

USING DIRECT DATABASE DRIVERS

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OVERVIEW

S-PLUS now includes access to the following databases via direct database drivers:

- Microsoft SQL Server (Windows only)
- IBM DB2 (Windows, Solaris 32, Linux, Compaq Tru64, HP, AIX)
- Sybase (Windows, Solaris 32, HP, AIX)
- Oracle (Windows, Solaris 32, Linux, HP, AIX)

This functionality is in addition to ODBC access on Windows, and it replaces the RogueWave database interface on Solaris and other UNIX platforms in previous versions of S-PLUS.

You can use the `importData` and `exportData` commands to access the above databases using the new direct drivers.

Exporting to databases now allows existing tables to be either replaced or appended to.

In addition, in S-PLUS for Windows, you can use the **Import From Database** and **Export to Database** dialogs to access these databases as data sources, just like accessing ODBC data sources. The previous versions of S-PLUS had menu items such as **Import Data ► From ODBC Connection** and **Export Data ► To ODBC Connection**, and these have been replaced with **Import From Database** and **Export to Database**, respectively. The dialogs presented now allow you to select either ODBC or direct database sources from the same list.

Direct database access is accomplished by using driver components which must be separately installed on the system that is running S-PLUS. These driver components are provided by the database vendor and usually consist of components that can be called directly by S-PLUS to send and receive database information in the native format that the database supports. In many cases, direct database drivers provide faster connectivity and data transfer than ODBC because there are fewer layers of data translation and interpretation of the request than with ODBC.

S-PLUS COMMANDS FOR IMPORTING AND EXPORTING

Before you can use the `importData` or `exportData` commands to access database via the direct drivers, you must install database client software on your system. Please refer to the sections below on installing database clients for your system type.

There are four new database type keywords that can be used in the type parameter of the **`importData`** or **`exportData`** commands:

- `DIRECT-DB2`
- `DIRECT-ORACLE`
- `DIRECT-SQL`
- `DIRECT-SYBASE`

As an example, consider the following S-PLUS commands to send data to a Sybase database:

```
mydata <- data.frame(COL1=c(1.2,1.3,1.51,2.1,3.9),
  COL2=c("a", "b", "c", "d", "e"),
  COL3=timeDate(c("1/1/2003", "2/1/2003",
    "3/15/2005", "10/24/2003", "11/11/2004"),
    format="%02m/%02d/%Y %02H:%02M:%02S.%03N"))

exportData(mydata, type="DIRECT-SYBASE",
  user="testqa", password="testqa",
  server="qaimage.insightful.com", database="testdb",
  table="testDirectSybase", appendToTable=F)
```

In this example, the data frame `mydata` is exported to the table `testDirectSybase` into the database `testdb` on the server `qaimage.insightful.com`. The database client software validates the user and password parameter values prior to exporting the data, and if they are incorrect, an error is reported in S-PLUS. The server name you specify here should be the one you specified during installation of the Sybase client software. See Step 6 in the Windows Sybase client installation instructions below for further information on this.

Notice that the string `DIRECT-SYBASE` was used in the type parameter of the `exportData` command to specify connection to a Sybase database. Also note that the user name, password, server name, database and table name are specified. For each of the four databases

supported by direct drivers in S-PLUS, slightly different combinations of these parameters must be specified. See the table below for a list of the differences.

Table 1.1: Table of parameters required for various direct database types in `importData` and `exportData`.

| Database type | Required parameters for <code>importData</code> and <code>exportData</code> | Comments |
|---------------|---|--|
| DIRECT-DB2 | user, password, database, table | Server parameter should <i>not</i> be specified for DB2. |
| DIRECT-ORACLE | user, password, server, table | Database parameter should not be specified for Oracle. Server parameter should be the network service name you specified when installing the Oracle client software. See Step 5. in the section Oracle Client. |
| DIRECT-SQL | user, password, server, database, table | Server parameter should be the server name you specified in the SQL Server Enterprise Manager program. See Step 11. in the section SQL Server 2000 Client. |
| DIRECT-SYBASE | user, password, server, database, table | Server parameter should be the server name you specified in the Sybase installation. See Step 6. in the section Sybase Client. |

Notice the existence of the `appendToTable` parameter, which controls whether or not to append the data you are exporting to the specified table. If this parameter is false, the data overwrites the table specified; if true, the data is appended.

