Information Builders

WebFOCUS

Accessing Data

Version 4 Release 3.6

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Contents

CHAPTER 1

Data Adapter Overview

Topic:

- Installing and Configuring Data Adapters

WebFOCUS provides data adapters that enable you to access the following relational data sources: EDA, IBM DB2, Hyperion ESSbase, Informix, Microsoft SQL Server, Microsoft SQL Server OLAP Services, Microsoft Access, ODBC, Oracle, Sybase, and others. For basic information about most of these data adapters see the corresponding topics in *Accessing Data*. For additional information see your server administration documentation.

Installing and Configuring Data Adapters

Before you can access relational data, you must configure WebFOCUS for each data adapter you require using the Setup program. You can complete these configuration steps during installation. However, if you have installed WebFOCUS without configuring the necessary data adapters, you can rerun Setup.exe from the install media and select the Configure Only option. The Setup program will guide you through the installation of the available data adapters.

Important:

When you run the Configure Only option, prior configuration files are not preserved. You will need to reconfigure all original outbound communications. Therefore, we recommend that you back up the following files to retain the original configuration for reference:

```
x:\IBI\DESKTOP43\conf\bin\edaserve.cfg
x:\IBI\DESKTOP43\conf\etc\edasprof.prf
x:\IBI\DESKTOP43\conf\etc\odin.cfg
x:\IBI\DESKTOP43\bin\focshell.ini
```

Reference

Server Setting Dialog Box

Regardless of which data source you are using, you can perform your set up tasks from the Server Setting dialog box, as an alternative to typing the equivalent code. For corresponding syntax, see individual data adapter topics and *Remote Execution via EDA and WebFOCUS Servers*.

The dialog box adjusts to suit the entries required for each supported data source. Your entries are retained in memory for the duration of the session.

You can access this dialog box from the toolbar at any time. In addition, the first time you attempt to send a request to the server, WebFOCUS looks for the required server settings and opens the Server Setting dialog box automatically if you not already provided this information.

The Server Settings dialog box has the following fields/options:

Database Engine

Choose one of the following:

- A relational data source that you wish to access via the corresponding data adapter. The current choices are: IBM DB2, Hyperion ESSbase, Informix, Microsoft SQL Server, Microsoft SQL Server OLAP Services, Microsoft Access, ODBC, Oracle, Sybase. See specific data adapter topics for details, supplemented by your server administration documentation as required.

  Tip:

  In order to access relational data via a data adapter, a Master File with the appropriate suffix (SQLORA, SQLSYB, etc) and a corresponding Access File must reside on your PC. You can create these files using the Create Synonym Wizard. For details, see *Creating Synonyms* in *Describing Data With Graphical Tools*.

- EDA Relational Gateway to access data on an EDA Server via the EDA Data Adapter, which delivers the requested data to WebFOCUS where all processing of business and presentation logic takes place. For details on this distributed data access method see *Data Adapters Overview* in *Accessing Data*.

  Tip:

  In order to access data using the distributed access method, a Master File with the appropriate suffix (EDA) and a corresponding Access File must reside on your PC. You can create these files using the Create Synonym Wizard. For details, see *Creating Synonyms* in *Describing Data With Graphical Tools*.

- EDA Server to access and process data on an EDA Server. As in distributed data access, the EDA Server uses the EDA Data Adapter. However, in this case the adapter manages both remote data access and processing of business logic on the EDA Server; only presentation logic is processed on the desktop. For details on remote execution options see *Remote Execution via EDA and WebFOCUS Servers* in *Accessing Data*.

  Tip:

  In order to access and execute data using this method, a Master File with the appropriate suffix (FPA) and a corresponding Access File must reside on your PC. You can create these files using the Create Synonym Wizard. For details, see *Creating Synonyms* in *Describing Data With Graphical Tools*.

- WebFOCUS to access and process data on a WebFOCUS Server via the HTTP protocol. This selection provides two types of non-persistent connection, one through the WebFOCUS cgi and the other through the HTTP Listener. Your service connection in this dialog box indicates the port you connected to, which in turn indicates which HTTP method you wish to use.

Note: When you make your Database Engine selection, other fields adjust to prompt for appropriate server setting information.

Server

Contains the name of the server that will be accessed.

For Microsoft SQL Server, Sybase, and DB2: Use the correct case (uppercase or lowercase letters) when completing this field.

Data Sources

For ODBC, Microsoft SQL Server, Microsoft SQL Server OLAP Services, Microsoft Access, and Hyperion ESSbase: Identifies the name of the data source you will access.

Database name

For DB2/2, Informix, and Oracle: Identifies the name of the database you will access.

User Name

Identifies the database user. Enter your user id. Use the correct case (uppercase or lowercase letters) based on the data source requirements.

Password

Determines whether the identified user is authorized to access the database. Enter your password. Use the correct case (uppercase or lowercase letters) based on the data source requirements.

Service

For WebFOCUS only: Identifies the port you are connected to:

- Port 80 indicates connection via the WebFOCUS cgi. This is the default value.
- Port 8101 indicates the HTTP Listener.

For details see *Choosing a Remote Execution Option* in *Remote Execution via EDA and WebFOCUS Servers* in *Accessing Data*.

How to Query Current Data Adapters Settings

Syntax

You can query general information about current data adapter settings by issuing the following commands from the Command Console

```
SQL sqlengine {?|? CONNECTINFO}
```

where:

sqlengine
: Is EDA, SQLSYB, SQLMSS, SQLDB2, SQLINF, SQLORA, SQLODBC, SQLMAC, ESSBASE, or MSOLAP.

CONNECTINFO
: After the connection is established, you can obtain detailed information about current data adapter settings by including this phrase after the question mark (?).

CHAPTER 2

Sybase Server Data Adapter

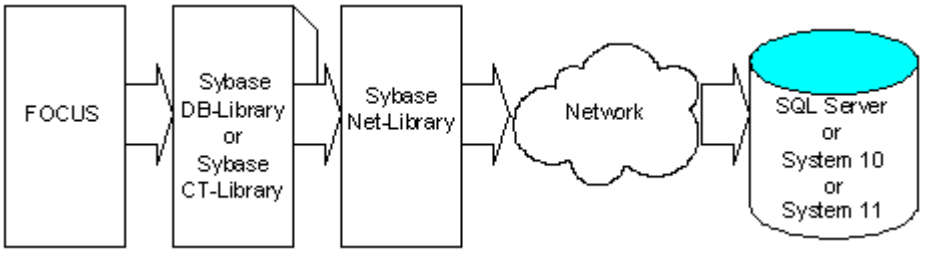
Topics:

- Sybase Client Software
- Supported Sybase Environments
- Sybase Configuration
- Accessing the Sybase Server
- Data Type Conversion Chart

The Sybase Server Data Adapter enables WebFOCUS to directly access information stored in Sybase Server data sources using the Sybase Open Client or Client Library software for Windows.

Sybase Client Software

The Open Client or Client Library software for Windows allows Windows applications to access any Sybase Server on the network over a variety of network protocols, as illustrated in the following diagram.



Although WebFOCUS can also access Sybase Server data using the ODBC Data Adapter and Microsoft's Open Database Connectivity (ODBC) solution, we recommend using the Sybase Server Data Adapter since it provides faster performance.

Reference **Sybase Server Data Adapter Limitations**

The following limitations apply specifically to the Sybase Server:

- Sybase Server is case sensitive. Therefore, you must supply data source and table names in the correct case. For example, if the table that you wish to access is in lowercase, you must type it in lowercase. This is particularly important when you enter commands in the Command Console. For details, see *Using the Command Console* in *Getting Started*.
- When using Direct SQL Passthru, you must specify SQL commands in uppercase.

Example **Specifying an SQL Command in Uppercase**

```
SQL SQLSYB SELECT * FROM titles
END
```

Supported Sybase Environments

Sybase System 10 and System 11. The Sybase Server Data Adapter accesses Sybase Server data using the Client Library for Windows software provided by Sybase. This software allows WebFOCUS to connect to and retrieve data from any Sybase Server on the network, provided the CT/LIB software has been installed and configured correctly for that server.

WebFOCUS has been tested at Information Builders with Sybase Adaptive Server 11.5.1 and Sybase Server for Windows NT release 11.0.2 using Microsoft's TCP/IP protocol.

Sybase Configuration

The Sybase Server Data Adapter is an integral part of WebFOCUS. Therefore, no additional configuration steps are required to access Sybase Server data. However, WebFOCUS does rely on the Sybase System 10 or System 11 Client Library software to access the Sybase Server data. You must ensure that this software has been configured correctly for the Windows workstation that will be used to access the data.

Requirements for configuring a Windows workstation with the Sybase client software (either Sybase Open Client or Client Library) will vary depending on the Sybase Server being accessed and the network protocol being used. Refer to the appropriate Sybase documentation for details about configuring Sybase client software.

Testing the Sybase Configuration Using SYBPING

Since WebFOCUS relies on the Open Client or Client Library software provided by Sybase, it is important to confirm that this software has been configured correctly before attempting to access the Sybase Server using WebFOCUS. If the Sybase Server client software is not configured correctly, WebFOCUS will not be able to access the Sybase Server data.

Sybase provides a utility to help test the client software installation. For Sybase System 10 and System 11, the utility is SYBPING. This utility tests the connectivity by performing a simple connect and disconnect. Please refer to your Sybase documentation for additional information.

If SYBPING is unable to connect to the Sybase Server, it reports the failure—possibly including information on why the connection could not be made. Before proceeding, correct this problem with the help of the Sybase documentation and/or your network administrator.

Testing the Sybase Configuration Using Direct SQL Passthru

Once you have tested the communications using SYBPING, you can test the WebFOCUS access to the Sybase Server.

Although you can test the WebFOCUS access to SQL data using the Report Painter, it is simpler to test the connection using Direct SQL Passthru. Direct SQL Passthru enables you to issue SQL commands from WebFOCUS, and view the results in the report viewing window. Unlike the Report Painter, Direct SQL Passthru does not allow you to graphically create and format report requests.

Syntax How to Test the Sybase Configuration Using Direct SQL Passthru

To test the configuration using Direct SQL Passthru, enter the following command in the Command Console window or from a procedure (FOCEXEC):

```
SET SQLENGINE=SQLSYB
SQL SQLSYB SET USER server-name/id,password
SQL SQLSYB sql-statement
END
```

Note: Sybase Server is case sensitive. See *Sybase Server Data Adapter Limitations* on page 2-2 for details.

Example Testing the Sybase Server Using the SELECT Statement

Although you can enter any SQL statement, we recommend that you test the connection using a basic SELECT statement on a known SQL table.

For example, when connecting to a Sybase Server, you could access the sample data sources (if they have been installed) as follows:

```
SQL SQLSYB SELECT * FROM interpubs.dbo.authors
END
```

Note: Sybase Server is case sensitive. See *Sybase Server Data Adapter Limitations* on page 2-2 for details.

Accessing the Sybase Server

When accessing Sybase Server data sources, you must provide the name of the server that will be accessed, along with the user name and password for that server. WebFOCUS prompts you for this information when you first access the Sybase Server.

As an alternative, you can provide the server name, user name, and password prior to accessing the Sybase Server, either directly from a procedure (FOCEXEC) or by using the Servers tool from the toolbar. When you access the server using the Servers tool, the settings you provide will remain in effect for the duration of the session. If you connect to a different server, the new data overwrites the Sybase server information. To access the Sybase server again, you must reset the server settings.

Setting the server information in a procedure (FOCEXEC) enables you to access the server every time you run that procedure. Using a procedure to access the server eliminates the process of resetting the server information.

Note: Use the correct case (uppercase or lowercase letters) when completing the server name, user name, and password fields.

Procedure How to Set the Server Name, User Name, and Password to Access Sybase Server Data

1. To define the Server settings from the toolbar, click the Servers button.

   The Server Settings dialog box opens.
2. Select Sybase Server from the Database Engine drop-down list.

   The required fields become active.
3. Enter the server name (also known as the database alias), user name, and password.

Syntax How to Set the Sybase Server Name, User Name, and Password

You can use the following syntax to set the server name, user name, and password from the Command Console command line. You can also use the Text Editor to create a procedure (FOCEXEC) that will be the first component to be executed when you run an application.

```
SQL SQLSYB SET USER server-name/username,password
```

Note: Sybase Server is case sensitive. See *Sybase Server Data Adapter Limitations* on page 2-2 for details.

Data Type Conversion Chart

The ACTUAL keyword in a Master File allows the conversion of Sybase Server data types to the corresponding FOCUS data types. The Sybase Server data types and the corresponding FOCUS ACTUAL types are specified in the following chart.

Sybase Server Data Type	ACTUAL Type	Format Description
Bit	I2	Either 0 or 1.
Char	A*n*	Fixed-length alphanumeric, not exceeding 254 characters.
Datetime	DATE	Date displayed as month, day, year (FOCUS USAGE can be used to determine MDY, YMD, DMY etc).
Datetime	A26	Date displayed in Sybase Server month, day, year, hour, minute and AM or PM format.
Float	D8	Numeric data that contains a decimal point.
Int	I4	4-byte binary integer; values range from -2147483648 to +2147483647.
Money	D8	Numeric data that contains monetary values.
Real	D8	Numeric data that contains a decimal point.
Smalldatetime	DATE	Date displayed as month, day, year (FOCUS USAGE can be used to determine MDY, YMD, DMY etc).
Smalldatetime	A26	Date displayed in Sybase Server month, day, year, hour, minute and AM or PM format.
Smallint	I4	2-byte binary integer; values range from +32767 to -32768.
Smallmoney	D8	Numeric data that contains a monetary value.
Text	TX	Text fields greater than 256 characters, also known as CLOBs (Character-based Large Objects).
Tinyint	I4	A whole number; values range from 0 to 255.
Varchar	A*n*	Variable-length character strings where *n* is less than or equal to 254 characters.

Note: Only the Sybase Server data types listed in this conversion chart are supported by the Sybase Server Data Adapter.

CHAPTER 3

Oracle Data Adapter

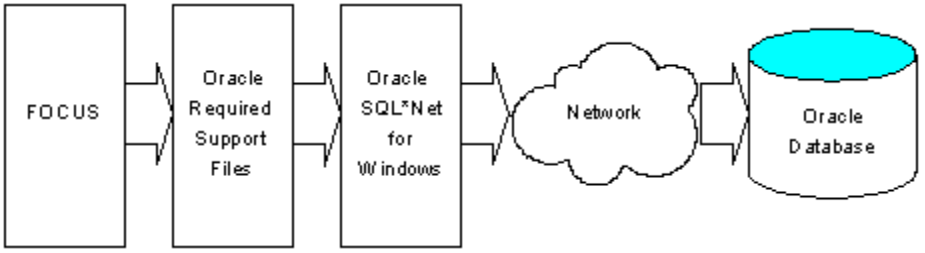
Topics:

- Oracle Client Software
- Supported Oracle Environments
- Oracle Configuration
- Accessing the Oracle Server
- Data Type Conversion Chart

The Oracle Data Adapter enables WebFOCUS to directly access information stored in Oracle 8 and Oracle 7.3 relational data sources using the Oracle client software for Windows 95/NT.

Oracle Client Software

The Oracle client software for Windows 95/NT consists of two components and allows Windows 95/NT applications to access Oracle Servers on the network over a variety of network protocols. The two components are the Oracle Required Support Files for Windows 95/NT and Oracle SQL*Net for Windows 95/NT, as illustrated in the following diagram.



WebFOCUS supports two versions of Oracle. By default, WebFOCUS is configured to work with Oracle 8 client software. However, you can configure WebFOCUS to work with Oracle 7.3.

Although WebFOCUS can also access Oracle data using the ODBC Data Adapter and Microsoft's Open Database Connectivity (ODBC) solution, we recommend using the Oracle Data Adapter since it provides faster performance.

Reference Oracle Data Adapter Limitations

The following limitations apply specifically to the Oracle Data Adapter:

- When using Direct SQL Passthru, you must specify SQL commands in upper case. For notes on typing FOCUS commands, see *Using the Command Console* in *Getting Started*.
- When you send a CREATE TABLE SQL command to Oracle, CHARACTER data types are changed to VARCHAR2. To change this behavior, issue the SET ORACHAR command.

Example Specifying an SQL Command in Uppercase

```
SQL SQLORA SELECT * FROM titles
END
```

Syntax How to Change VARCHAR2 Data Types to CHARACTER Data Types

You can execute this command from the Command Console, in which case, results will be valid for the session. You can also set it in the EDASPROF.PRF, located in x:\IBI\desktop436\conf\etc directory (where x:\IBI\desktop is the location of the WebFOCUS (Windows version) home directory); with this method results with be valid for all sessions.

