BusinessObjects Enterprise XI
Release 2

Configuring Database Connections

Document Background

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Introduction
This white paper discusses how to create database connections in BusinessObjects Enterprise XI Release 2.

CMS Database Connection
Depending on the operating system, the Central Management Server (CMS) data sources are limited to IBM DB2, Oracle, Sybase, Microsoft SQL Server, and MySQL. NOTE: On UNIX, it is not possible to use SQL server as the data source for the CMS database). Please make sure that you are using the correct version of database client when you trying to connect to the database server.

Windows platform

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<th>SP1</th>
<th>SP2</th>
<th>SP3</th>
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<tr>
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Linux/Solaris/AIX/HP-UX Platform

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<td>-</td>
<td>-</td>
<td>Sybase Open Client 12.5.2</td>
</tr>
</tbody>
</table>

DB2 as the CMS data source

The CMS requires the DB2 client to connect to the DB2 database. After installing the DB2 client on the CMS server, you need do some basic configuration before you can set DB2 as your CMS data source.

Windows

You can use the Configuration Assistant DB2 client tool to configure the DB2 database that you are trying to connect to; or you can use the DB2 command line to catalog the database, which is described in the UNIX section.

1. If it is your first time using the Configuration Assistant, you will see this message:
   “Welcome to the DB2 configuration Assistant. Would you like to add a database now?”

2. Click Yes, click Search the network, and then click Next (see Graphic 1).
3. Expand Other systems (search network) and its subfolders until you locate the DB2 database name that you want to use as the CMS database, select it, and click the Next button. You may choose to give the database name an alias, if desired.

4. You can give the database a new alias name or just keep the original database name as the alias name, then click the Next button.
5. You can also create a DSN for the ODBC connection.

6. Click the **Finish** button. The following window appears:

7. To specify the new data source for the CMS, go to CCM > CMS > Properties > Configuration tab > Specify button > select a data source > OK > DB2 native driver.
8. Use the DB2 alias name as the server name, and specify the user name and password to connect to, and then click **OK**.

9. The DB2 user you used to connect to CMS database must have at least the following three privileges: connect to database, create tables, and create packages.
10. You may get an error message such as “failed to retrieve cluster name from the database” because the CMS database is not initialized yet. In this case, go back to the Central Configuration Manager, and start the CMS server to initialize the CMS database.

**UNIX**

1. On UNIX, the DB2 client setup is usually done by running the script DB2profile under the sqllib directory. This script will set the environment variables for the DB2 client to run.

2. Next, execute the DB2 command.

3. To make the database connection to DB2, catalog the remote database locally as follows:
   
   DB2 => CATALOG TCPIP NODE Mynode REMOTE server1 SERVER 50000

4. To check that the TCPIP node that has already been cataloged, use this command:
   
   DB2 => list node directory

   - “Mynode” is the name to identify the remote node that is running DB2
   - “Server1” is the IP address or the hostname of the DB2 server
   - 50000 is the default port number that the DB2 instance is using

5. Execute this command:
   
   DB2=> CATALOG DATABASE cmsdb AS mycmsdb AT NODE Mynode

   Where:
“cmsdb” is the name of the database that you plan to have as your CMS database. “mysmsdb” is the alias for the database and it is the name that you used to specify the DB2 server in cmsdbsetup.sh.

6. To list the databases that has already been cataloged, you can use this command:
   DB2 => list database directory

7. To test the database connectivity, use this command:
   DB2=> connect to mycmsdb user cmsdbuser using password

8. To list all the tables owned by user cmsdbuser, use this command:
   DB2=> list tables

**SQL Server as the CMS data source**

Using SQL server as the CMS data source is only supported on Windows and using ODBC connections.

**Sybase as the CMS data source**

Create a Sybase CMS database

There are several requirements for using Sybase as the CMS database:

- The logical page size of the database server should be 8K or larger.
- The database character set must be Unicode
- A Sybase database user may have access to several databases on the same database server, but when specifying a Sybase database as the CMS database, we cannot specify which database we want to connect to. It will only use the default database of the Sybase database user as the CMS database.