An error occurs if the data types of the data you are sending and those already present in the table do not match. For example, if you export strings to a table that currently has columns of numeric values, you receive an error and the export fails.

Here is an example of using the `importData` command to read data into S-PLUS from an Oracle database table via the direct drivers:

```
mynewdata <- importData(type="direct-oracle",
                        user="testqa", password="testqa",
                        server="ORACLE.TESTDB",
                        table="testDirectOracle")
```

In this example, the table `testDirectOracle` is used. Since no specific SQL query is specified (normally specified with the `sqlQuery` parameter), all data from the table is imported. The database client software validates the user and password parameter values prior to importing the data and if they are incorrect, an error is reported in S-PLUS. The server name you specify here should be the one you specified as the network service name during installation of the Oracle client software. See Step 5. in the section Oracle Client installation instructions below for further information on this.

For more information on using the `importData` and `exportData` commands as well as additional information on using the `sqlQuery` parameter in `importData`, please see the online help.

DIALOGS FOR IMPORTING AND EXPORTING

In S-PLUS for Windows, you can use the **Import From Database** and **Export to Database** dialogs to access databases as data sources, just like accessing ODBC data sources. The previous versions of S-PLUS had menu items such as **Import Data ► From ODBC Connection** and **Export Data ► To ODBC Connection**, and these have been replaced with **Import From Database** and **Export to Database**, respectively. The dialogs presented now allow you to select either ODBC or direct database sources from the same list.

Import From Database

You can use the S-PLUS **Import From Database** dialog to import table data from direct database sources available on your system. Only those sources for which you have installed database clients are supported. For more information on installing database client software, see the section *Installing and Configuring Database Clients on UNIX* and the section *Installing and Configuring Database Clients on Windows* later in this document.

S-PLUS lists all data sources it supports in the **Import From Database** dialog. However, only those sources which have database clients installed on your system work. The others report errors until you install and configure the appropriate database clients.

When you first run S-PLUS, four direct data sources are listed in the **Import From Database** dialog, one for each type supported on Windows:

- Direct DB2
- Direct Oracle
- Direct SQL Server
- Direct Sybase

You can modify these data sources to configure them for your particular database setup, such as setting the correct server, database, username, password, and other information appropriate for how the database is set up on your network.

You can also add new direct sources (based on one of the four types listed above) to the list of data sources. This allows you to have one or more data sources for the same database type, thus enabling you to specify different database names or usernames and passwords to access other sets of tables on the same database server.

You can also remove direct data sources from the **Data Source** list.

To import data from a direct database source:

1. From the **File** menu, select **Import Data ► From Database**.
2. The **Import From Database** dialog appears, as shown in Figure 1.1.

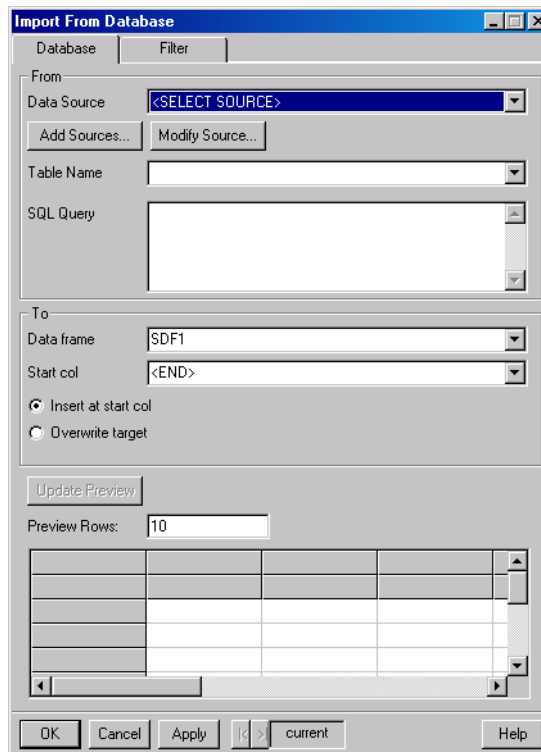


Figure 1.1: *The **Import From Database** dialog.*

3. Select a direct data source from the **Data Source** list.

You can customize these or create new direct sources by clicking the **Add Sources** button. See below for further information on creating direct data sources.

