MERANT™

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# DataDirect®
# Connect ODBC™

## Reference Supplement

**DB2 UDB**

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# Table of Contents

# 1 Connect ODBC for DB2 UDB

Connect ODBC for DB2 UDB (the "DB2 driver") supports the following database systems in the Windows 9*x*, Windows NT, Solaris, HP-UX, and AIX environments:

- DB2 for Windows NT
- DB2 Common Server

See the README file shipped with your DataDirect product for the file name of the DB2 UDB driver.

## System Requirements

The server requirement for all platforms is the same: The DB2 Server must be installed as the Server Version (*not* the Local Version).

To access the DB2 family of databases, you must have one of the following software packages for Windows or UNIX.

###  Windows 9*x* and Windows NT

- IBM DB2 Client Application Enabler (CAE) for Windows 9*x* and Windows NT, version 2.1 or higher
- IBM DB2 Software Development Kit (SDK) for Windows 9*x* and Windows NT, version 2.1 or higher

## UNIX

**AIX**

- IBM DB2 Client Application Enabler (CAE) for AIX, version 5.0 or higher
- IBM DB2 Software Development Kit (DB2 SDK) for AIX, version 5.0 or higher

**HP-UX**

- IBM DB2 Client Application Enabler (CAE) for HP-UX, version 2.12 or higher
- IBM DB2 Software Development Kit (DB2 SDK) for HP-UX, version 2.12 or higher

**Solaris**

- IBM DB2 Client Application Enabler (CAE) for Solaris, version 2.12 or higher
- IBM DB2 Software Development Kit (DB2 SDK) for Solaris, version 2.12 or higher

# Configuring Data Sources

Under Windows, data sources are configured and modified through the ODBC Administrator.

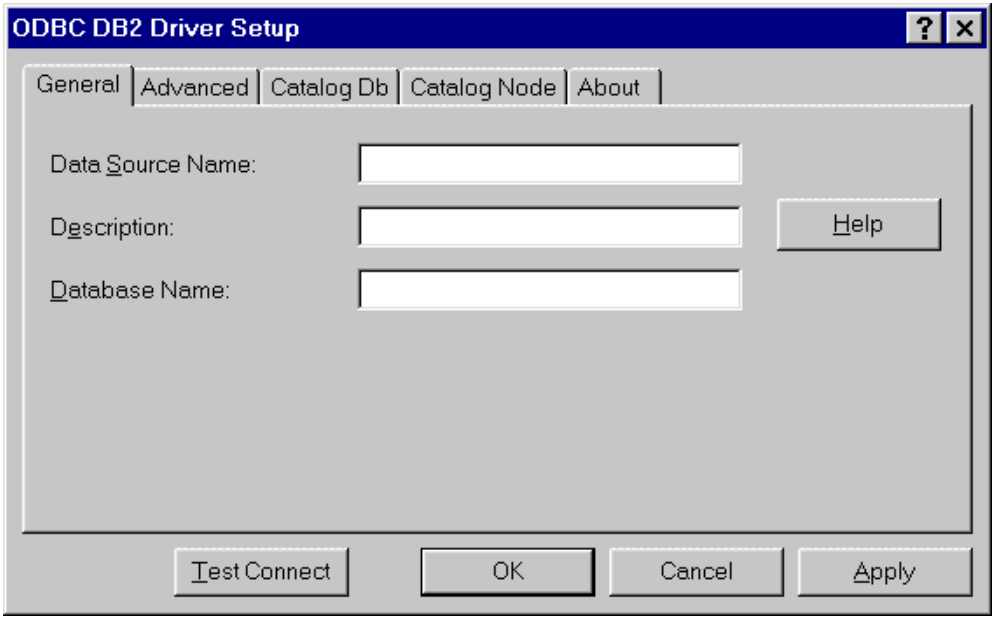
In the UNIX environment, there is no ODBC Administrator. To configure a data source in the UNIX environment, you must edit the system information file using the attributes in Table 1-1. You must also edit this file to perform a translation. See Appendix H of the Connect ODBC Reference for information about editing the file.

