iSecurity

DB-Gate™ User Manual

Software Version: 02.33

July 2014

RAZ-LEE™

The iSeries Security Experts

Copyright Notice

This document is provided by Raz-Lee Security for information purposes only.

The software described in this document is provided under Raz-Lee's license agreement.

Visit our web site at www.razlee.com.

Record your product authorization code here.

Computer Model	
Serial Number	
Authorization Code	

Table of Contents

1 About This Manual

This user guide is intended for system administrators and security administrators responsible for the implementation and management of security on IBM System i (AS/400) systems. However, any user with basic knowledge of IBM System i operations will be able to make full use of this product after reading this book.

Product Documentation Overview

Raz-Lee takes customer satisfaction seriously. Our products are designed for ease of use by personnel at all skill levels, especially those with minimal IBM System i experience. The documentation package includes a variety of materials to get you familiar with this software quickly and effectively.

Printed Materials

This user guide is the only printed documentation necessary for understanding this product. It is available in user-friendly PDF format and may be displayed or printed using Adobe Acrobat Reader version 6.0 or higher. If you do not have Acrobat Reader, you can download it from the Adobe website: http://www.adobe.com.

This manual contains concise explanations of the various product features as well as step-by-step instructions for using and configuring the product.

Online Help

IBM System i context sensitive help is available at any time by pressing the F1 key. A help window appears containing explanatory text that relates to the function or option currently in use. Online help will shortly be available in Windows help format for viewing on a PC with terminal emulation.

Typography Conventions

- Menu options, field names, and function key names are written in **Courier Bold**.
- References to chapters or sections are written in ***Italic.***
- IBM i (OS/400) commands and system messages are written in **Courier**.
- Key combinations are separated by a dash, for example: Shift-Tab.
- Emphasis is written in **Times New Roman bold**.

iSecurity Product Suite

Raz-Lee's iSecurity is an integrated, state-of-the-art security solution for all System i servers, providing cutting-edge tools for managing all aspects of network access, data, and audit security. Its individual components work together transparently, providing comprehensive "out-of-the-box" security.

The iSecurity Product Suite includes:

Product	Description
Anti-Virus 	Anti-Virus is a dedicated iSeries-specific product engineered to provide full protection to the server, its file contents, and resident iSeries or System i dedicated software.
AP-Journal 	AP-Journal automatically manages database changes by documenting and reporting exceptions made to the database journal.
Assessment 	Assessment checks your ports, sign-on attributes, user privileges, passwords, terminals, and more. Results are instantly provided, with a score of your current network security status with its present policy compared to the network if iSecurity were in place.
Audit 	Audit is a security auditing solution that monitors System i events in real-time. It includes a powerful query generator plus a large number of predefined reports. Audit can also trigger customized responses to security threats by means of the integrated script processor contained in Action.

Product	Description
Authority On Demand 	Authority on Demand provides an advanced solution for emergency access to critical application data and processes, which is one of the most common security slips in IBM System i (AS/400) audits. Current manual approaches to such situations are not only error-prone, but do not comply with regulations and often-stringent auditor security requirements.
Capture 	Capture silently captures and documents user screens for tracking and monitoring, without any effects on system performance. It also preserves job logs for subsequent review. Capture can run in playback mode and can be used to search within texts.
Change Tracker 	Change Tracker automatically tracks modifications in the software and file structure within production libraries. Changes are tracked at both the object and source levels. It does not require any special actions by programmers.
COMMAND 	COMMAND monitors and filters commands and its parameters before they are run, enabling you to control each parameter, qualifier or element, in conjunction with the context in which it is about to run. Options include Allow, Allow with Changes and Reject. It includes a comprehensive log, proactive alerting and easily integrates with SIEM.
Firewall 	Firewall protects and secures all types of access, to and from the System i, within or outside the organization, under all types of communication protocols. Firewall manages user profile status, secures entry via pre-defined entry points, and profiles activity by time. Its Best Fit algorithm determines the validity of any security-related action, hence significantly decreasing system burden while not compromising security.

Product	Description
Password 	Password provides a first-tier wall of defense for users by ensuring that user passwords cannot be easily cracked.
Screen 	Screen protects unattended terminals and PC workstations from unauthorized use. It provides adjustable, terminal- and user-specific timeout capabilities.
View 	View is a unique, patent-pending, field-level solution that hides sensitive fields and records from restricted users. This innovative solution hides credit card numbers, customer names, and so on Restricted users see asterisks or zeros instead of real values. View requires no change in existing applications. It works for both SQL and traditional I/O.
Visualizer 	Visualizer is an advanced DWH statistical tool with state-of-the-art technology. This solution provides security-related data analysis in GUI and operates on summarized files; hence, it gives immediate answers regardless of the amount of security data being accumulated.

2 Overview

Raz-Lee Security's **DB-Gate**, part of the iSecurity suite, lets you open concurrent and transparent SQL connections to numerous types of remote data sources and databases. You can do this on any IBM or non-IBM platform using STRSQL and compile using CRTSQL for programs which refer to these databases.

DB-Gate is a client-only product, so it saves you both money and time you would otherwise require to integrate new hardware or set up a complicated API.

System Requirements

Make sure your system meets the following requirements:

- **DB-Gate** requires the IBM i (OS/400) operating systemV5R3 or later
- **DB-Gate** requires Java 5.0 or later

Starting DB-Gate

To begin using **DB-Gate**, type **STRDB** on any command line. The **DB-Gate** main menu is displayed as shown below in Figure 2-1 on page 6.

You can access the different features from the **DB-Gate** main menu. The various feature groups are described in the following chapters:

- Remote DB Definitions
- DB Drivers
- Activity Log
- General Configuration and Maintenance

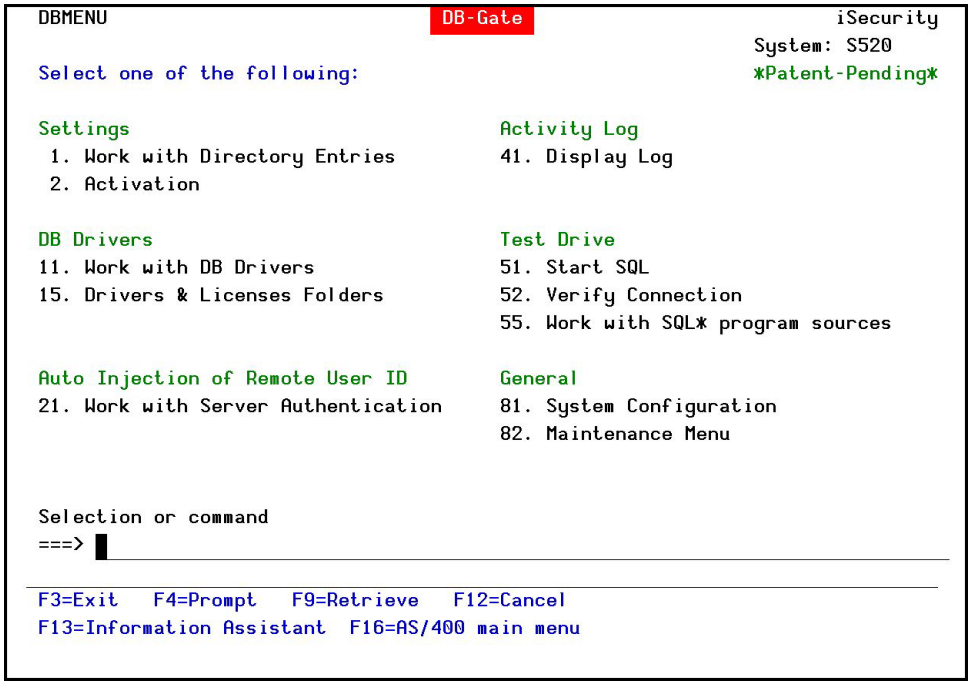


Figure 2-1. DB Gate Main Menu

Why You Need DB-Gate

IBM System i (AS/400) users often require access to remote, non-DB2 databases that do not support DRDA server behavior, such as Oracle, MS-SQL and Derby. These databases run on various operating systems and use standard languages (for example, SQL).

Typical Remote Access Limitations

To successfully access remote databases, companies have selected products based on either of the following limited methods:

- Using ambiguous or non-standard APIs that are not defined through RDBDIRE (relational Database Directory Entry) and therefore make no use of an ARD program.
- Selecting a client-server configuration that requires additional hardware.

These options are cumbersome and require special settings which often prevents the user from fully utilizing standard SQL commands on the IBM System i and often include hidden infrastructure costs as well.

DB-Gate Benefits

- “Opens” the entire non-DB2 spectrum of databases.
- Greatly expands programmer’s capabilities when working with non-DB2 databases.
- Reduces the need for redundant data and ETL (extract, transformation, load) data manipulation products. Eliminates the need for *SQLPKG, even when accessing another DB2 database (including one on the IBM System i).
- Unique technology enables transparent access to any database (MySQL, ORACLE, MS SQL, DB2, Informix, SQLite) or data source (for example, Excel) which resides on any IBM or non-IBM platform using STRSQL or programs in languages such as RPG, Cobol, and so on (compiled using CRTSQL...).
- Integration with the STRSQL lets you prompt to see the Column names and more, and expands IBM i-based DRDA functionality by enabling transparent connectivity with JDBC databases not supported by DRDA.
- Uses standard SQL syntax and is based upon standard IBM i functionality – so there is virtually no learning curve to get up and running Remote Server Authentication that makes use of the IBM Server Authentication Entries, injecting them seamlessly when needed and eliminating the need to remember and re-enter a user name and password for each CONNECT to a remote DB Provides detailed traceability logs.
- Uses standard SQL syntax and is based upon standard IBM i functionality - so there is virtually no learning curve.
- Use of the IBM Server Authentication Entries, injecting user and password seamlessly when needed and eliminating the need to remember and re-enter a user name and password for each CONNECT to a remote DB.

DB-Gate Restrictions

The following functions are not supported:

- Database large objects (BLOBs, CLOBs, DBCLOBs)
- Data links
- User IDs longer than ten characters
- Passwords longer than ten characters
- Stored procedure result sets
- SQL statements longer than 32K
- Stored procedures with Commit on Return
- Scrollable cursors
- Multi-row input
- Extended diagnostics
- RDB aliases

Commitment Control

NOTE: When using an ARDPGM, the system enforces the use of commitment control. If for example session attributes for commitment control is set to *NONE, the system will change this setting immediately after the connection.An RDB entry that is based on ARDPGM is always considered as a remote connection and thus cannot be assigned *NONE or *NC for commitment control as shown below in Figure 2-2 on page 8.

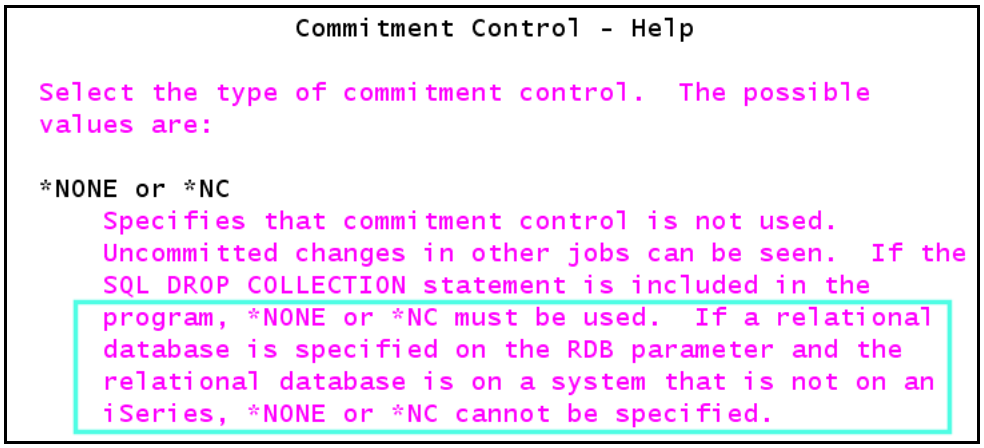


Figure 2-2. Commitment Control - Help

Native IBM i Text Based User Interface

DB-Gate is designed to be a user-friendly product. The user interface follows standard System i CUA conventions. All product features are available via the menus, so you are never required to memorize arcane commands. Many features are also accessible via the command line, for the convenience of experienced users.

Menus

Product menus allow for easy access to all features with a minimum of keystrokes. Menu option numbering and terminology are consistent throughout this product as well as other Raz-Lee products. To select a menu option, simply type the option number and press Enter. The command line is available from nearly all product menus. If the command line does not appear (and your user profile allows use of the command line), press **F10** to display it.

Data Entry Screens

Data entry screens include many convenient features such as:

- Pop-up selection windows
- Convenient option prompts
- Easy-to-read descriptions and explanatory text for all parameters and options
- Search and filtering with generic text support.

The following describes the different data entry screens.

- To enter data in a field, type the desired text and then press **Enter** or **Field Exit**.
- To move from one field to another without changing the contents press **Tab**.
- To view options for a data field together with an explanation, press **F4**.
- To accept the data displayed on the screen and continue, press **Enter**.

Table 2-1 on page 9 describes the standard function keys that may appear on data entry screens.

Table 2-1: Functions Keys

Function Key	Description
F1 - Help	Displays context-sensitive help.
F3- Exit	Ends the current task and returns to the screen or menu from which the task was initiated.
F4 - Prompt	Displays a list of valid options for the current field or command. For certain data items, a pop-up selection window appears.
F6 - Add New	Creates a new record or data item.
F8 - Print	Prints the current report or data item.
F9 - Retrieve	Retrieves the previously-entered command.
F12 - Cancel	Returns to the previous screen or menu without updating.

New Features and Functionality

Version 2.33

The following improvements have been made in this version:

RDB Connection

- You can verify the RDB connection from either the Work with DB Directory Entries screen or by using option 52. Verify Connection in the main DB-Gate menu.

Version 2.32

The following improvements have been made in this version:

Performance Improvements

- Performance improvements for data retrieval from SELECT statements
- Performance improvements for KEEP ALIVE statements

SQL

- Support for SELECT INTO adjusted to be compatible with IBM PTFs

Version 2.31

The following improvements have been made in this version:

ARDPGM

- DB-Gate now identifies and handles the state where the ARDPGM is cleared from the memory (for example, as a result of the Reclaim Resources command).

Logging

- When running in server mode, both the requester job and activation group details are now reported by the server to the DB-Gate engine. Those details are logged, which makes it easier to correlate server activity with engine activity.

SQL

- Improved support for SELECT INTO

Version 2.30

The following improvements have been made in this version:

UI

- New session monitor
- New screen for running performance and load tests

SQL

- Three part name support (limited to those supported by IBM)
- Support for SELECT INTO
- Support for callable statements with bound variables

Logging

- Both the **DB-Gate** server and engine write log files using a rotation of five files. Each file is 1 Mb
  - The Server log files are in the /tmp directory and are named **/dbgater_err_server.txt.<*n*>**, where ***n*** is a digit from 0 to 4. dbgater_err_server.txt.4 is the oldest file, dbgater_err_server.txt.0 is the newest.
  - The Engine log files are also in the /tmp directory and are named **/dbgater_err.txt.<*n*>**, where ***n*** is a digit from 0 to 4.
- **DB-Gate** server: the log level is checked now on the creation of every new service job. That means logging can be set on the native side (setting it to #3 or #5) and takes effect even while the server is running.