Complete these steps to create a CMS database on a Sybase server:

1. Install Sybase 12.5 ASE Server with default settings.
2. Create a server with a logical page size larger than 2k:
   i. Click Start → Programs → Sybase → Server Config.
   ii. Click Create an Adaptive Server.
   iii. Name the Adaptive Server whatever you wish and click Continue.
   iv. Choose an “8k” Server page size and then click Continue.
   v. Choose a path for the master database data file and leave the default setting for the “Master Device Size”.
   vi. Choose a path for the System Procedures data file, leave the default setting for the “System Procedures Device Size”, and then click Continue.
   vii. Choose an error log path and then click Continue.
3. Change the Sybase server character set to be Unicode (UTF-8):
   i. Start → Programs → Sybase → Server Config→ Configure Adaptive Server.
   ii. Select the server created in step 2 and then click Continue.
   iii. Log on as a system administrator using the default sa credentials: username: sa, password: (blank)
   ii. Click Language.
   iii. Under Character Set choose Add / Remove.
   iv. Select Unicode 3.1 UTF-8 Character Set and click OK.
   v. Click Set Default then select Unicode 3.1 UTF-8 Character Set then press OK. The current defaults for character set are now set to utf8.
   vi. Click OK to commit the changes and click the Save button to update your Sybase server.

   ![Language Options dialog box](image)

4. Grant “Select Into / Alter Table” privileges to a new user for a new CMS database:
   i. Start → Programs → Sybase → Sybase Central Java Edition
   ii. Tools → Connect
   iii. Connect to the Sybase server in step 2 that will house your CMS database using your “sa” login for that server.
   iv. Open the server in the left hand pane and click the Databases folder for your Sybase server.
   v. In the right-hand pane click Add Database.
   vi. Name the database that will house your CMS. Use all the default settings for creating a new database.
   vii. Open the server in the left hand pane and click the Logins folder for your Sybase server.
   viii. In the right-hand pane click Add Login.
   ix. Provide a logon name, set an initial password, and then click Next.
   x. For the “default database for the login”, select your newly created CMS database from step 4(vi), and then click Next.
   xi. Give this new user access to your newly created CMS database by clicking the checkmarks beside the database.
   xii. Click Next then click Finish.
   xiii. Right-click the newly created CMS database and choose Properties.
   xiv. Click the Options tab and check select into/bulkcopy/pllsort.
xv. Click the Devices tab, select the master database, and then click Edit.
xvi. Under add space, add another 64 MB of storage to allow room for the CMS log files, and then click OK.

5. Grant appropriate privileges to the CMS db user:

i. Expand the newly created CMS database.

ii. Click Users. On the right panel you will see the db user added in step 4.

iii. Right-click the user name and select properties, and then go to the Commands tab.

iv. Select create table and create procedure privileges.
v. Using the Central Configuration Manager, stop the CMS server, and then on the Configuration tab, specify the CMS data source, and then select the Sybase native driver. The server name is the Sybase server’s name (the one you created in step 2), not the database name. BusinessObjects Enterprise will always use the specified db user’s default database to create CMS database. As a result, if you want point CMS to other database which is on the same Sybase server, you need to create another db user and set its default database to the new database.

Configuring Sybase connection

Windows

On Windows, use the DSEDIT utility to configure the Sybase client connection:

1. Go to Start > Programs > Sybase > Dsed Utility.
2. Select a directory service to open and then click OK.
3. Go to Sever Object > Add and then do the following:
   i. Provide a server name.
   ii. Double click Server Address to modify this entry.
   iii. Click the Add button and set the Protocol to TCP and the Network Address to SybaseServerHostname, portnumber:

   iv. Go to Server Object > Ping Server to test the connection. After you exit the dsedit utility, you will find new entry is added to the Sybase\ini\sql.ini file. Then you can use the CCM to setup CMS DB connection.

UNIX

On a UNIX system, after you installed Sybase client, usually you will find SYBASE.sh script under the Sybase client directory. After running this script, the SYBASE client environment variables will be correctly setup. The script will setup the following environment variables:
SYBASE This variable contains the path to the root directory of your Sybase client installation (one level above the SYBASE_OCS version directory).

SYBASE_OCS This variable contains the name of the Sybase version directory (one level above the Sybase bin and lib directories).

library path The library search path (LD_LIBRARY_PATH on Solaris and Linux, LIBPATH on AIX, and SHLIB_PATH on HPUX) must include the lib directory of your Sybase client installation.

