DB2 Query Management Facility

Getting Started with DB2 QMF for Windows and DB2 QMF for WebSphere

Version 8 Release 1

SC18-7449-00

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Note:

Before using this information and the product it supports, be sure to read the general information under Appendix C, Notices.

First Edition (January 2004)

This edition applies to IBM DB2 QMF for Windows and IBM DB2 for WebSphere, Version 8, Release 1, a feature of QMF Distributed Edition Version 8.1, 5724-E86, and a feature of the QMF Family with Version 8.1 of DB2 Server for z/OS, 5625-DB2, and to all subsequent releases and modifications until otherwise indicated in new editions.

Contents

About this book

This book describes how to use the QMF™ for Windows® and QMF for WebSphere® applications.

Who should read this book

This book is intended for all QMF for Windows or QMF for WebSphere users.

Conventions and terminology used in this book

This book uses the following highlighting conventions:

- Boldface type indicates commands or user interface controls such as names of fields, folders, icons or menu choices.
- `Monospaced` type Used for system messages and command syntax. indicates examples of text that you enter exactly as shown such as commands and system messages.
- *Italic* type indicates variables that you should replace with a value, identifies publications, emphasizes significant words and specifies optional steps in a task.

Service updates and support information

To find service updates and support information, including software FixPaks, PTFs, Frequently Asked Questions (FAQs), technical notes, troubleshooting information, and downloads, refer to the following address:

www.ibm.com/software/data/qmf/support.html

Where to find information

The DB2 Information Management Web site provides current product documentation that you can view, print, and download. To locate publications with the most up-to-date information, refer to the following:

www.ibm.com/software/data/qmf/library.html

An IBM® Redbook that covers QMF for Windows is available, refer to the following:

www.ibm.com/software/data/qmf/support.html

Accessibility features

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use a software product successfully. The major accessibility features in QMF for Windows enable users to:

- Use assistive technologies such as screen readers and screen magnifier software.
- Operate specific or equivalent features using only the keyboard.

For more information on accessibility for the QMF for Windows and QMF for WebSphere applications see Appendix A, "Accessibility," on page 281.

How to order DB2 QMF books

To order hard copies, contact your IBM representative or visit the IBM Publications Center on the world wide web at: http://www.elink.ibmlink.ibm.com/applications/public/applications/publications/cgibin/pbi.cgi. Or, you can call 1-800-879-2755 in the United States or any of its territories.

How to send comments

Your feedback is important in helping to provide the most accurate and high-quality information. If you have any comments about this book, go to http://www.ibm.com/software/data/qmf/support.html, and click on Feedback.

Summary of Changes

Several modifications to the documentation have been made to QMF for Windows for Version 8.1:

Table 1. Chapter 4 - Revisions and enhancements

Chapter 4 - Defining servers	
Revision or enhancement	**Description**
OLAP query support	Support has been added for multidimensional OLAP (Online Analytical Processing) queries. This includes an OLAP Query Wizard, which helps users to create OLAP queries; filtering options to customize the data that is presented in the OLAP query results view; dynamic formatting of the query results using extended grouping options, and improved navigation tools including the Database Explorer, Query Results Explorer, and the Layout Designer.
Query Results Explorers	The Query Results Explorer is a dockable tool window that displays the query results in a tree structure. For relational and OLAP query results, users can drag columns to and from nodes and branches of the tree to restructure the appearance of the query results view.
Database Explorer	The Database Explorer is a dockable window used for viewing and accessing the QMF objects that reside on each database server that has been defined in the SDF. Branches in the Database Explorer tree list the servers in the SDF, the user's most recently used servers, and a user's most recently used objects. An additional branch lists any user-specified QMF objects. A filtering option allows user to specify which objects are included in the lists. The Database Explorer window opens with QMF for Windows and remains open for the entire session, which makes it a convenient starting point for most QMF for Windows functions.

Table 1. Chapter 4 - Revisions and enhancements (continued)

Chapter 4 - Defining servers	
Revision or enhancement	**Description**
Object Analyzer	The Object Analyzer works with the Database Explorer and provides information about the references that an object has on other objects. The objects referenced by a selected object are listed in the Database Explorer tree under the selected object. For tables, the columns are listed. These dependent objects (or tables) are accessible and can be run or displayed directly from the Database Explorer.
Extended Grouping Options	Multiple levels of grouping can be defined on both axes in the query results view. For relational and OLAP query results users can: • Group data columns on the vertical axis and display results with or without summaries. • Group data columns on the horizontal axis and display results with or without summaries. • Select columns for grouping using drag-and-drop operations directly in the query results view, or in the new Query Results or Layout Designer windows.
Layout Designer	The Layout Designer is a dockable tool window that contains a high-level visual representation of the columns included in the query results. The Layout Designer window provides a visible work area on which users can change the appearance of relational and OLAP query results. From the Layout Designer, users can change the order of columns in the query results view, and specify which columns will be grouped and summarized.
Create queries using prompted and diagram interfaces	Users can create the SQL statements for queries using two new interfaces. The diagram interface helps users build queries visually using diagrams. The prompted interface helps users build queries using dialogs.

Table 1. Chapter 4 - Revisions and enhancements (continued)

Chapter 4 - Defining servers	
Revision or enhancement	**Description**
Spatial Map Document	Spatial data maps are now viewed in a window where users access to map functions has been streamlined with the following enhancements: • Drop-down menu for map objects • Property and history information for map layers • Toolbar now contains new map icons with tooltips to explain functionality • Ability to save data maps to a file • Easy export of spatial data maps to procedures • Export of spatial data maps as a bitmap or windows enhanced meta file graphics file
Catalog	An option has been added that enables QMF for Windows administrators to specify that, for certain database servers, users must use the default QMF for Windows catalog located on the database server. This option ensures that resource limits established for users cannot be thwarted.
Long name support for catalogs	QMF for Windows now supports catalogs that store objects with short or long names. This support includes the ability to automatically convert short name catalog tables to long name catalog tables. **Note:** Converting to long name catalogs is not required even if the version of DB2 uses long names.
Set User Information	An option has been added to allow users to specify user information only once during a QMF for Windows session. Once this feature is enabled, the same user ID and password can be used to connect to every database server. For users who use the same ID and password for every server, this will eliminate repeated prompting for the same information.
Glossary	A glossary has been added to the manual to define common terms.
Toolbar	The toolbar contains new and redesigned icons for more intuitive access to features and functions.
IBM ObjectREXX	A chapter has been added for IBM ObjectREXX to differentiate between procedures and ObjectREXX procedures.

Chapter 1. Introduction

DB2 QMF for Windows and DB2 QMF for WebSphere are part of the DB2 Query Management Facility (QMF) query and reporting tool set for IBM's DB2 relational database management system.

- QMF for Windows, the backbone of the tool set, provides extensive query and reporting capabilities for novice to expert users.
- QMF for Windows Report Center enables users to launch established, centrally-shared queries and reports; and send the results to spreadsheets, desktop databases and browsers.
- QMF for WebSphere extends query and reporting capabilities to users from their platform-independent web browsers.
- QMF for WebSphere Report Center allows users to view QMF reports from their web browsers.
- The QMF for Windows Administrator application is used to configure and manage the query environment for all the DB2 QMF for Windows and DB2 QMF for WebSphere applications.

Extensive query and reporting capabilities

The query and reporting features of QMF for Windows and QMF for WebSphere include:

- a Database Explorer that enables users to easily discover the items that have been saved on the database server
- online analysis of query dependencies, including OLAP analysis
- the ability to build powerful queries without knowing SQL using the diagram or prompted interfaces
- support for DB2 UDB V8 functionality including DB2 Cube Views, long names, Unicode, and enhancements to SQL
- extensive drag and drop capabilities for restructuring the appearance of query results
- comprehensive query results formatting options including a robust expression language that allows users to conditionally format query results by retrieved column values
- the ability to add calculated columns to the query results and group data columns on both axes with or without summaries
- charts and other complex visuals for displaying query results
- simple step-by-step guidance to create traditional text-based reports or state-of-the-art reports with rich formatting

- query results can be sent to other applications
- API commands that developers can use in any application

Prerequisites

Operating system

Supported operating systems

- Microsoft®Windows 98
- Microsoft Windows ME
- Microsoft Windows NT 4.0
- Microsoft Windows 2000
- Microsoft Windows XP
- Microsoft Windows Server 2003

Add-in applications

The following add-in applications are supported by QMF for Windows and can be installed when QMF for Windows is installed.

- Microsoft Excel Version 7.0 or later
- Lotus 1-2-3 Version 97 or later

These add-in applications are included with the installation media.

Connectivity

Below are the connectivity types supported by QMF for Windows and QMF for WebSphere. See *Installing and Managing QMF for Windows* for detailed information.

TCP/IP

The Microsoft TCP protocol installed with the Windows operating system should work with any product that provides a WinSock interface.

SNA

IBM Personal Communications Version 4.1 or later should work with any product that provides a Win CPI-C interface.

ODBC

Most ODBC Version 2.x or Version 3.x drivers are acceptable.

CLI

IBM DB2 Universal Database runtime client Version 6.1 or later.

Other functionality

IBM ObjectREXX

IBM ObjectREXX for Windows Version 1.0.2.3 or later

Natural language query

EasyAsk software is required in order to perform natural language queries. This software is available at **www.easyask.com**

Database servers

QMF for Windows and QMF for WebSphere can connect to a wide range of DB2 UDB databases.

Supported DB2 UDB databases

- DB2 UDB for z/OS
- DB2 Server for VSE & VM
- DB2 Universal Database and DB2 Common Server
- DB2 Parallel Edition
- DB2 Information Integrator

Note: The DB2 QMF for Windows license controls the DB2s where you can install and connect to QMF for Windows.

Chapter 2. QMF for Windows interface

This chapter describes the QMF for Windows interface. It includes:

- Selecting the database server from the SDF
- Specifying user information
- Menu options

Selecting the database server from the SDF

The QMF for Windows server definition file (SDF) is an initialization (.ini) file that contains the technical information that QMF for Windows needs in order to connect users to database servers. Your QMF for Windows administrator is responsible for creating, configuring, maintaining and distributing the SDF for the QMF for Windows users.

Each database server that you are allowed to access is configured in the SDF. When configuring the database servers in the SDF, your QMF for Windows administrator assigned each database server a descriptive name that identifies the database. For example, `Purchasing Database` instead of the more technically correct name DB2P_01_PURCH.

When you open QMF for Windows the database servers that are available for you to use are listed in the Explorer window. You can select any of the database servers listed.

In some installations, you can have more than one SDF, each having different configurations of available database servers.

View or select the SDF

To view the SDF that you using or select a different SDF to use:

1. Select **View --> Options**.
2. The Options window opens.
3. Select the General page.
4. The Server Definition file field displays the name of the SDF that you are currently using.
5. Use the down arrow to see the list of available SDFs or use the browse button to select a different SDF.

Specifying user Information

Each time QMF for Windows connects to a database server on your behalf, it must supply a user ID and password. The user ID and password specifies what database security options are in effect and what functions can be performed. You must supply the user ID and password.

You supply QMF for Windows with your user ID and password using the Set User Information window. QMF for Windows will automatically open this window the first time you connect to a database server. Subsequently, QMF for Windows may or may not request user ID and password on every connection to the database server depending on the options you have selected.

You can open the Set User Information window and specify a user ID and password at any time before making a connection to the database server.

There are some database servers that do not require a user ID and password. If a database server does not require a user ID and password, it must be configured as such by your QMF for Windows Administrator in the SDF. If the database server is configured to not require a user ID and password, you will not be prompted for user information.

To specify user information

1. Select **Query -->Set User Information**.

   The Set User Information window opens.
2. Type your **user ID** and **Password** for the server.

   Note: The user ID and password are case sensitive. For example type your User ID and password in uppercase letters if they are set up that way. Some types of database servers treat user IDs and passwords as case sensitive; while, others do not.

   The user ID and password cannot be the same as your local or network user ID and password.
3. *Optional:* Type the account number used track system usage by certain criteria such as department or user ID. Ask your database administrator to find out if your system uses accounts.
4. *Optional:* Check the **Remember this password** check box to remember server passwords across QMF for Windows sessions.
   - If you are logged on to Windows, the Set User Information dialog box contains the *Remember this password* check box. If this check box is selected, then the password for that server is stored in the Windows password list. Whenever you are logged on to Windows, QMF for Windows retrieves the password without a prompt.

- If you are not logged on to Windows or if you are logged on as a different user, QMF for Windows prompts you for a user ID and password.

Note: If you check the **Remember this password** check box, anyone who can log on to your Windows account can access your database servers with your (server) user ID and password.

5. Check the **Use this information for every server I connect to** check box to apply the user information entered on the Set User Information dialog box when connecting to any database server. This option is useful if the current user ID and password, and optional account information, are used at all database servers.
6. Click **OK**.

   QMF for Windows stores this information for accessing the server.

Changing passwords

You can change your password for a database server using the Set User Information window if the database server you are connecting to supports this feature and your user ID has permission as granted by the QMF for Windows administrator.

Note: This feature is supported by DB2 for OS/390, Version 5 and later.

Procedure to change password

1. Click **Change**.
2. Type the new password in the **New password** field.
3. Re-type the new password in the **Confirm new password** field.
4. Click **OK**.

   The password is changed.

Specifying accounting Information

The database server uses accounting strings to track and charge-back system usage. Ask your database administrator to find out if your system uses accounting strings.

Use the same ID and password for every database server

Check the Use this information for every server I connect to check box to use the most recently entered ID and password when connecting to all database servers. If checked, QMF for Windows will use the same user ID and password for all connections to all database servers unless you open the Set User Information window and make a change

Menus

Three drop-down menus are available when you first open QMF for Windows:

- File
- View
- Help

Each main menu and its corresponding menu options is described below.

File menu

New

Opens the New window where you can select the type of query document that you want to create.

Table 2. Options on File Menu

Field	Description
Query	To create a new SQL query. You select Query if you will be creating the query by typing the SQL statements in the window directly or using one of the interfaces. The available interfaces include the prompted, diagram, or natural views.
OLAP Query	To create an OLAP query. OLAP queries can only be run against database servers that support DB2 Cube Views.
Form	Contains the formatting instructions that QMF for Windows uses to generate a report from query results.
Procedure	A set of commands used to run queries, print reports, import and export data, and perform other functions with a single command.
List	A list of objects (query, form, procedure or table) based on a filter, such as an object owner, object name, or object type.
Job	A file used to schedule and run unattended procedures. A job file can store a user ID, encrypted password, and substitution variables.
Map	Create a new spatial data map document
Layout	Create a new visual representation of the data in a layout document that includes many chart variations
Visual Report	Create a new report document using the visual report interface

Open
Opens an Open file window where you can select from a list of available files, the file that you want to open. The list of available files that you can open in QMF for Windows includes:

- query files (*.qry)
- queries saved in the prompted view files (*.pq)
- natural query files (*.nq)
- OLAP query files (*.oq)
- form files (*.frm)
- procedure files (*.prc)
- object list files (*.ol)
- map files (*.spm)
- job definition files (*.jdf)
- Layout files(*.vly)
- Visionary World files (*.vis)
- Visual report(*.vr) files
- IXF files (*.ixf)
- dbase III files (*.dbf)
- Web Query Markup Language files(*.wqml)

Open from server
Select this option to open an existing query, form, or procedure, or list file that has been saved on the database server

Draw query
Select this option to create a query document based on the query type and tables you specify.

Note: This menu command is the same as the DRAW command in host QMF.

Table 3. Fields on Draw Query Window

Field	Description
Server	The database server where the tables for the query are stored

Table 3. Fields on Draw Query Window (continued)

Field	Description
Query type	The type of query to create: • SELECT – create an SQL SELECT statement for the tables **Note:** More than one table can be selected for an SELECT statement. • UPDATE – create an SQL UPDATE statement for the table. **Note:** Only one table can be selected for an UPDATE statement. • INSERT – create an SQL INSERT statement for the table. **Note:** Only one table can be selected for an INSERT statement.
Owner	The table owner (in the correct format for identifiers) for the query
Name	The table name (in the correct format for identifiers) for the query
Identifier	The correlation ID for a table in the query **Note:** If left blank, a correlation ID is generated automatically.
Tables	The table or tables to include in the query **Note:** More than one table can be specified for a SELECT statement. Only one table can be specified for an UPDATE or INSERT statement.

Table Editor

Select this option to search for and edit rows in a table. Select **File--> Table Editor** or **List--> Edit** to use the Table Editor.

Table 4. Fields on Table Editor Window

Field	Description
Server	The database server where the table is stored
Table owner	The user who created the table
Table name	The table to search for

Table 4. Fields on Table Editor Window (continued)

Field	Description
Save Mode	Indicates whether to save changes with each row or when changes are complete: • **Immediate** The table will be updated at the server immediately after each change. • **End** The table will be updated at the server after you finish entering all changes. **Note:** If you select ″End″ as the save mode, other users are prevented from making changes to the table until the final changes are committed.
Edit	Click **Edit** to update a table in the database.
List Tables	Click **List Tables** to open the Tables dialog box that lists the tables owned by the specified owner. Select a table from the list and click **OK** to edit the table. *Optional:* The Set User Information dialog box opens when you click **List Tables** if you are not connected to the database. Use this dialog box to provide required user connectivity information to the database.
Edit	If you know the table name, click **Edit** to open the Edit Table dialog box. Use this dialog box to search for, update, insert or delete a row for the owner and server

Import data

Select this option to import data from an *.ixf or dBASE file into a new query document.

Recently Used files

Use this option to open local files that were accessed recently.

1. Click **File--> Recent Files**.

   The Recent Files menu opens.
2. Select a file from the list of files.

   The file data opens in a new dialog box.

   Note: There is no toolbar button for the Recent Files menu option.

Recently Used objects

Select this option to open objects on the server that were accessed recently. The format of the most recently accessed object is:

```
SERVER:OBJECT_TYPE:OWNER.NAME
```

1. Click **File--> Recent Objects**.
   The Recent Objects menu opens.
2. Select the object from the list of objects.
   The object data opens in a new dialog box.

   Note: There is no toolbar button for the Recent Objects menu option.

Terminate connections
Select this option to end the connection to the server.

Exit
Select this option to close QMF for Windows.

View menu

Natural
Click Natural to display the active query in the natural query view. This command is only available if the active query was created or saved as a natural query and EasyAsk software is installed.

Prompted
Click Prompted to display the active query in the prompted query view. This command is only available if the active query was created or saved in the prompted view.

SQL
Click SQL to view the SQL statements for all queries, including queries created using the diagram, natural or prompted views.

Diagram
Click Diagram to display the active query in the diagram query view. This command is only available if the active query was created or saved in the diagram view.

Results
Click Results to view the query results in the active window. This command is only available if there are query results available and the active window currently displays a query in the SQL, prompted, or diagram views.

Parameters
Displays the parameters returned by running a stored procedure. This command is only available if the stored procedure has input or output parameters.

Result Set List

Lists the result sets returned by running a stored procedure. Up to four result sets can be listed. Click on the number or the name of the result set that you want to display. This command is only available if the query results are from running a stored procedure.

More Result Sets

Opens the Results Sets window where all the result sets from running a stored procedure are listed. You can select the result set that you want to display. This command is only available if the query results are from running a stored procedure.

Resource Limits

Select **Resource Limits** to view the resource limits that have been specified for your user ID. Resource limits are set by the QMF for Windows Administrator. They control users access to database servers and resource usage.

The following types of limits and controls can be set by the QMF for Windows Administrator:

- Timeouts
- Limits
- SQL verbs
- Options
- Save data
- Binding
- Object tracking
- LOB options
- Report Center

Although the majority of resource limits set up for the database server are display-only, you can set certain limits while running a query, as described in ″Setting your own row limit.″

Setting your own row limit: Prior to submitting a query that you suspect will be time consuming or resource consuming, you can specify the maximum number of rows to retrieve. QMF for Windows will cancel the query when it reaches this row limit.

Note: The **Maximum Rows To Fetch** and **Maximum Bytes to Fetch** parameters specified by the System Administrator for your resource limits group take precedence over the row limit parameter you specify here.

1. Select **Query--> Set Row Limit**.

   The Set Row Limit dialog box opens.

2. In the **Enter the maximum number of rows to retrieve for this query** field, type the maximum number of rows that the query can return.

   Optional: Type a zero indicate *no limit*.

3. Click **OK**.

   The row limit is applied the next time you run the query.

   Note: Rows retrieved in excess of the specified row limit are retained and they can be viewed.

Connections

Click **View--> Connections** to open the Connection Information dialog box. This dialog box lists the servers and the number of connections between QMF for Windows and the database servers. You can open this dialog box at any time, even while working in QMF for Windows.

Table 5. Fields on Connections Window

Field	Description
Servers and Connections	This dialog box lists the servers connected to QMF for Windows and identifies the number of connections that QMF for Windows has to each server.
Show details	Click **Show Details** to obtain detailed information on each connection to a server in the Servers and Connections list. The Connection Details dialog box opens. This dialog box provides information about the server connection, the user ID, the connection state, connection statistics, and the method of connectivity

Global variables

Displays all local global variables. Click **View--> Global Variables** to open the Global Variables dialog box. Certain global variables are system-level, meaning you cannot change them. These global variables report on the state of the system; automate selections during procedures (such as exporting data in a specific format); supply values for substitution variables in a procedure; and pass information between procedures.

Table 6. Fields on Global Variables Dialog Box

Field	Description
Name	The name of the global variable. Each global variable has a prefix. For example, global variables prefixed with **AO** are system-level variables and cannot be changed; while, many global variables prefixed with **QW** are QMF for Windows variables that can be set.
Value	The value held by the global variable.

Toolbars

Click **View--> Toolbars** to open the Toolbars window. The Toolbars window lists the toolbars available to QMF for Windows. Check or uncheck the toolbars that you want to use.

Toolbars are initially docked at the top of each window, although, you can grab on to the toolbar and move the toolbar around the screen.

Table 7. Fields on Toolbars Window

Field	Description
Main toolbar	Check the **Main toolbar** check box to make the options on the Main toolbar available.
Query toolbar	Check the **Query toolbar** check box to make the options on the Query toolbar available when you work with a query.
Natural query toolbar	Check the **Natural Query toolbar** check box to make the options on the Natural Query toolbar available when you work with a natural query. **Note:** EasyAsk software must be available for this option.
Job toolbar	Check the **Job toolbar** check box to make the options on the Job toolbar available when you work with a job.
Query Results toolbar	Check the **Query Results toolbar** check box to make the options on the Query Results toolbar available when you work with query results.
Procedure toolbar	Check the **Procedure toolbar** check box to make the options on the Procedure toolbar available when you work with a procedure.
Form toolbar	Check the **Form toolbar** check box to make the options on the Form toolbar available when you work with a form.
List toolbar	Check the **List toolbar** check box to make the options on the List toolbar available when you work with a list.
Map toolbar	Click **Map toolbar** to make the options on the Map toolbar available when you work with spatial data.
OLAP Query	Click **OLAP toolbar** to make the options on the OLAP toolbar available when you work with OLAP queries.
Visual Reports toolbar	Click **Visual Reports toolbar** to make the options on the Visual Reports toolbar available when you work with visual reports.
Layout toolbar	Click **Layout toolbar** to make the options on the Layout toolbar available when you work with visionary data.
Formatting toolbar	Click **Formatting toolbar** to make the Formatting toolbar available when you are formatting columns in the query results.

Table 7. Fields on Toolbars Window (continued)

Field	Description
Command toolbar	Click **Command toolbar** to make the Command toolbar available when you are using the command line.
Documents toolbar	Click **Documents toolbar** to make the Documents toolbar available where you can see all the documents that you currently have open in the active window.

Command bar

Use the command bar to run a procedure at a server directly from any QMF window. You can type a command or select a command from the **Run command** drop-down list. You can select the associated server to run the command from the **at server** drop-down list.

Control Bar

Select **View--> Control Bar** to show or hide the following:

- Explorer Bar
- Status Bar
- Layout Designer

Explorer Bar

Select **View--> Control Bars--> Explorer Bar** to display or hide the Explorer Bar. The Explorer Bar is a dockable tools windows that opens in the left pane of the window but can be moved.

The tools that use the Explorer Bar are the Database Explorer, the Query Results Explorer and the Visual Reports Explorer as well as the Object Analyzer.

Status bar

Select **View--> Control Bars--> Status Bar** to display or hide the status bar at the bottom of every window.

The status bar displays information and messages and provides status information for queries.

Layout Designer

Select **View--> Control Bars--> Layout Designer** to display or hide the Layout Designer dockable window. The Layout Designer window opens in the bottom of the screen but can be moved. You use the Layout Designer when you work with query results.

Options [General tab]

Click **View--> Options**, then click the **General** tab to set general options for QMF for Windows, such as specifying which server definition file (SDF) will be used.

Table 8. Fields on Options - General

Field	Description
Server definition file	The server definition file (SDF) contains the technical information QMF for Windows need to connect users to database servers. Your QMF for Windows administrator creates, maintains and distributes the SDF. The SDF that you are using is displayed in this field. If you have multiple SDFs, you can select another SDF by typing the name of a SDF, or browsing with the browse button.
Display recently used servers first	Check this check box to display the most recently used servers from the SDF first in the Database Explorer window. If this check box is not checked, the servers are listed as they were configured in the SDF.
Filter	Click this button to open the Filter Servers window where you can select the database servers from the SDF that will be included in the selection list. By default all database servers that were configured in the SDF will be included in the selection lists.
Enable extensions for spatial data	Check the **Enable extensions for spatial data** check box to work with spatial data. This check box controls whether information will be gathered for the location, shape of, and relationships among business data and geographic data, including map data, and stored in industry standard files known as shapefiles (*.spm). With shape files, spatial data can be interchanged with other applications or databases that recognize this format.
User Interface language	Use this field to specify the language for the QMF for Windows user interface. You can select the language from a drop down list of supported languages.

Options [Appearance tab]

Click **View--> Options**, then click the **Appearance** tab to set appearance options. The Appearance options specify the strings that will be used for displaying and entering null and default values. You can also specify the data orientation that will be used for query results and reports, as well as whether coloring in text editors will be enabled.

Table 9. Fields on Options - Appearance

Field	Description
Special values	• **Display null values as** – Type the string QMF for Windows uses to display null values that are retrieved from the database server. • **Enter null values as** – Type the string to use when entering null values in query results and in the Edit Table dialog box. • **Enter default values as** – Type the string to use when entering default values in query results and in the Edit Table dialog box.
Data Orientation in query results and reports	• Left-to-Right Select this radio button to specify that the data orientation in query results and reports will read from left to right. • Right-to-Left Select this radio button to specify that the data orientation in query results and reports will read from right to left. • Based on Operating System Select this radio button to specify that the data orientation in query results and reports will be based on what has been specified for the operating system. If the operating system is bidi-enabled, data will display in a right-to-left direction. If the operating system is not bidi-enabled, data will display in a left-to-right direction.
Enable coloring in text editors	Check this check box to enable coloring in text editors. by checking this check box, the text that you type when creating SQL queries will be color enhanced. For example, SQL verbs will appear blue, while clauses are black. You can make changes to the coloring specification using the Formatting bar.

Options [Network tab]

Click **View--> Options**, then click the **Network** tab to set network options. The network options specify the connectivity-specific timeout limits for all database servers that use DRDA over TCP/IP, CLI, ODBC, or CPI-C connectivity. In addition, if you will access any database server using DRDA over SNA connectivity, you must specify the CPI-C services DLL that QMF for Windows will use in the Provider DLL field

Table 10. Fields on Options - Network

Field	Description
TCP	Use these fields to specify the timeouts for all database servers to which QMF for Windows connects using TCP/IP. • Warning The number of seconds that can elapse before a user is notified and given the opportunity to cancel a communication request that has not completed. • Cancel The number of seconds that can elapse before QMF for Windows automatically cancels a communication request that has not completed and returns an error.
CLI Timeouts	Use these fields to specify the timeouts for all database servers to which QMF for Windows connects using CLI • Warning The number of seconds that can elapse before a user is notified and given the opportunity to cancel a communication request that has not completed. • Cancel The number of seconds that can elapse before QMF for Windows automatically cancels a communication request that has not completed and returns an error.
ODBC	Use these fields to specify the timeouts for all database servers to which QMF for Windows connects using ODBC. • Warning The number of seconds that can elapse before a user is notified and given the opportunity to cancel a communication request that has not completed. • Cancel The number of seconds that can elapse before QMF for Windows automatically cancels a communication request that has not completed and returns an error.
CPI-C	Use these fields to specify the timeouts for all database servers to which QMF for Windows connects using TCP/IP. • Warning The number of seconds that can elapse before a user is notified and given the opportunity to cancel a communication request that has not completed. • Cancel The number of seconds that can elapse before QMF for Windows automatically cancels a communication request that has not completed and returns an error.

Table 10. Fields on Options - Network (continued)

Field	Description
CPI-C Provider DLL	Use this field to specify the name of the Provider DLL that QMF for Windows will use to access CPI-C services. You can use the Browse icon to search for available Provider DLLs. For information about what Provider DLLs you should use contact your QMF for Windows Administrator.

Options [LOBs]

Click **View--> Options**, then click the **LOBs** tab to specify how to handle retrieving and saving LOB data.

DB2 Universal Database has a LOB data type that is able to store non-traditional data such as text files, multimedia files, images, video, photograph, and sound files. A LOB is a database entry containing a file that is stored on the database server. LOBs are large and use a large amount of resources.

If the database being accessed contains tables with LOB fields, the QMF for Windows Administrator can prevent access to these tables using the resource limits for your user ID.

Table 11. Fields on Options - LOBs

Field	Description
Override LOB options if possible	Check this check box to specify that you will override the LOB options that have been specified by your QMF for Windows Administrator for your resource limits group. Your QMF for Windows Administrator must have given your resource limits group permission to override the LOB options. If you do not have permission to override LOB options, this check box is not available.
Lob Retrieval Options	You use this field to specify what large object data (LOB) data you will be retrieving. There are four choices: • Disable LOB columns Select this radio button to disable LOB data retrieval. By selecting this option, you will not be able to query any table that contains LOB data. • Disable LOB data retrieval Select this radio button to disable LOB data retrieval but allow access to the other columns in the tables that contain LOB data. By selecting this option, you can query tables that contain LOB data and get result data for all columns except those that contain LOBs

Table 12. Fields on Options - LOBs

Field	Description
	• Retrieve LOB data on demand Select this radio button to specify that you will query tables that contain LOB data and you want your result data to be returned for all columns including those that contain LOB objects. However, you want to select the LOB objects that will be displayed in the contents of the query results. Unless otherwise specified, all users of QMF for Windows can query tables that contain LOBs. To conserve resources, QMF for Windows stores retrieved LOB data in a file. Pointers to the LOB data objects are displayed in the query results. You click on the pointer to view the LOB object. • Retrieve LOB data automatically Select this radio button to specify that you will query tables that contain LOB data and you want your result data to be returned for all columns, including those that contain LOB objects. All result data is automatically displayed in the contents of the query results. This option can potentially consume a large amount of resources and time.
LOB Saving Option	You use this field to specify what large object data (LOB) data you can save. There are two choices: • Disable LOB data Select this radio button to disable saving LOB data on the database server. • Enable LOB data Select this radio button to allow saving LOB data on the database server.
Maximum LOB column size (KB):	Use this field to specify the maximum size of a LOB column, in kilobytes, up to 2G (the maximum LOB size). The default is 0, no maximum. If you query a table with LOB data that is larger than the maximum, the LOB data will not be returned for display.

Options [Traces tab]

Click **View--> Options**, then click the **Traces** tab to activate tracing. You can select one or more components about which information will be gathered during processing.

Note: Use tracing only when you are diagnosing a problem, because tracing can impact performance. Technical support will help you set up the tracing logs and tracing methods.

More than one component can be selected for tracing.

Table 13. Fields on Options - Traces Window

Field	Description
Trace file	The name of the file that will be used to store the trace data that is gathered. Click the browse button to select the trace file to use.
DDM	Check the **DDM** check box to trace DDM operations, which is this is the most frequent type of tracing used. DDM tracing can be used only for a DRDA connection to DB2. DDM tracing identifies the packages, the SQL sent and returned from DB2, and displays query results in English and hex format.
TCP	Check the **TCP** check box to apply tracing to operations executed under a TCP/IP connection to DB2.
CPI-C	Check the **CPI-C** check box to apply tracing to operations executed under a CPI-C connection to DB2. DRDA over SNA uses CPI-C when making the connection to the server.
CLI	Check the **CLI** check box to apply tracing to operations executed under a CLI connection to DB2.
Embedded SQL	Check the **Embedded SQL** check box to apply tracing to embedded SQL operations. Embedded SQL are SQL statements that are embedded within a host language program and are prepared (via the BIND process) before the program is executed.
SQLAM	Check the **SQLAM** check box (SQL Application Manager) to apply tracing to SQLAM operations. SQLAM is a function that represents an application to the remote relational database manager. The SQL application manager can be present in both an application requester and an application server.
REXX	Check the **REXX** check box (REstructured eXtended eXecutor) to apply tracing to IBM ObjectREXX operations. IBM Object REXX, an interpreted, structured, procedural script programming language allows programs and algorithms to be written in a clear, structured way.
Internet Mail	Check the **Internet Mail** check box to apply tracing to Internet Mail operations.

Table 13. Fields on Options - Traces Window (continued)

Field	Description
Messages	Check the **Messages** check box to apply tracing to the informational and error messages issued during a process.

Options [Web Update]

Click **View--> Options**, then click the **Web Update** tab to check for software application updates, such as modifications, on the QMF Resource Center on the Web. You can download and apply and updates from the Web page.

Table 14. Fields on Options - Web Update

Field	Description

Enable Web update	Check the **Enable Web update** check box to check for updates to QMF for Windows at the frequency specified in the **Check for update every __ days** field. If the **Enable Web update** feature is selected, the procedure to check for Web updates will be performed on startup.
	
	The following message displays if an update is found:
	`A new version of the product is available.`
	`Do you want to see more details?`
	
	If you choose to see more details, your browser opens at the QMF for Windows Resource Center.

Check for update every days	Type the number of days between checking for updates to QMF for Windows in the **Check for update every __ days** field. The default is one day from the last update.
Display message if unable to check	Check the **Display message if unable to check** check box to receive a message if there are problems checking for an update, such as Web communication, no Internet connection, or firewall prohibitions. A message similar to the following is issued if there was a problem checking for Web updates, such as from a firewall or communications issues: AN UNEXPECTED ERROR OCCURRED WHILE CHECKING FOR UPDATES.

Options [Database Explorer]

Click **View--> Options**, then click the **Database Explorer** tab to specify the default options that will be used by the Database Explorer. These options specify what branches to display in the tree, how many objects will be included in the branches and whether objects will be run or displayed when a user double clicks on them.

Table 15. Fields on Options - Database Explorer

Field	Description
Display	Use this field to select the branches that are included in the Database Explorer tree. Check one or more of the following check boxes: • Favorites Check this check box to include a Favorites branch in the Database Explorer tree. You can choose to include any QMF object in this folder. • Recently Used Servers Check this check box to include a Recently Used Servers branch in the Database Explorer tree. QMF for Windows will list and keep track of the servers that you have used in the most recent order. The number of servers listed is specified in the Recent List Entries field.
	• Recently Used Objects Check this check box to include a Recently Used Objects branch in the Database Explorer tree. QMF for Windows will keep track of and list the QMF for Windows objects that you have used in the most recent order. The number of objects listed is specified in the Recent List Entries field. • All Servers Check this check box to include an All Servers branch in the Database Explorer tree. QMF for Windows will list all of the database servers that have been configured in the SDF that you are using
Recent List Entries	Use these fields to specify the number of entries that will be included in the Recently Used Servers and Recently Used Objects branches of the Database Explorer tree. • Servers Use this field to specify the number of servers that will be included in the Recently Used Servers branch of the Database Explorer tree. You can include up to 8 servers. • Objects Use this field to specify the number of objects that will be included in the Recently Used Objects branch of the Database Explorer tree. You can include up to 8 objects.

Table 15. Fields on Options - Database Explorer (continued)

Field	Description
Default Action for Queries and Procedures	Use these fields to select the action that QMF for Windows will perform when you double-click on a object that is included in the Database Explorer tree. Your choices are: • Run object Select this radio button to run the object that is selected in the Database Explorer tree. • Display object Select this radio button to display the object that is selected in the Database Explorer tree.

Customizing the toolbar

You can customize the toolbar to display particular buttons.

Adding buttons to the toolbar

Follow these steps to add buttons to the toolbar, such as for job-specific functions.

1. Double-click the gray area surrounding the toolbar.

   The Toolbars dialog box opens.
2. Check the check box for a toolbar.
3. Click **Customize**.

   The Customize Toolbar dialog box opens.
4. In the **Available toolbar buttons** list box, select the button to add to the selected toolbar.
5. Click **Add**.

   The button is added to the toolbar.
6. *Optional:* Repeat steps 4 and 5 for each button you want to add to the selected tool bar.
7. Click **Close**.
8. Click **OK**.

   The Toolbars dialog box closes and the buttons are added to the toolbar.

Moving buttons on the toolbar

Follow these steps to rearrange buttons on the toolbar.

1. Double-click on the gray area surrounding the toolbar.

   The Toolbars dialog box opens.
2. Select a toolbar.
3. Click **Customize**.

The Customize Toolbar dialog box opens.

4. Select the button to move from the **Current toolbar buttons** list box.
5. Click the **Move Up** or **Move Down** button to reposition the button on the toolbar.
6. Click **Close**.
7. Click **OK**.

   The dialog box closes and the buttons appear in their new locations.

Removing buttons from the toolbar

Follow these steps to remove buttons from the toolbar.

1. Double-click on the gray area surrounding the toolbar.

   The Toolbars dialog box opens.
2. Select a toolbar.
3. Click **Customize**.

   The Customize Toolbar dialog box opens.
4. Select a button from the **Current toolbar buttons** list box.
5. Click **Remove**.

   The button is removed from the **Current toolbar buttons** list box.
6. Click **Close**.
7. Click **OK**.

   The dialog box closes and the buttons are removed from the toolbar.

Chapter 3. Queries

A query is a request for information from a database. To request information from a relational database, your query is constructed using Structured Query Language (SQL) statements. With QMF for Windows you can create the SQL statement that will query a relational database in any of the following ways:

- write your own SQL statements
- create SQL statements visually using diagram interface
- create SQL statements using the prompted interface
- create SQL statements using a natural language such as EasyAsk
- use the Database Explorer to find and select queries that have been saved on the database server

Query menu

The Query menu becomes available when you create a new query or open an existing query. Menu options vary depending on how you choose to build your query.

In addition to selecting commands from the main Query menu, you can right-click in the active query window to open a context sensitive menu that includes the most frequently used menu commands for working with queries.

Run

Select **Query--> Run** to run the active query.

Prepare

Select **Query--> Prepare** to invoke the `PREPARE SQL` command. This command instructs DB2 to evaluate the query for the most efficient execution and then devise a plan for its execution.

The Prepare option is available for queries only in the SQL view.

The Set User Information dialog box opens after you select the `PREPARE` option. Type a valid user ID and password to prepare the query on the database.

During this operation:

- resource limits are retrieved
- internal calculations are performed
- a path is devised to best run the query

- the run time is estimated
- the number of returned rows is estimated
- *no data is sent to the client's database*

If successful, an empty results set will be returned that shows all columns selected for the query.

Note: An error message displays if the PREPARE function determines that the query contains errors. The message provides details of the error condition.

Later, when you run the prepared query, the **prepared plan** will be executed instead of developing a plan at run time.

Cancel

Select **Query--> Cancel** to cancel the active query at the database server.

Note: This command is disabled for queries in the prompted or diagram formats.

Uppercase

Select **Query--> Uppercase** to type all new text in uppercase automatically until you deselect this option. No existing text will be modified.

Reformat SQL text

Select **Query--> Reformat** to reformat the SQL text to polish its appearance. The result is:

- text will be rearranged appropriately
- SQL keywords will be capitalized
- queries will be shortened to 79 characters per line, or less

Note: This is a requirement for saving a query at a database server.

Comment

Select **Query--> Comment** to add a comment to a line in a query. A commented line is typically a line of text that describes what the SQL will do in a specific section of code. Commented text is usually internal commentary.

Note: The commented text will not be included when the query runs.

The COMMENT option places two dashes (--) at the beginning of a line in the query, such as:

```
SELECT * FROM Q.STAFF
--USE THIS ONLY FOR MONTH-END REPORTS
```

Uncomment

Select **Query--> Uncomment** to remove the commented line or lines. Once a line is uncommented it will be read when the SQL query is run.

This option removes the comment flag, two dashes (--), from the beginning of a line in the query, such as:

```
SELECT * FROM Q.STAFF
USE THIS ONLY FOR MONTH-END REPORTS
```

Expression Builder

Select **Query--> Expression Builder** to access a submenu, or palette, of SQL elements for building an SQL expression. The Expression Builder palette contains common elements such as:

- operators (+, -, *, /)
- CONCAT
- ()
- constant
- column name
- special register
- function
- case expression

Note: Connect to the server before you use the Expression Builder.

A template for each expression element you select is inserted into the query document. This provides the fundamental structure for you to substitute parameters for the query in place of the <expression>. For example,

```
CASE <expression> WHEN <expression> THEN <result-expression> ELSE
<result-expression> END
```

Note: This command is disabled for queries in the prompted or diagram formats.

Set server

Select **Query--> Set server** to determine which database server will be used to run the active query.

Note: Only databases to which you have access will be listed.

Set user information

Select **Query--> Set user information** to set your database server user ID, and password for the active prompted query. Setting an accounting string is optional.

Note: You can change this information to run a query at an alternate server or at a server on which you require a higher level of authority.

Set row limit

Select **Query--> Set row limit** to specify the maximum number of rows to retrieve from the database server for the active query. This option reduces runaway queries and can be implemented at peak times.

Note: This limit is superseded by row limits defined by DB2 and the resource limits group to which you belong, as defined by the System Administrator.

Set font

Select **Query--> Set font** to change the font for the query. The entire text of the query changes when you select a new font.

Note: The font used for query results does not change when this option is selected.

Note: This command is disabled for queries in the prompted or diagram formats.

Bind Package

Select **Query--> Bind Package** to bind a package for a static query. This option becomes available after you type an SQL statement.

This operation enables distributed SQL to run at any DB2 database. A package must be bound at the database server that contains the active SQL statement as a static query.

Note: You need permission to access the database before binding the SQL to the server. When you select this option the Set User Information dialog box opens for you to provide a user ID and password for the selected server.

The Bind Static Package contains fields for the Collection ID, Package name, Owner ID, Delimiters, Isolation Levels, and input variables, if any.

For bound packages, host variables are used in place of each substitution variable in the SQL statement because a substitution variable cannot always be directly replaced by a host variable. Substitution variables provide direct text substitution in the query statement before the query is executed at the database server. Host variables are sent as part of the query to the database server. Refer to the documentation for your database server for rules on where and how host variables can be used in queries.

The SQL is bound at the server under the specified collection ID and package name. A consistency token and section number are assigned during the bind. The following message displays following the bind:

```
The query will now be run via static SQL.
You must save this query in order to continue running it via SQL in the future.
```

Static queries are run directly from the server and system resources are not consumed as when you run a query on an ad hoc basis.

Note: A query bound at a server cannot be changed. It displays as a read-only SQL statement. Select **Query-->Revert To Dynamic SQL** to update the query.

Add

The Add command is only available when you are creating a query using the prompted or diagram interfaces. The options that are available depend on the elements of the query that you are creating. The Add options are:

Add--> Table
Use this option to add a table to the query.

Add--> Join Condition
Use this option to specify the type of join condition that will be applied when you are using multiple tables in the query.

Add--> Column
Use this option to add a column or column expression to the query.

Add--> Sort Condition
Use this option to add a sort condition that will control how information is sorted in the results of the query.

Add--> Row Condition
Use this option to add a row condition that will control how many rows can be returned in the results of the query.

Revert to dynamic SQL

Select **Query-->Revert To Dynamic SQL** to convert the static query back to an ad hoc (″dynamic″) query. This enables you to edit and run a query after binding the package for it. It also enables you to provide substitution values at run time.

The following message displays when you select this option:

```
Do you want to delete the package from the server as well?
```

A secondary delete-confirmation message displays.

Confirm stored procedure parameters

Select **Query--> Confirm Stored Procedure Parameters** to confirm the input and output parameters that are sent to the database when running the stored procedure, such as the name of the program and the number of parameters expected.

This option displays when you type a `CALL` statement in a query window to run a DB2 stored procedure. With this option, QMF for Windows receives information about the parameter data types, modes, and values from the `CALL` statement, as well as the database server catalog.

Follow these steps to confirm the parameters for a stored procedure:

1. Select the server where the stored procedure is saved.
2. Select **File--> New--> SQL Query**.
3. Type a `CALL` statement.

   The **Confirm stored procedure parameters** option on the Query menu becomes available.
4. Select the **Confirm stored procedure parameters** option.
5. Select **Query--> Run**.

   The Confirm Stored Procedure Parameters dialog box opens. Confirm or update the name, data type, mode, and value of each parameter being sent.

   Note: An error message similar to the following displays if the statement contains errors:

   ```
   An error occurred while running the query.
   The CALL statement contains an invalid or unsupported syntax.
   ```

Use the Database Explorer to select an existing query

Use the Database Explorer to view, access, and analyze QMF objects that reside on the database servers that have been defined in the SDF. When the Explorer Bar is enabled, the (dockable) Database Explorer window opens along with QMF for Windows and it remains open for the entire session.