Version 2.1

The following improvements have been made in this version:

- A path relative to the **DB-Gate** default driver's location can be used for specifying drivers' files (in addition to absolute path).
- The URL field in the RDB Entries screen can contain a URL that points to a text file that contains the full JDBC URL.
- Internal JDBC driver for PC files:
  - Improved calculation of the length of fields
  - Added a link to the manual in the driver's screen
  - Improved Excel xlsx format handling
- Server mode now works with single data queue. This data queue can be recreated via the Activation menu
- PC installer for mode #3 (**DB-Gate** as an external server).
- Can run as an internal server on the IBM i, thereby eliminating the JVM starting time.
- Can run as an external server on a Windows, Linux or other platform supporting Java rather than using resources on the IBM i.
- Keep alive statement is sent repeatedly
- Support for SMB protocol to allow access to Excel/CSV files on shared folder.
- Added support for reading Excel 2007-2010 (XLSX) formats.
- Running on a PC enables **DB-Gate** to work with additional data sources by employing the JDBC-ODBC bridge. That means for example that we can get data from MS Access.
- Enhancements made to better support embedded SQL in RPG/COBOL.
- Added Bidi String Type option (-1 = NONE) in RDB entry screen.
- The product is bundled with a new JDBC driver for MS Excel (97/2000/XP/2003/2007/2010), CSV, ODF spreadsheet (LibreOffice/OpenOffice) and text files. This driver is an in house development. See Appendix A: JDBC Driver for Excel, CSV, etc. on page 67 for a description of how to use it.
- Support added for NVARCHAR field type.

3 Activation

Overview

DB-Gate can be activated to run in either:

- Mode 1 - Inline, running in the same job which requires external DB access.
- Mode 2 - Internal Server, running on a separate subsystem in the IBM i. This server supports any number of jobs.
- Mode 3 - External Server, running in an external system (consumes the processing power of a different computer). This server supports any number of jobs.

The functionality of **DB-Gate** is the same regardless of the mode run. No changes are required in the programs running on the IBM i. The choice of mode selected can be made at any stage.

Figure 3-1 on page 13 shows the architecture of the 3 run modes.

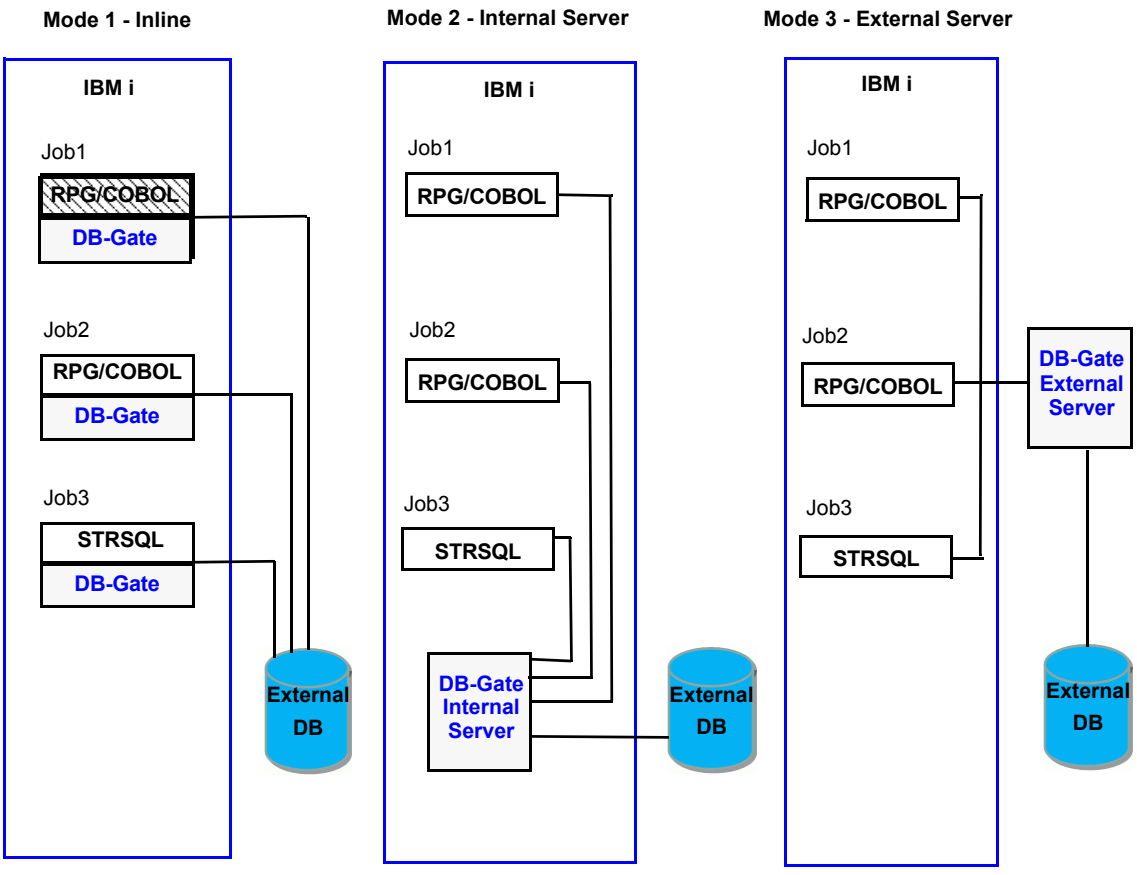


Figure 3-1. Run Mode Architecture

Mode 1 - Inline

Activation

DB-Gate runs the internal mode by default. No pre-activation is required. Note that first SQL command within a job activates, within **DB-Gate**, a process which may require a few seconds depending on available computing resources.

Mode 2 - Internal Server

DB-Gate runs as server job on a dedicated subsystem. This subsystem must be started before processing any SQL statement. The product can be configured to start this subsystem automatically after every IPL.

This mode has no initial extra processing and requires fewer memory resources.

Before You Begin

1. Ensure that all SQL jobs using **DB-Gate** are signed off. This should be done by your organization's IT Administrator.
2. Set a password for the user profile **SECURITYBP** (which initially has a password of ***NONE**) and set the password expiration interval (**PWDEXPITV**) to ***NOMAX**.

Activation

To activate **DB-Gate** to run in Internal Server Mode (2):

1. Ensure **DB-Gate** mode is set to Internal Server (2) as follows:
   a. Select **81. System Configuration** from the **DB-Gate** main menu. The **DB Directory Entry System Configuration** menu appears, as shown in Figure 3-2 on page 15.

```
DBPARMR              DB Directory Entry System Configuration   26/04/13 00:31:55

Select one of the following:

DB-Gate
 1. General Definitions


 9. Log Retention




                                          General
                                            98. Driver Licenses
Selection ===>  __                          99. Copyright Notice

Release ID . . . . . . . . . . . . . .  02.00 13-04-02    6561B7D  520 7140
Authorization code . . . . . . . . . .  B01304776591                1   BERT


F3=Exit    F22=Enter Authorization Code                        F12=Cancel
Modify data, or press Enter.
```

Figure 3-2. DB Directory Entry System Configuration Screen

   b. Select **1. General Definitions** from the **DB Directory Entry System Configuration** menu. The **General Definitions** screen appears, as shown in Figure 3-3 on page 15.

```
                          General Definitions                28/04/13 09:24:38

Type options, press Enter.

Run mode  . . . . . . . . . . . . . . .  2       1=Inline (no pre-activation)
                                                 2=Internal server
                                                 3=External server

For Run mode=2, set any password to user profile SECURITYBP to enable the
initiation of the Internal Server. This password does not have to be entered
anywhere in the product.
SQL Activities are always done by the actual user authority.

Auto Set Java version and CLASSPATH .  Y       Y=Yes, N=No
Java 1.5 or higher required; See CLASSPATH in /iSecurity/DB-Gate/sp.properties

Log level (errors are always logged)   5       1=No Log
                                                 2=Connects only
                                                 4=All (only first FETCH logged)



F3=Exit   F12=Cancel
```

Figure 3-3. General Definitions Screen

   c. Set the **Run mode** to **2** (if set to another mode) and press **Enter** continuously (usually 2 or 3 times) to return to the **DB-Gate** main menu.

2. Activate the server as follows:
   a. Select **2. Activation** from the **DB-Gate** main menu. The **Activation - Server Mode** menu appears, as shown in Figure 3-4 on page 16.

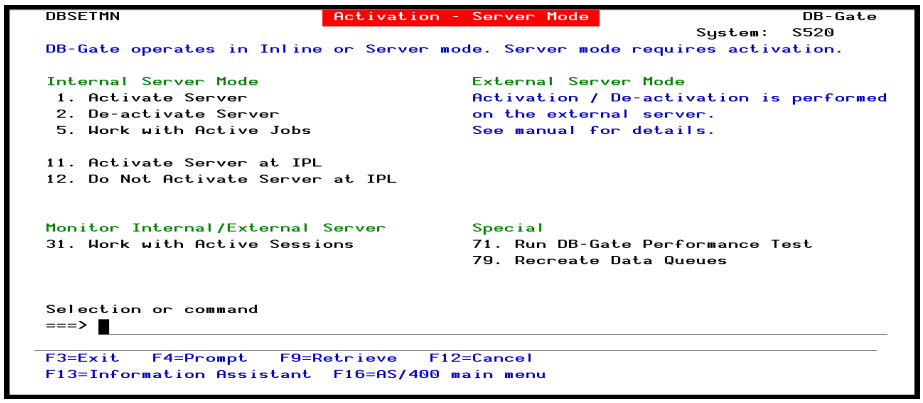


Figure 3-4. Activation Screen

   b. Select **1. Activate Server** from the **Activation - Server Mode** menu. **DB-Gate** begins to operate in Internal Server Mode. A message appears at the bottom of the screen indicating this.
   c. Select **5. Work with Active Jobs** from the **Activation - Server Mode** menu to verify that **DB-Gate** is working. The **Work with Subsystem Jobs** screen appears and displays active Subsystem Jobs and their status as shown in Figure 3-5 on page 16.

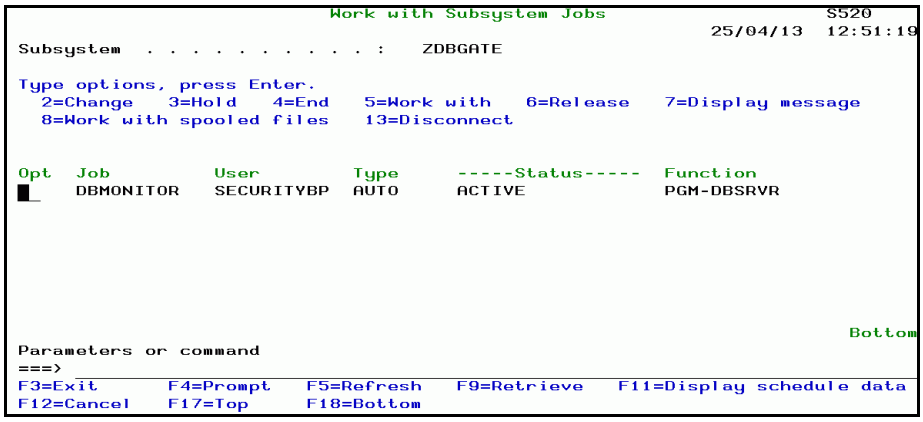


Figure 3-5. Work with Subsystem Jobs Screen

Automatic Activation upon Startup

Internal Server Mode can be set to automatically activate upon startup of the IBM System Initial Program Load (IPL) from the **Activation** screen (See Figure 3-4 on page 16).

- To enable automatic activation, select **11 - Activate Server at IPL**.
- To disable automatic activation, select **12 - Do Not Activate Server at IPL**.
- You can verify automatic activation status by typing **DSPJOBLOG** at the command prompt.

Mode 3 - External Server

DB-Gate runs as a server process on a different computer. That computer and the **DB-Gate** service running on it must be activated before any SQL processing is initiated.

The computer running this server mode can run on Windows, Unix, Linux, or any other operating system that supports Java. This mode has no initial extra processing and requires virtually no extra memory resources from the IBM i. All memory resources and processing power are consumed on the external computer running the **DB-Gate** server.

It is the user's responsibility to ensure activation of the computer and server running the external **DB-Gate**.

1. Install the **DB-Gate** server as follows:
   a. Close all applications.
   b. Run the setup file **DB-Gate_setup.exe**. The installation wizard opens.

Figure 3-6. DB-Gate Server Setup Wizard - Welcome Screen

c. Proceed through the Wizard choosing the destination path, name and shortcut settings and click **Install** on the **Ready to Install** screen. See Figure 3-7 on page 18.

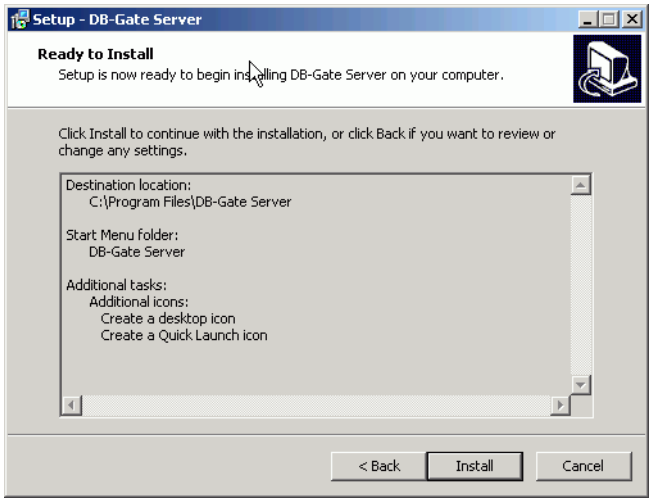


Figure 3-7. Ready to Install Screen

d. Upon completion select **Launch DB-Gate Server** and click **Finish**.

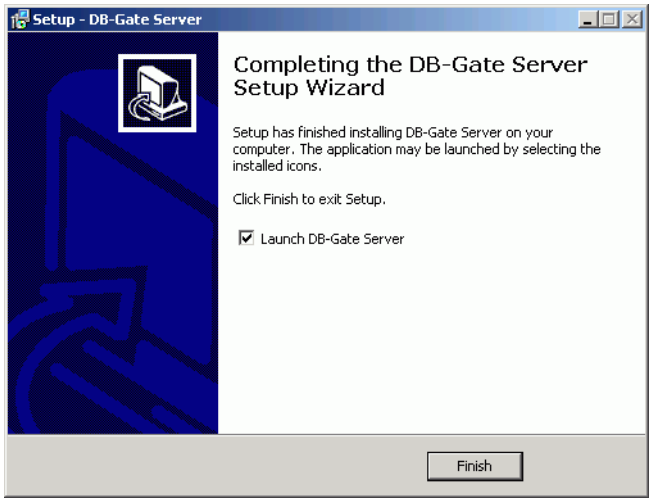


Figure 3-8. DB-Gate Server Setup Wizard - Finish Screen

The Connect to System dialog appears. See Running the DB-Gate Server on page 19.

