variable	The name of the variable for which the variable label is defined.
<var_name>_label	VARCHAR(*)	The variable label string for the variable. The size depends on the maximum string length of all labels for the variable.

Attributes Table

The Attributes table identifies the defined data file attributes. The AttributeTableId column is linked to the AttributeTableId column in the AttributeValues table.

<i>Table 4. Attributes Table</i>		
Column Name	Type	Description
AttributeName	VARCHAR(*)	The name of the defined attribute. The size depends on the maximum size of all attribute name lengths.
AttributeTableId	INTEGER	The ID for linking the attribute to an attribute value in the AttributeValues table.

VarAttributes Table

The VarAttributes table identifies the defined variable attributes. The VarName column is linked to the VarName column in the Variables table. The AttributeTableId column is linked to the AttributeTableId column in the AttributeValues table.

<i>Table 5. Attributes Table</i>		
Column Name	Type	Description
VarName	VARCHAR(*)	The name of the variable for which the variable attribute is defined. The size depends on the maximum size of all variable name lengths.
AttributeName	VARCHAR(*)	The name of the defined attribute. The size depends on the maximum size of all attribute name lengths.
AttributeTableId	INTEGER	The ID for linking the attribute to an attribute value in the AttributeValues table.

AttributeValues Table

The AttributeValues table defines the values for all data file and variable attributes in the data file. The AttributeTableId column is linked to the AttributeTableId column in both the Attributes and the VarAttributes tables.

<i>Table 6. AttributesValue Table</i>		
Column Name	Type	Description
AttributeTableId	INTEGER	The unique identifier for the attribute.
Number	INTEGER	A sequence number for the attribute.
Value	VARCHAR(128)	The value for the attribute.

MrSets Table

The MrSets table identifies the multiple response sets in the data file. The TableId column is linked to the TableId column in the MrSetVariables table.

<i>Table 7. MrSets Table</i>		
Column Name	Type	Description
Name	VARCHAR(128)	The name of the multiple response set.
Label	VARCHAR(255)	The label for the multiple response set.
Type	SMALLINT	An integer identifying the multiple response set type. 1 - Multiple category 2 - Multiple dichotomy
TableId	INTEGER	An integer linking the multiple response set to variables in the MrSetVariables table.
NConstant	DOUBLE	The numeric counted value for the multiple dichotomy.
SConstant	VARCHAR(128)	The string counted value for the multiple dichotomy.

MrSetVariables Table

The MrSetVariables table identifies the variables in the multiple response sets. The TableId column is linked to the TableId column in the MrSets table. The VarName column links to the VarName column in the Variables table.

<i>Table 8. MrSetVariables table</i>		
Column Name	Type	Description
TableId	INTEGER	An integer linking the variable to a unique multiple response set in the MrSets table.
VarName	VARCHAR(*)	The name of the variable used in the multiple response set. The size depends on the maximum variable name string length for all variables in the data file.

Cases Table

The Cases table identifies the cases and values in the data file. Except for the RECORD_NUM column, the columns in the Cases table correspond to the unique VarName values in the Variables table. The column types and sizes are based on the value of the Type column in the Variables table.

If the data file contains elapsed time variables, the values for these variables will not be correct if the time is greater than 24 hours. You should use the CasesElapsedTimeView table to get the correct elapsed time values. See the topic “CasesElapsedTimeView Table” on page 20 for more information.

<i>Table 9. Cases Table</i>		
Column Name	Type	Description
RECORD_NUM	INTEGER	A sequence number identifying each unique case.
<var_name>		The value of <i>var_name</i> for each case in the data file. The column types and sizes are based on the value of the Type column in the Variables table.

CasesView Table

The CasesView table identifies the cases and value labels in the data file. The RECORD_NUM column is linked to the RECORD_NUM column in the Cases table.

Except for the RECORD_NUM column, the columns in the CasesView table correspond to the unique VarName values in the Variables table. The column types and sizes are based on the value of the Type column in the Variables table. This table automatically extracts values labels from the VLVAR<var_name> tables and includes the value labels as strings. If there is no VLVAR<var_name> table for a specific variable, the original formatted value is included.

<i>Table 10. CasesView Table</i>		
Column Name	Type	Description
RECORD_NUM	INTEGER	An integer linking the row to a case in the Cases table.
<var_name>		The value of <i>var_name</i> for each case in the data file. If value labels exist for the variable, the label instead of the value is used. The column types and sizes are based on the value of the Type column in the Variables table.

CasesElapsedTimeView Table

The CasesElapsedTimeView table identifies the cases and elapsed time variables in the data file. The RECORD_NUM column is linked to the RECORD_NUM column in the Cases table. The CasesElapsedTimeView table exists only if there are elapsed time variables in the data file.