To configure a DB2 data source:

1 Start the ODBC Administrator to display a list of data sources.

2 If you are configuring an existing data source, select the data source name and click **Configure** to display the ODBC DB2 Driver Setup dialog box.

If you are configuring a new data source, click **Add** to display a list of installed drivers. Select the DB2 driver and click **Finish** to display the ODBC DB2 Driver Setup dialog box.




3 At any point during the configuration process, you can click **Test Connect** to attempt to connect to the data source using the connection properties specified in the Driver Setup dialog box. A logon dialog box is displayed; see "Connecting to a Data Source Using a Logon Dialog Box" on page 15 for details.

- If the driver can connect, it releases the connection and displays a "connection established" message. Click **OK**.

- If the driver cannot connect because of an improper environment or incorrect connection value, it will display an appropriate error message.

  Verify that all required client software is properly installed. If it is not, you will see the message:

  ```
  Specified driver could not be loaded due to system error [xxx].
  ```

  Click **OK**.

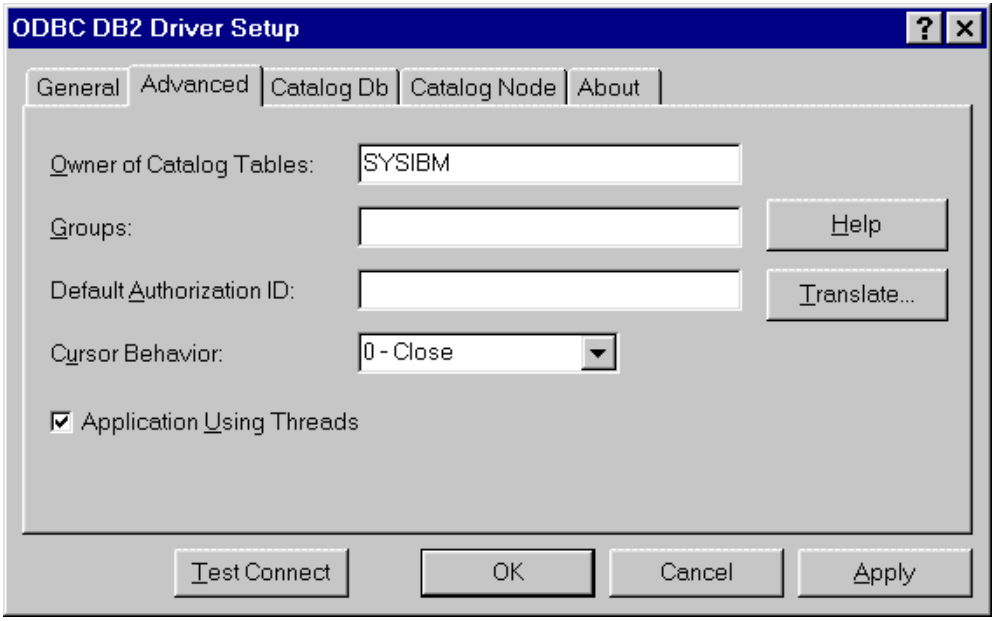
4 Specify values for the following; then, click **Apply**:

**Data Source Name**: A string that identifies this DB2 data source configuration in the system information. Examples include "Accounting" or "DB2-Serv1."

**Description**: An optional long description of a data source name. For example, "My Accounting Database" or "DB2 on Server #1."

**Database Name**: The name of the database to which you want to connect by default.

5 Click the **Advanced** tab to configure additional, optional settings for the data source.




6 Specify values for the following; then, click **Apply**.

**Owner of Catalog Tables**: On most DB2 systems, SYSIBM is the owner of the catalog system tables. If you have read access to the system tables, you do not need to change this option.

If you do not have read access, the system administrator must create a view of the system tables in another account and give you permission to use that view. In this case, specify the Authorization ID for the account that owns the views of the system tables.