Running the DB-Gate Server

The **DB-Gate** server is started either by:

- Selecting **Launch DB-Gate server** at the end of the installation process
- Starting the **DB-Gate** server from the Windows **Start** menu or the icon

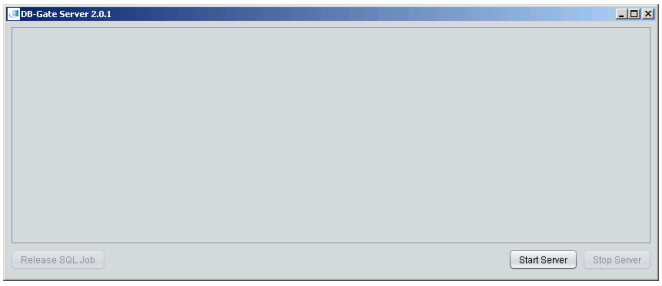


Figure 3-9. DB-Gate Server Startup Screen

1. Click **Start Server**. The **Connect To System** dialog appears. See Figure 3-10 on page 19.
2. Connect to the system as follows:
   a. Type the address (IP or network path) or host name for the **DB-Gate** server
   b. Type the **User** and **Password** to access that host.
   c. Click **OK**.

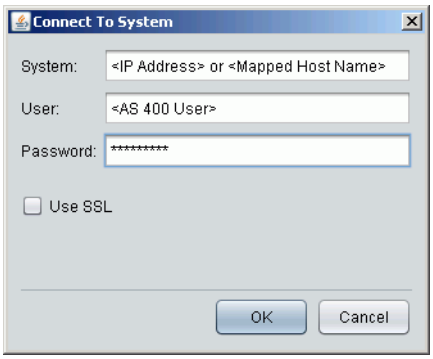


Figure 3-10. Connect to System Dialog

3. Log in to the IBM i.
4. Start SQL by typing **STRSQL**.
5. Connect to the SQL database instance as shown in Figure 3-11 on page 20.

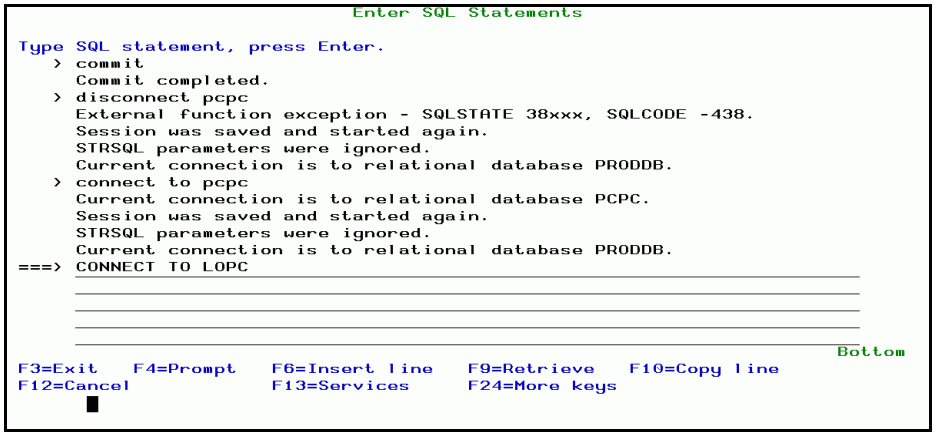


Figure 3-11. Connecting to Database Instance

6. Open the **DB-Gate** Server GUI by double-clicking from the Windows **Start** menu or the icon.

   The options are described in DB-Gate Server Commands on page 20.

DB-Gate Server Commands

The **DB-Gate** **Connected To [Database]** screen indicates active jobs connected to the **DB-Gate** server. See Figure 3-12 on page 20 and Table 3-1 on page 20 for a description of the relevant parameters and options.

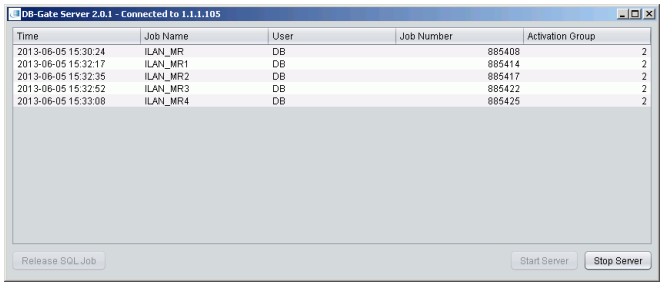


Figure 3-12. Database Connection Screen

Table 3-1: Database Connection Parameters and Options

Button / Column	Description
Release Job	Stops the selected job.
Stop Server	Deactivates the **DB-Gate** Server.
Job Name	Name of the job.
User	User who initiated the job
Job Number	Number of the job
Activation Group	Activation Group number in which the application is running.

Each job consists of one or more activation groups and it is important to note that **DB-Gate** operates on the level of Activation Group. Therefore, the same job attributes can appear more than once but in different Activation Groups. An example is provided in Table 3-2 on page 21

Table 3-2: Sample List of Connections

Job Name	User	Job Number	Activation Group
QPADEV0010	DB	123456	2
QPADEV0010	DB	123456	3

Changing the DB-Gate Mode of Operation

The mode of operation can only be changed when no active SQL processes are running in **DB-Gate**. It is recommended to change the mode of operation in conjunction with IPL.

To change the Run mode:

1. Notify all relevant users that you are about to stop and change the current Run mode.
2. Make sure all SQL jobs running through **DB-Gate** are signed off.
3. If **DB-Gate** is currently running in Server mode (2 or 3), stop the server.
4. Go the General Definitions screen (81) and set the new Run Mode.
5. Start **DB-Gate**:
   - For Inline Mode (1) no further action is necessary.
   - For Internal Server Mode (2), activate as described in Activation on page 14.
   - For External Server Mode (3), activate as described in Activation on page 15.

Data Queues

DB-Gate uses a a data queue for communication when operating in server mode (2 or 3). You can recreate this data queue (delete and build) using option **79** in the Activation screen (see Figure 3-13 on page 22). This maintenance task is useful when the data queue becomes too large. This task action should be only be performed while the server is down and there are no SQL jobs employing **DB-Gate**.

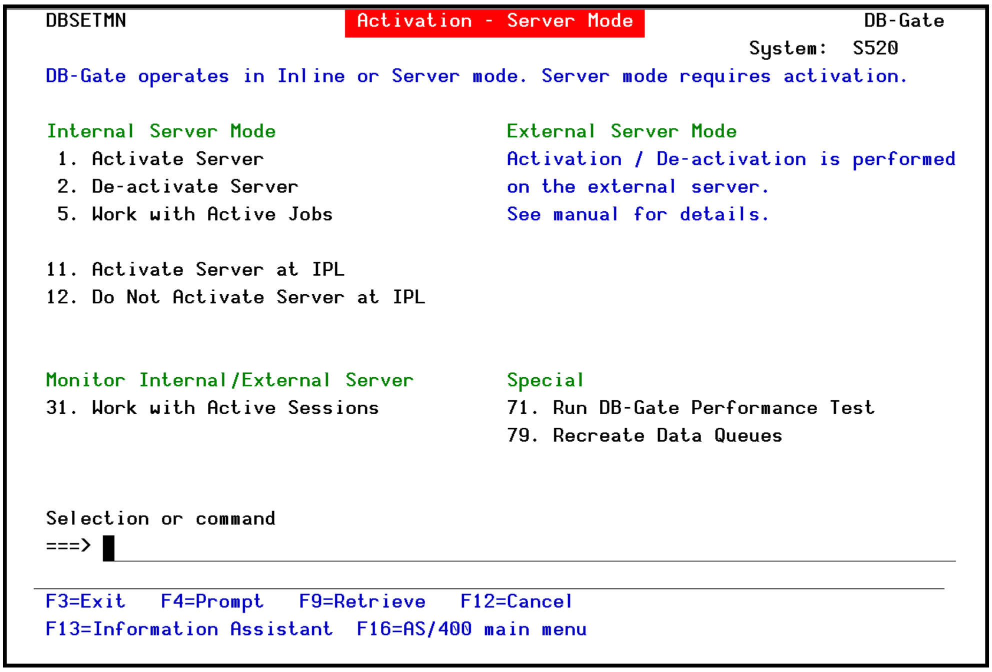


Figure 3-13. Activation Screen

Monitor Active Sessions

The Monitor feature enables you to observe and control the sessions managed by the **DB-Gate** server, regardless of whether the server is running on the IBM System i or externally. A session consists of one or more RDB entries that are registered with **DB-Gate** and are running in the same job and the same activation group.

With the monitor you can see the active sessions, and even end any of them without causing any issues to the server.

To monitor active sessions:

1. Select **31. Work with Active Sessions** in the **Activation - Server Mode** menu. The **Work DB-Gate Active Sessions** screen opens as shown in Figure 3-14 on page 23.

```
                        Work DB-Gate Active Sessions

Type options, press Enter.                    Subset  . . .
  1=Display   4=End session   5=DSPJOB Rqstr   6=DSPJOB Server

Opt Last activity      Active RDB        Format        -- Requester job --
 _  2014-02-03-14.46.51   Y              COMMIT    TST1#00003 DB         338319
 _  2014-02-03-14.46.52   Y   ORA        ARXI0100  TST1#00002 DB         338318
 _  2014-02-03-14.46.51   Y              COMMIT    TST1#00001 DB         338317

                                                                      Bottom
F3=Exit   F5=Refresh   F10=DSPJOB monitor   F12=Cancel   F23=End non-active
```

Figure 3-14. Work DB-Gate Active Sessions screen

Table 3-3 on page 23 describes the information and options on the **Work DB-Gate Active Sessions** screen.

Table 3-3: Work DB-Gate Active Sessions

Parameter/Option	Description
Last activity	The time of the last request from **DB-Gate**

Table 3-3: Work DB-Gate Active Sessions

Parameter/Option	Description
Active	**Y=** currently being processed by **DB-Gate** If the Active field is empty, the job displayed is usually a 'leftover' job from a previous activation of the **DB-Gate** server. The main reason for keeping these jobs in the list is the ability to send them a release command. This is effective if the job is stuck waiting for a reply from a remote DB server. Since the remote connection does not exists anymore, it might wait till ENDJOB is performed. Sending a release command is the clean way to clear things up.
RDB	The targeted RDB. Every session may have several RDB involved each called in different time frame. If a session is in commitment control (Format = **COMMIT**)
Format	For each request there is a dedicated internal format structure used to carry request/reply
Requester job	Details of the job that initiated the RDB connection
4=End session	Sends a release command for the session. Use this option with extra caution, especially if the session is active. When an active session is sent a release command, any remote connection is broken and **DB-Gate** will cease processing the requester job. Actually, the service job QZRCSRVS terminates. You should note that: When the release command is sent to an active session, the service job deletes the record. When the release command is sent to an non-active session, the monitor deletes the record. Non active sessions are deleted upon screen refresh when the requester job ends.
5=DSPJOB Rqstr	Open the DSPJOB option for the job requestor
6=DSPJOB Server	Open the DSPJOB option for the server.
F10=DSPJOB monitor	Open the DSPJOB monitor
F23=End non-active	End all non-active sessions

Performance Testing

You can run performance and load tests of the **DB-Gate** engine and server without the need for any coding. The test submits a number of jobs (according to the **Number of jobs to run** parameter). Each job connects to the given RDB entry and, if you use the default program provided, repeatedly performs the following for the number of repetitions set in the **Iterations per job** parameter. The number of rows to insert and then fetch is defined in the **Rows to process** parameter.

```
Creates a table on the given schema
Fills the table with data
Fetches from the table
Drops the table
```

To run a performance test:

1. Select **71. Run DB-Gate Performance Test** in the **Activation - Server Mode** menu. The **Test DB-Gate Performance** screen opens as shown in Figure 3-15 on page 25.

```
                    Test DB-Gate Performance (TSTDBPFR)

Type choices, press Enter.

RDB name . . . . . .
Existing RDB schema  . . . . . .          Name
Jobs prefix Id.  . . . . . .              Name
Number of jobs to run  . . . . .  10      Number
Iterations per job . . . . . .    50      Number
Rows to process  . . . . . .      200     Number
RDB user . . . . . .              *AUTO   Character value, *AUTO
RDB password . . . . . .          *AUTO   Character value, *AUTO
Test pgm (see SMZB/DBSOURCE) . .  DBPFRR  Name, DBPFRR
  Library  . . . . . .              SMZB  Name, SMZB, *LIBL

                                                                  Bottom
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
F24=More keys
```

Figure 3-15. Test DB-Gate Performance screen

Table 3-4 on page 26 describes the information and options on the **Work DB-Gate Active Sessions** screen.

Table 3-4: Test DB-Gate Performance

Parameter/Option	Description
RDB name	One of your Directory Entries. See Working with Directory Entries on page 27 for more details.
Existing RDB schema	The name of one of the schemas in the directory. This schema must exist; the test does not create it.
Jobs prefix ID	Enter a meaningful job prefix, for example TST1
Number of jobs to run	Enter the number of jobs you want to run simultaneously. This should be a reasonable approximation of the number of jobs you expect to be sent to the server.
Iterations per job	The number of times the test will be run.
Rows to process	The number of rows to be inserted and fetched for each iteration.
RDB user	**Name** - Type the User ID of one of the Remote Users you have defined for this RDB. See Injection of Remote User IDs on page 46 for more details. ***AUTO**
RDB password	**Password** - Type the password for the Remote User. ***AUTO**
Test pgm	Type the name of the program that will test the performance of the DB engine. Raz-Lee provides you with a default program to perform the test.
Library	The library where the test program is stored. The default test program is in library **SMZB**.

2. Enter the required parameters and press **Enter**. The performance test runs.

4 Remote DB Definitions

This chapter describes how to define a remote database.

When definitions are activated, they create an RDBDIRE (Remote DB Directory Entry) in the operating system.

Working with Directory Entries

To begin working with directory entries, select **1. Work with Directory Entries** from the **DB-Gate** main menu.

The **Work with Directory Entries** screen opens as shown in Figure 4-1 on page 28. Directories are marked as Active or (deactivated). You can perform the following activities:

- Viewing Subsets of Drivers
- Modifying a Directory Entry
- Copying an Existing Directory Entry
- Creating a New Directory Entry
- Removing a Directory Entry
- Activating a Directory Entry
- Deactivating a Directory Entry
- Verifying a Directory Connection

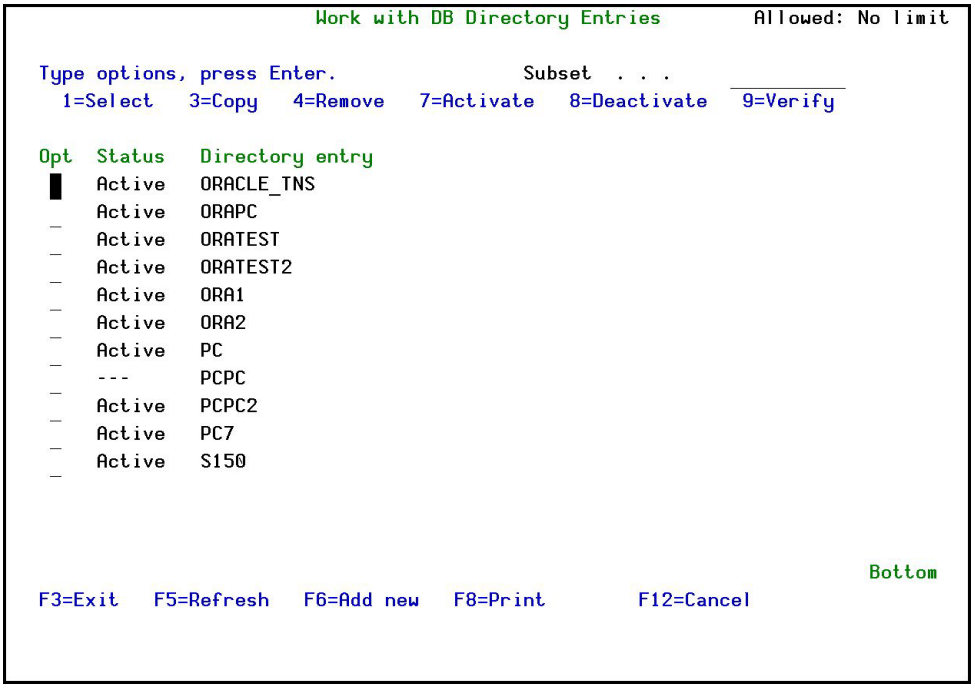


Figure 4-1. Work with Directory Entries

Viewing Subsets of Drivers

To view a specific subset of drivers, type the first alphanumeric characters of the driver in the **Subset by driver** field and **press Enter**.