Except for the RECORD_NUM column, the columns in the CasesElapsedTimeView table correspond to the unique elapsed time VarName values in the Variables table. Note that elapsed time is formatted as a string (VARCHAR) in this table.

<i>Table 11. CasesElapsedTimeView Table</i>		
Column Name	Type	Description
RECORD_NUM	INTEGER	An integer linking the row to a case in the Cases table.
<var_name>	VARCHAR(32)	The string value of <i>var_name</i> for each case in the data file.

VarSets Table

The VarSets table identifies the variables sets in the data file. The VarSets table is linked to one or more VARSETCASES<set_name> and VARSETCASESVIEW<set_name> tables. The TableName column identifies the specific VARSETCASES<set_name> table for each variable set, and the ViewTableName column identifies the specific VARSETCASESVIEW<set_name>.

<i>Table 12. VarSets Table</i>		
Column Name	Type	Description
Name	VARCHAR(*)	The name for the variable set.
Label	VARCHAR(*)	The label for the variable set.
TableName	VARCHAR(*)	The name of the table that contains cases for only the variables in the variable set. The variable set cases tables are named VARSETCASES<set_name>.
ViewTableName	VARCHAR(*)	The name of the view table that contains cases for only the variables in the variable set. The variable set cases view tables are named VARSETVIEWCASES<set_name>. Unlike the VARSETCASES<set_name> tables, these tables substitute labels for variable values when available.

VARSETCASES<set_name> Table

There can be more than one VARSETCASES<set_name> table. Each VARSETCASES<set_name> table identifies the variables in specific variable sets. The TableName column in the VarSets table identifies the associated VARSETCASES<set_name> table for each variable set. The RECORD_NUM column is also linked to the RECORD_NUM column in the Cases table.

Except for the RECORD_NUM column, the columns in the VARSETCASES<set_name> table correspond to the unique VarName values in the Variables table. The column types and sizes are based on the value of the Type column in the Variables table.

<i>Table 13. VARSETCASES<set_name> Table</i>		
Column Name	Type	Description
RECORD_NUM	INTEGER	An integer linking the row to a case in the Cases table.
<var_name>		The value of <i>var_name</i> for each case in the data file. The column types and sizes are based on the value of the Type column in the Variables table.

VARSETCASESVIEW<set_name> Table

There can be more than one VARSETCASESVIEW<set_name> table. Each VARSETCASESVIEW<set_name> table identifies the variables in specific variable sets. The ViewTableName column in the VarSets table identifies the associated VARSETCASESVIEW<set_name> table for each variable set. The RECORD_NUM column is also linked to the RECORD_NUM column in the Cases table.

Except for the RECORD_NUM column, the columns in the VARSETCASESVIEW<set_name> table correspond to the unique VarName values in the Variables table. The column types and sizes are based on the value of the Type column in the Variables table. This table automatically extracts values labels from the VLVAR<var_name> tables and includes the value labels as strings. If there is no VLVAR<var_name> table for a specific variable, the original formatted value is included.

<i>Table 14. VARSETCASESVIEW<set_name> Table</i>		
Column Name	Type	Description
RECORD_NUM	INTEGER	An integer linking the row to a case in the Cases table.

Table 14. VARSETCASESVIEW<set_name> Table (continued)

Column Name	Type	Description
<var_name>		The value of <i>var_name</i> for each case in the data file. If value labels exist for the variable, the label instead of the value is used. The column types and sizes are based on the value of the Type column in the Variables table.

Extensions Table

The Extensions table stores any extensions associated with the data file. Except for data file comments (created with the DOCUMENT command), extensions are typically reserved for internal features of IBM SPSS Statistics.

Table 15. Extensions Table

Column Name	Type	Description
Number	SMALLINT	A sequence number identifying each extension.
Content	VARCHAR(*)	The content of the extension. The size depends on the maximum content size of all extensions.

TrendsInfo Table

The TrendsInfo defines the Trends date variables in the data set.

Table 16. TrendsInfo Table

Column Name	Type	Description
Position	SMALLINT	A sequence number identifying each Trends date variable.
Name	VARCHAR(*)	The name of the Trends date variable. The size depends on the maximum length of all Trends date variable names in the data set.
Type	SMALLINT	An integer indicating the type of Trends date variable. 0 - None 1 - Cycle 2 - Year 3 - Quarter 4 - Month 5 - Week 6 - Day 7 - Hour 8 - Minute 9 - Second 10 - Observation 11 - Date
Period	INTEGER	The periodicity of the Trends date variable. This value depends on Type. If Type is 6 (week), a value of 2 equals 2 weeks.