Choose one of these or select another one you have created.

If you have not completely configured the source, the **Modify Data Source** dialog appears. Fill in all the fields with valid information for the data source chosen to continue.

4. Once a direct data source has been selected, the **Tables** list changes to contain all the tables in that source. Select a table from the list.
5. Specify any other options, including a valid SQL query in the **SQL Query** field. If you leave the **SQL Query** field blank, a default query of all columns and rows from the selected table is performed.
6. Click the **OK** button to start the import.

You can add new direct data sources that are based on one of the four supplied direct database types. You can add as many data sources as you wish. To add a direct data source, do the following:

1. From the **File** menu, select **Import Data ► From Database**.
2. Click the **Add Sources** button, and from the context menu, select **Add Direct Source**.
3. The **Add Direct Source** dialog appears (Figure 1.2).

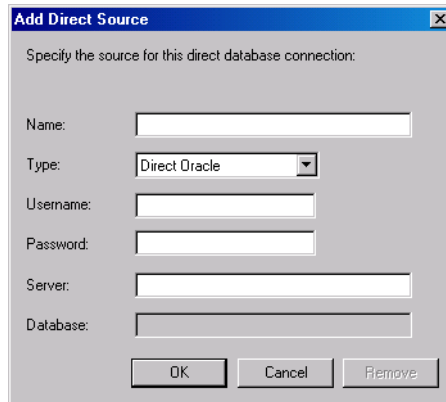


Figure 1.2: *The Add Direct Source dialog.*

4. Enter the name for the new direct data source in the **Name** field. The name you enter is used to display this data source in the list of data sources in the **Import From Database** and **Export To Database** dialogs. Choose a name that is different from other entries in the data sources list.
5. Select the type of database from the drop list of database choices in the **Type** field.
6. Depending on the type you select, specify the username, password, server and database name using the fields provided. Some database types do not require a server or database name, and so those fields may be unavailable.
7. Click **OK** to add the source to the data sources list. When you add a source, it is also selected as the current source to import from.

You can modify each of these with the appropriate information for your database configurations. To modify a direct data source:

1. From the **File** menu, select **Import Data ► From Database**.
2. Select the direct data source from the **Data Sources** list you want to modify.
3. If the data source has invalid or incomplete information or you are using the data source for the first time, the **Modify Data Source** dialog appears, as shown in Figure 1.3.

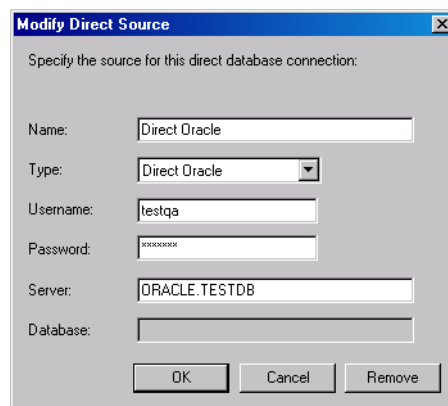


Figure 1.3: *The Modify Direct Source dialog.*

4. If the **Modify Data Source** dialog does not appear, it indicates that the information for this data source is valid. Click the **Modify Source** button below the list to display the **Modify Data Source** dialog.
5. In the **Modify Data Source** dialog, specify your user name and password along with the server name and database name for the source as appropriate for the database type. See Table 1.1 in the section S-PLUS Commands for Importing and Exporting for help identifying which fields need to be filled out for a given database type. The fields not required for a given type are greyed out in the dialog.
6. You can also change the data source name shown in the **Name** field and the database type shown in the **Type** drop list. Changing the data source name changes how it is listed in the **Data Sources** list in the dialog for both the **Import** and **Export** dialogs. Changing the database type changes which fields are available and may require you to specify different information depending on the database type chosen. If you change the database type, it is a good idea to change the name to identify it as a different data source in the list.
7. Click the **OK** button to accept your changes.

You can also remove direct data sources. Be careful using this dialog, as you can remove the four direct data sources that are provided with S-PLUS. If you do, you can add them again following the procedures above to add a data source. To remove a data source:

1. From the **File** menu, select **Import Data ► From Database**.
2. Select the direct data source from the **Data Sources** list you want to modify.
3. Click the **Modify Source** button. The **Modify Direct Source** dialog appears.
4. Click the **Remove** button in this dialog to remove the data source.