The driver list is redisplayed with results that match your query.

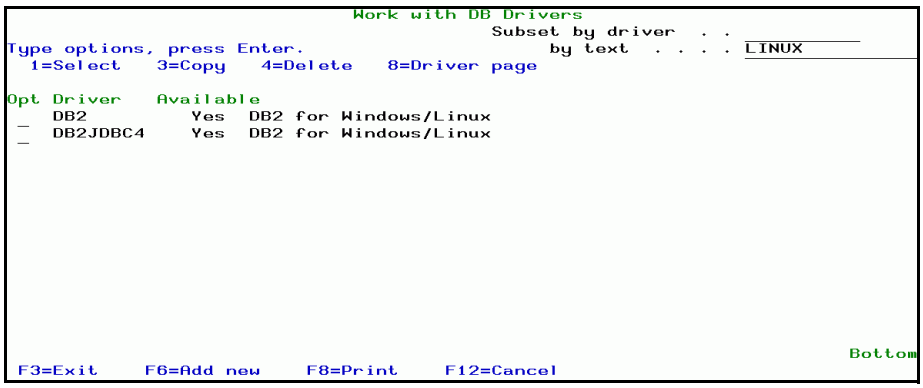


Figure 4-2. Work With DB Drivers

Modifying a Directory Entry

You can update all directory entries except for the names of the Directory.

To modify the details of a Directory Entry:

1. Type **1** in the **Opt** column to select it and press **Enter**.

   The **Modify Directory Entry** screen appears with the selected directory entry filled in as shown in Figure 4-3 on page 29.

```
                          Modify Directory Entry

Directory Entry . . . . . .  LOGISTICS     Active: Y      (Driver: MSSQL2005  )
Description . . . . . . . .  This is a MS SQL
Log . . . . . . . . . . . .  0                    0=Dft, 1=None, 2=Basic, 4=All
Host or IP  . . . . .<host>  1.1.1.197
Port  . . . . . . . .<port>   1433
Catalog . . . . . <catalog>
Schema  . . . . . .<schema>
Database  . . . . . . .<db>  AdventureWorks




URL . . . . . . . . . . . .  jdbc:sqlserver://<host>:<port>;databaseName=<db>
Auto replacments are:
  <host><port><catalog>
  <schema><db><adl1-4>


Language Support  . . . . .      4              *AUTO, *NONE, 4-11 for Bidi
F3=Exit    F4=Prompt    F7=Driver page    F8=Replace driver    F12=Cancel
```

```
                      Modify Directory Entry - Part B

Directory entry . . . . . .  ORACLE                        (Driver: ORACLE_SID )
Description . . . . . . . .

Language support  . . . . .  *AUTO               *AUTO, *NONE, 4-11 for Bidi
Keep alive interval . . . .      5               Minutes, 0=No
Keep alive statement  . . .  SELECT * FROM DUAL


                                                                        Bottom
F3=Exit    F12=Cancel
```

Figure 4-3. Modify Directory Entry Screen

Table 4-1 on page 29 describes the detailed information you enter to create a new RDB Entry. Some of the parameters may vary depending on the selected driver.

Table 4-1: RDB Entry Parameters

Parameter	Description / Options
Directory Entry	Name of the directory
Active	**Y** (yes) or **N** (no)

Table 4-1: RDB Entry Parameters

Parameter	Description / Options
Driver	The driver you associated with the new entry
Description	Description of the directory (optional)
Log	**0**=Global default (this value is taken from System Configuration's General Definitions screen) **1**=No log (no data is stored) **2**=Connect (the log will store a record of each connection and disconnection from a database) **4**=All (the log will store all commands sent; when a Fetch command is sent, it will only store the first in the series)
Host or IP	The address used to access the remote database
Port	The port number associated with the above address required for setting up a connection to the remote database
Catalog	If the database requires a Catalog for the connection, specify it here
Schema	The schema for the remote database
Database	Database name
Additional parameters: SID in this example	Up to four different parameters, based on the selected driver.
URL	Provided by the DB driver provider. May include parameters: **<host><ip><user><pwd><catalog><port><schema><adl1-4>** The URL field can contain a URL that points to a text file that contains the full JDBC URL. For example, the file at **http://www.acme.com/gui/jdbc_ms.txt** could contain the following: jdbc:sqlserver://<host>:<port>;databaseName=<db> If an empty Password is received when connecting, DB-Gate also ignores the User field and attempts to create a connection based on the JDBC URL only.
Language Support	***AUTO =** Default setting ***NONE** **4-11** = Based on an IBM setting for specific language support.
Keep alive interval	Frequency the keep alive SQL statement is sent to DB to ensure connection is maintained.
Keep alive statement	SQL statement sent to DB to ensure connection is maintained.
F8	**Replace Driver** = Enables users to replace the driver configuration for this RDB entry

Copying an Existing Directory Entry

You can add a new Directory Entry by copying one that already exists. Copying a directory entry is also the only way you can change the name of an existing directory entry.

To copy an existing directory:

1. Highlight it and select **3 - Copy.**

   The **Copy DB Directory Entry** screen appears with the selected directory entry appearing in both the **From** and **To:** / **Directory Entry** fields, as shown in Figure 4-4 on page 31.
2. Modify the **To:** / **Directory Entry** description and press **Enter** twice.

```
                          Copy DB Directory Entry
Type choices, press Enter.

From:
  Directory Entry  . . . . . MSACCESS

  Description  . . . . . .

To:
  New Directory Entry  . . . MSACC COPY




F3=Exit     F4=Prompt          F12=Cancel
Modify data, or press Enter to confirm.
```

Figure 4-4. DBG Copy Directory Entry Screen

All the existing directory entry details are automatically added and the **Work with Directory Entries** screen is redisplayed with the newly created directory entry in deactivated status. See Figure 4-5 on page 31.

```
                      Work with DB Directory Entries          Allowed: No limit
Type options, press Enter.                    Subset  . . .
  1=Select   3=Copy   4=Remove   7=Activate   8=Deactivate

Opt  Status   Directory entry
     Active   ALEX        TEST ALEX
 _   Active   A150
 _   Active   A520
 _   Active   LO
 _   Active   LOPC
 _   Active   MS          This is a MS SQL
 _   Active   MS_JTDS
 _   Active   MS_ROB      This is a MS SQL
 _   ---      MSACC COPY
 _   Active   MSACCESS
 _   Active   MSPC        This is a MS SQL
 _   Active   MY
 _   Active   MYFED
 _   Active   MYH2
 _                                                                  More...
F3=Exit   F5=Refresh   F6=Add new   F8=Print        F12=Cancel
Directory Entry copied.
```

Figure 4-5. Work with Directory Entries Screen

Creating a New Directory Entry

You can add a new Directory Entry either by copying one that already exists or by entering all the details on your own.

To create a new directory entry:

1. Select **F6 - Add New** to open the **Add New Directory Entry** screen.
2. Add a Directory Entry by doing one of the following:
   - Type the new **Directory Entry** alias name.
   - Select **F4 - Prompt** (while in the Directory Entry field) to display the existing Directory Entry list. Select the **Directory Entry** by typing **1** next to it. Press **Enter**. The selected Directory Entry is added to the new Directory Entry field.See Figure 4-6 on page 32.

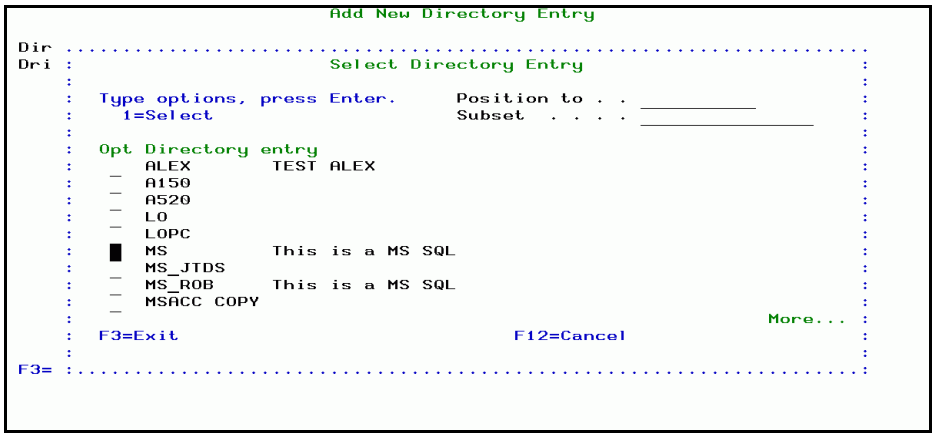


Figure 4-6. DBG Add New Directory Entry

3. Add a Driver by doing one of the following:
   - Type the new **Driver** name
   - Select **F4 - Prompt** (when in the Driver field) to display a list of the existing DB drivers. Select the **Driver** by typing **1** next to it. Press **Enter**. The selected Directory Entry is added to the new Directory Entry field.
4. Click **Enter** to move on to the empty **Add New Directory Entry Details** screen.

   This screen is the same as the **Modify Directory Entry** screen above as shown in Figure 4-3 on page 29.

NOTE: If the URL is already saved in the driver, it is automatically added.

Removing a Directory Entry

To remove a Directory Entry:

1. In the **Work with DB Directories** screen, select the directory to be removed by typing a **4** next to it and pressing **Enter**.

   The **Delete Directory Entry - Part A** screen appears with the Directory Entry details.
2. Press **Enter**, and then again **Enter** when the **Delete Directory Entry - Part B** screen appears to confirm.

   The **Work with DB Directory Entries** screen reappears with the Directory Entry removed.

Activating a Directory Entry

To activate a Directory Entry:

1. In the **Work with DB Directories** screen, select the directory to be activated by typing a **7** next to it and pressing **Enter**.
2. The Directory Entry is activated.

Deactivating a Directory Entry

To deactivate a Directory Entry:

1. In the **Work with DB Directories** screen, select the directory to be deactivated by typing a **8** next to it and pressing **Enter**.
2. The Directory Entry is deactivated.

Verifying a Directory Connection

To verify a Directory Connection:

1. In the **Work with DB Directories** screen, select the directory to be verified by typing a **9** next to it and pressing **Enter**. The **Verify DB-Gate RDB** screen appears.
2. Type the **RDB Name** and **RDB Password** used for the selected RDB, where relevant.

NOTE: The default *AUTO is for those RDBs that do not supply user/password directly or do not require credentials. Indirect credentials can be sent to ARDPGM via the use of server authentication entry or JDBC URL.

---

3. Press **Enter**. A message is displayed with the status of the connection.

5

DB Drivers

Working with Database Drivers

A database driver enables you to access a remote database, first by recognizing it and then by establishing a connection with it.

DB-Gate comes with pre-installed DB drivers. The default path for drivers is:

/iSecurity/DB-Gate/Drivers

You can enter a full path or a path relative to **DB-Gate** default driver's location as shown in Figure 5-1 on page 35.

Figure 5-1. Modify DB Driver - Full and Relative Paths

Setting Up a DB Driver

You may add any number of additional drivers or modify the existing ones.

To set up a database driver:

1. Select **11 - Work with DB Drivers** from the Main Menu.

   The **Work with DB Drivers** screen as shown in Figure 5-2 on page 36 with a three-column list of the different types of database already entered in the system is displayed.
2. You can create a remote connection from this screen which includes the following details:

   Driver Name **Available – Yes** indicates that the driver's Driver file parameter (in the **Modify DB Driver** screen as shown in Figure 5-3 on page 37) has been filled in with the path to the jar file on the IFS.

```
                          Work with DB Drivers
                                          Subset by driver  . .
Type options, press Enter.                     by text  . . . .
  1=Select   3=Copy   4=Delete   8=Driver page

Opt Driver   Available
 _  AS400DB2    Yes  DB2 on OS/400 platform
 _  CACHE        -   Cache
 _  DAFFODILLO   -   DaffodilDB Local
 _  DAFFODILSR   -   DaffodilDB Server
 _  DB2          Yes  DB2 for Windows/Linux
 _  DB2JDBC4     Yes  DB2 for Windows/Linux
 _  DERBY        Yes  JavaDB/Derby
 _  FIREBIRD     Yes  Firebird
 _  FRONTBASE    Yes  FrontBase
 _  HSQLDB       Yes  HSQLDB
 _  HSQLDBEMBD   Yes  HSQLDB Embedded
 _  H2_EMBED     Yes  H2 Database Engine (Embedded)
 _  H2_MEM       Yes  H2 Database Engine (In memory mode)
 _  H2_SERVER    Yes  H2 Database Engine (Server mode)
 _                                                          More...
 F3=Exit    F6=Add new    F8=Print    F12=Cancel
```

Figure 5-2. Work with DB Drivers

If the URL for the driver manufacturer has been saved within the driver's details, you can open the driver's web page in your browser and read detailed information on the database.

To do this, select **8 - Driver page** and then press **Enter**.

To view a specific subset of drivers, do one of the following:

1. In the Subset by driver field, at the top right of the screen, enter the first alphanumeric characters of the driver and press **Enter**.

   The driver list is redisplayed with results that match your query.
2. In the Subset by text field, enter any alphanumeric characters you want to match in either the Driver Name or Description fields and press **Enter**.

   The driver list is redisplayed with results that match your query.

Modifying a DB Driver

To modify a DB driver, do the following:

1. In the **Work with DB Drivers** screen, select the DB driver you want to update and press **1** - Select and then press **Enter**.

   The **Modify DB Driver** screen as shown in Figure 5-3 on page 37 opens with the driver's details.

2. Update the fields, then press **Enter**.

   A confirmation message appears asking if you want to modify any of the entries.

3. Press **Enter** again to save the changes to the driver.

   From within the driver page, you can view open the URL for the driver manufacturer to read detailed information on the DB driver by selecting **F7 - Driver page**.

To restore the default settings of the current driver, select **F9 - Restore Default**.

```
                          Modify DB Driver

Driver . . . . .  DB2        DB2 for Windows/Linux
Driver file  . .  /iSecurity/DB-Gate/Drivers/db2jcc.jar

Class  . . . . .  com.ibm.db2.jcc.DB2Driver

Driver page  . .  http://www-306.ibm.com/software/data/db2/java

Default port . .  50000
Additional parms  Label                Possible values
Parm 1 . .<adl1>
Parm 2 . .<adl2>
Parm 3 . .<adl3>
Parm 4 . .<adl4>
URL dft schema .  jdbc:db2://<host>:<port>/<db>
Std replacments:
<host><db>
<catalog><port>
<schema><adl1-4>

F3=Exit              F7=Driver page   F9=Restore Default          F12=Cancel
```

Figure 5-3. Modify DB Driver

The following table describes the information in the DB Driver screen.