PATH The search path must include the bin directory of your Sybase client installation.

Complete these steps:

1. You also need to modify the interfaces files under the $SYBASE directory. The interfaces file can also be modified using the $SYBASE_OCS/bin/dsedit command, and its GUI interface so you have to redirect your DISPLAY to Xwindows server. The interfaces file usually looks like this:

   myserver  
   master tcp ether SybaseHostname 5000  
   query tcp ether SybaseHostName 5000

2. After add you Sybase server to the interfaces file, you can use the isql to test the connections:

   $ isql -Smyserver -Uusername
   1> Sp_help
   2> Go

   It will list all objects available in the current database.

Oracle database as the CMS data source

To setup Oracle as the CMS database, complete these steps:

1. Create an Oracle user to connect to Oracle database. This db user needs at least three privileges: connect, create tables, and create packages.

2. On your BusinessObjects Enterprise server, create the TNS names for the Oracle client to connect to the Oracle instance where the CMS database is located.

   i. On windows, you can use the Program Files>Oracle>Configuration and Migration Tools>Net Configuration Assistant to create the TNS name.
      a. Click the Local Net Service Name configuration.
b. Add a new TNS name.

c. Provide the service name for the Oracle database.

d. Select the protocol used to connect, usually TCP
e. Give the Host name of the Oracle database server and the port number the instance is running on (default value is 1521).

f. Perform a connection test. **NOTE:** The default logon testing account is the system account, which is normally locked; therefore, you need to use the Change Login button to specify your own db account.
g. Provide a name for this net service name. The TNS name is successfully created.

You now see a new entry in the ...\NETWORK\ADMIN\tnsnames.ora file:

```
ARCH =
  (DESCRIPTION =
  (ADDRESS_LIST =
    (ADDRESS = (PROTOCOL = TCP)(HOST = vancsdb08.product.businessobjects.com)(PORT = 1521))
  )
  (CONNECT_DATA =
    (SERVICE_NAME = arch.product.businessobjects.com)
  )
)
```

You can also directly modify this file to add a TNS name. You can also use the environment variable TNS_ADMIN to specify the path that the tnsnames.ora and sqlnet.ora file are located.

On UNIX systems, after you installed Oracle client, usually you will find oraenv.sh script under the Oracle client directory. After running this script, the Oracle client environment variables will be correctly setup. The script will setup the following environment variables:
**ORACLE_HOME** This variable contains the path to the root directory of your Oracle client installation.

**Library path** The library search path (LD_LIBRARY_PATH on Solaris and Linux, LIBPATH on AIX, and SHLIB_PATH on HPUX) must include the lib directory of your Oracle client installation, make sure it’s point to lib32 directory.

**PATH** The search path must include the bin directory of your Oracle client installation.

After the environment variable is setup, you can verify the db connect using sqlplus:

1. `$sqlplus username@TnsName`
2. `$SQL> select table_name from user_tables;`
   
   This SQL command will list all tables owned by connected user account.
3. Use CCM (Windows) or cmsdbsetup.sh (UNIX) to specify the CMS database connections.

**MYSQL Database as the CMS Data Source**

MySQL 4.1.13 is shipped with BusinessObjects Enterprise as the default CMS database. CMS server will use the MySQL C-API to connect to the MySQL database server. Crystal, Web Intelligence, and Desktop Intelligence reports do not support this type of connection. If you also choose MySQL as the auditing database, you need to create the DSN for the MySQL database ODBC connection and change the universe connection to make the auditing sample reports work.

You can access the mysql database from the command line, on windows:

```
C:\>cd Program Files\Business Objects\MySQL\mysql-pro-4.1.13a-win32\bin
C:\>mysql -u UserName -p
```

```
mysql> show databases; ----List all the databases on the server
mysql> show grants;  ----Will show the current user’s privilege on the database
mysql> use DatabaseName;     ----Connect to the database
mysql> show tables;  ----List all the tables on the current database
```

On a UNIX system, you need to specify the socket file to connect to local MySQL database server:

```
$ mysql -S ../mysql.sock -u username -p
```

To connect to remote MySQL database syer:

```
$ mysql -h hostname -P PortNumber -u UserName -p
```

If the root password for the MySQL database is lost, you can refer this KB to restore the MySQL database password:

```
http://technicalsupport.businessobjects.com/KanisaSupportSite/search.do?cmd=displayKC&docType=kc&externalId=c2018927&ssliceId=&dialogId=8750546&stateId=1%200%208746980
```

**Report database connections**

This section discusses setting up database connections on UNIX.
Native connections

BusinessObjects Enterprise XI Release 2 only supports native connections to Oracle, Sybase, and DB2, which are already covered in the previous sections.