Navigating the Database Explorer tree

The Database Explorer displays in a tree structure the QMF objects that are stored on the database servers to which you have access. The Database Explorer tree contains four branches:

Favorites

The **Favorites** branch lists the QMF objects that you have selected for inclusion. You can move any QMF object listed in the Database Explorer branches to the Favorites folder by selecting the object and dragging it to the

folder. You can also right-click on the QMF object and select **Add to Favorites** from the context menu. The **Add to Favorites** window opens where you can add the object to your Favorites branch.

Recently used Objects

The **Recently Used Objects** branch lists the database objects that you have used during your the QMF for Windows session in the order that you have used them. QMF for Windows keeps track of your object usage during the session. The list is updated each time that you use an object. You can specify the number of QMF objects that are included in the list by clicking the **Options** icon. The Database Explorer Options window opens.

Recently Used Servers

The **Recently Used Servers** branch lists the database servers that you have used during your last QMF for Windows session in the order that you have used them. QMF for Windows keeps track of your server usage during the session. The list is updated each time QMF for Windows is restarted. You can specify the number of servers that are included in the list by clicking the **Option**s icon. The Database Explorer Options window opens.

All Servers

The **All Servers** branch lists all the database servers that have been defined in the SDF. You can expand each database server by clicking the (+) to the left of the server name. QMF for Windows retrieves and lists all the QMF objects that are stored on that database server. To select what objects should be included in the list, click the **Filter** icon. The Filters window opens

Using the Database Explorer

You can use the database Explorer to:

- Run or display a QMF object by double clicking on the object listed in any of the branches of the Database Explorer tree. By default, double clicking on the OMF object will display the object. To run the object by double clicking, you must open the Database Explorer Options window where you can change the default from **Display** to **Run.**
- Right-click on any database server listed in the Database Explorer tree and open a context menu. From the context menu you can select **Set Filters** to open the Filters window where you specify which QMF objects will be included in the database server branch in the Database Explorer tree. You can select **New Document** which opens a New query document window where you can select an icon that represents the type of new QMF object that you want to create. You can also choose to **Refresh** the list of objects that are available for the selected database server.
- You can right-click on any object listed in the Database Explorer tree and open a context menu. From the context menu you can Open, Run, Delete,

Rename, Copy or Refresh the object. If applicable to the selected object, you can access the Draw, Display Map, Register in Information Catalog, and Properties functions.

- You can view all of a QMF object's dependencies on other objects from the Database Explorer tree. All query objects, including procedures, listed in all of the Database Explorer branches, have a single child node that is labeled References. Expand the query object by clicking the (+) to the left, and then expand the branch References by clicking its (+) expand icon. The QMF for Windows object analyzer is invoked. An analysis is triggered to determine the selected object's dependencies. All reference objects will display beneath the References nodes. All operations that can be performed on objects listed in the Database Explorer branches, can also be performed on these objects.
- If you select a table, the QMF for Windows object analyzer will list the columns. The child node name is Columns. Expand the table object by clicking the (+) to the left, and then expand the branch Columns by clicking its (+) expand icon. The QMF for Windows object analyzer is invoked. An analysis is triggered to determine the selected table's columns. All table column names will display beneath the Columns branch.

Creating a new query

Select **File--> New** to create a new query. The query window opens. You can choose what method you will use to create your query. Your choices are:

- Type the SQL statements directly in the active query window
- Select **View --> Prompted** to create a query's SQL statement using a series of dialogs that will prompt you for the various elements of your query
- Select **View --> Diagram** to create a query's SQL statements using the visual method of diagrams
- Select **View --> Natural** to create a query's SQL statements using a natural language. This option is only available if you have EasyAsk installed.

Type the SQL statements in the Query window

To type the SQL statements for a query you must first open a new query document. To open a new query document select **New --> Query**. The query window opens. You can type the SQL statements directly in the active query window.

You can change the font and vary the color of the text of the SQL statements that you type in two ways:

- Use the Formatting bar

  To open the Formatting bar, select **View--> Toolbars**. From the toolbar window, check the Formatting bar check box.
- Select **Query--> Set Font**.

The Font dialog box opens.

The prompted view of a query

You can build simple to complex queries using the prompted query interface. Select **New --> Query**, then **View --> Prompted** to start building a query using the prompted query interface. The Prompted query interface has five sections where you specify the elements of your query. The five sections are:

- Tables where you specify the tables that will be used in the query.
- Join Conditions where you specify the join conditions for tables, if you are using multiple tables in the query.
- Columns where you specify what columns will be included in the query results
- Sort Conditions where you specify how the rows in the query results will be sorted.
- Row Conditions where you can specify conditions that will limit the rows that are returned in the query results.

In each section you can add, edit, delete and move through the entries using the icons located for each in the upper right hand corner.

Tables

You use the Tables dialog to specify the tables that you want to include in the query. You can specify one or more tables. If you specify more than one table, the Join Conditions dialog opens automatically.

Select **Query --> Add --> Tables** or click the icon in Tables List box to add one or more tables to the query.

Table 16. Tables dialog

Field	Description
Table Owner	The owner identifier of the table that you want to include in the query. You can use patterns to select objects from a list of matching objects. • Use the percent character (%) to match a string of any length containing any characters. For example, to list all tables with a name beginning with the letter A, enter A%. • Use the underscore character (_) to match a single character. For example, to list all tables with an owner that has the letter A in the second position, enter _A%.

Table 16. Tables dialog (continued)

Field	Description
Table Name	The name of the table that you want to include in the query. You can use patterns to select objects from a list of matching objects. See Table Owner for information on matching objects.
Add from List	Lists the tables that are on the database server.

Join Conditions

You can add more than one table to a query. When you add an additional table to a query using the Tables dialog, the Join Conditions dialogs open automatically. There are two Join Conditions dialog windows:

- The Join Tables dialog, where you specify what type of join will link the tables, such as an inner join or left, right or full outer join.
- The Join Columns dialog, where you specify the columns from each table that will be joined

The Join Tables dialog box contains the following fields:

Table 17. Join Tables Dialog

Field	Description
Select a table to join into the query	Lists the tables selected for the query. This table will be joined to another table based on the join condition.
Select the type of join to perform	Select the type of join condition that will be used to connect the table listed to the previously selected table. You have four choices: • Inner Join • Right Outer Join • Left Outer Join • Full Outer Join
Inner join	Only rows with matching values in both tables will be included in the results set. An INNER join is implicit if you do not specify any other join operator. **Note:** An inner join compares every row of the left table with every row of the right table keeping only the rows where the join-condition is true. The resulting table may be missing rows from either or both of the joined tables.

Table 17. Join Tables Dialog (continued)

Field	Description
Left Outer join	All rows in the left table, with matching rows from the right table, will be included. Outer joins include the rows produced by the inner join as well as the missing rows, depending on the type of outer joins. A **Left outer** join includes the rows from the left table that were missing from the inner join.
Right Outer join	All rows in the right table, with matching rows from the left table, will be included. Outer joins include the rows produced by the inner join as well as the missing rows, depending on the type of outer joins. A **Right outer** join includes the rows from the right table that were missing from the inner join.
Full Outer join	All rows from both tables will be included For a FULL OUTER (or FULL) join, the join condition is a search condition in which the predicates can only be combined with AND. In addition, each predicate must have the form'expression = expression', where one expression references only columns of one of the operand tables of the associated join operator, and the other expression references only columns of the other operand table. The values of the expressions must be comparable. Each full join expression in a FULL OUTER join must include a column name or a cast function that references a column. The COALESCE and VALUE functions are allowed. Outer joins include the rows produced by the inner join as well as the missing rows, depending on the type of outer joins. A **Full outer** join includes the rows from both tables that were missing from the inner join.
Continue	Click **Continue** to join the tables. The Join Columns dialog box opens.

Join Columns

Use the Join Columns dialog box to specify the columns that will used to link the tables. The columns from the current table that you are adding to the query and the columns from each table that is already included in the query are listed. Select a column from each list box with the same data type (`NUMERIC`, `DATE`, `TIME`, or `CHARACTER`). Rows that have equal values in those columns will be joined.

The Join Columns dialog box contains the following fields:

Table 18. Join Columns Dialog

Field	Description
Columns of	Lists all the columns that are included in the table that you are adding to the query. Select one column from this list. **Note:** Select a column with matching data types from each list.
Available columns to join	Lists all the columns from the table or tables that are already included in the query. Select one column from this list. **Note:** Select a column with matching data types from each list.

Columns

You use the Columns dialog to specify what columns will be included in the query results. By default, all the columns from a table that is included in the query are included in the query results. In the case where you have multiple tables included in the query, all the columns from each table will be included.

Select **Query --> Add --> Columns** or click the icon in Columns list box to specify the columns that will be included.

The following fields are available:

Table 19. Columns Dialog

Field	Description
Table	Lists the tables that are included in the query. If there are two or more tables, each table is prefixed by a letter, such as `Q.STAFF(A)` and `Q.INTERVIEW(B)`.
Column	Lists the columns for each table in the query
Type	Lists the data type (character, numeric or time) for each column, such as: `SMALLINT NOT NULL`
Label	Lists any labels associated with the column. Labels on columns are implemented as system column headings or column text. Column headings are used when displaying or printing query results.
Comments	Lists any comments associated with the table, such as: `Employee identification number`

Table 19. Columns Dialog (continued)

Field	Description
Or, enter an expression here	Use this field to enter a conditional expression that will determine whether a column is included in the query results. You can use the Expression Builder to help you build the expression. The Expression Builder offers a palette of common elements used to create SQL expressions, such as column names, constants, functions, and operators. When you click the Expression Builder buttons, templates for expression elements are inserted into the expression fields. You can invoke the Expression Builder by: 1. pressing **Alt** + **.** 2. clicking the browse icon to the right of the input field
Summary function	Apply the summary function to the column. QMF for Windows provides a number of summary functions, including `AVERAGE`, `COUNT`, `MAXIMUM`, `MINIMUM`, and `SUM`. The summary function must be compatible with the data type of the column.
New column name	A new column name for a column that will be used in the query results. Usually, this is simpler name than the column name defined in the database. Select a column from the **Column** list box, then type a new column name in the **New column name** field. The column will be renamed in the query results, such as `SHIFTEND` from `A.ENDTIME`.

Sort Conditions

Sort condition control how to sort the rows that will be included in the query results. Rows can be sorted in ascending (A-Z) or descending (Z-A) order.

If you sort your rows by more than one column, the first column is ordered first, then the second column is ordered within the sort order defined for the first column.

There are several methods by which to specify a sort condition:

- From the *Columns in the results set* list, select a column included in the query
- From the *Other available columns* list, select a column that was not selected from the tables in the query

- From the *Or, enter a sort condition* field, type a sort condition

Select **Query --> Add --> Sort Conditions** or click the icon in Sort Conditions list box to open the Sort Conditions dialog box and specify the sort conditions.

Table 20. Sort Conditions Dialog

Field	Description
Columns in result set	Lists the columns that will be included in the query results. • You can select one or more columns if you are adding a sort condition • You can select only one column if you are changing a sort condition
Other available columns	List columns that will not be included in the query results but are available in the table that was queried. You can select any of these columns for the sort.
Or, enter a sort condition	Type a condition by which columns should sort.
Expression Builder	The Expression Builder offers a palette of common elements used to create SQL expressions, such as column names, constants, functions, and operators. When you click the Expression Builder buttons, templates for expression elements are inserted. You can invoke the Expression Builder by: 1. pressing **Alt** + **.** 2. clicking the browse icon to the right of the **Enter a sort condition** field
Sort direction	Apply an ascending (lowest-to-highest) or descending (highest-to-lowest) sort order to the columns selected. The first column is used for the primary sort; subsequent columns will sort within the first.

Row Conditions

Use can specify row conditions to limit the rows that are returned in the query results. Without row conditions, all qualifying rows will be returned from the query.

Select **Query --> Add --> Row Conditions** or click the icon in Row Conditions list box to open the Row Conditions dialog box and specify the row conditions.

Table 21. Row Conditions Dialog

Part of the row condition	**Function**
Connector	An ″And″ or ″Or″ statement that links one row condition with another. These radio buttons are available only when a row condition has been added to the query.
Left side	Select the column from the list box to examine for inclusion in the query results
Operator	Select the **Is** or **Is Not** radio button to determine the relationship between the left- and right sides of the row. Also, select the operation to be applied to the row condition from the Operator drop-down menu. The available operators are: • Equal To • Less Than • Less Than or Equal to • Greater than • Greater than or Equal to • Between • Starting with • Ending with • Containing • Null • Equal in area to
	• Larger than • Larger than or equal to
Right side	Type the condition for which to check the rows. Only rows that meet this condition will be selected for the query

Table 21. Row Conditions Dialog (continued)

Part of the row condition	Function
Expression Builder	Use the Expression Builder for building SQL expressions for the prompted query. The Expression Builder offers a palette of common elements used to create SQL expressions, such as column names, constants, functions, and operators. When you click the Expression Builder buttons, templates for expression elements are inserted into the associated SQL query window or prompted query window. You can invoke the Expression Builder by: 1. pressing **Alt** + **.** 2. clicking the browse icon to the right of the **Enter a sort condition** field

The diagram view of a query

You can build simple to complex queries visually using the diagram query interface. Select **New --> Query**, then **View --> Diagram** to start building a query using the diagram query interface.

There are two main sections in the diagram query window:

- The top section which displays the tables that are included in the query as diagrams
- The bottom section which lists the columns from the tables that will be included in the query results

In creating a query using the diagram interface you can specify one or more of the following elements:

- You must specify the Tables that will be used in the query.
- If you are using more than one table, you must specify the Join Conditions that will link the tables.
- You can specify what Columns will be included in the query results. By default, all columns in all the tables are included in the query results.
- You can apply Sort Conditions control how the rows in the query results will be sorted.
- You can specify Row Conditions that will limit the rows that are returned in the query results.

Tables

You can add a table to the query in one of two ways:

- Right-click in any empty space of the top section of the diagram window. A context menu opens. Click Add table. The Tables window opens.
- Select **Add --> Tables**. The Tables window opens.

In the Tables window specify the table owner and name. You can use the Add from List button to open the Table List window where you can select a table from the list of tables available on the database server. The Tables window is the same window that is used to add tables from the prompted query interface. Refer to "Tables" on page 35 for more information on the fields in the Tables window.

A diagram of the table that you have specified or selected appears in the top section of the diagram window. All the columns that are included in the table are listed in the diagram. All the columns in the table are also listed in the bottom section of the diagram window.

You can include multiple tables in your query. You would follow the same procedure for including tables. However, when you add multiple tables to a query, you must specify how to link the tables using join conditions.

Join Conditions

When you include more than one table in a query you must specify how the tables will be linked. Those specifications are called the join conditions. From the diagram interface, there are several ways to specify the join conditions:

- When you add a table to the query, the Join Tables window and the Join Columns windows open automatically in sequence. You use these windows to specify the type of join will be applied to the tables and what columns will joined. These windows are the same as those used to specify join conditions when you creating queries using the prompted interface. Refer to "Join Conditions" on page 36 for more information on the fields in these windows.
- Use the drag and drop method. Select a column from one table and drag it to a column in another table. A connecting line is drawn from the column in the first table to the column in the second table.
- Select **Add --> Join Conditions**. The Join Tables window opens followed by the Join Columns window. These windows are the same as those used to specify join conditions when you creating queries using the prompted interface. Refer to "Join Conditions" on page 36 for more information on the fields in these windows.

You can change the join conditions or delete a join condition by right clicking on the line that joins the table diagrams in the top section of the window. A context menu opens offering you two choices:

- Select Remove join to remove the join condition that connects the two tables. You must have a least one join condition to link the tables.

- Select Change join to change the join condition. The Join Tables window opens., followed by the Join Columns window where you can make changes to the join conditions.

Columns

The columns for each table that is included in the query are listed in each table's diagram. In addition, all of the columns from all of the tables are listed in the bottom section of the diagram window. The name of the column is specified in Field and the table the column belongs to is specified in Table.

Unless otherwise specified, all the columns listed in the bottom section of the diagram interface will be included in the query results.

You can specify whether a column is included in the query results in one of two ways:

- Using the Include check box in the bottom section of the window. If this check box is checked, the column is included in the query results. If unchecked, the column is not included in the query results.
- From the top section of the window, right-click on a column name in the table diagram. A context menu opens. Select Remove column to exclude the column from the query results. The column is removed from the display in the bottom section of the window. It remains in the table diagram. Select Add column to include the column back in the query results. The column is added back to the display in the bottom section of the window. A column name is never removed from the table diagram in the top section of the window. The table diagrams always shows you what columns are available in the table, the bottom displays shows you want columns will be included in the query results.

Sort conditions

You specify sort conditions for the rows that are returned in the query results using the bottom section of the diagram window. You can specify the sort order and key sequence for each column that is included in the query results.

To select the sort order for a column, click in the Sort order field for one or more of the columns. Click on the arrow to select one of the sorting choices. You can choose:

- ascending to sort in ascending (A-Z) order
- descending to sort in descending (Z-A) order
- not sorted to not have the column's contents considered in the sort

The key sequence determines in what order the columns are sorted. Click in the Key Sequence field for each column and specify a number. The number ″1″ specifies that this column is first in the sort order.

Display Name

You can change the name of a column in the query results. For example, the name of a column in a table may be ″PRODID″ and you would like the name to appear as the name of the product, ″Lamps″ in the query results.

To change the name of the column in the query results:

- Type the new name in the Display name field in the bottom section of the diagram window.

Aggregation

You can apply an aggregation code to column to summarize the contents in the query results.

To select an aggregation code to apply to the column, click in the Aggregation field for one or more of the columns. Click on the arrow to select one of the ways to summarize the contents of the column. You can choose:

- (none)
- average
- count
- maximum
- minimum
- sum

Row conditions

Use can specify row conditions to limit the rows that are returned in the query results. Without row conditions, all qualifying rows will be returned from the query.

You use the following fields in the bottom section of the diagram window to specify the row conditions:

- Row Conditions and ors
- Additional row conditions
- Include duplicate rows

Row conditions and ors

Use this field to specify simple conditions that apply to the specific column. You can use any of the valid SQL operators. For example, enter ″=1″ in a row condition for a numeric column. This will specify that only those rows with a value of ″1″ in this column will be included in the query results.

Additional row conditions

Use this field to add additional row conditions. You have the choice of adding the conditions using an And or Or operator. You can type any valid SQL expression using connectors and columns.

Include duplicate rows
Check this check box to specify that duplicate rows will be included in the query results.

Running queries

1. Select one of the following options:
   - create a query by typing in the SQL statements directly in the active window
   - open an existing query
   - create a query using the prompted interface
   - create a query using the diagram interface
2. Click **Query--> Run** or click the **Run query** con.

   The query runs and the query results are returned.

Switching between query views

You can switch between different views of a query.

1. From the diagram view, select **View--> Prompted** to view your query from the prompted interface.
2. From the prompted view, select **View--> Diagram** to view your query from the diagram interface.
3. From the SQL view, select **View--> Diagram** to view your query from the diagram interface or **View--> Prompted** to view your query from the prompted interface.
4. From the prompted or the diagram views, select **View--> SQL** to view the SQL statements that have been created for your query.

   Note: If you are creating your query using the diagram or prompted views, and you switch to view the SQL statements, you cannot make changes to the SQL statements and then return to the prompted or diagram views. Once you make a change to the SQL statements you cannot go back to the original view.

EasyAsk

Select **File--> New--> Natural Query** to create a query using the EasyAsk program. This option is only available if EasyAsk is installed.

EasyAsk is a natural language, English-only, search interface that transforms your basic search request into a comprehensive advanced search for relevant information in documents and relational databases. EasyAsk returns precise answers in the format that best suits your needs.

You can ask questions in English without learning complex database languages, such as SQL. With EasyAsk, you can access information stored in any database that supports SQL. EasyAsk translates your plain-English request into SQL and displays the answer in a number of useful formats, such as:

- graphs
- spreadsheets
- OLAP pivot tables
- native formats of multiple, third-party reporting tools

Note: EasyAsk translates questions written in English into SQL; other languages are not supported.

Table 22. EasyAsk Options

Option	Description
Open Dictionary	Select the **Open Dictionary** option to open an existing dictionary. A dictionary is a compilation of definitions used to translate everyday English-languages into SQL.
Query Builder	Select the **Query Builder** option to open a window for entering questions for EasyAsk to answer.
View Interpretation	Select the **View Interpretation** option to review EasyAsk's interpretation of a question. This option displays the actual SQL generated for the question and provides a means to view a modified English translation of your question.
Dictionary Editor	Select the **Dictionary Editor** option to customize a dictionary by adding, editing, and removing definitions.
Dictionary Map	Select the **Dictionary Map** option to obtain a graphical view of the tables contained in the EasyAsk dictionary that illustrates the relationships between the tables.
Set Date	Select the **Set Date** option to set date parameters, such as: • defines the word `today` as any date • affects the meaning of other time-sensitive references, such as "last month" or "this quarter" • provides ability to query as-of a certain date • provides the ability to specify the last month of the fiscal year in your application

Table 22. EasyAsk Options (continued)

Option	Description
Construction Kit	Select the **Construction Kit** option to set dictionary parameters such as: • creates an EasyAsk dictionary for your ODBC data source • adds or deletes tables, columns and defined values to or from an existing dictionary
Dictionary Properties	Select the **Dictionary Properties** option to customize settings for the current dictionary, such as: • general properties • dialect properties • security properties • search properties

Draw queries

Select **File--> Draw Query** to create an SQL query automatically by specifying the tables to query and the query type, which can be a `SELECT`, `UPDATE` or `INSERT` query. The SQL statement is built automatically and it references the names and data types of all columns in the selected table or tables.

You can edit the SQL statement prior to running it.

Drawing SQL queries - by table name

1. Select **File--> Draw Query**.
   The Draw Query dialog box opens.
2. Specify the server where the tables are stored.
3. Select the query type:

Table 23. Query types

Query type	Result
SELECT	Retrieve rows from one or more tables
UPDATE	Change information in a table. **Note:** Select only one table. Otherwise, this message displays: `You cannot draw an Update or Insert query for more than one table at a time. Remove all but one of the tables from the table list.`

Table 23. Query types (continued)

Query type	Result
INSERT	Add new rows to a table **Note:** Select only one table. Otherwise, this message displays: `You cannot draw an Update or Insert query for more than one table at a time. Remove all but one of the tables from the table list.`

4. Type the table owner and name.
5. Click **Add**.
6. Click **OK**.

   This creates and displays an SQL query for the selected tables. You can edit the SQL.

Drawing SQL queries - by matching patterns

1. Select **File--> Draw Query**.

   The Draw Query dialog box opens.
2. Specify the server where the tables are stored.
3. Select the query type:

Table 24. Select Query Type

Query Type	Result
SELECT	Retrieve rows from one or more tables
UPDATE	Change information in a table. **Note:** Select only one table. Otherwise, this message displays: `You cannot draw an Update or Insert query for more than one table at a time. Remove all but one of the tables from the table list.`
INSERT	Add new rows to a table **Note:** Select only one table. Otherwise, this message displays: `You cannot draw an Update or Insert query for more than one table at a time. Remove all but one of the tables from the table list.`

4. Type a pattern to locate the table.

   Patterns enable you to search for table names from a list of matching tables. There are two types of search patterns:

- **Percent**

  Use the percent character (%) to match a string of any length containing any characters. For example, to list all tables with a name beginning with the letter A, enter A%.
- **Underscore**

  Use the underscore character (_) to match a single character. For example, to list all tables with an owner that has the letter A in the second position, enter _A%.

5. Click **Add from List**.
6. Select a table from the list.
7. Click **OK**.
8. Type a unique identifier for the table.
9. Click **Add**.

   The table is added to the query.
10. Click **OK**.

    The SQL for the selected table or tables is created and displayed. You can edit the SQL.

Variables in SQL queries

Variables are a small part of the computer program code that can be modified while the program is running. In this way, the same program can be used for several actions.

QMF for Windows has two kinds of variables:

- substitution variables, which are used in SQL queries
- global variables, which are system-level variables, described in the chapter, *Working with Global Variables*

Substitution variables

Substitution variables are used in QMF objects for substituting variables to strings at run time. This feature enables you to substitute a part of an SQL statement and make it more generic. Substitution variables are active only while the object (query, procedure or form) is running. As a result, only one object can access the substitution variable. The variable will not exist after the object is executed.

A substitution variable is special text in a query that begins with an ampersand character (**&**). A substitution variable and can contain up to 18 alphabetic, numeric or special characters such as ^ ! $ ~ { } ? @ # % \ or _.

A substitution variable can appear anywhere in a query. The value of the substitution variable can be anything used in a query (except a comment). For

example, you can use a substitution variable in place of a column name, search condition, subquery, or any specific value.

Example

You will be prompted for a customer number each time you run the following query:

```
SELECT ORDERNO, SALESREPNO, PRODNO, QUANTITY, &CUSTNO AS CUSTOMER#
FROM Q.SALES
```

When you run the query and supply customer number at the prompt, the query will retrieve only those records that are associated with the specified customer number. Later you can launch the query and provide a different customer instead of writing a separate query.

Task

The following sample query illustrates how to use a substitution variable:

1. Open a query.
2. Type this SQL statement:

   ```
   SELECT * FROM Q.STAFF WHERE DEPT >= &MIN_DEPT
   ```

3. Select **Query--> Run**.

   The Enter Substitution Variable Values dialog box opens.
4. Type 50 in the **Value** field.
5. Click **OK**.

Try experimenting with substitution variables by replacing values in the `SELECT` and `FROM` clauses. See what results your queries return.

Saving and opening queries

You can save queries on your PC, on a file server, or at a database server. A query is saved in the format that is currently being used to view the query. For example, if the query is being viewed in the prompted interface, it will be saved in the prompted format. If the query is being viewed in the diagram interface, it will be saved in the diagram format. If the SQL statements are being viewed, then the query will be saved in the SQL format. A saved query opens in the format in which it has been saved.

Saving queries to files

1. Create a query.
2. Select **File--> Save**.
3. Type the query name.
4. Click **OK**.

Opening saved SQL query files

1. Select **File--> Open**.
   The Open dialog box opens.
2. Select the file to open.
3. Click **OK**.

Saving SQL queries at the database server

Queries saved at the server so they are accessible to other users.

1. Open a query.
2. Select **File--> Save at Server**.
   The Save Query dialog box opens.
3. Type an owner and a name.
4. Check the **Share the object with other users** check box.
5. Click **OK**.

Opening queries saved at the database server

You can open queries that have been saved at the database server.

1. Click **File--> Open From Server**.
   The Open From Server dialog box opens.
2. Type a server, owner, and name.
3. Click **OK**.

Chapter 4. OLAP queries

For database servers that support DB2 Cube Views, you request information from the server using an OLAP query. OLAP queries are multidimensional queries that can present your data in a wide variety of views. Using QMF for Windows you can:

- Open existing OLAP queries using the Database Explorer
- Create new OLAP queries using the OLAP Query Wizard
- Work with the OLAP query results using the OLAP Query Results Explorer

Open OLAP queries using the Database Explorer

Use the Database Explorer to view, access, and analyze OLAP queries. When the Explorer Bar is enabled, the Database Explorer window opens along with QMF for Windows and it remains open for the entire session.

The Database Explorer displays in a tree structure the QMF objects that are stored on the database servers. The Database Explorer includes the same branches regardless of whether the server is a relational database server or one that supports DB2 Cube Views.

The Database Explorer does list different dependency information for OLAP queries. For OLAP queries the dependencies are:

- Cube
- Dimension
- Measure

To open an existing OLAP query, expand and collapse database server branches until you find the OLAP query that you want to open. Queries that have been been created and saved as OLAP queries are identified with a unique icon containing a small cube in front of the query name.

Open the OLAP query by double clicking on the query or right-clicking on the query to open a context menu where you would select **Run** to run the query. The query results are returned in the active window.

Create new OLAP queries using the OLAP Query Wizard

The OLAP Query Wizard helps you build an OLAP query. The OLAP Query Wizard has the following steps:

- Open the OLAP Query Wizard
- Select a database server
- Specify how the list of cubes on the database server will be presented to you
- Select the cube that will be included in the OLAP query

Open the OLAP query Wizard

From the QMF for Windows main window, select **File--> New--> OLAP Query** to Open the OLAP Query Wizard.

Select a server

Use the **OLAP Query Wizard Select a Server** dialog to select the database server where the cubes that will used in the OLAP query reside.

1. Select a server from the list.
2. Click **Next**.

   The **OLAP Query Wizard Sort Cube List by** dialog opens.

Sort Cube List by

Cubes are stored on the database server by schema and by model. You can choose how those cubes are presented to you for selection in the next step of the OLAP Query Wizard.

1. Select the sorting method to use.

   Select the **Schema** radio button to sort cubes by schema, which is the cube name or the owner of the object.

   Select the **Model** radio button to sort cubes by model.
2. Click **Next**.

   The **OLAP Query Wizard Select a Cube** dialog opens.

Select a Cube

The cubes that reside on the database server are presented in a tree structure based on the sort criteria you specified in the previous step. Use the **OLAP Query Wizard Select a cube dialog** to select the cube to use for the OLAP query.

1. Select the cube to use.

   If you sorted by **Schema** on the OLAP Query Wizard: Cube List Filters dialog box, the cube is shown in server, name, then cube order.

   If you sorted by **Model** on the OLAP Query Wizard: Cube List Filters dialog box, the cube is shown in server, model, then cube order.
2. Click **Finish**.

The OLAP query is run on the database server. The results are returned in the active window.

Work with the OLAP Query Results Explorer

After you run an OLAP query, the results are returned in the active window. The OLAP Query Results Explorer opens in the Explorer window. Once you have query results you have several options: one of which is to make changes to the query results as they appear in the active window.

- Use the Filter options to exclude data from the OLAP query
- Use the Query Results Explorer, Layout Designer, drag and drop, and menu commands to format the query results

Filtering Options

You can use the Filters dialog to select which cube dimensions will be included in the OLAP query. With this option you can choose to exclude data from the OLAP query.

The Filters dialog box lists the dimensions defined for the cube. Each dimension of a cube has one or more attributes. By checking or unchecking a check box you can choose to include or exclude the attribute's or entire dimension's data from being included in the OLAP query.

Select values to include in results

You cannot de-select an entire dimension, and you need to select at least one value for each dimension.

Procedure

1. Use the OLAP Query Wizard to select a cube, run the OLAP query and return results.
2. Open the Filter dialog by:
   - selecting **Results--> Filter** from the main menu
   - right-clicking on a dimension or attribute in the Query Results Explorer tree to open a context menu then select **Filter**
   - click on the **Filters** icon in the toolbar

   The Filters dialog opens.
3. Click the (+) to expand the dimension.
4. Uncheck the check box next to each dimension item you want to filter out from the OLAP query.

   Note: You cannot filter out an entire dimension.
5. Click **OK**.

   The OLAP query is rerun and results are returned recalculated.

Additional Filter Options

There are two additional filtering options:

- Filter out
- Filter Everything but

The **Filter out** and the **Filter Everything but** options are available from context menu that opens in the OLAP query results when you right click on a cell in a column. If you select **Filter out,** the cell of the column is filtered out of the query results. If you select **Filter Everything but,** then all the cells of the column are filtered out from the query results except for the one that you selected.

Formatting the OLAP query results

You can use the following to format the OLAP query results:

- OLAP Query Results Explorer
- Layout Designer
- Drag and drop
- Menu commands

OLAP Query Results Explorer

The OLAP Query Results Explorer opens in the Explorer window when the results of the OLAP query are returned. The OLAP Query Results Explorer displays the OLAP query results in a tree structure.

You can use the OLAP Query Results Explorer to move around, discover and easily modify the structure of the OLAP query results. You can select columns to summarize, group like information, and change the order of result columns dynamically in the active window.

The OLAP query re-runs each time you make changes to the query results using the OLAP Query Results Explorer.

Navigating the Query Results Explorer tree

The Query Results tree has the following branches:

- Cube
- Layout

Cube: The name of this branch is name of the cube that was selected for the OLAP query. It list the dimensions and measures that were used in the OLAP query. As you make changes to the query results in the active window, this branch remains unchanged. It serves as the source.

Layout: This branch lists the columns as they currently appear in the active window. As you make changes to the OLAP query results in the active window, the changes are reflected in this branch of the tree. There are three nodes in the Layout branch:

- Top Dimensions

  Lists the dimensions that you have selected to be summarized along the top of the query results.
- Side Dimensions

  Lists the dimensions that you have selected to be summarized along the left side of the query results.
- Measures

  Dynamically lists and relists the query results measures as they appear after each move that you make using the Query Results Explorer or the Layout Designer.

Working with the OLAP Query Results Explorer

There are two ways of working in the OLAP Query Results Explorer:

- using a context menu
- drag and drop

You can right-click on any measure listed in Layout branch to open a context menu. From the context menu you can:

- Apply formatting to whole columns and unique formatting to cells within columns in the query results
- Apply grouping to columns in the query results
- Remove columns from the query results

Many of the commands that are available from the context menu are also available from the Results menu in the main menu bar or from the context menu that opens when you right click in the open space of the query results. Each command is discussed in detail later in this chapter.

Drag and Drop: From the OLAP Query Results Explorer tree you have the following drag and drop capabilities:

- You can remove columns from the query results by selecting the column from the Measures branch and dragging it to the Cube dimensions branch. The measure (column) is removed from the query results.
- You can return the measure to the query results by selecting the column from the Cube Dimensions branch and dragging it to the Measures branch. You can drop the column any where in the query results.
- You can rearrange the order of columns in the query results by selecting a measure in the Data Columns branch and dragging it to a new position.

- You can select any measure branch and drag it to the Top Groups branch. The column will be summarized and placed across the top of the query results.
- You can select any column in the Data Columns branch and drag it to the Side Groups branch. The column will be summarized and placed as the first column to the left of the query results.
- An entire dimension must be selected for the side group. For example, you cannot select the MARKET_STATE characteristic alone; instead, you need to select the entire MARKET dimension.
- Remove the side group by dragging the dimension from the side dimensions branch in the layout designer to the Dimensions branch of the object tree.

Layout Designer: Another tool that is available to change the OLAP query results in the active window is the Layout Designer. The OLAP Query Results Explorer and the Layout Designer work together. Any changes made with one are dynamically incorporated by the other.

Layout Designer

The Layout Designer and the OLAP Query Results Explorer share much of the same functionality. You can access the same context menu and perform similar drag and drop moving of columns. These two tools work together and any changes you make with one are incorporated by the other. You would select which tool to use based on your preference of working with trees or working with a more visual representation of the query results.

There is one difference. With the Layout Designer you can choose to work offline, that means you can make changes to the query results and they are not immediately applied in the query results active window.

Depending on the complexity of the query results, applying each change dynamically can consume excessive time and system resources. By working offline, you can make all the changes, see how the query results will look in the Layout Designer window, without the changes actually occurring. This saves system resources. When you have made all the changes, then you can check the Enable online mode check box to update the view of the query results in the active window.

Menu commands

You can use any of the following menu commands to format the OLAP query results.

Copy

Use the **Copy** option to copy data for a measure or dimension directly to the clipboard.

Font and Format

You can apply extensive formatting options to the OLAP query results. The formatting options are the same as for relational query results and the details are covered in the chapter on Query Results.

Grouping and aggregation

The **Grouping and Aggregation** options are not available from the Results menu, or from the context menu. Instead, the grouping and aggregation options are defined by the administrator when creating the OLAP cubes using a third-party product.

Drill down

Use the **Drill Down** option to view detailed data for a dimension and its corresponding measures.

Procedure:

1. Right-click on a rolled-up (summary) dimension in the OLAP query results, or the Layout Designer, or OLAP Query Results Explorer.
2. Select **Drill Down** from the context menu.

   Detailed information rather than summary information is revealed for the dimension.

Drill up

Use the **Drill up** option to view summary data for a dimension and its corresponding measures.

Procedure:

1. Right-click on a dimension on the OLAP query results, or the Layout Designer or the OLAP Query Results Explorer that does not have summary information.
2. Select **Drill up** from the submenu.

   Summary information is revealed for the dimension.

Remove from Layout

Use the **Remove from Layout** option to remove a column from the OLAP query results. The column is removed from the layout but not from accessible query results.

Procedure: To remove a column from the query results layout:

1. Right-click on a column in the OLAP query results, or the Layout Designer or the OLAP Query Results Explorer.
2. Select the **Remove from Layout** option from the submenu.

Note: Notice that the column has been removed from the OLAP query results, the Layout Designer, and the Layout section of the Query Results Explorer.

To return the column to the layout:

1. Select the column from the Dimensions or Measures branches of the OLAP Query Results Explorer tree.
2. Drag the selected column to the Layout branch of the OLAP Query Results Explorer tree.

   The column is returned in the OLAP query results, the Layout Designer, and the Measures node of the Layout branch in the OLAP Query Results Explorer tree.

Chapter 5. Query results

Overview

After you run a query, the results are returned in the active window. Once you have query results you have several options, one of which is to make changes to the query results as they appear in the active window.

Query Results Explorer

The Query Results Explorer opens in the Explorer window when the results of the query are returned. The Query Results Explorer displays the query results in a tree structure.

You can use the Query Results Explorer to move around, discover and easily modify the structure of the query results. You can select columns to summarize, group like information, and change the order of result columns dynamically in the active window.

Navigating the Query Results Explorer tree

The Query Results tree has the following branches:

- Result Set
- Layout

Result Set branch

This branch lists the columns that are in the query results as they were returned from the query. As you make changes to the query results in the active window, this branch remains unchanged. It serves as the source.

Layout

This branch lists the columns as they currently appear in the active window. As you make changes to the query results in the active window, the changes are reflected in this branch of the tree. There are three nodes in the Layout branch:

- Top Groups

  Lists the columns that you have selected to be summarized along the top of the query results.
- Side Groups

  Lists the columns that you have selected to be summarized along the left side of the query results.
- Data Columns

Dynamically lists and relists the query results columns as they appear after each move that you make using the Query Results Explorer or the Layout Designer.

Working with the Query Results Explorer

There are two ways of working in the Query Results Explorer:

- using a context menu
- drag and drop

You can right-click on any column listed in Layout branch to open a context menu. From the context menu you can:

- Apply formatting to whole columns and unique formatting to cells within columns
- Apply grouping to columns in the query results
- Add columns to the query results based on expressions
- Remove columns from the query results
- Resort the rows in the query results based on different criteria

Many of the commands that are available from the context menu are also available from the Results menu in the main menu bar or from the context menu that opens when you right click in the open space of the query results. Each command is discussed in detail later in this chapter.

Drag and Drop

From the Query Results Explorer tree you have the following drag and drop capabilities:

- You can remove columns from the query results by selecting the column from the Data Columns branch and dragging it to the Result Set branch. The column is removed from the query results.
- You can return the column to the query results by selecting the column from the Results Set and dragging it to the Data Columns branch. You can drop the column any where in the query results.
- You can rearrange the order of columns in the query results by selecting a column in the Data Columns branch and dragging it to a new position.
- You can select any column in the Data Columns branch and drag it to the Top Groups branch. The column will be summarized and placed across the top of the query results.
- You can select any column in the Data Columns branch and drag it to the Side Groups branch. The column will be summarized and placed as the first column to the left of the query results.

Note: Data in the query results can be grouped by columns on the vertical axis, and related values by columns can be grouped on the horizontal

axis. This is known as pivot or ACROSS functionality. You can define multiple levels of grouping on both axes.

Layout Designer
Another tool that is available to change the query results in the active window is the Layout Designer. The Query Results Explorer and the Layout Designer work together. Any changes made with one are dynamically incorporated by the other.

Using the Layout Designer

Another tool that is available to change the query results in the active window is the Layout Designer. Using the Layout Designer you can:

- select columns to summarize vertically
- select columns to summarize horizontally
- change the order of columns in the query results

The Layout Designer does not open automatically when query results are returned to the active window. You must open the Layout Designer. Select **View --> Control Bars --> Layout Designer** to open the Layout Designer window.

Dynamically updating query results

The Layout Designer and the Query Results Explorer share much of the same functionality. You can access the same context menu and perform similar drag and drop moving of columns. These two tools work together and any changes you make with one are incorporated by the other. You would select which tool to use based on your preference of working with trees or working with a more visual representation of the query results.

There is one difference. With the Layout Designer you can choose to work offline, that means you can make changes to the query results and they are not immediately applied in the query results active window.

Depending on the complexity of the query results, applying each change dynamically can consume excessive time and system resources. By working offline, you can make all the changes, see how the query results will look in the Layout Designer window, without the changes actually occurring. This saves system resources. When you have made all the changes, then you can check the Enable online mode check box to update the view of the query results in the active window.

Navigating the Layout Designer window

The Layout Designer window consists of three sections:

- Drag column here to create top groups

Lists the columns that will be summarized across the top of the query results.

- Drag column here to create side groups

  Lists the columns that will be summarized in a column placed to the left of the first column of the query results.

- Columns workspace

  Lists the columns as they currently appear in the query results.

There are two ways of working in the Layout Designer:

- using a context menu
- drag and drop

Using the context menu

You can right-click on any column heading listed in Columns workspace to open a context menu. From the context menu you can:

- Apply formatting to whole columns and unique formatting to cells within columns
- Apply grouping to columns in the query results
- Add columns to the query results based on expressions
- Remove columns from the query results
- Resort the rows in the query results based on different criteria

Many of the commands that are available from the context menu are also available from the Results menu in the main menu bar or from the context menu that opens when you right click in the open space of the query results. Each command is discussed in detail later in this chapter.

Drag and drop

From the Layout Designer you have the following drag and drop capabilities:

- You can remove columns from the query results by selecting the column from the Columns workspace and dragging it to the Result Set branch of the Query Results Explorer. In order to remove columns from the Layout Designer by drag and drop the Query Results Explorer must be open. The column is removed from the query results.
- You can return the column to the query results by selecting the column from the Results Set branch of the Query Results Explorer and dragging it to the Columns workspace. You can drop the column any where in the query results. In order to return columns to the Layout Designer by drag and drop the Query Results Explorer must be open.
- You can rearrange the order of columns in the query results by selecting a column in the Columns workspace and dragging it to a new position.

- You can select any column in the Columns Workspace and drag it to the Drag column here to create top groups section. The column will be summarized and placed across the top of the query results.
- You can select any column in the Columns Workspace and drag it to the Drag column here to create side groups section. The column will be summarized and placed in a column to the left of the query results.

Note: Data in the query results can be grouped by columns on the vertical axis, and related values by columns can be grouped on the horizontal axis. This is known as pivot or ACROSS functionality. You can define multiple levels of grouping on both axes.

Formatting the query results

You can choose to apply a wide range of formatting options to the query results. There are two ways of applying formatting options:

- Formatting bar

  You can apply many of the formatting options using the Formatting bar. You can set the type and size of the font; specify a font style of bold or italic; select text and background color; and specify alignment, data format and precision.
- Layout Properties window

  From this window you can set all the formatting properties including conditional formatting.

Formatting Bar

The Formatting bar enables you to quickly apply many formatting options to the query results.

You open the Formatting bar by selecting **View --> Toolbars** and checking the Formatting bar check box. The Formatting bar opens in the top of the window.

To apply formatting, select a cell or a column in the query results and then select the formatting option from the Formatting bar that you want to apply.

Layout Properties window

From the Layout Properties window you can set all the formatting options that are available for the query results. The options are divided into the following groups:

- General
- Font
- Format
- Conditional

You can apply formatting options to entire columns, individual cells, column headings, and summary cells. The Layout Properties window includes a tree that will help you to navigate the query results, and select the cells or columns for formatting.

General Options

Table 25. General Options

Field	Description
Heading	Displays the name of the column that you have selected for formatting. You can type a new heading for the column in this field. The new name will appear in the query results.
Grouping and Aggregation	Displays the aggregation specifications that will be applied to the column. If none have been specified, this field is not available.
Width (in pixels)	Specifies the width of the column in pixels. You can change the width by typing a new number in the text box or selecting a number from the drop-down list.
Source	Displays the source for the data that is in the column that you have selected. If the column contents is the result of an expression, the conditional expression that was used is displayed.

Font options

Table 26. Font Options

Field	Description
Font	The name of the font, such as Arial or Times Roman
Font style	The style of the font, such as bold or italic
Size	The point size of the font
Script	The type of script being used, for example Western.
Foreground color	The color of the text, such as dark blue
Background color	The color the text is against, such as a gray background
Sample	A rendering of the current formatting

Table 26. Font Options (continued)

Field	Description
Set as default	Press the **Set As Default** button to set the current font attributes as the default for subsequent query results. **Note:** The default will remain in effect until you choose a new font or change the default.
Reset to default	Click the **Reset To Default** button to reset the font formatting attributes to the default setting

Format options

The available Format options vary depending on whether you selected a column with character, numeric, date or time data.

Table 27. Format options

Field	Description
Format	For numeric data: • As is • Currency • Decimal • Scientific • Percent • User Currency
	For character data: • As is • Hexadecimal • Binary
	For date and time data: • As is • the month, day and year (date) • the hour, minute, and second (time) • with the separator symbol that you choose
Sample	Shows a snapshot of the column format.
Horizontal alignment	From the drop-down list, select how to align data horizontally in the column. Options are: • left • right • center

Table 27. Format options (continued)

Field	Description
Vertical alignment	From the drop-down list, select how to align data vertically in the column. Options are: • top • center • bottom
Options	For numeric data: • Check the **Thousands separator** check box to place a thousands separator in numeric values (the symbol is taken from Windows settings). • Select the format for Negative numbers from the drop-down list. • Select the format for Decimal places from the drop-down list.
	For character data: • Check the **Wrap text** check box to wrap the contents of the cell to the next line within the cell.
	For Time and Date data: • Select the Separator symbol to format date data, such as a slash (/) for date data. An example is: 03/25/02. Select the symbol to format time data, such as a colon (:). An example is: 12:03:02. • Check the **12 hour mode** check box to display time in a 12-hour interval, such as 03:12:30 PM or 10:05:07 AM. If this check box is unchecked, time is displayed in 24-hour format (such as 15:12:06).
Set as default	Press the **Set As Default** button to set the current format attributes as the default for subsequent query results. **Note:** The default will remain in effect until you change the default.
Reset to default	Click the **Reset To Default** button to reset the format attributes to the default setting

Conditional options

You can specify conditional formatting options for each detail, summary and grand total cell in a column. Based on an expression, each cell in the column can be formatted differently. For example, within a column, you could specify

that if a cell's contents equals 0, then display the cell with a red background and if value is 100, display the cell with a blue background.

