



Mimer SQL

OpenVMS Guide

Version 8.2.4
August 2001

Mimer SQL, OpenVMS Guide, Version 8.2.4
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Chapter 1

Introduction

Since the first release of Mimer on VMS in 1982 (Mimer version 3.1 on VAX VMS 3), a large number of Mimer SQL users have deployed their solutions on the OpenVMS platform.

The current release of Mimer SQL for OpenVMS is version 8.2.4. While providing compatibility for old customers, the new version contains enhanced database functionality and takes advantage of new OpenVMS features such as DecThreads.

About this Guide

This guide describes how to install and use version 8.2.4 of the Mimer SQL relational database server under OpenVMS. It contains OpenVMS-specific instructions about installing the software, creating databases and managing database servers and is for general users, system administrators and programmers who use Mimer SQL on the OpenVMS operating system.

For practical purposes, Mimer SQL version 8.2.4 is sometimes referred to as MIMER8 in this guide.

About Mimer SQL for OpenVMS

You can download a full version of Mimer SQL for OpenVMS for *free* from <http://developer.mimer.com/downloads>. This distribution is for development and evaluation. It contains a complete copy of Mimer SQL version 8.2.4 and a built-in software key, with no time-limit. It supports up to 10 concurrent database connections.

Mimer SQL Run-time License

To use Mimer SQL for OpenVMS in production, you need a run-time license key.

Please contact your local Mimer representative, see www.mimer.com/contact/ or e-mail info@mimer.com.

The Mimer SQL Database Server

The Mimer SQL database server is a single, multi-threaded process. By using DecThreads, good SMP scalability is achieved.

Clients using TCP/IP or Decnet can access the server. For clients running on the same platform, a special shared-memory based communication method is used.

Embedded SQL

An embedded SQL preprocessor is included. It enables SQL commands to be embedded in programs written in C, C++, FORTRAN and COBOL. The embedded syntax complies with the ISO standard for embedded SQL.

JDBC Driver

A JDBC driver is included in the distribution. The driver is a type 4 driver, which means that it is written entirely in Java. This provides the driver with full portability so that it can be copied or downloaded to any Java-enabled platform. The driver uses TCP/IP to access a Mimer SQL 8.2.4 server on any platform.

The JDBC driver supports JDBC version 1.2 which makes it suitable for use with the JDK 1.1.8 platform included in OpenVMS 7.2. Mimer will soon release a JDBC version 2 driver which is suitable for the Java 2 platform.

ODBC Driver

The Mimer ODBC driver is a client library that enables applications to access Mimer database servers running on any platform. The driver complies with the ODBC 3.52 specification.

By using the ODBC driver on OpenVMS, you can develop ODBC applications and execute them on the OpenVMS platform.

Unlike other platforms, OpenVMS does not include a Driver Manager that enables OpenVMS applications to dynamically load drivers for different database products. Until such a Driver Manager becomes available on OpenVMS, you can link your applications directly to the Mimer ODBC driver.

Note that in order to run an ODBC application on a Windows platform, the Windows ODBC driver has to be installed on the client side. This driver can then access Mimer database servers on any platform (including OpenVMS). There is no need to install any special software on the server side in order to use ODBC.

Utilities

Mimer SQL includes the following utilities:

Utility	Description
BSQL	BSQL executes SQL statements which are entered interactively or read from a command file. It is described in the <i>Mimer SQL User's Manual</i> .
DBC	DBC check if a databank file is internally consistent. It is described in the <i>Mimer SQL System Management Handbook</i> .
DBOPEN	DBOPEN opens and restarts all databanks in a database. It is described in the <i>Mimer SQL System Management Handbook</i> .
ESQL	ESQL is a pre-processor for embedded SQL.
MIMCONTROL	MIMCONTROL provides facilities for managing the operation of a database server, for example, starting, controlled shutdown, etc.
MIMINFO	MIMINFO displays status information for a database server.
MIMLICENSE	Utility for managing Mimer SQL licenses.
PSMDEBUG	Java-based utility for debugging PSM procedures.
SDBGEN	SDBGEN generates the Mimer SQL system databanks SYSDB, TRANSDB, LOGDB and SQLDB.
UTIL	Utility functions for a database, see the <i>Mimer SQL System Management Handbook</i> .

The Mimer SQL distribution also contains examples of database programs and SQL statements. See *Appendix A Distributed Files* for more information

OpenVMS System Requirements

For the latest news regarding the OpenVMS version to use with Mimer SQL, please see our developer Web site:

http://developer.mimer.com/platforms/platform_9.tml

- Mimer SQL version 8 runs on the OpenVMS Alpha, version 7.2-1H1 operating system, or later.
- OpenVMS 7.3 contains problems in the DecThreads package so you should avoid the 7.3 version. If Compaq releases a patch for this version that fixes the DecThreads problems, you may upgrade to that version.
- If you are using OpenVMS 7.2-1H1, the following OpenVMS patch must be installed:

VMS721_UPDATE-V0300

- The installed Mimer SQL product requires about 44,000 disk blocks (22 Mb).
- The VAX architecture is not supported by Mimer version 8.2.4 since the DecThreads upcall mechanism is not available there.

Note: Normally, a version number like 7.2-1H1 is used for a OpenVMS version that provides support for new hardware. However, you can use 7.2-1H1 on all Alpha machines supporting OpenVMS. Version 7.2-1H1 contains DecThread fixes that are not present in 7.2-1.

User Requirements

To install Mimer SQL, you should have a working knowledge of system management within the OpenVMS environment.

Documentation Resources

You can find relevant information in the OpenVMS System Management Guide (published by Compaq).

Note: Most OpenVMS manuals can be found online at the following Internet address: <http://www.openvms.compaq.com:8000/>.

You should be familiar with the concepts and facilities provided by the Mimer SQL system.

Other documents that are referred to in this document or that may be of interest when dealing with the tasks described here are: the *Mimer SQL System Management Handbook*, the *Mimer SQL Programmer's Manual*, and the *Mimer SQL Release Notes*.

You can find them, at <http://developer.mimer.com/documentation/index.tml>.

This document is included in the Mimer SQL distribution. You can access it in Netscape by opening the following file:

[MIMER824A.DOC.VMSGUIDE]Mimer_SQL_OpenVMS_Guide.htm

Documentation Conventions

Convention	Example	Explanation
All uppercase	COMMIT	Indicates command names, SQL reserved words, and keywords
Monospace	\$ SET COMMAND MIMLIB8:MIMER	Indicates directory names, file names, code examples and interactive screen displays.
[]	[timeout]	Encloses optional items.
[]		Vertical bars separating optional items indicate that you can choose none, one or more than one item.
<i>Italics</i>	<i>Mimer SQL User's Guide</i>	Indicates a cross reference or the title of a guide.

Terms and Definitions

The following terms and acronyms are used in this document:

Term	Explanation
API	Application Programming Interface.
BSQL	Batch SQL, a program used to execute SQL statements which are read from a command file or entered interactively.
CLD	A Command Language Definition (CLD) file that contains definitions for new DCL commands.
Data source	ODBC term for a database.
Databank	Databank is the Mimer SQL term for the physical file in which one or more Mimer SQL tables are stored. A databank corresponds to one file in the operating system. A database may contain several databanks.
Database	A database is a collection of databanks, tables, shadows, etc., all defined as objects in the data dictionary. A computer may have several databases operating simultaneously, but no information is shared between them. Each database has a unique name, registered in the SQLHOSTS file.