ODBC connection

Environment variables

The environment variables related to ODBC reporting include:

- The library path that corresponds to your operating system (LD_LIBRARY_PATH on Sun Solaris and Linux, LIBPATH on IBM AIX, and so on)
- ODBC_HOME
- ODBCINI

The Business Objects Enterprise installation includes a file called env.sh that is sourced automatically each time you start the Business Objects Enterprise servers with the CCM. Thus, the environment for the Job Server and Page Server is set up automatically for the following:

- The INSTALL_ROOT/bobje/enterprise115/linux_x86/odbc/lib directory of your installation is added to the library path environment variable.
- The ODBC_HOME environment variable is set to the INSTALL_ROOT/bobje/enterprise115/<OS>/odbc directory of your installation.
- The ODBCINI environment variable is defined as the path to the odbc.ini file that was created by the BusinessObjects Enterprise installation under the <InstallRoot>/bobje directory.

Modify the environment variables in the env.csh script only if you have customized your configuration of ODBC. The main ODBC configuration file that you need to modify is the system information file.

ODBC system information file

The system information file (.odbc.ini) is created in the HOME directory of the user account under which you installed BusinessObjects Enterprise (typically the crystal user account). In this file, you define each of the ODBC data sources (DSNs) that the Job Server and Page Server need in order to process your reports. The BusinessObjects Enterprise installation completes most of the required information—such as the location of the ODBC directory and the name and location of each installed ODBC driver—and shows where you need to provide additional information.

On UNIX systems, BusinessObjects Enterprise XI installed the DataDirect ODBC driver for MS SQL Server and Sybase database by default. If you need ODBC driver for other database, you can download the DataDirect ODBC driver from

http://www.businessobjects.com/products/downloadcenter/crystalreportsxi.asp#51
The DataDirect ODBC Drivers provided by BusinessObjects Enterprise are supported with Crystal Reports only. This ODBC driver cannot be used for Web Intelligence or Desktop Intelligence reports. The following is the default odbc.ini file after the BusinessObjects Enterprise installation.

[ODBC Data Sources]
CRSQLServerWP=DataDirect 5.1 SQLServer Wire Protocol Driver
CRSybaseWP=DataDirect 5.1 Sybase Wire Protocol Driver
CRText=DataDirect 5.1 Text Driver

[CRSQLServerWP]
Driver=/export/home/boxi/bobje/enterprise115/solaris_sparc/odbc/lib/CRmss21.so
Description=DataDirect 5.1 SQLServer Wire Protocol Driver
Address=
Database=
QuotedId=Yes
AnsiNPW=No
LogonID=
Password=

[CRSybaseWP]
Driver=/export/home/boxi/bobje/enterprise115/solaris_sparc/odbc/lib/CRase21.so
Description=DataDirect 5.1 Sybase Wire Protocol Driver
NetworkAddress=
Database=
LogonID=
Password=

[CRText]
Driver=/export/home/boxi/bobje/enterprise115/solaris_sparc/odbc/lib/CRtxt21.so
Description=DataDirect 5.1 Text Driver
Database=

[ODBC]
IANAAppCodePage=4
InstallDir=/export/home/boxi/bobje/enterprise115/solaris_sparc/odbc
Trace=0
TraceFile=odbctrace.out
TraceDll=/export/home/boxi/bobje/enterprise115/solaris_sparc/odbc/lib/odbctrac.so
The first section [ODBC Data Sources] of this file will list all the data source names with their descriptions. The last section [ODBC] is important too. There must be an [ODBC] section in the system information file that includes the InstallDir keyword. The value of this keyword must be the path to the installation directory under which the /lib and /messages directories are contained. The installation process automatically writes your installation directory to the default odbc.ini. The odbc.ini file must contain these two sections. If you don’t have the [ODBC] section, you may have some weird issues. For example, on Solaris system, the ODBC connection to SQL server may still work, but when you use the custom database login for the report, you will get the database vendor code -208 error.