To set conditional formatting follow these steps:

1. From the Columns tree in the Layout Properties window, click on the Detail branch to apply conditional formatting to the detail cells of the column, the Summary branch to apply conditional formatting to the summary cells, or the Grand Total branch to apply conditional formatting to the grand total cell of the column.
2. With the appropriate branch selected, click the Add icon. The control fields Condition name and Condition Expression become available.
3. You must give each conditional expression that you create a name. Type the name of the expression in the Condition name field. A branch is automatically created in the tree using the condition name.
4. Each condition must have an expression. Type the expression in the Condition Expression field. You must follow the rules for building conditional formatting expressions.
5. After you have created the expression, select the Font or the Format page of the Layout Properties window to specify the formatting that will be applied to any cell in the column that meets the conditions set in the expression.

Table 28. Conditional options

Field	Description
Condition name	Use this field to specify a unique name for the conditional expression. A branch in the Layout Properties tree is created using this name.
Condition expression	Use this field to specify the conditional expression. You must follow the rules for building conditional formatting expressions. The expression language supports constant expressions, expressions defined as variables sourced on other columns in the result set (&1, &2, for example), numeric operators (such as +, -, *, /), character operators (+, CONCAT), numeric and character functions (such as MIN, MAX, AVG, SQRT, CONCAT, SUBSTR), and a set of logical and relational operators (such as >, <, =, !=) **Note:** For more information on the expression language refer to QMF for Windows online help.

Adding Calculated Columns to the query results

A calculated column is a column of data that is created and added to the query results. The contents of the new column is based on an expression that you define. The expression can use data from other columns, constants and variables.

You use the Calculated Columns window to add a calculated column to the query results. You can open the Calculated Columns window by:

- right clicking outside the query results in the active window and selecting **Add Calculated Column** from the context menu
- right clicking on a column in the Result Set branch of the Query Results Explorer tree and selecting **Add Calculated Column before** from the context menu

The expression used to calculate the value of the added column is saved with the query. The calculated column will be included in the query results each time the query is run.

Table 29. Calculated Columns dialog

Field	Description
Name	Use this field to specify the name for the new column as it should appear in the query results.
Expression	Use this field to specify the conditional expression. You must follow the rules for building conditional formatting expressions. The expression language supports constant expressions, expressions defined as variables sourced on other columns in the result set (&1, &2, for example), numeric operators (such as +, -, *, /), character operators (+, CONCAT), numeric and character functions (such as MIN, MAX, AVG, SQRT, CONCAT, SUBSTR), and a set of logical and relational operators (such as >, <, =, !=) **Note:** For more information on the expression language refer to QMF for Windows online help.

Grouping and aggregation

Purpose

You use the grouping and aggregation options to organize the query results into logical or summarized groupings.

You can, for example,

- Roll up data in a report by department
- Average departmental commissions

No aggregation

Select a column, then select **Results--> Grouping and Aggregation--> No Aggregation** to remove any aggregation or summary formatting from the selected column.

Top group with summaries

Select a column, then select **Results--> Grouping and Aggregation--> Top group with summaries** to:

- group data ACROSS on the query results by the selected column
- present query results data for the other columns selected for the query
- provide a summary line for each row

Data in the query results can be grouped by columns on the vertical axis. Related values by columns can be grouped on the horizontal axis, which is known as *pivot* or *ACROSS* functionality. You can define multiple levels of grouping on both axes. Grouping can be performed by drag-and-drop operations on the columns in the query results, within the layout designer, or within the query results explorer.

For example, select the **Top group with summaries** option, then specify to group data by EDLEVEL (Education Level). The query results will be reformatted so that the EDLEVEL column spans the other columns in the result set. A summary line for each row in the query results is added in the **All values** column.

Table 30. Top group with summaries option

05			**11**			**All values**		
TEMPID	**NAME**	**ADDRESS**	**TEMPID**	**NAME**	**ADDRESS**	**TEMPID**	**NAME**	**ADDRESS**
125	FOX	BOSTON				125	FOX	BOSTON
			460	IDE	EL PASO	460	IDE	EL PASO
			475	TILL	SEQUIM	475	TILL	SEQUIM

Top group with no summaries

Select a column, then select **Results--> Grouping and Aggregation--> Top group with no summaries** to:

- group data ACROSS on the query results by the selected column
- present query results data for the other columns selected for the query

For example, select the **Top group with no summaries** option, then specify to group data by DISP (Disposition). The query results will be reformatted so that the DISP column (HIRE or NO HIRE) spans the other columns in the result set.

Table 31. Top group with no summaries option

HIRE			NOHIRE		
TEMPID	**INTDATE**	**MANAGER**	**TEMPID**	**INTDATE**	**MANAGER**
410	2002-02-02	JACOBS			
			460	2002-10-01	MALVICHI
			475	2002-12-02	HJORDIS

Side group with summaries

Select a column, then select **Results--> Grouping and Aggregation--> Side group with summaries** to:

- aggregate data in the query results by the selected column
- present query results data for the other columns in the query

Note: The column selected for the side group moves to the left of the query results, and groups like data accordingly.

For example, select the **Side group with summaries** option, then specify to group data by JOB. The query results will be reformatted so that jobs are listed along the left side of the query results, and data specific to that job is grouped with each job.

Note: A blank summary line is included as the last row in each group for you to add summary information.

Also, you can drill-down (+) to view detailed data or roll up (-) to view summary data.

Things to note in the example below:

- **JOB** is the column by which data is grouped; jobs are listed in the left column of the query results
- the numbered columns in the first row represent the sequence of the columns in the table

Table 32. Side group with summaries option

1	2	3	4	5	6
JOB	**ID**	**NAME**	**DEPT**	**YEARS**	**SALARY**

Table 32. Side group with summaries option (continued)

(+) MGR	10	SANDERS	20	7	18357.22
(+) SALES	20	PROVENCAL	20	8	18000.06
(-) CLERK	110	NGAN	15	5	12508.20
	120	NAUGHTON	38		12954.75
	130	MOORE	42	6	10505.90
	142	HUME	57	11	14252.75

Side group with no summaries

Select a column, then select **Results--> Grouping and Aggregation--> Side group with no summaries** to:

- aggregate data in the query results by the selected column
- present query results data for the other columns in the query

Note: The column selected for the side group moves to the left of the query results, and groups like data accordingly.

For example, select the **Side group with no summaries** option, then specify to group data by JOB. The query results will be reformatted so that jobs are listed along the left side of the query results, and data specific to that job is grouped with each job.

Note: You can drill-down (+) to view detailed data or roll up (-) to view summary data.

Things to note in the example below:

- **JOB** is the column by which data is grouped; jobs are listed in the left column of the query results
- the numbered columns in the first row represent the sequence of the columns in the table

Table 33. Side group with no summaries option

1	**2**	**3**	**4**	**5**	**6**
JOB	**ID**	**NAME**	**DEPT**	**YEARS**	**SALARY**
(+) MGR	10	SANDERS	20	7	18357.22
	15	SWEENEY	21	10	25000.00

Table 33. Side group with no summaries option (continued)

(+) SALES	20	PROVENCAL	20	8	18000.06
	202	BAILEY	19	20	30000.00
(-) CLERK	110	NGAN	15	5	12508.20
	120	NAUGHTON	38		12954.75
	130	MOORE	42	6	10505.90
	142	HUME	57	11	14252.75
	250	BEAUSSET	63	2	40000.00

Count

Select a column, then select **Results--> Grouping and Aggregation--> Count** to create a summary row at the bottom of the query results showing the number of values in the column.

First

Select a column, then select **Results--> Grouping and Aggregation--> First** to create a summary row at the bottom of the query results showing the first value in the column.

Last

Select a column, then select **Results--> Grouping and Aggregation--> Last** to create a summary row at the bottom of the query results showing the last value in the column.

Maximum

Select a column, then select **Results--> Grouping and Aggregation--> Maximum** to create a summary row at the bottom of the query results showing the maximum value in the column.

Minimum

Select a column, then select **Results--> Grouping and Aggregation--> Minimum** to create a summary row at the bottom of the query results showing the minimum value in the column.

Sum

Select a column, then select **Results--> Grouping and Aggregation--> Sum** to create a summary row in the query results showing the sum of the values in the column.

Note: This option calculates interim summaries and overall summaries if another column is selected for grouping with summaries.

Cumulative sum

Select a column, then select **Results--> Grouping and Aggregation--> Cumulative Sum** to display the values in the column as a cumulative sum, which is a rolling sum. Each value is added to the value in the row below it. A cumulative summary is presented at the end.

For example, here is a list of values:

```
 18357.50
 18171.25
 17506.75
=========
54,035.50
```

Results from a cumulative sum of these values are:

```
  18357.50
  36528.75
  54035.50
==========
108,921.75
```

Average

Select a column, then select **Results--> Grouping and Aggregation--> Average** to create a summary row showing the average of the values in the column.

Standard deviation

Select a column, then select **Results--> Grouping and Aggregation--> Standard Deviation** to create a summary row showing the standard deviation of the values in the column. The standard deviation is a statistic that tells you how tightly all the various examples are clustered around the mean in a set of data.

Percentage of group

Select a column, then select **Results--> Grouping and Aggregation--> Percentage of Group** to display the values in the column as a percentage of the group's total, with a summary row showing the sum of the percentages. Percentage of group identifies how each value in the group contributes to the whole. For example a salary of $1,000 is 10% of a total salary of $10,000.

Percentage of total

Select a column, then select **Results--> Grouping and Aggregation--> Percentage of Total** to display the values in the column as a percentage of the column total, with a summary row showing the sum of the percentages.

Cumulative percentage of group

Select a column, then select **Results--> Grouping and Aggregation--> Cumulative Percentage of Group** to display the values in the column as a

percentage of the group total. A summary row at the bottom of the query results shows the sum of the percentages. For example, DEPT 42 earns 0.42% in commissions.

Cumulative percentage of total

Select a column, then select **Results--> Grouping and Aggregation--> Cumulative Percentage of Total** to display the values in the column as a percentage value of the group total and a percentage value of the column total. A summary row at the bottom of the query results shows the sum of the percentages.

For example, within DEPT 42, Wheeler earns 44.60% of the commissions, while Williams earns 55.40%, and Fraye earns no commission. Overall, this DEPT 42 earns 5.75% in commissions for the company.

Reset formatting

Select **Results --> Reset formatting** to remove all the formatting options that you have specified for the query results.

Select **Results --> Reset all** to reset all the formatting that has been applied to the query results, including changes to font, format, as well as summaries or aggregation.

Autofit

Select **Results--> Autofit** to adjust all columns and rows or selected columns and rows to fit the cell size, row size or column size.

Sort

Select **Results--> Sort** to specify sorting criteria for the query results. You can sort data in ascending or descending order, or develop a multi-level sorting scheme.

Sort ascending

Select **Results--> Sort Ascending** to reorder the data in the query results in lowest-to-highest order (such as 1 - 10), based on the column you are selecting for your sort.

Sort descending

Select **Results--> Sort Descending** to reorder the data in the results in highest-to-lowest order (such as 10 - 1), based on the column you are selecting for your sort.

Multi-level sort

To set-up a multi-level sort you select the first column as the primary column for sorting, the type of sort, and the method of sorting (ascending or descending). Once you enter this information, you can select a second column which will be a second column to sort by. You can repeat this for as many columns as you have in the query results.

For example, select `NAME` as the primary sort, to be sorted in ascending order, then select `DEPT` for the secondary sort, and specify to sort the data in ascending or descending order within the primary (`NAME`) sort.

Go-to

Select **Results--> Go to** to navigate the rows in the query results.

In the **Go to** field, type the number of rows or the percentage of the results to advance in the query results.

The **Go to** value determines whether to go to:

- a specific row in the query results
- a row relative to the current row
- a row located at a specific percentage of the result set

The *Go to* value works in conjunction with the **Absolute row**; **Relative to current row**; and **Percent of result set** fields.

Absolute row

1. Select **Results--> Go to**.
2. Type a number in the **Go to** field.

   This is the number of the row you want to go to.
3. Select the **Absolute row** radio button.
4. Click **OK**.

   The query results will reposition so that the go-to row will be the first row listed.

Relative to current row

1. Select **Results--> Go to**.
2. Type a number in the **Go to** field.

   This value represents the number of rows you want to go beyond the current row.
3. Select the **Relative to current row** radio button.
4. Click **OK**.

   The query results will reposition to the designated row.

For example, if you are on row 3002 and you enter 27 in the **Go to** field, the query results will be repositioned, starting with row number 3029.

Note: You cannot enter a negative value.

Percent of result set

1. Select **Results--> Go to**.
2. Type a number in the **Go to** field.

   This is the percentage to advance through the query results set, starting with row number one.
3. Select the **Percent of result set** radio button.
4. Click **OK**.

   For example if the query results set contains 33 rows and you enter 25 in the **Go to** field, you advance to the eighth row because this row is 25% of the query results.

Display chart

Select **Results--> Display chart** to define the layout for the chart being created from the query results. See Chapter 7, "Visualizing data," on page 111 for more information.

Display map

Select **File -->New --> Map** to visualize query results in the map form using a map application. See Chapter 7, "Visualizing data," on page 111 for more information.

LOB overview

Purpose

QMF for Windows can retrieve large objects (LOBs) from a database, save LOBs to a database, export LOB data to your PC, and insert data types such as text, graphics, audio, video, mixed media, and photo images.

You can retrieve a LOB from a database then edit the LOB in an application that supports the file type you retrieved. For example, you can edit a bitmap in Microsoft Paint (R), as long as Paint is installed on your computer. LOBs are stored in QMF for Windows tables and you manipulate the LOBs as you would any other type of data stored in a QMF for Windows table.

LOBs are supported by DRDA, CLI, and ODBC connections. For each server, LOB support is determined by which connection is used. For example, a

DRDA connection does not support LOBs for all UPB servers. For a UPB server, however, LOBs are supported by a CLI connection.

Because LOBs consume a significant amount of memory, DB2 provides three data types to store these data objects as strings of up to two gigabytes. These include:

- Binary large objects (BLOBS)
- Single-byte character large objects (CLOBs)
- Double-byte character large objects (DBCLOBs)

Features

LOBs can be:

- retrieved from a database and exported to a PC
- inserted as files (such as bitmaps and .gifs) into query results
- edited in the associated application
- stored in QMF for Windows tables in a database by calling the LOB in the same manner as any other type of data
- retrieved through a CLI connection only
- edited, viewed, and exported as an .ixf, .txt, or .htm file

  Note: Exporting as an .ixf file is recommended.
- included in HTML reports
- saved to the database

Retrieving LOBs from a database

Procedure

1. Run the query or procedure that calls the table where the LOB is stored on the database.

   The table with the LOB data is retrieved from the server.

   Note: Each cell in the column containing LOB data is identified with the label, `<LOB locator>`.

   If status bar at the bottom of the window displays the message, `All rows retrieved, more LOB data to retrieve`, it means that transferring LOB data can be resource-intensive. By default, QMF for Windows returns LOB locators that refer back to the actual data on the database. The LOB data will be retrieved on demand or when a function requires it.
2. *Optional:* Select **View--> Options**.

   The Options dialog box displays.

   a. Click **LOBs** to change the default options for retrieving LOBs.

b. Check the **Override LOB options, if possible** check box to make changes to the LOB options.

   Note: This option is available only if your database administrator has granted override authority to you.

View and edit LOB data

You can update the LOB on the server only if you are in edit mode.

Follow these steps to view or edit LOB data:

1. Double-click on a cell labeled <LOB locator>.

   The Column LOB Type Associations dialog box opens. Use this dialog box to specify the Windows file format of the data.
2. Click the **Mapping** button.

   The File Extension Mapping dialog box opens.
3. Select the file extension for the LOB at the File Extension column.

   For example, if the mapping value is bitmap, change the file extension from LOB to **.bmp**.

   Note: Certain applications display specific file extensions. Refer to the manual for your application to determine which files are supported.
4. Click **OK**

   The Column LOB Type Associations dialog box opens.
5. Click **OK**.

   The Column LOB Type Associations dialog box closes and the LOB opens in the designated application.
6. Click **OK**.

   A message box indicates how many rows in the database will be affected by the operation.

   The LOB locators column now contains icons that correspond to the application, such as for bitmaps.
7. Select **Results" Save to Database** to save the query to the server.

Exporting LOB data

Purpose

Use this option to export LOB data retrieved from the database.

Map the file extensions before you export LOB data retrieved from the database (see "View and edit LOB data"), then the export is similar to exporting ordinary data, but with LOB option specifications.

For example, you can export a LOB as a bitmap, then save it as an HTML file (.htm) in the Export Data dialog box.

For most LOB data, an HTML form may make the most sense because the file can be displayed as an HTML address for HTML reports and web pages. For more sophisticated web pages, use the HTML Form capabilities in QMF for Windows.

Procedure

Follow these steps to export LOB data into an .ixf, .txt or .html file:

1. Select **Results--> Save to File**.

   The Export Data dialog box opens.
2. Type a file name.
3. Select a file type, such as .ixf, .txt or .htm, in the **Save as Type** list box.
4. Click **Options**.

   The Export Text/DEL Options (General tab) dialog box opens.
5. Click the **LOBs** tab.

   The Export Text/Del Options (LOB tab) dialog box opens.
6. Choose a directory and a naming convention for your LOB data (database name).
7. Click **OK**.

   The Export Data dialog box opens.
8. Click **Save** to save the file to the specified directory.

   When opened, the text file displays the LOB query results information that was exported from the query results. The HTML file displays an active link.
9. Click the LOB link to display the LOB data in the selected application.

Start cell contents

Purpose

Select **Results--> Start Cell Contents** to open a LOB (large object) in a cell on the query results.

Procedure

1. Select a cell containing a LOB value.
2. Select **Results--> Start Cell Contents**.

   The Column LOB Type Associations dialog box opens.
3. Select one of the following options to make a connection between the LOB and the application used to open it:

- Select the **File Extension** radio button to select the executable file to open the application associated with the LOB, such as .txt for Notepad.

  Note: Use this option when all the LOBs have the same format.
- Select the **Mapping Column** radio button to map the LOBs individually to their applications.

  Note: Use this option if LOBs have different formats.

  Follow these steps:

  a. Select a column from the drop-down list.
  b. Click **Mapping**.

     The File Extension Mapping dialog box opens.
  c. Select the file extension from the file formats listed in the column from the LOB Type Associations dialog box.

     Note: This applies only if a file name is associated with the cell.

Retrieve all LOB values

Purpose

Select Retrieve all LOB values to retrieve all large object data files that are included in the query results.

The label for all cells with LOB data will change from `<LOB locator>` to `<LOB value>` to indicate that you can view or hear LOB data, among other options, depending on LOB type).

Note: Before you retrieve the LOB values, create associations between the LOB and its executable with the **Results--> Column LOB Associations** option.

Column LOB associations

Purpose

Use **Results--> Column LOB Type Associations** to select the executable to open the LOB.

Procedure

1. Select a column containing LOB data.
2. Select **Results--> Column LOB Associations**.
3. Select one of the following options select which executable will be used to open the LOB:

- Select the **File Extension** radio button to select the executable file to view and edit the LOB.

  Note: Use this option when all the LOBs have the same format.
- Select the **Mapping Column** radio button to individually specify which application will be mapped to each LOB.

  Follow these steps:

  a. Select the mapping column from the drop-down list.

  b. Click **Mapping**.

  The File Extension Mapping dialog box opens.

  c. Select the file extension from the LOB Type Associations dialog box.

  Note: This option applies only if a file name is associated with the cell.

Table 34. LOB type options

Field	Description
File Extension	The file extension of the LOB in the cell, from the Windows System Registry.
Mapping column	The column containing mapping values and extensions.

Save to database

Select **Results--> Save to Database** to save the query results to a table on the database server.

Note: You can run a query at a database server and save the query results to a table at a different database server.

The Save Data dialog box opens with three tabbed pages:

- At the **General** page, identify the database server, table owner, table name, comment, and table space for the data being saved
- At the **Options** page, identify how to save the data
- *Optional:* At the **ROWIDs** page, specify ROWID information

Note: This command is available only when you are viewing query results.

Save to file

Select **Results--> Save to File** to save the query results to a file with the file name, location, and format you specify.

This option is available only when you are viewing query results. You can save query results in various formats, such as .txt, .ixf, .html, .csv, .dbf, and .spm.

Optional: You can select a CCSID from the **CCSID** drop-down list if you are exporting the query results as a .txt, .csv or .htm file. This helps ensure operability between the exported files and other applications.

Send to

Select **Results--> Send To** to send the current document to the specified application or target in your Send To: folder.

Editing tables from the query results view

You can edit tables directly from the query results view.

Deleting a row from a table

You can delete rows from tables in the query results view.

1. Run a query.
2. Select a row.
3. Select **Edit--> Delete**.

   The row is deleted.

Updating columns in the table

You can update columns in a table from the query results view.

1. Run a query.
2. Double-click on a cell.
3. Type a new value.
4. Press **Enter**.

   The table is updated.

Zoom

Use the Zoom option to edit a cell in the query results.

Procedure

1. Click on a cell.
2. Press **Shift+F2** or click the right mouse button and select **Zoom** from the context menu.

   The Zoom dialog box opens.

Fields

As is
This option displays the data as it appears in the cell in the query results.

Advanced
Click **Advanced** to expand the dialog box with advanced zoom/edit options.

Note: This button is disabled for cells with numeric data.

When **Advanced** is enabled, the Zoom dialog box expands with additional fields to display the data in hexadecimal or binary format. The Zoom dialog box displays samples of the data in three different formats:

- As is
- Hexadecimal
- Binary

Hexadecimal
Select the **Hexadecimal** radio button to display the As is data in hexadecimal format. You can edit the hexadecimal values in the **As is** or **Advanced** sections of the Zoom dialog box. Changes are reflected in the **As is** field.

Binary
Select the **Binary** radio button to display the As is data in binary format. You can edit the binary values in the **As is** or **Advanced** sections of the Zoom dialog box. Changes are reflected in the **As is** field.

Chapter 6. Reports

Overview

There are two types of reports:

- Classic reports

  Character based reports that are created using forms.
- Visual Reports

  Robust reports containing graphics and rich-formatted text created visually using layout templates

You begin the process of creating either type of report with the Report Wizard. The Report Wizard opens when you have query results in the active window and you:

- Select **Results--> Display Report** from the main menu.
- Right click in the free space next to the query results, open the context menu and select **Results--> Display Report**.

Using the Report Wizard

You begin the process of creating a report with the Report Wizard. The Report Wizard helps you find the dialogs you need to create a new or open an existing report. The process flows as follows:

1. You specify that you are creating a new report or opening an existing report stored in a file or saved on the database server.
2. If you are opening an existing report stored in a file or saved on the database server, the dialogs that you need to open the existing report are presented to you. Based on your input, the Report Wizard opens the existing report.
3. If you are creating a new report, then you specify whether you will be creating a classic report or a visual report. Based on your input, the Report Wizard opens the dialogs that you need to create the report.

Table 35. Report Wizard

Field	Description
Report Wizard Type page	• Select Create a new report to create a new classic or visual report. The Report Wizard New Report page opens. • Select Use an existing report stored at a server to open an existing report that has been saved at the database server. The Report Wizard Open from Server page pens. • Select Use an existing report stored at a file to open an existing report that has been stored in a file. The Report Wizard Open from file page opens.
Report Wizard New Report page	• Select Create a visual report to create a new visual report. Specify whether the new report will be generated using the formatting that has been applied to the current query results or very basic, default formatting. The report opens in the Visual Report window. • Select Create a classic report to create aa new classic report. Specify whether the new report will be generated using the formatting that has been applied to the current query results or very basic, default formatting. The report opens.
Report Wizard Open from Server	Specify the database server, the owner and the name of the visual report or a form for a traditional report that you want to open. You can use the List button to search the database to see a list of the visual reports or forms that are on the database server.
Report Wizard Open from file	Specify the name of the file or use the Browse button to search for the file.

Classic Reports

Classic Reports are created by combining query results with formatting from a form. Forms contain the formatting instructions that are applied to the query results to create a classic report.

Create a new classic report

Follow these steps to create a new classic report:

1. Select **Query--> Run** to run a query and obtain query results.
2. Select **Results--> Display Report** from either the main menu or a context menu.

   The Report Wizard opens.

3. Select Create a new report from the Report Wizard Type page. Select Create a classic report from the Report Wizard New Report page.
4. Since this is a new classic report, and there is no assigned form or formatting instructions, you must specify how the report will be generated. You can select Generated based on the current query to generate the report based on the way the query results currently are formatted or you can select Default to generate the report based on a very basic set of default formatting options. The classic report opens.
5. When the classic report opens, the Form menu becomes available. Use the Form menu commands to specify the formatting options that you want for the report.
6. When you have completed specifying the form formatting options that will be applied to the query results to create a classic report, you can:
   - print the report
   - convert the report to a Visual Report
   - convert the report to HTML
   - change or update the data source
   - export the report
   - save the report
   - save the form

Form menu

Edit
Select **Form--> Edit** to specify the formatting options that will be included in the form.

Refresh from Query
Select **Form--> Refresh from Query** to update the report that is in the active window.

Check
Select **Form--> Check** to check the form for errors and warnings.

Perform check on OK
Select **Form--> Perform check on OK** to validate the form automatically when you click **OK** in the Form dialog box. If the form is valid, the change is applied.

Convert to Visual Report
Select **Form--> Convert to Visual Report** to convert the classic report to a visual report. QMF for Windows takes the query results used to create the classic report and based on the formatting specified in the associated form, creates a visual report.

Convert to HTML form
Select **Form--> Convert to HTML Form** to convert the classic report to an HTML file. When the HTML file is opened, you will see the classic report as it was formatted using the query results and the associated form.

View in Web browser
Select **Form--> View in Web Browser** to view the classic report in your default Web browser. This command is only available after you have converted the report to HTML.

Data Source
Select **Form--> Data Source** to select or change the data source that is used to create the classic report.

Set server
Select **Form--> Set Server** to open the Set Server dialog box to select a database server.

Set user information
Select **Form--> Set User Information** to specify your user ID, password, and optional accounting string that will be used to connect to the database server.

Set font
Select **Form--> Set Font** to change the display font attributes of the text you selected or all the text in the classic report.

Display Chart
Select **Form--> Display Chart** to display the data source that was used to create the classic report in a chart.

Specifying the formatting options in a Form
You specify the formatting options that are saved in the Form using the Form window. You can open the Form window by selecting **Form--> Edit**. The Form window has the following pages:

- Main
- Breaks
- Calculations
- Columns
- Conditions
- Details
- Final
- HTML
- Options
- Page

Main

Select the **Main** tab on the Form dialog box to define the primary components of a form, including form headings, footings, and breaks.

Typically, most formatting changes are made on other tabs on the Form dialog box and the formatting attributes are reflected on the **Main** tab.

Num: The value in the **Num** field identifies the column number. This number is used to resolve variable references, and to determine how query result columns map to report columns.

The first column in the query results is column number 1, the second column in the query results is column number 2, and so on.

Heading: Type the column name to be printed on the report.

Usage: Select a usage code to extract summary information about the data in a column, such as total summary information at the end of a column, or partial summaries at control breaks in a table.

The usage codes that are available depend on the data in the column and the type of summary. Refer to the online help for more information about usage codes.

Indent: Specify the number of blank spaces to the left of the column. The range is between 0 and 999.

Width: Specify the width of column. The range is 1 and 32767.

If the column is too narrow for numeric data, it is replaced with asterisks.

If the column is too narrow for character or date/time data, it is truncated (based on the alignment specified). To correct this, you can use a wrapping edit code to have the data wrap within the column width.

Edit: Select an edit code to control how data is formatted in a report. Edit codes are available for character, date, graphic, numeric, time, timestamp data. Also, user-defined edit codes can be created. Refer to the online help for more information about edit codes.

Seq: Specify a number to adjust the sequence of columns in the report.

If two columns have the same sequence number, they appear in the report in column number order, defined in the **Num** field.

Note: The sequence number is ignored in reports using the ACROSS usage code or if you check the **Automatic reordering of report columns?** check box on the Form Options dialog box.

Breaks

Select the **Breaks** tab on the Form dialog box to specify characteristics, content, and placement of up to six subtotal lines in a report, along with break heading text and break footing text.

1 of 6: Specify up to six break levels for the report.

New page for break: Check this check box to start a new page in the report when the current break level starts.

Blank lines before heading: Specify the number of blank lines before the first break heading line. The range is between 0 and 999.

Repeat detail heading: Check this check box to repeat the detail heading with the current break level.

Blank lines after heading: Specify the number of blank lines after the last break heading line. The range is between 0 and 999.

Alignment: Select how to align the heading text. Choices are: LEFT, RIGHT, CENTER or APPEND (merge with heading on previous line).

Text: Type the text that appears in the break heading.

You can insert *form variables* into text fields to produce information on the report based on certain conditions and where the form variables appear on the report.

Table 36. Form Variables

Form Variable	Use this variable to...
&ROW	display the row number
&DATE	display the current date
&TIME	display the current time
&PAGE	displays the current page number
&COUNT	displays the number of rows retrieved or printed since the last break at the same level
&CALCid	identifies a form calculation expression to use, where 'id' is the ID number of the expression
&n	displays the value of a column, where 'n' is the column number

Table 36. Form Variables (continued)

Form Variable	Use this variable to...
&an	displays the aggregation of a column, where 'n' is the column number, and 'a' is an aggregation variable: • AVG • COUNT • CPCT • CSUM • FIRST • LAST • MAX • MIN • PCT • STDEV • SUM • TCPCT • TPCT The aggregation is based on the rows retrieved or printed since the last break at the same level.

Optional: Use the **Text** field to specify a *global variable*, which is a variable set prior to a QMF for Windows session that is in effect for the duration of the session.

Optional: Use the **Text** field to an *HTML variable*, which formats data for HTML presentation. You can place these variables in any section of a form:

- **&IMAGEn**, which places the contents of column 'n' inside an HTML image reference tag, making graphic files visible in reports.
- **&LINKn**, which places the contents of column 'n' inside an HTML link tag, which is used to add links to other HTML pages.
- **&MAILTOn**, which places the contents of column 'n' inside an HTML mail to tag for an email link.
- **&ANCHORn**, which places an anchor point at the location of the variable value. These anchors are referenced from within the report, such as the top of the page or the beginning of a break section.
- **&REFn**, which places the text contained in the DSQQW_HTML_REFTXT (a global variable, which contains text that appears in a report; the default = 'BACK TO') into an HTML reference tag, and is used to create links to anchors created with the &ANCHORn variable in the report.

Hint:

Refer to the online help for a chart that explains where form variables can appear in a report.

New page for footing: Check this check box to start a new page in the report when the current break level ends

Blank lines before footing: Specify the number of blank lines before the first break footing line. The range is between 0 and 999 or BOTTOM (which is treated as a zero when producing reports in QMF for Windows).

Put summary at line: Specify the line number where the break summary is placed vertically in the break footing lines. The range is between 1 and 999. Specify `NONE` if you do not want a break summary line.

Blank lines after footing: Specify the number of blank lines after the last footing line. The range is between 0 and 999.

Break footing text: Specify the text for the break footing:

- **Line:** specify the line number where the text is placed vertically in the break footing
- **Alignment:** select the alignment option, which controls where the text is placed horizontally on the line, and can be LEFT, RIGHT, CENTER, APPEND, or the number of a specific position in the line. 'APPEND' indicates that text is placed immediately following the previous line of text.
- **Text:** type the text that appears in the break footing.

Calculations

Select the **Calculations** tab on the Form dialog box to define report calculation expressions.

Note: You must have IBM's ObjectREXX installed on your machine to use form calculations.

ID: Specify a number, between 1 and 999, that identifies the calculation expression.

Expression: Type a valid ObjectREXX expression, up to 50 characters.

Form variables cannot be used in this field.

Pass nulls?: Specify whether to pass the expression to ObjectREXX for evaluation when a variable in the definition has a null value.

Width: Specify the width used to format the result of the calculated expression when used as a variable in the form.

Edit: Specify the edit code, which is used to format the result of this calculated expression when used as a variable in the form. See the online help for more information about Edit Codes.

Columns

Select the **Columns** tab on the Form dialog box to control the appearance and formatting of columns in the report. Definable characteristics include column heading, column usage, indentation, width, edit code, and sequence.

- **Num:** specify the number to identify the column. This number is used to resolve variable references, and to determine how query result columns map to report columns.
- **Heading:** type the text of the column heading on the report
- **Usage:** specify a usage code to collect summary information about the data in a column, such as total summary information at the end of a column, or partial summaries at control breaks in a table.

  The usage codes that are available depend on the data in the column and the type of summary.

  See the online help for more information about Usage Codes.
- **Indent:** specify the number of blank spaces to indent to the left of the column. The range is between 0 and 999.
- **Width:** specify the width of the column. The range is between 1 and 32767.

  If the column is too narrow for numeric data, it is replaced with asterisks.

  If the column is too narrow for character or date/time data, it is truncated (based on the alignment specified). To avoid this, you can use a wrapping edit code to have the data wrap within the column width. See the online help for more information about Edit Codes.
- **Edit:** specify an edit code, which controls how data is formatted in a report. Edit codes are available for character, date, graphic, numeric, time, timestamp data. Also, user-defined edit codes can be created. See the online help for more information on Edit Codes.
- **Seq:** specify the sequence number for the columns in the report.

  If two columns have the same sequence number, they appear in the report in column number order, in the **Num** field.

  Note: The sequence number is ignored in reports using the ACROSS usage code or if you check the **Automatic reordering of report columns?** check box on the Form Options dialog box.

Conditions

Select the **Conditions** tab on the Form dialog box to define conditional formatting constraints, such as suppressing records that do not meet certain characteristics.

ID: Specify a number between 1 and 999 to identify the conditional expression.

Expression: Type a valid ObjectREXX expression, up to 50 characters. An expression that evaluates to 1 is considered true; anything else is considered false.

You can use form variables in this field.

Pass nulls?: Specifies whether or not to pass the expression to ObjectREXX for evaluation when a variable in the definition has a null value.

Details tab

Select the **Details** tab on the Form dialog box to define report detail headings and body text. This is where you can combine or replace tabular data with free-form text to create form letters or address labels.

Enable: Specify when to enable the detail variation:

- **YES** indicates that the variation is always selected for formatting.
- **NO** indicates that the variation is never selected for formatting.

You can conditionally enable the variation by referring to a Form Conditions expression using the Cnn and Enn specifications.

Include column headings with detail heading: Check this check box to display column headings with detail headings.

Detail heading text: Specify the lines of detail heading text:

- **Line:** specify where the text appears vertically in the detail heading. You do not have to start with line 1 and you do not have to specify consecutive line numbers.
- **Alignment:** specify where the text is placed horizontally on the line.

  Valid alignment values are LEFT, RIGHT, CENTER, APPEND, or the number of a specific position in the line. If you specify APPEND, the text is placed immediately following the previous line of text.
- **Text:** type the text that appears in the detail heading.

  You can use form variables in this field.

New page for detail block: Check this check box to start a new page in the report for the detail block.

Blank lines after block: Specify the number of blank lines after the last detail block line. The range is between 0 and 999.

Repeat detail heading: Check this check box to repeat the detail heading before each occurrence of the detail block.

Put tabular data at line: Specify where the tabular data line is placed vertically in the detail block. The range is between 1 and 999. If you do not want a tabular data line, specify NONE.

Keep block on page: Check this check box to keep the detail block on one page.

If you check this check box and a detail block is too long to fit on one page, QMF for Windows will start the detail block on a new page. If you do not check this check box, detail blocks can split across two or more pages.

Detail block text: Specify the lines of detail block text:

- **Line:** this number specifies where the text is placed vertically in the detail block. You do not have to start with line 1 and you do not have to specify consecutive line numbers.
- **Alignment:** specify where the text is placed horizontally on the line. Valid alignment values are LEFT, RIGHT, CENTER, APPEND, or the number of a specific position in the line. If you specify APPEND, the text is placed immediately following the previous line of text.
- **Text:** type the text that appears in the detail block.

  You can use form variables in this field.

Final

Select the **Final** tab on the Form dialog box to define the content and placement of your report's final text. For example, you can include final text and summary data at the end of the report.

New page for final text: Check the **New page for final text** check box to start a new report page for the final text.

Put final summary at line: Specify where the final summary line is placed vertically in the final text lines. The range is between 1 and 999. If you do not want a final summary line, specify NONE.

Blank lines before text: Specify the number of blank lines before the first and final text line. The range is between 0 and 999 or the word BOTTOM, which is treated as a zero when producing reports in QMF for Windows.

Final text: Specify the lines of final text:

- **Line:** specify where the final text is placed vertically. You do not have to start with line 1 and you do not have to specify consecutive line numbers.
- **Alignment:** specify where the text is placed horizontally on the line. Valid alignment values are LEFT, RIGHT, CENTER, APPEND, or the number of a specific position in the line. If you specify APPEND, the text is placed immediately following the previous line of text.
- **Text:** type the text that appears at the bottom of the report.

HTML

Select the **HTML** tab on the Form dialog box to define the content and placement of HTML tags and formatting in HTML reports.

Note: This tab is enabled only for HTML forms.

<HEAD> associated tags: Specify the HTML tags added to the <HEAD> section of the report.

<BODY> tag extensions: Specify the HTML extensions added to the <BODY> tag of the report.

Column heading line prefix: Specify the HTML tags that appear before each column heading line. For example, to make a heading bold, you would place a <B> tag here.

Column heading line suffix: Specify the HTML tags that appear after each column heading line. For example, to close off a bold heading, you would place a </B> tag here.

Tabular data line prefix: Specify the HTML tags that appear before each tabular data line. For example, to make a line italic, you would place a <I> tag here.

Tabular data line suffix: Specify the HTML tags that appear after each tabular data line. For example, to close off an italic line, you would place a </I> tag here.

Page separator: Specify the HTML tags that appear as a page separator. For example, you could use a horizontal rule <HR> tag to separate pages.

Include tabular data as HTML table: Check this check box to display the results grid in HTML format. Separate data, such as comments, are displayed in a separate table from the HTML format table.

Save as user defaults: Check this check box to save these settings as the default user settings for future HTML reports.

Reset: Click **Reset** to reset all values in the Form HTML dialog box to their original settings. A submenu with three options opens.

- **User Defaults:** select this option to reset values to those saved by the user
- **Product Defaults:** select this option to reset values to QMF for Windows values
- **Clear Values:** select this option to resets values to spaces

Options

Select the **Options** tab on the Form dialog box to define miscellaneous options that control the appearance of the report.

Detail spacing: Specify the number of lines for the spacing between tabular data lines or detail blocks. This value must be a number between 1 and 999.

Line wrapping width: This field applies only to forms created using the ISPF version of QMF (host QMF).

Specify the number of characters at which to wrap the columns in the report. The range is between 0 and 999 or the word NONE.

Note: This value is ignored for reports produced in QMF for Windows.

Report text line width: For reports, specify the width of the final text, detail heading text, detail block text, and break text in a report. The range is between 1 and 32767, or the words DEFAULT or COLUMNS.

For DEFAULT, break footing text and final footing text use the full width of all columns up to the first summary column. For COLUMNS, all text areas use the full width of all columns.

Number of fixed columns in report: Specify the number of columns that remain in place when you scroll reports horizontally on the screen or break reports onto multiple pages when printing. The range is between 1 and 999, or the word NONE.

Outlining for break columns: Check this check box to display the value in columns with the BREAK usage code when the value changes.

Default break text (*): Check this check box to generate break footing text in breaks for which you did not indicate break footing text.

The default break text consists of one asterisk for the highest numbered break level text, two asterisks for the next-highest numbered break level text, and so on.

Function name in column heading when grouping: Check this check box to add the name of the summarization function to the heading of the aggregated columns, if a report has summarized columns and you use the GROUP usage code to suppress the tabular data lines.

Column wrapped lines kept on a page: This field applies only to forms created using the ISPF version of QMF (host QMF).

Check this check box to split wrapped columns between two pages, if you specified column wrapping for one or more columns.

Note: This value is ignored for reports produced in QMF for Windows.

Across summary column: Check this check box to display the automatically generated ACROSS summary column, which produces additional columns that summarize (total) across the specified columns.

Automatic reordering of report columns: Check this check box to automatically reorder the columns in a report when you specify a BREAK or GROUP usage code, or one of the aggregating usage codes.

If selected, the columns are reordered so that BREAK columns are to the far left, GROUP columns are to the left after BREAK columns, all non-aggregated columns are to the left after BREAK and GROUP columns, and all aggregated columns are to the far right.

Page renumbering at the highest break level: Check this check box if a printed report should begin a new page beginning with the number 1 whenever the value in the control column when the highest break level changes.

Note: The highest break level is the one with the lowest number.

Column heading separator: Check this check box to display a row of dashed lines between the column headings and the tabular data lines.

Across heading separator: Check this check box to mark columns in ACROSS reports with dashed lines and arrows.

Break summary separator: Check this check box to display a row of equal signs between the tabular data lines and the break summary.

Final summary separator: Check this check box to display a row of equal signs between the tabular data lines and the final summary.

Place LOB contents inline: *Optional:* Check this check box to display LOB contents in-line in the contents of the form.

Page

Select the **Page** tab on the Form dialog box to define the content and placement of the page heading and page footing on your report.

Blank lines before heading: Specify the number of blank lines before the first page heading line. The range is between 0 and 999.

Blank lines after heading: Specify the number of blank lines after the last page heading line. The range is between 0 and 999.

Page heading text: Type each line of page heading text.

- **Line:** specify where to place the final text vertically. You do not have to start with line 1 and you do not have to specify consecutive line numbers.
- **Alignment:** specify where place the text horizontally on the line. Valid alignment values are LEFT, RIGHT, CENTER, APPEND, or the number of a specific position in the line. If you specify APPEND, the text is placed immediately following the previous line of text.
- **Text:** type the final text that appears in the page heading on the report. You can use form variables in this field.

Blank lines before footing: Specify the number of blank lines before the first page footing line. The range is between 0 and 999.

Blank lines after footing: Specify the number of blank lines after the last page footing line. The range is between 0 and 999.

Page footing text: Specify each line of text printed in the page footing at the bottom of the page:

- **Line:** specify where to place the final text vertically. You do not have to start with line 1 and you do not have to specify consecutive line numbers.
- **Alignment:** specify where to place the text horizontally on the line. Valid alignment values are LEFT, RIGHT, CENTER, APPEND, or the number of a specific position in the line. If you specify APPEND, the text is placed immediately following the previous line of text.
- **Text:** type the page footing text that appears at the bottom of the report.

Saving forms

You can save the forms that are used to create a classic report on your PC, on a file server, or at a database server. You can also choose to save forms with or without their data source.

When you save a form, you are only saving the formatting options for a set of query results. When you open the form, you will need to supply the query results. That means you must run a query again and select the form in order to create the classic report.

You can save both the data source and the form. If you choose this option you are saving both elements that are used to create the report. When you open a form that has been saved with both the data source (query results) and the form (formatting options), QMF for Windows finds the data source, runs the query, applies the formatting from the form, and presents the report. If you choose this option, the same data source is always used with the form.

Saving a form with the data source

To save both the data source and the form:

1. Select **Form-->Data Source**.
2. Check the Always use this object when opening this document check box.
3. Click OK. The Data Source window closes and you can continue working with the form and formatting the report. When you have finished, you save the report following the same steps as you would if you were just saving the form.

Saving a form to a file

1. Select **File--> Save**.

   The **Save As** dialog box opens if the form has not been saved.
2. Specify the name of the file and the location where it will be saved.
3. Click **OK**.

Opening saved form files

1. Select **File--> Open**.

   The Open dialog box opens.
2. Select the file to open.
3. Click **OK**.

Saving forms at the database server

Forms saved at the server can be made accessible to other users. If you want to share your forms with other users, save them at the database server.

1. Select **File--> Save at Server**.

   The Save Form dialog box opens.
2. Type an owner and a name.
3. *Optional:* Type comments in the **Comment** field.
4. *Optional:* Check the **Share object with other users** check box to share the saved form with others.
5. *Optional:* Check the **Register the object in the Information Catalog** check box to register the object in the Information Catalog in DB2 Warehouse Manager.

   Registering the object allows the object to be listed in and launched from the DB2 Warehouse Information Catalog.

6. Click **OK**.

Opening saved forms at the database server

You can open forms that have been saved at the database server.

1. Select **File--> Open from Server**.

   The Open From Server dialog box opens.
2. Type a server, owner, and name.
3. *Optional:* Click **List Objects** to browse for a form.
4. Click **OK**.

Printing forms

You can print reports.

1. Open a form.
2. Select **File--> Print Report**.
3. Click **OK**.

Exporting forms

You can export a report to a file.

1. Open a form.
2. Select **File--> Export Report**.

   The Export Report dialog box opens.
3. Type the name of the file where you want the report stored. Forms are exported in .txt format.
4. Click **OK**.