Term	Explanation
Database home directory	The directory where the SYSDB databank file is located, also recorded in the SQLHOSTS file.
DCL	Digital Command Language.
DCL\$PATH	A logical name used by DCL to find executable programs. By including the MIMEXE8 directory in the definition of this logical name, all Mimer SQL programs can be started by typing their names directly. Some of the programs also accept UNIX-style command options when started in this fashion.
Dynamic SQL	SQL statements constructed at runtime and passed to the database management system for execution.
Embedded SQL	The term used for SQL statements when they are embedded in a traditional host language.
ESQL	The preprocessor for embedded SQL.
Java	A platform independent language invented by Sun. See http://java.sun.com .
JDBC	Java DataBase Connectivity. A set of Java interfaces for accessing relational databases. See: http://java.sun.com/jdbc .
MIMER8	The general term used in this document for version 8 of Mimer SQL.
MIMERxxxxx	Symbolic name for the distribution directory tree, unique for each Mimer SQL release, where "xxxxx" stands for the current version number, e.g. "822A".
ODBC	Microsoft's Open Database Connectivity, a specification for a database API in the C language, independent of any specific DBMS or operating system.
PSM	Persistent Stored Modules, the term used by ISO/ANSI for Stored Procedures.
Shadow	A shadow is a copy of the original (master) databank and is continuously updated by Mimer SQL. A Mimer SQL databank may have one or more shadows. If the databank is shadowed, there will be one file for each shadow. If the master databank is lost, it is possible to continue operations from the shadow databank without stopping the database server. A databank must have the TRANS or LOG option to be shadowed. For more information, see the <i>Mimer SQL System Management Handbook</i> .
SQL	Structured Query Language, standardized language for database manipulation.
SQLHOSTS	A file containing lookup information for all accessible Mimer SQL databases, relative to the current node.
Table	Tables (or relations) hold all the information in a relational database. A table is stored in a databank. It may not be split across databanks, but a databank may contain several tables.

Chapter 2

Installing Mimer SQL

This chapter describes how to install the Mimer SQL software on OpenVMS. It also documents how to remove a Mimer SQL installation.

Overview

The following steps provide an overview of how to install Mimer SQL for OpenVMS.

Step 1 Unpack the distribution file to a directory tree

To unpack the file, simply execute it. Note that the `MIMER824A.EXE` file must reside in your current directory, so you may have to copy the file.

A new directory will be created in your current default directory. For example:

```
$ COPY MIMER824A.EXE somedisk:[000000]  
$ SET DEF somedisk:[000000]  
$ RUN MIMER824A
```

For more information, see *Unpacking the Mimer SQL Distribution File* on page 8.

Step 2 Set-up the Mimer SQL Environment

Using `MIMSETUP8`, you must set-up locations for programs, libraries, data files, documentation, etc., for users and applications. For example:

```
$ @somedisk:[MIMER824A]MIMSETUP8 SYS
```

For more information, see *Setting-up the Mimer SQL Environment* on page 9.

Step 3 (Optional) Install your Mimer SQL License Key

A default key, for test and development only, is automatically installed, that is, you can finish the installation without adding a key.

But, if you going to put Mimer SQL into production you must install a run-time license.

See *Installing the Mimer SQL License Key* on page 12.

Step 4 (Optional) Add a MIMSETUP8 command in the SYSTARTUP_VMS.COM file

In order to set-up Mimer SQL each time the system boots, include the MIMSETUP8 command in the system startup file:

`SYS$MANAGER:SYSTARTUP_VMS.COM`, for example:

```
$ @disk:[MIMER824A]MIMSETUP8 SYSTEM
```

When you have carried out the steps above, you are ready to create your first database, see *Chapter 3 Establishing a Database*.

Unpacking the Mimer SQL Distribution File

The most common way of acquiring the Mimer SQL distribution for OpenVMS is to download it, in ZIP file format, from <http://developer.mimer.com>. The ZIP file is created using Info-ZIP.

Once downloaded, the file look like an ordinary executable (*.exe) file For example, the file containing Mimer SQL version 8.2.4 is named `MIMER824.EXE`.

Unpacking the ZIP File

To unpack the contents of the ZIP file, execute the file. Note that the `MIMER824A.EXE` file must reside in your current directory, so you may have to copy the file.

The Mimer SQL distribution directory will be created under the current directory. For example:

```
$ COPY MIMER824A.EXE somedisk:[000000]
$ SET DEF somedisk:[000000]
$ RUN MIMER824A
```

Ensuring Correct File Protections

Note: The three consecutive dots in the “[...]” construction used in the OpenVMS command examples that follow, together with savesets, are an essential part of the command syntax. If they are omitted, all files on the distribution media will be assigned to a single directory and the Mimer SQL installation will fail.

The auto-extract facility may not always apply the correct file protections to the files it extracts.

Therefore, we recommend that you run the following commands to ensure that the correct file protections are applied to the files in the tree:

```
$ SET FILE/PROT=(S:RWED,O:RWED,G:RE,W:RE) [MIMERxxxxx...]*.*
$ SET FILE/PROT=(S:RWE,O:RWE,G:RE,W:RE) MIMERxxxxx.DIR
```

The Mimer SQL Directory Tree

Once you have successfully unpacked Mimer SQL, you can review the directory structure in which the MIMER8 software resides.

The name of the installation root directory in the tree contains the word 'MIMER' and the version number of the product, for example: 'MIMER824A' (generally denoted as MIMERxxxx).

The name of the root directory is unique for each Mimer SQL release. This makes it easier to install new versions without affecting any previous versions of the product.

For more information about the files installed, see *Appendix A Distributed Files*.

Setting-up the Mimer SQL Environment

Before you can run Mimer SQL (also referred to as MIMER8), you must carry out certain setup operations. These include defining locations for programs, libraries, data files and documentation for users and applications.

You set-up Mimer SQL using the MIMSETUP8 command procedure. MIMSETUP8 defines the logical names needed to run Mimer SQL applications.

You can find the MIMSETUP8 command procedure in the Mimer SQL root directory.

Note: When running MIMSETUP8, you may require some of the following privileges: SYSPRV, CMKRNL, SYSNAM, see *Privileges* on page 10 for details.

MIMSETUP8 Syntax

The syntax for the MIMSETUP8 command is as follows:

```
$ @disk:[MIMERxxxxx]MIMSETUP8 [-][lnm-table]
```

The parameter `lnm-table` specifies which logical name table to use when defining the logical names required to access a Mimer SQL installation.

If the parameter `lnm-table` is preceded by a hyphen (-), the `MIMSETUP8` command procedure will remove the effects of any Mimer SQL setup previously performed for the specified table, including uninstalling shareable images.

Valid Values

Valid values for `lnm-table` are:

- SYSTEM
- GROUP
- JOB
- PROCESS

In general, we recommend that you execute `MIMSETUP8` to update the `SYSTEM` logical name table so that the definitions are available to all users.

SYSTEM or GROUP

If you specify `SYSTEM` or `GROUP`, the following shared images will be installed if they are not installed already:

- MIMLIB8:MIMDBP8.EXE
- MIMLIB8:MIMDB8.EXE
- MIMLIB8:MIMDBS.EXE

Therefore, for a Mimer SQL installation, you must perform a `SYSTEM` or `GROUP` level setup at least once in order to get these essential shared images installed. For more information, see *Shared Images* on page 42.

PROCESS or JOB

You can perform `MIMSETUP8` at the `PROCESS` or `JOB` level to set up logical names that may be different to those available from the `SYSTEM` or `GROUP` level (no shared image installation is involved in a `PROCESS` or `JOB` level setup).