SQL DDL Script

Following is the SQL Data Definition Language (DDL) script for creating the IBM SPSS Statistics data file.

```
CREATE TABLE Properties (
  Encoding VARCHAR NOT NULL
);
CREATE TABLE Variables (
  VarName VARCHAR NOT NULL,
  Label VARCHAR,
  IsWeightVar BIT ( 1 ) NOT NULL,
  Format SMALLINT NOT NULL,
  Width INTEGER NOT NULL,
  Decimals INTEGER NOT NULL,
  WriteFormat SMALLINT NOT NULL,
  WriteWidth SMALLINT NOT NULL,
  WriteDecimals SMALLINT NOT NULL,
  Alignment SMALLINT NOT NULL,
  MeasLevel SMALLINT,
  MvCode SMALLINT,
  Role SMALLINT,
  NMissingValue1 DOUBLE PRECISION,
  NMissingValue2 DOUBLE PRECISION,
  NMissingValue3 DOUBLE PRECISION,
  SMissingValue1 VARCHAR ( 8 ),
  SMissingValue2 VARCHAR ( 8 ),
  SMissingValue3 VARCHAR ( 8 ),
  DMissingValue1 DATE,
  DMissingValue2 DATE,
  DMissingValue3 DATE NOT NULL,
  Position INTEGER,
  Type INTEGER,
  ValueLabelTableName VARCHAR,
  CONSTRAINT TC_MeasLevel CHECK (MeasLevel >= 0 && MeasLevel <= 5),
  CONSTRAINT TC_MvCode CHECK (MvCode == -3 || MvCode == -2 || MvCode == 0 || MvCode == 1 ||
  MvCode == 2 || MvCode == 3 ),
  CONSTRAINT TC_Type CHECK (Type >= 0 && Type <= 32767),
  CONSTRAINT TC_Alignment CHECK (Alignment >= 0 && Alignment <= 2)
);
CREATE TABLE VLVAR<var_name>* (
  <var_name> VARCHAR NOT NULL,
  <var_name>_label VARCHAR NOT NULL
);
CREATE TABLE Attributes (
  AttributeName VARCHAR NOT NULL,
  AttributeTableId INTEGER NOT NULL
);
CREATE TABLE VarAttributes (
  VarName VARCHAR NOT NULL,
  AttributeName VARCHAR NOT NULL,
  AttributeTableId INTEGER NOT NULL
);
CREATE TABLE AttributeValues (
  AttributeTableId INTEGER NOT NULL,
  Number SMALLINT NOT NULL,
  Value VARCHAR ( 128 ) NOT NULL,
  CONSTRAINT PK_Id_Number PRIMARY KEY (AttributeTableId, Number)
);
CREATE TABLE MrSets (
  Name VARCHAR NOT NULL,
  Label VARCHAR NOT NULL,
  Type SMALLINT NOT NULL,
  TableId INTEGER NOT NULL,
  NConstant DOUBLE PRECISION NOT NULL,
  Sconstant VARCHAR ( 128 ) NOT NULL
);
CREATE TABLE MrSetVariables (
  TableId SMALLINT NOT NULL,
  VarName VARCHAR NOT NULL
);
CREATE TABLE Cases (
  RECORD_NUM INTEGER NOT NULL,
  <var_name> VARCHAR NOT NULL
);
CREATE TABLE CasesView (
  RECORD_NUM INTEGER NOT NULL,
  <var_name> VARCHAR NOT NULL
);
CREATE TABLE CasesElapsedTimeView (
  RECORD_NUM INTEGER NOT NULL,
  <var_name> VARCHAR(32) NOT NULL
);
CREATE TABLE VarSets (
  Name VARCHAR NOT NULL,
  Label VARCHAR,
  TableName VARCHAR NOT NULL,
  ViewTableName VARCHAR NOT NULL
);
CREATE TABLE VARSETCASES<set_name>* (
  RECORD_NUM INTEGER NOT NULL,
  <var_name> VARCHAR NOT NULL
);
CREATE TABLE VARSETCASESVIEW<set_name>* (
  RECORD_NUM INTEGER NOT NULL,
  <var_name> VARCHAR NOT NULL
);
CREATE TABLE Extensions (
  Number SMALLINT NOT NULL,
  Content VARCHAR NOT NULL
);
CREATE TABLE TrendsInfo (
  Position SMALLINT NOT NULL,
  Name VARCHAR NOT NULL,
  Type SMALLINT NOT NULL,
```

```
Period INTEGER NOT NULL  
);
```

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