Table 5-1: DB Driver Parameters and Commands

Parameter / Command	Description
Driver	Driver's name and description. It will appear in the DB Drivers list when configuring a connection.
Driver file	Path to the jar file on the IFS that contains the JDBC driver for this database.
Class	JDBC driver class name.
Driver page	URL for the driver developer's web-page.

Table 5-1: DB Driver Parameters and Commands

Parameter / Command	Description
Default port	The default port to use when setting up a connection.
Additional Parameters	You may define up to four parameters which are specific for this driver. The definition includes the label, as well as a short explanation or the possible values. Parameters which are defined here will be displayed when this driver is selected.
F4	When in the Driver field, displays a Select DB Driver window with the option to select a specific DB Driver. After entering **1 - Select**, the window closes and your selection is displayed in the Driver field.
F7	Once the Driver page has been entered, selecting **F7** opens the URL in your default browser.
F9	Restores the original definition of a driver if it was supplied alongside the DB-Gate and replaces the current settings.

Copying a DB Driver

To copy a DB driver, do the following:

1. In the **Work with DB Drivers** screen, select the DB driver you want to copy, press **3 - Copy** and then press Enter.

   The **Copy DB Driver** screen opens with the name and description of the selected driver as shown in Figure 5-4 on page 39.
2. In the new Driver field, change the name and then press **Enter**.
3. After a confirmation message appears asking if you want to modify any of the entries, press **Enter** again to save the new driver.

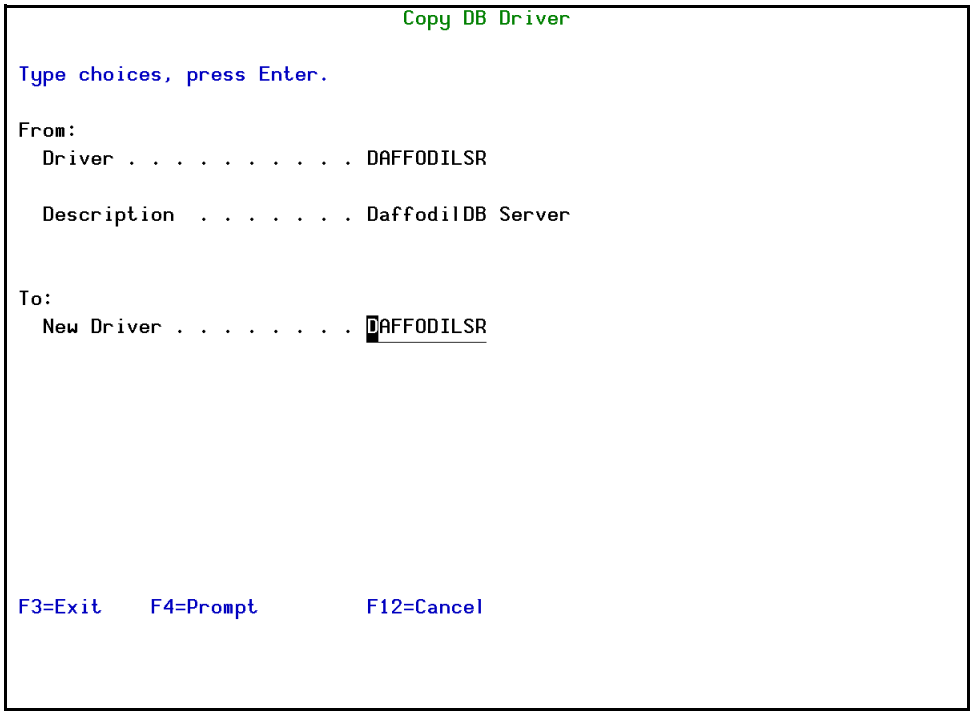


Figure 5-4. Copy DB Driver

Adding a New DB Driver

To add a new DB driver:

1. From the **Work with DB Drivers** screen, press **F6**.

   An empty **Add New DB Driver** screen appears.
2. After you complete the fields, press **Enter**.
3. After a confirmation message appears asking if you want to modify any of the entries, press **Enter** again to save the new DB driver.

Deleting a DB Driver

To delete a DB driver from the list:

1. In the **Work with DB Drivers** screen, select the DB driver and then select **4 - Delete**.
   The driver's page is displayed.
2. Press **Enter** to confirm the delete request.
   The driver is deleted.

Drivers and Licenses Folders

To view and update a connection to a remote database:

- Select **15 - Drivers & Licenses** Folders from the main screen. The **Work with Object Links** screen appears.
  This resource screen lets you see the paths to the third party drivers and their licenses.

```
                          Work with Object Links

Directory  . . . . :   /iSecurity/DB-Gate/Drivers/./.

Type options, press Enter.
  2=Edit   3=Copy   4=Remove   5=Display   7=Rename   8=Display attributes
  11=Change current directory ...

Opt   Object link            Type            Attribute    Text
__    .                      DIR
__    ..                     DIR
_     db2                    DIR
__    derby                  DIR
__    excel                  DIR
__    firebird               DIR
__    hsqldb                 DIR
__    h2sql                  DIR
__    jtds                   DIR
                                                                  More...
Parameters or command
===>
F3=Exit   F4=Prompt   F5=Refresh   F9=Retrieve   F12=Cancel   F17=Position to
F22=Display entire field          F23=More options
```

Figure 5-5. Work with Object Links

The drivers belong to the official owners. They are supplied with the product for your convenience. Next to each driver you can find the actual license under which it is supplied. These drivers have been downloaded and are supplied by Raz-Lee with the understanding that they may be supplied in this way.

6 DB-Gate Log

The **DB-Gate** Display Log shows the contents of the history log, which saves various data gathered from the different directory entries as you have defined them, in a standard format and using basic filter criteria. The "Backward Glance" feature lets you look at the last several minutes of activity without the need to define specific time or date parameters.

Display Log Entries

To begin filtering log entries,

1. Select **41. Display Log** from the **DB-Gate** main menu. The **Display DB-Gate Log Entries** screen appears, as shown in Figure 6-1 on page 42.

```
                    Display DB-Gate Log Entries (DSPDBLOG)

Type choices, press Enter.

Display last minutes . . . . . *BYTIME       Number, *BYTIME
Starting date and time:
  Starting date  . . . . . .    *CURRENT     Date, *CURRENT, *START...
  Starting time  . . . . . .    000000       Time
Ending date and time:
  Ending date  . . . . . .      *CURRENT     Date, *CURRENT, *YESTERDAY...
  Ending time  . . . . . .      235959       Time
User profile . . . . . .        *ALL         Name, generic*, *ALL
Remote user profile  . . . . .  *ALL         Name, generic*, *ALL
Relational DB Entry  . . . . .  *ALL         Name, generic*, *ALL
SQL Operation  . . . . . .      *ALL         Name, *ALL, ALTER, CLOSE...
SQL State  . . . . . .          *ALL         Character, generic*, *ALL
SQL Error Code . . . . . .      *ALL         Number, *ERR, *NOERR, *ALL
SQL Statement contains . . . .  *ALL

                                                                   More...
F3=Exit    F4=Prompt    F5=Refresh    F12=Cancel    F13=How to use this display
F24=More keys
```

Figure 6-1. Display DB-Gate Log Entries Screen (1)

```
                    Display DB-Gate Log Entries (DSPDBLOG)

Type choices, press Enter.

SQL Message contains . . . . .  *ALL

From job name  . . . . . .      *ALL         Name, generic*, *ALL
  User . . . . . .                *ALL       Name, generic*, *ALL
  Number . . . . . .              *ALL       000000-999999, *ALL
From program name  . . . . . .  *ALL         Name, generic*, *ALL
  Library  . . . . . .            *ALL       Name, generic*, *ALL
Number of records to process .  *NOMAX       Number, *NOMAX
Output . . . . . .              *            *, *PRINT, *OUTFILE

                                                                   Bottom
F3=Exit    F4=Prompt    F5=Refresh    F12=Cancel    F13=How to use this display
F24=More keys
```

Figure 6-2. Display DB-Gate Log Entries Screen (2)

Table 6-1 on page 43 describes the various settings you can define to filter log entries.

Table 6-1: Filter Log Settings

Parameter	Description
Display last minutes	Number, ***BYTIME** This “Backward Glance” feature lets you enter the number of minutes of recent activity you want to view, without the need to define any other time or date parameters. The feature is particularly helpful when trying to clarify the cause of problems.
Starting date	Choose from: **Current, Start, Yesterday, Week Start, Previous Weeks, Month Start, Previous Months, Year Start, Previous Years,** and each day of the week
Starting time	hh:mm:ss format
Ending date	Same options as **Starting date**
Ending time	hh:mm:ss format
User profile	All (default) or a specific user profile on the IBM System i
Remote user profile	All (default) or a specific user profile on the remote database
Relational DB Entry	All (default) or a specific remote DB entry
SQL Operation	All (default) or a specific SQL operation that is used at the beginning of an SQL statement (for example, **CONNECT, CREATE, DROP**, and so on)
SQL State	All (default) or a specific state
SQL Error Code	All (default), a specific error code number or name that describes the problem, or entries without any error code
SQL Statement contains	All (default) or a specific SQL statement
SQL Message contains	All (default) or a specific error message that is associated with an error code
From job name	All (default) or specific job
User	All (default) or specific user
Number	All (default) or a specific number
From program name	All (default) or the program in the IBM System i that created this log
Library	All (default) or specific library of the program name
Number of records to process	No Maximum amount (NOMAX) or a specific number
Output	On the screen (*), Printed on one of the defined printers. If you enter **Outfile**, you must then define the following additional parameters: File to receive output, Library, Member to receive output, Replace or add records

2. Define your filter parameters and press **Enter**. The Display DB Gate Log screen appears. Figure 6-3 on page 44 shows an example of the output displayed.

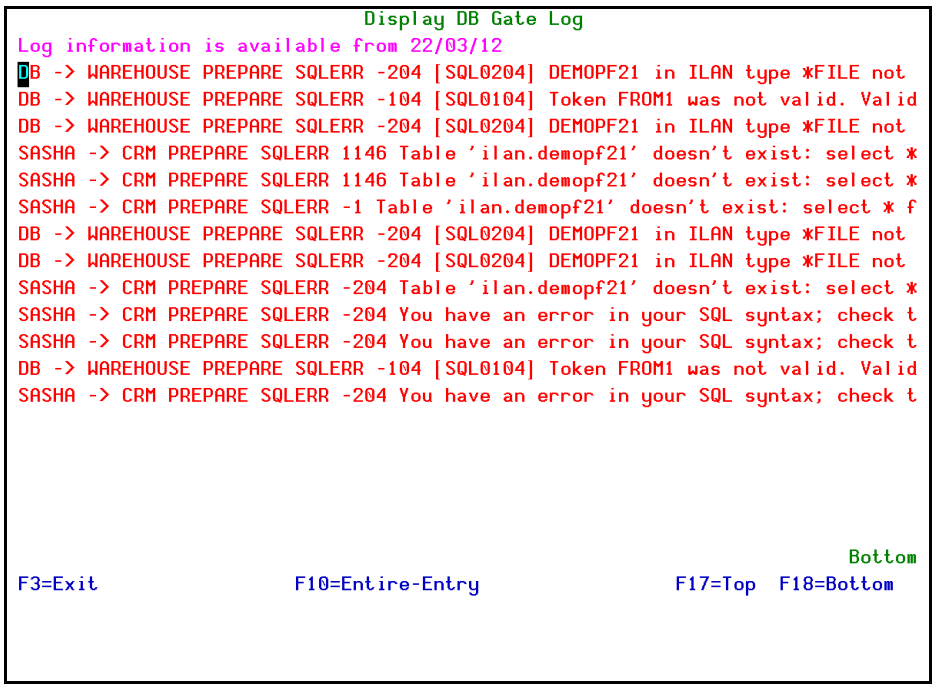


Figure 6-3. Display DB-Gate Log

3. To view further details for the output, select **F10. Entire Entry**. The following screen appears.

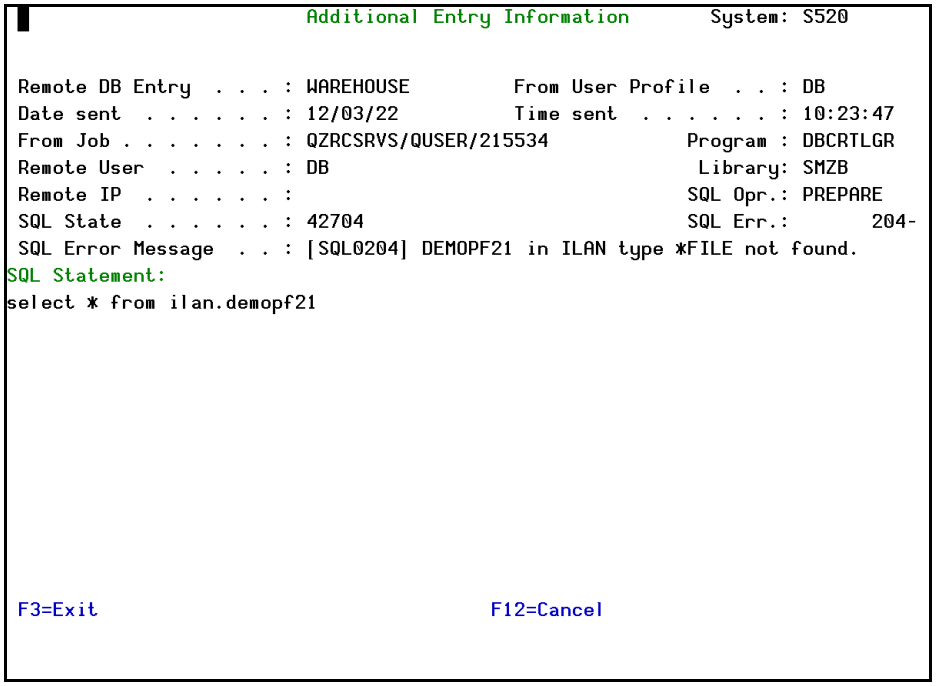


Figure 6-4. Additional Entry Information from DB-Gate Log

7 Remote User ID

This chapter describes how to work with server authentications. The parameters and settings rely on standard IBM commands, such as **ADDSVRAUTE** and **CHGSVRAUTE**, which are described in detail in the IBM documentation.

At the time that authentication information is required, the data entered here will be used. This eliminates the need for repetitive entries of the authentication information.

Injection of Remote User IDs

To set up auto injection of remote user IDs, select **21. Work with Server Authentication** from the **DB-Gate** main menu and press **Enter**.

The **Work with Server Authentication Entries** screen is displayed as shown in Figure 7-1 on page 46.

```
                  Work with Server Authentication Entries
                                          Subset by user . . . .
Type options, press Enter.                          server . . .
  1=Select   4=Remove                               remote user.

Opt  User        Server                  Remote user             Password
     AU          CRM1                    SASHA2
     AU          RDBIMP                  QSECOFR                   *YES
     AU          S520DDM                 QSECOFR                   *YES
     AV          testrdb10               AV
     DB          CRM                     SASHA                     *YES
     DB          LOGISTICS               sasha                     *YES
     DB          SALES                   tm1                       *YES
     DB2ADMIN    acum_db                 DB2ADMIN                  *YES
     DB2ADMIN    ACUMSDB                 db2admin                  *YES
     DPROP       ODED                    DPROP
     DPROP       REPLICA                 ODED
     DPROP       SHI                     DPROP
     DPROP       192.168.168.182         DPROP
     DPROP       192.168.168.4           DPROP
                                                                   More...
F3=Exit    F6=Add New    F12=Cancel
```

Figure 7-1. Work with Server Authentication Entries

To view a specific subset of server authentication entries:

1. Select one of the following subset fields:
   - **User**
   - **Server**
   - **Remote User**
2. Enter the first alphanumeric characters of the entry and press **Enter**.