The syntax for the SET ORACHAR command is

```
SQL SQLORA SET ORACHAR [FIX|VAR]
```

where:

`FIX`
Produces CHARACTER data types.

`VAR`
Produces VARCHAR2 data types. This setting is the default.

You will see the difference between the CHARACTER and VARCHAR2 data types when using the WHERE clause, since Oracle will use different matching semantics.

Supported Oracle Environments

WebFOCUS supports Oracle 8 by default, and can be configured to access Oracle 7.3.

The Oracle Data Adapter accesses Oracle data using the Required Support Files for Windows 95/NT and SQL*Net for Windows 95/NT software provided by Oracle. This Oracle client software allows WebFOCUS to connect to and retrieve data from any Oracle Server on the network, provided the software has been installed and configured correctly for that server.

Oracle Configuration

The Oracle Data Adapter is an integral part of WebFOCUS and can be used to access Oracle data using the Oracle 8 and Oracle 7.3 client software. In each case, WebFOCUS relies on the Oracle Required Support Files for Windows 95/NT and Oracle SQL*Net to access the data. You must ensure that this software has been installed and configured correctly for the Windows 95/NT workstation that will be used to access the data.

Requirements for configuring a Windows 95/NT workstation with the Oracle client software vary depending on the Oracle Server being accessed, and the network protocol being used. The Oracle client documentation provides full information on configuring the Oracle client software.

A naming convention called TNS is used with these versions of Oracle running SQL*NET. This method of naming makes use of a Service Name (also called database aliases) configured on the client workstation, which maps to the actual machine name of the machine running the Oracle Server. To add a service name after you have installed the client software, invoke the Oracle Net8 Easy Configuration utility that is available with the Oracle client software. Please refer to your Oracle documentation for additional information.

Testing the Oracle Configuration Using SQL Plus

Since WebFOCUS relies on the Oracle client software provided by Oracle, it is important to confirm that this software has been configured correctly before attempting to access the Oracle server using WebFOCUS. If the Oracle client software is not configured correctly, WebFOCUS will not be able to access the Oracle data.

Oracle provides a utility called SQL Plus to help test the Oracle client software installation. SQL Plus enables you to test the connection to the Oracle Server. Please refer to your Oracle documentation for additional information.

Note: If SQL Plus is unable to connect to the Oracle Server, note any error messages. Before proceeding, correct the problem with the help of the Oracle documentation and/or your network administrator.

Testing the Oracle Configuration Using Direct SQL Passthru

Once you have tested the Oracle client software using TNSPING, you can test the WebFOCUS access to the Oracle server.

Although you can test the WebFOCUS access to Oracle data using the Report Painter, it is simpler to test the connection using Direct SQL Passthru. Direct SQL Passthru enables you to issue SQL commands from WebFOCUS and view the results in the report viewing window. Unlike the Report Painter, Direct SQL Passthru does not allow you to graphically create and format report requests.

Syntax How to Test the Oracle Configuration Using Direct SQL Passthru

To test the configuration using Direct SQL Passthru, enter the following command in the Command Console, or from a procedure (FOCEXEC):

```
SET SQLENGINE=SQLORA
SQL SQLORA SET USER id/password@server
SQL SQLORA sql-statement
END
```

When connecting to an Oracle server, WebFOCUS prompts for the server name (connection string), user name, and password. (See *Accessing the Oracle Server* on page 3-5 for details.)

Example

Testing the Oracle Server Using the SELECT Statement

Although you can enter any SQL statement, we recommend testing the connection using a basic SELECT statement on a known SQL table.

For example, when connecting to an Oracle server, you could access the sample data sources (if they have been installed) as follows:

```
SQL SQLORA SELECT * FROM EMP
END
```

If the Oracle client software has been installed correctly, and you have supplied the correct connection information, WebFOCUS retrieves the information from the Oracle server and displays the results in the report viewing window.

Accessing the Oracle Server

When accessing Oracle data sources, you must provide the database alias that will be accessed, along with the user name and password for that server. WebFOCUS prompts you for this information when you first access the Oracle server.

As an alternative, you can provide the server name, user name, and password prior to accessing the Oracle server, either directly from a procedure (FOCEXEC) or by using the Servers tool from the toolbar. When you access the server using the Servers tool, the settings you provide will remain in effect for the duration of the session. If you connect to a different server, the new data overwrites the Oracle server information. To access the Oracle server again, you must reset the server settings.

Setting the server information in a procedure (FOCEXEC) enables you to access the server every time you run that procedure. Using a procedure to access the server eliminates the process of resetting the server information.

Procedure

How to Set the Database Alias, User Name, and Password to Access Oracle Data

1. To define the Server settings from the toolbar, click the Servers button:

   The Server Settings dialog box opens.

2. Select Oracle from the Database Engine drop-down list.

   The required fields become active.

3. Enter the server name (also known as the service name or database alias), user name, and password.

Syntax How to Set the Oracle Database Alias, User Name, and Password

You can use the following syntax to set the database alias, user name, and password from the Command Console. You can also use the Text Editor to create a procedure (FOCEXEC) that will be the first component to be executed when you run an application.

```
SQL SQLORA SET USER username/password@server
```

Data Type Conversion Chart

The ACTUAL keyword in a Master File allows the conversion of Oracle data types to the corresponding FOCUS data types. The Oracle data types and the corresponding FOCUS ACTUAL types are specified in the following chart.

Oracle Data Type	ACTUAL Type	Description
Char	A*n*	Fixed-length alphanumeric, not exceeding 254 characters.
Varchar	A*n*	Variable-length character strings where *n* is less than or equal to 254 characters.
Date	DATE	Date displayed as month, day, year (FOCUS USAGE can be used to determine MDY, YMD, DMY etc.).
Date	A26	Date displayed in Oracle month, day, year, hour, minute and AM or PM format, determined by the Oracle NLS_DATE_FORMAT setting.
Long	A*n*	Variable-length character strings where *n* is less than or equal to 254 characters.
Number	D8 or I4	Numeric data that contains a decimal point. Integer.
Varchar2(n)	TX	Text fields greater than 256 characters also known as CLOBs (Character-based Large Objects).

Note: Only the Oracle data types listed in this conversion chart are supported by the Oracle Data Adapter.

CHAPTER 4

IBM DB2 Data Adapter

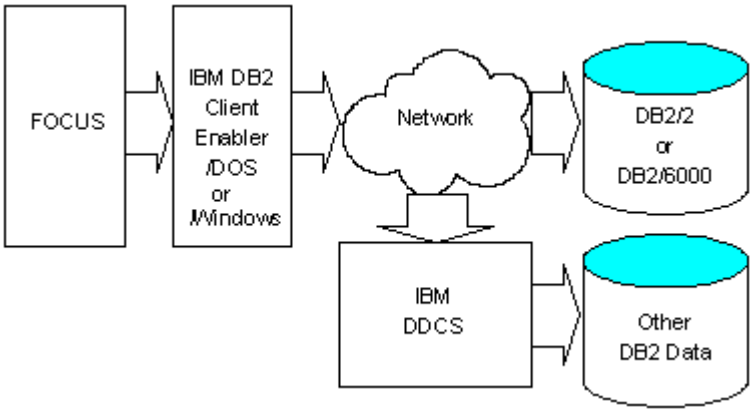
Topics:

- DB2 Client Software
- Supported DB2 Environments
- IBM DB2 Configuration
- Accessing a DB2 Data Source
- Data Type Conversion Chart

The DB2 Data Adapter enables WebFOCUS to directly access information stored in DB2 data sources using the IBM DATABASE Client Application Enabler. The DB2 relational data adapter can also be used to access any other IBM DB2 family data source using IBM's DRDA connectivity solution.

DB2 Client Software

The IBM DATABASE 2 Client Application Enabler provides access to IBM DB2 relational database servers. It provides access to DB2 for NT, OS/2, and DB2/6000 database servers and through DDCS, to DB2 for MVS, SQL/DS for VM and VSE, OS/400 databases, and other DRDA database management systems, as illustrated in the following diagram.



Although WebFOCUS can also access IBM DB2 data using the ODBC Data Adapter and Microsoft's Open Database Connectivity (ODBC) solution, we recommend using the DB2 Data Adapter since it provides faster performance.

Reference IBM DB2 Data Adapter Limitation

When using Direct SQL Passthru, you must specify SQL commands in uppercase. For notes on typing FOCUS commands, see *Using the Command Console* in *Application Development Getting Started*.

Example Specifying an SQL Command in Uppercase

```
SQL DB2 SELECT * FROM org
END
```

Supported DB2 Environments

The DB2 Data Adapter accesses DB2 data using the IBM DATABASE Client Application Enabler for DB2 Universal Database (version 5.2 and 6.1). This IBM client software allows WebFOCUS (or any other enabled Windows application) to connect to and retrieve data from any DB2 server on the network, provided the software has been installed and configured correctly for that server.

WebFOCUS (Windows version) has been tested at Information Builders with IBM DATABASE 2 for NT Universal Database (UDB) version 5.2 and 6.1.

IBM DB2 Configuration

The IBM DB2 Data Adapter is an integral part of WebFOCUS and does not require any additional configuration steps. However, WebFOCUS does rely on the IBM Client Application Enabler to access the DB2 data. You must ensure that this software has been installed and configured correctly for the Windows workstation that will be used to access the data.

Requirements for configuring a Windows workstation with the DB2 Client Application Enabler software will vary depending on the release of DB2 and the network protocol being used. The IBM manual *Installing and Using DB2 Clients for Windows 95 and Windows NT* provides full information on configuring the IBM Client Application Enabler software.

These steps include:

- Installing IBM Client Application Enabler.
- Using the DB2 Command Window utility to specify the workstation name (NetBIOS only).
- Using the DB2 Command Window utility to *catalog* the target DB2 server NODE.
- Using the DB2 Command Window utility to *catalog* the target DB2 data source.

Note: WebFOCUS performs the BIND process during the configuration stage of the installation.

Setting Up the DB2 Client: Cataloging Databases and Nodes

Once the IBM Client Application Enabler has been installed, you must specify the workstation name (NetBIOS only) or hostname/service name (TCP/IP only), and catolog the target DB2 server and database names.

For the IBM Client Application Enabler, the setup is performed using the DB2 Command Window utility.

Example Setting Up the IBM Client Application to Access the DB2 Data Source

To set up your workstation to access the DB2 data source SAMPLE on the server named DELL310 using the NetBIOS protocol, you would perform the following steps from the Command Window:

1. Start the DB2 Command Window utility from the DOS command prompt by clicking on the DB2 Command Window. Then enter the following command:

   ```
   DB2
   ```

2. Set the NetBIOS name for your workstation (NetBIOS only) using the command

   ```
   UPDATE DATABASE MANAGER CONFIGURATION USING NNAME client1
   ```

   where:

   *client*1

   Is the unique name for your workstation.

3. Catalog the name of the target DB2 server using the command:

   ```
   CATALOG NETBIOS NODE DELL310 REMOTE DELL310 ADAPTER 0
   ```

4. Catalog the name of the target DB2 data source using the command:

   ```
   CATALOG DATABASE SAMPLE AS SAMPLE AT NODE DELL310
   ```

These steps will vary depending on the protocol you are using and the names of your server(s) and data source(s). For more information, refer to your IBM documentation and/or contact your DB2 administrator.

Testing the Configuration Using the DB2 Utility

Since WebFOCUS relies on the Client Application Enabler software provided by IBM, it is important to confirm that this software has been configured correctly before attempting to access the DB2 server using WebFOCUS. If the Client Application Enabler software is not configured correctly, you will not be able to access the DB2 data using WebFOCUS.

Note: The command line processor utility is used to catalog information about the workstation, database server, and DB2 data sources. It can also be used to bind WebFOCUS to the DB2 data source being accessed.

Syntax How to Run the DB2 Utility and Test DB2/2 Data Source Connectivity

1. To run the utility, select the command line processor utility from the DB2 program group. This will display the DB2 Command Line Processor prompt:

   ```
   DB2 =>
   ```

2. To test connectivity to a DB2/2 data source, enter

   ```
   CONNECT TO database USER username USING password
   ```

   where:

   database
   Is the name of the DB2 data source you will access.

   username
   Is your user name for the data source.

   password
   Is your password for the data source.

   If you are able to connect to the DB2 data source, a message similar to the following will be displayed:

   ```
   Database Connection Information
   Database product       = DB2/2 2.1.2
   SQL authorization ID   = USERID
   Local database alias   = SAMPLE
   ```

   If you are unable to connect to the DB2 data source, refer to the IBM documentation to determine the cause of the problem.

Testing the DB2 Configuration Using Direct SQL Passthru

Once you have tested the IBM client software using the command line processor, you can test the WebFOCUS access to the DB2 server.

Although you can test the WebFOCUS access to DB2 data using the Report Painter, it is simpler to test the connection using Direct SQL Passthru. Direct SQL Passthru enables you to issue SQL commands from WebFOCUS and view the results in the report viewing window. Unlike the Report Painter, Direct SQL Passthru does not allow you to graphically create and format report requests.

Syntax How to Test the DB2 Configuration Using Direct SQL Passthru

To test the configuration using Direct SQL Passthru, enter the following command in the Command Console, or from a procedure (FOCEXEC) using the Text Editor:

```
SET SQLENGINE=DB2
SQL DB2 CONNECT TO database USER username USING password
SQL DB2 sql-statement
END
```

When connecting to a DB2 server, WebFOCUS will prompt for the database name, user name, and password. (See *Accessing a DB2 Data Source* on page 4-7 for details.)

Example Testing the DB2 Server Using the SELECT Statement

Although you can issue any SQL statement, we recommend that you test the connection using a basic SELECT statement on a known DB2 table.

For example, when connecting to a DB2 server, you could access the sample data sources (if they have been installed) as follows:

```
SQL DB2 SELECT * FROM org
END
```

If the DB2 client software has been installed correctly and you have supplied the correct connection information, WebFOCUS will retrieve the information from the DB2 server and display the results in the report viewing window.

Accessing a DB2 Data Source

When accessing DB2 data sources, you must provide the name of the data source that will be accessed, along with the user name and password for the data source. WebFOCUS prompts for this information when you first access the DB2 data source.

As an alternative, you can provide the database name, user name, and password prior to accessing the DB2 data source either by using the Servers tool from the toolbar or directly from a procedure (FOCEXEC). When you access the server using the Servers tool, the settings you provide will remain in effect for the duration of the session. If you connect to a different server, the new data overwrites the DB2 toolbar. To access the DB2 data source again, you must reset the server settings.

Setting the server information in a procedure (FOCEXEC) enables you to access the server every time you run that procedure. Using a procedure to access the server eliminates the process of resetting the server information.

Procedure How to Set the Database Alias, User Name, and Password to Access DB2 Data

1. To define the server settings from the toolbar, click the Servers button:

   The Server Settings dialog box opens.

2. Select IBM DB2 from the Database Engine drop-down list.

   The required fields become active.

3. Enter the database alias (also known as the server name), user name, and password.

Syntax How to Set the Database Alias, User Name, and Password

You can use the following syntax to set the database alias, user name, and password from the Command Console or by using the Text Editor to create a procedure (FOCEXEC) that will be the first component to be executed when you run an application.

```
SQL DB2 CONNECT TO database USER username USING password
```

Data Type Conversion Chart

The ACTUAL keyword in a Master File allows the conversion of DB2 data types to the corresponding FOCUS data types. The DB2 data types and the corresponding FOCUS ACTUAL types are specified in the following chart.

DB2/2 Data Type	ACTUAL Type	Format Description
Character (fixed length)	A*n*	Fixed-length alphanumeric, not exceeding 254 characters.
Character (variable length)	A*n*	Variable-length character strings where *n* is less than or equal to 254 characters.
Small Integer	I4	2-byte binary integer; values range from +32768 to -32768.
Large Integer	I4	4-byte binary integer; values range from -2147483648 to +2147483648.
Decimal	D8	Numeric data that contains a decimal point.
Date	DATE	A three-part value (year, month, and day) that designates a point in time according to the Gregorian calendar.
Time	A8	A three part value (hour, minute, and second) that designates a time of day based on a 24-hour clock.
Special Data	N/A	
System Date and Time	A26	Alphanumeric, 26 characters.
Scientific Notation	D8	Floating-point numbers.
Varchar(n)	TX	Text fields greater than 256 characters, also known as CLOBs (Character-based Large Objects).

Note: Only the DB2 data types listed in this conversion chart are supported by the DB2 Data Adapter. The DB2 data types with corresponding ACTUAL types of N/A are not supported by the DB2 Data Adapter.