Visual Reports

Visual reports are robust reports containing graphics and rich-formatted text. You create these reports visually using layout templates.

Create a new visual report

Follow these steps to create a new visual report:

1. Select **Query--> Run** to run a query and obtain query results.
2. Select **Results--> Display Report** from either the main menu or a context menu.

   The Report Wizard opens.
3. Select Create a new report from the Report Wizard Type page. Select Create a visual report from the Report Wizard New Report page.
4. Since this is a new visual report you must specify how the report will be generated. You can select Generated based on the current query to generate the report based on the way the query results currently are

formatted or you can select Default to generate the report based on a very basic set of default formatting options. The Visual report window opens.

5. When the visual report opens, the Report menu becomes available. You can use the Report menu commands to help you in designing the visual report.
6. Using the **Report--> Insert** command select an element to insert in a section of the report. Assign properties to the element.
7. When you have completed creating the visual report, you can:
   - print the report
   - change or update the data source
   - export the report
   - save the report

Working in the visual report window

The Visual Report window is divided into three sections:

- Explorer
- Design
- Properties

Visual Report Explorer

When you open a Visual Report, the Visual Report Explorer opens in the Explorer Bar. The Visual Report Explorer is a dockable tool window that displays in a tree structure the visual report that is active in the Design Pane. The tree includes two main branches:

- Data Source branch displays information about the data source for the report
- Report branch displays information about the active visual report in the design pane.

Data Source branch

This branch of the tree displays information about the data source that is used for the visual report. It identifies the name and location of each data item that will be used in the report. There are three nodes in the Data Source branch:

- The Columns node which displays the column names of the data that will be used. These are the columns names from the query results.
- The Variables node displays information identifying the variables that will be used in the report.
- The Linked Pictures node displays information identifying the graphics (pictures) that will be used in the report.

Report branch

This branch of the tree displays information about the active visual report that is in the Design pane. There are three nodes in the Report branch:

- The Embedded Pictures node displays the names of the graphic files (pictures) that have been inserted in the report.
- The Groups node displays any grouping and aggregation that has been specified and will be applied to the columns of the report.
- The Sections node displays information about each section of the report as it is being designed in the design window. There are four Sections nodes:
  1. The Page Heading node lists each element that has been inserted for the page heading.
  2. The Detail node lists each element that has been inserted for the report page. There are multiple detail nodes. One for each page of the report.
  3. The Report Footing node lists the elements that have been inserted for the report footings.
  4. The Page Footing node lists the elements that have been inserted for each page footing for the report.

Visual Report design pane

You use the design pane to design the visual report. There are four sections of the design pane each directly associated with a section of the report. The four sections are:

- Page Heading
- Detail
- Report Footing
- Page Footing

Page Heading

Use this section to design the heading of each page of your report. You can insert a picture, text, line or label in the page heading. The properties of each element that you insert in the page heading are displayed in the Properties pane. You can modify the elements in the page heading section directly in the design pane or by modifying the elements properties in the Properties pane.

Detail

Use this section to design each page of your report. You can insert a picture, text, line or label on the page The properties of each element that you insert in the page are displayed in the Properties pane. You can modify the elements in the page section directly in the design pane or by modifying the elements properties in the Properties pane.

Report Footing

Use this section to design the report footing of your report. The report footing appears at the end of the last page of your report. You can insert a picture, text, line or label in the report footing The properties of each element that you insert in the page are displayed in the Properties pane. You can modify the

elements in the report footing section directly in the design pane or by modifying the elements properties in the Properties pane.

Page Footing

Use this section to design the page footing of your report. The page footing appears at the bottom of each page of your report. You can insert a picture, text, line or label in the report footing The properties of each element that you insert in the page are displayed in the Properties pane. You can modify the elements in the page footing section directly in the design pane or by modifying the elements properties in the Properties pane.

Visual Report properties pane

The Properties pane lists the different properties that you can apply to:

- each section of the design pane.

  The sections of the design pane are Page Heading, Detail, Report Footing, and Page Footing.

- each element that you can insert in the sections of the design pane

  The elements that you can insert are Labels, Text boxes, Pictures and Lines.

You can modify the properties of the design pane sections and elements from the Properties pane. The properties of some of the elements can also be changed in the design pane.

Properties

Name: This property names the section of the design pane that you have selected or the element that you have inserted in a section of the design pane. The Name property appears for each section of the design pane and for each type of element (label, text, picture, line) that can be inserted. You can change the name of the section or element by typing text directly in the Name property's corresponding text box. The name that you type in the Name properties text box is used to identify the design pane section or the element in the design pane.

Visible: Use this property to show or hide a section of the design pane or an element in a section of the design pane. The Visible property applies to sections and for the label, text, and picture elements. Select from the drop down menu Yes for the section or the element to appear in the design pane or No for it to be hidden. Hiding a section or an element does not remove it from the report.

Keep on Page: Use this property to keep a section of the design pane in the report. The Keep on Page property only applies to the sections of the design pane. Select from the drop down menu Yes to keep the section in the report or No to remove the section.

Height: Use this property to increase or decrease the height of a section in the design pane or an element in a section to the size specified. For example, if the measure value you have selected is inches, a value of 2 will change the size of the element to be 2 inches tall. Enter the value in the text box and click Enter to change the size of the element. The Height property appears for each section and the elements Label, Text box, and Picture.

Background color: Use this property to specify the color of a section in the design pane or an element's background. Click the browse button that is part of the text box. A color pallet window opens where you can select the background color. This property is available for all the sections and the elements Label, Text box, and Picture.

Place at the end of the page: Use this property to specify that a footing be placed at the very bottom of a page. Unless otherwise specified the footing is placed a few lines after the detail text ends.

Left: Use this property to align the left side of the element to a specific position in the section of the design pane. For example, if the measure value you have selected is inches, a value of 1 will align the left side of the element to one inch from the left hand edge of the page. Enter the value in the text box and click Enter to move the element. The Left property appears for each type of element (label, text, picture, line) that can be inserted.

Top: Use this property to align the top side of the element to a specific position in the section of the design pane. For example, if the measure value you have selected is inches, a value of 1 will align the top side of the element to one inch from the top edge of the page. Enter the value in the text box and click Enter to move the element. The top property appears for each type of element (label, text, picture, line) that can be inserted.

Width: Use this property to increase or decrease the width of the element to the size specified. For example, if the measure value you have selected is inches, a value of 2 will change the size of the element to be 2 inches wide. Enter the value in the text box and click Enter to change the size of the element. The Width property appears for each type of element (label, text, picture, line) that can be inserted.

Background Type: Use this property to specify the transparency of the element's background. Select from the drop down menu Opaque for the background of the element to be solid. That means any underlying elements will not be visible behind the top element. Select Transparent for the background of the element to be see through. Underlying elements can then be visible. This property is available for the elements Label, Text box, and Picture.

Border Type: Use this property to specify the type of border that will surround the element. Select one line type from the drop down menu. Your choices are Solid, for a solid line, Dash for a line of all dashes, Dot for a line of all dots, Dash Dot for a line of alternating dashes and dots, or Dash Dot Dot for a line that repeats the dash dot dot pattern. This property is available for the elements Label, Text box, and Picture

Border Color: Use this property to specify the color of the border that will surround the element. Click the browse button that is part of the text box. A color pallet window opens where you can select the background color. This property is available for the elements Label, Text box, and Picture.

Border Width: Use this property to specify the width of the border that will surround the element. Select from the drop down menu Thin for the thinnest line or a specific point of 1 to 6. This property is available for the elements Label, Text box, and Picture.

Font: Use this property to specify the font that will be used for any text in the report that is associated with the element. The Font window opens. This property is available for the elements Label and Text box.

Wrap: Use this property to specify whether text will be wrapped. Select from the drop down menu Yes for the text of the element to be wrapped around to the next line or No for the text to be truncated if it cannot fit in the element container This property is available for the elements Label and Text Box.

Can Grow: Use this property to specify whether the size of the element will expand to fit the content. Select from the drop down menu Yes to allow the element to be expandable, or No to keep the element the specified size regardless of the content. This property is available for the elements Label and Text box.

Outline: Use this property to specify that when there are multiple rows with the same value, the value will only be displayed once until a break occurs or value changes. Select from the drop down menu Yes to allow the element to be outlined, or No to not outline. This property is available for the elements Label and Text box.

Vertical Alignment: Use this property to specify how the text in the element will be aligned. Select from the drop down menu Top to align the text at the top of the element container, select Center to align the text in the center of the element container or Bottom to align the text at the bottom of the element container. This property is available for the elements Label and Text box.

Horizontal Alignment: Use this property to specify how the text in the element will be aligned. Select from the drop down menu left to align the text to the left of the element container, select Center to align the text in the center

of the element container or Right to align the text to the right of the element container. This property is available for the elements Label and Text box.

Control: Use this property to specify that the Label element will be associated with another element that has been defined in the section. When associated, both elements move together. Select from the drop down menu one of the existing elements in the section where the Label has been placed. This property is available only for the Label element.

Caption: Use this property to specify the text for the Label element. You can type any text in the text box. Other property specifications will effect the amount of text that will be allowed. This property is available only for the Label element.

Expression: Use this property to specify an expression that will be evaluated to fill the content of this text box element. Click the browse button to open the Expression window where you can build the expression This property is available for the Text Box element.

Format: Use this property to specify the format of the text that appears in the element. Click the browse button to open the Expression window where you can build the expression This property is available for the Text Box element.

Source: Use this property to specify where a picture will be located. Click the browse button to open Picture Source window where you specify the location of the picture and whether it will be embedded or linked to by the report. This property is available for the Picture element.

Stretch: Use this property to specify how the picture will be resized to fit within the element container. Select from the drop down menu Yes to resize the picture and change the aspect ratio. Select No to keep the picture as is, no resizing occurs. If the picture is larger than the container then it will be truncated. If the picture is smaller, than there will be no change. Select Zoom to resize the picture without changing the aspect ratio. This property is available for the Picture element.

Length: Use this property to specify the length of the line in the Line element. Enter the value in the text box and click Enter to change the length of the line. The length property only applies to the Line element.

Orientation: Use this property to specify the orientation of the line. Select from the drop down menu Vertical to position the line from the top of the page to the bottom of the page. Select Horizontal to position the line from one side of the page to the other side. This property is available only for the Line element.

Style: Use this property to specify the style of the line. Select one line type from the drop down menu. Your choices are Solid, for a solid line, Dash for a line of all dashes, Dot for a line of all dots, Dash Dot for a line of alternating dashes and dots, or Dash Dot Dot for a line that repeats the dash dot dot pattern. This property is available only for the Line element.

Color: Use this property to specify the color of the line. Click the browse button that is part of the text box. A color pallet window opens where you can select the background color. This property is available only for the Line element.

Inserting elements in the visual report

First Paragraph

Chapter 7. Visualizing data

There are three ways of visualizing data:

- Simple Charts
- Spatial Maps
- Complex Visuals

Simple Charts

Select **Results--> Display chart** to define the layout for the chart being created from the query results.

Overview

You can display query results in a graphical format using Lotus 1-2-3 or Microsoft Excel for charting, or view them in a browser.

The Java charting component is installed with QMF for Windows; however, you need to install the Microsoft Excel or Lotus 1-2-3 application separately to display charts. You can use the charting application to further customize your chart after it is created by QMF for Windows.

Charts have a standard set of characteristics, regardless of the application used to create and display them:

- A horizontal line displays along the bottom of the chart. This is the Category axis, also known as the X-axis.

  Values of any data type, taken from one or more columns in the query results or report, are plotted along the X-axis.
- There is a vertical line along the left of the chart. This is known as the Value axis, also known as the Y-axis.

  Numeric values, that are taken from one or more columns in the query results, are plotted along the Y-axis.

Labels can be defined for the X- and Y-axes to describe the plotted values. A legend is displayed on the side of the chart. It contains the column headings for each column plotted on the Y-axis. A chart title displays above the chart.

Charting rules

The following conditions apply when creating charts from query results or from a report:

1. If the query results or report used to create the chart contains group or break columns, the columns will appear on the X-axis of the chart; otherwise, the first column on the left appears on the X-axis.
2. The remaining columns with numeric data types appear on the Y-axis.

Table 37. Chart elements

	Category axis columns	**Value axis columns**	**Legend**	**Title**
Query Results	All group columns. If there are none, use the first column.	All remaining numeric columns	Value axis column headings	Value specified on the Chart Options dialog box
Report	All BREAK or GROUP columns. If there are none, use the first column.	All remaining numeric columns	Value axis column names	FORM.PAGE heading text or the value specified on the Chart Options dialog box

Chart options

Purpose

Select **Results--> Display chart** to define graphical attributes for charts created from query results or reports.

Procedure

1. Run the query or procedure.
2. Select **Results--> Display Chart**.
   The Chart Options dialog box opens.
3. Select the charting application from the **Application** drop-down menu.
   Supported applications include:
   - Java
   - Lotus 1-2-3, Version 97 or later
   - Microsoft Excel, Version 7.0 or later
4. Select the type of spreadsheet to create from the **Type** drop-down menu.
   Supported types include:
   - Area
   - Area (Stacked Percentage)
   - Area (Stacked)
   - Bar

- Bar (Stacked Percentage)
- Bar (Stacked)
- Column
- Column (Stacked Percentage)
- Column (Stacked)
- Line
- Line (Stacked Percentage)
- Line (Stacked)
- Line (Stacked) With Markers
- Line (With Markers)
- Pie
- Scatter

Note: The Java chart application does not support all available chart types. If you select an unsupported chart type, the closest supported type will be substituted automatically.

5. Select the source for the title of the chart. Select one of the following options:
   a. Select the **Report page heading** radio button if you are creating a chart from a report (not directly from the query results). This option uses the report page heading as the chart title, by default.

      Note: This option is not available if you are creating a chart from the query results.
   b. Select the **Text** radio button to type the text of the report title.
6. Type a label in the **Category (X) axis** field.

   This is the label for the horizontal axis on the report. This setting will not affect which columns will appear on the Category axis; all group or break columns will be used, or the first column will be used if there are no group or break columns.
7. Type a label in the **Value (Y) axis** field.

   This is the label for the vertical axis on the report. This setting does not affect which columns will appear on the Value axis; all columns with a numeric data type that do not appear on the Category axis will be used.
8. Use the **Left**, **Top**, **Width**, and **Height** fields to define the attributes of the chart.
9. In the **Units** drop-down list, select the unit type to correspond with the chart dimensions.

   Options are:
   - Centimeters

- Inches
- Percentage of screen size

10. Click **OK**.

    The exported chart data displays in a browser or spreadsheet application using the chart attributes defined here.

Axes

Use the **Chart -->Axes** window to define which columns in the query results are plotted on the Category (X) and Value (Y) axes in a chart.

Procedure

1. Click **Axes** on the Chart Options dialog box.

   The Chart Axes dialog box opens.
2. Select a column to plot on the chart from the **Available columns** list box.
3. Click **Add** to add the column to the **Category (X) axis** pane or **Value (Y) axis** pane.

   This column will be plotted on the chart.
4. *Optional:* Select a column from the **Category (X)** axis pane or **Value (Y) axis** pane and click **Remove**.

   This column will not be plotted on the chart.
5. *Optional:* Use the **Up** and **Down** arrows to order the values on the axes.
6. Click **OK**.

   You return to the Chart Options dialog box.

Spatial maps

Purpose

Select **File -->New --> Map** to visualize query results in the map form using a map application.

The **Map** option enables you to view data from DB2 in a map rather than through conventional means such as in a chart, report, or browser. Only tables having a column with type of **GEO** can be rendered as a map in QMF for Windows.

The maps, composed of layers of spatial data, enable you to visualize connections between tables, such as the geographic distribution of customers for a branch of a bank. Rather than submitting a query and creating a report, you can specify the layers (for example, a branch layer and a customer layer) and view the clustering.

Two things happen when you select the Map option:

1. Information will be gathered for the location, shape of, and relationships among business data and geographic data, including map data.
2. This information will be stored in industry standard files known as shape files (.spm).

With shape files, spatial data can be interchanged with other applications or databases that recognize this format.

An error message will be sent if the **Map** option is selected for a table that does not contain Geo data.

Complex visuals

Use the Layout Wizard to display query result data in a variety of complex visual formats.

With query results in the active window, you can open the Layout Wizard:

- Select **Results --> Display Layout**
- Select **File -->New --> Layout**

Layout Wizard

The Layout Wizard helps you build complex visuals in a four step process:

1. Step 1

   From the Layout Wizard Step 1 window, select the type of layout that you want to use for your data. The types of layouts are listed in the **Category** list box. Each layout **Category** has several different styles. The styles that are available for the category are listed in the **Styles** list box. You can choose from the following: categories:

   - Chart

     Pie Chart, Bar Chart, Column Chart, Scatter Chart, XY Chart, Stock Chart, Candlestick Chart, Timeline Chart, Event Band Chart and Multivariate Chart
   - Hierarchy

     Cluster Graph, Organization Chart, and Tree Chart
   - Map

     Linear
   - Pattern

     Spiral and Horizon
2. Click **Next**. The Layout Wizard Step 2 window opens.
3. Step 2

   From the Layouts Wizards Step 2 window you specify the dimensions of the layout that you have selected. You must specify the width of the

layout in the **Width** field, and the height in the **Height** field. If you are creating a pie chart you specify the **Radius**. Optionally you can specify a title in the **Title** field.

4. Click **Next.** The Layout Wizard Step 3 window opens.
5. Step 3

   From the Layouts Wizards Step 3 window you specify the parameters that pertain to specific types of layouts. The fields that are displayed are different for each type of chart or layout that you select. For information on the fields refer to the QMF for Windows online help.
6. Click **Next**. **Next** is available only if there is a step 4. Not all layouts require a step 4. The Layout Wizard Step 4 window opens.
7. Step 4

   The fields that you specify in Step 4 different for each type of chart or layout that you select. For information on the fields refer to the QMF for Windows online help.
8. Click **Finish**.

   The Layout Wizard completes its processing. The query results that you specified as the data source are displayed in the layout that you selected. format.

Working with the finished layout

There are many things you can do with the finished layout:

- Print the layout

  Right click on the layout and from the context menu, select **Print**. You can also select **Results --> Print.**
- Edit the Layout
- Change the data source
- Refresh the contents
- Edit the layout using QMF Visionary studio
- Move the layout around in the window using the **Select**, **Grab**, **Pan** and **Center** commands.
- Using the View menu, you can change your view of the layout with the **Zoom** in and out commands.

Chapter 8. Procedures

You can create, edit, and run procedures from QMF for Windows. Procedures are sets of commands that enable you to run queries, print reports, import and export data, as well as perform other functions with a single `RUN` command.

You can store procedures at the database server or save procedures to a local file or on a file server. All commands issued through procedures are governed by your resource limits.

About procedures

A procedure is a QMF for Windows object that contains procedure commands instead of SQL commands. While SQL manipulates data, procedure commands manipulate QMF objects (tables, queries, forms, and even other procedures). Procedures automate actions that are typically accomplished by clicking buttons and making menu selections.

You can use a procedure to list a set of queries to be run, data to be saved, reports to be created, for example, and to run them all at once. Procedures can take advantage of sophisticated data and object management.

Procedures are sets of commands used to:

- run queries
- print reports
- import data
- export data
- perform other functions

QMF for Windows procedures differ from IBM ObjectREXX procedures, which handle simple and complex calculations, logic, column definitions, detail variations, and conditions in QMF for Windows. IBM ObjectREXX is required to use REXX calculations. Refer to “Calculations” on page 139 for more information.

Procedure menu

Run

Select **Procedure--> Run** to run the active procedure.

Close all result windows

Select **Procedure--> Close all result windows** to close all result windows generated by the procedure when the procedure ends.

Close intermediate result windows

Select **Procedure--> Close intermediate result windows** to suppress all result windows while the procedure is running and display result windows only when the procedure ends.

Uppercase

Select **Procedure--> Uppercase** to format the procedure in uppercase text. The font attribute will remain in uppercase until you de-select this option.

Note: Existing text will not be reformatted into uppercase, even if you highlight the text then select the Uppercase option.

Comment

Select **Procedure--> Comment** to comment out a line in a procedure. For example, you can comment out a line that describes a part of the procedure. The commented text will not be included when the procedure runs.

This option inserts two dashes (--) at the beginning of a commented line. The text after the dashes will be ignored when the procedure runs.

The last line will be ignored in the example below:

```
SET GLOBAL (DSQQW_RPT_USE_PS=0 DSQQW_RPT_FONT=TERMINAL,
+DSQQW_RPT_FONT_SZ=5, DSQQW_RPT_ORIENT=1
RUN QUERY YEAREND.ACCT
PRINT REPORT
--USE EOY FORM ONLY
```

Uncomment

Select **Procedure--> Uncomment** to remove the dashes from the commented line or lines. Once you uncomment a line, it will be read when the procedure runs.

This option removes the comment (two dashes) from the beginning of a commented line in the procedure. For example,

```
SET GLOBAL (DSQQW_RPT_USE_PS=0 DSQQW_RPT_FONT=TERMINAL,
+DSQQW_RPT_FONT_SZ=5, DSQQW_RPT_ORIENT=1
RUN QUERY YEAREND.ACCT
PRINT REPORT
USE EOY FORM ONLY
```

Set server

Select **Procedure--> Set server** to select the database server for running the procedure.

Set user information

Select **Procedure--> Set user information** to set the database server user ID, password, and optional accounting string for the procedure.

Set font

Select **Procedure--> Set font** to change the font style for the selection.

Creating a procedure

Creating procedures

Select **File--> New--> Procedure** to create a procedure. A new procedure query document opens. Write the procedure, then select **Procedure--> Run** to submit the procedure.

Running the procedure at a database server

1. Open a new procedure document and type a set of commands, or open an existing procedure from a file or the database server.
2. Select **Procedure--> Run**.

Saving procedures

You can save procedures on your PC, on a file server, or at a database server.

Saving procedures to files

1. From an open procedure, select **File--> Save**.

   The Save As dialog box opens if the procedure has not been saved.
2. Type the name of the file where you want the procedure stored.
3. Click **OK**.

   The procedure is saved.

Opening a saved procedure file

1. Click **File--> Open**.

   The Open dialog box opens.
2. Select the procedure file to open.
3. Click **OK**.

   The selected procedure opens in a new procedure document.

Saving a procedure to the database server

1. Open a procedure.
2. Select **File--> Save at server**.

   The Save Procedure dialog box opens.
3. Type an owner and a name.

4. Check the Specify whether to share the saved procedure with other users.
5. *Optional:* Type a comment.
6. *Optional:* Check the **Share the object with other users** check box to enable other uses to use the procedure.
7. *Optional:* Check the **Register the object in the Information Catalog** check box to register the object in the Information Catalog.

   When checked, the object is registered with the Information Catalog in DB2 Warehouse Manager.
8. Click **OK**.

Opening saved procedures at the database server

You can open procedures that have been saved at the database server.

1. Click **File--> Open from Server**.

   The Open From Server dialog box opens.
2. Type a server, owner, and name.
3. Click **OK**.

Printing procedures

You can print the text of a procedure.

Previewing a procedure

1. Open a procedure.

   The procedure commands appear.
2. Select **File--> Print Preview**.

Printing a procedure

1. Open a procedure.

   The procedure commands appear.
2. Select **File--> Print**.

Procedure reference

Line continuation

If a command extends over multiple lines, type a plus sign (+) as a continuation character in the first column of each additional line.

Comments

Enter two hyphens (--) at the beginning of a line in a procedure to include comments. All text following the hyphens through the end of the line is commented and is not interpreted by QMF for Windows.

Substitution variables

You can use substitution variables to parameterize a procedure. Each time you submit a procedure, it is scanned for substitution variables. You need to provide values for all substitution variables before you run the procedure. Values for substitution variables can come from:

- a `RUN PROC` command
- global variables
- the Enter Substitution Variables dialog box

  The Enter Substitution Variables Values dialog box opens when you run a dynamic query that contains substitution variables. Use this dialog box to provide values for these substitution variables. QMF for Windows substitutes the values into the query and then sends the query request to the database server.

  Provide the following information at the Enter Substitution Variables Values dialog box:

  – **Name**

    The name of the substitution variable. You cannot modify the variable name.

  – **Value**

    The value to use for this substitution variable. QMF for Windows substitutes the value for each variable in the SQL statement before it sends the statement to the database server.

    Note: Enclose character values in quotation marks.

Current objects

Many procedure commands operate on named objects in the database or current objects in temporary storage.

- **Current query object:** The current query object is the most recently activated SQL or prompted query document.
- **Current form object:** The current form object is the most recently activated form document.
- **Current procedure object:** The current procedure object is the most recently activated procedure document.
- **Current report object:** The current report object is a synonym for the current form object.
- **Current data object:** The current data object is the most recently activated SQL or prompted query document with query results.

Reading syntax diagrams

The procedure command syntax diagrams are read from left to right, top to bottom. Each command starts with ″>>″ and ends with ″<<″. If a command is continued from one line to the next, the first line ends with ″>″ and the next line begins with ″>″.

A command can have two types of parameters:

1. **Positional parameters,** which must be placed in a certain position within a command.
2. **Keyword parameters**, which are assigned a value and can be placed in any order within a command.

   The first keyword parameter used in a command must be preceded by a left parenthesis.

   All parameters must be 80 characters or less. All parameters are separated by commas. A right parenthesis is not required, but can be used to end the command.

Required parameters

Parameters are on the main path if they are required.

```
>>-- CONNECT TO ServerName ------------------------------------------------<<
```

When one parameter is on the main path with others listed below, you must choose at least one from the list.

```
>>-- DISPLAY --- QUERY ------------------------------------------------------<<
              +- FORM ---+
              +- PROC ---+
              +- REPORT -+
```

Optional parameters

When a parameter is shown below the main path, it is optional. When all parameters are shown in a list below the main path, you can specify a single parameter or none at all.

```
>>-- ERASE ------------- ObjectName ------------------------------------<<
            +- QUERY -+
            +- FORM --+
            +- PROC --+
            +- TABLE -+
```

Sometimes two values are separated by a forward slash (/). This indicates that one of the two values must be entered:

```
>-------------------------------------------------------------------------<<
  +- ( CONFIRM = YES/NO -+
```

Procedure commands

BOTTOM command

The BOTTOM command scrolls to the last row of a query result set. This command is equivalent to the FORWARD MAX command.

Syntax

```
>>-- BOTTOM ------------------------------------------------------------<<
```

CONNECT command

The CONNECT command will establish a connection to a database server. Subsequent procedure commands will run at the specified server. The running procedure's server will also be changed to the specified server. No immediate action is taken upon any other current objects within the procedure. However, subsequent commands which affect those objects may result in additional processing.

Example

Assume query Q1 has been run but not completed at server X. The CONNECT TO 'SERVER Y' command is then issued, connecting to server Y. Next, the SAVE DATA AS T1 command is issued.

Query Q1 is not immediately affected by the CONNECT command to server Y, but the SAVE DATA command requires completion (or cancellation) of query Q1 at server X. Once the data object is completed, the server for query Q1 is changed to Y, and the data is saved in table T1 at server Y.

Syntax

```
>>-- CONNECT TO ServerName ------------------------------------------<<
```

Parameters

Table 38. CONNECT Command Parameter

Parameter	Description
ServerName	The name of a database server. **Note:** Enclose the server name in quotes if the name includes spaces.

Example

```
CONNECT TO SERVER1
```

CONVERT command

The CONVERT command will convert a prompted query to a new SQL query. The original query (whether a named object in the database or a temporary object) is unaffected by this operation.

Syntax

For a target object in the database:

```
>>-- CONVERT ------------ QueryName -----------------------------------<<
             +- QUERY -+
```

For a temporary target object:

```
>>-- CONVERT QUERY ------------------------------------------------------<<
```

Example

```
CONVERT QUERY
```

DISPLAY command

The DISPLAY command will display an object in temporary storage or an existing object that was saved in the database. DISPLAY for an object in temporary storage will act only upon the current object; there is no way to DISPLAY an object from temporary storage that is not the current object.

For example, consider the following procedure:

```
DISPLAY QUERY Q1
DISPLAY QUERY Q2
DISPLAY FORM F1
DISPLAY QUERY
```

After this procedure runs, query Q2 is the active window, and is the current query object. Query Q1 is inaccessible from any command accessing temporary storage. F1 is the current form object and is accessible from a command accessing the current form object in temporary storage. For example, DISPLAY FORM would display F1.

Syntax

For a target object in the database:

```
>>-- DISPLAY ------------ ObjectName -----------------------------------<<
             +- QUERY -+
             +- FORM --+
             +- PROC --+
             +- TABLE -+
```

For a temporary target object:

```
>>-- DISPLAY --- QUERY -------------------------------------------------<<
             +- FORM ---+
             +- PROC ---+
             +- REPORT -+
```

Example

```
DISPLAY QUERY USER1.QUERY1
```

DRAW command

The DRAW command creates a basic query for a table based on the description of the table in the database.

Syntax

```
>>-- DRAW TableName ------------------------------------------------------<<
                     +- ( --- TYPE = --- SELECT -----+
                          |              +- INSERT -+   |
                          |              +- UPDATE -+   |
                          +- IDENTIFIER = CorrName -+
```

Parameters

Table 39. DRAW Command Parameters

Parameter	Description
TableName	The name of the table for which to create a query.
TYPE	Specifies the type of SQL query to create. The default is SELECT.
IDENTIFIER	Specifies the correlation name to be associated with the table in the resulting query. It is ignored when TYPE=INSERT. There is no default.

Example

```
DRAW Q.STAFF (TYPE=SELECT
```

ERASE command

The ERASE command removes a query, form, procedure, or table from the database.

Syntax

```
>>-- ERASE ------------- ObjectName ------------------------------------<<
            +- QUERY -+              +- ( CONFIRM = YES/NO -+
            +- FORM --+
            +- PROC --+
            +- TABLE -+
```

Parameters

Table 40. ERASE Command Parameters

Parameter	Description
ObjectName	The name of the object to remove from the database.
CONFIRM	Specifies whether or not to display a confirmation dialog before removing the object. If CONFIRM is not specified or is NO, the corresponding resource limit is used.

Example

```
ERASE QUERY USER1.QUERY1
```

EXPORT command

The EXPORT command copies objects from the database or temporary storage to a file.

Syntax

For a target object in the database:

```
>>-- EXPORT --- QUERY --- ObjectName TO FileName ------------------------<<
             +- PROC --+                          +- ( CONFIRM = YES/NO -+

>>-- EXPORT FORM ObjectName TO FileName ----------------------------------->


>-------------------------------------------------------------------------<<
  +- ( --- CONFIRM = YES/NO -----------+
       +- LANGUAGE = ENGLISH/SESSION -+


>>-- EXPORT TABLE ObjectName TO FileName ---------------------------------->
                                        +- ( --- CONFIRM = YES/NO -+
                                             +- DATAFORMAT = IXF -+
```

For a temporary target object:

```
>>-- EXPORT --- QUERY --- TO FileName ----------------------------------<<
             +- PROC --+              +- ( CONFIRM = YES/NO -+


>>-- EXPORT FORM TO FileName ------------------------------------------<<
                             +- ( --- CONFIRM = YES/NO -----------+
                                  +- LANGUAGE = ENGLISH/SESSION -+


>>-- EXPORT DATA TO FileName ------------------------------------------<<
                             +- ( --- CONFIRM = YES/NO -+
                                  +- DATAFORMAT = QMF/IXF/TEXT/HTML/CSV -+
                                  +- OUTPUTMODE = BINARY/CHARACTER/PC -+
                                  +- LOBSINFILE = YES/NO -+
                                  +- LOBSTO = path1;path2; -+
                                  +- LOBFILE = basefile1;basefile2; -+


>>-- EXPORT REPORT TO FileName -----------------------------------------<<
                               +- ( --- CONFIRM = YES/NO --+
                                    +- DATAFORMAT = QMF/HTML/TEXT -+
```

Parameters

Table 41. EXPORT Command Parameters

Parameter	Description
ObjectName	The name of the object to export from the database.
FileName	The name of the file to which to export the object.
CONFIRM	Specifies whether or not to display a confirmation dialog before replacing an existing file. If CONFIRM is not specified or is NO, the corresponding resource limit is used.
LANGUAGE	Specifies whether a form is exported in English or in the current session language. A form that is exported in English can be run in any NLF session. A form exported in the session language can only be run in a session of the same language. The default value is provided by the DSQEC_FORM_LANG global variable.
DATAFORMAT	Specifies the file format of the exported data. If you omit this parameter, the DSQQW_EXP_DT_FRMT global variable supplies the format to be used. The file format can be: • 0 = Text format • 2 = HTML format • 3 = CSV format • 4 = IFX format If you specify IXF, the DSQQW_EXP_OUT_MDE global variable can be set to either '0' for character mode System/370 IXF or '1' for PC/IXF. **For Reports** QMF format is not supported in the Windows environment. HTML format adds the <PRE> tag. TEXT is for a text-based file.
OUTPUTMODE	Specifies the output format of the data.
LOBSINFILE	Specifies whether or not LOBs are included in the exported data.
LOBSTO	Specifies the location to save the LOBs.
LOBSFILE	Specifies the base name of the exported LOBs.

Example

```
EXPORT QUERY USER1.QUERY TO C:\Queries\query1.qry
```

FORWARD command

The FORWARD command scrolls forward in a query result set. MAX is the only acceptable parameter for this command, making it equivalent to the BOTTOM command.

Syntax

```
>>-- FORWARD MAX -----------------------------------------------------<<
```

Example

```
FORWARD MAX
```

IMPORT command

The IMPORT command copies data from a file into temporary storage or to the database.

Syntax

For a target object in the database:

```
>>-- IMPORT --- QUERY --- ObjectName FROM FileName ------------------------>
             +- PROC --+

>-------------------------------------------------------------------------<<
  +- ( --- CONFIRM = YES/NO ---+
       +- COMMENT = Text ---+
       +- SHARE = YES/NO ---+


>>-- IMPORT FORM ObjectName FROM FileName ---------------------------------->

>-------------------------------------------------------------------------<<
  +- ( --- CONFIRM = YES/NO -------------+
       +- COMMENT = Text -------------+
       +- LANGUAGE = ENGLISH/SESSION -+
       +- SHARE = YES/NO -------------+
>>-- IMPORT TABLE ObjectName FROM FileName --------------------------------->
>-------------------------------------------------------------------------<<
  +- ( --- CONFIRM = YES/NO ----------+
       +- COMMENT = Text ----------+
       +- ACTION = REPLACE/APPEND -+
```

For a temporary target object:

```
>>-- IMPORT --- QUERY --- FROM FileName ---------------------------------<<
             +- PROC --+
             +- FORM --+
             +- DATA --+
                +- LOBSFROM = path1;path2; -+
```

Parameters

Table 42. IMPORT Command Parameters

Parameter	Description
ObjectName	The name of the object to import into the database.
FileName	The name of the file from which to import the object.
CONFIRM	Specifies whether to display a confirmation dialog before replacing an existing object. If `CONFIRM` is not specified or is set to NO, the corresponding resource limit is used.
COMMENT	Specifies a comment with the imported object. Enclose the text in quotes.
SHARE	Specifies whether or not other users are allowed to use the imported object.
LANGUAGE	Specifies whether a form is imported in English or in the current session language. A form that is imported in English can be run in any NLF session. A form that is imported in the session language can only be run in a session of the same language. The default value is provided by the DSQEC_FORM_LANG global variable.
ACTION	Specifies whether or not to replace the entire database table or append data to the existing table.
LOBSFROM	Specifies the location of the LOB.

Example

```
IMPORT QUERY FROM C:\Queries\query1.qry
```

PRINT command

The `PRINT` command prints a copy of an object in temporary storage or from the database.

Syntax

For a target object from the database:

```
>>-- PRINT ------------- ObjectName ------------------------------------<<
            +- QUERY -+              +- PRINTER = Printer -+
            +- PROC --+
            +- TABLE -+
```

For a temporary target object:

```
>-- PRINT --- QUERY ------------------------------------------------------<<
            +- PROC --+ +- PRINTER = Printer -+
            +- TABLE -+


>>-- PRINT REPORT ---------------------------------------------------------<<
```

```
>-------------------------------------------------------------------------<<
  +- ( --- DATETIME = YES/NO ----------+
       +- PAGENO = YES/NO ------------+
       +- PRINTER = Printer ----------+
       +- FORM = --- FORM ------------+
                 +- FormName --------+
       +- COPIES = NumChars ----------+
       +- TYPEFACE = Fontname --------+
       +- SIZE = NumChars ------------+
       +- BOLD = YES/NO --------------+
       +- ITALIC = YES/NO ------------+
       +- CHARSET = ANSI/DEFAULTS/SYMBOL/SHIFTJIIS/GB2312/ -------+
                    HANGUEL/CHINESEBIG5/OEM/JOHAB/HEBREW/ --------+
                    ARABIC/GREEK/TURKISH/THAI/EASTEUROPE/ --------+
                    RUSSIAN/MAC/BALTIC/ --------------------------+
       +- ORIENTATION = PORTRAIT/LANDSCAPE ----------------------+
       +- USEFORMPS = YES/NO ----------+
       +- LENGTH = NumChars/CONT/AUTO -+
                    +- CONT -----------+
       +- WIDTH = NumChars/CONT/AUTO --+
```

Parameters

Table 43. PRINT Command Parameters

Parameter	Description
ObjectName	The name of the object to print.
DATETIME	Specifies whether or not to include the current date and time in the page footing. When you print a report, the date and time are printed in the page footing unless you specify `DATETIME=NO` or include the `&DATE` or `&TIME` variables in the page text in the form. If included, the date and time are formatted according to the current Windows regional settings.
PAGENO	Specifies whether or not to include page numbers in the page footing. When you print a report, page numbers are printed in the page footing unless you specify `PAGENO=NO` or include the `&PAGE` variable in the page text in the form.
PRINTER	Specifies the name of the printer on which to print the object or report.
FORM	Specifies which form to use when generating the report. You can specify the keyword FORM to use the current form object, or specify the name of a form saved in the database.
COPIES	Specifies the number of copies to print when printing the object.
TYPEFACE	Specifies the font typeface to use when printing the object.
SIZE	Specifies the font size to use when printing the object.

Table 43. PRINT Command Parameters (continued)

Parameter	Description
BOLD	Specifies whether or not to use bold text when printing the object.
ITALIC	Specifies whether or not to use italic text when printing the object.
CHARSET	Specifies the character set to use when printing the object.
ORIENTATION	Specifies the paper orientation of the printed object.
USEFORMPS	Specifies whether or not to use the Windows form associated with the object.
LENGTH	Specifies the LENGTH of the printed object, which is one of the following: • The maximum number of lines to print on each page (from 1 to 999) • CONT (to cause continuous printing without page breaks) • AUTO If LENGTH is omitted, the values of the DSQQW_RPT_LEN_TYP and DSQQW_RPT_NUM_LINES global variables are used.
WIDTH	Specifies the WIDTH of the printed object, which is one of the following: • The maximum number of characters to print on each line (from 1 to 999) • CONT (to cause continuous printing without page breaks) • AUTO When you print a report, lines longer than WIDTH are formatted on a subsequent page.

Example

```
PRINT QUERY
PRINT REPORT (LENGTH=60, DATETIME=NO
```

RESET GLOBAL ALL command

The RESET GLOBAL ALL command deletes the names and values of global variables that have been set using the SET GLOBAL command.

Syntax

```
>>-- RESET GLOBAL (Variable1, Variable2 ... ------------------------<<
```

or

```
>>-- RESET GLOBAL ALL ----------------------------------<<
```

Parameters

Table 44. RESET GLOBAL ALL Command Parameters

Parameter	Description

VariableName	Specifies the names of the variables to be deleted. You can name up to 10 variables previously set by the SET GLOBAL command.
	
	ALL deletes the names and values of all variables previously set by the SET GLOBAL command. Even if you do not have several global variables defined, or you do not remember the names of your global variables, you can use this parameter to reset all global variables at one time.
	
	Variables prefixed with **DSQ** are restricted, and cannot be deleted.
	Note: You can use global variables in queries, procedures, and forms, but not in the DB2 Table Editor.
	
	When you issue the RESET GLOBAL ? command, you are prompted to fill in the names of the variables you want to reset.
	
	On the Global Variable List dialog, you can reset a variable by positioning your cursor on the line you want to delete and pressing **Delete**.
	
	For example, to delete the values for all global variables that were previously set, type:
	`RESET GLOBAL ALL`
	
	To delete the values only for the variables named DEPT and LOCATION, type:
	`RESET GLOBAL (DEPT LOCATION`

Example

```
RESET GLOBAL (Variable1, Variable2
```

or

```
RESET GLOBAL ALL
```

RUN command

The RUN command executes procedures or queries from temporary storage or from the database.

Syntax

To run a target object from the database:

```
>>-- RUN ------------- ObjectName --------------------------------<<
          +- QUERY -+              +- ( --- &&Variable = Value ----+
                                      +- CONFIRM = YES/NO ------+
                                      +- FORM = --- FORM -------+
                                      |          +- FormName -+ |
                                      +- ROWLIMIT = NumRows-----+

>>-- RUN ------------ ObjectName --------------------------------<<
         +- PROC -+                +- ( &&Variable = Value ... -+
```

To run a temporary target object:

```
>>-- RUN QUERY ------------------------------------------------------<<
               +- ( --- &&Variable = Value ----+
                     +- CONFIRM = YES/NO ------+
                     +- FORM = --- FORM -------+
                     |          +- FormName -+ |
                     +- ROWLIMIT = NumRows/NO -+

>>-- RUN PROC -------------------------------------------------------<<
              +- ( &&Variable = Value ... -+
```

Parameters

Table 45. RUN Command Parameters

Parameter	Description
ObjectName	The name of the query or procedure to run.
&&Variable	Assigns a value to a variable in the query or procedure that is being run. The variable name can be from 1 to 17 characters long and the value can be from 1 to 55 characters long. You can specify any number of variables and values on the RUN command. You will be prompted to provide values for each variable in the query or procedure if you did not provide values on the RUN command, and the variable was not a global variable. Once a global variable is set, the variable can be used for an entire QMF for Windows session. A global variable can be used in a query, form, or procedure. When you include variable assignments in a procedure, you must use two ampersands (&&) to prevent variable substitution before the procedure is run.
CONFIRM	Specifies whether or not to display a confirmation dialog before replacing or changing an object as a result of this command. If CONFIRM is not specified or is set to NO, the corresponding resource limit is used.

Table 45. RUN Command Parameters (continued)

Parameter	Description
FORM	Specifies a form to use when generating a displayed report using the data retrieved by the query. You can specify the keyword FORM to use the current form object, or specify the name of a form saved in the database.
ROWLIMIT	Specifies the maximum number of rows to retrieve for the query.

Example

```
RUNQUERY USER1.QUERY1 (&&Var1=10
```

SAVE command

The SAVE command stores the contents of an object in temporary storage into the database.

Syntax

```
>>-- SAVE --- QUERY --- AS ObjectName ------------------------------------<<
           +- PROC --+                 +- ( --- COMMENT = Text ---+
                                             +- CONFIRM = YES/NO -+
                                             +- SHARE = YES/NO ---+


>>-- SAVE FORM AS ObjectName ----------------------------------------------<<
                              +- ( --- COMMENT = Text -------------+
                                    +- CONFIRM = YES/NO -----------+
                                    +- SHARE = YES/NO -------------+
                                    +- LANGUAGE = ENGLISH/SESSION -+


>>-- SAVE DATA AS TableName -----------------------------------------------<<
                           +- ( --- COMMENT = Text ----------+
                                 +- CONFIRM = YES/NO --------+
                                 +- METHOD = REGULAR/FAST --------+
                                 +- SCOPE = NumChars --------+
                                 +- ROWIDADD = YES/NO --------+

                                 +- ROWIDNAME = Text ---------+
                                 +- ROWIDDISP = ALWAYS/BYDEFAULT --------+
                                 +- ROWIDDISPnnn = EXCLUDE/CONVERT/ALWAYS/BYDEFAULT+
                                 +- ACTION = REPLACE/APPEND -+
```

Parameters

Table 46. SAVE Command Parameters

Parameter	Description
ObjectName	The name to assign to the object (query, form, procedure, or table) when it is saved.

Table 46. SAVE Command Parameters (continued)

Parameter	Description
COMMENT	Specifies a comment with the saved object. Enclose the text in quotes.
CONFIRM	Specifies whether or not to display a confirmation dialog before replacing or changing an object as a result of this command. If CONFIRM is not specified or is set to NO, the corresponding resource limit is used.
SHARE	Specifies whether or not other users are allowed to use the saved object.
LANGUAGE	Specifies whether or not a form is saved in English or in the current session language. A form that is saved in English can be run in any NLF session. A form that is saved in the session language can only be run in a session of the same language. The default value is provided by the DSQEC_FORM_LANG global variable.
METHOD	Specifies the method of saving the data. • **Regular save:** Sends data from the client back to the database server to be inserted into the table. • **Fast saved:** Reruns the query at the server and inserts the results directly into the table.
SCOPE	Specifies the commit scope of the data.
ROWIDADD	Specifies whether or not to add the Row ID column to the table.
ROWIDNAME	Specifies the name to assign to the new Row ID column.
ROWIDDISP	Specifies the disposition of the new Row ID column.
ROWIDDISPnnn	Specifies the disposition of existing Row ID columns.
ACTION	Specifies whether or not to replace the entire database table or append data to the existing table.

Example

```
SAVE QUERY AS USER1.QUERY1 (CONFIRM=NO
```

SEND TO command

The SEND TO command exports reports and data from the database or temporary storage and sends the reports and data to the specified target or application in your Send To folder.