   The list is redisplayed with results that match your query.

Modifying a Server Authentication Entry

To modify a server authentication entry:

1. Highlight the server authentication entry that you want to update in the **Work with Server Authentication Entries** screen and press **1 - Select** and then press **Enter.** The **Modify User Authentication Entry** screen appears as shown in Figure 7-2 on page 47.
2. Update the **User profile**, **Server** and **Remote user ID** details displayed.
3. Press **Enter**. After a confirmation message appears, press **Enter** again to save your settings.

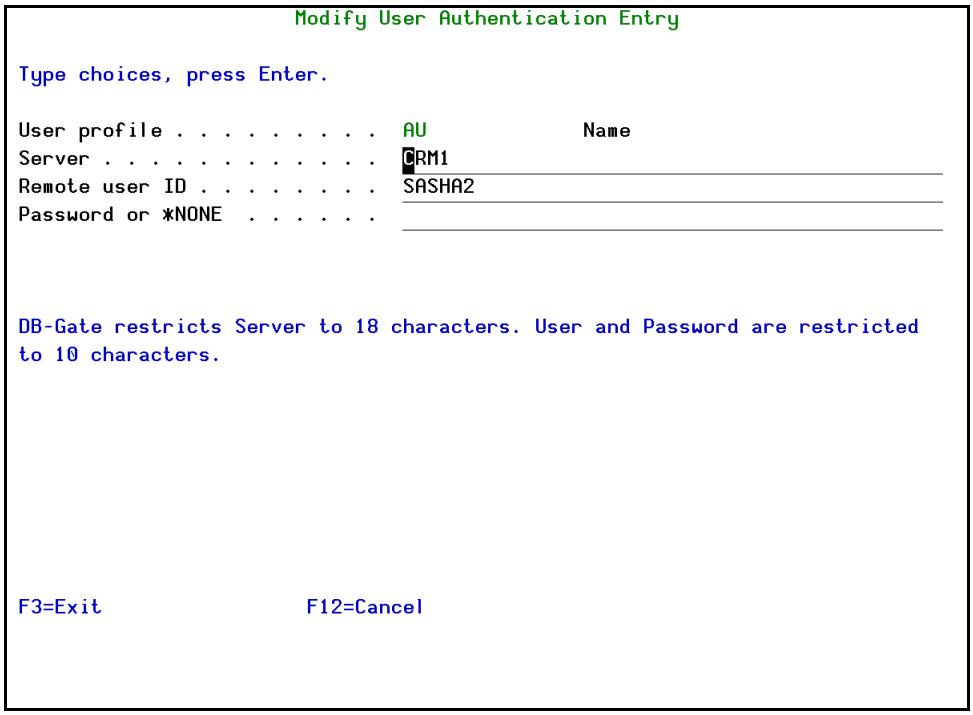


Figure 7-2. Modify User Authentication Entry

Adding a New Server Authentication Entry

To add a new server authentication entry:

1. In the **Work with Server Authentication Entries** screen, press **F6 - Add New**. An empty **Add User Authentication Entry** screen appears.
2. Update the User profile, Server and Remote user ID details displayed.
3. Press **Enter**. After a confirmation message appears, press **Enter** again to save your settings.

8 Test Drive

This chapter describes the various ways you can start SQL and work with SQL programs. These features rely on standard IBM commands, which are described in detail in the IBM documentation.

Starting SQL

To start working with SQL and to begin writing SQL commands directly from your System i:

- Select **51. Start SQL** from the **DB-Gate** main menu. The **Enter SQL Statements** screen appears, as shown in Figure 8-1 on page 49.

  This is the main screen for interactive Structured Query Language (SQL) for running SQL statements. SQL messages also appear on this screen.

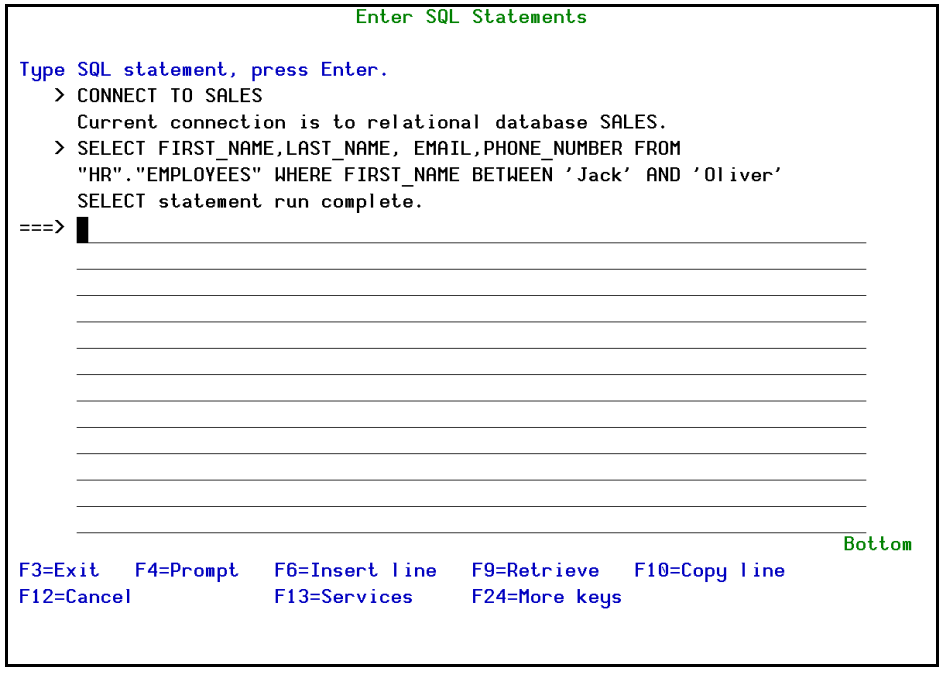


Figure 8-1. Enter SQL Statements

Verifying the Connection

Before you start working with SQL, you may want to verify that you have a connection to the RDB with which you want to work.

To verify a connection:

1. Select **52. Verify Connection** from the **DB-Gate** main menu. The Verify DB-Gate RDB screen appears, as shown in Figure 8-2 on page 50.

```
                        Verify DB-Gate RDB (VFYRDB)

Type choices, press Enter.

RDB name . . . . . .
RDB user . . . . . .   *AUTO          Character value, *AUTO
RDB password . . . . . .              Character value, *AUTO

                                                                      Bottom
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
F24=More keys
```

Figure 8-2. Verify DB-Gate RDB

2. Enter the **RDB name** and the **RDB password**, if relevant.

NOTE: The default *AUTO is for those RDBs that do not supply the user/password directly or do not require credentials. Indirect credentials can be sent to ARDPGM via the use of server authentication entry or JDBC URL.
If an empty Password is received when connecting, DB-Gate also ignores the User field and attempts to create a connection based on the JDBC URL only. You can set the JDBC URL in the Modify Directory Entry screen, see Modifying a Directory Entry on page 29 for more details.

---

3. Press **Enter**. A message is displayed with the status of the connection.

Working with SQL Program Sources

To begin working with SQL Program Sources:

- Select **55.- Work with SQL* program sources** from the **DB-Gate** main menu. The **Work with Members Using PDM** screen appears, as shown in Figure 8-3 on page 51.

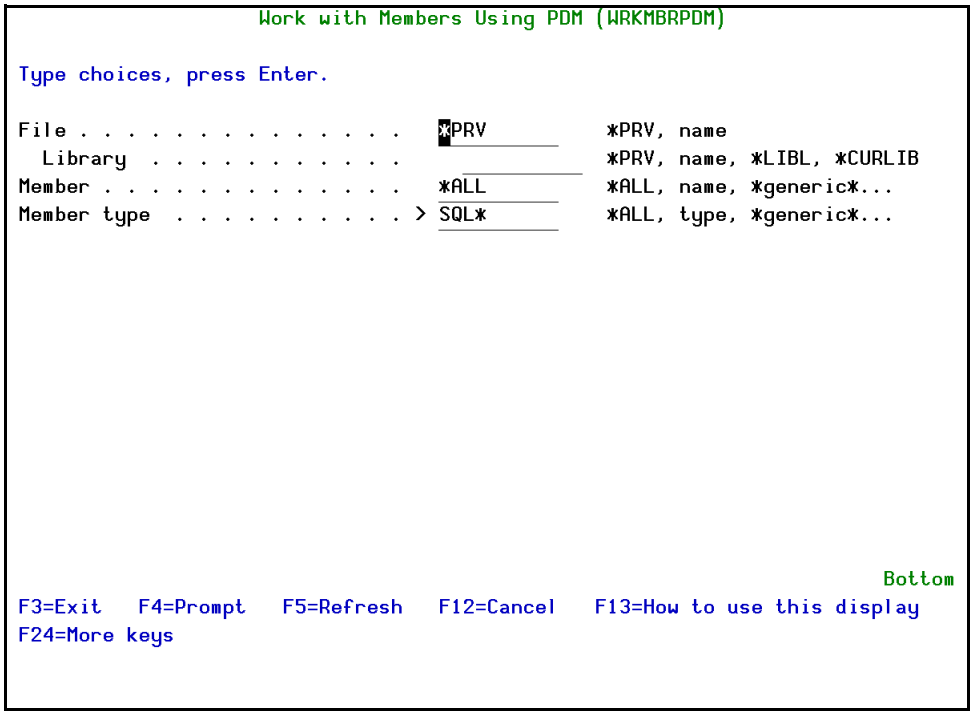
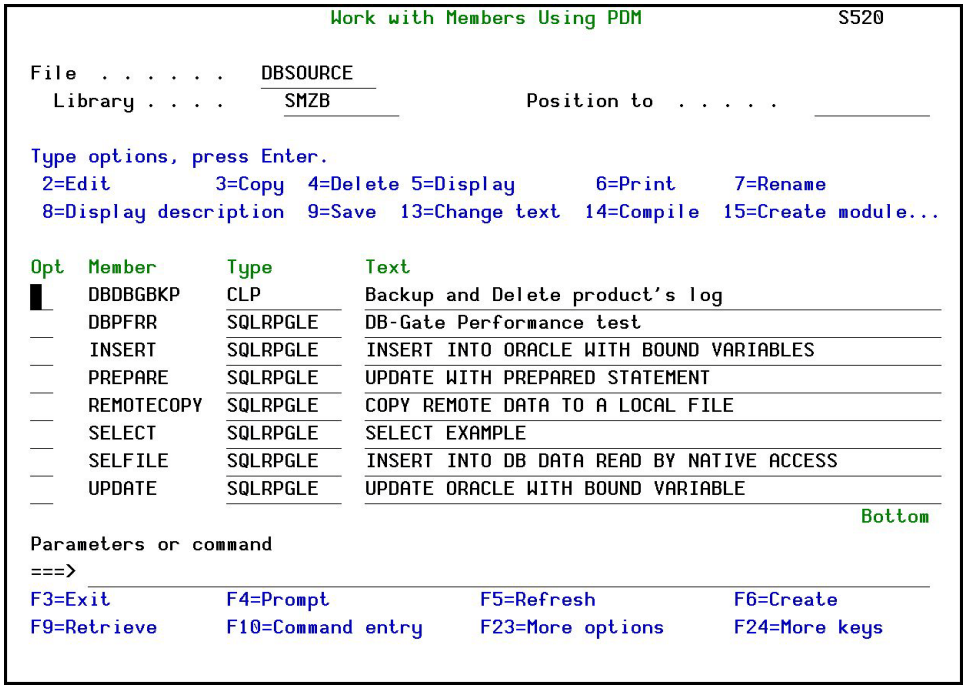


Figure 8-3. Work with Members using PDM

iSecurity provides you with SQL code examples in file DBSOURCE in library SMZB, as shown in Figure 8-4 on page 52.



```
                        Work with Members Using PDM                 S520

File  . . . . . .   DBSOURCE
  Library . . . .     SMZB              Position to  . . . . .

Type options, press Enter.
 2=Edit         3=Copy  4=Delete 5=Display      6=Print     7=Rename
 8=Display description  9=Save  13=Change text  14=Compile  15=Create module...

Opt  Member      Type        Text
     DBDBGBKP    CLP         Backup and Delete product's log
     DBPFRR      SQLRPGLE    DB-Gate Performance test
     INSERT      SQLRPGLE    INSERT INTO ORACLE WITH BOUND VARIABLES
     PREPARE     SQLRPGLE    UPDATE WITH PREPARED STATEMENT
     REMOTECOPY  SQLRPGLE    COPY REMOTE DATA TO A LOCAL FILE
     SELECT      SQLRPGLE    SELECT EXAMPLE
     SELFILE     SQLRPGLE    INSERT INTO DB DATA READ BY NATIVE ACCESS
     UPDATE      SQLRPGLE    UPDATE ORACLE WITH BOUND VARIABLE
                                                                  Bottom
Parameters or command
===>
F3=Exit          F4=Prompt          F5=Refresh         F6=Create
F9=Retrieve      F10=Command entry  F23=More options   F24=More keys
```

Figure 8-4. SQL Code Examples

9 System Configuration

DB-Gate is ready-to-run right out of the box. You should review a few system configuration parameters that control important features prior to using the product for the first time.

It should be pointed out that there is no “typical” or “optimal” configuration for a connectivity product such as **DB-Gate**. Each installation or application has different operational criteria and security needs. For example, the log requirements for a large manufacturing environment may be quite different from those for a bank, a software developer or a service organization.

To access system configuration, select **81. System Configuration** from the DB-Gate main menu. The **DB Directory Entry System Configuration** menu appears, as shown in Figure 9-1 on page 53.

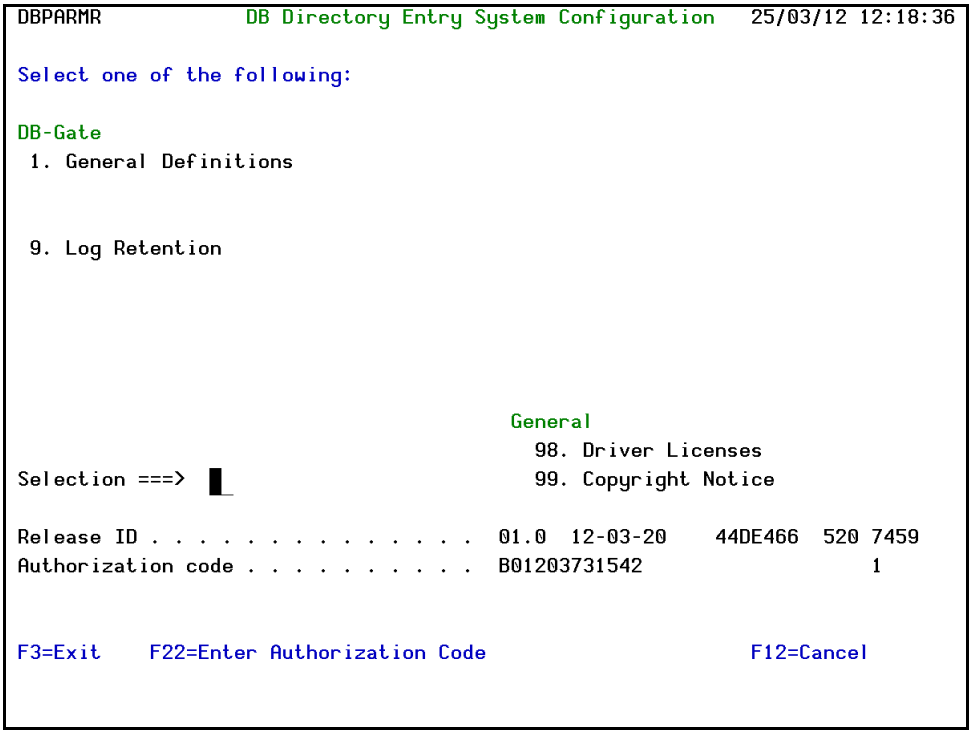


Figure 9-1. DB Directory Entry System Configuration

After you modify any of the parameters accessible from this menu, the message **Modify data, or press Enter** appears upon return to the menu.