**Groups**: A value to determine which tables you can access. Your system administrator may have placed you in a "group" of users and granted table access to the entire group. If this is the case, specify the names of any groups to which you belong; separate each name with a comma. Alternatively,

specify the word ALL so that you see all table names even if you cannot access the table.

**Default Authorization ID**: The default Logon ID used to connect to your DB2 database. A Logon ID is required only if security is enabled on your database. Your ODBC application may override this value or you may change this value in the logon dialog box.

**Cursor Behavior**: Select Preserve if you want cursors to be held at the current position when the transaction ends. Otherwise, leave this set to Close. Selecting Preserve may impact the performance of your database operations. This setting does not apply to SQL/DS.

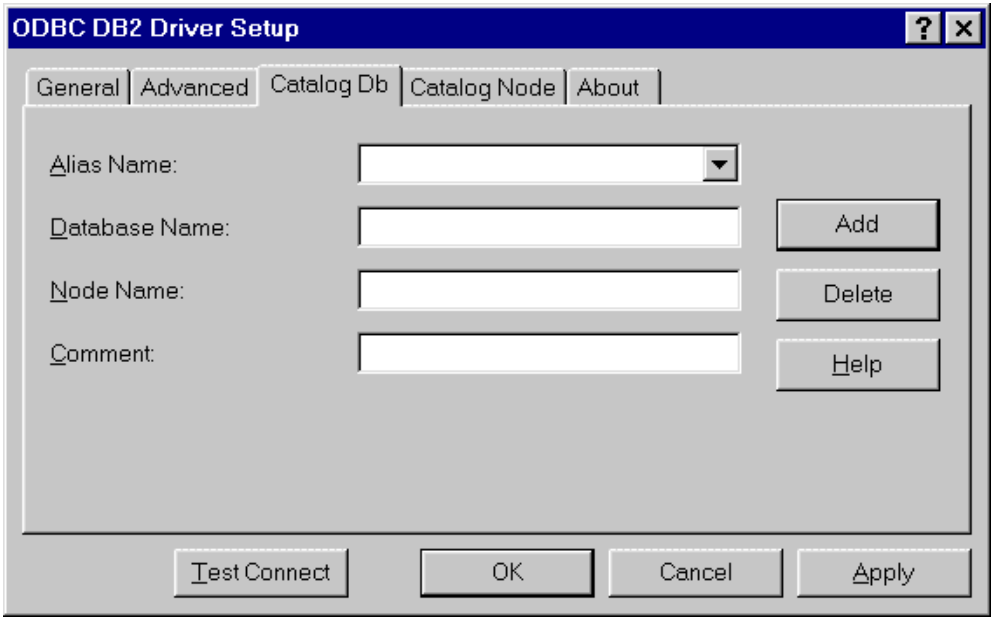
When you select Preserve, the driver returns SQL_CB_PRESERVE from SQLGetInfo (SQL_CURSOR_COMMIT_BEHAVIOR). But only Select statements and prepared Update or Delete…Where Current of Cursor statements are preserved when the transaction ends. All other prepared statements are closed and deleted.

**Application Using Threads**: A setting that ensures that the driver works with multi-threaded applications. You can clear this check box when using the driver with single-threaded applications. Turning off this setting avoids additional processing required for ODBC thread safety standards.

**Translate:** Click **Translate** to display the Select Translator dialog box, which lists the translators specified in the ODBC Translators section of the system information. DataDirect provides a translator named "OEM to ANSI" that translates your data from the IBM PC character set to the ANSI character set.

Select a translator; then, click **OK** to close this dialog box and perform the translation.