CHAPTER 5

ODBC Data Adapter

Topics:

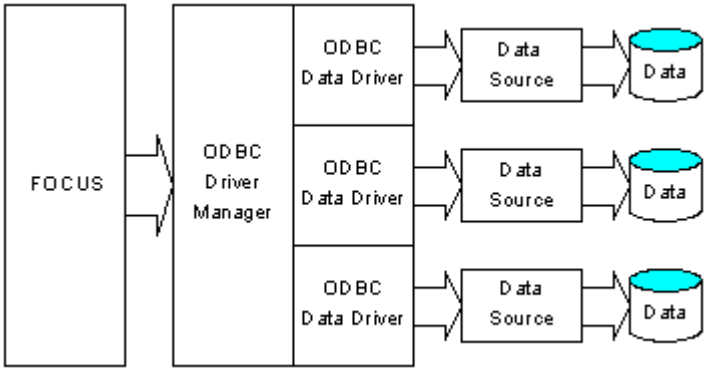
- ODBC Client Software
- Supported ODBC Environments
- ODBC Configuration
- Accessing an ODBC Data Source
- Data Type Conversion Chart

The ODBC Data Adapter enables WebFOCUS to access a variety of data using the Microsoft Open Database Connectivity (ODBC) standard. This includes relational and non-relational data.

ODBC Client Software

The ODBC specification was developed by Microsoft to allow Windows applications to access data in database management systems using SQL. Unlike vendor-specific access methods, the ODBC specification provides a common method for accessing all data types.

The ODBC architecture can be illustrated as follows:



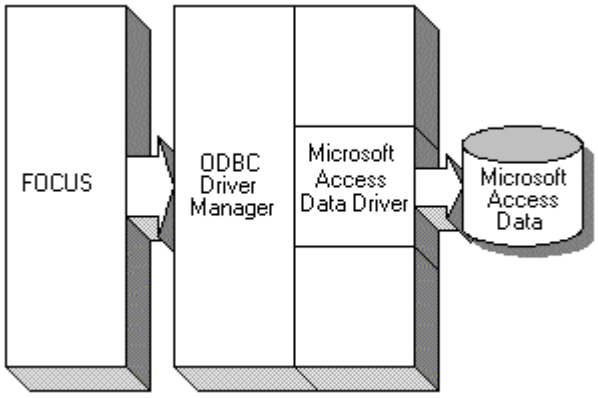
The components are:

- **The Application** The application calls ODBC functions to connect to ODBC data sources, submit SQL statements, and retrieve results.
- **The ODBC Driver Manager.** The Driver Manager is responsible for loading data adapters for the application.
- **The ODBC Data Adapter.** The data adapter takes ODBC function calls and converts them to a format compatible with the data source being accessed.
- **The Data Source.** The Data Source is the data that you want to access.

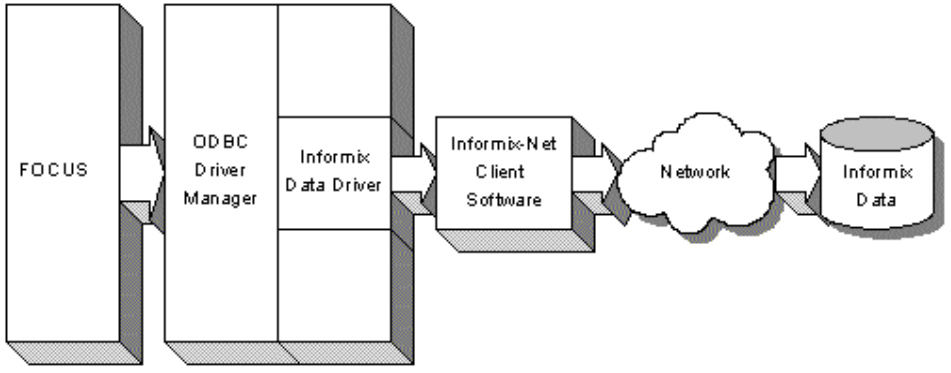
The Driver Manager is typically developed by Microsoft and includes an ODBC Administrator component as well as the actual Driver Manager. The Driver Manager is usually supplied with the data adapter software when it is purchased from a Driver vendor. The ODBC Administrator allows you to add and configure new data adapters, as well as configure existing data adapters.

Multiple vendors produce a variety of data adapters, which access a very wide variety of data source types. Examples include data adapters for Informix, Digital Rdb, Paradox, Microsoft Access, and AS/400 data sources.

In some cases, the data adapter will access a local data file. For example, Microsoft Access:



In other cases, the data adapter will interface with a relational data source system's client software to communicate with a data source server on the network. For example, Informix:



However, these differences are invisible to the ODBC application since the application communicates with the ODBC Driver Manager using standard ODBC functions.

The ODBC Data Adapter allows you to use WebFOCUS to access data sources supported by ODBC. This includes many data sources for which WebFOCUS does not have a direct interface.

WebFOCUS does have direct interfaces to Microsoft SQL Server, Oracle, DB2, Sybase, Informix, and EDA data sources. In these cases, we recommend the direct interface rather than ODBC, since this typically provides improved performance.

Note: Information Builder's Enterprise Data Access (EDA) solution does provide connectivity to a wide variety of data sources on many platforms and should be considered as an alternative to ODBC. For information, contact your Information Builders representative.

Reference ODBC Data Adapter Limitation

When using Direct SQL Passthru, you must specify SQL commands in uppercase. For notes on typing FOCUS commands, see *Using the Command Console* in *Application Development Getting Started*.

Example Specifying an SQL Command in Uppercase

```
SQL SQLODBC SELECT * FROM org
END
```

Supported ODBC Environments

WebFOCUS can access any ODBC-enabled data source, providing the ODBC Driver supports the ODBC functions used by WebFOCUS.

To find out if an ODBC Data Adapter is available for your data source, contact your data source vendor.

Reference Required ODBC Function Support

The following ODBC function calls are used by WebFOCUS and must be supported by the ODBC Data Adapter.

ODBC Function	ODBC Version	API Conformance Level
SQLAllocConnect	1.0	Core
SQLAllocEnv	1.0	Core
SQLAllocStmt	1.0	Core
SQLBindCol	1.0	Core
SQLCancel	1.0	Core
SQLColumns	1.0	Level 1

ODBC Function	ODBC Version	API Conformance Level
SQLConnect	1.0	Core
SQLDescribeCol	1.0	Core
SQLDisconnect	1.0	Core
SQLError	1.0	Core
SQLExecDirect	1.0	Core
SQLExecute	1.0	Core
SQLFetch	1.0	Core
SQLFreeConnect	1.0	Core
SQLFreeEnv	1.0	Core
SQLFreeStmt	1.0	Core
SQLGetData	1.0	Level 1
SQLGetInfo	1.0	Level 1
SQLGetTypeInfo	1.0	Level 1
SQLNumResultCols	1.0	Core
SQLPrepare	1.0	Core
SQLRowCount	1.0	Core
SQLSetConnectOption	1.0	Level 1
SQLSetParam	1.0	Core
SQLSetStmtOption	1.0	Level 1
SQLTables	1.0	Level 1
SQLTransact	1.0	Core

ODBC Configuration

The ODBC Data Adapter enables WebFOCUS to access data sources that do not have a native interface, for example, Excel or Microsoft Access. However, WebFOCUS does rely on the 32-bit ODBC Data Source Driver Manager and a 32-bit ODBC Data Adapter to access any ODBC-enabled data source. You must ensure that this software has been installed and configured correctly for the Windows workstation that will be used to access the data.

Before using WebFOCUS to access a data source using ODBC, you must do the following:

- Locate and purchase a 32-bit ODBC Data Adapter for the data source you want to access.
- Install the data adapter software using the install that comes with it.
- Use the 32-bit ODBC Data Source Driver Manager to configure the data adapter and add it to the list of available data sources.
- Configure the connection between WebFOCUS and the ODBC Data Adapter. See *Data Adapters Overview* in *Accessing Data*.

Additionally, as an optional step after configuring the ODBC Data Adapter, you can use the following syntax to control settings and connect to a specific ODBC data source. Note that most of the values set for each depend on the driver and data source you use. WebFOCUS does not set any defaults as each ODBC driver or data source expects different values. The only default set is for CONCUR, set to RONLY (for MS SQL this gets set to ROWVER). TIMEOUT and ISOLATION get set after establishing a connection with the source.

To set …	Setting	Possible values
The data source accessed	`SQL SQLODBC SET SERVER servername`	Any valid data source name
The user ID for data source access	`SQL SQLODBC SET USER`	User ID
The password for data source access	`SQL SQLODBC SET PASSWORD`	Password
How long the interface retries the connection to the data source	`SQL SQLODBC SET TIMEOUT n`	*n* is number of seconds
Concurrency control	`SQL SQLODBC SET CONCUR`	RONLY LOCK ROWVER VALUES
Isolation control	`SQL SQLODBC SET ISOLATION`	RU (Read Uncommitted) RR (Repeatable Read) SE (Serializable) VE (Versioning) RC (Read Committed)

Depending on the data adapter being used, additional steps may be required to allow your workstation to access the actual data source. Refer to the documentation that is supplied with the data adapter to determine when additional steps are needed.

Setting Up an ODBC Data Source

Before an application can access a data source using ODBC, the ODBC Administrator must be used to add the data adapter to the list of available data sources. The ODBC Administrator allows you to view available data adapters, as well as add and configure all the data adapters on your workstation.

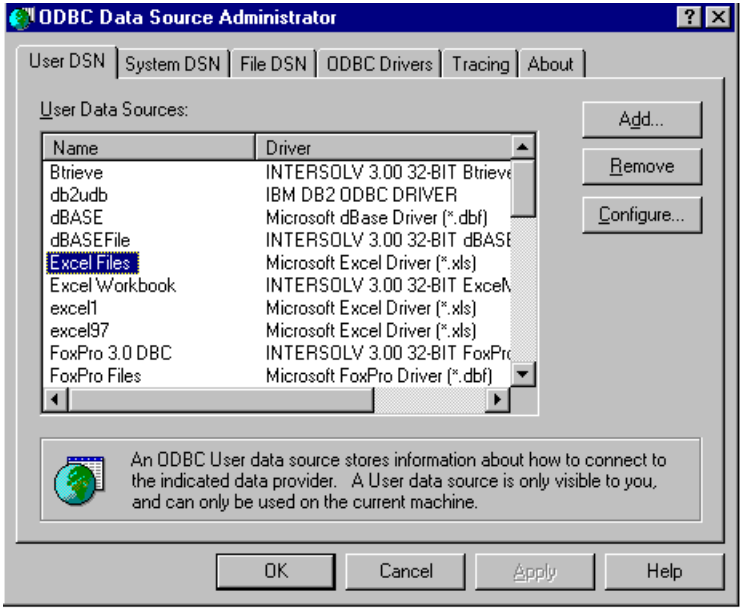
Note: WebFOCUS (Windows version) requires 32-bit ODBC drivers.

For full information on installing and configuring your data adapter, refer to the documentation accompanying the data adapter.

Procedure How to Use the ODBC Administrator to View Available Data Sources

To use the ODBC Administrator to view available data sources, locate and double-click the 32-bit ODBC Administrator icon:

This opens the ODBC Administrator application.



The location of the ODBC Administrator icon will vary for each driver. Common places include the folder for the data adapter (if one was created) or within the Control Panel.

The Data Source (Driver) list box shows all the currently available data sources. The name you gave the data source is shown first, with the data adapter that is being used shown in parentheses.

Procedure How to Use the ODBC Administrator to Create, Add, or Capture Available Data Sources

From the ODBC Administrator, you can use the following buttons to create, add, or capture data sources:

Button	Function
Drivers	To add additional drivers.
Add	To create a new data source using a driver that is already installed.
Setup	To configure a data source that has already been created. Configuration options vary for each driver but typically include such options as a default data source, user name, and password information.

Testing the ODBC Configuration

Since WebFOCUS uses the ODBC data source to access the ODBC data, it is important to confirm that the data source is installed and configured correctly before using WebFOCUS. If the ODBC data source is not set up correctly, WebFOCUS cannot access the data.

Unfortunately, there is no standard method of testing the ODBC configuration; you will have to check the documentation that accompanies your data adapter to determine the best testing mechanism.

Testing the ODBC Configuration Using Direct SQL Passthru

Although you can test the WebFOCUS access to the ODBC data source using the Report Painter, it is simpler to test the connection using Direct SQL Passthru. Direct SQL Passthru enables you to issue SQL commands from WebFOCUS and view the results using the report viewing window. Unlike the Report Painter, Direct SQL Passthru does not allow you to graphically create and format report requests.

Syntax How to Test the ODBC Configuration Using Direct SQL Passthru

To test the configuration using Direct SQL Passthru, you can use the following syntax in the Command Console, or from a procedure (FOCEXEC):

```
SET SQLENGINE=SQLODBC
SQL SQLODBC SET USER datasource-name/id,password
SQL SQLODBC SET SERVER datasource-source-name
SQL SQLODBC sql-statement
END
```

Note: In order to use a different data source, issue the following command:

```
SQL SQLODBC SET SERVER new-data-source-name
```

Example Testing the Oracle Server Using the SELECT Statement

Although you can issue any SQL statement, we recommend testing the connection using a basic SELECT statement on a known ODBC table.

For example, if you have a table named *course*, you could issue the following command from the Command Console:

```
SET SQLENGINE=SQLODBC
SQL SQLODBC SET user data_source/id,password
SQL SQLODBC SELECT * FROM course
END
```

If the ODBC data source is configured correctly and you have supplied the correct connection information, WebFOCUS will retrieve the information from the ODBC data source and display the results in the report viewing window.

Accessing an ODBC Data Source

When accessing ODBC data sources, you must provide the name of the data source that you wish to access, along with the user name and password for the data source (if applicable). WebFOCUS prompts for this information when you first access the ODBC data source.

As an alternative, you can provide the data source name, user name, and password prior to accessing the ODBC data source either by using the Servers tool on the toolbar or directly from a procedure (FOCEXEC). When you access the server using the Servers tool, the settings you provide will remain in effect for the duration of the session. If you connect to a different server, the new data overwrites the ODBC data source information. To access the ODBC data soruce again, you must reset the server settings.

Setting the server information in a procedure (FOCEXEC) enables you to access the server every time you run that procedure. Using a procedure to access the server eliminates the process of resetting the server information.

Procedure How to Set the Data Source, User Name, and Password to Access ODBC Data

1. To define the server settings from the toolbar, click the Servers button:

   The Server Settings dialog box opens.

2. Select ODBC from the Database Engine drop-down list.

   The required fields become active.

3. Enter the data source, username, and password.

Syntax How to Set the Data Source, User Name, and Password

You can use the following syntax to set the data source, user name, and password from the Command Console, or by using the Text Editor to create a procedure (FOCEXEC) that will be the first component to be executed when you run an application.

```
SQL SQLODBC SET USER data-source/username,password
```

Syntax How to Define Multiple SQL SQLODBC SET USER Commands to Access Multiple ODBC Data Sources

You can define multiple SQL SQLODBC SET USER commands in order to access multiple ODBC data sources.

1. Set the data source, user name, and password for each ODBC data source you wish to access. For example:

```
SQL SQLODBC SET USER data-source1/username1,password1
SQL SQLODBC SET SERVER data-source-name

SQL SQLODBC SET USER data-source2/username2,password2
SQL SQLODBC SET SERVER data-source-name
```

2. When multiple ODBC data sources are accessed simultaneously, in order to view the data sources, you must modify the Access File to include the SERVER= parameter. For example:

```
SEGNAME=FILEDESCRIPTION NAME (ALIAS)
TABLENAME=DESCRIPTION (FULL NAME)
SERVER=SERVERNAME
```

Data Type Conversion Chart

The ACTUAL keyword in a Master File allows the conversion of ODBC data types to the corresponding FOCUS data types. The ODBC data types and the corresponding FOCUS ACTUAL types are specified in the following chart.

ODBC Data Type	ODBC Data Type Number	ACTUAL Type	Description
Char	1	A*n*	Character string up to 254 characters.
Numeric	2	D8	Numeric containing decimal point.
Decimal	3	D8	Numeric containing decimal point.
Integer	4	I4	Integer up to 10 digits.
Smallint	5	I4	Integer up to 5 digits.
Float	6	D8	Numeric containing decimal point.
Real	7	D8	Numeric containing decimal point.
Double	8	D8	Numeric containing decimal point.
Date	9	DATE	Date.
Time	10	A*N*	Time.
Timestamp	11	A26	Date/Time.
Varchar	12	A*N*	Variable length string up to 254.
Longvarchar	-1	N/A	Variable length string.
Binary	-2	N/A	Binary fixed length up to 254.
Varbinary	-3	N/A	Binary variable length up to 254.
Longvarbinary	-4	N/A	Binary variable length.
Bigint	-5	N/A	Integer up to 19 digits.