General Definitions

Refer to Activation on page 13 for detailed descriptions and instructions on the three Run modes.

To change the global settings of **DB-Gate**:

1. Select **1. General Definitions** from the **System Configuration** menu. The **General Definitions** screen appears as shown in Figure 9-2 on page 54.

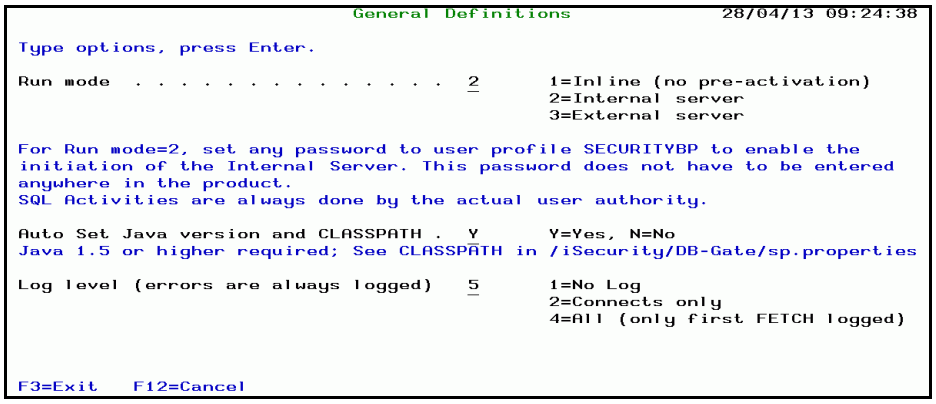


Figure 9-2. General Definitions Screen

2. Enter a Log level setting from one of the following options:

Option	Description
1 = No Log	No data is stored.
2 = Connects only	The log will store a record of each connection and disconnection from a database.
4 = All	The log will store all commands sent; when a **Fetch** command is sent, it will only store the first in the series.

NOTE: Modifying a Directory Entry on page 29 describes how to change a global default setting (**0=Global**) default setting for a specific directory entry. The above procedure overrides the global default setting (**0**).

Log Retention

Setting DB Log Retention Parameters

Log Retention parameters govern the retention and backup of the **DB-Gate** history log files. In order to preserve desk storage capacity and improve query response time, you should retain transactions for the minimum period necessary to maintain an effective audit program. The recommended initial settings are shown below.

To set the log retention periods:

1. Select **9. Log Retention** from the **DB Directory Entry System Configuration** menu. The **DB Log Retention** screen appears as shown in Figure 9-3 on page 55 and described in Table 9-1 on page 55.
2. Enter the parameters as defined in the table below and press **Enter**. After a confirmation message appears, press **Enter** again to save your settings.

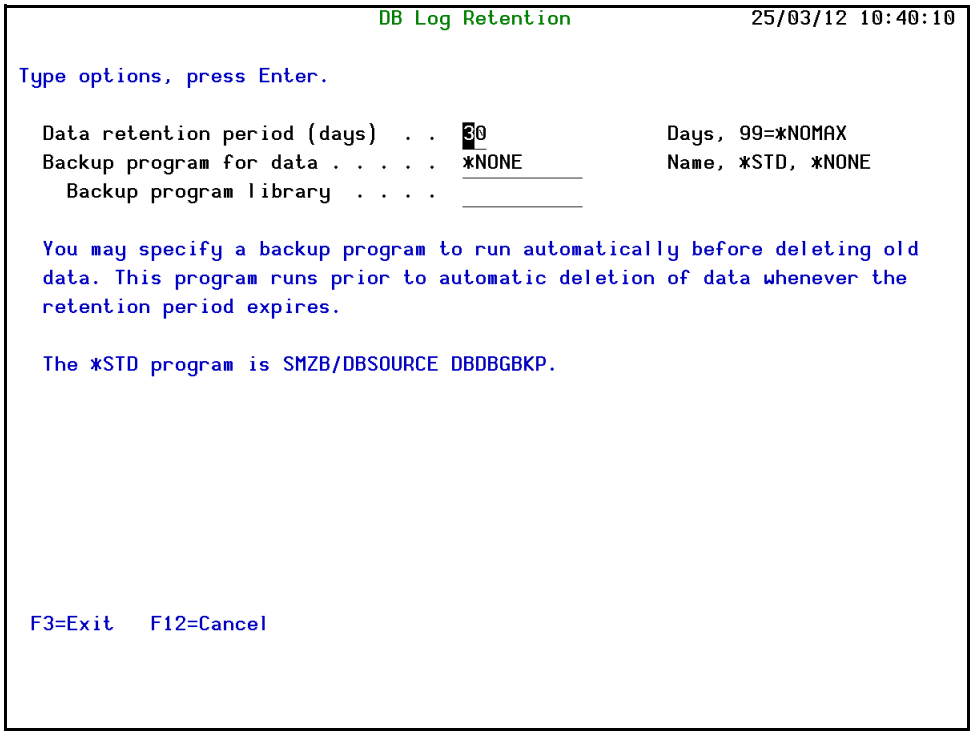


Figure 9-3. DB Log Retention

Table 9-1: DB Log Retention Parameters

Parameter	Description
Data retention period	The number of days that the queries are retained. At the end of this period, queries are purged from the log. Enter 99 to retain all data indefinitely.
Backup Program for data	Enter the name of the backup program you wish to use: ***STD** to use the standard backup program, or ***NONE** for no backup.
Library	Enter the name of the library where the backup program is located.

10 Maintenance Menu

The **Maintenance Menu** enables you to set and display global definitions for **DB-Gate**.

To access the Maintenance menu, select **82 - Maintenance Menu** from the DB-Gate main menu.

The **Maintenance Menu** appears as shown in Figure 10-1 on page 57.

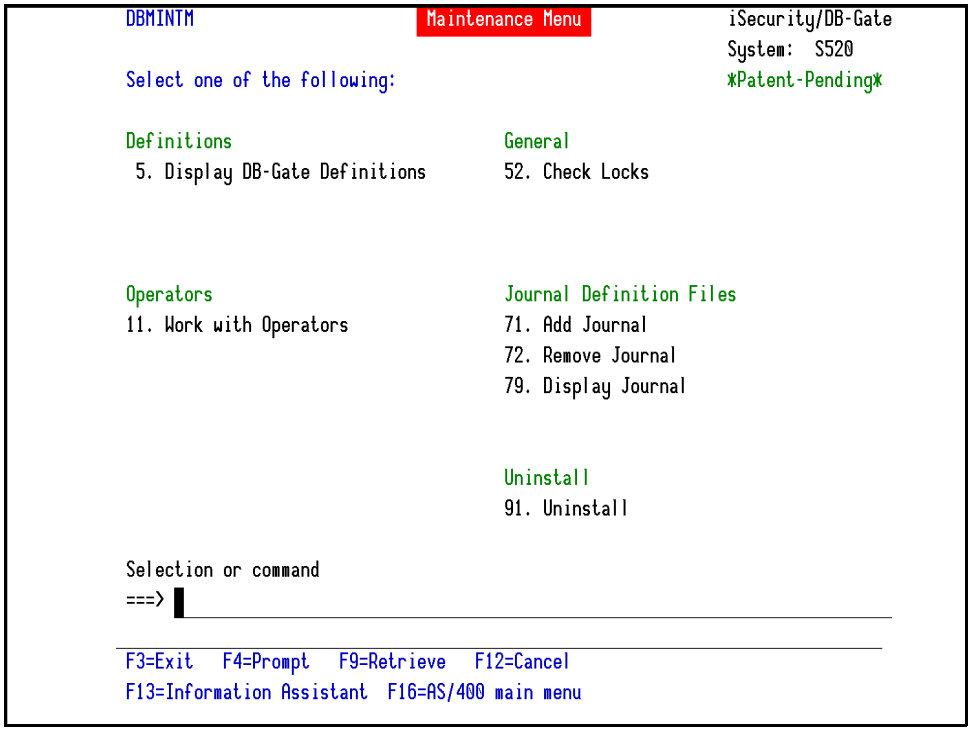


Figure 10-1. Maintenance Menu

Display DB-Gate Definitions

To print or display the definitions that you entered for DB-Gate:

1. Select **5. Display DB-Gate Definitions** from the **Maintenance Menu** screen. The **Display DB-Gate Definitions** screen appears as shown in Figure 10-2 on page 58. Table 10-1 on page 58 explains the options.

Table 10-1: DB Gate Definition Options

Parameter	Value	Description
Report Type	***ALL**	All of the following options
	***DBENTRY**	The definitions for the Directory Entries
	***DBDRVR**	The definitions for the DB Drivers
From Item	***All**	
	***Start**	From the beginning of all values
To Item	***Only**	
	***Last**	
Format	***List**	Short form
	***Details**	Full form
Output	*	Screen
	***Print**	Spool

2. Press **Enter**. After a confirmation message appears, press **Enter** again to save your settings.

```
                  Display DB-Gate Definitions (DSPDBDFN)

Type choices, press Enter.

Report type  . . . . . . . . . . > *DBENTRY      *ALL, *DBENTRY, *DBDRVR
From item  . . . . . . . . . . .   *ALL          Character value, *ALL, *START
To item  . . . . . . . . . . . .   *SAME         Character value, *ONLY, *LAST
Format . . . . . . . . . . . . .   *DETAILS      *LIST, *DETAILS
Output . . . . . . . . . . . . .   *             *, *PRINT

                                                                       Bottom
F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
F24=More keys
```

Figure 10-2. Display DB-Gate Definitions Screen

Work with Operators

The operators' authorities' management is maintained in one place for this product. It also offers the site a possibility of implementing a second password to protect use of the product.

There is one default group: *AUD#SECAD. It allows all users both *AUDIT and *SECADM special authorities. By default, this group has full access (Read and Write) to all the product's components.

You may add more operators, delete them, and give them authorities and passwords as required. You even have the option to make the new operators' definitions apply to all your systems; therefore, upon import, they will work on every system.

To view existing operator authorities and modify them, do the following.

1. Select **11 - Work with Operators** from the **Maintenance Menu** screen.The **Work with Operators** screen appears as shown in Figure 10-3 on page 59.

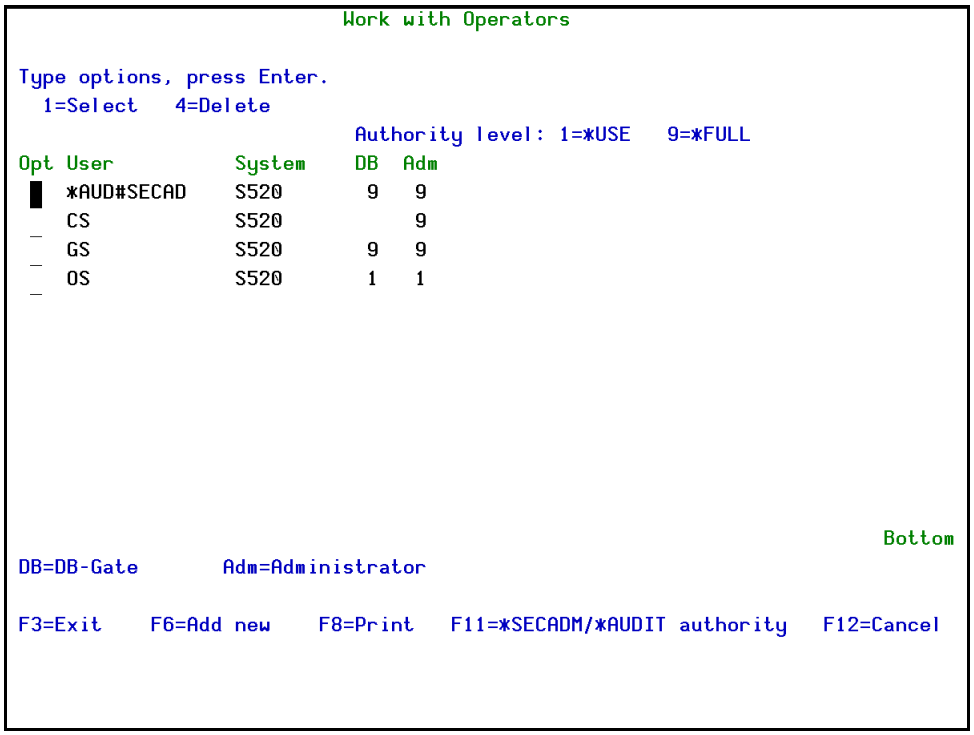


Figure 10-3. Work with Operators

2. To modify an operator, highlight it and choose **1 - Select**.
   The **Modify Operator** screen appears as shown in Figure 10-4 on page 60.
3. To add a new operator, press **F6.**

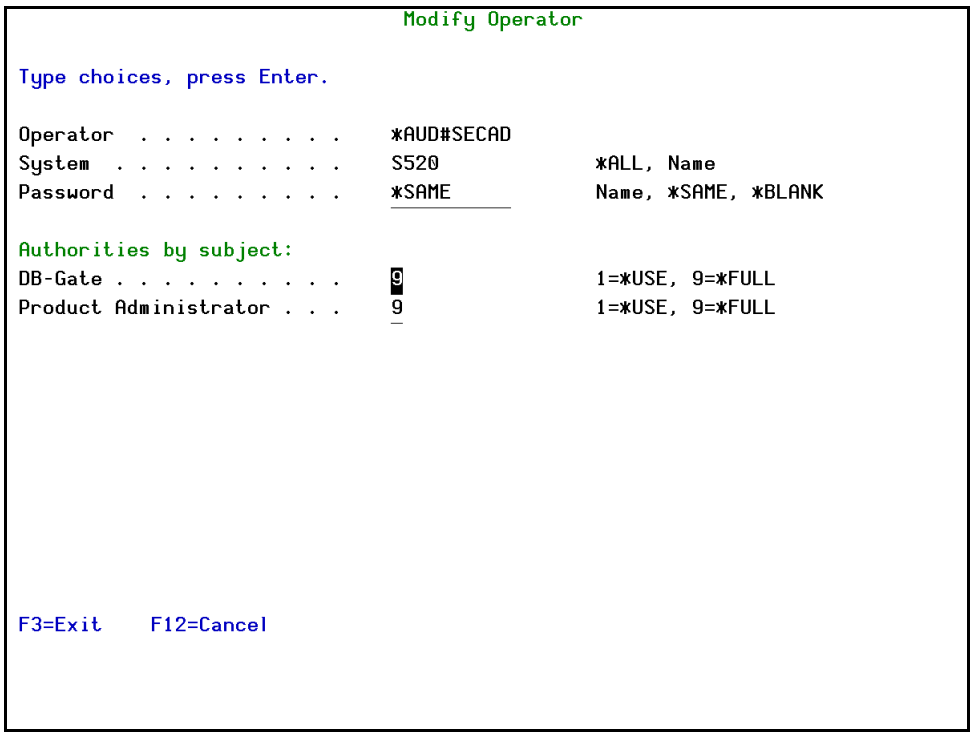


Figure 10-4. Modify Operator Screen

Table 10-2 on page 60 explains the parameters on the **Modify Operator** Screen.