7 You must catalog any remote database that you want to access. To do so, click the **Catalog Db** tab.




8 Specify values for the following; then, click **Apply**.

**Alias Name**: Enter an alias name for the remote database.

**Database Name**: Enter the name of the remote database.

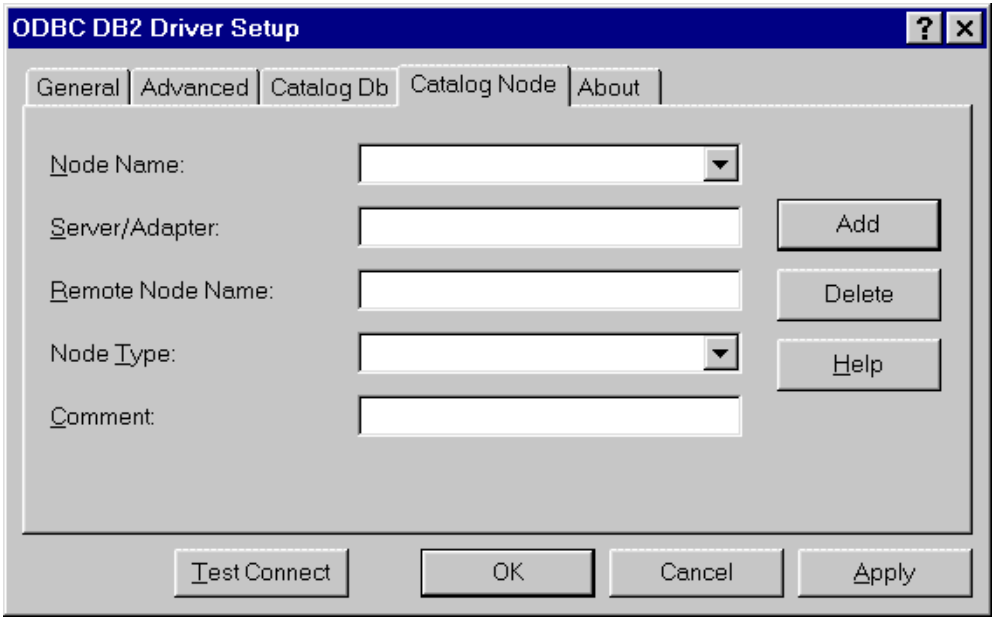
**Node Name**: Enter a name as an alias for the node. The node name could describe the remote node name and the communication protocol used to access it.

**Comment**: At your option, you can enter a comment.

**Add**: Click **Add** to catalog the entry and add the alias name to the Database Name drop-down list on the Logon dialog box.

**Delete**: Select the alias you want to delete from the Alias Name drop-down list and click **Delete** to uncatalog the entry.

9 To provide information about the remote site for the DB2 databases, click the **Catalog Node** tab.




10 Specify values for the following; then, click **Apply**.

**Node Name**: Select a node name. Only names of previously cataloged nodes are available.

**Server/Adapter**: Enter the name of the server or the number of the adapter (for NetBIOS nodes).

**Remote Node Name**: Enter the name of the remote node (the node where the server is installed).

**Node Type**: Enter the type of communication protocol to use to access the node (IPX/SPX, NetBIOS, or TCP/IP).

**Comment**: At your option, you can enter a comment.

**Add**: Click **Add** to catalog the entry.

**Delete**: Select the node you want to delete from the Node Name drop-down list and click **Delete** to uncatalog the entry.

11 Click **OK** or **Cancel**. If you click **OK**, the values you have specified become the defaults when you connect to the data source. You can change these defaults by using this procedure to reconfigure your data source. You can override these defaults by connecting to the data source using a connection string with alternate values.

# DB2 Binding and Privileges

Access to DB2 requires that you bind and grant privileges to the DataDirect bind files, a process described in this section.

Enter the DB2 command line processor by typing `db2` from a shell prompt. For example, from Windows NT, type:

```
c:\> db2
```

**Note**: The DB2 command processor prompt is `db2=>`.

Once inside the DB2 command line processor, the first step is to connect your DB2 database using the following syntax:

```
db2=> CONNECT TO <database_name> USER <userid> USING <password>
```

## Binding

The next step is to bind the DataDirect SQL files to the database. You may choose to use special options on the BIND command, based on your installation. Consult the manual "Command Reference" in the DB2 manual set for a detailed list of BIND options. To bind the files, enter the commands listed in the following two sections. To exit the DB2 command processor, enter the verb `quit`.