DataDirect Wire Protocol ODBC Driver doesn’t need the database client to be installed. The following is an example of odbc.ini that connects to different databases using DataDirect Wire Protocol ODBC driver.

[ODBC Data Sources]
mySybase=DataDirect 5.1 Sybase Wire Protocol Driver
myOracle=DataDirect 5.1 Oracle Wire Protocol Driver
myOracle8i=DataDirect 5.1 Oracle Wire Protocol Driver
myDB2=DataDirect 5.1 DB2 Wire Protocol ODBC Driver
myInformix=DataDirect 5.1 informix Wire Protocol ODBC Driver
sqlserverodbc=DataDirect 5.1 SQLServer Wire Protocol Driver

[mySybase]
Driver=/bo/xir2/bobje/enterprise115/linux_x86/odbc/lib/CRase21.so
Description=DataDirect 5.1 Sybase Wire Protocol Driver
NetworkAddress=HostName, PortNumber
Database=
LogonID=
Password=

[myOracle]
Driver=/bo/xir2/bobje/enterprise115/linux_x86/odbc/lib/CRora21.so
Description=DataDirect 5.1 Oracle Wire Protocol Driver
HostName=
ServiceName=
PortNumber=1521
LogonID=
Password=

[myOracle8i]
Driver=/bo/xir2/bobje/enterprise115/linux_x86/odbc/lib/CRora21.so
Description=DataDirect 5.1 Oracle Wire Protocol Driver
HostName=
sid=
LogonID=
Password=

[myDB2]
Driver=/bo/xir2/bobje/enterprise115/linux_x86/odbc/lib/CRDB221.so
Description=DataDirect 5.1 DB2 Wire Protocol ODBC Driver
IpAddress=
Database=
TcpPort=
LogonID=
Password=

[myinformix]
Driver=/bo/xir2/bobje/enterprise115/linux_x86/odbc/lib/CRifcl21.so
Description=DataDirect 5.1 informix Wire Protocol ODBC Driver
HostName=
Database=
PortNumber=
LogonID=
Password=

[sqlserverodbc]
Driver=/bo/xir2/bobje/enterprise115/linux_x86/odbc/lib/CRmsss21.so
Description=DataDirect 5.1 SQLServer Wire Protocol Driver
Address=<HostName, PortNumber>
Database=
QuotedId=Yes
AnsiNPW=No
LogonID=
Password=

[ODBC]
IANAAppCodePage=4
InstallDir=/export/home/boxi/bobje/enterprise115/solaris_sparc/odbc
Trace=0
TraceFile=odbctrace.out
TraceDll=/export/home/boxi/bobje/enterprise115/solaris_sparc/odbc/lib/odbctrac.so

DataDirect also supports client-required ODBC connections which will use the database vendor’s own ODBC driver, such as Oracle, Informix, and Progress. To use the vendor’s ODBC drivers, you must make sure that the relative database environment variables have been correctly setup. For example, if you are connecting to Oracle, you must make sure you are able to connect it using the Oracle client native connection. If you are connecting to Infomix, you need to configure the following:

1. Setup the environment variables: INFORMIXDIR, which is pointing to the installation directory of your Informix ODBC driver
2. LD_LIBRARY_PATH=$LD_LIBRARY_PATH:$INFORMIXDIR/lib:$INFORMIXDIR/lib/esql
3. Configure the /etc/services file, you need to add the Informix server to this file with entry like this:
4. <Hostname> <portnumber>/tcp
5. Configure the $INFORMIXDIR/etc/sqlhosts file, you need to add entry like this:
6. <ServerName> olsoc tcp <hostname> <portnumber>

[ODBC Data Sources]
Oracleclient=DataDirect 5.1 Oracle Database Driver
informixclient=DataDirect 5.1 informix ODBC Driver

[Oracleclient]
Driver=/bo/xir2/bobje/enterprise115/linux_x86/odbc/lib/CRor821.so
Description=DataDirect 5.1 Oracle Driver
DataSourceName=Oracleclient
ServerName=<TNS name for the Oracle connection>
ClientVersion=10gR1
LogonID=
Password=