ODBC Data Type	ODBC Data Type Number	ACTUAL Type	Description
Tinyint	-6	I2	Integer up to 3 digits.
Bit	-7	I2	Single bit binary data.

Note: Only the ODBC data types listed in this conversion chart are supported by the ODBC Data Adapter. The ODBC data types with corresponding ACTUAL types of N/A are not supported by the ODBC Data Adapter.

CHAPTER 6

Informix Data Adapter

Topics:

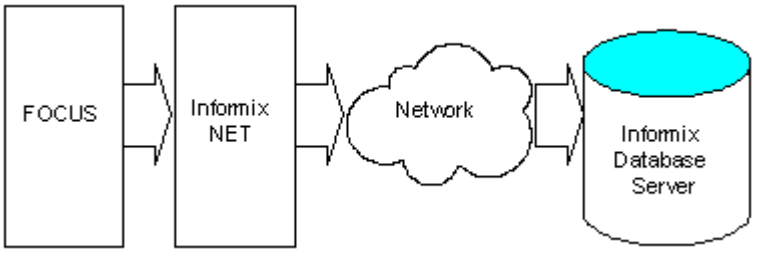
- Informix Client Software
- Supported Informix Environments
- Informix Configuration
- Accessing an Informix Data Source
- Data Type Conversion Chart

This topic provides introductory and setup information, and describes how WebFOCUS accesses data stored in Informix relational data sources.

The Informix Data Adapter enables WebFOCUS to directly access information stored in Informix relational data sources using the Informix-NET software for Windows.

Informix Client Software

The Informix-NET software for Windows allows Windows applications to access any Informix server on the network over a variety of network protocols, as illustrated in the following diagram.



Although WebFOCUS can also access Informix data using the ODBC Data Adapter and Microsoft's Open Database Connectivity (ODBC) solution, we recommend using the Informix Data Adapter since it provides faster performance.

Reference **Informix Data Adapter Limitations**

The following limitations apply specifically to the Informix Data Adapter:

- Informix is case sensitive. Therefore, you must supply data source and table names in the correct case. For example, if the table that you wish to access is in lowercase, you must type it in lowercase. This is particularly important when you enter commands at the Command Console prompt. For details, see *Using the Command Console* in *Application Development Getting Started*.
- When using Direct SQL Passthru, you must specify SQL commands in uppercase.

  You can execute Informix stored procedures using Direct SQL Passthru. However, WebFOCUS cannot display the answer set from a stored procedure.

Example **Specifying an SQL Command in Uppercase**

```
SQL SQLINF SELECT * FROM titles
END
```

Supported Informix Environments

Informix 7.x. The Informix Data Adapter accesses Informix data using the Informix-NET software provided by Informix. This software allows WebFOCUS to connect to and retrieve data from any Informix server on the network, provided the Informix-NET software has been installed and configured correctly for that server.

WebFOCUS (Windows version) has been tested at Information Builders with the Informix Online Workgroup server for Windows NT release 7.22 using Microsoft's TCP/IP protocol.

Informix Configuration

The Informix relational Interface is an integral part of WebFOCUS. Therefore, no additional WebFOCUS configuration steps are required to access Informix data. However, WebFOCUS does rely on the Informix-NET to access the Informix data. You must ensure that this software has been configured correctly for the Windows workstation that will be used to access the data.

Requirements for configuring a Windows workstation with the Informix-NET software will vary depending on the Informix server being accessed and the network protocol being used. Refer to the appropriate Informix documentation for details about configuring Informix-NET client software.

Testing the Configuration Using Direct SQL Passthru

Although you can test the WebFOCUS access to Informix data using the Report Painter, it is simpler to test the connection using Direct SQL Passthru. Direct SQL Passthru enables you to issue SQL commands from WebFOCUS and view the results using the Report Viewer. Unlike the Report Painter, Direct SQL Passthru does not allow you to graphically create and format report requests.

Syntax How to Test the Informix Configuration Using Direct SQL Passthru

To test the configuration using Direct SQL Passthru, enter the following command from the Command Console, or from a procedure (FOCEXEC) using the Text Editor:

```
SET SQLENGINE=SQLINF
SQL SQLINF SET DATABASE database-name
SQL SQLINF sql-statement
END
```

Note: Informix is case sensitive. See *Informix Data Adapter Limitations* on page 6-2 for details.

When connecting to the Informix server, WebFOCUS requires the data source name. (See *Accessing an Informix Data Source* on page 6-5 for details.)

Example Testing the Informix Server Using the SELECT Statement

Although you can enter any SQL statement, we recommend that you test the connection using a basic SELECT statement on a known SQL table.

For example, when connecting to an Informix server, you could access the sample data sources (if they have been installed) as follows:

```
SQL SQLINF SELECT * FROM authors
END
```

Note: Informix is case sensitive. See *Informix Data Adapter Limitations* on page 6-2 for details.

If the Informix-NET software has been installed correctly and you have supplied the correct connection information, WebFOCUS retrieves the information from the Informix server and displays the results in the report viewing window.

Accessing an Informix Data Source

When accessing Informix data sources, only the data source name is required to establish a connection with the server. WebFOCUS prompts you for this information in the Server Settings dialog box when you first access the Informix Server.

As an alternative, you can provide the data source name prior to accessing the Informix server either directly from a procedure (FOCEXEC), or by using the Servers tool on the toolbar. When you access the server using the Servers tool, the settings you provide will remain in effect for the duration of the session. If you connect to a different server, the new data overwrites the Informix server information. To access the Informix server again, you must reset the server settings.

Setting the server information in a procedure (FOCEXEC) enables you to access the server every time you run that procedure. Using a procedure to access the server eliminates the process of resetting the server information.

Procedure **How to Set the Database Name to Access Informix Data Sources**

1. To define the Server settings, click the Servers button:

   The Server Settings dialog box opens.
2. Select Informix from the Database Engine drop-down list.

   The required fields become active.
3. Enter the data source name.

Syntax **How to Set the Database Name for Informix Data Sources**

You can use the following syntax to set the data source name from the Command Console or by using the Text Editor to create a procedure (FOCEXEC) that will be the first component to be executed when you run an application.

```
SQL SQLINF SET DATABASE database
```

Note: Informix is case sensitive. See *Informix Data Adapter Limitations* on page 6-2 for details.

Data Type Conversion Chart

The ACTUAL keyword in a Master File allows the conversion of Informix data types to the corresponding FOCUS data types. The Informix server data types and the corresponding FOCUS ACTUAL types are specified in the following chart.

Informix Data Type	ACTUAL Type	Format Description
Serial	I4	Informix assigned positive sequential 4-byte integer up to +2147483647.
Char	A*n*	Fixed-length alphanumeric, not exceeding 254 characters.
Datetime	DATE	Date displayed in Informix server month, day, year, hour, minute and AM or PM format.
Float	D8	Numeric data that contains a decimal point.
Integer	I4	4-byte binary integer; values range from -2147483648 to +2147483647.
Money	D8	Numeric data that contains monetary values.
Decimal	D8	32 significant digits. (16 is the default.)
Smallfloat	F4	4-byte double-precision floating point number with 7 significant digits.
Smallint	I2	2-byte integer; values range from -32768 to + 32767.
Text	TX	Text fields greater than 256 characters, also known as CLOBs (Character-based Large Objects).

Note: Only the Informix server data types listed in this conversion chart are supported by the Informix Data Driver.

CHAPTER 7

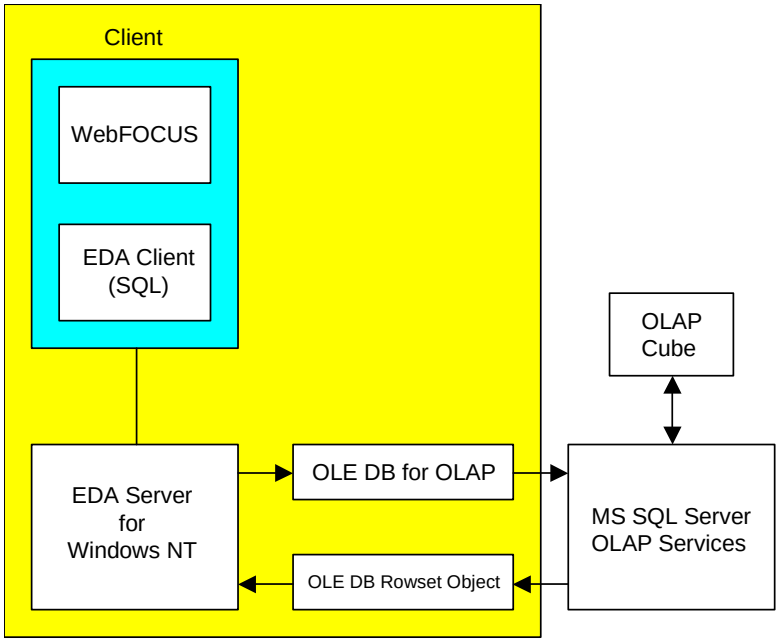
MS SQL Server OLAP Services Data Adapter

Topics:

The MS SQL Server OLAP Services Data Adapter provides read-only access to analytical data stored in Microsoft's SQL Server OLAP cubes. The data adapter is an OLE DB for OLAP consumer that use Multidimensional Data Retrieval (MDX) language to access aggregated or "rolled-up" data used for decision-support processing.

Using this data adapter to access MS OLAP cubes enables you to make OLAP data available to your entire enterprise. Additionally, data from SQL Server OLAP cubes can be joined with data from any other supported data source, providing additional information to your analytical process.

The following diagram illustrates the different components required by the MS SQL Server OLAP data adapter:



Prerequisites

The following software components are required to use the MS SQL Server OLAP data adapter:

- Microsoft SQL Server Version 7.0 or later with OLAP Services installed
- OLAP Services Client Components installed on the PC
- WebFOCUS configured with the MS SQL Server OLAP Services Data Adapter

OLAP Services Client Components Software

Part of the OLAP Services installation is the Client Components installation. This option installs client components and other related files which are required in order to retrieve data from an OLAP Server and perform local analysis and presentation of data from relational or multi-dimensional databases.

Configuring the MS SQL Server OLAP Services Data Adapter

Configuration of the MS SQL Server OLAP Services data adapter can be done during installation or after installation, by rerunning Setup and selecting the Configure only option. No additional configuration steps are required to access the OLAP data.

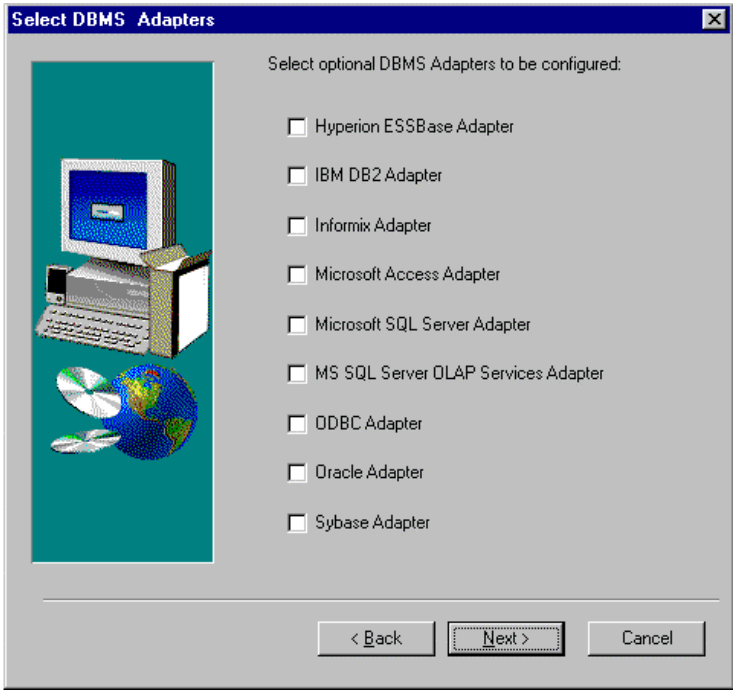
If your organization has several MS OLAP servers, you can manually configure for multiple MS SQL Servers with OLAP by editing the edasprof.prf global profile and adding the required information. This file is located in the x:\ibi\desktop436\conf\etc where *x* is the drive in which WebFOCUS (Windows version) is installed. For information on the syntax, see *How to Configure Access to Multiple OLAP Servers* on page 7-6.

Procedure **How to Configure Access to the MS SQL Server OLAP Services Data Adapter**

1. Click the MS SQL Server OLAP Services Data Adapter checkbox on the Select DBMS Data Adapters dialog box during the installation process.

   or

   Rerun Setup from the installation CD and select the Configure Only option then click the MS SQL Server OLAP Services Data Adapter checkbox on the Select DBMS Data Adapters dialog box.



2. Specify the following information to configure access to the Microsoft SQL Server OLAP Services data adapter:

Source Name. Enter the machine name in which the primary SQL Server OLAP Server is running.

Syntax How to Configure Access to Multiple OLAP Servers

To configure access to multiple OLAP servers, edit the EDA Server global profile, edasprof.prf and add the following line

```
SQL MSOLAP SET USER datasourcename
```

where:

datasourcename
Is the name of the machine where the secondary SQL Server OLAP Server(s) is running.

Note: If you configured MS SQL Server OLAP Services during installation, the edasprof.prf global profile already contains the engine settings for the primary OLAP server.

Testing the MS SQL Server OLAP Services Configuration

It is important to confirm that the OLAP Services client software has been configured correctly before attempting to access the MS OLAP server. If the OLAP Services client software is not configured correctly, you will not be able to access the MS OLAP server data.

Microsoft provides a utility called MDX Sample Application, which is installed as part of the OLAP Services Client Component Software, to help test the OLAP Services client software installation. MDX Sample Application enables you to try out multidimensional expressions (MDX) queries against an MS OLAP server and to use the provided source code as an aid to understanding how to create your own applications. For additional information, see the OLAP Services Client Component Software documentation.

Note: If MDX Sample Application is unable to connect to the MS OLAP Server, note any error messages. Before proceeding, correct the problem with the help of the Microsoft documentation and/or your network administrator.

Using the MS SQL Server OLAP Services Data Adapter

A Master File and Access File must exist for each OLAP cube you access. These data source descriptions provide the information necessary to locate, traverse, and navigate through the SQL Server OLAP cubes. It also provides information about data types, field lengths, field names, and more.

You can create data source descriptions using one of the following:

- **Create Synonym Wizard.** You can select SQL Server OLAP cubes from the appropriate data source on the OLAP server and automatically create synonyms, local metadata described by Master and Access Files. All synonyms created are saved to your PC. For information on using the Create Synonym Wizard, see *Creating Synonyms* in *Describing Data With Graphical Tools.*
- **Catalog Administrator.** A GUI tool, available only with the Developer Studio version of this product, which enables you to select the desired cubes from the appropriate databases on the OLAP server.

  When the data source descriptions are created, they are stored in the EDA Dynamic Catalog on the EDA Server and do not have to be recreated unless the data source structure changes. For additional information, see the *EDA Catalog Administrator* online help. For your convenience, this manual is included on your WebFOCUS (Windows version) CD.

  Note: This utility is available only with the Developer Studio version of this product.

MS SQL Server OLAP Services Data Adapter Limitations

The following are limitations of the MS SQL Server OLAP Services data adapter:

- Provides read-only access.
- Joins to other data types is not supported, unless data is stored locally using the HOLD command and then perform JOINs.
- Available only on Windows NT.

Accessing an MS OLAP Data Source

When accessing MS OLAP data sources, you must provide the name of the data source that you wish to access. You are prompted for this information when you first access the OLAP data source.

As an alternative, you can provide the data source name prior to accessing the OLAP data source either by using the Servers tool on the toolbar or directly from a procedure (FOCEXEC). When you access the server using the Servers tool, the settings you provide will remain in effect for the duration of the session. If you connect to a different server, the new data overwrites the OLAP data source information. To access the OLAP data source again, you must reset the server settings.

Setting the server information in a procedure (FOCEXEC) enables you to access the server every time you run that procedure. Using a procedure to access the server eliminates the process of resetting the server information.

Procedure How to Set the Data Source Name to Access OLAP Data

1. To define the server settings from the toolbar, click Servers:

   The Server Settings dialog box.

2. Select MS SQL Server OLAP Services from the Data Adapter drop-down list.

   The required field becomes active.