Syntax

For a temporary target object:

```
>>-- SEND DATA TO Target ------------------------------------------------<<
                                    +- DATAFORMAT = IXF -+
>>-- SEND REPORT TO Target ---------------------------------------------<<
                                      +- DATAFORMAT = HTML -+
```

Parameters

Table 47. SEND TO Command Parameters

Parameter	Description
Target	The name of the file to export the object to. Targets containing space characters must be enclosed in single or double quotes.
DATAFORMAT	Specifies the file format of the exported data or report. If you omit this parameter, the DSQQW_EXP_DT_FRMT global variable supplies the format to be used. This parameter can be set to: • 0 = Text format • 2 = HTML format • 3 = CSV format • 4 = IXF format If you specify IXF, the DSQQW_EXP_OUT_MDE global variable can be set to '0' for character mode System/370 IXF or '1' for PC/IXF data.

Example

```
SEND DATA TO "Excel Shortcut"
```

SET GLOBAL command

The SET GLOBAL command sets the values of existing global variables or creates new variables and values. Any new global variables created exist for the entire QMF for Windows session (unless you delete them manually).

Syntax

```
>>-- SET GLOBAL ( VariableName = Value, ... ----------------------------<<
```

Parameters

Table 48. SET GLOBAL Command Parameters

Parameter	Description
VariableName	The name of the global variable to set or create. Global variable names can be from 1 to 17 characters long. Variables prefixed with **DSQ** are restricted, and cannot be created or deleted.

Table 48. SET GLOBAL Command Parameters (continued)

Parameter	Description
Value	The value for the global variable. The value can be from 1 to 55 characters long. The values of variables prefixed with **DSQ** are restricted.

Example

```
SET GLOBAL (Var1=abc, Var2=def
```

SHOW command

The SHOW command displays objects from temporary storage and is similar to the DISPLAY command.

- The SHOW QUERY, SHOW FORM, and SHOW PROC commands activate the current query, form or procedure window.
- The SHOW REPORT command is a synonym for the SHOW FORM command.
- The SHOW GLOBALS command opens the Global Variables dialog box.

Syntax

Syntax

```
>>-- SHOW --- FORM ------------------------------------------------------<<
           +- PROC ----+
           +- REPORT --+
           +- GLOBALS -+
>>-- SHOW QUERY ----------------------------------------------<<
                +- ( --- VIEW = SQL/PROMPTED/NATURAL/RESULTS/STATUS/ ----+
                          +- RESULTSET = NumChars -----------+
```

Parameters

Table 49. SHOW Command Parameters

Parameter	Description
VIEW	Specifies the appearance of the target query.
RESULTSETS	Specifies the maximum number of characters in the result set.

Example

```
SHOW QUERY
```

WINDOWS command

The WINDOWS command activates the target Windows application, document, or URL.

Syntax

```
>>-- WINDOWS CommandLine ------------------------------------------------<<
```

Parameters

Table 50. WINDOWS Command Parameters

Parameter	Description
CommandLine	An application command line, document name, or URL to launch. The command is launched and execution of the procedure continues without waiting for completion of the command.

Example

```
WINDOWS
c:\programs\notepad.exe
```

Sample procedure

The following sample procedure demonstrates how to display, run, and print a report using a query and a form. It also creates a new query based on a table, runs that query, exports the data to a file, and saves the data in a table at a different database server.

```
SET GLOBAL (TABLE=SMITH.PAYROLL
DISPLAY QUERY SMITH.PAYROLL_QUERY
RUN QUERY (FORM=SMITH.PAYROLLFORM
PRINT REPORT
DRAW SMITH.PAYROLLTABLE (TYPE=SELECT
RUN QUERY
EXPORT DATA TO C:\TEMP\EXP1.IXF (DATAFORMAT=IXF

CONNECT TO 'SERVERC'
SAVE DATA AS SMITH.DATASAVE
SHOW REPORT
```

Chapter 9. ObjectREXX procedures

IBM ObjectREXX (Restructured Extended Executor) is an interpreted script language (programming language) developed by IBM, which is available for the mainframe and Windows environments. It is designed for ease of learning and use and to make programming accessible to non-programmers. It offers powerful character-manipulation, automatic data typing, manipulation of words, numbers, and names, and debugging capabilities.

In QMF for Windows procedures, IBM ObjectREXX (ObjectReXX) handles simple and complex calculations, logic, column definitions, detail variations, and conditions.

ObjectREXX functions have the following syntax:

```
function-name ([[expression] [,] [expression] [,] ...])
```

where *0* to *n* expression arguments can exist (*n* is the maximum number of comma-separated expressions allowed by ObjectREXX).

You can add programming logic in a procedure by including ObjectREXX code for IF/THEN/ELSE, SELECT, CALL, looping, form calculations, and other features.

Note: IBM ObjectREXX must be installed to create procedures with ObjectREXX logic.

Requirements

You can add ObjectREXX functionality directly to forms. The following form components require access to ObjectREXX in order to perform the calculations and logic for the report formatting.

Calculations

Select **Form--> Edit**, then select the **Calculations** tab to enter an ObjectREXX expression containing user-defined usage codes and form variables in the **Expression** field.

Note: ObjectREXX for Windows Version 1.0 or later, must be installed; otherwise, an error message is issued when you display a report containing ObjectREXX expressions.

Column definitions

Follow these steps to create an ObjectREXX expression that will define columns dynamically from form data in other columns.

1. Select **Form--> Edit**.
2. Click the **Columns** tab.
3. Click **Add**.

   The Column dialog box opens.
4. Type the name for the new column in the **Heading** field.
5. *Optional:* Provide additional information about the column in the **Usage code**, **Edit code**, **Indent**, **Width**, **Heading Alignment**, **Sequence**, and **Data alignment** fields.
6. Enter the ObjectREXX expression in the **Definition** field.
7. *Optional:* Check the **Pass nulls** check box to pass the definition to ObjectREXX for evaluation when a variable in the definition has a null value.

Note: ObjectREXX for Windows Version 1.0 or later, must be installed; otherwise, an error message is issued when you display a report containing ObjectREXX expressions.

Conditions

Select **Form--> Edit**, then select the **Conditions** tab to define logical criteria in the **Expression** field. This information will be used to select the detail variation for a row.

Note: ObjectREXX for Windows Version 1.0 or later, must be installed; otherwise, an error message is issued when you display a report containing ObjectREXX expressions.

Task

Follow these steps to create a procedure with logic:

1. Select **File--> New--> Procedure**.

   A procedure document opens.
2. Type an ObjectREXX comment line as the first line of the procedure.

   An ObjectREXX comment line begins with **/*** and ends with ***/**.
3. Type the procedure command in uppercase letters and enclose the commands with single quotation marks.
4. Type the ObjectREXX commands in the procedure.

Note: Object REXX commands are run locally, not at the database server.

ObjectREXX calculations

ObjectREXX has a special function that performs sophisticated calculations. For example:

1. Open a default form.
2. Select **Form--> Edit**.
3. Click the **Calculations** tab.
4. Type the ObjectREXX expression for the form in the **Expression** field, such as:

   ```
   &6 +&7
   &SUM6 +&SUM7
   ```

5. Click the **Columns** tab.
6. Select the row on which the calculation operation will be performed.
7. Select the `CALC` usage code for that row in the **Usage** field.

Complex ObjectREXX calculations

To use complex ObjectREXX calculations, you need to write a full program in ObjectREXX and call it from the CALC. For example, a complex ObjectREXX program could divide two values, compare the result to another value and place a comment or value in the report based on the comparison.

The following is an example of CALC syntax for a complex ObjectREXX calculation:

```
PROG(&6,&7,.03)
```

where `PROG` is the REXX program.

Column definitions

ObjectREXX offers a column definition function, by which new columns can be created interactively in the original query.

1. Create a report.
2. Select the default form.
3. Select **Form--> Edit**.
4. Click the **Columns** tab.
5. Click on a row.
6. Click **Add**.

   The Column dialog box opens.
7. Type the name for the new column in the **Heading** field.
8. *Optional:* Provide additional information about the column in the **Usage code**, **Edit code**, **Indent**, **Width**, **Heading Alignment**, **Sequence**, and **Data alignment** fields.

Note: You can embed an ObjectREXX function in the **Definition** field to call an ObjectREXX program.

9. Type the ObjectREXX expression in the **Definition** field.
10. *Optional:* Check the **Pass nulls** check box to pass the definition to ObjectREXX for evaluation when a variable in the definition has a null value.

Conditions and detail variations

Conditions and detail variations can be incorporated into an ObjectREXX program.

- *Conditions* define the situations under which an action will occur, such as printing a message.
- *Detail variations* specify the action that will occur when the condition is met.

A set of simple conditions is presented below:

1. Select a default form.
2. Select **Form--> Edit**.
3. Click the **Conditions** tab and define the conditions, such as:

```
&7/&6>.03
&7/&6<.03
```

4. Click the **Details** tab.
5. Select *Yes* from the **Enable** drop-down list.
6. Check the **Include column headings with detail headings** check box.
7. Type the number of blank lines in the **Blank lines after block** field.
8. Type the text for the detail block in the **Detail Block Text** field.
9. Click **2 of 2**.
10. Select *Yes* from the **Enable** drop-down list.
11. Check the **Include column headings with detail headings** check box.
12. Type the number of blank lines in the **Blank lines after block** field.
13. Type the text for the detail block in the **Detail Block Text** field.

Chapter 10. Object lists

Collections of QMF objects can be viewed using lists. Lists can be created for particular types of objects or objects owned by a person or group. For example, a list of queries owned by the Accounting department can be developed, saved, and restricted to members of this department.

Objects

QMF for Windows recognizes four types of objects:

- Queries (SQL queries and prompted queries)
- Forms
- Procedures
- Tables

You can use the List window to view the objects based on the object name, owner, and type.

Listing objects

1. Select **File--> New List**.

   The List window opens.
2. Specify an owner and a name.

   Optional: You can use patterns to select objects from a list of matching objects.

   - Use the percent character (%) to match a string of any length containing any characters. For example, to list all tables with a name beginning with the letter A, enter A%.
   - Use the underscore character (_) to match a single character. For example, to list all tables with an owner that has the letter A in the second position, enter _A%.
3. Check the object types to include:
   - Queries
   - Forms
   - Procedures
   - Tables
4. Click **Refresh List**.

List window commands

Right-click an object in the List window to display a sub-menu that is identical to the List menu.

Display object

Select **List--> Display** to open the selected object for viewing. This option is available for queries, forms, procedures, and tables.

Run object

Select **List--> Run** to run the selected object.

Note: This option is available for queries and procedures.

Draw object

Select **List--> Draw** to create a query based on the selected table. You can draw an SQL SELECT, UPDATE, or INSERT query, or a prompted query.

Note: This option is available for tables.

Edit object

Select **List--> Edit** to open the Table Editor for editing a table.

Note: This option is available for tables.

Properties

Select **List--> Properties** to display the properties of the object, including comments, attributes, and historical usage information.

Note: This option is available for queries, forms, procedures, and tables.

Using the Database Explorer

The Database Explorer is a dockable Window tool in which the objects in the List document display as leaf nodes, such as a node for servers (as defined in the Server Definition File) and Favorites.

Right-click on a node, before you expand the node (+), and select **Filter** from the submenu. Use the Filter dialog box to specify filter options for the node.

Creating lists

You can create lists to serve as collections of objects. For example, you could create a list of all inventory-related queries, forms, procedures, and tables to keep your work in one place. Once the list is created, you can add and remove objects from the list and save the list for future use.

Adding objects to lists

You can add objects to an existing list.

1. Select **File--> Open** to open a list.
2. At the top of the List window, specify information for the objects you want to add to the list, such as identifying the *Object Owner*, *Object Name*, and *Object Type*.
3. Click **Add to List**.

   The objects matching the owner and name are added to the list.
4. Select **File--> Save As** to save the list.

   The Save As dialog box opens. The **Save as type** field is set to the file type *.ol, which is for Object List Files. Save the object list, then open this custom list when using QMF for Windows.

Removing objects from lists

You can remove unrelated objects from lists by opening a list and selecting **List--> Remove From List**.

The object is removed from the list, but is not deleted from the database.

Saving lists to files

1. Open a list.
2. Select **File--> Save**.
3. Type the name of the file where you want the list stored.
4. Click **OK**.

Opening saved list files

1. Click **File--> Open**.

   The Open dialog box opens.
2. Select the file that you want to open.
3. Click **OK**.

Chapter 11. Static queries

A static query is an SQL query that has been passed to a database server and bound into a package. When a static query runs, the database server uses the SQL text bound in the package instead of the SQL text currently appearing in the query window. Static queries are more resource efficient than dynamic queries.

Note: You cannot edit static queries.

Creating static queries

1. Select **Query--> Bind Package**.
   The Bind Static Package dialog box opens.
2. Click the **Package** tab.
3. Enter a collection ID and package name, and change any other options.
4. *Optional:* Click the **Input Variable**s tab if the query contains any substitution variables.
5. Replace the substitution variables with host variables.
6. Click **OK**.

   Note: After you bind a query, save the query to a file or to the database server.

Replacing substitution variables

When you bind a package, you must specify a host variable to use in place of each substitution variable in the SQL text. However, a substitution variable cannot always be directly replaced by a host variable. Substitution variables provide direct text substitution in the query text before the text is sent to the database server. Host variables are sent as part of the query to the database server. Refer to the documentation for your database server for rules on where and how host variables can be used in queries.

After you specify a relationship between a substitution variable and a host variable, QMF for Windows remembers the relationship, and suggests it in future queries, making binding packages simpler.

The valid data types for host variables are:

- CHAR(n)
- VARCHAR(n)

- INTEGER
- SMALLINT
- FLOAT
- DECIMAL(p,s)
- DATE
- TIME
- TIMESTAMP

Procedure

1. Select the **Input Variables** tab on the Bind Static Package dialog box.
2. Specify the variable type for each host variable.
3. Click **OK**.

Running static queries

You run static queries the same way as you run other queries. See "Use the Database Explorer to select an existing query" on page 32.

Chapter 12. Table Editor

Use the table editor to search for, add, edit, or delete data stored in tables without writing SQL statements.

About the Table Editor

The table editor gives you flexibility in editing and searching through data.

Searching for rows using the table editor

1. Select **File--> Table Editor**.

   The Table Editor dialog box opens.
2. Select the server on which the table resides.
3. Specify a table owner and table name.

   Note: You can use patterns to select table names from a list of matching tables.

   - Use the percent character (%) to match a string of any length containing any characters. For example, to list all tables with a name beginning with the letter A, enter A%.
   - Use the underscore character (_) to match a single character. For example, to list all tables with an owner that has the letter A in the second position, enter _A%.
4. Click **List Tables**.

   The Tables dialog box opens.
5. Select a table from the list.

   The Table Editor dialog box opens.
6. Select a Save Mode.
   - **Immediate**

     The table is updated at the database server immediately after each change.
   - **End**

     The table is updated at the database server after you finish entering all changes. Other users will not be able to make changes to the table while you are making your changes.
7. Click **Edit**.

   The Edit Table dialog box opens.
8. Type search conditions:

- **For a simple search**

  Type search values in the **Value** column.
- **For an advanced search**

  Type search criteria in the **Additional search criteria** field to specify more complex search conditions.

  Note: You can enter any valid SQL predicate in this field.

9. Click **Start Search**.

   The first matching row is displayed in the **Value** column.

Adding a row

1. Open the Edit Table dialog box.
2. Enter information for the new record.
3. Click **Insert Row**.

   The new row is added to the table.
4. Click **OK**.

Changing a row

1. Open the Edit Table dialog box.
2. Search for the row you want to change.
3. Click **Next Row** until you locate the row to be changed.
4. Edit the data in the **Value** column.
5. Click **Update Row**.

   The row is updated.
6. Click **OK**.

Deleting a row

1. Open the Edit Table dialog box.
2. Search for the row that you want to delete.
3. Click **Next Row** until you locate the row to be deleted.
4. Click **Delete Row**.

   The row is deleted.
5. Click **OK**.

Editing tables from the query results view

You can edit tables directly from the query results view.

Deleting a row from the query results view

You can delete individual rows from tables in the query results view.

1. Run a query.

2. Select a row from the query results view.
3. Select **Edit--> Delete**.

Updating columns from the query results view

You can update individual columns in the query results view.

1. Run a query.
2. Double-click a cell.
3. Type a new value.
4. Press **Enter**.

Chapter 13. Data distribution

Query results data can be exported to other databases and applications.

Exporting methods

There are three methods to export data from QMF for Windows into other applications:

- Exporting the data into a TXT, CSV, IXF, HTML, or shape file
- Saving the query results to a table
- Adding query results directly into a Microsoft Excel or Lotus 1-2-3 spreadsheet

Exporting data to files

1. Run the query.
2. Select **Results--> Save to File**.

   The Export Data dialog box opens.
3. Select one of the following output file types from the **Save as type** field:
   - TXT

     You can produce a text file, with a .txt extension. This is a standard ASCII file with optional string and column delimiters (as specified in the Export Text/DEL Options dialog box).
   - HTML

     You can produce an .htm type file (HTML). This is an HTML file that can be viewed by any web browser. All of the HTML tags are automatically generated in the file and it is prepared to be published on your Internet or intranet web site. The options you choose on the Export HTML Options dialog box control the appearance of the exported data.
   - IXF

     You can produce an .ixf type file. An IXF export preserves all database information, including column headings and data types. It is typically used to transfer information from one database to another.
   - CSV

     You can produce a .csv type file. A CSV export is similar to a text export, using a comma as the column delimiter. This format is most commonly used by spreadsheet applications.
   - DBF

     You can produce a .dbf file, which is a dBASE III file, part of the popular database management system. The dBASE format for storing

data has become a de facto standard, and is supported by nearly all database management and spreadsheet systems. Even systems that do not use the dBASE format internally are able to import and export data in dBASE format.

- SPM (map file)

  You can produce a SPM file, which enables you to view data from DB2 in a map rather than through conventional means such as in a chart, report, or browser. Only tables having a column defined as **GEO** type can be rendered as a map in QMF for Windows.

4. Click **Options**.

   One of the following dialog boxes opens:

   - The Export Text/DEL Options dialog box opens for **TXT** output options
   - The Export HTML Options dialog box opens for **HTML** output options
   - The Export IXF Options dialog box opens for **IXF** output options
   - The Export CSV Options dialog box opens for **CSV** output options
   - The Export dBASE Options dialog box opens for **DBF** and **SHP** output options

5. Select the options for the export file.
6. Click **OK**.
7. Click **OK**.

Importing data

You can import data that has been saved in an IXF file. Once data is imported into a query window, it can be saved to a database server, exported to a new file, or used for reports. PC/IXF and character mode System/370IXF files are supported.

1. Select **File--> Import Data**.

   The Import Data dialog box opens.

2. Select the file you want to import.
3. Click **OK**.

   The imported data opens in a new query window.

IXF messages

The IXF Messages dialog box displays when you export or import data successfully into an IXF format file.

Table 51. IXF Import/Export Confirmation

Field	Description
Messages	The messages section of the IXF Messages dialog box displays detailed data and process information when importing or exporting from an IXF file. For example, it could provide information about the number of rows that were imported or exported, which rows were rejected, and which data was truncated. The edit box is read-only; however, you can select and copy these messages.
OK	Click **OK** to close the dialog box.

Sample messages	Sample messages are presented below:
	`The H record in the PC/IXF file has product "DB202.00, date "20011025 time "160300", single CCSID "0" and double CCSID "0".`
	
	`The C record in the PC/IXF file has column name "ID", data type "INTEGER", single CCSID "0", and double CCSID "0"`
	`...`
	`The T record in the PC/IXF file has a name "STAFF", qualifier "Q", and source "TEST".`
	`...`
	`The application is beginning to export data to file c:\temp.IXF.`
	`...`
	`The row 5 is rejected.`
	`The data in (1,3) is truncated.`
	`The data in (4,3) is truncated`
	`...`
	`Number of rows rejected = 1.`
	`Number of data truncated = 2.`
	`Number of rows exported = 10.`
	`...`
	`The application has completed processing. "26" rows were exported from the file c:\temp.IXF.`

Saving data to a database server

You can save imported query results to a database table.

1. Open the imported query results.
2. Select **File--> Save Data**.

   The Save data dialog box opens.
3. Select a database server, enter a table owner and name, or choose other options.
4. Click **OK**.

Using the Microsoft Excel add-in

The 32-bit version of QMF for Windows includes an add-in for Microsoft Excel 7.0 or later. This enables you to run QMF for Windows and export query results directly into a spreadsheet. The appropriate add-in is automatically installed if you choose the ″Typical″ installation option, or if you choose the ″Custom″ installation option and select the Microsoft Excel Add-In.

1. Run a query in QMF for Windows.

   The query results open in the query results grid.
2. Select the data you want to return to Excel.
3. Select **Results--> Display Chart**.
4. Select Microsoft Excel from the **Application** drop-down list.
5. Specify the chart type, chart title, chart labels, and other charting options.
6. Click **OK**.

   Microsoft Excel opens and displays the exported spreadsheet.

Using the Lotus 1-2-3 add-in

The 32-bit version of QMF for Windows includes an add-in for Lotus 1-2-3 that enables you to run QMF for Windows from 1-2-3 and return query results directly into a spreadsheet. This add-in is installed if you choose the ″Typical″ installation option, or if you choose the ″Custom″ installation option and select the Lotus 1-2-3 Add-In option.

1. Run a query in QMF for Windows.

   The query results display in the query results grid.
2. Select the data you want to return to Lotus 1-2-3.
3. Select **Results--> Display Chart**.
4. Select Lotus 1-2-3 from the **Application** drop-down list.
5. Specify the chart type, chart title, chart labels, and other charting options.
6. Click **OK**.

   Lotus 1-2-3 opens and displays the exported spreadsheet.

Using sample applications

Several sample applications and integration solutions are available for QMF for Windows. To find out more, visit the IBM web site:

`http://www.ibm.com/qmf`

Building an application using the QMF for Windows API

You can build your own applications using QMF for Windows. Refer to the API online help for a complete listing of all the API functions and their effects. Also, visit the IBM web site for programming examples:

`http://www.ibm.com/qmf`

Chapter 14. Job files

You can schedule and run procedures using job files. Job files store procedure parameters and use the Microsoft Windows scheduler to run the procedures at the time and date you specify. Job files allow you to schedule lengthy or resource-intensive queries to run at more convenient times.

You can create job files and store them locally or at the database server.

Job menu

Set server

Select **Job--> Set Server** to select the database server that contains the procedure you want to run.

Set user information

Select **Job--> Set User Information** to set your database server user ID and password.

Optional: Specify an accounting string that the database server uses to track system usage.

Optional: Check the **Remember this password** check box to have QMF for Windows use the password specified in the **Password** or **New Password** fields across multiple QMF for Windows sessions. If unchecked, QMF for Windows uses the password only for the duration of the current session.

Optional: Check the **Use this information for every server I connect to** check box to use the same user ID and password entered in the **User ID** and **Password** fields for connecting to all database servers. If this check box is checked QMF for Windows will use the same user ID and password for all connections unless you open the Set User Information dialog box and make a change.

Run

Select **Job--> Run** to run the job in a separate QMF for Windows instance, which leaves the current session available to perform other tasks.

Test

Select **Job--> Test** to run the scheduled task at the same time that QMF for Windows runs the SQL for that task. Both transactions are performed in the same instance, but in separate windows.

Schedule

Select **Job--> Schedule** to open the Schedule Job dialog box. Use this dialog box to schedule the job using the Microsoft Windows Scheduler.

View scheduled tasks

Select **Job--> View Scheduled Tasks** to open the Scheduled Tasks dialog box and review the command used to launch the job, the comment associated with the job, the creator, the last used date, the edit code, and the trigger count.

Creating job files

1. Select **File--> New Job**.

   A new job document opens.
2. Specify job-specific information, such as server, user ID, password, procedure name, or procedure file.
3. *Optional:* Define a variable to be used in place of a substitution variable.
4. Select **File--> Save** to save the job file locally or at the database server.

Saving a job files

You can save job files locally or at a database server.

1. Select **File--> Open** to open a job file.
2. Select **File--> Save As**.

   The Save As dialog box opens.
3. Specify a location and file name.
4. Click **OK**.

Saving a job file to a server

You can save a job file to a database server.

1. Select **File--> Open** to open a job file.
2. Select **File--> Save At Server**.

Running job files

You can run job files that have been saved locally or at a database server.

1. Select **File--> Open** to open a job file.
2. Select **Job--> Run**.

Scheduling job files

You can schedule job files to run unattended using the Microsoft Windows scheduler.

Note: Save your user ID and password with the job file to schedule a job file that has been saved locally, but be aware that, although your password is saved as encrypted text, it could be vulnerable to discovery.

1. Select **File--> Open** to open a job file.
2. Select **Job--> Schedule**.

   The Schedule Job dialog box opens.
3. Specify the scheduling information for the job file.
4. Click **OK**.

Chapter 15. QMF for Windows Report Center

Use QMF Report Center to produce custom reports by using shared QMF objects (queries, forms, procedures, and tables). With quick access to these objects, you can specify data format preferences and produce custom reports that can be viewed and manipulated in a variety of applications. The QMF Report Center is a simple user interface that launches centrally-shared queries and QMF reports and sends the results to spreadsheets, desktop databases, browsers, or to a printer.QMF Report Center

QMF Report Center application is installed along with QMF for Windows and QMF for Windows Administrator.

Features

The following are some features of QMF for Windows Report Center:

- Queries and reports can be stored and run against multiple DB2 UDB database servers.
- Results can be viewed, formatted, and saved.
- Lists of favorite reports can be created and sent to the Favorites folders on your desktop in various formats, such as Lotus 1-2-3, Microsoft Excel, Microsoft Access, or as .txt files.
- Administrators can set governing limits based on schedules and user groups to restrict users from running large reports at specific times and days.
- Administrators can control who has access to queries and reports, which leaves distribution and central control over the reports with the administrator

Definitions

Table 52. Key Definitions for QMF Report Center

Term	Definition
Query	A description of a result set of data to retrieve from a database server **Note:** Queries cannot be created or modified in QMF Report Center.
Table	A collection of stored data. You interact with tables by running queries

Table 52. Key Definitions for QMF Report Center (continued)

Term	Definition
Form	Contains the formatting instructions for generating a report from the query results
Procedure	A set of commands for running queries, printing reports, importing and exporting data, and performing other functions

Getting acquainted with QMF Report Center

Navigation tips

- Right-click on any object or folder to open a subfolder
- Click the plus symbol (**+**) next to any folder to open the first level of contents
- Press **Shift** while you click + to open all subfolders for a folder

Directory structure

The QMF Report Center window contains a tree-like structure of available Favorites, DB2 servers, Public Favorites, objects, and a Recycle Bin.

Each type of object has an icon, such as an icon for a query or database server. Click on the icon for an object type to view the objects for each server and view all other available servers.

Favorites

Your Favorites folder contains reports based on objects that reside on a server. You can create reports by copying objects to your Favorites folder. The objects are not physically located on your hard drive; instead, the reports point to objects on the server.

Note: No one else can access objects in your Favorites folders because you are the owner of these folders.

DB2 servers

This part of the tree lists all DB2 servers that are in your server definition file (SDF).

Note: Servers that you cannot access may still be listed.

Reports

This part of the tree lists, by server name, all available objects to which you have access.

Public favorites

The Public Favorites folder resides on a server and contains reports, along with your Favorites folders. Any user can access Public favorites; whereas, only you can access objects in your Favorites folders because you are the owner of these folders.

Recycle Bin

The Recycle Bin contains items that you delete from your Favorites folder.

Deleted items remain in the Recycle Bin until you empty the bin. The Recycle Bin acts as an "undo" feature because you can move items out of the bin and back to your Favorites.

- **Deleting items from QMF Report Center**

  Select an item, then select **Edit--> Delete**.
- **Emptying the Recycle Bin**

  Select **Report--> Empty Recycle Bin**.

  Note: Items will be deleted permanently from QMF Report Center.
- **Restoring items to QMF Report Center**

  Drag the item from the Recycle Bin to another location.

Working with folders and favorites

Folders group reports and QMF objects. Folders are named according to object owner names. You can perform the same operations on folders that you do on reports, such as running reports and defining report properties.

Note: When you perform an operation at a top-level folder the operation is applied to every report contained in the folder.

To run the reports within a folder consecutively, click on the *folder*, then select **Report--> Run**.

QMF Report Center contains two top-level folders where you can store reports. The folders contain reports that point to objects on servers. The actual objects are not contained within your Favorites folders.

- Your **Favorites** folders reside locally. You are the only one who can access the folders and the contents within the folders.
- A **Public Favorites** folder resides on each server and can be accessed by all authorized users.

  You may have access to several Public Favorites folders at several different servers, depending on your resource limits.

  Note: There is only one Public Favorites folder on each server.

When you copy QMF objects to your Favorites folders and Public Favorites folders, the folders are renamed automatically to include the object type and owner name. When you copy an entire object type (for example, a folder containing procedures) from a server, the server name is also included in the new folder name.

Adding reports to Favorites

You can add any object or report from a server to your Favorites folders, or to the Public Favorites folder on a server (with permission from your system administrator).

Adding reports to your Favorites folders

Select one of the following options:

- Select the report then select **Report--> Add to Favorites**
- Select the report then drag the report to your Favorites folder

The report is added to the top of your Favorites folder with the following naming convention:

```
Objecttype OWNERNAME.OBJECT NAME
```

For example:

```
Query QMFGUEST."SELECT"
```

Adding reports to a Public Favorites folder on a server

Select a report than drag the report a Public Favorites folder on a server. You can add reports from your Favorites folders or from another server.

Note: After you add or modify a report in a Public Favorites folder, select **Report--> Save changes to Public Favorites** to save the updates at the server.

Connecting to a server

Follow these steps to connect to a server to fetch reports.

1. Click the plus symbol (+) to the left of the DB2 server to list the servers.
2. Click the + next to a server.
3. Provide user information at the Set User Information dialog box.

   A dialog box opens showing that QMF Report Center is connecting to the server and retrieving information.
4. Click the + next to a folder. Folders are available for the following object types:
   - DB2 Forms

- Public Favorites
- QMF Forms
- QMF Procedures
- QMF Queries
- Tables

5. Click + next to a top-level folder to list the individual objects within a folder.

Working with reports and objects

Reports are based on queries and forms, and contain certain formatting and output specifications. Reports that are contained in your Favorites folder point to objects that reside on the server.

All items in your Favorites folder and in the Public Favorites folders on each server are considered reports. You can manipulate formatting and display options for reports.

You do not modify a QMF object. Instead, you modify its link. Because reports are based on objects, properties of objects also apply to reports.

You can create reports from objects that reside on a server, but they are not saved to the server. This allows you to create one-time, ad hoc reports. After creating a report from objects on a server, you can save the report to your Favorites folders.

Creating reports

You can create reports from reports in your Favorites folders and from QMF objects that reside on a server.

Create reports locally

Follow this step to create a report locally:

1. Connect to the server that contains the object you will base the report on.
2. Select an object, then drag the object to your Favorites folder.

   You can now run the report or define report properties unique to the report.

Create reports from the server

Select one of these options to create reports from the server:

- Right-click on an object then click **Run**
- Right-click on an object, then click **Properties**. The Report Properties dialog box opens. Change the properties associated with the report, then click **Run**.

If you select this method to create a report, you are prompted to save the report in your Favorites folder. Your report will not be saved if you skip this step.

- Modify report properties, then use the first option

Note: Reports that are created from objects that reside on the server are not saved to the server.

Running reports

You can run reports from your Favorites folders or from objects located on the server.

1. *Optional:* Select the report or object, then select **Report--> Properties**.

   The Report Properties dialog box opens.
2. *Optional:* Define properties. See "Properties" on page 172.

   You can set properties for formatting, output, procedures, variables, miscellaneous, schedule, security, and email for objects that reside in your Favorites folders and objects on the server.
3. Click **Run**.
4. Provide your user ID and password.
5. Click **OK**.

   The report is processed.

If you checked the **View report after publishing** check box at the **Report Properties--> Output** tab, the report opens in the application you specified in the **Select output application** field.

The query results display in the format specified in the **Report--> Properties** dialog box. By default, it will point to a text (.txt) application. Other format options include:

- Web browser (.htm)
- Text (.txt)
- Mi crosoftWord (.doc)
- Lotus®Word Pro® (.lwp)
- Microsoft Excel (.xls)
- Lotus 1-2-3 (.123)
- Microsoft Access (.mdb)
- Printer

Running multiple reports

To run multiple reports, you can repeat the procedure for running reports while you are in your Favorites folder.

You can also run a report by:

- Selecting the report, then choosing **Report--> Run**
- Right-clicking on the report, then choosing **Run**
- Double-clicking on the report name

You can run reports in separate memory so you can continue to work in the QMF Report Center while reports are running. To do this, check the **Run as a separate process** check box on the **Miscellaneous** tab of the Report Properties dialog box.

If you checked the **View report after publishing** check box on the **Output** tab of the Report Properties dialog box, the report opens in the application you specified.

Printing reports

You can print QMF Report Center reports from the output application or directly from QMF Report Center.

Procedure

1. Select one of the following options:
   - Select the report, right-click, and select **Properties**
   - Select the report, then select **Report--> Properties**

   The Report Properties window opens.
2. Click the **Output** tab.
3. Select a printer from the drop-down list.
4. Click **Options**.
5. Specify the printing options.
6. Click **OK**.

Scheduling reports

You can schedule the reports and folders in your Favorite folder to run at a specific date and time, or at regular intervals.

The QMF Report Center scheduler is based on the Windows scheduler. Make sure the Windows scheduler is running and you have authority to use the scheduler. You will be notified if the Windows scheduler is not running when you try to schedule jobs.

Note: If you are using an NT machine that does not have the Windows scheduler, only the user whose name was identified as the log-on account for running the ″AT″ scheduler can schedule jobs.

Check with your system administrator to determine which account is set up on your computer.

Procedure

Select one of the following options to schedule reports if you have the Windows scheduler and the authority to use it:

Option 1

1. Select **Tools--> Set User Information**.

   The Set User Information dialog box opens.
2. Provide user ID and password information.
3. Check the **Remember this password** check box.
4. Click **OK**.
5. Select one of the following options:
   - Select the report and select **Report--> Properties**
   - Select the report, right-click, then select **Properties**
6. Click the **Schedule** tab.

   The Schedule page opens in the Report Properties window.
7. Select schedule options.
8. Click **OK**.

   The scheduled jobs run as a separate process. This enables you to keep working in QMF Report Center while scheduled jobs are running.

Note: If you set up a daily and monthly schedule in which reports will run once a day, two separate jobs are entered (one for the weekly schedule and one for the monthly schedule).

Viewing scheduled reports

You can view the schedule for scheduled reports.

Procedure

Select **View--> Scheduled jobs** to open the QMF Scheduled Jobs dialog box.

Viewing report history

You can display a chronological list of all reports run in Report History. Report History contains data about the run date and time, report name, output application, file location, and size of a report run.

Procedure

Select **View--> Report history** to open the Report History dialog box, which lists the date, report, application, file location, and file size of the reports that were run.

Renaming reports and folders

You can rename reports and folders contained in your Favorites folder.

Note: You cannot rename QMF objects.

Procedure

Option 1

1. Select the report or folder.
2. Right-click on the report.
3. Select **Rename**.
4. Type the new name for the report or folder.
5. Press **Enter**.

Option 2

1. Select the report or folder.
2. Select **Edit--> Rename**.
3. Type the new name for the report or folder.
4. Press **Enter**.

Moving reports, objects, and folders

You can move reports, objects, and folders on a server and within your Favorites folders.

Procedure

1. Select one of the following options:
   - Select the item, right-click, and select **Cut**
   - Select the item, then select **Edit--> Cut**
2. Select one of the following options:
   - Right-click on the location, then select **Paste**
   - Right-click on the location, then select **Edit--> Paste**

Note: Dragging an item does not move the item from one location to another. Instead, dragging makes a copy of the item, except when you are working in your Favorites folders.

Copying reports, objects, and folders

You can copy reports, objects, and folders from a server or within your Favorites folders.

Copy and paste reports from a server

1. Select one of the following options to copy the item:
   - Drag the item from its current location to another location
   - Select the item, right-click, then select **Copy**
   - Select the item, then select **Edit--> Copy**
2. Select one of the following options to paste the item:
   - Right-click on the folder to which you want to copy the item then select **Paste**

- Right-click on the location, then select **Edit--> Paste**

A message confirms that the item has been pasted and the item is added to the bottom of the current folder.

Copy within Favorites folders

Use the copy and paste method described in "Copy and paste reports from a server" on page 171 to copy reports within your Favorites folders.

Note: Dragging reports within your Favorites folders only moves the reports from one folder to another.

Deleting reports, objects, and folders

Objects and reports that you delete from your Favorites folders are sent to the Recycle Bin and can be recovered. However, objects and reports that you delete from the server are deleted permanently.

Note: You may be prohibited from deleting items from the server.

Procedure

Select one of the following options:

- Select the item, right-click, then select **Delete**
- Select the item, then select **Edit--> Delete**

A delete-confirmation message is issued for objects and reports being deleted from a server.

Note: The task scheduler must be running for you to delete a report that has scheduled jobs or remove the report from the Recycle Bin.

Menu options

Report menu

Run

Select **Report--> Run** to run the report.

Properties

1. Select a report at a server.
2. Select **Report--> Properties** to open the Report Properties window.

In this window, you can provide the following report information:

- General
- Formatting
- Output

- Procedure
- Variables
- Miscellaneous
- Schedule
- Security
- Global variables

Note: The Formatting, Output, and Procedures tabs are disabled for queries that do not use the SQL SELECT statement because they do not return data (non-SELECT SQL verbs).

REPORT PROPERTIES - FAVORITES

A hidden menu with two options is available from the Properties window. The menu becomes enabled when you select a report from your Favorites folder, select **Properties**, than right-click on any page in the Properties window.

- **Report Comments**

  Select this option to open the Report Comments dialog box and work with comments for the report.
- **Edit local query**

  Select this option to open the Query Text dialog box where you can modify the SQL for a local query.

REPORT PROPERTIES - GENERAL TAB

The General page of the Report Properties window opens when you select **Report--> Properties**, then click the **General** tab.

Table 53. General Options

Field	Description
Report name	This field display report name information, such as: • The QMF object type followed by OBJECTOWNER.OBJECTNAME, such as: `QUERY Q.STAFF` • the report description if the selected report is in your Favorites folder
Server	Type the name of the server on which the report resides, or select a server from the drop-down list.

Table 53. General Options (continued)

Field	Description
Object type	This field identifies the type of object with which your are working. This can be a query, table, or procedure. You cannot edit this field directly. To select another object, click **Select** to open the Object Filter dialog box.
View QMF Object text	Check this check box to display the SQL for of the QMF object.

REPORT PROPERTIES - FORMATTING TAB

The Formatting page of the Report Properties window opens when you select **Report--> Properties**, then click the **Formatting** tab.

Note: Select the **No formatting (data only)** radio button to use Microsoft Excel, Lotus 1-2-3, or Microsoft Access as the output application.

Table 54. Formatting Options

Field	Description
No formatting (data only)	Select the **No formatting** radio button to return raw data to the file
Include column headers	Check this check box to add labels to report columns.
Default QMF formatting	Select this radio button to return data in the default QMF format, which includes column headers and a horizontal line to separate the headers and data.
QMF formatting from form	This field displays the form that will be used for data formatting.
Select form	Click **Select Form** to open the Form Filter dialog box to specify an object owner and object name of the form to use for the report. The Select a Form dialog box opens and lists the forms available to use for data formatting.
Run	Click **Run** to run the SQL

REPORT PROPERTIES - OUTPUT TAB

The Output page of the Report Properties window opens when you select **Report--> Properties**, then click the **Output** tab.

Note: Select the **No formatting (data only)** radio button on the **Formatting** page of the Report Properties window to use Microsoft Excel, Lotus 1-2-3, or Microsoft Access as the output application.

Table 55. Output Options

Field	Description
Select output application	Select or browse for the application for which you want to format the report. For Microsoft Excel, Lotus 1-2-3, and Microsoft Access applications and the printer option, click **Options** to define specific output options.
	MICROSOFT EXCEL Select Microsoft Excel from the **Select output application** drop-down list, then click **Options**. The Report Output Options dialog box opens. • **Select or enter a sheet name** Select a sheet name from the drop-down list or type a new sheet name in the text box for the Microsoft Excel worksheet. • **Use the QMF object name** Check this check box to use the object name as the report name. • **Append the above name with** Select the date format from the drop-down list to use as a suffix for the report name. • **Include column names** Check this check box to display column headers in the formatted report. • **Output range** Click the **Output range** text box to launch Microsoft Excel. The Output range dialog box opens. Click the cell in the spreadsheet where the results should be written. The output range will be updated to the specified cell position. Click **Data Options** to specify additional formatting options for graphing and grouping data. **Note: Data Options** is disabled if you selected **Default QMF formatting** or **QMF formatting** from the **Properties--> Formatting** tab.

Table 55. Output Options (continued)

Field	Description
	LOTUS 1-2-3 Select Lotus 1-2-3 from the **Select output application** drop-down list, then click **Options**. The Report Output Options dialog box opens. • **Select or enter a sheet name** Select a sheet name from the drop-down list or type a new name in the text box for the Lotus 1-2-3 worksheet. This option is not available if the **Use the QMF object name** check box is checked. • **Use the QMF object name** Check this check box to use the object name as the report name. • **Append the above name with** Select the date format from the drop-down list to use as a suffix for the report name. • **Include column names** Check this check box to display column headers in the formatted report. • **Output range** Click the **Output range** text box to launch Lotus 1-2-3. The Output range dialog box opens. Click the cell in the spreadsheet where the results should be written. The output range will be updated to the specified cell position. Click **Data Options** to specify additional formatting options for graphing and grouping data. **Note: Data Options** is disabled if you selected **Default QMF formatting** or **QMF formatting** from the **Properties--> Formatting** tab.

Table 55. Output Options (continued)

Field	Description
	MICROSOFT ACCESS Select Microsoft Access from the **Select output application** drop-down list, then click **Options**. The Report Output Options dialog box opens. • **Select or enter a table name** Select a table name from the drop-down list or type a new name in the text box for the Microsoft Access table. This option is not available if the **Use the QMF object name** check box is checked. • **Use the QMF object name** Check this check box to use the object name as the table name. • **Append the above name with** Select the date format from the drop-down list to use as a suffix for the table name. • **Overwrite existing data in table** Check this check box to replace existing data in the named table with data from the most recent report. • **Select or enter a report name (optional)** *Optional:* Select or enter a report name to view a predefined Microsoft Access report when the database opens. This option is useful when you want to view the report after it runs. Click **Data Options** to specify additional formatting options for graphing and grouping data. **Note: Data Options** is disabled if you selected **Default QMF formatting** or **QMF formatting** from the **Properties--> Formatting** tab.

Table 55. Output Options (continued)

Field	Description
	PRINTER • **Select a printer** Select an installed printer from the drop-down list, or click **Options** to select from other printers. • **Number of Copies** Type the number of copies of the report to print. • **Font Options** Select the font type and size for data in the report, or click **Options** to choose other font options. • **Orientation** Select the **Portrait** radio button to print the page with the short edge on top. Select the **Landscape** radio button to print the page with the long edge at the top.

Table 55. Output Options (continued)

Field	Description
	• **Page Width** Three options are available to control the width of the report page: – **Fit to printer page:** Select this radio button to size the page width or length to fit the size of the printed page. – **Characters:** Select this radio button, then type the number of character lines for the page size. The page size will be restricted to this number of lines. – **Continuous:** Select this radio button to print continuous pages, without page breaks, or to wrap text for page width • **Page Length** – **Fit to printer page:** Select this radio button to size the page width or length to fit the size of the printed page. – **Lines:** Select this radio button, then type the number of character lines for the page size. The page length will be restricted to this number of lines. – **Continuous:** Select this radio button to print continuous pages without page breaks or wraps. • **Other Options** – **Include date and time:** Check this check box to include a date and time stamp on the report. – **Include page number:** Check this check box to include a page number on the report. • **Margin (inches)** Set the top, bottom, left and right margins for the report by using the up and down arrow keys or by typing the value in the input field. Margins are measured in inches.

REPORT PROPERTIES - PROCEDURE TAB

The Procedures page of the Report Properties window opens when you select **Report--> Properties**, then click the **Procedure** tab.

Table 56. Procedure Options

Field	Description
This procedure produces no output	Check this check box to indicate that there is no output, such as report results, produced from this procedure. Instead, the procedure will run and a subsequent action will take place.
The procedure uses the DSQQW_PROC_OUTPUT substitution variable	Select this radio button if the procedure uses the DSQQW_PROC_OUTPUT substitution variable. The variable is used to export data to the location you specify in the output location. The output location is passed to the procedure using this substitution variable. The syntax EXPORT REPORT TO &DSQQW_PROC_OUTPUT substitution variable must be included in the procedure. Substitution variables will not display in the Properties dialog box for the report.
Publish to a temporary file, in the following directory	Select this radio button to specify the filename to which the procedure will send output.
Use the temporary directory of the machine running this report	Check this check box to use the machine's temporary directory to save the report.
Start file name with	*Optional:* Type the prefix for the file. This option is used with the **Publish to a temporary file, in the following directory** option.
End file name with	*Optional:* Select a date format to use as a suffix for the file name. Select RANDOM use assigned suffixes and avoid overwriting existing report names. This option is used with the **Publish to a temporary file, in the following directory** option.
Extension	*Optional:* Select one of the following file formats to use for the temporary file: • .csv • .htm • .txt
Publish to a specific file	Select this radio button to browse for a filename where the report will be saved
View output after running	Check this check box to open the report after it is produced.