If you run `MIMSETUP8` without specifying the `lnm-table` parameter, a `PROCESS` level setup is performed by default.

Privileges

In order to run a `SYSTEM`-wide `MIMSETUP8`, you must have `SYSPRV`, `CMKRNL` and `SYSNAM` privileges.

When logical names are defined in the `SYSTEM` table, they are defined in executive mode.

To run a `GROUP`-wide `MIMSETUP8`, you must have `SYSPRV` and `CMKRNL` privileges.

System Startup Command File

Since all setups have to be re-executed each time the OpenVMS system is booted, we recommend that you enter the command(s) in the system startup command file: `SYS$MANAGER:SYSTARTUP_VMS.COM`.

For example:

```
$ @disk:[MIMER824A]MIMSETUP8 SYSTEM
```

MIMSETUP8 Examples

Defining Logical names SYSTEM Wide

The following example defines logical names SYSTEM wide, that is, all OpenVMS users may access the Mimer SQL installation. Shareable images are installed.

```
$ @SDEPT2:[MIMER822A]MIMSETUP8 SYSTEM
```

Overriding the Default Definition of the Logical Names

The following example shows how any user can override the default definition of the logical names. This is useful when a user wants to test an alternative Mimer SQL installation. No shareable images are installed.

```
$ @SDEPT2:[MIMER822A]MIMSETUP8
```

Removing a Mimer SQL Setup

The following example demonstrates how to remove a Mimer SQL setup which was previously made GROUP wide by running MIMSETUP8 (MIMROOT8 was defined by MIMSETUP8). Shareable images are uninstalled.

```
$ @MIMROOT8:[000000]MIMSETUP8 -GROUP
```

Logical Names Defined by MIMSETUP8

The MIMSETUP8 command defines the logical names listed below:

Logical Name	Description
MIMROOT8	A concealed logical name pointing to the root of the Mimer SQL distribution.
MIMER_SQLHOSTS	Points to the SQLHOSTS file which contains one entry for every accessible Mimer SQL database. Normally this logical name is set to <code>SYS\$SPECIFIC:[SYSMGR]SQLHOSTS.DAT</code>
MIMDB8	Logical name pointing to the Mimer SQL shareable library. Used when starting Mimer SQL applications.
MIMDBP8	Logical name pointing to the MIMDBP8 image. Used when starting Mimer SQL applications.
MIMDOC8	Points to the directory containing on-line documentation.
MIMEXAMPLES8	Points to the examples directory in the Mimer SQL distribution.
MIMEXE8	Points to the directory containing executable programs in the Mimer SQL distribution.
MIMLIB8	Points to the directory containing application libraries, CLD files, etc.

Installing the Mimer SQL License Key

Mimer SQL for OpenVMS is free for development and evaluation. A development and evaluation license key is included in the Mimer SQL distribution and is automatically installed.

This means that, as long as you use Mimer SQL for development and/or evaluation, you can set up a complete Mimer SQL environment and work with Mimer SQL without adding any additional license keys.

Mimer SQL for OpenVMS in Production

If you want to use Mimer SQL in production, you must purchase a valid runtime license key and then install it. Please contact your local Mimer SQL representative, see www.mimer.com/contact/ or e-mail info@mimer.com.

Node Name

Your representative will need to know the node name of the computer on which the Mimer SQL database server will run.

There are three ways of obtaining the node name:

- 1 Use MIMSETUP8, for example:

```
$ @disk:[MIMERxxxxx]MIMSETUP8
```

- 2 If the OpenVMS node is part of a cluster, the `scsnod` parameter describes its name:

```
$ WRITE SYS$OUTPUT F$GETSYI("SCSNODE")
```

- 3 If the OpenVMS system is not clustered, the node name parameter may be blank. In this case, you should check the `SYS$NODE` logical name instead:

```
$ SHOW LOG SYS$NODE
```

Receiving Your Run-time License Key

Your run-time license key and instructions for installing it will be e-mailed or faxed to you.

Usually, license key files are distributed via e-mail. When you receive the file, save it in an accessible directory.

The MIMLICENSE Utility

You use the MIMLICENSE utility to administrate the license key file. You can add, remove and update keys using MIMLICENSE.

You can also use MIMLICENSE to list and describe the contents of the key file.

Note: When entering the Mimer SQL license key, you must have appropriate access to the key file.

Adding a License Key using MIMLICENSE

To add a license key

- 1 Assuming that SET COMMAND MIMLIB8:MIMER is done, see *Setting the Command Style* on page 23, enter the following:

```
$ mimlicense /FILE=file_name.mcfg
```

For example, if the license key file you received was named `1234.mcfg`, you would enter the following:

```
$ mimlicense /FILE=1234.mcfg
```

MIMLICENSE Syntax

The MIMLICENSE program is controlled by flagged information specified on the command-line.

MIMLICENSE Command-line Arguments

Argument	Function
/ADD= <i>hexcode</i>	Adds a license key.
/FILE= <i>file-name</i>	Adds a license key from a .mcfg file.
/DELETE= <i>key-id</i>	Deletes the specified key.
/REMOVE	Removes all keys. (Each key must be verified.)
/LIST	Lists the contents of the key file.
/COMBINED	Describes what the combined keys permits.
/SILENT	Silent mode, i.e. execution with no output.

The name for the key file is:

```
SYS$SPECIFIC:[SYSMGR]MIMERKEY.DAT
```

Removing a Mimer SQL Installation

Caution: If you plan to remove any Mimer SQL databases, see *Removing a Mimer SQL Database* on page 24, please do so before removing the Mimer SQL installation.

To remove a Mimer SQL installation:

- 1 Check that no Mimer SQL applications or database servers are using the installation.
- 2 Run the MIMSETUP8 command procedure to uninstall shared images and deassign logical names:

```
$ disk:[MIMERxxxxx]MIMSETUP8 -SYSTEM
```

- 3 Delete the Mimer SQL directory tree, for example:

```
$ SET DEF disk:[000000]
$ SET PROC/PRIV=BYPASS
$ DELETE [.MIMERxxxxx...]*.*.*
$ DELETE [.MIMERxxxxx...]*.*.*
$ DELETE [.MIMERxxxxx...]*.*.*
$ SET PROC/PRIV=NOBYPASS
```

Note: You may have to issue the DELETE command more than once, because the DELETE command will not remove directory files unless they are empty

- 4 If there are no other Mimer SQL installation trees in the system, you may want to delete the SQLHOSTS file and the Mimer SQL license key file:

```
$ DELETE SYS$SPECIFIC:[SYSMGR]SQLHOSTS.DAT.*  
$ DELETE SYS$SPECIFIC:[SYSMGR]MIMERKEY.DAT.*
```

- 5 If you have added any Mimer SQL-related commands to the OpenVMS startup file: SYS\$MANAGER:SYSTARTUP_VMS.COM or the OpenVMS shutdown file: SYS\$MANAGER:SYSHUTDOWN.COM, remove the commands.
- 6 If you have added any database-specific commands to the system startup file: SYS\$MANAGER:SYSTARTUP_VMS.COM or the shutdown file: SYS\$MANAGER:SYSHUTDOWN.COM you should remove them.
- 7 Edit the SQLHOSTS files. Remove the database from the list of accessible databases. This will involve deleting it from the list of local databases on the node where it resides and deleting the remote database definition created for it on each other network node from which it was made accessible.

Chapter 3

Establishing a Database

This chapter describes how to establish a local database and how to access a remote database already established in the network. It also describes how to upgrade and remove a database.