Export to Database

You can use the S-PLUS **Export to Database** dialog to export data frame objects from S-PLUS to direct database sources available on your system. Only those sources that you have installed database

clients for are supported. For more information on installing database client software, see the *Installing and Configuring* sections later in this document.

S-PLUS lists all data sources it supports in the **Export to Database** dialog. However, only those sources which have database clients installed on your system work. The others sources report errors until you install and configure the appropriate database clients.

When you first run S-PLUS, four direct data sources are listed in the **Export To Database** dialog, one for each type supported on Windows. These are listed as follows:

- Direct DB2
- Direct Oracle
- Direct SQL Server
- Direct Sybase

You can modify these data sources to configure them for your particular database setup, such as setting the correct server, database, username, password, and other information appropriate for how the database is setup on your network.

You can also add new direct sources (based on one of the four types listed above) to the list of data sources. This allows you to have one or more data sources for the same database type, thus enabling you to specify different database names or usernames and passwords to access other sets of tables on the same database server. You can also remove direct data sources from the data sources list.

To export data to a direct database source:

1. From the **File** menu, select the **Export Data ► To Database**.

2. The **Export to Database** dialog appears (Figure 1.4).

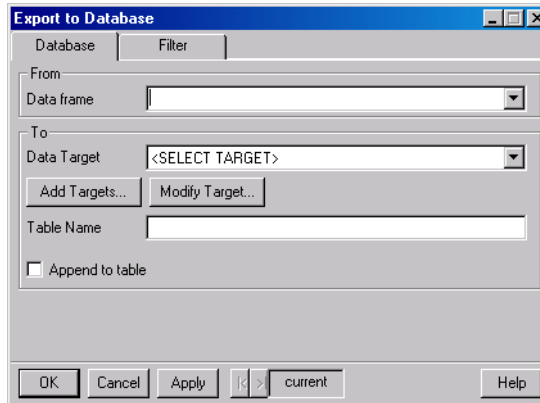


Figure 1.4: *The **Export to Database** dialog.*

3. Select a data frame object to export from the **Data frame** list.
4. Select a direct data source from the **Data Target** list.

You can customize these or create new direct sources by clicking the **Add Targets** button. See below for further information on creating direct data sources.

Choose one of these or select another one you have created.

If you have not completely configured the source, the **Modify Data Source** dialog appears. Fill in all the fields with valid information for the data source chosen to continue.

5. Specify the table name you want to export to. Follow the syntax rules for table names that the target database imposes. Check your database documentation for more information on this topic. By default, the table name shown is based on the name of the data frame name specified in the dialog.

6. You can append data to the table you specify if it already exists in the database. To do this, check the **Append to table** checkbox.

Note

If you try to append data that does not have columns which match the data types of columns that already exist in the table, you will receive error messages and the export fails.

7. Click the **OK** button to perform the export.

You can add new direct data sources that are based on one of the four supplied direct database types, and you can add as many data sources as you wish. To add a direct data source:

1. From the **File** menu, select the **Export Data ► To Database**.
2. Click the **Add Targets** button and from the context menu which appears, choose **Add Direct Source**, and a new dialog appears.
3. Enter the name for the new direct data source in the **Name** field. The name you enter is used to display this data source in the list of data sources in the **Import From Database** and **Export to Database** dialogs. Choose a name that is different from other entries in the data sources list.
4. Select the type of database from the drop list of database choices in the field called **Type**.
5. Depending on the type you select, specify the username, password, server and database name using the fields provided. Some database types do not require server or database names and so those fields, so those fields may be unavailable for those types.
6. Click **OK** to add the source to the data sources list. When you add a source it is also selected as the current source to export to.

You can modify each of these with the appropriate information for your database configurations. To modify a direct data source:

1. From the **File** menu, select the **Export Data ► To Database**.

2. Select the direct data source from the **Data Target** list you wish to modify.
3. If the data source has invalid or incomplete information or you are using the data source for the first time, the **Modify Data Source** dialog appears.
4. If the **Modify Data Source** dialog does not appear, it means that the information for this data source is valid. Click the **Modify Target** button below the list to display the **Modify Data Source** dialog.
5. In the **Modify Data Source** dialog, specify your user name and password along with the server name and database name for the source as appropriate for the database type. The fields not required for a given type are unavailable (“grayed out”) in the dialog.
6. You can also change the data source name shown in the **Name** field and the database type shown in the **Type** drop-down list. Changing the data source name changes how it is listed in the lists in the dialog for both the **Import From Database** and **Export to Database**. Changing which fields are available may require you to specify different information depending on the database type chosen. If you change the database type, it is a good idea to change the name to identify it as a different data source in the list.
7. Click the **OK** button to accept your changes.