REPORT PROPERTIES - VARIABLES TAB

The Variables page opens when you select **Report--> Properties**, then click the **Variables** tab.

The **Variable name** field lists the variables defined for the report.You can present values for each variable.

1. Type a value for the variable in the **Variable value** field.
2. *Optional:* Select the **Variable value** field.
3. *Optional:* Click **List of values** to open the Variable Values List dialog box.
   a. Type a value for the variable in the text box at the top of the dialog box.
   b. Click **Add**.
   c. *Optional:* Click **Remove** to delete values from the variable values list.
   d. *Optional:* Click **Move Up** or **Move Down** to resequence the values in the list.
   e. *Optional:* Click the **User can type in their own values when the report is run** check box if the user can provide alternate values for the variable when the report is run.
   f. Click **OK**.

   The **Variable value** field is updated as follows, indicating that multiple values have been defined for the variable:

   ```
   <List Value>
   ```
4. Check the **Hide this value** check box to hide the value of the variable when you run the report.
5. *Optional:* Click **Clear Values** to delete all values defined for the variables.
6. *Optional:* Click **Calculated date** to define which date to put on the report when you run the report or schedule the report in the report scheduler.

   This is similar to a date wizard. For example, you can use the Calculated date function when you run a report on Mondays, but you want to use the previous Friday's date on the report. The Calculated date function will determine the correct date each time you run the report, or pass in the correct date for a scheduled report.

   Note: Use this feature only for queries that accept dates as substitution values.

The Date Substitution Value dialog box opens.

Table 57. Date Substitution Values

Group box	Description	Task	Notes
Calculated date	By days	Select this radio button to specify the number of days prior to the current date to use for the report date	Type a number in the **Number of days prior to current date** field or select a number from the drop-down list
	By days of the week	Select this radio button to specify the day of the week, whether in the current month, or the last month, to use for the report.	• **Last occurrence in current month:** Select this radio button, then select a day to pass to the report, such as the September 24, which is the last Tuesday of this month. • **First occurrence in current month:** Select this radio button, then select a day to pass to the report, such as September 3, which is the first Tuesday of the current month. • **Last occurrence in previous month:** Select this radio button, then select a day to pass to the report, such as August 26, which is the last Tuesday of the previous month. • **First occurrence in previous month:** Select this radio button, then select a day to pass to the report, such as August 6, which is the first Tuesday of the previous month.

Table 57. Date Substitution Values (continued)

Group box	Description	Task	Notes
	By month	Select this radio button to specify the month to use for the report, and whether to use the first day or last day of the specified month on the report.	Select **By first day of month**, then select a number from the **Month prior to current** drop-down list to calculate the date for the first day of the prior *x* number of months. For example, select the **By first day of the month** radio button and type 6 in the **Month prior to current** field, to print March 1 on a report if the current month is September. For example, select the **By last day of month** radio button and type 2 in the **Month prior to current** field, to print July 31 on a report if the current month is September.
	By quarter	Select this radio button to specify the quarter and the day during that quarter to use on the report.	1. Select the **By quarter** radio button. 2. Select the first, second, third or fourth quarter from the **From beginning of** drop-down list. 3. Select the first month of the fiscal year from the **Fiscal year starts** drop-down list.

Table 57. Date Substitution Values (continued)

Group box	Description	Task	Notes
Date format options	Date format	This field controls how the date will be formatted on the report.	Select the format in which to display the date on the report from the **Date format** drop-down list.
	Date separator	This field defines the symbol used to separate the elements of the date (year, month, and day).	Select a date separator symbol from the **Date separator** drop-down list.
	Use PC date as current date	Use the current date set on your PC	Select the **Use PC date as current date** radio button to use the date stored on the PC as the current date on the report.
	Use DB2 date as current date	Use the current date set on the DB2 system (to account for time zones)	Select the **Use DB2 date as current date** radio button to use the date from DB2 as the current date; this enables users to use the correct date, based on their time zones
Sample date	Click **View Sample** to see an example of how the date will display.		
Current PC date	In the lower-right corner of the Date Substitution Value dialog box, displays the current date you have set on your PC		

REPORT PROPERTIES - MISC TAB

The Miscellaneous page of the Report Properties window opens when you select **Report--> Properties**, then click the **Miscellaneous** tab.

Table 58. Miscellaneous Options

Field	Description
Run as a separate process	Check this check box to run reports in a separate instance of QMF Report Center, which allows you to continue working within QMF Report Center.
Suppress informational messages	Check this check box to hide informational messages
Suppress error messages	Check this check box to hide error messages while reports are running
Limit the number of rows returned	Type a number in this field to control the number of rows returned to the report, which preserves system resources, especially at peak times.
Send an email message whenever I run the report	Check this check box to send an email notification each time the report is run.
Send an email message whenever the scheduler runs a report	Check this check box to send an email notification each time the report is run through the report scheduler.
Attach report output to the email	Check this check box to include the report output in the email notification. **Note:** For reports produced at the folder level, this option will attach report output for all reports contained under the folder.
Properties	Click **Properties** to open the Internet Mail Wizard where you provide addressing and routing information for the email.

REPORT PROPERTIES - SCHEDULE TAB

The Schedule page of the Report Properties window opens when you select a query in the Favorites folder, select **Report--> Properties**, then click the **Schedule** tab.

Table 59. Schedule Options

Field	Description
Job ID	This field displays the number of each scheduled job. The number is assigned automatically and cannot be edited.
Interval	This field displays the frequency with which the job is run, as specified in the **Recurrence** field.

Table 59. Schedule Options (continued)

Field	Description
Days of week	This field displays the day or days on which the job is scheduled to run, as specified in the **Days of week to run** field. Optionally, this field may be blank or contain `<Customized>` if the job has been edited using Microsoft's Task Scheduler (R), indicating that QMF Report Center is not able to display the job details.
Days of month	This field displays the calendar day of the month on which the job is scheduled to run, as specified in the **Days of month to run** field.
Time	This field displays the time, in a 24-hour time format, at which the job is scheduled to run on the specified days.
Time	Type the hour and minute at which to run the report, using a 24-hour time format.
Days of week to run	Check the check box next to each day on which the report is scheduled to run. *Optional:* Check the **Select all** check box to select all days of the week.
Days of month to run	Check the check box for the day or days during the month when the job is scheduled to run. *Optional:* Check the **Select all** check box to select all days of the month.
Recurrence	• **Today only** Select this radio button to run the job today only • **Once for the days marked** Select this radio button to run the job only once on the days indicated in the **Days of week to run** or **Days of month to run** field • **Every time for the days marked** Select this radio button to run the job on the day or days selected in the **Days of week to run** field or in the **Days of month to run** field

Table 59. Schedule Options (continued)

Field	Description
Set Variable Values	Click **Set Variable Values** to open the Variable Input for Sched Job dialog box where you specify variables to be used with the scheduled report.
Edit Variable Values	Click **Edit Variable Values** to open the Variable Input for Scheduled Job dialog box where you can modify the values for a variable. **Note:** Select the report name to activate this command button.

REPORT PROPERTIES - SECURITY TAB

The Security page of the Report Properties window opens when you select the Public Favorites folder and you select **Report--> Properties**, then click the **Security** tab.

Use this page to define security information for users or groups of users who can access objects in the Public Favorites folder.

Table 60. Security Options

Field	Description
User ID	Select the name of the user or user group to which you are assigning permission to the current object. Authorized users and their permissions are displayed in the text box below.
Add	Click **Add** to add the selected user, in the **User ID** field, to the authorized users for the current object.
Add All	Click **Add All** to add all of the users in the drop-down list to the authorized users for the current object.
Remove	Click **Remove** to remove the selected user or group of users from the authorized users.

Table 60. Security Options (continued)

Field	Description
Permissions	• **Read** Check the **Read** check box to allow the user or user group to view the current Public Favorites and run the objects in it. • **Write** Check the **Write** check box to allow the user or user group to modify properties of the current object and add reports and folders if the selected item is a folder. • **Administer** Check the **Administer** check box to allow the user or group of users to grant or revoke access to the current object.
Take ownership	Click **Take ownership** to grant ownership of the current object to the user or user group. **Note:** This option may not be available, depending on your resource limits.
Use these settings for all reports under this folder	Check this check box to apply the security settings to all reports and subfolders contained in the current folder

REPORT PROPERTIES - GLOBAL VARIABLES TAB

The Global Variables page of the Report Properties window opens when you select **Report--> Properties**, then click the **Global Variables** tab.

The following are rules for global variables:

- If a global variable is set at the main folder level, then the global variable is set for each report in the folder when the folder is run.
- If a global variable is set at the report level, it becomes the default for the report. If a folder is run and the folder has the same global variable value as the report, then the report value is used.
- If a global variable is set at the sub-folder level and a global variable has been set from the folder being run or from the individual reports, then the global variable for the sub-folder is ignored.

Table 61. Global Variables Options

Field	Description
Variable Name	Type the name of the global variable in the highlighted text box. Global variable names must be unique, they are not case-sensitive, and they can begin with an ampersand (&).
Variable Value	Type the value for the variable in the highlighted box.
Add	Click **Add** to add a global variable.
Remove	Click **Remove** to remove a global variable.
Run	Click **Run** to run the SQL.

Add to Favorites

Select **Report--> Add to Favorites** to add a pointer in your Favorites folder to the selected table, procedure, or query on a server.

The report will be added to the top of your Favorites folder with the following naming convention:

```
Objecttype OWNERNAME.OBJECT NAME
```

For example:

```
Query QMFGUEST."SELECT"
```

Create shortcut

Select **Report--> Create shortcut** to create a shortcut (.qrs file) to a report in your Favorites at a specific location.

You can create a shortcut to reports in your Favorites folder. The shortcut enables you to access a report by launching QMF Report Center and locating the report using the shortcut.

Follow these steps to create a shortcut:

1. Select a report.
2. Drag the report to your Favorites folder.
3. Select **Report--> Create shortcut**.
4. Specify the filename and location for the shortcut.
5. Click **OK**.

   The file extension **.qrs** is added to the filename.
6. Double-click the shortcut to launch the report.

QMF for Windows opens, runs the report, then closes. The report remains open.

Note: Shortcuts are launched when the report name is found.

Save changes to Public Favorites

Select **Report--> Save changes to Public Favorites** to save report changes in the Public Favorites folder.

New Report linked to locally saved query

Select **Report--> New Report linked to locally saved query** to create a report by selecting a query saved locally on your network or workstation.

1. Select the Favorites folder.
2. Select **Report--> New Report linked to locally saved query**.

   The Locate the QMF for Windows query to link to dialog box opens.
3. Select the query.

   The query is added to the Favorites folder.

Note: Only the SQL and server information are used. Other options saved with the .qry file are ignored.

Editing SQL in QMF Report Center

Follow these steps to edit SQL for a report in QMF Report Center. This is the only situation where SQL can be edited by QMF Report Center.

1. Locate the report on your local machine.
2. Double-click on the report.
3. Edit the QMF object text.
4. Save the changes.

New folder

Select **Report--> New folder** to create a folder within the current folder.

Empty recycle bin

Select **Report--> Empty Recycle Bin** to remove the deleted items from the Recycle Bin.

Exit

Select **Results--> Exit** to exit from QMF Report Center.

Edit menu

Cut
Select **Edit--> Cut** to remove an item from the active document.

Optional: Select **Edit--> Paste** to paste the item at another location.

Copy
Select **Edit--> Copy** to copy the item, then select **Edit--> Paste** to paste the copied item at another location.

Paste
Select **Edit--> Paste** to paste the item, that was copied or cut, at the insertion point.

Delete
Select **Edit--> Delete** to delete an item and add it to the Recycle Bin. QMF objects that reside on a server are not added to the Recycle Bin.

Rename
Select **Edit--> Rename** to change the name of the item.

View/Change Server
Select the **Edit--> View/Change Server** option to view or edit the server associated with the report without initializing the report at the server.

The View/Change Server dialog box opens.

Table 62. View/Change Server

Field	Description
Current server	This field displays the name of the server the report runs on
Available Servers	The Available Servers list box lists the servers available to run the report

The list of servers is disabled when:

- the report is in the Public Favorites folder and you do not have permission to run the report, and
- the report is a locally-bound, server-dependent static query

Note: Because the query is not initialized to determine if it is static, you can change the server but it will fail to run.

View menu

QMF Names

Select **View--> QMF Names** to display the name view of tables, forms, procedures, and queries. This option toggles with the QMF Comments option.

The *QMF Name* is taken from the "Save As" name when the report was created.

QMF Comments

Select **View--> QMF Comments** to display the comment view of tables, forms, procedures, and queries. This option toggles with the QMF Names option. The QMF Name view displays for objects that do not have comments.

Objects on the server can have comments that include descriptive information about the object. These comments are assigned to the object when the object is created. You cannot modify comments.

Comments are displayed for the current level and all levels below. For example, if you select QMF queries, all owners and objects contained within QMF queries are displayed with comments.

Note: Retrieving comments can be a time-consuming process. To save resources, you can view comments for a particular object, rather than viewing comments for all objects of the same type.

QMF Object text

Select **View--> QMF Object text** to open the Query Text dialog box, which displays the object name and the SQL for the object. For example:

```
Table: DB2ADMIN.MAX_T
Select * from DB2ADMIN.MAX_T
```

Note: You cannot edit the QMF object text using this function unless it is a local query (.qry) that has not been statically bound to a server.

Report Comments

Select **View--> Report Comments** to open the Report Comment dialog box where you can view or type comments for the report.

Filter options

Select **View--> Filter options** to specify display options for the object. You can filter by any of the following for the object owner and object name:

- Tables
- QMF queries
- QMF procedures
- QMF forms

- Public favorites
- DB2 forms

Server filter options

Select the **View--> Server filter options** option to select the servers to hide from the QMF Report Center directory tree. The Select Servers to Hide dialog box opens and it lists the servers included in the SDF (Server Definition File).

Check the check box next to each server you want to hide, or click **Select All** or **Clear All**. You can run reports against hidden servers.

Text size

Select **View--> Text size** to specify the relative display size of text in QMF Report Center.

Scheduled jobs

Select **View--> Scheduled jobs** to view, edit, delete, and set properties for scheduled reports.

The QMF Scheduled Jobs dialog box opens. The dialog box provides information about scheduled jobs, including the report name, interval, day of the week, day of the month, time, type of object, server, and QMF object name.

- Select **Report--> Properties**, then click the **Schedule** tab to define schedule information for a job

  See "Scheduling reports" on page 169 for more information about scheduling jobs.
- Click **Edit** to open the Schedule Job dialog box where you can work with job execution information.

Report history

Select **View--> Report history** to open the Report History dialog box, which provides details for reports run, in chronological order.

The history captured for the report includes the date run, the report name, the application, the file location, and the file size.

Table 63. Report History command buttons

Click this button	To do this
Clear Selected	Click **Clear Selected** to clear a specific history file from the overall report history
Delete Files	Click **Delete Files** to delete all history files for the report
View Report	Select a history file, then click **View Report** to open the report

Activity log
Select an object then select **View--> Activity log** to open all activities in chronological order. The activity log contains detailed information on reports run and errors encountered during QMF Report Center operations.

Refresh
Select **View--> Refresh** to obtain an updated view of the directory tree, which will reflect any recent changes made to objects on the server. If the **Prompt me with this filter every time** check box is checked on the Filter Options dialog box, the Filter Options dialog box opens each time you click **Refresh**.

Tools menu

Set user information
Select a server, then select **Tools--> Set user information** to log in as another user, or specify account information.

The Set User Information dialog box opens.

1. Type the user ID in the **User ID** field.
2. Type the password in the **Password** field.
3. *Optional:* Check the **Remember this password** check box to retain the password.
4. *Optional:* Type an account number in the **Account** field to type an accounting information string that the database server uses to track system usage. The use of accounting string information is determined by your database administrator.
5. Optional: Check the **Use this information for ever server I connect to** check box to use the user information entered on the Set User Information window for connecting to all database servers.

   If this check box is checked, QMF for Windows will use the same user ID and password for all connections unless you open the Set User Information dialog box and uncheck the check box.

Run QMF for Windows
Select **Tools--> Run QMF for Windows** to open QMF for Windows while QMF Report Center remains active.

Note: You must have permission to use QMF for Windows in your resource limits.

Export favorites
Select your Favorites folder, then select **Tools--> Export Favorites** to export a report in your Favorites folders to a .qrs file.

The Export Favorites dialog box opens. A message prompts you to export subreports contained in subfolders. Check the **When importing overwrite existing favorites** check box on the Export Favorites dialog box to overwrite objects of the same name. Click **Yes**.

The Export dialog box opens. Specify where to export the Favorites folder.

Import favorites

Select **Tools--> Import Favorites** to import a .qrf file (Favorites file) to your Favorites folders. The Import dialog box opens. Specify the location of the import file.

Options

Select **Tools--> Options** to set optional parameters for QMF Report Center. The Global Options window opens.

ACTIVITY LOG

Select **Tools--> Options** then click the **Activity Log** tab to open the Activity Log page.

Table 64. Global Options - Activity Log

Field	Description
Enable activity tracking	Check this check box to record all QMF Report Center activity and error messages in the log file, QMF_RCLOG.txt.
Location of activity log	Specify the full path and directory for the activity log file. *Optional:* Click **Select** to browse for the location.
Delete log	Click **Delete log** to delete the activity log. A new log is created the next time you perform a task in QMF Report Center.
View log	Click **View log** to display the activity log file in your default text viewer. **Note:** Do not edit this file.

CREATING FAVORITES

Select **Tools--> Options** then click the **Creating Favorites** tab to open the Creating Favorites page.

Table 65. Global Options - Creating Favorites

Field	Description
Prompt only if a conflict occurs	Check this check box to hide informational messages when the report runs unless a conflict requires action
Suppress all error messages	Check this check box to hide error messages when the report runs
View report after publishing	Check this check box to open the finished report
Overwrite file if it already exists	Check this check box to replace an report in your Favorites folder
Select output application	Select the application from the drop-down list with which to view or modify reports. Click **Options** to provide more information about the output application. The **Options** command button is available if you selected Microsoft Excel, Lotus 1-2-3, Microsoft Access or a printer as the output application. See "Options" on page 195 for more information about output application options.
Publish to a temporary file, in the following directory	Select this radio button to save the report to a temporary file in the selected directory.
Use the temporary directory of the machine running this report	Check this check box to save the report to the temporary directory of the machine from which the report is being run.
Start file name with	Type the prefix used with the filename, if applicable.
End file name with	Select a date format that will be used as a suffix to the filename. Select "Random" for QMF Report Center to generate a unique filename so that previous reports are not overwritten.
Publish to	Select this radio button to specify the filename to use for the report *Optional:* Click **Select** to browse for the filename. A dialog box opens where you can specify a filename based on the application you selected in the **Select output application** field.

Table 65. Global Options - Creating Favorites (continued)

Field	Description
Select the type of formatting for your report	Specify how to return data to the report: • **No formatting (data only)** Select this radio button to return raw, unformatted data to the file – **Include column headers** Check this check box to add labels to report columns • **Default formatting** Select this radio button to return data in the default QMF format, which includes column headers and a horizontal line to separate headers and data

CREATING FOLDERS

Select **Tools--> Options** then click the **Creating Folders** tab to open the Creating Folders page.

Table 66. Global Options - Creating Folders

Field	Description
Prompt only if a conflict occurs	Check this check box to hide informational messages unless a conflict requires action
Suppress all error messages	Check this check box to hide error messages for objects in the new folder
Prompt for variable values prior to running reports	Check this check box to prompt for variable input for each underlying report in a folder
Do not display any of the reports being run	Check this check box to produce the report without opening it. Instead, you can view the report by selecting **View--> Report history**.
Continue running subsequent reports if an error occurs	Check this check box to continue running other reports in this folder even if errors occur

MISCELLANEOUS

Select **Tools--> Options** then click the **Miscellaneous** tab to open the Miscellaneous page.

Table 67. Global Options - Miscellaneous

Field	Description
Display 'Save As' dialog	Check this check box to open the 'Save As' dialog box every time you make changes to QMF objects residing on a server.
Display 'Security for Scheduled Job' dialog	Check this check box to be prompted with a reminder to set user and password information when you schedule a new job.
Display 'Internet Mail Wizard' introductory page	Check this check box to open the first page of the Internet Mail Wizard when you select **Report Properties--> Miscellaneous**, then click **Properties**.
Display 'About to send email' message for folders	Check this check box to be prompted with a message each time you run a folder for which you selected the **Attach all underlying report output to email message** option on the Miscellaneous dialog box. The message indicates the number of reports contained in the folder and gives you the option of canceling the email messages.
Display 'Report formatting variable' prompt	Select this option to be prompted to enter variable values for reports using Microsoft Excel or Lotus 1-2-3 as the output application so column headers can be retrieved.
Display 'Unique columns needed for grouping' warning	Select this option to be prompted with a message that you can only select unique columns when setting grouping options in the **Data Grouping and Charting** options for Microsoft Excel or Lotus 1-2-3.

Help menu

Contents

Select **Help--> Contents** to display the table of contents for the online help system.

About

Select **Help--> About** to display QMF Report Center copyright information.

Associating forms with objects

Forms contain formatting for QMF query results. Forms need to be associated with a query or table.

Procedure

Option 1

Drag a form from the server on top of a query or table in your Favorites folders. The form is associated with the object automatically.

Option 2

1. Select an object in your Favorites folders.
2. Right-click and select **Properties**.
3. Click the **Formatting** tab to open the Formatting page.
4. Select the **QMF formatting from form** radio button to open the Form Filter dialog box.
5. Type information in the Object owner and Object name fields to locate the form. You can use wildcards.

   The Select a Form dialog box opens.
6. Select a form.
7. Click **OK**.
8. Click **Run** to run the report.
9. Click **OK**.

   The Save as dialog box opens.
10. Specify save options.

Copying reports, objects, and folders

You can copy reports, objects, and folders from a server or within your Favorites folders.

Copy from a server

There are several ways to copy an item from a server:

- Drag the item from its current location to another location
- Select the item, right-click, then select **Copy**
- Select the item, then select **Edit--> Copy**

Paste to server

Right-click on the location to paste the item, then select **Edit--> Paste**.

A confirmation dialog box opens, and the item is added to the bottom of the selected folder.

Copy within your Favorites folders

Use the copy and paste method described in the “Copy from a server” section to copy reports within your Favorites folders.

Note: Reports are moved, not copied, if you drag reports within your Favorites folders.

Moving reports, objects, and folders

You can move reports, objects, and folders on a server and within your Favorites folders.

Procedure

Option 1

1. Select the item.
2. Right-click.
3. Select **Edit--> Cut**.
4. Right-click on the location where the object is being copied.
5. Select **Paste**.

Option 2

1. Select the item.
2. Select **Edit--> Cut**.
3. Right-click on the location where the object is being copied.
4. Select **Edit--> Paste**.

Note: When you drag an item, you make a copy of the item, except when you work in your Favorites folders.

Deleting reports, objects, and folders

Reports and folders deleted from your Favorites folders are sent to the Recycle Bin. Objects and reports deleted from the server are deleted permanently.

Note: You may not have permission to delete items from the server.

Procedure

Select one of these options to delete reports, objects, or folders:

- Select the item, right-click, then select **Delete**
- Select the item, the select **Edit--> Delete**

Note: The task scheduler must be running to delete a report with scheduled jobs and then remove it from the Recycle Bin.

Copying tables on a server

You can copy tables between locations on a server, and you can copy tables between servers. When you copy a table, you only copy the data, not the table itself.

Procedure

Select one of these options to copy tables on a server:

- Drag the table (the folder or the individual tables) to the Tables object section of another server
- Select the table, right click, and select **Copy**
- Select the table and select **Edit--> Copy**

The Save Data dialog box opens.

Refreshing objects

Refresh objects periodically because objects on a server can change while you are using them.

Procedure

Select an object on a server, then select **View--> Refresh**. The Object Filter dialog box opens. Click **OK**.

Note: All options are inactive when you refresh an *object* because you are refreshing the view for the object and all objects below the current level. Alternatively, all options are active when you refresh a *server*.

Tips and time-savers

To run reports simultaneously

Group all reports that can be run simultaneously into a folder. Instead of running each report individually select the folder, then select **Report--> Run**. All reports in the folder are run consecutively.

To run reports as a separate process

Check the **Run as a separate process** check box on the **Report Properties--> Miscellaneous** page to run reports in the background while you continue to work.

To limit rows returned

You can limit the number of rows of data that are returned to your report to reduce processing time.

1. Select **Report--> Properties**.
2. Click the **Miscellaneous** tab.

3. Type a number in the **Limit the number of rows returned** field.

Chapter 16. APIs

This chapter describes how an application can access the queries stored in the QMF query repository and manipulate them. QMF for Windows has a set of application programming interfaces (APIs) that enable the application to execute these functions.

What is an API?

An API contains pre-defined functionality that the application can use to execute a function without any knowledge on how the function is performed. An API has well-defined inputs and outputs but the process is transparent. An API is useful when dealing with device drivers for hardware or software packages.

Most programming languages designed for Windows can access the APIs. The method by which this is done varies between programming languages, but all languages have a way of calling the APIs. Once the APIs are included in the programming language environment, using them is like a regular function in the program.

Any programming language that accesses the Windows API can access the QMF for Windows API, including IBM Visual Age for Java.

You do not need extra middleware to develop an application using an API, beyond the middleware required for the end-user. This means that there are no special prerequisites for developers. The basic middleware is the middleware necessary for the network environment, the installation of QMF for Windows on the computer, and the programming language used. The same thing happens with the final application that you distribute to your users. The only middleware necessary for the application to run is the middleware for the network and QMF installed within the environment.

Blocking calls

QMF for Windows API functions are synchronous. When an API is called in an application, it blocks, or does not return, until the requested action completes. The code just below the line calling the API will not be executed until the API completes its function. This implementation is simplifies programming in the client application. However, if the application is single-threaded, it will not be able to respond to user input or perform screen refreshes while it is waiting for a QMF for Windows API function to return.

The QMF for Windows API responds to one function call at a time from a client. If the client application is multi-threaded, you must:

- wait for one function call to complete before making another, or
- create multiple instances of the QMF for Windows API (one instance for each thread using the API)

If it is necessary for the application to be synchronous, the programmer has to create a new thread within the application and call the API from the new thread. The new thread will then be blocked, but all other threads will continue to execute normally. The programmer has to manage the timing and execution of the threads.

When developing multi-threaded applications, note that the QMF for Windows API responds to one function call to complete before making another, or create multiple instances of the QMF for Windows API (one for each thread using the API).

Unit of work

Each instance of the QMF for Windows API object represents a single ″unit of work,″ and can connect to a single database server. To connect to multiple database servers simultaneously, you need to create multiple instances of the QMF for Windows API object, one instance for each database server. To connect to multiple database servers serially (one after the other) using the same QMF for Windows API object, call Commit() or Rollback() and then InitializeServer(). Calling these functions ends the current unit of work, and subsequent calls start a new unit of work.

Governing

One of the key features of QMF for Windows is its ability to govern, or oversee, your use of database resources based on the resource limits established by your system administrator. The QMF for Windows API enforces all resource limits except warning level limits. When you reach a cancel limit, QMF for Windows generates an error indicating that the current action has been disallowed by your system administrator.

Database connections

Each instance of the QMF for Windows API object creates and uses a single connection to the database for all database activity that is subject to a subsequent rollback or commit, including opening a query, fetching data, and executing SQL statements.

If you create more than one query in a given instance of the QMF for Windows API object by calling InitializeQuery() two or more times, the queries will share the same single connection. QMF for Windows creates and uses a second connection to the database to handle administrative database activity (such as retrieving QMF information) when you call:

- n DeleteQMFObject()
- n GetQMFObjectInfo()
- n GetQMFObjectInfoEx()
- n GetQMFObjectList()
- n GetQMFObjectListEx()
- n GetQMFQueryText()
- n SaveQMFQuery()

This second connection is necessary to support a consistent rollback and commit mechanism for client applications.

The QMF for Windows API object handles these connections automatically to the database; however, if your system administrator has established a limit for the number of connections allowed, note that each instance of the QMF for Windows API object may use two connections.

Controlling QMF for Windows with APIs

The following steps describe how to work with the API to control QMF for Windows:

1. Create an instance of the QMF for Windows API object.

   If you are using Microsoft Visual Basic, add a reference to the QMF for Windows type library, `qmfwin.tlb`. Then use the Dim statement:

   ```
   Dim QMFWin As New QMFWin
   ```

   Or, use the CreateObject statement:

   ```
   Dim QMFWin As Object
   Set QMFWin = CreateObject("QMFWin.Interface")
   ```

   If you are using Microsoft Visual C++ and MFC, create a wrapper class for the QMF for Windows API object from the QMF for Windows type library `qmfwin.tle`. Then use the CreateDispatch(() function:

   ```
   COleException e;
   IQMFWin QMFWin;
   QMFWin.CreateDispatch("QMFWin.Interface", &e);
   ```

   Note: If you are using a different development environment, refer to your product documentation on how to complete this step.

2. Select the DB2 server you want to use and call InitializeServer() to initialize a connection to the database.

   Note: You cannot initialize a server until a user ID and password are validated by DB2. You can have QMF for Windows prompt for the

user and password, or you can prompt for user information in your application and pass them as parameters in the InitializeServer() function call.

3. Select the query you want to run using InitializeQuery(). If the query contains variables, use the SetVariables() function to set the variable values.
4. Open or execute the query. Use the Open() function to open the query's cursor for `SELECT` statements. Use the Execute() function to execute the SQL for non-SELECT statements.
5. If the query is a `SELECT` statement, fetch rows of data by repeatedly calling FetchNextRow(). To fetch more than one row at a time, use FetchNextRows(), or use CompleteQuery() to direct QMF for Windows to fetch all of the rows.
6. If the query is a `SELECT` statement, close the query using the Close() function.
7. Terminate the unit-of-work using the Commit() or Rollback() functions.

QMF for Windows APIs

API example

AddDecimalHostVariable()

```
short AddDecimalHostVariable(long QueryID, short Type, short Precision,
 short Scale, const VARIANT& Value)
```

Description

This function applies the data in *Value* to a variable in the static SQL statement initialized with *QueryID*. You call this function for each variable in the statement. QMF for Windows does not match values to variables, so you need to call this function in the same order as the variables in the SQL statement.

Parameters

Table 68. AddDecimalHostVariable() Parameters

Name	Description
QueryID	The ID of the query as returned from InitializeStaticQuery().
Type	The SQL data type of the value to be passed to the database server. This value influences the conversion of Value from a `VARIANT` data type to the value actually passed. The only valid value for AddDecimalHostVariable() is 484 (RSDT_DECIMAL).
Precision	The precision of the decimal value.

Table 68. AddDecimalHostVariable() Parameters (continued)

Name	Description
Scale	The scale of the decimal value.
Value	The data value to substitute in the statement. To specify a null value, set the type of the variant to VT_EMPTY.

Return Value

Zero if successful, nonzero if unsuccessful. If the return value is nonzero, you can call GetLastErrorString() or GetLastErrorType() for additional error information.

Additional information

For additional information about the APIs for QMF for Windows, see the online help for QMF for Windows. The online help discusses APIs in detail, and lists the APIs by name, description, parameters, and return values.

Chapter 17. Global variables

Global and substitution variables

Global variables stay active while the QMF instance (session) is active, or stay active permanently by updating the Windows registry. Substitution variables, however, stay active only during execution of the object.

Global variables are associated with QMF for Windows and the operating system's registry (if you update the registry to make global variables permanent). Substitution variables are associated with QMF objects.

Because global variables are active while QMF for Windows is active, the variables will have the same value until the instance of QMF for Windows is finished. The global variable can be accessed by all QMF objects. Different instances of QMF cannot see the global variables for another instance.

There are two types of global variables:

- user-defined global variables
- pre-loaded (system) global variables

A global variable can be used in a query, form, or procedure. You can update global variables by selecting **View--> Global Variables**.

The global variables provided by QMF for Windows are stored in the Windows registry. The system administrator can view and edit the system global variables before installation. Global variables can be exported to all users by copying the variables from one system to another after installation to keep the variables in sync. The global variables are located in the following path in the Registry:

```
HKEY_CURRENT_USER\SOFTWARE\IBM\RDBI\GlobalVariables
```

Global variables in procedures

1. Create or open a procedure.
2. Type global information in the procedure, such as:

   ```
   SET GLOBAL(MY_GLOBAL=20
   ```

3. *Optional:* Add multiple variables, such as a string of variables:

   ```
   SET GLOBAL(MY_GLOBAL=20,START_DATE=&DATE,DEPARTMENT=&DEPT
   ```

   This example lists each variable and uses the `SET GLOBAL` command only for the first time:

```
SET GLOBAL(MY_GLOBAL=20,
START_DATE=&DATE,
  +DEPARTMENT=&DEPT
```

4. Type the following command as the last line in the procedure:

```
RESET GLOBAL ALL
```

   Note: This command resets the user variables.

Updating the registry

You can create global variables for the current work session. These are known as user-defined variables. These variables are lost when you close QMF for Windows because the variables are session variables.

Follow these steps to retain user-defined global variables:

1. Open the Windows Registry.
2. Go to the following location in the registry:

   ```
   HKEY_CURRENT_USER\SOFTWARE\IBM\RDBI\Options
   ```

3. **Select Edit--> New--> DWORD Value.**
4. Label the DWORD, **SaveGlobals**.
5. Type a **1** for the `SaveGlobals` global variable.

   The user-defined variables will be retained between sessions.

After you update the registry, the global variables that you create will be stored in the Windows Registry and will be kept from one instance to another.

You can add your own global variables manually or during a procedure.

Note: You cannot add a global variable with a **DSQ** prefix because these global variables are pre-loaded with QMF for Windows.

Also, you cannot change the value of a global variable with a **DSQAO** prefix.

User-defined global variables

The user-defined global variables are global variables used for executing queries, procedures or forms. In a query or procedure, no dialog box opens for you to enter a value if you created a user-defined global variable. Instead, the value specified for the global variable will be used.

Adding variables manually

Follow these steps to create global variables manually:

1. Select **View--> Global Variables**.

2. Click **Add**.

   The Add Global Variable dialog box opens.

3. Type the global variable name and its value.

   Global variable names must be between 1-17 characters. Global variable values must be between 1-55 characters.

   Note: You cannot prefix the name of a new global variable with **DSQ** because this is the prefix for system global variables.

4. Click **Add**.

Adding global variables in procedures

Follow these steps to add a global variable in a procedure:

1. Create or open a procedure.
2. Add global information to the procedure such as:

   ```
   SET GLOBAL(MY_GLOBAL=20
   ```

3. *Optional:* Add multiple variables, such as:
   - With a string of variables:

     ```
     SET GLOBAL(MY_GLOBAL=2,START_DATE=&DATE,DEPARTMENT=&DEPT
     ```

   - With a list of each variable that uses the SET GLOBAL command only for the first line:

     ```
     SET GLOBAL(MY_GLOBAL=2,
        +START_DATE=&DATE,
        +DEPARTMENT=&DEPT
     ```

4. Type the following command as the last line in the procedure:

   ```
   RESET GLOBAL ALL
   ```

Editing a global variable

Click **Edit** to change the name or value of a user-defined global variable.

Deleting a global variable

Click **Delete** to remove a user-defined global variable.

System global variables

QMF for Windows has a set of global variables that is pre-loaded with the product. Select **View--> Global Variable** to view the system global variables.

Note: Tooltips are available for each global variable defined for QMF for Windows.

Restrictions

Because system global variables are hard-coded into a procedure, you cannot change or delete status information for the system global variable. Under

some circumstances, however, you can change the *value* of the system global variable. You cannot change the name of a system global variable.

The global variables defined for *host* QMF are recognized by *QMF for Windows*, but may not apply to QMF for Windows. Any references to queries, forms or procedures to QMF host global variables that are not supported by QMF for Windows are ignored. Only the variables listed below are used and are accessible by QMF for Windows. If QMF for Windows does not recognize a global variable it will be used as a substitution variable at run time.

Global variables prefixed with **DSQQW** are QMF for Windows global variables. All other global variables prefixed with **DSQ** are supported by QMF for Windows and host QMF.

Viewing variable values

Follow these steps to view the values for a global variable:

1. Select **View--> Global Variables**.
2. Click on a global variable.

   Note: You cannot view the value for system-level global variables that are prefixed with **DSQAO**.

   The following message is issued if you try to change a system-level global variable:

   ```
   You cannot set the value of [       ].
   ```
3. Click **OK**.

   The Change Global Variable Value dialog box opens.
4. Select a variable from the drop-down list.
5. Click **OK**.

For example, select one of the following global variable values for the DSQEC_FORM_LANG global variable:

```
0 - Use NLF language when saving forms
1 - Use English language when saving forms
```

Naming convention

The naming convention for global variables is:

```
DSQcc_xxxxxxxxx
```

where DSQcc can be one of the following category identifiers:

Table 69. Global Variable Naming Convention

Identifier	Description
DSQAO	State information (controls administrative objects)

Table 69. Global Variable Naming Convention (continued)

Identifier	Description
DSQCP	Table Editor information
DSQDC	Display information for QMF for Windows
DSQEC	Command and procedure execution information
DSQQW	Environment information specific to QMF for Windows

State information variables

Global variable names prefixed with **DSQAO** provide state information about QMF for Windows.

Note: None of these variables can be modified by the `SET GLOBAL` command.

Table 70. State Information Global Variables

Global variable	Length	Description
DSQAO_BATCH	1	Batch or interactive mode. The value can be 1 (interactive session) or 2 (batch session). See `/Batch` command parameter.
DSQAO_CONNECT_ID		The ID used to connect to the current database.
DSQAO_CURSOR_OPEN	1	Status of current query's database cursor. Value can be: • 1 = cursor is open • 2 = cursor is closed
DSQAO_DBCS	1	DBCS support status. Value can be: • 1 = DBCS support • 2 = DBCS support is not present
DSQAO_NLF_LANG	1	National language ID.
DSQAO_NUM_FETCHED	10	Rows fetched by current query object.
DSQAO_OBJ_NAME	18	Name of current QMF object (query, form or procedure). **Note:** This value is blank if there is no current object.
DSQAO_OBJ_OWNER	8	Owner of current QMF object (query, form or procedure). **Note:** This value is blank if there is no current object.
DSQAO_QMF_RELEASE	2	Application release number.

Table 70. State Information Global Variables (continued)

Global variable	Length	Description
DSQAO_QMF_VER_RLS	10	Application version and release number, such as **QMF V8R1**.
DSQAO_QRY_SUBTYPE	1	Subtype of current query. Value can be: • 1 = SQL query • 3 = prompted query
DSQAO_QUERY_MODEL	1	Model of current query. Value can be 1 (relational).
DSQAO_SYSTEM_ID	1	Operating system (OS). Values can be: • 6 = Windows 3.x • 7 = Windows 95 or Windows 98 • 8 = Windows 2000 and Windows NT

Table Editor variables

Global variable names prefixed with **DSQCP** control the operation of the Table Editor. You can also modify these variables with the `SET GLOBAL` command.

Table 71. Table Editor Global Variables

Global variable	Length	Description
DSQCP_TEDFLT	1	Default character for a column in QMF Table Editor. The default value is '+'. You can also set this value at the Options dialog box.
DSQCP_TENULL	1	Default character for a NULL character for a column in QMF Table Editor. The default value is '-'. You can also set this value at the Options dialog box.

Display information variables

Global variable names prefixed by **DSQDC** control how QMF for Windows displays information. You can also modify these variables with the `SET GLOBAL` command.

Table 72. Display Information Global Variables

Global variable	Length	Description
DSQDC_CURRENCY	18	Custom currency symbol for DC edit code.

Table 72. Display Information Global Variables (continued)

Global variable	Length	Description
DSQDC_DISPLAY_RPT	1	Display a report after `RUN QUERY`. The value can be: • 0 = the default, do not display a report • 1 = automatically display the report with the form
DSQDC_LIST_ORDER	2	Default sort order for objects in List window. The value for the first character can be: • 1 = default order. • 2 = sort by object owner • 3 = sort by object name • 4 = sort by object type The value for the second character can be: • A = sort in ascending order. This is the default. • D = sort in descending order **Note:** The default value is 1A.

Command and procedure variables

Global variable names prefixed with **DSQEC** control how QMF for Windows executes commands and procedures. You can also modify these variables with the `SET GLOBAL` command.

Table 73. Command and Procedures Global Variables

Global variable	Length	Description
DSQEC_FORM_LANG	1	Default NLF language for saving or exporting a form. Value can be: • 0 = presiding NLF language • 1 = English. This is the default.
DSQEC_NLFCMD_LANG	1	Expected NLF language for commands in procedures. Value can be: • 0 = presiding NLF language. This is the default. • 1 = English

Table 73. Command and Procedures Global Variables (continued)

Global variable	Length	Description
DSQEC_RESET_RPT	1	Prompt when handling an incomplete data object. Value can be: • 0 = complete the data object without prompting • 1 = prompt the user to complete the data object • 2 = reset the data object without prompting
DSQEC_SHARE	1	Default value for sharing saved objects. Value can be: • 0 = do not share the object • 1 = share the object

Windows environment variables

Global variable names prefixed with **DSQQW** are specific to the QMF for Windows connections. You can also modify these variables with the `SET GLOBAL` command.

Table 74. Windows Environment Global Variables

Global variable	Length	Description
DSQQW_AUTOMATION	1	Indicates whether the current instance of QMF for Windows was started to service OLE automation requests (value is 1) or to service the user interface (value is 0).

Table 74. Windows Environment Global Variables (continued)

Global variable	Length	Description
DSQQW_CONNECTIONS	1	Use server connections while running a procedure. This setting controls the number of server connections for procedures. • 0 = minimize the number of connections. This is the default. Specifying a value of 0 can force QMF for Windows to reset or complete a data object before continuing the execution of a procedure. If set to 0, you specify a linear connection, which means that the first query must complete before the next is run. These queries are run in a series. • 1 = all: a new connection for each `RUN QUERY` command If set to 1, subsequent connections are opened so the queries are run in parallel (at the same time). **Note:** This global variable is designed to be used with DSQQW_FST_SV_DATA (by which the query will be PREPARED only on `RUN QUERY`.
DSQQW_DQ	″	Double-quote character
DSQQW_EXP_DT_FRMT	1	Format for EXPORT DATA. Value can be: • 0 = text. This is the default. • 2 = html • 3 = csv (comma-separated value) • 4 = ixf For the EXPORT command, you can export the report to a file name with a file type of .qmf, .html or .txt. **Note:** In a procedure (with a .txt file type), if no options are specified as delimiters, the default is spaces.

Table 74. Windows Environment Global Variables (continued)

Global variable	Length	Description
DSQQW_EXP_OUT_MDE	1	IXF mode for procedures. Value can be: • 0 = System/370 character mode IXF. This is the default. • 1 = PC/IXF
DSQQW_FST_SV_DATA	1	Use 'Fast Save' mode for `SAVE DATA`. Value can be: • 0 = do not use fast mode. This is the default. • 1 = use fast mode
DSQQW_HTML_REFTXT	55	Text for `&REF` form variable. The default is 'Back To'.

DSQQW_PROC_OUTPUT		Report Center will pass the path name and file name to a procedure that uses `&DSQQW_PROC_OUTPUT`.
		`EXPORT REPORT TO &DSQQW_PROC_OUTPUT`
		Alternatively:
		`EXPORT DATA TO &DSQQW_PROC_OUTPUT`

DSQQW_QUERY_LANG	1	Subtype of query created by `DISPLAY QUERY` when no query object exists. Value can be: • 0 = SQL. This is the default. • 1 = prompted
DSQQW_QUERY_PREP		Prepare the query on a `RUN` command instead of running. This option invokes the `PREPARE SQL` command. DB2 will check the query syntax and the existence of every object associated with the query. Internal calculations will be performed, but no data will be sent to the client. This option can be used to validate queries with complicated calculations or ones that will return significant data. Value can be: • 0 = No • 1 = Yes

Table 74. Windows Environment Global Variables (continued)

Global variable	Length	Description
DSQQW_RPT_COPIES	10	Number of copies for PRINT REPORT. The default is 1. **Note:** If DSQQW_RPT_USE_PS is set to 1, the Page Setup options are used. If it is set to 2, the global variable settings are used.
DSQQW_RPT_FONT	55	Font for PRINT REPORT. The default is 'Courier New'. **Note:** If DSQQW_RPT_USE_PS is set to 1, the Page Setup options are used. If it is set to 2, the global variable settings are used.
DSQQW_RPT_FONT_BD	1	Bold attribute for PRINT REPORT. The default is 0. **Note:** If DSQQW_RPT_USE_PS is set to 1, the Page Setup options are used; if it is set to 2, the global variable settings are used.
DSQQW_RPT_FONT_IT	1	Italic attribute for PRINT REPORT. The default is 0. **Note:** If DSQQW_RPT_USE_PS is set to 1, the Page Setup options are used; if it is set to 2, the global variable settings are used.
DSQQW_RPT_FONT_SZ	2	Font size for PRINT REPORT. The default is 10. **Note:** If DSQQW_RPT_USE_PS is set to 1, the Page Setup options are used; if it is set to 2, the global variable settings are used.
DSQQW_RPT_LEN_TYP	1	Type of page length for PRINT REPORT. The value can be: • 0 = fit the length of the printed page. This is the default. • 1 = specify an explicit number of lines • 2 = specify a continuous report with no page breaks **Note:** If DSQQW_RPT_USE_PS is set to 1, the Page Setup options are used; if it is set to 2, the global variable settings are used.