Refer to the *Mimer SQL System Management Handbook* for background information which is useful for understanding the issues and the different components involved in establishing a Mimer SQL database.

Overview

Having installed Mimer SQL, you can now establish a local database on the node on which you unpacked the Mimer SQL distribution.

To establish a database on an OpenVMS node, you must carry out the following steps:

Step 1 Create a home directory for your Mimer SQL database

See *Creating a Home Directory* on page 18.

Step 2 Prepare access to the database by editing the SQLHOSTS file

See *Editing the SQLHOSTS File* on page 18.

Step 3 Run SDBGEN to generate the system databanks and the SYSADM ident

See *Generating System Databanks and SYSADM* on page 19.

Creating a Home Directory

First of all you must create a home directory for your database, for example:

```
$ CREATE/DIR somedisk:[MYDB]
```

Editing the SQLHOSTS File

The SQLHOSTS file is used to list all the databases that are accessible to a Mimer SQL application from the node on which it is installed.

On a VMS node, the SQLHOSTS file is located by translating the logical name MIMER_SQLHOSTS.

The MIMSETUP8 command will define it to be:

```
SYSS$SPECIFIC:[SYSMGR]SQLHOSTS.DAT
```

A default SQLHOSTS file is installed the first time you run MIMSETUP8.

The SQLHOSTS file contains three sections:

- **LOCAL**
The LOCAL section contains the names of the local databases on the current node, see *Adding a Local Database* on page 18.
- **REMOTE**
The REMOTE section contains the names of remote databases accessible from the node, see *Accessing a Remote Database* on page 21.
- **DEFAULT**
One of the local or remote databases can be set to be the default database for the node by specifying its name in the DEFAULT section, see *Specifying the Default Database* on page 19.

Note: In the SQLHOSTS file, a line of text beginning with the character sequence `--` is interpreted as a comment.
The maximum length for the name of a database on an OpenVMS node is 30 characters.

Adding a Local Database

To add a local database:

- 1 Open the SQLHOSTS file in a text editor and locate the LOCAL section.
- 2 Under Database, enter the name of the database.
- 3 Under Path, enter the name of the directory which is to be the database's home directory.

Example of a LOCAL Entry

```
LOCAL:
--
-- Database           Path
-----
M8SERVER             DISK:[DIRECTORY]
--
=====
```

Specifying the Default Database

The DEFAULT section in the SQLHOSTS file contains a single line that specifies the default database. This is the database which will be used if a database is not explicitly specified when logging on.

The default database must be listed in either the LOCAL or the REMOTE section.

Example of a Default Entry

```
DEFAULT:
--
-- Database
-----
M8SERVER
-----
```

Generating System Databanks and SYSADM

You generate the Mimer SQL system databanks SYSDB, TRANSDB, LOGDB and SQLDB by running the SDBGEN program.

When you run SDBGEN, it also generates the system administration ident SYSADM.

SDBGEN loads the system tables and defines the data dictionary views detailed in the *Mimer SQL Reference Manual*.

Note: A databank created for one SYSDB cannot be accessed by using a different SYSDB even if identical data dictionary definitions are created in it.

SDBGEN

The SDBGEN command has two purposes. Either to create a new set of system databank files, or to upgrade database files created in an earlier version of Mimer SQL to version 8.2.4. Upgrade can be done for databank files created by Mimer SQL version 7.1 and later.

For more information on upgrading, see *Upgrading a Database* on page 24.

SDBGEN Syntax

Assuming that SET COMMAND MIMLIB8:MIMER is done, you run SDBGEN from the command line, using arguments.

The syntax for creating databank files is as follows:

```
SDBGEN [/PASSWORD=password] [dbase] [syssz] [tfn] [tsz] [lfn] [lsz] [sfn] [ssz]
```

sdbgen Command-line Arguments

Argument	Function
<i>/PASSWORD=password</i>	Password for SYSADM
<i>dbase</i>	Database name
<i>syssz</i>	Size of SYSDB
<i>tfn</i>	Filename for TRANSDB
<i>tsz</i>	Size of TRANSDB
<i>lfn</i>	Filename for LOGDB
<i>lsz</i>	Size of LOGDB
<i>sfn</i>	Filename for SQLDB
<i>ssz</i>	Size of SQLDB

Generating the System Databanks

For example, the following SDBGEN call:

```
$ SDBGEN /PASSWORD=oops my_database
```

will generate a database named `my_database` and the database administration ident `SYSADM` will be assigned the password `oops`.

If you do not enter the `password` parameter, SDBGEN will prompt you for all parameters that are missing, including the password for SYSADM.

If you enter the `password` parameter, SDBGEN will not prompt for any missing parameters, it will use default values.

If you do not enter the `dbase` parameter, the environment variable `MIMER_DATABASE` is used to determine which database the databank files should be created for.

Note: When establishing Mimer SQL databases on an OpenVMS node, you must have write access to the file pointed to by the logical name `MIMER_SQLHOSTS`.

Setting the Initial Size

You can specify the initial size for each of the Mimer SQL system databanks.

The size for the databanks is specified in Mimer SQL pages. The size of a Mimer SQL page is 2 kilobytes.

SYSADM Password

When you run SDBGEN, the database administration ident SYSADM is created and you must specify a password (passwords are case-sensitive) for this ident.

SYSADM Password Case

DCL converts all VMS-style commands to uppercase and all UNIX-style commands to lowercase. To control the case used in your password, you may have use quotes.

The following table shows how to use quotes to set the password case.

Entering:	Sets the password to:
SDBGEN/PASS=oops	OOPS
SDBGEN/PASS="oops"	oops
SDBGEN -p OOPS	oops
SDBGEN -p "OOPS"	OOPS

SYSADM Password Security

For security reasons, the password specified for SYSADM is not echoed on the screen when you enter it.

You should change the password at appropriate intervals using Mimer SQL with the ALTER IDENT statement.

Caution: Take care to safeguard the SYSADM password, because if it is lost, it cannot be retrieved from the system and it is not possible to set a new one.

Accessing a Remote Database

You can access databases that reside on other nodes in the network environment by editing the REMOTE section in the SQLHOSTS file and adding information about the remote database.

For more information on the SQLHOSTS file, see *Editing the SQLHOSTS File* on page 18.

Access to remote databases is provided by using either DECNET or TCP/IP to establish a client/server connection to the remote machine.

Each entry in the REMOTE section can contain up to five fields, separated by spaces and/or tab characters.

The fields in the REMOTE section specify the following:

Field	Explanation
DATABASE	The DATABASE field specifies the name of the remote database.
NODE	The NODE field specifies the network node name of the remote machine. If you are using the TCP/IP interface, you can specify the IP address here.
PROTOCOL	You can specify DECNET or TCP depending on the type of network protocol to be used to create the client/server connection. The default, specified by ' ' (two single quote characters), is TCP.
INTERFACE	The INTERFACE field is currently not used. Specify ' ' (two single quote characters) here.
SERVICE	TCP/IP If using the TCP/IP protocol, enter the TCP/IP port number the database server uses. The default is 1360. DECNET If using DECNET, enter the database name. The server listens to the network object using the same name as the database. (A Mimer SQL 7 database server using DECNET listens to the network object named "MIMER").

Adding a Remote Database

To add a remote database:

- 1 Open the SQLHOSTS file in a text editor and locate the REMOTE section.
- 2 Fill in the fields, as specified above, according to your network configuration.