3. Enter the data source name.

Rollover Security for OLAP Cubes

When accessing OLAP cubes, the MS SQL Server OLAP data adapter respects the security that the OLAP Database Administrator specifies and applies that security to catalogs and cubes using the SQL Server OLAP Services. Although the client establishes the connection to the SQL Server OLAP Server, impersonation of the client is used to maintain access rights.

The user ID and password of the Interactive user (person logged onto a Windows NT Server or Workstation) is passed to the SQL Server OLAP Server to establish a connection and access rights. This is the logon ID specified for the Windows NT Server or Windows NT Workstation after it was first started.

CHAPTER 8

EDA Data Adapter

Topics:

- Distributed Client/Server Methodologies
- Verifying EDA Data Adapter Configuration
- How the EDA Data Adapter Works
- Logging on to the EDA Server
- User Environment for Client/Server Access
- Performing Cross-Platform Joins
- Managing the EDA Connection
- Logging Off From the EDA Server
- EDA Data Adapter Limitations

The EDA Data Adapter enables WebFOCUS to access an EDA Server using client/server technology.

Distributed Client/Server Methodologies

By using the EDA Data Adapter, you can apply either of two distributed methodologies when creating your client/server application:

- **Distributed Data Access.**

  With this method, the EDA Server is used as a data server, providing access to one or more data sources. The server delivers data to the WebFOCUS (Windows version) client, where all processing of business and presentation logic takes place. This methodology requires a Master File for the data source that is available to the EDA Server. You can create this Master File and its corresponding Access File using the Create Synonym Wizard. For details see *Creating Synonyms* in *Describing Data With Graphical Tools.*

  The Master File that the wizard creates contains the attribute SUFFIX=EDA, which indicates that the EDA Data adapter will be used to find and access the EDA Server based either on parameters in the Access File or on adapter settings.

  Once you have set up your Master File and Access File and configured your adapter settings, you can use graphical tools, such as Report Painter and Report Assistant, to create reports that access remote data just as if it were local data.

  You can also use this method to join data sources across platforms. For example, you can issue a join query against two Master Files, one pointing to a data source that resides on an MVS server and the second to a data source that resides on a UNIX server. For details see *Performing Cross-Platform Joins* on page 8-11.

- **Remote Execution.**

  With this method, the EDA Server shares in the processing of business logic, leaving WebFOCUS (Windows version), with its more robust formatting capabilities, to process the presentation logic. This methodology requires the use of remote syntax. The commands and procedures for which the remote syntax applies are routed to an EDA Server based on data adapter settings. For details see *Remote Execution via EDA and WebFOCUS Servers* in *Accessing Data*.

Verifying EDA Data Adapter Configuration

Before using the EDA Data Adapter to access the EDA Server, you must confirm that the data adapter has been configured correctly. If the adapter has not been configured correctly, WebFOCUS (Windows version) will not be able to access the EDA Server.

Configuration of the EDA Data Adapter is dependent on the proper configuration of your EDA Client software. EDA Client is automatically installed during the WebFOCUS (Windows version) installation. Proper configuration of the EDA Data Adapter and EDA Client are handled by the Setup program, which displays the EDA Outbound Communications dialog box.

See the *EDA Client for Windows 32-bit* manual for more information. For your convenience, this manual is included on your WebFOCUS (Windows version) CD.

Testing the EDA Relational Data Adapter

Once you have configured the EDA Data Adapter, you can test its ability to access the EDA Server before creating any part of the application.

Syntax How to Issue SQL Commands to the EDA Server From the Command Console

From the Command Console, issue the following commands:

```
SQL EDA
SELECT * FROM data_source;
END
```

where:

data source
Is a data source located on the EDA Server.

Press Ctrl + Enter to run the request on EDA the server. The output appears in the Report Viewer.

Example Issuing SQL Commands to the EDA Server

Issue the following SQL command from the Command Console:

```
SQL EDA
SELECT * FROM SYSTABLE;
END
```

SYSTABLE is a standard EDA Catalog table, which lists the data source tables available to the EDA Server.

Press Ctrl + Enter to run the request on EDA the server and view your output in the Report Viewer.

Syntax How to Execute a Remote Procedure

In addition to making data available to the client, an EDA Server can maintain and process stored procedures, which are considered to be remote procedures when executed from the WebFOCUS (Windows version) client.

Issue the command

```
SQL EDA
EX rpcname parm1, parm2, ...
```

where:

rpcname

Is a procedure on the EDA Server.

parm1, parm2,...

Are parameter values that are sent to the server for execution with the remote procedure that is specified in the request.

Example Executing a Remote Procedure Call

Issue the following SQL command from the Command Console:

```
SQL EDA
EX EDAEXEC '? Rel';
END
```

EDAEXEC is a standard stored procedure provided on EDA Servers. If EDAEXEC is available, the request evaluates the parameter string '? Rel' and displays, in the Output window, the EDA Release signature for the EDA Servers using the current EDA Data Adapter settings.

How the EDA Data Adapter Works

The following attribute in a Master File

```
SUFFIX=EDA
```

directs a request to the EDA Data Adapter, which sends the request to an EDA Server.

The name of the server can either be stored in the Access File or established by the following command:

```
SQL EDA SET SERVER servername
```

The following is an example of an Access File (EMPLOYEE.ACX) with a server name (SERVER=EDASERVE):

```
SEGNAME= EMPLOYEE,TABLENAME=EDADBA.
EMPLOYEE,KEYS=5,WRITE=YES,SERVER=EDASERVE,$
```

A server name in an Access File overrides a name specified in the SQL EDA SET SERVER command. You can also remove the SERVER parameter from the Access File and control the server location with the SQL EDA SET SERVER command. For more information see *Access File* on page 8-6.

When the Master File that describes a data source contains the attribute SUFFIX=EDA, all of the WebFOCUS (Windows version) graphical tools (for example, the Report Painter) can operate and manipulate the data from the remote EDA Server as if they were local data sources. The output from EDA data can be styled and converted to any supported HOLD format.

Generally, you need to create Master Files and Access Files only once on the client workstation. You need to regenerate them only if the structure of the data source on the server changes.

You can create a Master File for the EDA Server tables using the Create Synonym Wizard, which enables you to add an EDA Server table to the list of available data sources. It accesses the EDA Server and copies the Master File from the server automatically. For details about the wizard see *Creating Synonyms* in *Describing Data With Graphical Tools.*

In addition, with the EDA Data Adapter your queries can join fields in EDA data sources residing on different platforms. For details see *Performing Cross-Platform Joins* on page 8-11.

Syntax

Access File

The Create Synonym Wizard creates an Access File with the following syntax

```
SEGNAME=TABLE, TABLENAME=qualifier.creator.table,
  KEYS=n, WRITE=YES, SERVER=servername, KEYORDER=order
```

where:

table
Is the name of the EDA table. (One, two, and three-part table names are fully supported. The full table name is used in the Access File generated by the Create Synonym Wizard.)

qualifier
Is the qualifier for the table. This value may not be present if the data source does not have a qualifier.

creator
Is the creator or owner name for the table. This value may not be present if the data source does not have a creator name.

n
Indicates how many columns constitute the primary key for the table.

servername
Identifies the EDA Server on which your data resides.

order
Identifies the logical sort sequence of data by the primary key.

Logging on to the EDA Server

Before you can communicate with the EDA Server, you must log on. Logon is achieved in one of several ways:

- Click the Servers button on the toolbar to display the Server Settings dialog box and enter the required logon information. For more information see *How to Logon to the EDA Server (Server Settings Dialog Box)* on page 8-8 and *Server Settings Dialog Box* in *Data Adapter Overview* under *Accessing Data*.

  This method puts SQL EDA settings in memory so that subsequent requests for distributed data access or remote execution will use these server settings, unless they are overridden by server information in the Access File. This method is particularly useful for testing server connections during a session. When you close WebFOCUS (Windows version), you lose the connectivity.

  Note: To save system resources, WebFOCUS (Windows version) defers server logon until you make a processing request against the server. This means that if the "credentials" typed into the Server Settings dialog box are not valid, or if the server is not "up," you will not receive an error message until you make your first processing request.

- Include the SQL EDA settings in your WebFOCUS (Windows version) profile (PROFILE.FEX), which is executed automatically each time you enter. Note that if you are using this method, you may wish to access the Server Settings dialog box to reset server information for the current session.

- Include the SQL EDA settings in an application's startup procedure. This method provides SQL EDA application portability since your server settings are run every time the application runs, whether from WebFOCUS (Windows version) or in a run-time application.

Procedure How to Logon to the EDA Server (Server Settings Dialog Box)

1. To establish Server settings for the current session, click the Servers button on the toolbar

   or choose Servers from the Command menu. The Server Settings dialog box opens.

2. From the Database Engine list, choose:

   - EDA Relational Gateway to access data on an EDA Server via the EDA Data Adapter (distributed data access). With this method, the EDA Server is used as a data server, providing access to one or more data sources, as if they were local data.

     Note that accessing the EDA Server through the EDA Relational Gateway requires a local Master File with the attribute SUFFIX= EDA, which you can create with the Create Synonym wizard.

   - EDA Server to access and process data on an EDA Server via the EDA Data Adapter. This method requires the use of remote syntax. The commands and procedures for which the remote syntax applies are routed to an EDA Server based on data adapter settings. This selection also sets the LINKMODE parameter to EDA, indicating a direct connection to the EDA Server. For details see *Remote Execution via EDA and WebFOCUS Servers* in *Accessing Data*.

     Note that direct access to the EDA Server requires a local Master File with the attribute SUFFIX= FPA, which you can create with the Synonym Wizard.

   For related information see *Creating Synonyms* in *Describing Data With Graphical Tools.*

3. Enter a server name, user ID, and password and click OK.

Syntax

How to Log on to an EDA Server Using SQL EDA SET Commands

You can log on to an EDA Server using SQL EDA SET commands. These commands can be issued in a WebFOCUS (Windows version) profile or application startup procedure.

The SET SERVER command sets the server destination (as an alternative to placing the server name in the Access File).

The SET USER command sends a user id and password to the server. This command does not affect the EDA Server to which requests are directed; it simply associates a user id and password with a particular EDA Server.

The syntax is

```
SQL EDA SET SERVER servername
SQL EDA SET USER servername/userid,password
```

where:

servername
Is the EDA Server name. It must match the SERVER keyword in the ODIN.CFG file Partner Block.

servername
Is the server with which you want to associate this user ID and password.

userid
Is the user ID.

password
Is the password.

See the *EDA Client for Windows 32-bit* manual for more information. For your convenience, this manual is included on your WebFOCUS CD.

Syntax How to Turn Automatic Logon On and Off

If you have not included SQL EDA SERVER commands in your WebFOCUS profile or in an application's startup procedure, or set the corresponding information in the Server Setting dialog box, you are automatically prompted for logon information prior to accessing the EDA Server. This behavior is controlled by the default AUTOLOGON=ON setting.

Under some circumstances this automatic logon procedure might not be desirable (for example, for unattended batch processing where a logon failure message is preferable to having FOCUS wait for a user to supply a user id and password). To turn AUTOLOGON on and off, issue the command

```
SET AUTOLOGON = [ON|OFF]
```

where:

ON

If you have not included server settings in the WebFOCUS profile or application startup file, this setting displays the Server Settings dialog box the first time you send a request to the server. (It will not appear for subsequent requests since the settings are retained in memory.) ON is the default setting.

OFF

Suppresses the Automatic Logon feature.

User Environment for Client/Server Access

Once you have established your data adapter settings and connected to the EDA Server, your user environment is controlled by settings in the EDA Server's Global or User profile. However, an EDA Server administrator can customize the Global or User profile settings for your working environment. For more information on establishing the user environment on the EDA Server, see the EDA Server manuals.

Performing Cross-Platform Joins

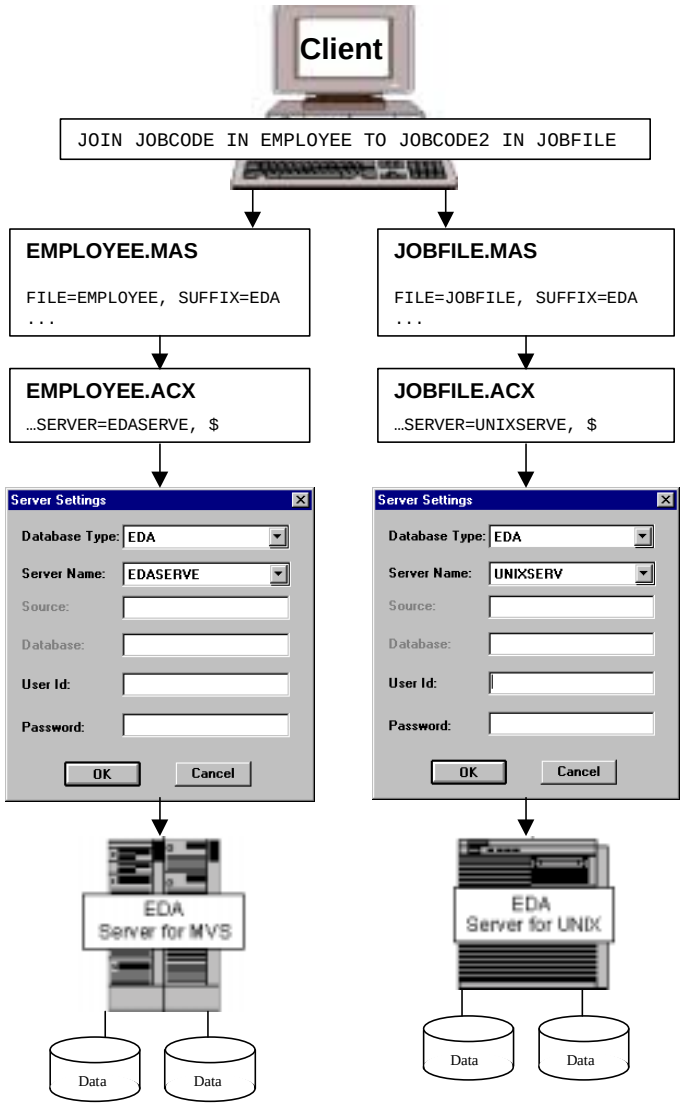
You can use the EDA Data Adapter to join files that reside on different platforms. The figure below illustrates how the EMPLOYEE file, residing on an MVS system, and the JOBFILE file, residing on a UNIX system can be joined.

- SUFFIX=EDA in the Master File points to the EDA Data Adapter.
- The EMPLOYEE.ACX file points to the EDASERVE server.
- If AUTOLOGON is on, and you have not previously issued the SQL EDA SET USER command for EDASERVE, the Server Settings dialog box opens.
- The JOBFILE.ACX file points to the UNIXSERVE server.
- If AUTOLOGON is on, and you have not previously issued the SQL EDA SET USER command for UNIXSERVE, the Server Settings dialog box opens.

For more information on joins, see *Joining Data Sources* in *Creating Reports With Graphical Tools.*

Note: The EDA Data Adapter works faster if you join the smaller file to the larger file. This is because the data adapter makes one SQL call to the first file, and then make one SQL call to the second file for each value of the referenced field.

The following diagram illustrates cross-platform joins.



Managing the EDA Connection

WebFOCUS uses only one connection to each EDA Server, regardless of the type of activity being performed against the server. Activities can be any combination of:

- EDA Data Adapter requests (SUFFIX=EDA).

  and

- Remote Execution requests. See *Remote Execution via EDA and WebFOCUS Servers* in *Accessing Data*.

You can explicitly terminate connections to an EDA Server at any time using REMOTE FIN or you can terminate connections implicitly using SQL EDA SET AUTODISCONNECT.

Logging Off From the EDA Server

The REMOTE FIN command logically terminates a session with an EDA Server. You should issue it at the conclusion of remote execution before issuing a general FIN command or exiting WebFOCUS (Windows version).

Syntax

How to Log Off From an EDA Server Using REMOTE FIN

The syntax is:

```
REMOTE FIN
```

The server should be available when you issue this command.

EDA Data Adapter Limitations

WebFOCUS supports decimal numbers up to a maximum length of 16 digits. If you are accessing an EDA Server with decimal columns larger than 16 digits, the following occurs:

- The Create Synonym Wizard describes the large decimal columns with the largest possible number of digits. For example, a large decimal number column of 28 digits is described as D16.
- When retrieving data:
  - If the data value does not exceed 16 digits, the data is displayed in the reports.
  - If the data value exceeds 16 digits, the overflow (*********) character is displayed in the column for that record.