Table 74. Windows Environment Global Variables (continued)

Global variable	Length	Description
DSQQW_RPT_NUM_CHR	10	Number of characters across a printed page for `PRINT REPORT`. This has an effect only when DSQQW_RPT_WID_TYP is 1. The default value is 80. **Note:** If `DSQQW_RPT_USE_PS` is set to 1, the Page Setup options are used; if it is set to 2, the global variable settings are used.
DSQQW_RPT_NUM_LNS	10	Number of lines down a page for `PRINT REPORT`. This has an effect only when DSQQW_RPT_LEN_TYP is 1. The default value is 60. **Note:** If `DSQQW_RPT_USE_PS` is set to 1, the Page Setup options are used; if it is set to 2, the global variable settings are used.
DSQQW_RPT_ORIENT	1	Page orientation for `PRINT REPORT`. The value can be: • 0 = portrait. This is the default. • 1 = landscape **Note:** If `DSQQW_RPT_USE_PS` is set to 1, the Page Setup options are used; if it is set to 2, the global variable settings are used.
DSQQW_RPT_USE_PS	1	Set of page formatting options (page length, page length) for `PRINT REPORT`. The value can be: • 0 = use the values specified on the `PRINT REPORT` command or in global variables • 1 = use the values specified in the form document's page setup. This is the default. **Note:** If this value is set to 1, the Page Setup options are used; if it is set to 2, the global variable settings are used.

Table 74. Windows Environment Global Variables (continued)

Global variable	Length	Description
DSQQW_RPT_WID_TYP	1	Type of page width for `PRINT REPORT`. The value can be: • 0 = fit the width in the printed page. This is the default. • 1 = specify an explicit number of characters. **Note:** If this value is set to 1, the Page Setup options are used; if it is set to 2, the global variable settings are used.
DSQQW_SHOW_QUERY	1	View of a query for `SHOW QUERY`. The value can be: • 0 = SQL or prompted view. This is the default. • 1 = results view
DSQQW_STRIP_SPACE	1	Remove trailing spaces from objects retrieved from server. The value can be: • 0 = retain trailing spaces • 1 = remove trailing spaces. This is the default.
DSQQW_SV_DATA_C_S	10	Rows to insert before commit for `SAVE DATA`. Value can be: • 0 = all rows. This is the default. • *n* = where *n* equals an explicit number of rows
DSQQW_UEDIT_DLL	55	DLL implementing user edit routines. The default value is `rsuedit.dll`
DSQQW_PROC_WNDWS		Procedure results options. The values are: • 0 = leave the most recent objects open at the end of the procedure For example, leave the most recent query and form open at the end of the procedure, but not the most recent procedure. • 1 = leave all objects open at the end of the procedure

Chapter 18. Command line

Use the command line to type a command and select the server at which to execute the command.

Activate the command line

1. Select **View--> Command bar**.

   The command line is available at the top of all windows.
2. *Optional:* Type a command in the **Run command** field.
3. *Optional:* Select a recent command from the **Run command** drop-down list box.
4. Select the server at which to run the command at the **At server** field.

   The **At server** drop-down list lists the servers defined in your server definition file (SDF).

Running commands automatically

Settings and actions can be defined to take effect when QMF for Windows is started. These parameters are defined on the QMF for Windows command line. They can be used to preset settings or to run unattended sessions.

For help on adding command line parameters to an icon or start menu, refer to your operating system's help facility.

Command line parameters

The command line parameters are listed and described below.

Table 75. Command Line Parameters

Parameter	Description
ObjectName	The QMF for Windows file (query, procedure, job, or form) that opens when you start QMF for Windows.
/IProcName:procedurename	The name of the procedure, which is stored at a database server, to run after QMF for Windows starts. Specify the */IServer* parameter if the server is different from the server at which the procedure was created.
/IProcFile:procedurefile	The location and name of a locally-stored procedure file to run after starting QMF for Windows.

Table 75. Command Line Parameters (continued)

Parameter	Description
/IServer:servername	The server where the startup procedure is stored, as specified on the */IProcName* parameter.
/IObject:"ObjectOwner"."ObjectName"	The name of an object stored at a database server that will be retrieved after starting QMF for Windows. You also need to specify the */IServer* parameter.
/Run	Start an opened or retrieved object. This parameter is used in conjunction with the */IUserID* and */IPassword* parameters. **Note:** This parameter ignores forms and jobs.
/IDisplay	An opened or retrieved object. If the */IRun* or */IDisplay* parameters are not specified, then the */IDisplay* parameter will be used.
/IUserID:userID	The user ID to use when running an object specified with any of the following parameters: • */IProcName* • */IProcFile* • *ObjectName* • */IObject* The */IUserID:userID* parameter is used in conjunction with the */IPassword* parameter.
/IPassword:password	The user's password specified with the */IUserID* parameter. **Note:** The */IPassword* parameter includes the user's password in plain text.
/Batch	End the current session and close the application after running the object specified on the command line. **Note:** This parameter suppresses all warnings and error messages.
&variablename-variablevalue	Define or update global variable values for a procedure or query. Multiple variables can be defined. **Note:** The value sent to the procedure must be enclosed in double quotes (" ").
/ICatalogUserID	The user ID to use when connecting to an ODBC data source. It is used in conjunction with the */ICatalogPassword* parameter.

Table 75. Command Line Parameters (continued)

Parameter	Description
/ICatalogPassword	The user's password, as specified with the */ICatalogUserID* parameter. This parameter is used when accessing ODBC data sources.
ICatalogUserID	The the user ID for the catalog server associated with the */IServer* parameter. The *ICatalogUserID* parameter is used in conjunction with the */ICatalogPassword* parameter.
ICatalogPassword	The user password associated with the */ICatalogUserID* parameter. **Note:** The */ICatalogPassword* parameter includes the user's password in plain text.

Sample task

Follow these steps to use the command line:

1. Create a procedure.

   For example,

   ```
   run query ObjectTracking (form=ObjectTrackingForm
   export report to c:\qmftrack.rep
   windows notepad c:\qmftrack.rep
   ```

   This example executes a query called ObjectTracking using the form called `ObjectTrackingForm` for report generation. The procedure exports the report to a file called `qmftrack.rep` at the local system in the c:\directory. Then, in the `Windows Notepad c:\qmftrack.rep` line of the procedure, the saved report file is opened using Notepad.
2. Save the procedure at the server or as a local file.

   For example,

   ```
   c:\procedure1.prc
   ```
3. Run the procedure.
4. Type the following command in the **Run command** field if the procedure was *saved at the server*:

   ```
   "C:\Program Files\IBM\QMF for Windows\qmfwin.exe" /IServer:DB2AIX
    /IProcname:DB2INST1.Procedure1 /IUserID:db2inst1
    /IPassword:db2inst1
   ```
5. Type the following command in the **Run command** field if the procedure was *saved locally*:

   ```
   "C:\Program Files\IBM\QMF for Windows\qmfwin.exe" /IServer:DB2AIX
    /IProcfile:"c:\Procedure1.prc" /IUserID:db2inst1
    /IPassword:db2inst1
   ```

Command line indirection

Instead of typing all parameters directly on the command line, you can place some or all of the parameters in a file, then reference the file on the command line, preceded by an ampersand (@).

For example, if the file C:\Temp\options text contains:

```
/CollectionID:QMF81
/BIND
```

specify this command line:

```
rsadmin.exe sdf.ini /Server:"Server 1" @C:\Temp\options.tex
```

this is equivalent to specifying this command line:

```
rsadmin.exe sdf.ini /Server:"Server 1" /CollectionID:QMF81 /Bind
```

For example, the following command line creates a server named, ″Test Server″ in the server definition file sdf.ini, with RDB name ″TEST″, using a TCP/IP connection to host name ″db2test.ibm.com″ and port number 446. All other parameters have default values:

```
rsadmin.exe sdf.ini /Server:"Test Server" /CollectionID:QMF81 /Bind
```

This command line defines a new server named ″Test Server″ in the server definition file named ″sdf.ini″, using a TCP/IP connection to IP address ″127.0.0.1″ and port number 446. It also sets ″QMF81″ as the collection ID for the server, creates any of the QMF for Windows database objects that do not exist (using default statements), binds the QMF for Windows packages, and grants EXECUTE authority on those packages to PUBLIC:

```
rsadmihn.exe sdf.ini /Server:"Test Server" /RDBName:TEST /HostName:127.0.0.1
/PortNumber:446 /CollectionID:QMF81 /CreateObjects /Bind /Grant:PUBLIC
```

Chapter 19. Expression Builder

About the Expression Builder

Use the Expression Builder to build SQL expressions for SQL and prompted queries.

The Expression Builder contains a palette of common elements used for creating SQL expressions. Examples of these elements include column names, constants, functions, and operators. When you click a button on the Expression Builder palette, a template for the expression element is inserted into the SQL query window or prompted query window. The end-result is a framework on which you can build the SQL or prompted query.

When you are through building the expression, click outside of the Expression Builder window or press **Esc** to close the window.

Opening the Expression Builder

To invoke the Expression Builder from an SQL query:

- select **Query--> Expression Builder**
- click the Expression Builder icon on the toolbar
- press **Alt** + **.**

For a prompted query, click the icon to open the Expression Builder:

- on the Columns dialog box, next to the **Enter an expression** field
- on the Sort Conditions dialog box, next to the **Enter a sort condition** field
- on the Row Conditions dialog box, next to the **Right side** set of fields

Available expressions

The following are a few examples of the SQL expressions that are available in the Expression Builder.

Note: The SQL Reference publication for your database type and version is the authoritative source for the syntax of SQL expressions. Refer to this documentation for more information about how to code SQL.

Table 76. SQL Expressions

SQL Expression	Description
+	Insert a template for adding two expression elements

Table 76. SQL Expressions (continued)

SQL Expression	Description
-	Insert a template for subtracting two expression elements
*	Insert a template for multiplying two expression elements
/	Insert a template for dividing two expression elements
CONCAT	Insert a template for concatenating two string expression elements
()	Group together different parts of an expression
constant>>	Display a submenu of constants to insert, such as: • Integer • Decimal • Floating point • Character • Graphic
column name>>	Display a list of all columns in all tables referred to by the current query Select one or more of the columns and press **Enter** to insert the selected names into the expression.
special register>>	Display a submenu of SQL special registers to insert, such as: • CURRENT DATE • CURRENT TIME • CURRENT TIMESTAMP • CURRENT SQLID • USER

Table 76. SQL Expressions (continued)

SQL Expression	Description
function>>	Display a tree view containing SQL column and scalar functions. The functions are organized into related groups, and each group is displayed under a different branch of the tree. To insert a reference to a function in the expression, select the function in the tree and click **Enter**. The two branches that display at the top of the tree have a special purpose: • *Favorite Functions* lists the functions that used most frequently. Add a function to your favorites by right-clicking on the function and selecting **Add to Favorites**. Remove a function from your favorites by right-clicking on the function and selecting **Remove from Favorites**. • *Recently Used Functions* lists the ten functions most recently used. Use this feature to enter the same function references repeatedly, in the same expression or in a different expressions. After you select a function, the display area below the tree view displays the function reference template that will be inserted. When you right-click on a function and select **View Reference** from the submenu, a Web browser opens and provides IBM reference documentation for the function. **Note:** This option requires an active Internet connection.

case expression>>	Insert an SQL case expression:
	• **Simple**
	`CASE <expression> WHEN <expression> THEN <result-expression> ELSE <result-expression> END`
	• **Searched**
	`CASE WHEN <search-condition> THEN <result-expression> ELSE <result-expression> END`

Chapter 20. DB2 Intelligent Miner™ Scoring

About Intelligent Miner Scoring

Use the IBM Intelligent Miner Scoring (IM Scoring) functions to import certain types of mining modules into a DB2 table, apply the models to data within DB2, and obtain scoring results.

Scoring results are obtained after the model is applied. Scoring results differ based on the type of model that is applied. IM Scoring includes functions that retrieve the values in the scoring results. The scoring functions require DB2 Universal Database, Version 8.1 or higher because DB2 UDB Version 8.1 implements the REC2XML function that is used for scoring.

IM Scoring, Version 8.1, extends the capabilities of DB2 to include data mining functions. Mining models continue to be built using the IBM DB2 Intelligent Miner for Data application, which produces PMML (predictive model markup language) modules; whereas, with the mining application mode functions are integrated into DB2.

Additional references

For further descriptions of the mining functions, see *IBM Intelligent Miner Scoring V7.1 Administration and Programming for DB2* at `http://www/ibm.com/software/data/iminer/scoring/library.html`, and *"Using the Intelligent Miner for Data V6.1* at `http://www.ibm.com/software/data/iminer/fordata/library.html`.

Available scoring functions

The functions, implemented as DB2 user-defined functions (UDFs), apply the mining models to data held in DB2 tables and retrieve the results.

The administrator, who is responsible for data mining activities, creates the following functions during installation. Then, the administrator uses the IM Scoring functions to provide the mining modules to other uses.

The definitions of the functions refer to mining modules in DB2, but QMF for Windows does not provide functions to create those models.

QMF for Windows provides the following Intelligent Miner Scoring functions:

- `Q.PredictClusterID`
- `Q.PredictClusConf`
- `Q.PredictClusScore`

- Q.PredictClass
- Q.PredictClassConf
- Q.PredictValue

Clustering

The functions Q.PredictClusterID, Q.PredictClusConf and Q.PredictClusScore are based on a mining technique called *clustering*. This data mining technique discovers sets of rows with common characteristics, or clusters, so that the rows are possibly homogeneous inside a cluster and possibly heterogeneous between two clusters.

This technique is typically used for customer segmentation and profiling. It divides customers into groups, based on parameters such as usage patterns, cross-selling opportunities, and demographic data.

Classification

The functions Q.PredictClass and Q.PredictClassConf are based on the *classification* technique. This technique groups records into predefined classes, in order to predict a class based on other input fields.

This technique is typically used for risk analysis.

Numeric value prediction

The function Q.PredictValue is based on *numeric value prediction*. This is similar to the classification technique; however, Q.PredictValue returns numbers that could possibly be in a continuous value range.

This technique is typically used for risk analysis.

IM Scoring example

The following example is of a simple query that uses IM Scoring:

```
SELECT A.Name
       Q.PredictClass('DemoBanking',
                      REC2XML(2,'COLATTVAL','',
                              A.Type, A.Age, A.Siblings, A.Income)
                     ) As RiskClass
FROM BankCustomers A
```

This query refers to the arbitrary table BankCustomers, which contains information about the customers of a bank. For each customer, the scoring function computes a value that might be a classification of credit risk. This prediction is implemented by the scoring function Q.PredictClass. The first argument, 'DemoBanking', is the name of a mining module. The second argument is the input data, constructed by **REC2XML**.

The query results contain simple values such as:

Table 77. Sample IM Scoring Query Results

Name	Risk class
Joe Padeni	high
Susan Sztuba	high
Callie Atchue	low

The `Q.PredictClass` function returns a VARCHAR. In the example, it produces a ″high″ or ″low″ value. A mining model contains the patterns and formulas needed to predict clusters, classes, or numeric values. These patterns are read by the UDF in order to compute predictions.

Q.PredictClusterID

Description

This function obtains, from the query results data, the cluster ID that is produced when you apply a clustering model. This identifies the particular cluster in the clustering model that is the best match for this data.

Format

```
Q.PredictClusterID(ModelName VARCHAR(256), Values VARCHAR(32672))
```

Parameters

Table 78. Q.PredictClusterID Parameters

Name	Description
ModelName	The name of a model in the default table that contains clustering models.
Values	A string that contains the input arguments required by the model. This value is produced by the DB2 function **REC2XML**.

Return value

This function returns the cluster ID as data type INTEGER.

Q.PredictClusConf

Description

This function obtains the confidence from the query results data that is produced when you apply a clustering model. This is a value between 0.0 and 1.0. This value expresses the probability that the predicted cluster is the best match against the other clusters.

Format

```
Q.PredictClusConf(ModelName VARCHAR(256), Values VARCHAR(32672))
```

Parameters

Table 79. Q.PredictClusConf Parameters

Name	Description
ModelName	The name of a model in the default table that contains clustering models.
Values	A string that contains the input arguments required by the model. This value is produced by the DB2 function **REC2XML**.

Return value

This function returns the clustering score as data type DOUBLE.

Q.PredictClusScore

Description

This function obtains the clustering score from query results data that is produced when you apply a clustering model. The score is an expression of how closely the data matches the predicted cluster.

- **Demographic clustering:** a score value close to 1.0 indicates a good match.
- **Neural clustering:** a score value close to 0.0 indicates a good match.

Note: The score value may indicate a good match even when the confidence returned by `PredictClusConf` is low. This happens if the data matches another cluster that is very close to the first one.

Format

```
Q.PredictClusScore(ModelName VARCHAR(256), Values VARCHAR(32672))
```

Parameters

Table 80. Q.PredictClusScore Parameters

Name	Description
ModelName	The name of a model in the default table that contains clustering models.
Values	A string that contains the input arguments required by the model. This value is produced by the DB2 function **REC2XML**.

Return value

This function returns the clustering score as data type DOUBLE.

Q.PredictClass

Description

This function obtains the predicted class from query results data that is produced when you apply a classification model. This identifies, within the model, the particular class that matches the data.

Format

```
Q.PredictClass(ModelName VARCHAR(256), Values VARCHAR(32672))
```

Parameters

Table 81. Q.PredictClass Parameters

Name	Description
ModelName	The name of a model in the default table that contains clustering models.
Values	A string that contains the input arguments required by the model. This value is produced by the DB2 function **REC2XML**.

Return value

This function returns the predicted class as data type VARCHAR.

Q.PredictClassConf

Description

This function obtains the classification confidence value from results data that is produced when you apply a classification model. The confidence is a value between 0.0 and 1.0 that expresses the probability that the class is predicted correctly.

Format

```
Q.PredictClassConf(ModelName VARCHAR(256), Values VARCHAR(32672))
```

Parameters

Table 82. Q.PredictClassConf Parameters

Name	Description
ModelName	The name of a model in the default table containing clustering models.
Values	A string that contains the input arguments required by the model. This value is produced by the DB2 function **REC2XML**.

Return value

This function returns the confidence value as data type DOUBLE.

Q.PredictValue

Description

This function obtains the predicted value from query results data that is produced when you apply a regression model. This value is calculated according to relations that are established by the model.

Format

```
Q.PredictValue(ModelName VARCHAR(256), Values VARCHAR(32672))
```

Parameters

Table 83. Q.PredictValue Parameters

Name	Description
ModelName	The name of a model in the default table that contains clustering models.
Values	A string that contains the input arguments required by the model. This value is produced by the DB2 function **REC2XML**.

Return value

This function returns the predicted value as data type DOUBLE.

Chapter 21. IBM DB2 Spatial Extender

Description

The IBM DB2 Spatial Extender (Spatial Extender) stores, accesses, manages, and analyzes spatial data that you can query. The Spatial Extender works with spatial visualization tools. This enables you to gather spatial data, such as geographic data, and attach non-spatial business data attributes to it.

IBM DB2 Spatial Extender is incorporated into the IBM DB2 Universal Database. Spatial data consists of values that denote the location of objects and areas with respect to one another.

An estimated 80% of all data has embedded spatial characteristics. This data can be exploited to formulate queries containing relevant parameters.

Business applications

Business decisions can be achieved by adding the location factor to queries. You can combine relevant spatial data with business data in the same RDBMS to better manage your data within DB2. Spatial data can aid you in answering basic business issues, such as:

- Where to build new offices based on costs and statistics, but also the proximity of competitors and potential clientele?
- Which customers live inside and outside sales areas?
- Whether the center of a sales area is too far away from most of the customers in the area?
- What extent your sales areas overlap with those of competitors?
- Which customers own homes valued at over $400,000 that are within one mile of an earthquake fault?
- Combine spatial data with business data in the same RDBMS to better manage your data within DB2

Features

- Generate and analyze spatial and business information, and store and manage this data using a single SQL interface.
- Control whether information will be gathered for the location, shape of, and relationships among business data and geographic data, including map data.

- Import census data in common spatial formats, such as well-known text, well-known binary, or shape format
- Ability to save spatial data maps to a file
- Export spatial data maps to procedures or as graphics files (as .bmp or .emf files)
- Use SQL extensions to handle complex data types and allow applications to store and manipulate objects directly inside the DB2 database
- Make these data more SQL accessible
- Perform SQL querying of spatial data or joining this data with conventional business data stored any DB2 database
- Work with visualization tools to provide visual map renderings of spatial data
- Implement spatial data modeling
- Work with multiple data types
- Support popular industry formats, such as ESRI shape files (.spm)

User interface

The QMF for Windows uses a unique user interface for spatial maps:

- Spatial maps display in a separate window
- A drop-down menu is available for map objects
- Property and history information can be obtained for map layers
- Map icons are available along with informational tooltips

Prerequisites

- DB2 Spatial Extender, version 7.2 or higher
- Licensed copy of DB2 Universal Database Enterprise Edition (EE) version 7.2, or a licensed copy of DB2 Universal Database Enterprise-Extended Edition (EEE) version 7.2 for Windows NT, Windows 2000 or AIX®
- Microsoft Windows NT (R), Microsoft Windows 2000 (R), or IBM AIX, 32-bit or 64-bit environment for UNIX® platforms, Sun Solaris, Linux on Intel and zSeries, HP-UX
- A visualization too, such as ESRI ArcExplorer, ArcView GIS, Arcinfo, ArcView, BusinessAnalyst, or ArcIMS

Integration with QMF for Windows

Save As dialog box

Select **File--> Save as**. The Save As dialog box opens. Select *.spm as the extension in the **Save as type** field.

Invoking the visualization component

You can invoke the visualization component, which renders the shape files (*.spm) visually.

File menu

1. Select **File--> Open**.

   The Open dialog box opens.
2. Select the map file, or type the name of the file in the **File name** field, if you know it.
3. *Optional:* Select Map Files (*.spm) from the **Files of type** field.
4. Click **OK**.

   The Display Map window opens.

Map menu

Use the Map menu to control the attributes and view of a spatial map.

Add Layer

Select **Map--> Add Layer** to add a layer to the spatial map. The Add Layer dialog box opens.

Note: You can select this option only if there is at least one result set open that contains spatial data, which means that the layer must have a column with GEO spatial data, as defined in the database.

Table 84. Add layer dialog box

Field	Description
From File	Select this radio button to select a shape file from a file. 1. Select the **From File** radio button. The Add Layer dialog box refreshes with an input field for **Name**. 2. Type the name of the file in the **Name** field. 3. Click **Add**.

Table 84. Add layer dialog box (continued)

Field	Description
From Database	Select this radio button to select a shape file from a database. 1. Select the **From Database** radio button. The Add Layer dialog box refreshes with entry fields for **Server**, **Owner**, **Name**, and **Type**. 2. At the **Server** field, select the server from the drop-down list. 3. At the **Owner** field, type the name of the owner of the shape file. 4. At the **Name** field, type the name of the object owner. 5. At the **Type** field, select one of the following shape object types from the drop-down list: • Query • Table 6. Click **Add**. 7. *Optional:* Click **List Objects**. The Objects at [Owner] dialog box opens. Use the List Objects dialog box to view a list of objects matching your entries for server, owner, name, or type. 8. *Optional:* Click **Properties** from the Objects at [Owner] dialog box. The [Owner Properties] dialog box opens. Use this dialog box to review historical detail for the object.
From Open Document	Select this radio button to add a layer from an open spatial document. The Add Layer dialog box is refreshed, and a list box opens where you can select the layer.

List Objects

Click **List Objects** at the Add Layer dialog box to open the Objects at [Server] dialog box. This control is available only if you are adding a layer from a database.

Table 85. Objects at [Server]

Field	Description
Server	Select the server from the drop-down list.

Table 85. Objects at [Server] (continued)

Field	Description
Owner	Type the owner name of the shape file
Name	Type the name of the shape file.
Type	Select the object type, either table or query.
Comment	Review or type a comment associated with the object.
Refresh List	Click **Refresh List** to repaint the Objects at [Server] dialog box
OK	Click **OK** to select the object and close the dialog box
Cancel	Click **Cancel** to return to the previous dialog box without making any changes
Properties	Click **Properties** to open the [Object] Properties dialog box, which provides various information about the object, including a comment (that can be updated), attributes, usage summary, and number of times the object has been accessed

Properties

Click **Properties** at the Objects at [Server] dialog box to obtain detailed information for the object. The [Server] Properties dialog box opens.

Table 86. [Server] Properties dialog box

Field	Description
Comment	A comment associated with the object. You can type information in this field.
Shared with other users	This check box indicates whether the object is shared with other users

Table 86. [Server] Properties dialog box (continued)

Field	Description
Attributes	Various attributes associated with the object, including: • **Level** The internal level of the object. • **Type** The type of the object. • **Subtype** The subtype of the query object, either SQL or prompted, or of the table object either **T** (for table) or **V** (for view). • **Restricted** Specifies whether the object is shared or restricted. • **Model** Specifies the internal object model of the object. For prompted queries, this is always **REL**. For all other objects, it is unused.

Table 86. [Server] Properties dialog box (continued)

Field	Description
Usage Summary	The type of usage summary statistics, such as: • **Show First Used** Click this radio button to view details about when the object was first used. The bottom half of this group box is updated. • **Show Last Used** Click this radio button to view details about when the object was last used. The bottom half of this group box is updated. • **Show last modified** Click this radio button to view details about when the object was last modified. The bottom half of this group box is updated. • **Date, usage information** From Usage Summary • **Time** From Usage Summary • **User ID** From Usage Summary • **SQL ID** From Usage Summary, the CURRENT SQLID of the person who first used, last used, or last modified the object, such as DB2ADMIN • **Environment** From Usage Summary, the environment (such as Windows, TSO, or CICS), in which the object was first used, last used, or last modified • **Mode** From Usage Summary, the mode (Online or batch) in which the object was first used, last used, or last modified • **Command** From Usage Summary, the command (such as IMPORT) that was used when the object was first used, last used, or last modified
Number of times	• Number of times used • Number of times run • Number of times cancelled

Run History

Click **Run History** on the [Server] Properties dialog box to obtain summary history for the object. The [Object] Run History dialog box lists each time the object has run, if detailed object tracking is enabled in the QMF for Windows Administrator for your resource limits group.

History information is available for the user ID, date, start time, end time, success flag, and byte count.

Table 87. [Object] Run History dialog box

Field	Description
User ID	The user ID associated with the object, when it was run
Date	The date on which the object was run
Start Time	The time at which the object was submitted to run
End Time	The time at which the object completed running
Success	A code indicating the final result of the run
Byte Count	The number of bytes retrieved by running the object (if the object is a query)

Display

Click **Display** on the Object [Run History] dialog box to obtain detailed run history for the object.

Table 88. Run Detail dialog box

Field	Description
Date	The date on which the object was run
User ID	The user ID associated with the object, when it was run
Start Time	The time at which the object was submitted to run
SQL ID	The SQL ID, such as DB2ADMIN, which is the CURRENT SQL ID of the person who first used, last used, or last modified the object, from the Usage Summary
End Time	The time at which the object completed running
Environment	Environment, such as Windows, which is the environment (Windows, TSO, CICS) in which the object was first used, last used, or last modified, from Usage Summary

Table 88. Run Detail dialog box (continued)

Field	Description
Row count	The number of rows retrieved by running the query. This object is zero when the object is run from QMF for Windows.
Mode	The online or batch mode in which the object was run
Byte Count	The number of bytes retrieved by running the object (if the object is a query)
CPU time	The amount of CPU time consumed by running the object. This value is zero when the object is run from QMF for Windows.
Result	The final result of the run, indicating whether it completed successfully or if it was cancelled prematurely. Some of the results that may be displayed can occur only when the object is run from host QMF.
SQL text	The actual SQL text run for the query. SQL text is tracked only if the Enable SQL text tracking resource limit is enabled in QMF for Windows Administrator, for your resource limits group.

Delete Layer

Select **Map--> Delete Layer** to delete a layer on the spatial map immediately.

Note: No delete-confirmation message is issued before QMF for Windows deletes the layer.

Layer Properties

Select **Map--> Layer Properties** to work with the attributes of the mapping points on the layer. One of the following dialog boxes opens, depending on the type of layer.

- **Point Layer Properties**

Table 89. Point Layer Properties dialog box

Field	Description
Name	The name of the layer

Table 89. Point Layer Properties dialog box (continued)

Field	Description
Style	Select one of the following radio buttons: • **Image,** which enables the **Image** attributes and controls how the points appear on the spatial map, as a circle, square, triangle, or cross. • **Symbol,** which enables the **Symbol** attributes and control the font, angle, and character of points on the spatial map.
Size	The point size of the image or symbol.
Color	The color of the image or symbol, as selected from the color palette.

- **Polygon Layer Properties**

Table 90. Polygon Layer Properties dialog box

Field	Description
Name	The name of the layer
Color	The color of the polygons in this area

Table 90. Polygon Layer Properties dialog box (continued)

Field	Description
Style	Select one of the following styles: • **Solid,** presents the polygon as a solid shape • **Transparent,** presents the polygon as an outline • **Horizontal,** fills the polygon with horizontal lines, in the selected color • **Vertical,** fills the polygon with vertical lines, in the selected color • **Upward diagonal,** which fills the polygon with vertical, diagonal lines in the selected color (going from bottom-right to top-left) • **Downward diagonal,** which fills the polygon with vertical, diagonal lines in the selected color (going from top-right to bottom-left) • **Cross,** which fills the polygon with a horizontal and vertical grid pattern, in the selected color • **Diagonal cross,** which fills the polygon with a left and right diagonal grid pattern, in the selected color • **Light gray fill,** by which other aspects of other layers in the map become visible in the polygon by the addition of light gray fill • **Gray fill,** by which other aspects of other layers in the map become visible in the polygon by the addition of gray fill • **Dark gray fill,** by which other aspects of other layers in the map become visible in the polygon by the addition of dark gray fill
Border	Check this check box to display a border between the polygon and other features within the map
Color	The color of the border separating the polygon and other features within the map, if the **Border** check box is selected.
Thickness	The point size of the border separating the polygon and other features within the map, if the **Border** check box is selected.

- **Line Layer Properties**

Table 91. Line Layer Properties dialog box

Field	Description
Name	The name of the layer
Color	The color of the line surrounding the boundaries of the polygon
Style	The type of line, such as solid, dashed, dotted, and other variations
Thickness	The point size of the line

Layer Labels

Select **Map--> Layer Labels** to work with the attributes of labels associated with features of the layer. The Layer Labels dialog box opens.

Table 92. Layer Labels dialog box

Field	Description
Layer name	The name of the layer
Display labels	Check this check box to display labels for the selected column in the layer. The check box is enabled when you select a column from the **Column** drop-down list.
Column	A column associated with the layer. Select a column from the drop-down list.
Placement	Select one of the following options to determine how to place the labels for the layer: • on feature • above feature • below feature A feature is a specific point on the layer.
Vertical alignment	Select one of the following options to determine how the labels will be placed vertically on the layer: • top • center • baseline • bottom

Table 92. Layer Labels dialog box (continued)

Field	Description
Horizontal alignment	Select one of the following options to determine how the labels will be placed horizontally on the layer: • left • right • center
Font	Specify the font style for the layer's labels from the Font dialog box

Zoom In
Select **Map--> Zoom In** to magnify an area of the layer. The cursor changes to a magnifying glass with a (+). Move the cursor to the area you want to view in detail, then click on that spot.

Zoom Out
Select **Map--> Zoom Out** to obtain a high-level view of the layer or to reset the view after zooming in to the layer.

The cursor changes to a magnifying glass with a (-). Move the cursor to the area you want to view, then click on that spot.

Zoom to Fit
Select **Map--> Zoom to Fit** to fit the map to the work area.

Zoom to Current Layer
Select **Map--> Zoom to Current Layer** to view the selected layer. You can toggle between layers by selecting a different layer, then selecting **Map--> Zoom to Current Layer**.

The image is adjusted to fit your work area.

Pan
Select **Map--> Pan** to drag the map image left to right, or up and down, to obtain different views of the layer.

The cursor changes to a hand when you select this option. Place the hand over the map image, click the mouse, then hold down the main mouse button to shift the image.

Identify
Select **Map--> Identify** to obtain detailed information about a point on the spatial map.

Select the Identify option, then hover over on the map. Place the cursor over the area about which you would like additional information. The cursor changes to a pointer with an ″I″ symbol. Click that area. The Identify Results dialog box opens.

Table 93. Identify Results dialog box

Field	Description
Location	An output field that identifies the coordinates of the location (X and Y axes)
Range	Specify the range, or radius, for which you want information, such as an area of 30-degrees beyond the selected location. The Identify Results dialog is refreshed with identifying information for all features within the specified range. **Note:** The larger the range, the more features will be identified. For example, by specifying a range of 1 within all visible layers, information is collected for two customers of a bank, including information regarding their checking accounts, average daily balance, and the main roads surrounding their homes.
Layers	Select the layers for which you want identifying information. Choices are: • visible layers • selected layers • all layers in the spatial map
Features	The individual layers included in the results, within the specified radius. The Query Results Explorer pane provides a tree-view of the layers and associated categories of data within each layer
Attributes	The detailed information available for the selected layers, for the specified range and layers

Export

Select **Map--> Export** to export the map file to another location. The Save As dialog box opens. Specify the directory path, file name, and file type, then click **Save**.

Note: The file will be exported as an image file, as a *.bmp (bitmap) or a Windows enhanced metafile (*.emf) file type.

Refresh
Select **Map--> Refresh** to redraw and refresh the contents of the spatial map.

Map Properties
Select **Map--> Properties** to define general settings for the spatial map application.

Table 94. Map Properties dialog box

Field	Description
Scrollbars on map	Check this check box to add vertical and horizontal scrollbars on the spatial map work area.
Escape key	Specify the action to take when pressing the Escape key. Choices are: • Ignore • Stop drawing layer • Stop drawing map
Border style	Specify the type of border to use on the spatial map to delineate features. Choices are: • None • Flat • 3-D
Background color	Select, from the color palette, the background color that will fill the background area of the map

Export Map to Procedure
Select **Map--> Export Map to Procedure** to generate the SQL for the spatial map, in a procedure document. The original spatial map is retained.

Layers
Select **Map--> Layers** to view the layers selected for the spatial map.

Display Map

Select **File--> New--> Map** to open the Map window. The window displays spatial data and the corresponding layers used to build the data. This window has two panes: the Query Results Explorer (layers list), and the map.

Layers list
The left side of the Map window contains an Query Results Explorer that lists the layers belonging to the map. Each layer corresponds to a shape file in the file system, including temporary files.

For each layer created from an existing shape file, the label for each layer will be the label of the shape file.

Table 95. Layers List Controls

Control	Description
Add	Display the Add Layer dialog box, where you can add a layer by selecting a result set that contains spatial data, a query or table, or a shape file.
Remove	Remove the selected layer from the right pane display.

Result Map

The right side of the Display Map dialog box contains the spatial data developed from the selected layers (from the selected queries, tables, or shape files).

Procedure commands

The SPATIAL command performs spatial operations from a procedure. The SPATIAL commands are listed below.

Note: In many of the following procedures, an error occurs if the current data object does not contain exactly one column with a spatial data type.

Also, in many of the following procedures, an error occurs if the current visualization specification is empty.

Table 96. Procedure Commands

Procedure	Description
SPATIAL RESET	Remove all layers from the current visualization specification
SPATIAL ADD	Export the current data object to a temporary shape file and add the shape file, as a new layer, to the current visualization specification.
SPATIAL EXPORT TO file-name (DATAFORMAT-JPG|BMP|GIF|...,CONFIRM=YES|NO	Invoke the ESRI component to visualize the layers in the specification and export the image to a file with a specific file name and data format. The CONFIRM option controls whether an "overwrite" confirm message is issued if the file exists.
SPATIAL DISPLAY	Display the Visualize Spatial Data dialog box to view the layers in the specification. The procedure is suspended until the user closes the dialog box.

Table 96. Procedure Commands (continued)

Procedure	Description
`EXPORT DATA`	Accept the following values for the `DATAFORMAT` option: • DBF • SPM This function is similar to the `EXPORT FORMAT` command and the Export Data dialog box.
`IMPORT DATA`	This procedure works with shape files. This function is similar to the `IMPORT DATA` command and the Import Data dialog box. The type of data that is being imported is determined by the file extension, where **.spm** is a shape file, and anything else is an **.ixf** file (which maintains backward compatibility).

Chapter 22. IBM DB2 Warehouse Manager

With QMF for Windows you can register QMF for Windows objects, such as spreadsheets, reports, and queries, in the DB2 Warehouse Manager Information Catalog. This allows the object to be listed in and launched from the DB2 Warehouse Information Catalog.

Methods to register objects

There are two methods to register QMF for Windows objects:

- Saving an object at the database server
- Selecting an object from an object list

Saving an object at the database server

Procedure

1. Select **File--> Save at Server** when you save the object for the first time.
2. Provide owner, name and other information about the object.
3. Check the **Register the object in the Information Catalog** check box.
4. Click **OK**.

   The Save Query dialog box expands with options for registering objects in the Information Catalog.

Field descriptions

1. **Register immediately**

   Select this radio button to send an immediate registration request to the DB2 Warehouse Manager when the object is saved. The object is registered in Information Catalog when the object is saved at the database server.

   Provide the following information:

   - Catalog

     The name of the DB2 Warehouse Manager Information Catalog to which the object will be registered. Your DB2 Warehouse Manager Information Catalog administrator can give you this information.

   - User ID

     The user ID that you are using to register the object. This can be the same as your database user ID.

   - Password

     The password that you are using to register the object. The password can be the same as your database password.

2. **Register later**

   Select this radio button to bundle the object registration information into a tag file to wait for registration by your DB2 Warehouse Manager Information Catalog administrator.

   Provide the following information:

   - Tag file

     Type or browse for the location and file name of the tag file that contains the registration information of the object being saved. Your DB2 Warehouse Manager Information Catalog administrator can provide location and file name information.

     Windows generates a tag file in the specified folder. The DB2 Warehouse Manager Information Catalog administrator uses the Information Catalog to import the tag file and register the object.

Selecting an object from an object list

Procedure

You can select multiple QMF for Windows objects to be registered simultaneously in the Information Catalog.

1. Select multiple objects from an object list.
2. Select **List--> Register in Information Catalog**.

   The Register Objects in the Information Catalogs dialog opens. Select a registration option, as described in the section, "Saving an object at the database server" on page 255.

Chapter 23. Database Explorer

Use the Database Explorer to view, access, and analyze QMF for Windows objects that reside on the database servers that have been defined in the SDF. When the Explorer Bar is enabled, the (dockable) Database Explorer window opens along with QMF for Windows and it remains open for the entire session.

The Database Explorer displays, in an object tree structure, the QMF for Windows objects that are stored on the database servers that are configured in the current SDF. The object tree contains four branches for Favorites, Recently Used Objects, Recently Used Servers, and All Servers.

The Database Explorer is a quick launching pad for accessing the servers and objects with which you have most recently worked, which saves time and effort in locating them. The Database Explorer also contains a branch for your favorite servers or objects so that you can do your own work more efficiently.

Features

With the Database Explorer, you can:

- obtain instant information about the servers and the objects that are available on the servers
- run objects
- expand or collapse servers and nodes
- filter objects by object owner and object name
- add objects to the Favorites folder
- work with recently-used objects and recently-used servers

The **All Servers** branch lists the database servers that have been defined in the SDF. You can expand each database server by clicking the (+) to the left of the server name. QMF for Windows retrieves and lists the QMF objects that are stored on that database server. Click the `Filter` icon to select which objects should be included in the list. The Filters window opens.

The **Recently Used Objects** branch lists the database objects that you used during your last QMF for Windows session in the order that you used them. QMF for Windows keeps track of your object usage during the session. The list is updated each time each time that you use an object. You can specify the number of QMF objects that are included in the list by clicking the `Options` icon. The Database Explorer Options window opens.

Opening and Closing the Database Explorer

The Database Explorer opens when you start QMF for Windows if you select **View --> Explorer Bar**, or you select the Explorer icon. The Database Explorer will open automatically each time you start QMF for Windows.

The Database Explorer closes when you de-select **View --> Explorer Bar** or you click the Explorer icon. The Database Explorer will not open until you select it.

Favorites

Use the Favorites folder to drag the objects that you use most frequently, or to create sub-folders for these objects. You can drag objects from different servers to the Favorites node or to a Favorites folder.

This enables you to work from a single folder.

Recently Used Objects

Objects that you have accessed recently are added automatically to the Recently Used Objects node of the Database Explorer. This enables you to reselect an object directly from the database server. You can double-click on the object to run it, or right-click on the object to view a sub-menu.

Note: The Set User Information dialog box opens if a User ID and Password are required.

Recently Used Servers

The **Recently Used Servers** node of the Database Explorer automatically lists the database servers that you have used during your last QMF for Windows session in the order that you used them. QMF for Windows keeps track of your server usage during the session. The list is updated each time you restart QMF for Windows.

You can specify the number of servers that are included in the list by clicking the `Options` icon. The Database Explorer Options window opens.

You can also enter filtering information to filter by object owner and object name by clicking the `Filter` icon.

A series of dialog boxes opens. The Set User Information dialog box opens if a User ID and Password are required to access the database server. Additionally, the Set User Information dialog box opens if a User ID and Password are required to access the objects on the database server.

Right-click on the object, then select **Run** from the sub-menu to run the object.

All Servers

Select the All Servers node on the Database Explorer to view the database servers that are defined in the server definition file (SDF).

The SDF is an initialization (.ini) file that contains the technical information that QMF for Windows requires for connecting end-users to database servers.

The Administrator determines who has access to database servers, based on user authority and user resource limits. Therefore, the servers listed under the All Servers node may not be accessible by all users.

Running Objects

1. Select a node on the Database Explorer.
2. Right-click on the icon.
3. Select **Run** from the sub-menu.
4. *Optional:* Provide a substitution variable value if the Enter Substitution Variable Values dialog box opens.

Creating and Deleting Folders

You can create and delete folders only at the Favorites node of the Database Explorer.

Creating Folders

1. Right-click on the Favorites node on the Database Explorer.
2. Select **New Folder** from the sub-menu.
3. Specify the folder name.
4. Drag items to the folder.

Deleting Folders

1. Right-click on a folder in the Favorites node on the Database Explorer.
2. Select **Delete Folder** from the sub-menu.

Retrieving the Object's References

Select this option to obtain the references for an object, such as:

- the tables and columns selected for a query
- the queries used in a procedure
- the columns defined for a table

When you select *References*, QMF for Windows performs an instant analysis to determine the tables, columns, and queries associated with the query or procedure.

Follow these steps to view the references for an object:

1. Expand the node for queries or procedures on the Database Explorer tree.
2. Expand the node for the object.
3. Expand the node to obtain the References.

Chapter 24. QMF for WebSphere

Overview

DB2 QMF for WebSphere is part of the DB2 Query Management Facility (QMF) toolset for IBM's DB2 relational database management system. QMF for WebSphere extends query and reporting capabilities to users via their web browsers. There are three QMF for WebSphere applications:

- QMF for WebSphere
- QMF for WebSphere Report Center
- QMF for WebSphere Administrator

  For more information on using QMF for WebSphere Administrator, see *DB2 QMF for Windows and DB2 QMF for WebSphere Installing and Managing Guide.*

Using QMF for WebSphere

QMF for WebSphere has the same look and feel as QMF for Windows and includes much of the same functionality. You can refer to the chapters in this document for additional information on common functionality.

To use QMF for WebSphere, open a web browser and go to:

`http://host:port/QMFWebSphere/Pages/QMFWebSphere.jsp`

where *host* is the host name of the WAS server machine and *port* is the port on which the QMF for WebSphere application is configured to listen.

Connecting to a database server

You can connect to any of the database servers that have been configured in the distributed server definition file (SDF). All QMF for WebSphere users use the same SDF. The SDF includes the technical information QMF for WebSphere needs to connect to the database servers and control resource usage. The SDF is created, maintained and distributed by the person who is responsible for configuring your QMF query environment.

The database servers that are available for you to use are listed in the **All Servers** branch of the Database Explorer tree when you open QMF for WebSphere.

Specifying user information

You must specify user information for every connection to the database server. The Set User Information window is used to specify user information.

Whenever QMF for WebSphere connects to a database server, the Set User Information window opens requesting a user ID and password.

QMF for WebSphere opens the Set User Information window and requires that you specify a user ID and password at least once during the QMF for WebSphere session for each database server to which you will connect. For all subsequent connections to the specific database server, QMF for WebSphere will use the same user ID and password.

Fields

Server: The name of a database server that QMF for WebSphere is connecting to.

User ID: The user ID that you want to use to connect to the database server. The user ID is validated by the database server for authorization. User IDs are case sensitive.

Password: The password associated with user ID you typed in the **User ID** field. Passwords are validated by the database server for authorization. Passwords are case sensitive.

Remember this password: Check this check box to have the password specified in the Password field saved across QMF for WebSphere sessions. Unchecked, the password is only saved for the duration of the current QMF for WebSphere session.

Specifying multiple user IDs and passwords

If you are connecting to a database server that uses a catalog that resides on a different database server, the Set User Information window will request user ID and password information for both database servers.

1. In the first **User ID** field, type the user ID that you want QMF for WebSphere to use to connect to the primary database server. In the **Password** field, specify the password associated with the user ID that you typed in the **User ID** field.
2. In the second **User ID** field, type the user ID that you want QMF for WebSphere to use to connect to the database server where the catalog resides. In the **Password** field, specify the password associated with the User ID that you typed in the **User ID** field.
3. Click **OK**.

Queries

Using QMF for WebSphere you can query a database server in one of the following ways:

- write your own SQL statements
- create SQL statements using the prompted interface
- create an OLAP query using the QLAP query Wizard
- use the Database Explorer to find and select queries that have been saved on the database server
- run a procedure
- create a list and select an object from the list

Query menu

The Query menu becomes available when you create a new query or open an existing query. You can access the query menu commands from the main menu or from the Actions window. You can use the menu commands for all queries to:

Run

Select **Query--> Run** to run the active query.