Example of a REMOTE Entry

```
REMOTE:
--
-- Database           Node           Protocol Interface Service
-----
M8ACCESS             STARTREK      TCP           ' '           1360
```

Mimer SQL System Settings

You can edit your startup and shutdown files to automatically set-up logical names and install images, command style and automatic database server startup and shutdown.

Setting-up Logical Names and Install Images

In order to set-up Mimer SQL logical names and install images each time your OpenVMS system starts up, you must edit your startup file.

Edit `SYS$MANAGER:SYSSTARTUP_VMS.COM` to include the following line:

```
$ @disk:[MIMER824A]MIMSETUP8 SYSTEM
```

Setting the Command Style

You can use either OpenVMS- or UNIX-style commands.

To set-up your system to automatically accept the style you prefer, you can edit the `LOGIN.COM` file.

OpenVMS-style Commands

In `LOGIN.COM`, add the following line:

```
$ SET COMMAND MIMLIB8:MIMER
```

UNIX-style Commands

In `LOGIN.COM`, add the following line:

```
$ DEFINE DCL$PATH MIMEXE8
```

Automatic Database Server Start

If you want the Mimer SQL database server to start automatically whenever the system is booted, you must edit the `SYS$MANAGER:SYSTARTUP_VMS.COM` file.

The following example starts two Mimer SQL database servers:

```
$ MIMCONTROL/START PRODUCTION  
$ MIMCONTROL/START INVENTORY
```

Automatic Database Server Shutdown

If you want to perform a controlled shutdown of the database server whenever the OpenVMS system is shut down, you must edit the `SYS$MANAGER:SYSHUTDOWN.COM` file and add the relevant commands at the end.

The following example stops two database servers:

```
$ MIMCONTROL/STOP PRODUCTION
$ MIMCONTROL/STOP INVENTORY
```

Upgrading a Database

The SDBGEN program syntax (expressed in OpenVMS-style) for upgrading databank files to Mimer SQL version 8.2.4 is as follows:

```
$ SDBGEN /UPGRADE [dbase]
```

For more information on upgrading a database, see the *Mimer SQL Release Notes*.

Removing a Mimer SQL Database

To remove a database, perform the following steps:

- 1 Check that no one is using the database.
- 2 Check that no database server is started against the database you are going to remove.
- 3 Create a list of all databank files by doing the following:

```
$ bsql -s database
Username: SYSADM
Password: xxxxxx
SQL> SELECT DATABANK_FILENAME FROM SYSTEM.DATABANKS;
SQL> EXIT;
```
- 4 Using the list generated in the previous step, locate and delete all the physical databank files. If the file name does not contain a directory specification, the directory will be the home directory of the database.
- 5 Delete any directories that have been specifically created to hold databank files for the database.
- 6 Delete the database entry in:

```
SYS$SPECIFIC:[SYSMGR]SQLHOSTS.DAT
```

Chapter 4

Managing a Database Server

This chapter contains a short guide to administrating database servers under OpenVMS. It also describes how to use the MIMCONTROL command under OpenVMS.

For general information on managing database servers, refer to the *Mimer SQL System Management Handbook*.

The MIMCONTROL Command

Before you can access a database, the Mimer SQL database server must be started on the node it resides on.

You start, stop and control database servers on OpenVMS using the MIMCONTROL command.

Note: You cannot start the MIMCONTROL program by using the DCL command RUN.

Required Privileges

To use MIMCONTROL you must have either:

- SETPRV privilege

or

- CMKRNL, CMEXEC, SHMEM, SYSPRV, WORLD, TMPMBX, OPER, NETMBX, PSWAPM, DETACH, ALTPRI, PRMGBL, SYSGBL, SYSLCK and SYSNAM privileges.

Database Server Parameters – the MULTIDEFS File

When you start a database server on an OpenVMS machine for the first time, MIMCONTROL will create a MULTIDEFS file containing default parameter values for the database server. These parameters are based on the amount of memory installed on the machine.

You may also generate the MULTIDEFS file manually by using the MIMCONTROL/GENERATE command. For example:

```
$ MIMCONTROL/GENERATE my_database
```

It is not possible to change the parameters for a running database server.

You can fine-tune database server performance by adjusting the parameters as required.

Refer to the *Mimer SQL System Management Handbook* for details.

MIMCONTROL Syntax

You run the MIMCONTROL program is using arguments specified on the command-line.

For example:

```
$ MIMCONTROL/START my_database
```

Starts the database server and provides access to my_database.

If you run the MIMCONTROL command without any options it displays help on command-line arguments.

MIMCONTROL Command-line Arguments

For more information on MIMCONTROL arguments and their combinations, see the *Mimer SQL System Management Handbook*.

Argument	Function
/STATUS/DCL	Output status information about the specified database server into the symbol MIMER_STATUS for use in a command procedure. For details about the output string resulting from this option, see <i>MIMCONTROL (/STATUS/DCL)</i> on page 28.
/STATUS	Output status information about the specified database server.
/DISABLE	Disable new user connections to the database server. Users already connected are not affected.
/ENABLE	Enable new user connections to the database server.
/KILL	Kill the database server immediately. This should only be used in emergency situations when a normal stop does not work. The next time the database is started, all databanks that were open at the time the server was killed will be automatically checked. Connected users will receive an error the next time they attempt to access the database.
/LOGOUT=chan	Force logout of the specified channel number. Use channel numbers displayed by the USERS option of the MIMINFO command, see the <i>Mimer SQL System Management Guide</i> .
/START [=timeout]	Start the database server. If the server does not become operational within the specified number of seconds, the server will be killed. The default timeout is 600 seconds.
/STOP [=timeout]	Stop a database server. Any remaining users will be logged out. If the database server does not stop within the specified number of seconds, the server will be killed. The default timeout is 120 seconds.
/WAIT [=timeout]	Wait for all connected users to log out. If there are still users connected after the timeout period expires, the command fails. The timeout period should be given in seconds. If no timeout period is specified wait will be performed without any timeout.
/DUMP	Create a dump directory and produce dumps of all internal database server areas to files in that directory. The files produced can be examined by using MIMINFO, see the <i>Mimer SQL System Management Guide</i> .
/GENERATE	Create a new MULTIDEFS.DAT file with default for parameters, if the file is missing.

Argument	Function
<i>database</i>	Specifies the name of the database to access. If a database name is not specified, the default database will be controlled. The default database is determined by setting the MIMER_DATABASE logical name. The DEFAULT setting in SQLHOSTS is not used for MIMCONTROL.

MIMCONTROL (/STATUS/DCL)

The MIMCONTROL/STATUS/DCL command is a special form of the MIMCONTROL/STATUS command which returns the database server status information in the form of a single string containing a comma-separated list which is useful when writing command procedures.

On OpenVMS, the MIMCONTROL command is silent and sets the DCL symbol MIMER_STATUS to the value of the status string.

You can use the lexical function F\$ELEMENT() to extract the list elements.
For example:

```
$ MIMCONTROL/STATUS/DCL
$ SHOW SYMBOL MIMER_STATUS
MIMER_STATUS == "Running,Enabled,LOKE_0:[PER.LOKE824],0,A2,2001-07-04 16:10"
$ DIR=F$ELEMENT(2,"",MIMER_STATUS)
$ USERS=F$ELEMENT(3,"",MIMER_STATUS)
$ PID=F$ELEMENT(4,"",MIMER_STATUS)
$ SHOW SYMBOL DIR
DIR = "LOKE_0:[PER.LOKE824]"
$ SHOW SYMBOL USERS
USERS = "0"
$ SHOW SYMBOL PID
PID = "A2"
```

The MIMTCP Server

If you are using the TCP/IP protocol, a MIMTCP server listening to a specific port (usually port 1360) will be started the first time the database server is started.