CHAPTER 9

Remote Execution via EDA and WebFOCUS Servers

Topics:

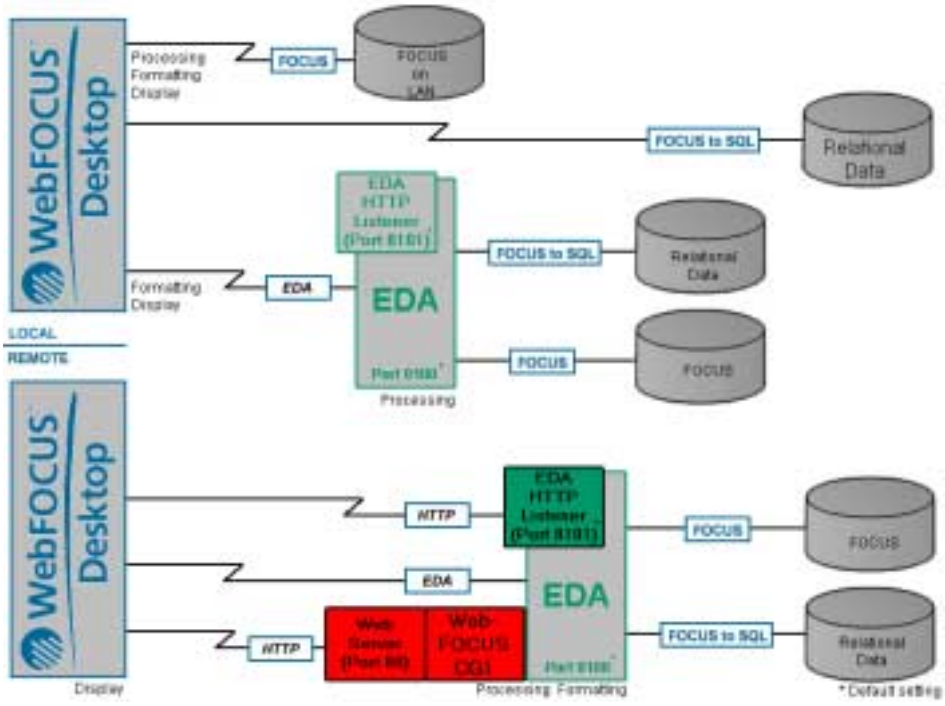
- Choosing a Remote Execution Option
- Setting WebFOCUS for Remote Execution
- Secure EDA and WebFOCUS Servers
- Flagging Reports and Applications for Remote Execution
- Sending a Request to the Server
- Using WebFOCUS Resource Governor With Remote Execution

WebFOCUS provides users with multiple ways to access and process their data:

- Local execution (where all data access and processing occur on the local machine). For details, see topics on specific data adapters in *Accessing Data* and *Creating a Reporting Application* in *Developing Reporting Applications*.
- Distributed data access via the EDA Data Adapter (where the server is used primarily for data access, and requests are processed on the local machine). For details see *EDA Data Adapter* in *Accessing Data*.
- Three remote execution options that take full advantage of client/server and web architectures. With these methods, all work (data access and processing) is done on the server and the answer set is returned to the Desktop Viewer. These options are controlled by a LINKMODE setting that specifies your data access method as:
  - EDA: distributed remote execution via the EDA Data Adapter. This method accesses the EDA Server directly. See *EDA Data Adapter* in *Accessing Data* for details.
  - HTTP: Web-based remote execution, which accesses the EDA server by way of the WebFOCUS CGI.
  - HTTP: Web-based remote execution which accesses the EDA server by way of the EDA HTTP Listener.

When using remote execution options from WebFOCUS (Windows version) you have access to the data and stored procedures available to the EDA Server.

Reference **Diagram Illustrating Local, Distributed, and Remote Execution Options**



Choosing a Remote Execution Option

The following descriptions may help you determine which remote execution method or methods best suit your needs:

- LINKMODE=EDA provides remote execution through a direct, persistent connection to the EDA Server. With a persistent connection, Joins, Virtual fields (Defines), String Substitutions (Lets), etc. stay in effect from one server request to the next.

  To use LINKMODE=EDA, you must define and maintain information about your outbound nodes (that is, the EDA Servers you are connecting to) in the ODIN.CFG file. This method, which uses the EDA Data Adapter to manage your connection to the EDA Server, is required for distributed data access (SUFFIX=EDA) and also supports remote execution. See *EDA Data Adapter* in *Accessing Data* for details.

- LINKMODE=HTTP via the EDA HTTP Listener provides remote execution through a non-persistent connection. The EDA HTTP Listener is delivered as part of your EDA Server software, so no additional purchase is required.

  This method supports remote execution, but not distributed data access (SUFFIX=EDA).

- LINKMODE=HTTP via the WebFOCUS CGI provides remote execution through a non-persistent connection. WebFOCUS (Windows version) accesses the EDA Server by way of the WebFOCUS CGI. The WebFOCUS CGI is an item purchased separately and must be installed and configured for a web server.

  This method supports HTML report format with on-demand paging, analysis through the OLAP Control Panel, and access to the WebFOCUS Managed Reporting Environment. It also supports remote execution, but not distributed data access (SUFFIX=EDA).

HTTP is the default LINKMODE setting, as indicated in the EDASPROF.PRF file. For HTTP connections, the servers you configure are defined in the Server Setting dialog box or via REMOTE commands. You do not need to maintain server information in the ODIN.CFG file.

Note also that both HTTP-based methods offer better support for multi-user environments since their non-persistent connections minimize system resource requirements at the EDA Server.

Setting WebFOCUS for Remote Execution

Whether you wish to report against an EDA Server via the EDA Data Adapter or via HTTP, you must configure WebFOCUS for connectivity to the EDA Server. You can do this using the Server Settings dialog box or by adding SET commands to your profile (PROFILE.FEX) or to an application's startup procedure.

Procedure How to Set Server Options in the Server Settings Dialog Box

The Server Settings dialog box prompts you for the information required by the type of server (database engine) you select. Based on your selections, the Servers Settings dialog box automatically sets LINKMODE for you.

1. Click the Servers button on the Main toolbar. The Server Setting dialog box opens.
2. Enter the information required for the remote execution option you wish to use:

   To connect directly to the EDA Server, enter the following information in the Server Settings dialog box:

Database Engine	Select EDA Server.
Server	Choose a server from the drop-down list, which displays all servers configured in your ODIN.CFG file.
Username and Password	Enter your user identification.

   See *EDA Data Adapter* in *Accessing Data* for details.

   To connect to the EDA Server via the HTTP Listener, enter the following information in the Servers Setting dialog box:

Database Engine	Select WebFOCUS.
Server	Choose a server from the drop-down list or enter a new server.
Username and Password	Enter your user identification.
Port	Usually, set to 8101.

   To connect to the EDA Server via the WebFOCUS CGI, type or select the following information in the Servers Setting dialog box:

Database Engine	Select WebFOCUS.
Server	Choose a server from the drop-down list, or enter a new server.
Username and Password	Enter your user identification.
Port	Usually, set to 80.

In addition to setting LINKMODE to HTTP, WebFOCUS (Windows version) also sets the CGIPATH based on information it retrieves from the FOCSHELL.INI file. If you enter a new server, by default the CGIPATH is set as follows:

```
/cgi-bin/ibi_cgi/ibiweb.exe
```

To override the default CGI path and executable name, issue the following command:

```
REMOTE CGIPATH=(cgi path)
```

3. Click OK.

How to Set Server Options in a Procedure

Syntax

Include the following code in the procedure prior to the remote execution command (either, REMOTE EX or REMOTE -BEGIN).

- To connect directly to the EDA Server, issue the following commands:

  ```
  SET LINKMODE = EDA
  REMOTE DEST= server name/username, password
  ```

  See *EDA Data Adapter* in *Accessing Data* for more information about connecting directly to an EDA Server.

- To connect to the EDA Server via the EDA HTTP Listener, issue the following commands:

  ```
  SET LINKMODE = HTTP
  REMOTE DEST= [server name]
  REMOTE USER = [username]
  REMOTE PASSWORD = [password]
  REMOTE SERVICE=[port number](usually 8101)
  ```

- To connect to the EDA Server via the WebFOCUS CGI, issue the following commands:

  ```
  SET LINKMODE = HTTP
  REMOTE DEST= [server name]
  REMOTE USER = [username]
  REMOTE PASSWORD = [password]
  REMOTE SERVICE=[port number](usually 80)
  ```

- As a variation on the connection to EDA through the WebFOCUS CGI, you can connect through the WebFOCUS CGI to an EDA Server, and then to an additional EDA Server for three-tier reporting (see *Diagram Illustrating Local, Distributed, and Remote Execution Options* on page 9-2 for a visual represenation).

- To do so, issue the command

  ```
  REMOTE EDANODE=(node name)
  ```

  where:

  server name
  Is the name of the EDA Server to be accessed.

  username
  Is the name of a valid EDA Server user.

  password
  Determines whether the identified user is authorized to access the EDA Server.

  port number
  Indicates the port to which you are connected, usually 80 for the WebFOCUS cgi (the default) or 8101 for the HTTP Listener.

  node name
  Is the name of the remote EDA node. Blank, the default setting, indicates that WebFOCUS should use its default EDA Server.

  Tip:

  When used in Managed Reporting, the LINKMODE option should be set in the profile domain. A Managed Reporting administrator can also initiate remote execution of a reporting object or standard report on either an EDA Server or a WebFOCUS Server. See the *Administrator's Reference* for details.

Syntax How to Invoke the Server Settings Dialog Box From a Procedure

You can prompt in advance for user "credentials" during the execution of a procedure so they can be set up prior to accessing secure EDA or WebFOCUS servers. To invoke the Server Settings dialog box at any point in a procedure, include the REMOTE SIGNON command in your code:

```
REMOTE SIGNON
-REMOTE BEGIN
? REL
-REMOTE END
```

For related information see *How to Turn Automatic Logon On and Off* in *EDA Data Adapter* under *Accessing Data*.

Secure EDA and WebFOCUS Servers

WebFOCUS provides full support for secure EDA and WebFOCUS Servers. WebFOCUS security can include up to three layers depending on how your administrator has implemented security and which WebFOCUS products you use.

- **EDA Server.** Controls access to a secure EDA Server.

  To access a secure EDA Server, you must enter the correct user name and password in the Server Settings dialog box where prompted. For details see *Server Setting Dialog Box* in *Data Adapter Overview* under *Accessing Data*.

- **Web Server.** Controls access to the Web Server over HTTP.

  Two WebFOCUS variables control Web Server security:

  - `REMOTEWEBUSER` Web Server user ID
  - `REMOTEWEBPASS` Web Server user password

  By default these variables are not set. WebFOCUS prompts users for a user ID and password only if security is set on.

Flagging Reports and Applications for Remote Execution

You can "flag" an individual report or an entire application to run remotely on an EDA or WebFOCUS server. When a flagged report or application is run, WebFOCUS sends the report to the server you are connected to. The report is processed at the server, and output is returned to your desktop. You can set flags for remote execution as follows:

- Any WebFOCUS user can set an existing procedure to run remotely.
- A WebFOCUS developer or administrator can flag an entire application to run remotely.

  Tip:

  We recommend this method only after an application has been built and tested.
- A Managed Reporting administrator can set the following to run remotely:
  - An entire domain. This setting includes all standard reports and reporting objects.
  - Standard reports.
  - Reporting objects.

  Note: Using the remote option with a WebFOCUS Server does not allow you to save WebFOCUS reporting objects to the WebFOCUS Server or to administer a WebFOCUS Managed Reporting repository. The remote option simply uses the WebFOCUS server to run reports.

Sending a Request to the Server

You can send a request from the client PC to the server in several ways:

- From the Explorer or from a graphical reporting tool.
- By including the commands -REMOTE BEGIN and -REMOTE END around the procedure code that you want to send to the server.
- From the Command Console.

You can execute a remote procedure call within a procedure or from the Command Console.

For more information on remote execution of applications and procedures see *Creating a Reporting Application* and *Creating a Reporting Procedure* under *Developing Reporting Applications*.

Procedure Running Reports and Applications Remotely

To run a procedure that has been flagged for remote execution, simply:

- Select a procedure or an application and click the Run button or pick Run from a menu.

  or

- In a reporting tool (Report Painter, Report Assistant, or Graph Assistant), choose Run from the File menu.

  WebFOCUS automatically sends flagged procedures or applications to a remote server for processing.

To run a report remotely from a reporting tool, even if it has not been explicitly flagged for remote execution, select Run Remote from the File menu.

Similarly, to run a report locally from a reporting tool even if it has been flagged for remote execution, select Run Local from the File menu in the Report Painter, Report Assistant, or Graph Assistant.

The original setting (whether local or remote) is temporarily overridden, then reinstated for future use.

Procedure How to Create Styled Reports Using Remote Execution

To create a styled report in the Report Painter using Remote Execution, follow these steps:

1. In the Report Painter, choose Hold Data from the Report menu.

   The Hold dialog box opens.

2. In the Hold dialog box, select PCHOLD. Click OK.

3. Run the report.

   A HOLD file is created. By default, the Master File is named HOLD.MAS and the data source is named HOLD.FTM.

4. Exit the Report Painter and update your procedure (FOCEXEC) when prompted.

5. Open the HOLD file in the Report Painter, and style your report using the Report Painter's robust styling capabilities. For details see *Creating Reports With Report Painter* in *Creating Reports With Graphical Tools.*

   Tip:

   To generate styled report output directly, use remote execution or remote HTTP.

Syntax How to Execute a Procedure Using -REMOTE BEGIN and -REMOTE END

To execute a report remotely from a coded procedure, enter the -REMOTE BEGIN and -REMOTE END commands around the code you want executed by the server, and then run the procedure.

```
-REMOTE BEGIN
.
.
.
-REMOTE END
```

Reference Usage Notes for -REMOTE BEGIN and -REMOTE END

Using -REMOTE BEGIN and -REMOTE END provides two advantages:

- The syntax for invoking a remotely executed procedure does not differ from the syntax for executing a local procedure.
- The developer can segment one procedure into separate components; each component may be executed remotely or locally.

Keep the following issues in mind:

- When developing procedures for reporting applications, you can use multiple -REMOTE BEGIN and -REMOTE END pairs in the procedure. However, you cannot nest -REMOTE BEGIN and -REMOTE END pairs.
- A -RUN command must be located between a -REMOTE BEGIN and -REMOTE END command pair. All FOCUS commands preceding the -RUN are sent to, and executed on the server. Commands following the -RUN are placed on the FOCSTACK after control returns from the server to the PC. These commands are executed on the server when -REMOTE END is encountered.
- If you plan to execute a request using the Remote Exec, Run Remote, or REMOTE EX commands, do not use -REMOTE BEGIN and -REMOTE END.

Example Executing a Request With -REMOTE BEGIN and -REMOTE END

The following example demonstrates the use of a Dialogue Manager amper variable (&1) with FOCUS commands. The request, named MARGIN.FEX, executes a JOIN and report request on the server. The numbers on the left refer to the notes that follow.

```
1.  -REMOTE BEGIN
2.  JOIN PROD_CODE IN &1 TO PROD_CODE IN PROD AS AJOIN
    TABLE FILE &1
    PRINT UNIT_SALES
    AND COMPUTE
    MARGIN/D8.2= RETAIL_PRICE - UNIT_COST;
    BY STORE_CODE BY PROD_CODE
    END
3.  -REMOTE END
```

1. -REMOTE BEGIN identifies the beginning of the commands to be executed on the server. Any commands already on the FOCSTACK are executed when -REMOTE BEGIN is encountered.

2. The request includes FOCUS commands and an amper(&) variable.

3. -REMOTE END identifies the end of the commands to be executed on the server.

You execute MARGIN.FEX on the PC, providing the name of the data source as an argument on the command line. For example, to obtain the margin report for the SALES file, issue the command:

```
EX MARGIN SALES
```

SALES is substituted for the Dialogue Manager variable &1 in the JOIN and TABLE commands, and the commands then execute on the server. The resulting report is returned by the server and displayed in a report viewing window on your PC.

Executing Remote Procedure Calls

In addition to making data available to the client, both the EDA Server and WebFOCUS can maintain and process *stored procedures*, which are considered to be remote procedures when executed from the WebFOCUS client. You can use remote execution commands to execute stored procedures or to dynamically send a procedure located on the desktop to the server for execution.

Syntax How to Execute Remote Procedure Calls

You can use the EDA Server to execute a procedure using the following techniques:

- Issue the command

  ```
  REMOTE EX pc_focexec
  ```

  where:

  pc_focexec
  Is a FOCUS procedure located on the desktop containing a command for the server to execute.

- Issue the commands

  ```
  -REMOTE BEGIN
  EX server_focexec
  -REMOTE END
  ```

  where:

  server_focexec
  Is a procedure stored at the EDA Server.