Save at Server

Select **Query--> Save at Server** to save the query at the database server.

Save to File

Select **Query--> Save to File** to save the query as a file located on your local or network drive.

Convert to SQL

Select **Query--> Convert to SQL** to see the SQL statements that were created for your query. This menu choice is only available when you are working with the prompted query interface.

Use the Database Explorer to select an existing query

The Database Explorer opens in the Explorer window when QMF for WebSphere opens. You can use the Database Explorer to view, access, and analyze QMF objects that reside on the database servers that have been defined in the SDF.

Navigating the Database Explorer tree

The Database Explorer displays in a tree structure the QMF objects that are stored on the database servers to which you have access. The Database Explorer tree contains four branches:

Favorites: The **Favorites** branch lists the QMF objects that you have selected for inclusion. You can move any QMF object listed in the Database Explorer

branches to the Favorites folder by selecting the object and dragging it to the folder. You can also right-click on the QMF object and select **Add to Favorites** from the context menu. The **Add to Favorites** window opens where you can add the object to your Favorites branch.

Recently Used Objects: The **Recently Used Objects** branch lists the database objects that you have used during your the QMF for WebSphere session in the order that you have used them. QMF for WebSphere keeps track of your object usage during the session. The list is updated each time that you use an object. You can specify the number of QMF objects that are included in the list by selecting **View--> Options** and clicking the Database Explorer Options page.

Recently Used Servers: The **Recently Used Servers** branch lists the database servers that you have used during your last QMF for WebSphere session in the order that you have used them. QMF for WebSphere keeps track of your server usage during the session. The list is updated each time QMF for WebSphere is restarted. You can specify the number of servers that are included in the list by clicking **View--> Options** and clicking the Database Explorer Options page.

All Servers: The **All Servers** branch lists all the database servers that have been defined in the SDF. You can expand each database server by clicking the (+) to the left of the server name. QMF for WebSphere retrieves and lists all the QMF objects that are stored on that database server. To select what objects should be included in the list, right-click on a database server in list and select **Filter** from the context menu. The Filters window opens

Using the Database Explorer

You can use the database Explorer to:

- Run or display a QMF object by double clicking on the object listed in any of the branches of the Database Explorer tree. By default, double clicking on the OMF object will run the object. To display the object by double clicking, you must select **View--> Options** and select the Database Explorer page where you can change the default from **Run** to **Display.**
- Right-click on any database server listed in the Database Explorer tree and open a context menu. From the context menu you can select **Set Name Filter** or **Set Type Filter** to open the Filters windows where you specify which QMF objects will be included in the database server branch in the Database Explorer tree. You can select **New Document** and choose to create a new Query, OLAP query or Procedure. You can also choose to **Refresh** the list of objects that are available for the selected database server.
- You can right-click on any object listed in the Database Explorer tree and open a context menu. From the context menu you can Open, Run, Delete, and Rename the object. If applicable to the selected object, you can access the add the object to your Favorites folder or view Properties.

- You can view all of a QMF object's dependencies on other objects from the Database Explorer tree. All query objects, including procedures, listed in all of the Database Explorer branches, have a single child node that is labeled References. Expand the query object by clicking the (+) to the left, and then expand the branch References by clicking its (+) expand icon. The Object Analyzer is invoked. An analysis is triggered to determine the selected object's dependencies. All reference objects will display beneath the References nodes. All operations that can be performed on objects listed in the Database Explorer branches, can also be performed on these objects.
- If you select a table, the Object Analyzer will list the columns. The child node name is Columns. Expand the table object by clicking the (+) to the left, and then expand the branch Columns by clicking its (+) expand icon. The Object Analyzer is invoked. An analysis is triggered to determine the selected table's columns. All table column names will display beneath the Columns branch.

Type the SQL statements in the Query window

To type the SQL statements for a query you must first open a new query document. To open a new query document select **Create --> SQL Query**. The query window opens. You can type the SQL statements directly in the active query window.

Expression Builder

You can use the Expression Builder to help you build conditional expressions that can be included in the SQL statements for your query. Click the **Expression Builder** to access a submenu, or palette, of SQL elements for building an SQL expression. The Expression Builder palette contains common elements such as:

- operators (+, -, *, /)
- CONCAT
- ()
- constant
- column name
- special register
- function
- case expression

A template for each expression element you select is inserted into the query document. This provides the fundamental structure for you to substitute parameters for the query in place of the <expression>. For example,

```
CASE <expression> WHEN <expression> THEN <result-expression> ELSE
<result-expression> END
```

Note: This command is disabled for queries in the prompted or diagram formats.

The prompted view of a query

You can build simple to complex queries using the prompted query interface. Select **Create --> Prompted Query** to start building a query using the prompted query interface. The Prompted query interface has five sections where you specify the elements of your query. The five sections are:

- Tables where you specify the tables that will be used in the query.
- Join Conditions where you specify the join conditions for tables, if you are using multiple tables in the query.
- Columns where you specify what columns will be included in the query results
- Sort Conditions where you specify how the rows in the query results will be sorted.
- Row Conditions where you can specify conditions that will limit the rows that are returned in the query results.

In each section you can add, edit, delete and move through the entries using the icons located for each in the upper right hand corner.

Tables

You use the Tables dialog to specify the tables that you want to include in the query. You can specify one or more tables. If you specify more than one table, the Join Conditions dialog opens automatically.

Click the icon in Tables List box to add one or more tables to the query.

Table 97. Tables dialog

Field	Description
Table Owner	The owner identifier of the table that you want to include in the query. You can use patterns to select objects from a list of matching objects. • Use the percent character (%) to match a string of any length containing any characters. For example, to list all tables with a name beginning with the letter A, enter A%. • Use the underscore character (_) to match a single character. For example, to list all tables with an owner that has the letter A in the second position, enter _A%.
Table Name	The name of the table that you want to include in the query. You can use patterns to select objects from a list of matching objects. See Table Owner for information on matching objects.

Table 97. Tables dialog (continued)

Field	Description
Add from List	Lists the tables that are on the database server.

Join Conditions

You can add more than one table to a query. When you add an additional table to a query using the Tables dialog, the Join Conditions dialogs open automatically. There are two Join Conditions dialog windows:

- The Join Tables dialog, where you specify what type of join will link the tables, such as an inner join or left, right or full outer join.
- The Join Columns dialog, where you specify the columns from each table that will be joined

The Join Tables dialog box contains the following fields:

Table 98. Join Tables Dialog

Field	Description
Select a table to join into the query	Lists the tables selected for the query. This table will be joined to another table based on the join condition.
Select the type of join to perform	Select the type of join condition that will be used to connect the table listed to the previously selected table. You have four choices: • Inner Join • Right Outer Join • Left Outer Join • Full Outer Join
Inner join	Only rows with matching values in both tables will be included in the results set. An INNER join is implicit if you do not specify any other join operator. **Note:** An inner join compares every row of the left table with every row of the right table keeping only the rows where the join-condition is true. The resulting table may be missing rows from either or both of the joined tables.
Left Outer join	All rows in the left table, with matching rows from the right table, will be included. Outer joins include the rows produced by the inner join as well as the missing rows, depending on the type of outer joins. A **Left outer** join includes the rows from the left table that were missing from the inner join.

Table 98. Join Tables Dialog (continued)

Field	Description
Right Outer join	All rows in the right table, with matching rows from the left table, will be included. Outer joins include the rows produced by the inner join as well as the missing rows, depending on the type of outer joins. A **Right outer** join includes the rows from the right table that were missing from the inner join.
Full Outer join	All rows from both tables will be included For a FULL OUTER (or FULL) join, the join condition is a search condition in which the predicates can only be combined with AND. In addition, each predicate must have the form'expression = expression', where one expression references only columns of one of the operand tables of the associated join operator, and the other expression references only columns of the other operand table. The values of the expressions must be comparable. Each full join expression in a FULL OUTER join must include a column name or a cast function that references a column. The COALESCE and VALUE functions are allowed. Outer joins include the rows produced by the inner join as well as the missing rows, depending on the type of outer joins. A **Full outer** join includes the rows from both tables that were missing from the inner join.
Continue	Click **Continue** to join the tables. The Join Columns dialog box opens.

Joining Columns: Use the Join Columns dialog box to specify the columns that will used to link the tables. The columns from the current table that you are adding to the query and the columns from each table that is already included in the query are listed. Select a column from each list box with the same data type (`NUMERIC`, `DATE`, `TIME`, or `CHARACTER`). Rows that have equal values in those columns will be joined.

The Join Columns dialog box contains the following fields:

Table 99. Join Columns Dialog

Field	Description
Columns of	Lists all the columns that are included in the table that you are adding to the query. Select one column from this list. **Note:** Select a column with matching data types from each list.
Available columns to join	Lists all the columns from the table or tables that are already included in the query. Select one column from this list. **Note:** Select a column with matching data types from each list.

Columns

You use the Columns dialog to specify what columns will be included in the query results. By default, all the columns from a table that is included in the query are included in the query results. In the case where you have multiple tables included in the query, all the columns from each table will be included.

Select **Query --> Add --> Columns** or click the icon in Columns list box to specify the columns that will be included.

The following fields are available:

Table 100. Columns Dialog

Field	Description
Table	Lists the tables that are included in the query. If there are two or more tables, each table is prefixed by a letter, such as `Q.STAFF(A)` and `Q.INTERVIEW(B)`.
Column	Lists the columns for each table in the query
Type	Lists the data type (character, numeric or time) for each column, such as: `SMALLINT NOT NULL`
Label	Lists any labels associated with the column. Labels on columns are implemented as system column headings or column text. Column headings are used when displaying or printing query results.
Comments	Lists any comments associated with the table, such as: `Employee identification number`

Table 100. Columns Dialog (continued)

Field	Description
Or, enter an expression here	Use this field to enter a conditional expression that will determine whether a column is included in the query results. You can use the Expression Builder to help you build the expression. The Expression Builder offers a palette of common elements used to create SQL expressions, such as column names, constants, functions, and operators. When you click the Expression Builder buttons, templates for expression elements are inserted into the expression fields. You can invoke the Expression Builder by: 1. pressing **Alt** + **.** 2. clicking the browse icon to the right of the input field
Summary function	Apply the summary function to the column. A number of summary functions, including `AVERAGE`, `COUNT`, `MAXIMUM`, `MINIMUM`, and `SUM`. The summary function must be compatible with the data type of the column.
New column name	A new column name for a column that will be used in the query results. Usually, this is simpler name than the column name defined in the database. Select a column from the **Column** list box, then type a new column name in the **New column name** field. The column will be renamed in the query results, such as `SHIFTEND` from `A.ENDTIME`.

Sort Conditions

Sort condition control how to sort the rows that will be included in the query results. Rows can be sorted in ascending (A-Z) or descending (Z-A) order.

If you sort your rows by more than one column, the first column is ordered first, then the second column is ordered within the sort order defined for the first column.

There are several methods by which to specify a sort condition:

- From the *Columns in the results set* list, select a column included in the query
- From the *Other available columns* list, select a column that was not selected from the tables in the query

- From the *Or, enter a sort condition* field, type a sort condition

Click the icon in Sort Conditions list box to open the Sort Conditions dialog box and specify the sort conditions.

Table 101. Sort Conditions Dialog

Field	Description
Columns in result set	Lists the columns that will be included in the query results. • You can select one or more columns if you are adding a sort condition • You can select only one column if you are changing a sort condition
Other available columns	List columns that will not be included in the query results but are available in the table that was queried. You can select any of these columns for the sort.
Or, enter a sort condition	Type a condition by which columns should sort.
Expression Builder	The Expression Builder offers a palette of common elements used to create SQL expressions, such as column names, constants, functions, and operators. When you click the Expression Builder buttons, templates for expression elements are inserted. You can invoke the Expression Builder by: 1. pressing **Alt** + **.** 2. clicking the browse icon to the right of the **Enter a sort condition** field
Sort direction	Apply an ascending (lowest-to-highest) or descending (highest-to-lowest) sort order to the columns selected. The first column is used for the primary sort; subsequent columns will sort within the first.

Row Conditions

Use can specify row conditions to limit the rows that are returned in the query results. Without row conditions, all qualifying rows will be returned from the query.

Click the icon in the Row Conditions list box to open the Row Conditions dialog box and specify the row conditions.

Table 102. Row Conditions Dialog

Part of the row condition	Function
Connector	An ″And″ or ″Or″ statement that links one row condition with another. These radio buttons are available only when a row condition has been added to the query.
Left side	Select the column from the list box to examine for inclusion in the query results
Operator	Select the **Is** or **Is Not** radio button to determine the relationship between the left- and right sides of the row. Also, select the operation to be applied to the row condition from the Operator drop-down menu. The available operators are: • Equal To • Less Than • Less Than or Equal to • Greater than • Greater than or Equal to • Between • Starting with • Ending with • Containing • Null • Equal in area to
	• Larger than • Larger than or equal to
Right side	Type the condition for which to check the rows. Only rows that meet this condition will be selected for the query

Table 102. Row Conditions Dialog (continued)

Part of the row condition	Function
Expression Builder	Use the Expression Builder for building SQL expressions for the prompted query. The Expression Builder offers a palette of common elements used to create SQL expressions, such as column names, constants, functions, and operators. When you click the Expression Builder buttons, templates for expression elements are inserted into the associated SQL query window or prompted query window. You can invoke the Expression Builder by: 1. pressing **Alt** + **.** 2. clicking the browse icon to the right of the **Enter a sort condition** field

Global variables

QMF for WebSphere supports global variables in much the same way as QMF for Windows. See the Global Variable chapter in this book for more information.

Create new OLAP queries using the OLAP Query Wizard

For database servers that support DB2 Cube Views, you request information from the server using an OLAP query. OLAP queries are multidimensional queries that can present your data in a wide variety of views. You use the OLAP Query Wizard to help you build an OLAP query. The OLAP Query Wizard has the following steps:

- Open the OLAP Query Wizard
- Select a database server
- Specify how the list of cubes on the database server will be presented to you
- Select the cube that will be included in the OLAP query

Open the OLAP query Wizard

Select **Query--> OLAP Query** to Open the OLAP Query Wizard.

Select a server

Use the **OLAP Query Wizard Select a Server** dialog to select the database server where the cubes that will used in the OLAP query reside.

1. Select a server from the list.
2. Click **Next**.

   The **OLAP Query Wizard Sort Cube List by** dialog opens.

Sort Cube List by

Cubes are stored on the database server by schema and by model. You can choose how those cubes are presented to you for selection in the next step of the OLAP Query Wizard.

1. Select the sorting method to use.

   Select the **Schema** radio button to sort cubes by schema, which is the cube name or the owner of the object.

   Select the **Model** radio button to sort cubes by model.
2. Click **Next**.

   The **OLAP Query Wizard Select a Cube** dialog opens.

Select a Cube

The cubes that reside on the database server are presented in a tree structure based on the sort criteria you specified in the previous step. Use the **OLAP Query Wizard Select a cube dialog** to select the cube to use for the OLAP query.

1. Select the cube to use.

   If you sorted by **Schema** on the OLAP Query Wizard: Cube List Filters dialog box, the cube is shown in server, name, then cube order.

   If you sorted by **Model** on the OLAP Query Wizard: Cube List Filters dialog box, the cube is shown in server, model, then cube order.
2. Click **Finish**.

   The OLAP query is run on the database server. The results are returned in the active window.

Saving and opening queries

You can save queries on your PC, on a file server, or at a database server. A query is saved in the format that is currently being used to view the query. For example, if the query is being viewed in the prompted interface, it will be saved in the prompted format. If the SQL statements are being viewed, then the query will be saved in the SQL format. A saved query opens in the format in which it has been saved.

Saving queries to files

1. Create a query.
2. Select **Query--> Save to file**.
3. Type the query name.
4. Click **OK**.

Opening saved SQL query files

1. Select **Open--> From File**.

   The Open dialog box opens.
2. Select the file to open.

3. Click **OK**.

Saving SQL queries at the database server

Queries saved at the server so they are accessible to other users.

1. Open a query.
2. Select **Query--> Save at Server**.
3. Type an owner and a name.
4. Check the **Share the object with other users** check box to share the query with others.
5. Click **OK**.

Opening queries saved at the database server

You can open queries that have been saved at the database server.

1. Click **Open--> From Server**.

   The Open From Server dialog box opens.
2. Type a server, owner, and name.
3. Click **OK**.

Working with query results

After you run a query, the results are returned in the active window. Once you have query results you have several options:

- Use the Query Results Explorer to change the query results in the active window by applying extensive formatting options
- Create a classic or visual report
- Create a chart
- Save the query results

Query Results Explorer

The Query Results Explorer opens in the Explorer window when the results of the query are returned. The Query Results Explorer displays the query results in a tree structure. The tree structure looks very similar for both SQL and OLAP queries with the exception of the branch names.

You can use the Query Results Explorer to move around, discover and easily modify the structure of the query results. The formatting options available to you depend on the type of query that was run to create the results.

Working with the Query Results Explorer

There are two ways of working in the Query Results Explorer:

- using a context menu
- drag and drop

You can change the order of columns in the query results by dragging and dropping columns to and from branches in the Query Results tree. You can also add or delete columns to and from the query results by dragging and dropping to and from branches in the Query Results tree.

You can right-click in the Query Results tree to open different context menus. Using some of the options from the context menu you can:

- Apply formatting to whole columns and unique formatting to cells within columns
- Apply grouping to columns in the query results
- For SQL queries, you can add columns to the query results based on expressions
- Remove columns from the query results

The functionality of the Query Results Explorer in QMF for WebSphere is very similar to its functionality in QMF for Windows. See the Query Results chapter for more information on what you can do with the Query Results Explorer.

Create a classic or visual report

There are two types of reports:

- Classic reports

  Character based reports that are created using forms.
- Visual Reports

  Robust reports containing graphics and rich-formatted text created visually using layout templates

You begin the process of creating either type of report with the Report Wizard. The Report Wizard opens when you have query results in the active window and you:

- Select **Results--> Display Report** from the main menu.
- Select **Results--> Display Report** from the Actions window.

Using the Report Wizard

You begin the process of creating a report with the Report Wizard. The Report Wizard helps you find the dialogs you need to create a new or open an existing report. The process flows as follows:

1. You specify that you are creating a new report or opening an existing report stored in a file or saved on the database server.
2. If you are opening an existing report stored in a file or saved on the database server, the dialogs that you need to open the existing report are presented to you. Based on your input, the Report Wizard opens the existing report.

3. If you are creating a new report, then you specify whether you will be creating a classic report or a visual report. Based on your input, the Report Wizard opens the dialogs that you need to create the report.

Table 103. Report Wizard

Field	Description
Report Wizard Type page	• Select **Create a new report** to create a new classic or visual report. The Report Wizard New Report page opens. • Select **Use an existing report stored at a server** to open an existing report that has been saved at the database server. The Report Wizard Open from Server page pens. • Select **Use an existing report stored at a file** to open an existing report that has been stored in a file. The Report Wizard Open from file page opens.
Report Wizard New Report page	• Select **Create a visual report** to create a new visual report. Specify whether the new report will be generated using the formatting that has been applied to the current query results or very basic, default formatting. The report opens in the Visual Report window. • Select **Create a classic report** to create aa new classic report. Specify whether the new report will be generated using the formatting that has been applied to the current query results or very basic, default formatting. The report opens.
Report Wizard Open from Server	Specify the database server, the owner and the name of the visual report or a form for a traditional report that you want to open. You can use the **List** button to search the database to see a list of the visual reports or forms that are on the database server.
Report Wizard Open from file	Specify the **Name** of the file or use the **Browse** button to search for the file.

Create a new classic or visual report

Follow these steps to create a new classic or visual report:

1. Select **Query--> Run** to run a query and obtain query results.
2. *Optional:* Use the Query results Explorer and the formatting options to format the query results in the active window. When either the classic or visual report is created, the formatting that is applied to the report is taken from the query results or the default report specifications.
3. Select **Results--> Display Report** from either the main menu or a context menu.

The Report Wizard opens.

4. Select **Create a new report** from the Report Wizard Type page. Select **Create a classic report** or **Create a visual report** from the Report Wizard New Report page.
5. Since this is a new report, and there is no assigned form or formatting instructions, you must specify how the report will be generated. You can select **Generated based on the current query** to generate the report based on the way the query results currently are formatted or you can select **Default** to generate the report based on a very basic set of default formatting options. The report opens.
6. When the report opens, you cannot edit the contents or the formatting of the report. You can:
   - Export the report
   - Change the data source of the report
   - Change the default report options.
   - Print the report
   - Save the report

Create a chart

You can display the query results as a chart. All numeric data columns in the query results can be charted. You can specify the type of chart and different charting options for each set of query results.

To display the query results as a chart:

1. Open the Chart window.

   The Chart windows opens. The numeric data columns of the query results are charted according to the default chart options.
2. *Optional:* To change the type of chart or the appearance of the chart, click the **Options** button which is located at the bottom of the window.
3. *Optional:* To open a new window that includes just the chart, click the **New** window button. A separate browser window opens.

QMF for WebSphere Report Center

QMF for WebSphere Report Center is used to view reports that were created and saved on the database server using QMF for Windows Report Center.

To use QMF for WebSphere Report Center, open a web browser and go to:

`http://host:port/QMFWebSphere/Pages/RcMain.jsp`

where *host* is the host name of the WAS server machine and *port* is the port on which the QMF for WebSphere application is configured to listen.

Opening a report

QMF for WebSphere Report Center uses a tree structure to organize and display reports and QMF objects that are available for your use.

Expand or collapse branches from the tree to find your report. Select or double click on the report to open.

Navigating the tree

The QMF for WebSphere Report Center tree consists of three main branches:

- Favorites
- DB2 Servers
- Recycle Bin

Favorites

The Favorites branch lists reports and folders of reports that you have selected and placed in the folder. The reports and folders reside on your machine's local hard drive or on a network drive. The actual entry in your Favorites folders points to the object on the database server that is used to create the report. That object does not actually reside in your Favorites folder, it remains safely on the database server. The entry in your Favorites folder also contains the instructions as to how the report will be formatted.

DB2 UDB Servers

Each database server that has been configured in the server definition file (SDF) is by default displayed as a branch under the DB2 UDB servers branch. The SDF used is configured and distributed by your QMF for Windows Administrator.

Each database server branch lists the objects (could be contained in folders) that have been created and saved to that database server and a Public Favorites folder that is created when QMF for WebSphere Report Center and QMF for WebSphere are installed.

There is only one Public Favorites folder on a database server, however, it can contain many subfolders. The Public Favorites folders list the reports that have been saved to the database server by one or more users of QMF for WebSphere Report Center. Your view of the Public Favorites folders (what reports are listed and that you can access) is dictated by security permissions that are specified using the QMF resource limits and security permissions specified when the report was created. Reports that reside on the Public Favorites folders point to an object that is used to retrieve data from a database server to create a report.

Your access to the objects on a database server is dictated by the permissions granted to your user ID and password as well as security permissions that are specified by the QMF for Windows Administrator using the QMF resource

limits. If you can access an object (query, table, procedure) from the Report Center tree based on the permissions granted to user ID, then you can run the object and obtain query results. The query results are formatted using default formatting. By directly running an object from a database server you are creating an ″ad-hoc″ report. In order to save those query results, you must save them as a report in either the personal Favorites or the Public Favorites (if you have permission) folders. Saved reports point to the objects that were used to create them, and the formatting that is to be applied to the query results.

Specify user information

Before connecting to a database server, you must specify your user ID and password. You use the **Set User Information** window to specify a user ID and password that QMF for WebSphere Report Center will use for the current connection to the database server.

QMF for WebSphere Report Center always opens the Set User Information window requesting user ID and password information before making any connection to a database server. For each database server that you connect to, you can specify a unique user ID and password.

Appendix A. Accessibility

Software accessibility features help individuals with physical disabilities, such as restricted mobility or limited vision, to use their computers.

QMF for Windows accessibility features include:

- Standard keyboard equivalents
- Standard keyboard navigation
- Operating system accessibility
- Assistive technology products
- Navigation concepts

QMF for WebSphere accessibility features include:

- Standard keyboard navigation
- Operating system accessibility
- Assistive technology products
- Navigation concepts

QMF for Windows accessibility features

Standard keyboard equivalents

The keyboard is the most frequently used alternative for performing mouse functions. Keyboard equivalents use keyboard keys to perform mouse actions instead of using a mouse. For example, QMF for Windows supports the following keyboard equivalents:

- Shortcut, or accelerator keys, to perform the most frequently used functions in pull-down menus without going to the menu. For example:
  - **Ctrl+S** to save
  - **Ctrl+P** to print
  - **Ctrl+R** to run a query

  Shortcuts display in the pull-down menu next to its function.
- Mnemonics, or access keys, are available to perform each function on a menu or dialog box. A mnemonic for a function is the underlined character in the function name. For example, press...
  - F to open the File menu
  - O to open the Open dialog box

Use **ALT** to activate the mnemonic and move the keyboard focus.

For more information, refer to the Microsoft Windows Keyboard Design Guide for a complete list of standard keyboard equivalents.

Standard keyboard navigation

"Keyboard navigation" refers to using keys instead of a mouse to move from item to item on your screen. The movement is usually in the order specified by the operating system or your application.

QMF for Windows follows the standards with regard to the typical keys used for keyboard navigation such using **TAB** and **SHIFT+TAB** to move between controls, and arrow keys to move up, down, and sideways between items.

Operating system accessibility

The Windows operating system has a set of accessibility options that enable individuals with disabilities to customize system-wide settings. Individuals can set these options with the Accessibility Wizard on the Control Panel.

QMF for Windows:

- Inherits settings from the Microsoft Windows operating system
- Does not interfere with keyboard accessibility features built into the Windows operating system
- Complies with the IBM Software Accessibility Checklist.

For more information, please go to:

`http://www.ibm.com/able/accesssoftware.html`

Assistive technology products

QMF for Windows supports assistive technology products, such as screen readers and voice synthesizers.

Note: QMF for Windows requires special navigation when using a screen reader with query results. See "Navigation in QMF for Windows" for more information.

Navigation in QMF for Windows

Table 104. Navigation Concepts

To...	Do the following...
Obtain online help	Press **F1** or **Alt+H**. **Note:** In online help, use **Tab** to jump from link to link, then press **Enter** to open the link.

Table 104. Navigation Concepts (continued)

To...	Do the following...
Add object or condition	1. **Tab** to a pane, such as in the Prompted Query dialog box. 2. **Tab** to the ″Add″ icon. 3. Press spacebar to display the ″Add″ dialog box.
Select multiple objects	1. **Tab** to the list box. 2. Press **Shift+Arrow** to select rows. 3. Press **Shift+Enter** to add the objects.
View object properties in an object list	1. Select the object from the object list. 2. Press **Alt+Enter**.
Use screen reader for query results - or - Use browser to display query results in high-contrast mode for the visually impaired	**Option 1** 1. Run the query. 2. Press **Alt+R** to open the Results menu. 3. Select **Save to File**. 4. Select HTML file (*.htm) for **Save as Type**. 5. Open the *.htm file in browser. **Option 2** 1. Run the query. 2. Press **Alt+R** to open the Results menu. 3. Select **Display Report**. 4. Select the form type. 5. Press **OK**. 6. Press **Alt+O** to open the Form menu. 7. Select **Convert to HTML form**. 8. Check the **Include tabular data as HTML table** check box. 9. Press **OK**. 10. Press **Alt+O** to open the Form menu. 11. Select **View in Web browser** **Option 3**. 1. Run the query. 2. Press **Alt+R** to open the Results menu. 3. Select **Save to File**. 4. Select CSV file (*.csv) for **Save as type**. 5. Open the *.csv file in Microsoft Explorer or Lotus 1-2-3.

Table 104. Navigation Concepts (continued)

To...	Do the following...
Edit (editable) rows in list box	1. **Tab** to the list box, such as the Global Variables dialog box. 2. Press the spacebar or move the arrow key to select the row. 3. Press **F2** to activate edit mode. 4. Use **Tab** to move between columns and rows. 5. Press **Enter** to accept edits. 6. Press **Tab** to exit the listbox and move to the next control in the dialog.
Edit query results	1. Press **Alt+E** for the Edit menu. 2. Select **Find**. The Find dialog box opens. 3. Type the search text 4. Press **Enter**. 5. Press **Esc** to close the Find dialog box. 6. Press **Enter** to edit the cell.
Change font for query results	1. Run the query 2. Press **Ctrl+A** to select all 3. Press **Alt+R** to display the Results menu 4. Press **F** to display the font dialog box

QMF for WebSphere accessibility

Standard keyboard navigation

″Keyboard navigation″ refers to using keys instead of a mouse to move from item to item on your screen, usually in the order specified by the operating system or your application.

QMF for WebSphere follows the standards with regard to the common keys used for keyboard navigation such using **TAB** and **SHIFT+TAB** to move between controls, and arrow keys to move up, down, and sideways between items.

Operating system accessibility

Your operating system has a set of accessibility options that enable individuals with disabilities to customize system-wide settings to further enhance and improve their ability to use their computer. QMF for WebSphere inherits and does not interfere with the keyboard accessibility features that are set for the operating system.

Assistive technology products

QMF for WebSphere supports assistive technology products, such as screen readers and voice synthesizers, to deliver information in a more accessible manner.

Keyboard navigation in QMF for WebSphere

Table 105. Navigation Concepts

To...	**Do the following...**
Move focus through each element	Press **TAB** to move forward or **SHIFT+TAB** to move in the opposite direction.
Emulate clicks on a link	Use the **TAB** key to jump from link to link, then press the **Enter** key.
Emulate clicks on a button	Use the **TAB** key to jump from button to button, then press the key.
Within a dialog, activate the default action	Press the **Enter** key.
Within a dialog, cancel the action	Press the **Esc** key.
Move focus to the command line	Press the **ALT+C** keys.
Move focus to the main menu	Press the left **ALT** key. Navigate through the menu commands using the arrow keys.
Open context menus	Press the **Context menu key** if you have an extended keyboard. You can also press the right **Ctrl** key to open a context menu. Navigate through the menu commands using the arrow keys.

Appendix B. Object Analyzer

Determining dependencies

The Object Analyzer provides information about the dependencies an object has on other objects, such as queries that are referenced by a procedure. The analysis is based on the retrieval and parsing of an object (based on the current user and substitution values), the determination of which objects are referenced, and an analysis performed on all referenced objects.

The Object Analyzer analysis is triggered when you expand the Dependencies node on the Database Explorer tree. This analysis will return dependency information, as described in the next section.

Displaying dependencies

Objects displayed in the Database Explorer tree have a single child node that is labeled, *Dependencies*.

When you expand the Dependencies node on the Database Explorer tree, an analysis will be triggered to determine the selected object's dependencies, as described above. After the analysis, all referenced objects will display beneath the Dependencies nodes and all operations that can be performed on regular objects can be performed on objects in the Dependencies node.

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Glossary

A

accelerators. Functions, also known as shortcut keys, available on pull-down menus to select an option via the keyboard rather than a mouse.

access keys. (*mnemonics*): An underlined character that performs each menu or dialog function.

accessibility. Software and hardware accessibility features help those with physical disabilities to use their computer.

accessibility options. Options available through the Accessibility Wizard in the Windows operating system used to deliver information in a more accessible manner.

ad hoc query. A query that has not been named or saved; it has been submitted and executed ″on the fly.″

aggregation. Data that is the result of applying a process to combine data elements. Data that is taken collectively or in summary form.

B

bind. A process that compiles one or more DBRMs into an application plan.

C

column. Contains the values that have the same data type in the database. A value is similar to a field in a record. A value is the smallest unit of data that you can manipulate with SQL. The two basic components of the column definition are the name and the data type.

CPI-C. (Common Programming Interface for Communications): Provides a cross-system-consistent and easy-to-use programming interface for applications that require program-to-program communication. CPI-C defines a single programming interface to the underlying network protocols across many different programming languages and environments.

csv. (Comma Separated Values): A file format used as a portable representation of a database. Each line is one entry or record and the fields in a record are separated by commas. Commas may be followed by arbitrary space and/or tab characters which are ignored. If field includes a comma, the whole field must be surrounded with double quotes.

D

DB2 Warehouse Manager. A graphical environment for creating and managing high-performance, scalable DB2 data warehouses.

DB2 Warehouse Manager includes the Information Catalog, which enables users and Administrators to directly register information in the catalog--from QMF for Windows--such as spreadsheets, reports, queries, and other relevant information that will be shared.

dbf. (dBase database file): A file format for exporting a database file.

decimal delimiter. A character or string used to separate or mark the start of and end of items of data in a database, text file, or in source code. A decimal delimiter uses a period or comma to delimit this data.

default resource limits group. When the system administrator does not assign a user to a resource limits group or when there are no active schedules in the resource limits group to which a user is assigned, the user is assigned to the default resource limits group <Default> automatically.

DRDA. (Distributed Relational Database Architecture): A set of protocols that software developers can follow to develop connectivity solutions between heterogeneous RDBMs. DRDA coordinates communication between an application requester (such as QMF for Windows) and an application server (such as DB2), by defining what must be exchanged and how it must be exchanged.

dynamic query. A query whose SQL text is passed to a database server each time it is executed. Dynamic queries can contain substitution variables.

dynamic SQL. A set of facilities which allow the development of generalized programs; these programs, in contrast to static SQL programs, can accept actual SQL statements at execution time and prepare and execute them.

E

edit codes. Codes that determine how a column is formatted in a report. You use different edit codes depending on the type of data you want to format. Some edit codes include: character, date, graphic, numeric, time, timestamp, and user-defined.

embedded SQL. SQL statements are embedded within a host language program and are prepared (via the BIND process) before the program is executed.

Expression Builder. A utility that assists in building expressions for SQL queries and prompted queries. The Expression Builder presents a palette of common elements used to create SQL expressions such as column names, constants, functions, and operations. When you click the Expression Builder buttons, templates for expression elements are inserted into the corresponding SQL query window or prompted query expression window.

F

form. An object that contains the specifications for printing or displaying a report or chart. The resulting report is based on certain default choices made by QMF about the format of the report. You can modify forms by specifying break information, calculations, column alignment, grouping and aggregations, and other attributes.

G

global variable. Used for executing queries, procedures, or forms. In a query or procedure, no dialog box displays for the user to enter a value if a user-defined global variable has been created. The value specified for that global variable will be used instead.

governing. Establishes certain limits and controls for database and communication resources.

H

high-contrast mode. A system setting by which visually impaired users can view the screen.

host variable. Host variables enable you to use the same static query to retrieve different data. To retrieve different data, you do not need to rebind a package for the static query; instead, you supply different values for the host variables in the query.

Database servers specify rules for where host variables can appear in a query. Refer to documentation for your database server for these rules.

Host variables must have a specific data type. A value that you provide for a host variable must conform to that variable's data type.

HTML. A platform independent programming code file. Contains unformatted ASCII text instructions used by a Web browser on the World Wide Web. Invented by Tim Berners-Lee, formerly of CERN-Geneva.

I

Information Catalog. Included in the DB2 Warehouse Manager, and enables users and

Administrators to directly register information in the catalog--from QMF for Windows--such as spreadsheets, reports, queries, and other relevant information that will be shared

Information Catalog Manager. A component of DB2 Warehouse Manager that: populates the catalog through metadata interchange with Data Warehouse Center and other analytical and reporting tools; enables users to register shared information objects directly; provides direct navigation or searching across objects to find relevant information; displays metadata about the object; launches tools used to render the information for the end-user.

Intelligent Miner Scoring. A tool that is implemented as database extenders. Your applications score records--segment, classify, or rank the subject of those records--based on a set of predetermined criteria expressed in a data mining model. The mining model and the scoring logic are isolated from the application.

ixf. (Integration Exchange Format): A file format used to import or export data.

J

job. A file used to schedule and run unattended procedures. A job file can store a user ID, encrypted password, and substitution variables.

K

keyboard equivalents. Keystrokes necessary to perform mouse functions using the keyboard.

keyboard navigation. A method of using the keyboard instead of the mouse to move from item to item on your screen.

L

large object. (LOB): A database entry containing a file that is stored within the database. LOBs can contain text files, multimedia files, or virtually any type of object.

linear procedure. Any procedure that does not begin with an IBM Object REXX comment. A linear procedure can run QMF commands, comments, blank lines, RUN commands, and substitution variables.

list. To display data in an ordered format. For example, the LIST command in BASIC displays lines of a program. A list is any ordered set of data.

LOB. (Large Object): A sequence of bytes representing bit data, single-byte characters, double-byte characters, or a mixture of single- and double-byte characters. A LOB can be up to 2 GB-1 byte in length.

LOB values may or may not be stored inline with other row data in the database. In either case, LOBs have the full transactional support of the database server. A database table stores a LOB locator which points to the LOB value which may be in a different storage space.

M

matching patterns. A character (such as % or _) used in a query, form or table name instead of a specific character.

Use the percent character to match a string of any length containing any characters. Use the underscore character to match a single character.

mnemonics. (*access keys*): An underlined character that performs each menu or dialog function.

N

natural query. A query written in conversational English, such as, "Show me all the managers who work 45 hours or more." The query is converted to SQL and run normally at the database. You must have EasyAsk installed on your machine to use natural queries.

neural clustering. (*Used in Intelligent Miner Scoring*): A technique that employs a type of neural network called the Kohonen feature map that clusters together similar data records and

defines the typical attributes of an item that falls in a given cluster or segment. It discovers associations, sequential patterns, and similar time sequences and creates predictive or classification models of the data. It performs deviation detection by relying heavily on statistical analysis and visualization. The visualization techniques are useful for detecting deviations that hold for a rather small subset of the data, while it uses statistics to measure their significance.

O

object. A query, form, procedure, or table.

object list. Tree-structured representations of the database objects available on the server. Which objects can be viewed depends upon your resource limits. Objects can be added and removed from the object list; also, the objects can be saved and shared with other users.

object tracking. An option that keeps a detailed record whenever a specific object is used, and identifies the time the object was run, who ran it, and the results.

ODBC. (Open Database Connectivity): A standard for accessing different database systems. There are interfaces for Visual Basic, Visual C++, SQL and the ODBC driver pack contains drivers for the Access, Paradox, dBase, Text, Excel and Btrieve databases.

An application can submit statements to ODBC using the ODBC flavor of SQL. ODBC then translates these to whatever flavor the database understands. ODBC is based on Call-Level Interface and was defined by the SQL Access Group.

OLAP. (On-line analytical processing) OLAP queries perform complex calculations, trend analyses and modeling, derived from end-user requirements. OLAP queries can be used to perform ad hoc analyses of data in multidimensions.

P

procedure. An object containing QMF commands. A procedure can be run with a single RUN command.

A procedure is a set of commands that enable you to run queries, print reports, import and export data, and perform other functions with a single command.

procedure comments. Text that is not part of the actual commands that are executed when you run a procedure. Use comments within the procedure to store information for future reference about the procedure.

Procedure comments begin with two hyphens (--) and can continue to the end of the line on which they appear. You can include as many comments as you want in a procedure. A procedure's comments, including the hyphens, are ignored by QMF for Windows until you remove the hyphens (uncomment) or remove the comments.

procedure continuation lines. Each line of a procedure typically contains a single command. You can, however, continue a command over multiple lines by placing a plus sign (+) in the first column of each additional line.

procedure with logic. Any QMF procedure beginning with an IBM Object REXX comment. In a procedure with logic, you can perform conditional logic, make calculations, build strings, and pass commands back to the host environment.

prompted query. A query that is built based on the user's responses to a set of dialog windows. Prompted queries are the recommended method for writing and editing queries if you are not familiar with SQL syntax.

Q

query. A request for a specific result set of information from a database. You can work with an SQL query, a prompted query or a natural query.

query comments. Text that is not part of the SQL code executed by the database server. Use comments in the query to store information about the query for future reference.

Query comments begin with two hyphens (- -) and can continue to the end of the line on which they appear. The query comments and hyphens are ignored by QMF for Windows and the database server at which you run the query. For example:

```
SELECT ID, NAME --names of the columns used
FROM Q.STAFF -- the table containing these
 columns
```

quoting characters. Characters used for character values and identifiers. Legal characters are the apostrophe (') and the quotation mark ("). Different quoting characters must be assigned for character values and identifiers.

R

resource limits. Limits and controls that govern the use of database and communication resources. These include setting schedules, time-outs, limits, authorization to SQL verbs, binding and object tracking privileges, LOB options, Report Center, and other options.

resource limits group. Users belonging to a group for which certain restrictions and permissions have been defined for schedules, time-outs, limits, SQL verbs, options, save data, binding, object tracking, LOB options, and the Report Center.

resource limits group schedule. The days and times during which the schedule for a resource limits group is active or inactive. The schedule includes parameters for time-outs, limits, SQL verbs, miscellaneous options, binding, save data, object tracking, LOB options, and Report Center.

restricted object. An object that is available only to its owner. Queries, forms, tables, and procedures are all objects.

results grid. The results of an SQL query, prompted query, or procedure. A preview of the results before the data is saved to a form, exported, or saved as a chart.

REXX. (Restructured Extended Executor): IBM Object REXX, an interpreted, structured, procedural script programming language that allows programs and algorithms to be written in a clear structured way.

It was designed so that it would be truly easy to use for both professionals and casual users and was designed to work in several diverse application areas -- such as personal programming, command processing, application macro processing and application prototyping -- where different languages are typically used. It is, however, designed to be platform-independent.

S

screen reader. An assistive technology product used to deliver information in a more accessible manner to those who cannot use a mouse.

security. Techniques for ensuring that data stored in a computer cannot be read or compromised. Most security measures involve data encryption and passwords. Data encryption is the translation of data into a form that is unintelligible without a deciphering mechanism. A password is a secret word or phrase that gives a user access to a particular program or system.

server. A computer system that processes database queries, such as those from QMF for Windows.

server definition file. (SDF): An initialization file created and maintained by QMF for Windows Administrator that defines server, connection, resource limits, and other crucial information for QMF for Windows to connect to the database server. The SDF is updated each time a database server s added, updated or deleted.

shared object. An object that is available to all users. Queries, forms, tables, and procedures are all objects.

shortcut keys. Functions, also known as accelerator keys, available on pull-down menus to select an option via the keyboard rather than a mouse.

shp. (Shape File format): A file format for spatial data, which is exported data represented in multiple layers, such as in a topographical map.

SNA. (Systems Network Architecture): A set of network protocols developed by IBM. Originally designed in 1974 for IBM's mainframe computers, SNA has evolved over the years so that it now also supports peer-to-peer networks of workstations.

spatial data. Any information about the location and shape of, and relationships among, geographic features. This includes remotely sensed data as well as map data.

special characters. Any characters that are not included in the list of regular characters, including:

- A through Z (uppercase)
- 0 through 9
- #
- $
- @
- _

SQL query. (Structured Query Language): A standardized language for defining and manipulating data in a relational database. SQL is used to write queries in descriptive phrases.

static query. An SQL query that has been previously passed to a database server and bound into a package.

When a static query is executed, the database server uses the SQL text bound into the package, rather than the SQL text currently appearing in the query window. Static queries are more resource efficient than dynamic queries, but static queries cannot be edited.

static SQL. SQL statements, embedded within a program, that are prepared during the program preparation process, before the program is executed. After being prepared, the SQL statement does not change (although variable values that are specified by the statement might change).

stored procedure. A group of SQL statements that form a logical unit and perform a particular task. Stored procedures are used to encapsulate a set of operations or queries to execute on a database server. For example, operations on an employee database (hire, fire, promote, lookup) could be coded as stored procedures executed by application code. Stored procedures can be compiled and executed with different parameters and results, and they may have any combination of input, output, and input/output parameters. Stored procedures are supported by most DBMSs, but there is a fair amount of variation in their syntax and capabilities.

string delimiter. A character or string used to separate or mark the start of and end of items of data in a database, text file, or in source code. A string delimiter uses an apostrophe or quote to delimit this data.

substitution variable. A variable in a procedure or query whose value is specified by a global variable or a run-time variable. Or, it is a variable in a form whose value is specified by a global variable.

Substitution variables must begin with an ampersand (&) and can contain up to 18 characters, which can be alphabetic, numeric or one of the following characters: `[ ! $ ~ { } ? @ # % \ _`.

T

table. A collection of stored data under the control of the relational database manager, consisting of a fixed number of rows and columns. You can interact with tables by running queries or by using the table editor.

table editor. A tool used to search for, add, edit or delete table data without writing QMF statements.

TCP/IP. (Transmission Control Protocol/Internet Protocol): The suite of communications protocols used to connect hosts on the Internet. TPC/IP uses several protocols, the two main ones being TCP and IP. TCP/IP is built into the UNIX operating system and is used by the Internet, making it the *de facto* standard for transmitting data over networks.

txt. (Text): A text-only file format (.txt).

U

usage code. Codes that control how data is summarized, such as at the end of a column or as a partial summary at the control breaks in a table. Which usage codes are available depend on the data in the column and the type of summary.

V

variable. A data element that specifies a value that can be changed. A variable is a symbol or name that stands for a value.

voice synthesizer. An assistive technology product used to deliver information in a more accessible manner to those who cannot use a mouse.

W

WinCPI-C. (Windows Common Programming Interface for Communications): A portable application programming interface (API), that enables peer-to-peer communications among programs in an SNA environment.

CPI-C enables application programs distributed across a network to work together. By communicating with each other and exchanging data, they can accomplish a single processing task, such as querying a remote database.

WYSIWYG. (What You See is What You Get): a method by which the content of a document or form appears as it has been formatted, such as displaying a custom font style or aggregation and grouping.

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