You can also remove direct data sources. Use caution, as you can remove the four direct data sources that are provided with S-PLUS. If you do, you can add them again following the procedures above to add a data source. To remove a data source:

1. From the **File** menu, select the **Export Data ► To Database**.
2. Select the direct data source from the **Data Target** list you wish to modify.
3. Click the **Modify Target** button, and the **Modify Direct Source** dialog appears.
4. Click the **Remove** button in this dialog to remove the data source.

How Direct Data Sources are Stored

The entries in the data sources drop lists appearing in the **Import From Database** and **Export to Database** dialogs are actually stored in a special text file located in the **.Prefs** subfolder of your project folder **[S_PROJ]\.Prefs**. The file is called **datasources.ini**, and can be edited with any text editor.

Each line of the file is a comma-delimited specification of the necessary information for the data source, as in the following example:

```
DIRECTDB:Direct DB2,direct-db2,,testdb,testqa,testqa
DIRECTDB:Direct Oracle,direct-oracle,ORACLE.TESTDB,,testqa,
DIRECTDB:Direct SQL Server,direct-sql,,,,
DIRECTDB:Direct Sybase,direct-sybase,qa.insightgul.com,,,
```

Each line must begin with the string **DIRECTDB:** This allows S-PLUS to distinguish the information as pertaining to direct data sources. Following this string, each field which appears in the dialog is entered in the following order, with commas separating the fields:

```
[name], [type], [server name], [database name], [username],
[password]
```

where **[name]** is the data source name that appears in the drop-down lists in the dialogs. The **[type]** field must be one of the following (matching the type field in the `importData` and `exportData` commands):

- `direct-db2`
- `direct-oracle`
- `direct-sql`
- `direct-sybase`

The **[password]** field must be specified as clear text.

Unspecified or blank field values must be separated by commas, as in the example below where the database name and password fields are left unspecified:

```
DIRECTDB:Direct Oracle,direct-oracle,ORACLE.TESTDB,,testqa,
```

As an alternative to managing direct database sources in the dialogs, you can simply edit this file after closing S-PLUS. Restart S-PLUS so that the changes you made to the data sources in this file are used in S-PLUS.

INSTALLING AND CONFIGURING DATABASE CLIENTS ON UNIX

In testing direct driver support on Linux and UNIX platforms, we have found that the database vendors provide fairly complete installation instructions regarding database clients on supported platforms.

Please refer to the installation instructions that came with the database software to install database clients on your system.

INSTALLING AND CONFIGURING DATABASE CLIENTS ON WINDOWS

In order to use direct database driver support in S-PLUS for Windows, you must install database client software on the same system where S-PLUS is installed. Currently, S-PLUS supports 32-bit versions of the following database clients:

- SQL Server 2000
- Sybase 12.5
- Oracle 9i
- DB2 7.2

The SQL Server 2000 client supports access to a variety of SQL Server versions, including SQL Server 6.5. The Oracle 9i client supports access to most previous versions of Oracle, including 8i.

Other versions of the database clients may work but have not been tested by Insightful.

You can follow the instructions provided by a database vendor to install a database client. Alternatively, you can follow the steps below for the appropriate client. These instructions are provided to help get you started quickly installing and using a particular database client. For more in-depth information, consult the instructions provided with the database client software.

SQL Server 2000 Client

1. Insert the Microsoft SQL Server 2000 Enterprise Edition CD in your CD-ROM drive and run **English ► Ent ► autorun.exe**.
2. In the dialog that appears, select **SQL Server 2000 Components** from the available setup options.
3. In the next screen, select to install the **Database Server**.
4. In the next screen, select **local computer**, and select a destination on your system.
5. In the next screen, select **Create a new installation of SQL Server, or Install Client Tools** from the available options.