## *Windows 9x and Windows NT*

```
db2=> BIND QECSV1.BND blocking all grant public
db2=> BIND QERRV1.BND blocking all grant public
db2=> BIND QEURV1.BND blocking all grant public
db2=> BIND QECSWHV1.BND blocking all grant public
db2=> BIND QERRWHV1.BND blocking all grant public
db2=> BIND QEURWHV1.BND blocking all grant public
```

## *UNIX*

### AIX

```
db2=> BIND iscsax.bnd blocking all grant public
db2=> BIND isrrax.bnd blocking all grant public
db2=> BIND isurax.bnd blocking all grant public
db2=> BIND iscswhax.bnd blocking all grant public
db2=> BIND isrrwhax.bnd blocking all grant public
db2=> BIND isurwhax.bnd blocking all grant public
```

### HP-UX

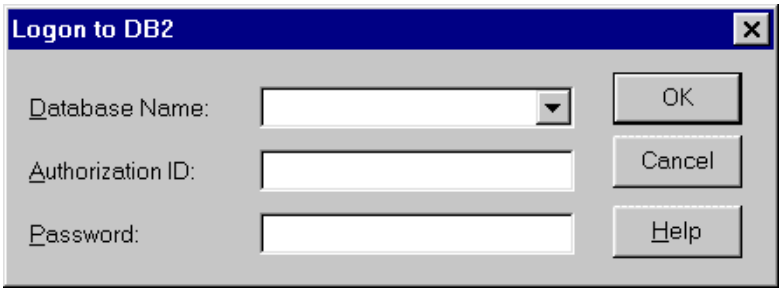
```
db2=> BIND iscshp.bnd blocking all grant public
db2=> BIND isrrhp.bnd blocking all grant public
db2=> BIND isurhp.bnd blocking all grant public
db2=> BIND iscswhhp.bnd blocking all grant public
db2=> BIND isrrwhhp.bnd blocking all grant public
db2=> BIND isurwhhp.bnd blocking all grant public
```

### Solaris

```
db2=> BIND iscsso.bnd blocking all grant public
db2=> BIND isrrso.bnd blocking all grant public
db2=> BIND isurso.bnd blocking all grant public
db2=> BIND iscswhso.bnd blocking all grant public
db2=> BIND isrrwhso.bnd blocking all grant public
db2=> BIND isurwhso.bnd blocking all grant public
```

# Connecting to a Data Source Using a Logon Dialog Box

Some ODBC applications display a logon dialog box when you are connecting to a data source. In these cases, the data source name has already been specified. For DB2, the dialog box is as follows:




In this dialog box, do the following:

1. Type the name of the remote database or select the name of the remote database from the Database Name drop-down list box.

   You must have cataloged any database you want to access from the client. (See the section "Configuring Data Sources" on page 6 for information on how to do this.)

2. If required, type your user name (authorization ID).
3. If required, type your password.
4. Click **OK** to complete the logon and to update the values in the system information.

# Connecting to a Data Source Using a Connection String

If your application requires a connection string to connect to a data source, you must specify the data source name that tells the driver which section in the system information to use for the default connection information. Optionally, you may specify *attribute=value* pairs in the connection string to override the default values stored in the system information. These values are not written to the system information.

You can specify either long or short names in the connection string. The connection string has the form:

```
DSN=data_source_name[;attribute=value[;attribute=value]...]
```

An example of a connection string for DB2 is:

```
DSN=DB22 TABLES;DB=PAYROLL;UID=JOHN;PWD=XYZZY;GRP=ACCTNG
```

Table 1-1 gives the long and short names for each attribute, as well as a description.


To configure a data source in the UNIX environment, you must edit the system information file. This file accepts only long names for attributes. See Appendix H of the Connect ODBC Reference for information about editing the file.