TCP/IP Port Number

The TCP/IP port number that the MIMTCP server will listen to is specified in the TCPport parameter in the MULTIDEFS.DAT file. If several database servers specify the same port number, they will share the same MIMTCP server.

When a client connects to the TCP/IP port, the MIMTCP server will accept the connection. The client specifies the database to which a connection is to be established and the MIMTCP server will hand over the connection to the appropriate database server. All further communication between the client and the database server is then done directly without involving the MIMTCP server.

System Logical Names

Whenever a MIMTCP server starts, it will define the system logical name “MIMTCP_XXXX” (where XXXX is the port number) to be the PID of the MIMTCP server process. This makes it easy to find the MIMTCP server process that is listening to a particular TCP/IP port.

Manually Starting a MIMTCP Server

Usually it is not necessary to start a MIMTCP server manually because the MIMTCP process is started automatically when a database server is started.

It is possible to start several MIMTCP servers listening on several ports. This will make MIMER8 servers accessible from all ports.

To start a MIMTCP server, you must have either:

- SETPRV privilege
- or
- SYSPRV, TMPMBX, OPER, NETMBX and SYSNAM privileges.

Example

To manually start a MIMTCP server process listening to port 1377 execute the following command:

```
$ RUN/PRIV=(SYSPRV,TMPMBX,OPER,NETMBX,SYSNAM)/DETACH/INPUT=1377 -  
$_ /OUTPUT=MIMROOT8:[000000]MIMTCP.LOG MIMEXE8:MIMTCP
```

The /INPUT parameter is used to specify the port number on which the server process listens.

The /OUTPUT parameter is used to specify the server process log file. Note that several server processes can share the same log file.

Stopping MIMTCP Servers

There is no explicit command for stopping MIMTCP servers as there is generally no need to do this. The MIMTCP process does not have to be stopped or restarted when database servers are stopped or (re)started.

To manually stop the MIMTCP server process listening to port 1360 (for example), execute the following commands:

```
$ SHOW LOG MIMTCP_1360      ! Find PID of process  
$ STOP/ID=xxxxxxxx         ! Delete the process found
```

Troubleshooting Tips

In order to successfully start a database server, the following conditions must be fulfilled:

- The system databank file, `SYSDB82.dbf`, must have been created. See *Generating System Databanks and SYSADM* on page 19
- There must be an entry for the database in the local section of the `SQLHOSTS` file. See *Editing the SQLHOSTS File* on page 18
- The `ProcName` of the `MULTIDEFS` file must not specify a process name prefix that is identical to that of another running multi-user system.
- The `MIMSETUP8` command procedure must have defined the logical names to be `SYSTEM`-wide or `GROUP`-wide.
- There must not be any logical names in the `JOB` or `PROCESS` tables that override the `SYSTEM` or `GROUP` definitions.
- The shareable image in the file named `MIMLIB8:MIMDBP8.EXE` must be properly installed.
- There must not be any other node in a cluster which has started the same database server.
- The database must not be in use in single-user access mode at the time the database server is started.
- The file `SYS$MANAGER:MIMERKEY.DAT` must contain a valid Mimer SQL license key.

Chapter 5

Running Mimer SQL Applications

This chapter describes how to run applications in the Mimer SQL environment.

It covers information that applies to the utilities included in the Mimer SQL installation as well as to applications that may have been created to access a Mimer SQL database.

This chapter also describes:

- Defining whether OpenVMS-style or UNIX-style command-line flags are accepted by the utilities which are supplied as part of the Mimer SQL installation.
- Selecting a Mimer SQL installation – if several Mimer SQL installations reside on the same computer, it is essential that users access the correct one.

Executing Mimer SQL Utilities

This section describes the various ways an application can be executed under OpenVMS and also describes how to set up the Mimer SQL-supplied utilities to use UNIX-style or OpenVMS-style command-line flags.

Using the DCL command RUN

The DCL command RUN can be used as follows:

```
$ RUN MIMEXE8:BSQL
```

You cannot specify any flags or other input parameters on the command-line when you use the RUN command.

Some of the Mimer SQL-supplied programs allow parameters and options to be supplied via logical names, e.g. MIMER_DATABASE to supply a database name and MIMER_MODE to define the database access mode.

See documentation for the programs in the *Mimer SQL System Management Handbook* for specific details.

Using OpenVMS Command Definitions

You can set up the programs supplied by Mimer SQL so that they can be run by specifying the program name followed by the VMS-style command line flags and parameters.

You do this by defining the Mimer SQL programs as DCL command verbs.

Use the following OpenVMS command to define all the Mimer SQL-supplied programs as DCL command verbs:

```
$ SET COMMAND MIMLIB8:MIMER
```

Example using OpenVMS-style command-line arguments:

```
$ BSQL/SINGLE MYDB
```

You can un-define a DCL command by issuing the following command:

```
$ SET COMMAND/DELETE=command-name
```

Caution: Take care when using this DCL command, because any DCL command verb can be un-defined.

Using the DCL\$PATH Logical Name

The DCL\$PATH logical name defines a list of directories in which the OpenVMS operating system will look when trying to locate the executable for a specified program name.

Utilities started this way accept UNIX-style command options.

Note: If you set-up a Mimer SQL-supplied utility as a DCL command verb, the UNIX-style command-line flags and parameters are not used, even if MIMEXE8 is included in DCL\$PATH.

In order for the utilities supplied by Mimer SQL to be run by specifying the utility name followed by the UNIX-style command line flags and parameters, you must include the MIMEXE8 directory in the directory list defined in DCL\$PATH.

If there are other directories containing executables for programs that are to be run this way, those directories must also be included in the directory list defined in DCL\$PATH.

For example, the following DCL\$PATH definition:

```
$ DEFINE DCL$PATH MIMEXE8,disk:<directory.app>
```

will allow the utilities supplied by Mimer SQL to be run by specifying the utility name followed by the UNIX-style command line flags and parameters.

It will also allow all programs found in the specified application directory to be run by specifying the program name.

Example using UNIX-style command-line flags:

```
$ bsql -s mydb
```

Running the PSM Debugger

You can use the Mimer SQL PSM Debugger for debugging PSM procedures that are stored in the Mimer SQL database server. The PSM debugger is written in Java and requires a Java 2 environment.

Since the Debugger accesses the Mimer SQL server by using the TCP protocol, you can execute the Debugger on any machine that has adequate Java support, such as a Windows or Linux machine.

If you want to execute the PSM debugger on the OpenVMS platform, you must first make sure that the Java 2 environment is active.

You can display the current Java version using the following command:

```
$ JAVA -VERSION
```

If you need to install a newer Java version on OpenVMS, you can download the installation kit from the following site: <http://www.compaq.com/java/download/index.html>

Starting the PSM Debugger

To start the PSM debugger, use the following command:

```
$ JAVA -JAR MIMLIB8:PSMDEBUG.JAR
```

More information about the PSM debugger can be found in the included on-line help file.

Selecting a Mimer SQL Installation

A host computer can have several versions of the Mimer SQL database system installed simultaneously.

Access to a specific version is done through logical names (MIMEXE8, etc.). Since the major version number (currently 8) is included in the logical names, Mimer SQL version 7 and version 8 can run concurrently without any interference.

If several versions of MIMER8 are installed, you can use the MIMSETUP8 command procedure to specify exactly which version a program should work with.