6. In the next screen, choose **Client Tools Only** from the available options
7. In the feature installation screen, accept all the selected features – *do not remove any!*
8. Once installed, run the **Enterprise Manager** from the **Start** menu using the icon at **Programs ► Microsoft SQL Server ► Enterprise Manager**.
9. In the **SQL Server Enterprise Manager** window, there is a sub-window called **Console Root ► Microsoft SQL Servers**. In the left pane of this window, expand the tree view to **Console Root ► Microsoft SQL Servers ► SQL Server Group**.
10. Right-click this expanded node and select **New SQL Server Registration** from the menu.
11. In the **Select a SQL Server** dialog which appears, choose the name of the server system you installed SQL Server on from the list on the left, and click the **Add** button to add it to the right.
12. In the dialog **Select an Authentication Mode**, choose the radio button for **SQL Server Authentication**.
13. Next, specify the appropriate login name and password when prompted.
14. Finally, choose to add the SQL server to the existing group called **SQL Server Group**.

After you have successfully setup the client following the steps above, ensure that the paths below are in your PATH environment variable:

```
[install path]\80\Tools\BINN
```

where [install path] is the path you chose to install the client tools in step 4 above.

Sybase Client

Insert the Sybase 12.5 Adaptive Enterprise client CD into your CD-ROM drive. The installation program should automatically start.

Note

If the Sybase installer crashes or locks up during startup in **java.exe**, then you may need to disable Java “just-in-time” compiling on your system. See Sybase technical article www.sybase.com/detail/1,6904,1013241,00.html on the Sybase Web site for more information about this problem.

Carry out the following steps to install a Sybase client on your system:

1. Choose the **Standard** install.
2. Accept the default location or specify another location. Make sure that the install directory you choose does *not* contain any spaces.
3. Ensure that the following paths are in your PATH environment value:

```
[install path]\CFG-1_0\bin;[install path]\OCS-12_5\dll;[install path]\OCS-12_5\lib3p;[install path]\OCS-12_5\bin
```

where [install path] is the path you chose in step 2 above.

After installation, select **Programs ► Sybase ► dsedit** from the **Start** menu to start this utility program. Then do the following steps:

1. Click **OK** on the first screen to open the **Interfaces Driver** screen.
2. From the **Server Object** menu, select **Add**.
3. In the **Input Server Name** box, enter the network internet protocol name of the server running Sybase, and click **OK** (e.g., **qaimage.insightful.com**).
4. In the **attributes** column of the **Interfaces Driver** dialog, double-click the server address row.
5. In the **Network Address Attribute** window, click the **Add** button.
6. Select **TCP** as the network connection protocol from the drop-down list and enter

[server ip name], 2048

in the **Edit** field. **[server ip name]** is the internet protocol name of the server that has Sybase installed, and should be the same as specified in step 3 above, as in **qaimage.insightful.com**. 2048 is the port number it receives on, and you may have to change the port number, depending on the server. Click **OK** to accept the changes.

The **[server ip name]** you specify here is used in S-PLUS to connect to the server and use Sybase.

7. Click **OK** to accept the **Network Address Attribute** window.
8. Test the connection to the new server by selecting **Ping** from the **Server Object** menu.
9. In the **Ping** dialog, click the **Ping** button. You should see another dialog appear, indicating that the connection was successful.
10. Close the **dsedit** utility program.
11. Test the connection using the Sybase ISQL utility:
 - Open a DOS Command window and type the following:
isql -Utestqa -Ptestqa - S[server ip name]
 - At the isql program prompt, enter the following:
select * from pubs2.dbo.sales
go

After you type **go**, you should get an output table printed in the window.

Oracle Client

Insert the Oracle 9i Client for Win32 CD in your CD-ROM drive. The setup starts automatically, and you can follow these steps:

1. In the **Oracle Universal Installer: File Locations** dialog, enter the path to install the Oracle client software on your system in the **Destination path** field.
2. For the type of installation, select **Administrator**.
3. Use the default port number of 2030.