- Issue the commands

  ```
  SQL EDA
  EX rpcname parm1, parm2, ...
  ```

  where:

  rpcname
  Is a procedure stored at the EDA Server.

  parm1, parm2,...
  Are parameter values that are sent to the server for execution with the remote procedure that is specified in the request.

Example Executing a Request Remotely From the Command Console

The following example shows a procedure called EDHOURS executed from the Command Console with the REMOTE EX command.

```
REMOTE EX EDHOURS
```

EDHOURS contains the following request:

```
TABLE FILE EMPLOYEE
  HEADING CENTER
  "SUMMARY REPORT OF EMPLOYEE CLASSROOM HOURS"
  " "
  SUM ED_HRS BY EMP_ID
END
```

Any request that you execute this way need not contain the commands -REMOTE BEGIN and -REMOTE END. These commands are issued automatically by REMOTE EX.

Saving Output Generated From Remote Execution

You can save the results of a remotely executed request by including a PCHOLD command in the request to hold the data in an extract file on the PC.

Example Saving Request Output

In the following example the procedure executes on the server using remote execution. The numbers on the left refer to the notes that follow.

```
1.  -REMOTE BEGIN
    TABLE FILE EMPLOYEE
      PRINT EMP_ID CURR_SAL CURR_JOBCODE
      IF DEPARTMENT EQ 'MIS'
2.  ON TABLE PCHOLD FORMAT WP
    END
    -REMOTE END
```

1. When the user executes this procedure on the PC, the -REMOTE commands send the report request to the server, where it is executed.
2. The output from the report request is saved in an extract file named HOLD and shipped to the PC. The extract file is created in WP (word processor) format, which can be read by any text editor.

Special Considerations for Remote Execution

Keep the following conventions and caveats in mind:

- During execution, you can minimize WebFOCUS, or switch to another application using Alt+Tab or the task list. This enables you to do other things during communication with the server.
- Requests that are executed with the Run Remote option should not contain the commands -REMOTE BEGIN and -REMOTE END. Those commands are issued automatically.
- Remote Execution supports long fieldnames (that is, fieldnames greater than 12 characters) for data sources located on an EDA or WebFOCUS Server. As a prerequisite, you must issue the command

  ```
  SET FIELDNAME = NEW
  ```

  prior to retrieving values for fieldnames greater than 12 characters. NEW is the default. (Note that this is required when PCHOLDing a data source with fieldnames greater than 12 characters.)
- If you are accessing WebFOCUS through HTTP, the output is displayed in the Desktop Viewer.
- For remote execution under VM/CMS, the Master File must reside on an accessible minidisk of the server for report requests.

  For remote execution under MVS/TSO and MVS VTAM, Master Files must be stored in a partitioned dataset allocated to the ddname MASTER. This allocation should reside on the MVS server JCL or VM/CMS server EXEC for LU6.2 configurations, or on the startup CLIST for LU2 configurations. For more information, see the documentation for the server.
- You can use any combination of requests, FOCUS commands, and Dialogue Manager statements in a procedure, with the following exceptions:
  - Interactive FOCUS commands, such as CRTFORM and PROMPT, cannot be included in procedures processed through remote execution.
  - Partial FOCUS requests cannot be executed using remote execution; every request must finish with the END command.
- All Dialogue Manager statements are executed on the PC.
- You can use all FOCUS commands that are available with a release and are also compatible with the server.
- Reports generated via remote execution can use all report viewing capabilities. However, once you exit the report, the data is gone. You cannot RETYPE the report or HOLD the results in a file.

- Commands and facilities that use mainframe indexed fields, like JOIN, LOOKUP, and FIND, are supported. For example, you can issue JOIN commands between host data files or execute report requests that use indexed views.
- You can use graphs on the server and the output will be returned to the PC in the Desktop Viewer.

Viewing System and Error Messages for Remote Execution

All system messages returned from an EDA or WebFOCUS Server are displayed in the Console Output window. To view the Console window, click the Console button on the toolbar or choose Command Console from the Command menu.

Using WebFOCUS Resource Governor With Remote Execution

WebFOCUS Resource Governor is a component of the EDA Server and WebFOCUS Server that limits the execution of requests based on the "cost" of a query in terms of system resources:

- A query that is *below* the WebFOCUS Resource Governor cost threshold executes normally.
- A query that is *above* the threshold will *not* execute, and results in the following two error messages: FOC848 and FOC849. These messages inform you that the query would consume too many system resources and will not be executed.

CHAPTER 10

Accessing FOCUS Data Sources

Topics:

- Identifying FOCUS Data Sources With the Use Tool
- Identifying FOCUS Data Sources With USE Syntax
- Storing Product Files

The FOCUS USE command enables you to access FOCUS data sources in another directory, on another drive, or with another name. USE also enables you to join together FOCUS data sources on different drives and directories, and access read-only multi-user applications.

When you perform a task that references a FOCUS data source, FOCUS searches for a file with the same name as the Master File and the extension .FOC. FOCUS first searches the current directory on the current drive, then continues with other directories specified by EDAPATH until it locates such a file. However, when you identify FOCUS data sources with the USE command or tool, a USE directory is created; this directory is a list of data source definitions. When a USE directory is in effect, FOCUS locates files using the path specified in the USE directory instead of the path indicated by EDAPATH.

A USE directory enables you to access up to 255 FOCUS data sources. The first data source you specify in the USE directory establishes the default drive letter, directory, and file extension. These default values remain in effect for the duration of the session or until you clear or replace the USE directory.

Note: The USE directory applies only to FOCUS data sources; for other data sources, use the Filedef tool. For information on the Filedef tool, see *Assigning Logical Names to Files and Devices* in *Accessing Data*.

You can create a Use directory with:

- The Use tool.
- The USE command issued from the Command Console.

Your USE assignments last for the duration of the session or until you change them.

You can also place assignments in a file that you create with the Text editor. You can run these assignments whenever you wish to apply them. You can also include the assignments (or run the file that contains them) in your profile; they will be applied automatically every time you start the product.

Procedure How to Display the Current Use Directory

You can use the Query tool to display the current Use directory.

1. Choose Command Console from the Command menu and click the Query button on the toolbar.

or

Choose Utilities from the Command menu, then Query from the cascading menu.

The Query Subjects dialog box opens.

2. Select USE in the Query subjects box, then click OK.

or

Double-click USE.

Tip:

You may have to scroll down using the arrows to find USE.

Identifying FOCUS Data Sources With the Use Tool

The USE dialog box enables you to identify the FOCUS data sources that you want to use with your applications.

Procedure How to Access the USE Tool

If you want to identify a FOCUS data source within a procedure:

1. Right-click the procedure in the Procedures folder and choose Open from the shortcut menu. The Procedure (FOCEXEC) window opens.
2. Click and hold a component connector (yellow diamond), then click the Use button on the Component Connector toolbox.

   The Use tool opens. You are now ready to define your USE directory. See *USE Dialog Box* on page 10-6.

Note: If you want to make a USE definition available to all procedures during your session, issue the USE command from the Command Console. The setting is retained internally for the duration of the session or until you change it. See *Identifying FOCUS Data Sources With USE Syntax* on page 10-8 and *Using the Command Console* in *Getting Started*.

Procedure

How to Identify FOCUS Data Sources With the Use Tool

1. Open the USE dialog box. See *How to Access the USE Tool* on page 10-3.
2. Type the name of a FOCUS data source in the Database Filename box, then click the Add button.

   or

   To add a data source to the current USE directory, type the name of a FOCUS data source in the Database Filename box, click the Append to the present database list radio button, then click the Add button.

   Tip:

   Alternatively, you can click Browse to search the network drives and directories for the file you want to add. Your selection appears in the Database Filename box.

   Note: You can also enter the UNC name of the file you want to add to the USE directory in the Database File name box. For example:

   ```
   \\Server1\Disk1\employee.foc
   ```

   The Universal Naming Convention (UNC) allows you to enter the server name without entering the explicit path to the server. However, in order to take advantage of the UNC you must first attach to the server. For information on attaching to a server or mapping network drives, consult your Network Administrator.
3. Click Run, then Close. You are prompted to save your changes.

For additional information, see *How to Add a Master File for a FOCUS Data Source That Resides Locally* on page 10-5 and *How to Add a Master File for a FOCUS Data Source That Resides on a Server* also on page 10-5.

Procedure

How to Add a Master File for a FOCUS Data Source That Resides Locally

Follow steps 1 and 2 in *How to Identify FOCUS Data Sources With the Use Tool* on page 10-4. Then, to specify a Master File that resides locally:

1. In the MASTER File box, enter the name of the Master File (file description) you want FOCUS to use when it reads the data file.
2. If the file does not exist, select the New File checkbox.
3. Click Run.

Tip:

When you update a data source that does not exist, FOCUS creates the data source in the current directory, giving it a default file name and file extension. Selecting New File enables you to give the data source a file name, file extension, or location that is different from the default.

Procedure

How to Add a Master File for a FOCUS Data Source That Resides on a Server

Follow steps 1 and 2 in *How to Identify FOCUS Data Sources With the Use Tool* on page 10-4. Then, to specify a Master File that resides on a server:

1. In the MASTER File box, enter the name of the Master File (file description) you want FOCUS to use when it reads the data file.
2. In the Database Server box, enter the name of the server on which the file resides.

   A server can control more than one data source, however, a data source can be controlled by only one server.
3. Click Run.

Procedure How to Restrict FOCUS Data Source Access to Read-Only

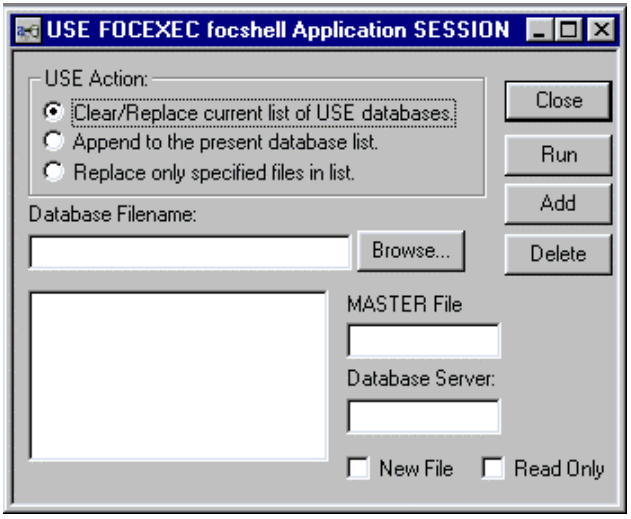
In the USE dialog box,

1. Click Add.
2. Enter the complete file name in the Database Filename box. The name can include the drive letter and directory.

   or

   Click the Browse… button. A dialog box opens. Choose the file from the dialog box.
3. In the MASTER File box, enter the name of the Master File (file description) you want FOCUS to use when it reads the data file.
4. Select the Read Only checkbox, then click Run.

Reference USE Dialog Box



USE Action:

Clear/Replace current list of USE databases

Select this radio button to clear all entries or replace the current list of USE data sources with those in the list box, then click Run. To remove a single file, see Delete.

Append to the present database list

Select this radio button to add data sources to the current Use directory. Type the new file name in the Database Filename box, or click Browse to locate the file. Then click Run.

Replace only specified files in list
: Select this radio button to change one or more data source assignments in the current USE directory. Click the file to be replaced. Type the new file name in the Database Filename box, or click browse to locate the file. Then click Run.

Database Filename
: Displays the name of the data file, including the drive letter and complete path where applicable. All current file names appear in the box.

Add
: Click this button to add a new data source to the current USE directory.

Master File
: Displays the name of the Master File that is used to read the data source.

New File
: Check this box to create a data source to the current USE directory.

Read only
: Check this box to specify read-only access to the selected data source.

Database Server
: Identifies the database server on which the file resides, if it is not a local data source.

Close
: Click to exit the Use tool. A dialog box prompts you to save your changes.

Run
: Click this button to execute the action you have selected.

Delete
: Select a file name in the list below Database Filename, then click Delete to remove the selected definition from the USE directory.

Tip:

To eliminate a file, select the file, then click Delete before clicking Run.

Identifying FOCUS Data Sources With USE Syntax

As an alternative to the graphical Use tool, you can enter USE syntax directly in the Command Console to identify FOCUS data sources in a USE directory. For details on using the Console, see *How to Enter Commands* in *Using the Command Console* under *Getting Started*.

Syntax How to Identify FOCUS Data Sources

To create a USE directory from the Command Console, the syntax is

```
USE action
filename [READ|NEW] [AS mastername]
```

or

```
filename AS mastername ON server READ
```

```
[d:\path\]filename [NEW|READ]
```

or

```
[d:\path\]filename ON server
.
.
.
END
```

where:

action

Is one of the following:

ADD appends one or more new file names to the present directory. If you issue the USE command without the ADD parameter, the list of data sources you specify replaces the existing USE directory.

CLEAR erases the USE directory. The keyword END is not required with this option. Any other options specified will be ignored.

REPLACE replaces an existing file name in the USE directory. This option enables you to change the file specification for the file name and the options following the file name.

filename

Is the name of the data source. If you omit the extension, FOCUS automatically uses the extension .FOC.

`READ`

Restricts data sources to read-only access.

`NEW`

Indicates that the data source does not yet exist.

When you update a data source that does not exist, FOCUS creates the data source in the current directory, giving it a default file name and file extension. Use this parameter to give the data source a file name, file extension, or location that is different from the defaults.

`AS` *`mastername`*

Specifies the name of the Master File to be associated with the file name.

`ON`

Indicates that the data source is under the control of a server. A server can control more than one data source; however, a data source can be controlled by only one server.

`server`

Is the name of the server.

`d:\path`

Is the path to the FOCUS data source. You can use the path parameter with files that reside locally or on a server.

Note: You can also use the Universal Naming Convention to specify the name of the server and shared volume. You must specify the path if the file is not located in the root directory of the shared volume.

Note: The following options after the file name are valid together:

```
READ and AS
NEW and AS
AS and ON and READ
```

Any other combination of options after the file name is not valid.

Syntax How to Specify Different Names for FOCUS Data Sources

If the FOCUS data source you wish to use has a file name other than the default, issue the USE command to identify the file, with its file specifications, and associate it with a specific Master File.

The syntax is

```
USE
filename AS mastername
END
```

where:

filename
Is the name of the data source.

mastername
Is the name of the Master File that will be associated with the data source.

Example Specifying Different File Names

To read the data source with the name EMP026 described by the Master File EMPLOYEE, enter this USE command:

```
USE
EMP026 AS EMPLOYEE
END
```

After entering the USE command, you can read the EMP026 data source by entering the command TABLE FILE EMPLOYEE.

Example Changing Default File Attributes

The following example illustrates how to use the file EMPLOYEE.ABC on drive F: and the file PRODUCT.FOC on drive A: when performing a task that references either the EMPLOYEE or PRODUCT data sources:

```
USE
F:\IBI\APPS\SAMPLES\STANDARD\EMPLOYEE.ABC
A:PRODUCT.FOC
END
```

The first definition establishes F: as the default drive, \IBI\.APPS\SAMPLES\STANDARD as the default directory, and ABC as the default extension. A subsequent reference to another FOCUS data source causes FOCUS to search the \IBI\APPS\SAMPLES\STANDARD directory on the F: drive for a file with the extension .ABC. These default values remain in effect for the duration of the session or until you change them.

Note that since FOCUS does not use EDAPATH when a USE directory is in effect, specifying the location of a data source in the USE directory can improve access time.

Example Accessing FOCUS Data Sources Under the Control of a Server

This example shows how to access the following data sources, which are under the control of servers. These data sources are PAYABLE and RECVABLE under the ACCTING server; ORDERS under the LEDGER server, and the ITEMS data source under the STOCK server.

```
USE
PAYABLE.FOC ON ACCTING
RECVABLE.FOC ON ACCTING
ORDERS.FOC ON LEDGER
D:\SALES\ITEMS.FOC ON STOCK
END
```

Example Concatenating FOCUS Data Sources

If a single file description applies to several data sources and you wish to read data from all of them, you can concatenate the data sources and treat them as one.