Normally, you do a system wide definition of the logical names. However, you can specify another Mimer SQL version by running the MIMSETUP8 command procedure and specifying a GROUP, JOB or PROCESS logical name definition (see *MIMSETUP8 Syntax* on page 9 for details on MIMSETUP8).

Note: When starting a database server, any JOB or PROCESS logical names will not be inherited by the database server process. The database server will use the Mimer SQL version specified in the GROUP or SYSTEM logical name tables.

Chapter 6

Using the JDBC Driver

The Mimer SQL distribution includes a JDBC driver. This driver enables Java programs running on OpenVMS to access any Mimer SQL database server running at least version 8.2.

The JDBC driver is a 'type 4' driver which means that it is written entirely in Java, and can be moved to any platform supporting Java.

The Mimer JDBC driver resides in `MIMLIB8:MIMJDBC-n_n.JAR`.

For more information about Java and JDBC, please see:

- `SYS$COMMON:<SYSHLP.JAVA.RELEASE_NOTES>
JDK118_VMS_RELEASE_NOTES.HTML`
- `MIMDOC8:MIMJDBC-n_n.HTML` – Information on the Mimer JDBC driver.
- <http://java.sun.com/products/jdbc> – JDBC technology information from Sun.

Using the JDBC Driver

To use the JDBC driver, you must first set-up the OpenVMS Java environment.

Defining Java Commands

Use the following commands to define the Java commands:

```
$ DEASSIGN JAVA$USE_DCL
$ @SYS$MANAGER:JAVA$SETUP
```

Setting CLASSPATH

To use the Mimer JDBC driver, the Java environment must be able to find it.

The logical name `CLASSPATH` is used for this purpose. This logical name contains a list of directories and Java archives (`.ZIP` and `.JAR` files).

Please note that the `CLASSPATH` logical name specifies the file names using a UNIX syntax. It is also possible to use the `JAVA$CLASSPATH` logical name which uses standard VMS file specifications. Please read the VMS Java release notes for further details.

The following example first determines the exact version of the file to be used, and then sets the `CLASSPATH` logical name accordingly.

Since the equivalence string becomes rather long, and must be enclosed in quotes, a DCL string is constructed.

Example

```
$ DIR MIMLIB8:MIMJDBC*.JAR

Directory MIMROOT8:<LIBRARY>

MIMJDBC-1_3.JAR;1

Total of 1 file.
$ SHOW LOG CLASSPATH
"CLASSPATH" = "/sys$common/java/lib/JDK118_CLASSES.ZIP:."
(LNM$PROCESS_TABLE)
$ CLASSPATH=F$TRNLNM("CLASSPATH")+":/MIMLIB8/MIMJDBC-1_3.JAR"
$ DEFINE CLASSPATH "'CLASSPATH' "
```

The Mimer JDBC driver should now be accessible.

Verifying the Environment

Since the driver contains a `main()` function, it is possible to execute it as a program for testing purposes.

Use the `-version` switch to verify that the Java environment can locate and use the Mimer JDBC driver. Note that quotes must be used since Java package names are case sensitive.

```
$ JAVA "com.mimer.jdbc.Driver" -version
Mimer JDBC driver version 1.3
```

Testing the Connection

Use the `-ping` switch to test that the driver can make a connection with a Mimer SQL v8.2 database server.

Please read the JDBC driver guide for an explanation of the syntax of the connection URL.

```
$ JAVA "com.mimer.jdbc.Driver" -ping -
$_      "jdbc:mimer://SYSADM:PASSWORD@mynode/mydatabase"
Database connection established.
getDatabaseProductName():  MIMER/DB
getDatabaseProductVersion(): 08.02.0001 MIMER/DB 8.2.04
```

Ping tests:

```
0      2 ms
1      2 ms
2      1 ms
3      1 ms
4      1 ms
5      1 ms
6      0 ms
7      2 ms
8      1 ms
9      1 ms
avg    1 ms      min    0 ms      max    2 ms
```

Finally, compile and execute the JDBC example program. You should copy the example program to a private directory and edit it in order to set the connection URL string, database user name and passwords.

```
$ SET DEF [SOMEWHERE.PRIVATE]
$ COPY MIMEXAMPLES8:EXAMPLE.JAVA []
$ ! Edit the example. Alter the URL and username/password
$ EDIT EXAMPLE.JAVA
$ JAVAC EXAMPLE.JAVA
$ JAVA "Example"
```


Appendix A

Distributed Files

The Mimer SQL distributed files are all located in a directory structure.

Root Directory Files

File Name	Description
DEFAULTKEY.MCFG	Default Mimer SQL license key.
MIMSETUP8.COM	Command procedure that defines logical names and installs images, see <i>Setting-up the Mimer SQL Environment</i> on page 9.
VERSION.DAT	Contains the version number of the Mimer SQL distribution.

Documentation Files (MIMDOC8)

File Name	Description
RELNOTES.PDF	Mimer SQL Release Notes.
MIMJDBC-n_n.HTML	JDBC usage guide.
README.TXT	A short description of Mimer SQL and how to get started.
[.VMSGUIDE]MIM_VMS.htm	The HTML user guide.

Example Files (MIMEXAMPLES8)

File Name	Description
BLOBSAMP.EC	Example of a program written in embedded C that stores and retrieves binary data.
CJDATE.SQL	SQL examples.

File Name	Description
CREHOTDB.DAT	Contains SQL commands that create an example database, see the <i>Mimer SQL System Management Handbook</i> .
DSQL.EC	Embedded C examples that demonstrates the use of dynamic SQL.
DSQL.H	Header file for the dynamic SQL example.
DSQLSAMP.C	Main program for the dynamic SQL example.
EXAMPLE.EC	Very simple embedded C example.
EXAMPLE.ECO	Very simple embedded COBOL example.
EXAMPLE.EFO	Very simple embedded FORTRAN example.
EXAMPLE.JAVA	Java example program using JDBC.
EXAMPLES.SQL	Text file containing examples of SQL commands. This assumes that the example database is loaded, see the <i>Mimer SQL System Management Handbook</i> .
FREQCALL.EC	Example of a program written in embedded C that calls a stored procedure.
FREQCALL.ECO	Same as FREQCALL.EC, but written in COBOL.
FREQCALL.EFO	Same as FREQCALL.EC, but written in FORTRAN.
SINGLEDEFS.DAT	Contains a template for database parameters in single-user mode, see the <i>Mimer SQL System Management Handbook</i> .
SQLHOSTS.DAT	Contains a template for the SQLHOSTS.DAT file. The actual SQLHOSTS file is pointed to by the MIMER_SQLHOSTS logical name (normally SYS\$MANAGER:SQLHOSTS.DAT). Do not edit this template file.
WAKECALL.EC	Example of a program written in embedded C that calls a stored procedure.
WAKECALL.ECO	Same as WAKECALL.EC, but written in COBOL.
WAKECALL.EFO	Same as WAKECALL.EC, but written in FORTRAN.