4. After installation, the **Oracle Net Configuration Assistant** automatically appears. If it does not automatically appear, you can manually start it from the **Start** menu at **Programs ► Oracle - OraHome90 ► Configuration and Migration Tools ► Net Configuration Assistant**.
5. In the **Net Configuration Assistant Wizard**, enter the values specified in the appropriate wizard steps indicated below:
 - Select **Perform typical configuration** in the **Welcome** step. Click **Next**.
 - Select **No, I will create net service names myself...** Click **Next**.
 - Select **Oracle8i or later database or service**. Click **Next**.
 - Specify an appropriate network service name. It is suggested that you specify a name that contains the name of the database and your network domain, as in **testdb.insightful.com** for the service name. Click **Next**.
 - Select **TCP** as the protocol. Click **Next**.
 - Specify the name of the server which is running Oracle on your network. Specify only the system name (and not an IP address), such as **qadb-s2k** for the host name, and specify an appropriate port number. You can accept **1521** as the default port or change it, depending on how your server is configured. Click **Next**.
 - Select **Yes, perform a test** to test the connection. Click **Next**. You should get an unsuccessful connection screen with a **Change Login** button on it.
 - Click the **Change Login** button, and specify the appropriate username and password in the dialog. Click **OK** and then **Next**.
6. Now, the test connection should report success. Click **Next**.
7. Accept or change the network service name shown. This is the name you specify in S-PLUS to access the ORACLE server. Click **Next**.

8. When asked whether you want to configure another net service name, choose **No**. Click **Next**.

After a successful installation, ensure that the following paths are in your PATH environment value:

```
[install path]\ora90\bin
```

where [install path] is the path you chose during setup in step 1 above.

DB2 Client

Insert the DB2 Universal Database Enterprise Edition Version 7.2 CD into your CD-ROM drive. The installer should start automatically.

1. Choose **Install** from the list of setup options.
2. In the **Select Products** dialog, choose **DB2 Administration Client**.
3. Select **Typical** setup type.
4. Select a destination for the installation or accept the default path.
5. In the **Enter Username and Password for Control Center Server** dialog, enter your network login name and password. Note that you can enter another username and password, but using your network login and password make it easy to remember.
6. You may receive a dialog telling you that you don't have privileges to do certain things with DB2 on your system. Click the **OK** button in this dialog to continue with the setup.
7. If you are prompted to restart your system, make sure you do this. Some services that are installed as part of the DB2 installation need to be installed and mounted.
8. After your system is restarted or after the end of a successful setup, the **First Steps** dialog appears. In this dialog, select **Catalog Sample Databases** from the list on the left.
9. The **Client Configuration Assistant** is started.
10. In the **Welcome** dialog, click the **Add Database** button.

11. A “wizard” dialog appears. In the **Source** page, click the **Search the network** radio button, and switch to the **Database name** page.
12. In the **Tree** view, expand the **Other Systems** node and wait until the program has scanned all network systems for DB2 servers. The list it finds appears below this node.
13. Look for the name of the server that has DB2 installed on it in this tree. If you don’t see it, check the server, and make sure DB2 has been properly started. Once it is located, expand the server name node in the tree to see a list of databases.
14. Select the database you want to use from the **Local databases** node. The name appears in the **Target Database** field at the bottom of the dialog. Click **Next**.
15. In the **Alias** page, verify that the alias for this database is listed as the database name you chose. Click **Next**.
16. In the **ODBC** page, accept the defaults for registering the database as a system source. Click **Finish**.

Click the **Close** button when a confirmation dialog appears. Do not attempt to test the connection at this time as the settings are not correct yet. You are then returned to the **Client Configuration Assistant** main window.

17. You can see that the database you selected was added as a database. Select this database, then click the **Properties** button. This opens another dialog called **Database Properties – [database name]**.
18. Click the **Properties** button. This opens another dialog called **Update Connection Wizard – [database name]**.
19. Protocol should be set to **TCP/IP**. Click **Next**.
20. Correct the host name by changing it to the IP name of the database server, such as **qadb-snt.insightful.com**. Click the **Finish** button. You are returned to the **Database Properties – [database name]** dialog. Click **OK**.
21. In the main **Client Configuration Assistant** window, select the database you selected from the list and click the **Test** button.

22. In the **Connect to DB2 Database**, enter the appropriate username and password in the fields and leave other default settings. Click the **OK** button. You should receive a “connection successful” dialog.
23. Close the **Client Configuration Assistant**.
24. Close the **First Steps** dialog.
25. Ensure that the path `[install path]\BIN` is in your PATH environment value. `[install path]` is the path you selected in step 4 above.