The defaults listed in the table are initial defaults that apply when no value is specified in either the connection string or in the data source definition in the system information. If you specified a value for the attribute when configuring the data source, that value is the default.

*Table 1-1. DB2 Connection String Attributes*

| Attribute | Description |
|---|---|
| ApplicationUsing Threads (AUT) | ApplicationUsingThreads={0 \| 1}. Ensures that the driver works with multi-threaded applications. The default is 1, which makes the driver thread-safe. When using the driver with single-threaded applications, you may set this option to 0 to avoid additional processing required for ODBC thread safety standards. |
| CursorBehavior (CB) | CursorBehavior={0 \| 1}. Determines whether cursors are preserved or closed at the end of each transaction. The initial default is 0 (close). Set this attribute to 1 if you want cursors to be held at the current position when the transaction ends. Doing so may impact the performance of your database operations.<br>This attribute is not valid for SQL/DS.<br>When CursorBehavior=1, the driver returns SQL_CB_PRESERVE from SQLGetInfo (SQL_CURSOR_COMMIT_BEHAVIOR). But only Select statements and prepared Update or Delete…Where Current of Cursor statements are preserved when the transaction ends. All other prepared statements are closed and deleted. |
| Database (DB) | The name of the database to which you want to connect. |
| DataSourceName (DSN) | A string that identifies a DB2 data source configuration in the system information. Examples include "Accounting" or "DB2-Serv1." |
| Groups (GRP) | A value that determines which tables you can access. Your system administrator may have placed you in a "group" of users and granted table access to the entire group. If this is the case, set Groups to the names of any groups to which you belong; separate each name with a comma. Alternatively, Groups=ALL lets your application see all table names even if you cannot access the table. |

*Table 1-1. DB2 Connection String Attributes (cont.)*

| Attribute | Description |
|---|---|
| LogonID (UID) | The default logon ID used to connect to your DB2 database. A logon ID is required only if security is enabled on your database. If so, contact your system administrator to get your logon ID.<br>For DB2 Common Server on UNIX, normal UNIX security is used. The LogonID value is your UNIX user ID. |
| Password (PWD) | Password. |
| Sysibm (SI) | On most DB2 systems, SYSIBM is the owner of the catalog system tables. If you have read access to the system tables, you do not need to change this option.<br>If you do not have read access, the database administrator must create a view of the system tables in another account and give you permission to use that view. In this case, specify the Authorization ID for the account that owns the views of the system tables. |

# Data Types

Table 1-2 shows how the DB2 data types map to the standard ODBC data types.

*Table 1-2. DB2 Data Types*

| DB2 | ODBC |
|---|---|
| Char | SQL_CHAR |
| Char() for Bit Data | SQL_BINARY |
| Date | SQL_TYPE_DATE |
| Decimal | SQL_DECIMAL |
| Float | SQL_DOUBLE |
| Integer | SQL_INTEGER |
| Long Varchar | SQL_LONGVARCHAR |
| Long Varchar for Bit Data | SQL_LONGVARBINARY |
| Smallint | SQL_SMALLINT |
| Time | SQL_TYPE_TIME |
| Timestamp | SQL_TYPE_TIMESTAMP |
| Varchar | SQL_VARCHAR |
| Varchar() for Bit Data | SQL_VARBINARY |

**Note**: The Graphic, Vargraphic, and Long Vargraphic data types are not supported.

# Isolation and Lock Levels Supported

DB2 supports isolation levels 0 (read uncommitted), 1 (read committed), and 2 (repeatable read). It supports record-level locking.

# ODBC Conformance Level

See Appendix C of the Connect ODBC Reference for a list of the API functions supported by the DB2 driver. In addition, the following X/Open functions are supported:

- SQLProcedures
- SQLProcedureColumns

The driver supports the minimum SQL grammar.

# Number of Connections and Statements Supported

The DB2 database system supports a single connection and multiple statements per connection.