[informixclient]
Driver=$INFOMIXDIR/lib/cli/iclis09b.so
Description=Informix ODBC driver
HostName=
ServerName
Database=
LogonID=
Password=

If you are not using the DataDirect ODBC drivers, make sure the library path of installed ODBC driver has been add to the corresponding environment variables. Because the DataDirect ODBC Driver library path is set to the environment variable by env.sh, sometimes it will cause some problems when you try to use a particular database ODBC driver. For example, if you are connecting Teradata database using its own ODBC driver, you may get the “Unicode converter buffer overflow” error because the DataDirect ODBC driver is loaded before Teradata ODBC driver. Please refer the following KB for solutions.

http://technicalsupport.businessobjects.com/KanisaSupportSite/search.do?cmd=displayKC&docType=kc&externalId=2712433&sliceId=&dialogID=19392229&stateId=1%200%2019388441

Here are some examples using non-DataDirect ODBC driver:

[ODBC Data Sources]
teradataodbc= NCR 3600 running Teradata V2R6.1
mysqlodbc=MySQL 3.5.1.12 ODBC driver

[teradataodbc]
Driver=/usr/odbc/drivers/tdata.so
Description=NCR 3600 running Teradata V2R6.1
DBCName=10.54.44.245
Username=
Password=
DefaultDatabase=
Characterset=UTF8

[mysqlodbc]
Driver=/path/to/myodbc/libmyodbc3_r.so
Description= MySQL 3.5.1.12 ODBC driver
Address=<your server name or ip>
Database=
LoginID=
Password=
Socket=/path/to/xir2/bobje/mysql/mysql.sock

Please also refer to the Data Access Guide for some specific database connection parameters.

**JDBC Connection**

**Server side configuration**

1. Configure the CRconfig.xml file that is found in the <installDir>/bobje/java/ folder. The JDBC driver is shipped with Enterprise; therefore, you are able to see the ClassPath is configured with 
   `${BOBJEDIR}/java/lib/external/ysql-connector-java-com-3.1.11-bin.jar`

2. To use it, you need to add the following to the <GenericJDBCDriver> section:
   ```xml
   <MySQL>
     <ServerType>MySQL</ServerType>
     <QuoteIdentifierOnOff>OFF</QuoteIdentifierOnOff>
     <DriverClassName>com.mysql.jdbc.Driver</DriverClassName>
     <StoredProcType>Standard</StoredProcType>
     <LogonStyle>MySQL</LogonStyle>
   </MySQL>
   ```

**Client side configuration**

1. Download the MySql JDBC driver.

2. Once you have extracted the distribution archive, you can install the driver by placing mysql-connector-java-[version]-bin.jar in your classpath, by adding the full path to it to your CLASSPATH environment variable.

3. Modify the CRConfig.xml file under directory c:\Program Files\Business Objects\common\3.5\java\CRConfig.xml

4. You need to add the path to the mysql-connector-java-[version]-bin.jar to the CLASSPATH in the <DataDriverCommon> section

5. You also need to add the same text as we added in your server side CRConfig.xml in the <GenericJDBCDriver> section

6. In Crystal Reports, create a JDBC connection like the following:
Usually the readme file of any JDBC driver will give you an example on connection URL and Database classname. List a few examples here:

**MS SQL Server**
Connection URL: jdbc:Microsoft:sqlserver://ServerName:Port#

Database Classname: com.microsoft.jdbc.sqlserver.SQLServerDriver

**Oracle**
Connection URL: jdbc:Oracle:thin:@<hostname>:<port>:<sid>

Database Classname: Oracle.jdbc.driver.OracleDriver

**DB2**
Connection URL: jdbc:DB2:database

Database Classname: COM.ibm.DB2.jdbc.app.DB2Driver

**Sybase**
Connection URL: jdbc:sybase:Tds:HOST_NAME:PORT_NUMBER/data source name

Database Classname: jdbc:sybase:

**NOTE:** JDBC is supported in Universes in BusinessObjects XI 3.0. The configuration file is located at:

<BusinessObjects Enterprise install dir>\win32_x86\dataAccess\connectionServer\jdbc\jdbc.sbo.

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