The following example shows how to concatenate three data sources, A:EMP01.FOC, C:EMP02.FOC, and C:EMP03.FOC, to be read using a single Master File, EMPLOYEE:

```
USE
A:EMP01.FOC AS EMPLOYEE
C:EMP02.FOC AS EMPLOYEE
C:EMP03.FOC AS EMPLOYEE
END
```

To concatenate data sources with cross-references, specify both the host and the cross-referenced data sources in the USE command. The following example shows how to concatenate the host data sources EMP01 and EMP02 with the cross-referenced data source EDUCFILE:

```
USE
A:EMP01.FOC AS EMPLOYEE
C:EMP02.FOC AS EMPLOYEE
C:EDUCFILE.FOC
END
```

If the cross-referenced data source also consists of separate files, follow each host file with the corresponding cross-referenced file. The following example shows how to concatenate the host data sources EMP01 and EMP02 with the cross-referenced data sources ED01 and ED02:

```
USE
C:EMP01.FOC AS EMPLOYEE
C:ED01.FOC AS EDUCFILE
D:EMP02.FOC AS EMPLOYEE
D:ED02.FOC AS EDUCFILE
END
```

The following example shows how to concatenate the EMPLOYEE data source on the ACCTING server and the EMPLOYEE data source on the PRSONNEL server:

```
USE
EMPLOYEE.FOC ON ACCTING
EMPLOYEE.FOC ON PRSONNEL
END
```

Storing Product Files

FOCUS product files can either be stored on the file server's hard disk (the network disk) or on the workstation's local hard disk.

Placing product files on the file server disk allows all users to access WebFOCUS (Windows version) from one central location. This facilitates maintenance since the system administrator updates only one location when installing a new version of the software. In addition, disk space is not used on workstations, and the product files are backed up as part of the normal file server backup.

However, if the files are located on the file server, each time a user runs WebFOCUS (Windows version) the workstation must access the executable files across the network. This is often slower than accessing the files from the PC's local hard disk and, depending on your version of the software, may affect performance.

You should also consider the relative speed of the workstation's local hard disk when deciding where to place the product files. In cases where the workstation's hard disk is very slow, it may be quicker to access WebFOCUS (Windows version) from the file server's high performance disk.

In general, better performance and lower network traffic are achieved by storing a copy at each workstation. However, since each network and application is unique, we recommend that you take benchmark measurements to determine if the performance benefits are significant enough to offset the additional maintenance overhead.

Configuring Applications and Data Sources

Application files (Procedures and Master Files) and FOCUS data sources can be configured in various locations, each of which affects performance, network traffic, and ease of maintenance. The available options vary, depending on whether the database server and the file server software use separate or the same PCs.

There are three different file location options if you use separate computers for the file server. You can place data source files on the file server or on the user workstations. Each affects performance in a different way. For details, see *Separate File Server and Database Server PCs* on page 10-14 and *File Server and Database Server on Same PC* on page 10-16.

Reference Separate File Server and Database Server PCs

	Slowest Option	Recommended Option	Fastest Option
Storage Method	Database, application files, and Master Files on file server.	Database files on database server; applications and Master Files on file server.	Application and Master Files on workstations; databases on database server.
Advantages	All files centrally located for ease of maintenance. All files backed up as part of file server backup. Network security applied to all files.	Less network traffic and increased performance since database server accesses databases from local hard disk. Programs and Master Files still centrally located. Network security still applied to programs and Master Files.	Least network traffic since all workstations and the database server have files on local hard disk.
Disadvantages	High network traffic and reduced performance since the workstation and database server must go to the file server for all files.	Workstation and database server must still go to file server for FOCEXECs and Master Files. Database server disk must be backed up. No network security on FOCUS databases. Slightly harder to maintain since FOCUS files must now be maintained from the database server PC.	Very difficult to maintain since each workstation must be updated when a FOCEXEC has changed. FOCEXECs and Master Files must be backed up from at least one workstation. No security on any files. Users could edit or erase application files.

In most cases, the second (recommended) option provides the highest performance, while retaining the ability to effectively maintain the application. However, this performance benefit will only be realized if access to the database server's hard disk is faster than access to the file server's hard disk across the network. This may not be the case for slower local hard disks.

Backups can still be taken of the database files by using remote backup software, copying the files to the file server, or attaching a backup device to the database server PC. You can overcome security issues by using FOCUS database security facilities and/or physically securing the database server PC through use of keyboard locking mechanisms, or by placing the database server PC in a secure environment.

The first (slowest) file location option is useful when a very secure environment is desired, since the network file level security mechanism is used in addition to FOCUS security. The application will also be backed up as part of the normal file server backup, reducing the reliance on additional backup steps. However, this first option is likely to be significantly slower than the second option and will generate a higher level of network traffic.

The third (fastest) option is useful when network traffic is a major issue or when the user's network connection is very slow, such as a dial-in network link. With this configuration, only the actual client/server data requests are passed across the network; all file I/O is carried out locally.

This option is difficult to maintain and back up, although much of the maintenance process can be automated at the application level by retaining and managing a central copy of the application on the file server. The application can then check the central copy on startup for a "last changed date" using the DOS command DIR, or through a date placed in a sequential file. If the date indicates that programs have been changed, the changed programs can then be automatically copied to the workstation by the application.

Reference

File Server and Database Server on Same PC

There are two possible configurations if you use the same computer for the file server and the database server. You can place all files on the server, or place the application files and Master Files on the workstations, and place the data sources on the server. These options are explained in the following table:

	Recommended Option	**Fastest Option**
Storage Method	Databases, applications, and Master Files on database server PC.	Application and Master Files on workstations, databases on database server.
Advantages	Less network traffic and increased performance since database server accesses databases from local hard disk. All files centrally located for ease of maintenance. All files backed up as part of file server backup. Network security applied to all files.	Least network traffic since all workstations and database server have files on local hard disk.
Disadvantages	Workstation must still go to file server for FOCEXECs and Master Files.	Very difficult to maintain since each workstation must be updated when a FOCEXEC has changed. FOCEXECs and Master Files must be backed up from at least one workstation. No security on any files. Users could edit or erase application files.

In most cases, the first (recommended) option provides the highest performance while retaining the ability to effectively maintain the application.

The second (fastest) option is useful when network traffic is a major issue or when the user's network connection is very slow, such as a dial-in network link. With this configuration, only the actual client/server data requests are passed across the network; all file I/O is carried out locally. This option is difficult to maintain and back up, although much of this maintenance process can be automated at the application level by retaining and managing a central copy of the application on the file server. The application checks the central copy on startup for a "last changed date" using the DOS command DIR, or through a date placed in a sequential file. If the date indicates that programs have been changed, the changed programs are automatically copied to the workstation by the application.

Storing Work and Temporary Files

The database server also requires user work files, which are the temporary files used by the application (for example, HOLD.FTM), and WebFOCUS (for example, FOCSTACK.FTM and FOCSORT.FTM). You must create and store these files in a unique directory for each user since no two users' work files should conflict. All temporary files are placed in the \CONF\EDATEMP directory when the user starts WebFOCUS; however, you can change the default directory using the SET TEMPDIR command. This directory can either be on the user's local hard disk or on the file server.

Placing temporary directories on the workstation's local hard disk improves performance when the local disk is faster than the network drive. However, if the application makes little use of temporary files, this increase in performance may not be noticeable.

If the work directory is on the file server, verify that each user has an individual directory area. If two or more users inadvertently share the same work directory, their temporary files will conflict, resulting in apparently random errors when they use WebFOCUS.

CHAPTER 11

Assigning Logical Names to Files and Devices

Topics:

- Assigning FILEDEFs Using the Graphical Tool
- Assigning Logical Names With the FILEDEF Command
- Using the FILEDEF Command

FILEDEF enables you to assign a logical name, called a ddname, to a file or to a device. You can use it to:

- Identify a data source and associate it with a Master File.

  Note that you identify FOCUS data sources in a Use directory, not with FILEDEF. For details, see *Accessing FOCUS Data Sources* in *Accessing Data.*

- Send an output file directly to the default Windows printer.

You can assign logical names to files and devices:

- With the FILEDEF tool.

  or

- With a FILEDEF command issued from the Command Console.

The assignments you make with this tool last for the duration of the session or until you change them. You can place assignments in a file, which you can run whenever you wish to apply them. You can also include the assignments (or run the file that contains them) in your profile; they will be applied automatically every time you start the product.

To display the current assignments, use the Query tool described in *Displaying Information About the Environment* in *Developing Reporting Applications*.

Assigning FILEDEFs Using the Graphical Tool

WebFOCUS provides a graphical tool for assigning logical names to files and devices.

You create the FILEDEF as an object, separate from any other object or procedure. You are responsible for placing the FILEDEF object in the correct position within your procedure (that is, before a Define, Report, or Graph), and for running it. The FILEDEF remains active for the entire session, unless you explicitly clear it.

Procedure How to Define Logical Names With the Filedef Tool

If you want to define logical names (ddnames) for files and devices within a procedure:

1. Right-click the procedure in the Procedures folder and choose Open from the shortcut menu. The Procedure (FOCEXEC) window opens.
2. Click and hold a component connector (yellow diamond), then click the Filedef button on the Component Connector toolbar.

   The Filedef tool opens. Define the logical names. See *FILEDEF Dialog Box* on page 11-2.

Note: If you want to make the logical names available for use with all procedures during your session, issue the FILEDEF command from the Command Console. The setting is retained internally for the duration of the session or until you change it. See *How to Assign Logical Names in a FOCUS Command* on page 11-5 and *Using the Command Console* in *Application Development Getting Started*.

Reference FILEDEF Dialog Box

The FILEDEF dialog box has the following entry fields and buttons:

Name

Shows the logical (defined) name of a file or device (1-8 characters).

Device

Identifies the type of device to associate with the logical name. Select New, assign a logical name (1-8 characters) that you wish to assign to the output file, then select:

Disk to associate the specified logical name with a file.

Printer to associate the specified logical name with a Windows printer.

Terminal to indicate that the keyboard and monitor are the input source and output destination for the file.

Clear to clear the FILEDEF assigned to a file name. (Select the logical name in the list below the Name box.)

Filename

Shows the full file name. It may include a drive and directory specification.

Enter a file name in the box, or click the Browse… button to open a dialog box and select the file.

Fixed

Indicates that you are assigning a logical name to a file with a fixed record length.

Enter the length of the record in the Record Size box.

Append

Appends records to the end of the file. Without this option, the file is overwritten.

Record Size

Specifies the record length of the file.

Lower Case

Retains the case (lowercase or mixed case) of keyboard input in the Command Console. Select the Terminal radio button under Device, then select the Lower Case checkbox.

New

Moves the cursor into the Name box for your entry.

Run

Applies the current FILEDEF assignments.

Delete

Deletes the logical name you select from the list below the Name box.

Exit

Exits the tool. A dialog box prompts you to save your changes.

Procedure How to Assign a Logical Name to a File With Variable Record Length

1. Click New.

   The cursor appears in the Name box.

2. Enter the logical name you wish to assign to the file.

   The name can be from 1 to 8 characters. If you are identifying a database, the name must be the same as the name of the file description (Master File).

3. Select the Disk radio button under Device.
4. Use the Tab key or mouse to move the cursor to the Filename box.
5. Enter the full file name. The name can include the drive letter and directory.

   or

   Click Browse. A dialog box opens. Choose the file from the dialog box.

Procedure How to Assign a Logical Name to a File With Fixed Record Length

1. Complete the steps for a file with variable format.
2. Select the Fixed checkbox.
3. Use the Tab key or mouse to move the cursor to the Record Size box.
4. Enter the record length.

Procedure How to Clear a FILEDEF Assignment

In the FILEDEF tool:

1. Select the logical name in the list below the Name box.
2. Select the Clear radio button under Device.

Assigning Logical Names With the FILEDEF Command

You can issue FILEDEF commands in the Command Console or include your FILEDEFs in a stored procedure.

Syntax How to Assign Logical Names in a FOCUS Command

To assign logical names to files and devices, enter the following syntax in the Command Console

```
FILEDEF ddname DISK [filename ] [(APPEND] [LRECL n ] [RECFM F] [CLEAR]
```

or

```
FILEDEF SYSIN TERM [LOWER]
```

or

```
FILEDEF ddname PRINTER
```

where:

ddname
Is the logical name you want to assign to the file, input, or output. The ddname can be from 1 to 8 characters. When used to assign a database to a file description, the ddname must match the name of the file description.

DISK
Associates the specified ddname with a file.

filename
Is the complete file name. It may include a drive and directory specification.

APPEND
Appends records to the end of the file. Without this option, the file is overwritten.

LRECL *n*
Specifies the record length; *n* is an integer.

RECFM F
Specifies fixed-length records.

CLEAR
Clears a current FILEDEF setting.

TERM
Denotes the keyboard and monitor as the input source and output destination.

LOWER
Sends keyboard input to FOCUS as entered.

PRINTER
Denotes the printer as the output destination.

Reference FILEDEF Syntax Usage Notes

You must specify LRECL and RECFM values for:

- SAVB files (extract files created with the ON TABLE SAVB command that contain binary values).
- Fixed-format transaction files used in data maintenance (FIXFORM files) that contain binary values.

The following ddnames are automatically assigned:

- SYSIN to input from keyboard. It is assigned to TERM. This is equivalent to the command FILEDEF SYSIN TERM.
- SYSPRINT to output to be displayed on the screen. It is assigned to TERM. This is equivalent to the command FILEDEF SYSPRINT TERM.
- OFFLINE to output sent to the printer. It is assigned to PRINTER. This is equivalent to the command FILEDEF OFFLINE PRINTER.
- FOCSTACK to the file FOCSTACK.FTM. This is equivalent to the command FILEDEF FOCSTACK DISK FOCSTACK.FTM. For more information on FOCSTACK, see your WebFOCUS 4.3 documentation.

Note: You can also use the Universal Naming Convention (UNC) to assign logical names to files that are located on a server. In order to take advantage of the Universal Naming Convention (UNC) you must first attach to the server you want to use. For information on attaching to a server or mapping network drives, consult your network administrator.

Example Assigning a Logical Name to a File Located on a Server

The following example demonstrates how to assign a logical file name to a file located on a server using the Universal Naming Convention (UNC)

```
FILEDEF DATFILE DISK \\SERVER2\DISK1\MAYSPLES.DAT
```

where:

`DATFILE`
: Is the name (ddname) of the file.

`DISK`
: Associates the specified ddname with a file.

`\\SERVER2`
: Is name of the server.

  Note: UNC names start with two backslashes followed by the server name. All other fields in the name are separated by a single backslash.

`DISK1`
: Is the shared volume.

`MYSPLES.DAT`
: Is the name of the file you want to use on the server.

Using the FILEDEF Command

The following are a number of ways in which FILEDEFs are typically used:

- To identify databases.

  WebFOCUS automatically creates FILEDEF assignments for .DAT files and temporary files (.FTM) in the current search path. You must create FILEDEF assignments (or Use directories, in the case of FOCUS data sources) for all other data sources you wish to use.

  The following example shows how to assign the logical name LIBRARY to the database LIBRARY.PRN on the A: drive:

  ```
  FILEDEF LIBRARY DISK A:LIBRARY.PRN
  ```

- To redirect input and output.

  Three ddnames are used for input and output:

  - SYSIN for input.
  - SYSPRINT for output to be displayed on the screen.
  - OFFLINE for output sent to the printer.

  You can redirect input or output by reassigning these ddnames.

  The following example shows how to redirect OFFLINE output from the printer to a file named REPORT.DAT:

  ```
  FILEDEF OFFLINE DISK REPORT.DAT
  ```

  The following example shows how to send output to the LPT1 port (provided that the machine is configured properly):

  ```
  FILEDEF OFFLINE DISK LPT1
  ```

- To set search paths.

  By specifying an asterisk as the disk drive letter in the FILEDEF assignment, the EDAPATH search paths can be used to search for the file.

  The following example shows how to search all directories on the search path for the NEW_EMPS.DAT file:

  ```
  FILEDEF SYSIN DISK *:NEW_EMPS.DAT
  ```

  For information on search paths, see *Reviewing and Modifying an Application's Properties* in *Creating a Reporting Application* under *Developing Reporting Applications.*

Example

Sample Uses for the FILEDEF Command

The following examples illustrate applications of FILEDEF.

- The following example shows how to append a report extract from the LIBRARY database to the current content of the file C:LIB03.FTM:

```
FILEDEF SAVE DISK C:\LIBRARY\LIB03.FTM (APPEND
```

- The following example shows how to save a report extract in binary format (ON TABLE SAVB) in the file C:BINLIB.FTM; each record is 135 bytes long:

```
FILEDEF SAVB DISK C:BINLIB.FTM LRECL 135 RECFM F
```

- The following example shows how to reroute the diagnostic output, such as ECHO and TRACE output, from the screen to a file called HLI.DAT:

```
FILEDEF HLIPRINT DISK HLI.DAT
```

- The following example shows how to read standard text editor files. You can specify an LRECL equal to or greater than that implied LRECL for the request. For example, if the line length of the longest line in your text file is 7 characters, you can issue this command:

```
FILEDEF BIGLINE DISK BIGLINE FTM (LRECL 7
```

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