Table 10-2: Modify Operator - Parameters

Parameter	Value	Description
Operator		The Operator can be a user or group profile. DB-Gate provides one type of Operator group: *AUD#SECAD. This group has full access (Read and Write) to all parts of DB-Gate.
System	*ALL	
	Name	
Password	Name	Password
	*SAME	Same as previous password when edited
	*BLANK	No password
DB-Gate Controls use of the product	1	***USE** (Read authority only)
	9	***FULL** (Read and Write authority)
Product Administrator Can perform backups, set authorization codes, and so on	1	Person responsible for backups, setting authorization codes, and so on ***USE** (Read authority only)
	9	Person responsible for backups, setting authorization codes, and so on ***FULL** (Read and Write authority)

Check Locks

To verify if objects are locked in the system:

- Select **52 - Check Locks** from the **Maintenance Menu**. The **Check Locks** screen appears, as shown in Figure 10-5 on page 61.

```
GSLCKMNU                          Check Locks                        iSecurity
                                                                  System:   S520
Select one of the following:

Check Locks
   1. Data Base Files

   -. Display Files
      End this session. Enter CHKSECLCK OBJTYPE(*DSPF) from a new session.

   -. All File Types
      End this session. Enter CHKSECLCK OBJTYPE(*ALL ) from a new session.




Selection or command
===>

F3=Exit    F4=Prompt    F9=Retrieve    F12=Cancel
F13=Information Assistant  F16=AS/400 main menu
```

Figure 10-5. Check Locks Screen

Uninstall

Use the Uninstall feature to remove DB-Gate from your computer.

1. Select **91. Uninstall** from the **Maintenance Menu**.
2. Follow the directions that follow on the **Uninstall SECURITYBP** screen.

```
                          Uninstall SECURITYBP

You are about to uninstall this product.
All program files, data and definitions will be deleted.
You are advised to print this screen for further reference.
Before proceeding, ensure that:
  o No user or batch job is working or intends to work with this product


To run uninstall procedure you should do the following:
  o Exit from the current session
  o Open a new session using QSECOFR or equivalent user profile
  o Enter: CALL SMZB/DBRMVPRD

Once the uninstall is completed, enter: DLTLIB SMZB
Manually delete IFS directory /iSecurity/DB-Gate
Backups of previous releases might exist under the name QGPL/P_SMZ*
To confirm proper uninstall, use DSPUSRPRF SECURITYBP TYPE(*OBJOWN)


F3=Exit
```

Figure 10-6. Uninstall SECURITYBP Screen

11 Troubleshooting

This chapter describes various issues that may arise and how to handle them. Please review the following sections prior to contacting your Raz-Lee distributor or customer support.

Issue:

`Java versions lower than v5.0 loaded by default.`

Workaround: DB-Gate requires Java v. 5 or higher to run. If any job has an earlier version of Java loaded, perform the following workaround, running either

- Mode 1 - Inline
- Mode 2 - Internal Server (recommended)

Mode 1 - Inline

The following steps will impact on all Java programs running in every job.

1. Copy the file:
   /iSecurity/DB-Gate/sp.properties
   to:
   /iSecurity/DB-Gate/SystemDefault.properties
2. Update the Home Directory for the user profile to your own unique IFS folder. Modify the desired user profile by typing the following command:
   CHGUSRPRF USRPRF(xxx) HOMEDIR('/iSecurity/DB-Gate')
3. Run the command sequence:
   STRDB > 81 > 1
4. Turn off **Auto Set Java version and CLASSPATH**
5. Make sure that the file **SystemDefault.properties** contains the line:
   java.version=1.5

```
                          General Definitions              28/05/13 12:31:00

Type options, press Enter.

Run mode  . . . . . . . . . . . . . . .  1       1=Inline (no pre-activation)
                                                 2=Internal server
                                                 3=External server

For Run mode=2, set any password to user profile SECURITYBP to enable the
initiation of the Internal Server. This password does not have to be entered
anywhere in the product.
SQL Activities are always done by the actual user authority.

Auto Set Java version and CLASSPATH .   N       Y=Yes, N=No
Java 1.5 or higher required; See CLASSPATH in /iSecurity/DB-Gate/sp.properties

Log level (errors are always logged)    5       1=No Log
                                                 2=Connects only
                                                 4=All (only first FETCH logged)



F3=Exit    F12=Cancel
```

Figure 11-1. General Definitions Screen - Mode 1 Options

6. Start a new job to test.

Mode 2 - Internal Server

It is recommended to use Mode 2 since only the internal DB-Gate user will be affected.

1. Copy the file:
   /iSecurity/DB-Gate/sp.properties
   to:
   /iSecurity/DB-Gate/SystemDefault.properties
2. Update the Home Directory for the user profile to your own unique IFS folder For example, to modify the **SECURITYBP** user profile, type:
   CHGUSRPRF USRPRF(SECURITYBP) HOMEDIR('/iSecurity/DB-Gate')
3. Run the command sequence:
   STRDB > 81 > 1
4. Turn off **Auto Set Java version and CLASSPATH**:by changing the status to **N**.
5. Make sure that the **SystemDefault.properties** file contains the line:
   java.version=1.5
6. Deactivate and then reactivate the server.

Issue:

```
The installation of the product failed.
```

Workaround: Perform a manual installation

1. On the System i, run the following command: `CRTSAVF QGPL/SMZB`.
2. On the server, perform the following to extract the save file (.A2P extension) from the zip file FTP xyzxyz.A2P and copy it to the IBM System i as save file QGPL/SMZB
   a. ftp AS400_IP
   b. ...
   c. bin
   d. cd QGPL
   e. put DB0220V71.A2P SMZB
   f. bye
3. On the System i, run the following commands:
   - `RSTOBJ OBJ(DBI) SAVLIB(SMZB) DEV(*SAVF) SAVF(QGPL/SMZB) RSTLIB(QTEMP)`
   - `CALL QTEMP/DBI ('*SAVF' 'DB' 'QGPL' 'SMZB')`

The installation should now be complete.

Error Messages in Server Mode

The following error messages may appear when running in server mode.

DB-Gate messages in server mode

Message

```
DB-Gate server disconnected.
```

Reason. DB-Gate has disconnected from running the SQL job due to activation group end, job end or explicit disconnect request for that job ('Release Job' from GUI).

Message

```
No response from DB-Gate server.
```

Reason. DB-Gate server is not currently active.

Message

```
Connection terminated. Job should be restarted.
```

Possible Reasons. ■

- DB-Gate server has been deactivated while the SQL job was working with DB-Gate. This doesn't mean DB-Gate server is not currently active but any connection made with DB-Gate until that message is lost. It is recommended to restart the job.
- Error in the DB-Gate Java engine

Appendix A: JDBC Driver for Excel, CSV, etc.

Adding an Entry

To add an entry:

1. Type **STRDB**. The **DBG-Gate** main menu appears.
2. Select option **1. Work with Directory Entries**.
3. Press **F6**, give it a name and point it to the supplied PC_FILE driver as shown in Figure A-1 on page 67.
4. Press **Enter**. Set log level and language support if needed and confirm.

   The entry is activated and available for use.

```
                          Add New Directory Entry

Directory Entry . . . . .   PC
Driver  . . . . . . . . .   PC_FILE              F4=Prompt
```

Figure A-1. Add New Directory Entry

```
Opt Driver   Available
 _  ORACLE_SID  Yes  Oracle SID
 _  ORACLE_SRV  Yes  Oracle Service
 _  ORACLE_TNS  Yes  Oracle TNS
 _  PC_FILE     Yes  CSV, Microsoft Excel, Text, ODF Spreadsheet, XML
 _  PERVASIVE    -   Pervasive
 _  POINTBASEL  Yes  PointBase Local
 _  POINTBASES  Yes  PointBase Server
```

Figure A-2. Opt Driver Available

The driver operates based on target file's extension:

- xls/xlsx for MS Excel
- csv for comma-separated values
- ods for ODF spreadsheet
- txt and any other extension is treated as text file.

Connecting

Working with the JDBC Driver Connect the entry (no user/password is required): **CONNECT TO PC**

Complete either of the following steps:

- An SQL 'COMMENT ON' statement: **COMMENT ON QGPL.MY_TABLE IS 'file:///tmp/customers.xls'**
- One can also use: **COMMENT ON QTEMP.MY_TABLEIS...**or **COMMENT ON MY_TABLEIS...**

NOTE: In both cases, the file MY_TABLE is created in an internal QTEMP library. This is not to be confused with the current Job's QTEMP lib.

When issuing the SELECT statement the QTEMP library must be specified:

SELECT* FROM QTEMP.MY_TABLE

When completed, the file QGPL/MY_TABLE is created and available with the data.

An SQL 'SELECT' statement: **SELECT * FROM QGPL.MY_TABLE**

The driver accesses the source PC file in a read only manner.

Excel sheets can be accessed by specifying the sheet number in the '**COMMENT ON**' statement.

Example:

COMMENT ON QGPL.MY_TABLE IS 'file:///tmp/customers.xls@2'

On this example, the file is **customers.xls** and the query targets the second sheet @2.

The first sheet is '@1'.

Tables embedded in ODF Text Documents (LibreOffice/OpenOffice) can be accessed in the same manner as sheets on Excel spreadsheet.

Table A-1: Access Protocols Examples

Function Key	Description
File	Mainly for accessing files in the IFS file system: **COMMENT ON QGPL.MY_TABLE IS 'file:///tmp/customers.xls'**
HTTP	Mainly for the web **COMMENT ON QGPL.MY_TABLE IS 'http://www.razlee.info/gui/db_gate/ms.xls'**
FTP	**COMMENT ON QGPL.MY_TABLE IS 'ftp://myserver.com/readme.txt'**
SMB	MS Windows shares **COMMENT ON QGPL.MY_TABLE IS 'smb://192.168.1.181/shareddocs/sales.csv'**

Appendix B: Oracle TNS Names

B

Working with Oracle TNS

An RDB entry for Oracle can be defined using the ORACLE_TNS driver. There are two methods for specifying the JDBC URL; inline on the System i or by referring to a TNS entry name in the external file (**tnsnames.ora**).

Inline Method

To define the RDB for Oracle:

1. Add a new Directory Entry, as described in Creating a New Directory Entry on page 32.
2. Ensure that the **URL** entry is as shown in Figure B-1 on page 69.

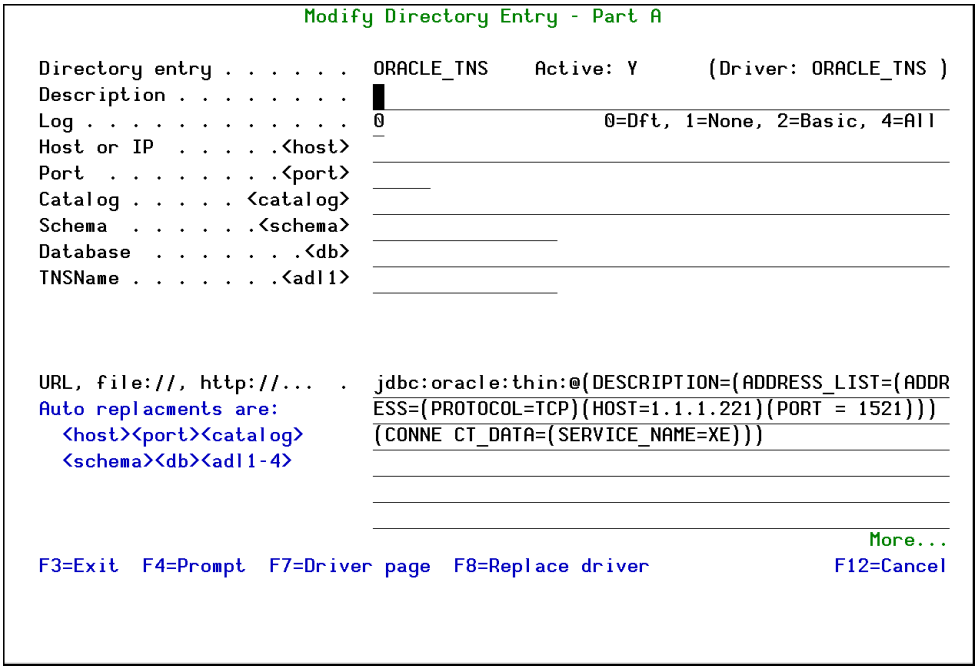


Figure B-1. Oracle TNS RDB

External File Method

You can find the available TNSNAMES entries listed in the **tnsnames.ora** file on the client computer from which you are connecting. The file is located and loaded upon an attempt to connect the RDB entry. The location of the file is written to the IFS file **/iSecurity/DB-Gate/sp.properties**, for example:

```
oracle.net.tns_admin=/iSecurity/DB-Gate
```

This is the default location for the **tnsnames.ora** file. If you move it to another location, you must also update the **sp.properties** file.

After modifying the sp.properties file, you must restart DB-Gate. If you are running in either internal server mode or external server mode, you must restart the server. If inline run mode is used, any new SQL job will be affected.

Below is an example of the **tnsnames.ora** file:

```
PROD=
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCP)(HOST = 192.168.1.221)(PORT =
1521))
    )
    (CONNECT_DATA =
      (SERVICE_NAME = XE)
    )
  )

TEST=
  (DESCRIPTION =
      (ADDRESS_LIST =
        (ADDRESS=(PROTOCOL=TCP)(HOST=192.168.1.21)(PORT=1521))
        (ADDRESS=(PROTOCOL=TCP)(HOST=192.168.1.22)(PORT=1521))
      )
      (CONNECT_DATA=
        (SERVICE_NAME=XE2)
     )
  )
```

In the Modify Directory Entry screen, ensure that the **JDBC URL** field is set to **jdbc:oracle:thin:@PROD** or **jdbc:oracle:thin:@TEST** as appropriate.

```
                        Modify Directory Entry - Part A

 Directory entry . . . . . .  ORACLE_TNS    Active: Y      (Driver: ORACLE_TNS )
 Description . . . . . . . .  ____________________________________________________
 Log . . . . . . . . . . . .  0                  0=Dft, 1=None, 2=Basic, 4=All
 Host or IP  . . . . .<host>  ____________________________________________________
 Port  . . . . . . . .<port>  _____
 Catalog . . . . . <catalog>  ____________________________________________________
 Schema  . . . . . .<schema>  ________________
 Database  . . . . . . .<db>  ____________________________________________________
 TNSName . . . . . . .<adl1>  ________________



 URL, file://, http://...  .  jdbc:oracle:thin:@PROD
 Auto replacments are:        ____________________________________________________
   <host><port><catalog>      ____________________________________________________
   <schema><db><adl1-4>       ____________________________________________________
                              ____________________________________________________
                              ____________________________________________________
                                                                          More...
 F3=Exit  F4=Prompt  F7=Driver page  F8=Replace driver                F12=Cancel
```

Figure B-2. Oracle TNS RDB Defined Externally