Executable Programs (MIMEXE8)

File Name	Description
BSQL.EXE	Program that executes SQL statements which are entered interactively or read from a command file. It is described in the <i>Mimer SQL User's Manual</i> .
DBC.EXE	Program that can check if a databank file is internally consistent. It is described in the <i>Mimer SQL System Management Handbook</i> .
DBOPEN.EXE	Program that opens and restarts all databanks in a database. It is described in the <i>Mimer SQL System Management Handbook</i> .
DBSERVER.EXE	The database server. Do not start this program directly, use MIMCONTROL to do this.
ESQL.EXE	Pre-processor for embedded SQL.
MIMCONTROL.EXE	The MIMCONTROL command, which is used to control database servers, <i>The MIMCONTROL Command</i> on page 25.
MIMINFO.EXE	Program that can display status information for a database server.
MIMLICENSE.EXE	Application used to administrate the license key(s).
MIMTCP.EXE	The program executed by the MIMTCP server, see <i>The MIMTCP Server</i> on page 28. Do not start this program directly.
PSMDEBUG.JAR	The PSM Debugger. For more information, see <i>Running the PSM Debugger</i> on page 33.
SDBGEN.EXE	Program used to create the initial Mimer SQL system databank files in a database, described in the <i>Mimer SQL System Management Handbook</i> .
UTIL.EXE	Utility functions for a database, see the <i>Mimer SQL System Management Handbook</i> .

Library Files (MIMLIB8)

File Name	Description
LR.OLB	Library with entries for backward compatibility.
LRU.OLB	Library with entries for backward compatibility.
MDR.OLB	Library with entries for backward compatibility.
MIMDB8.EXE	Shareable library image containing the code for the Mimer SQL database client API, see <i>Shared Images</i> on page 42.

File Name	Description
MIMDBP8 . EXE	Protected shareable library image containing code that performs secure and fast shared memory based communication with local database servers.
MIMDBS . EXE	Shareable library image containing code for running a Mimer SQL database in single-user mode. This library is mapped in dynamically when required.
MIMER . CLD	Command definitions for all the executable programs supplied with the Mimer SQL software.
MIMER . OPT	Options file used for linking Mimer SQL applications.
MIMJDBC-n_n . JAR	JDBC driver.
MIMODBC8 . EXE	ODBC driver library.

Shared Images

The Mimer SQL distribution contains a number of shareable images which are located in the MIMLIB8 directory.

The shared images are installed by the MIMSETUP8 command procedure when defining logical names in the SYSTEM or GROUP name table.

Mimer SQL applications are linked with the shareable library
MIMLIB8:MIMDB8 . EXE.

When the application image is activated, the OpenVMS system locates the correct shareable image by using the logical name MIMDB8 (which MIMSETUP8 has defined as MIMLIB8:MIMDB8). This allows users to run applications with other versions of Mimer SQL by using the MIMSETUP8 procedure, without having to re-link the applications.

If you start an image that is installed with privileges or if you do not have read (R) access to the image file, OpenVMS will only use logical names defined in executive mode when activating shareable images. This is a security precaution that OpenVMS takes to avoid activating non-trusted shareable images together with trusted images.

Note: All logical names that MIMSETUP8 defines in the SYSTEM logical name table are defined in executive mode. This means that privileged or protected images will run the Mimer SQL version defined in the SYSTEM table even if there is another Mimer SQL version defined in one of the other tables!

Appendix B

Data Types Used in Mimer SQL

The following sections explain how to compile applications using floating point data types, and what data types Mimer SQL uses internally and externally.

Compiling Applications Using Floating Point Data Types

The floating point data types supported on Alpha/VMS are:

- F_FLOAT (4 bytes)
- G_FLOAT (8 bytes).

Use the default compiler option /G_FLOAT when compiling programs that are to be linked with Mimer SQL libraries.

Mimer SQL does not currently support D_FLOAT or the use of the two IEEE floats, S_FLOAT and T_FLOAT.

H_FLOAT is also not supported by Mimer SQL on Alpha/VMS since that data type is not supported natively by the Alpha architecture.

Internal Mimer SQL Representation

Mimer SQL uses only two data representations internally: numeric and character. These two types are used to store all data in the database.

The numeric data type stores numbers in packed BCD format with a maximum precision of 45 digits. Every number stored has an exponent with a range of -999 to +999.

The character data type uses the ISO 8859-1 standard character set, also known as Latin 1. This standard specifies graphic characters and the representation of each character.

On most platforms, including OpenVMS, the ISO 8859-1 character set is used by Mimer SQL to transfer data to and from the application, i.e. the same character set as is used internally.

The ISO 8859-1 character set is presented in the *Mimer SQL Reference Manual*.

External Data Types Supported by Mimer SQL

Any value stored in the database may be read into host language variables as described in the *Mimer SQL Programmer's Manual*.

Mimer SQL will perform all the necessary conversions and will signal an error if the value to be converted is not compatible with the destination type.

Appendix C

Using MIMER7 Applications with MIMER8

General database upgrade information is provided in the *Mimer SQL Release Notes*.

This appendix describes the specific task of using a MIMER7 application with a MIMER8 database server.

License Keys

Please note that the MIMER7 application needs a MIMER7 license key (located in MIMKEY7).

The MIMER8 database server needs a MIMER8 license key located in `SYSS$SPECIFIC:[SYSMGR]MIMERKEY.DAT`.

A single node will need both license keys if it runs MIMER7 applications and a MIMER8 database server.

Communication Methods

If a MIMER7 application is to be used with a MIMER8 database server, there are four main approaches to establishing communication:

- Re-link the application with the MIMDB8 library. See *Re-linking Applications* on page 46.
- Use the sharable images distributed with MIMER8. See *Remapping Shareable Libraries* on page 46

- Connect to the database using the client/server interface, i.e. from a MIMER7 client node to a MIMER8 server node. See *Client-server Access* on page 46.
- Connect to the database using the client/server interface locally, i.e. the MIMER7 client and MIMER8 server are on the same node. See *Local Client/server Access* on page 47.

Re-linking Applications

This method is recommended for applications running on the same node as the database server.

You can re-link MIMER7 applications for use in a MIMER8 environment, accessing a MIMER8 database server using the special command procedure `MIMBUILD8.COM`.

To read more about this and download `MIMBUILD8.COM`, please go to:

<http://developer.mimer.com/howto>

Remapping Shareable Libraries

This method is recommended for MIMER7 tools, such as PG or QL.

A MIMER7 application can access a MIMER8 database server by mapping in the MIMER8 sharable image instead of the MIMER7 one.

This can be achieved by defining the following logical names, after executing `MIMSETUP7`:

```
$ DEFINE MIMDB7M MIMDB8
$ DEFINE MIMDB7S MIMDB8
```

Client-server Access

This method is recommended when the Mimer SQL version 8 database server is on a remote node in a network.

MIMER7 applications and tools can access a MIMER8 database server through the client/server interface without any modification to the application.

The entry created for a MIMER8 database server in the `SQLHOSTS` file is described in the *Mimer SQL System Management Handbook*.

In MIMER8, the SERVICE field of the SQLHOSTS file should specify the specific port (TCP/IP) or network object (DECNET) to which the database server listens. If the NODE field is set to the name of the current node and the SERVICE field specifies a local database server, the connection will be established to the local server, using the client/server interface.

Local Client/server Access

It is possible to use the client/server interface locally, i.e. using a remote database definition which actually points to a local database server.

To achieve this, the file MIMLIB7:SQLHOSTS.DAT must be updated in a specific way using a 6th parameter in the remote definition.

The following example demonstrates this. The current node is "STARTREK", i.e. where the MIMER8 database "M8SERVER" runs.

To access the "M8SERVER" database, the MIMER7 application must connect to the database "M8ACCESS".

```
--
-- =====
DEFAULT:
--
-- Database
-----
example_localdb
-- =====
LOCAL:
--
-- Database          Path
-----
example_localdb    DISK:[DIRECTORY]
-- =====
REMOTE:
--
-- Database          Node          Protocol Interface Service
-----
example_remotedb   server_nodename  ''         ''         1360
M8ACCESS           STARTREK         TCP        ''         1360
-- =====
```


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