

SQLBase

Guide to New Features

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Preface

This manual provides reference information about using new features in SQLBase.

This preface provides the following information:

- Who should read this manual.
- The organization of this manual.
- The documentation format.
- The notation conventions used in this manual.
- Related publications.

Audience

This manual is intended for **Application Developers** building client applications that access Gupta SQLBase using frontend products such as Visual Basic, C++, and Delphi. Additionally, this manual is intended for **Database Administrators** who are responsible for installing and maintaining SQLBase database servers.

This manual assumes you have a working knowledge of SQLBase, relational databases in general, and SQL.

Notation conventions

Before you start using this manual, it is important to understand the typographical conventions we use in this manual:

Formatting Convention	Type of Information
You	A developer who reads this manual
User	The end-user of applications that you write
bold type	Menu items, push buttons, and field names. Things that you select. Keyboard keys that you press.
Courier 9	Development language code example
SQL.INI MAPDLL.EXE	Program names and file names
Precaution	Warning:
Vital information	Important:
Supplemental information	Note:
Alt+1	A plus sign between key names means to press and hold down the first key while you press the second key

Other helpful resources



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Technical Publications Department
Gupta Technologies
975 Island Drive
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techpubs@guptaworldwide.com

Chapter 1

New Features in SQLBase Version 8.5

Multiple SQLBase Installations

SQLBase now has the ability to support more than one installation of SQLBase on a computer. Multiple instances of the SQLBase database engine, even different versions of SQLBase, can run simultaneously. Multiple client configurations can also run simultaneously without interfering with each other.

The configuration differences that make multiple installation possible are only available in SQLBase 8.5. You can run one or more SQLBase 8.5 database engines concurrently with one earlier version of SQLBase, but you cannot run multiple earlier versions simultaneously.

SQLBase configuration file (SQL.INI)

In order to support multiple installations, the configuration file, always named SQL.INI in versions prior to 8.5, now has a flexible name and path specification. You may use whatever name you like in place of SQL.INI. *We will continue to use the name SQL.INI throughout SQLBase documentation*, although your actual file name may be different.

Multiple installations are optional. If, upon installation, you choose not to take the extra steps to accommodate multiple installations, then the configuration file will

continue to be named SQL.INI, and the search algorithm used to find the file will be identical to that used in SQLBase versions 7.x, 8.0, and 8.1.

The multiple installation feature requires several new keywords in several sections of SQL.INI. These are ordinarily created in response to your answers during the install process. For more detailed information about the keywords, see chapter 3 of the *Database Administrator's Guide*. The new keywords are AUTOSTARTSERVERPATH, CLIENTRUNTIMEDIR. Keyword SERVERPATH, previously only in the WS32 protocol section, will now also appear in sections SPX32, WSSPX, MPIPE, and APIPE.

SQLBase installer

The installer has changed greatly in order to support multiple SQLBase installations, but these changes are primarily internal. By default the installer still uses the SQL.INI behavior of earlier versions - a file named SQL.INI in the same directory as the server executables. However, after installation, you can use the Connectivity Administrator utility to specify a different file name and different directory in place of the default SQL.INI. More details and examples are in the Connectivity Administrator section below.

Windows registry

Previous versions of SQLBase wrote information to the HKEY_LOCAL_MACHINE portion of the Windows registry. Version 8.5 writes instead to HKEY_CURRENT_USER. This means that now the user doing the installation of SQLBase does not need Administrator privileges. However, if SQLBase is to be registered as a Windows service, then the user does need appropriate privileges for creating a new service.

Use of registry information has been greatly reduced in SQLBase 8.5. The primary purpose of the entries in HKEY_CURRENT_USER is to allow utilities such as Connectivity Administrator and SQLBase Management Console to locate and enumerate server installations. The database server itself does not use registry information at all.

COM+ support and SQLBase Resource Manager

Some features in SQLBase use COM+ to surface their functionality. For example, SQLBase Management Console (SMC) displays statistics about SQLBase Resource Manager (SQLBrm) transactions, and it obtains those statistics from SQLBrm by calling methods from the SQLBrm COM+ interfaces. And SQLBrm itself allows your client applications to enroll the SQLBase engine as part of a distributed COM+ transaction.

COM+ servers must be registered with Windows before they can be used. Each component name must be unique. If you install multiple SQLBase 8.5 servers, each using the same component names, only one of those servers can have its COM+ components registered with Windows at a given time. For this reason, only one of the installations will be able to use SQLBrm at a time.

SQLBase API

The name and path of the server configuration file (SQL.INI in previous versions) are now available by using parameter `SQLPSINI` in a call to the `sqlget` method., Similarly, parameter `SQLPCINI` will return the name and path of the client configuration file currently in use.

There is a new API method called `sqliniEx`. This new method is implemented in `SQLWNTM.DLL`.

```
SQLTRCD sqliniEx (SQLTDAP pINI, SQLTDAL nLength) ;
```

This new method has the functionality of method `sqlini` in earlier versions of SQLBase. It also accepts two new parameters: The first is a string argument that provides the configuration file name and location for the client. The second is a 2-byte integer that specifies the number of characters passed in the first argument. If this is 0, the first parameter is presumed to be null-terminated.

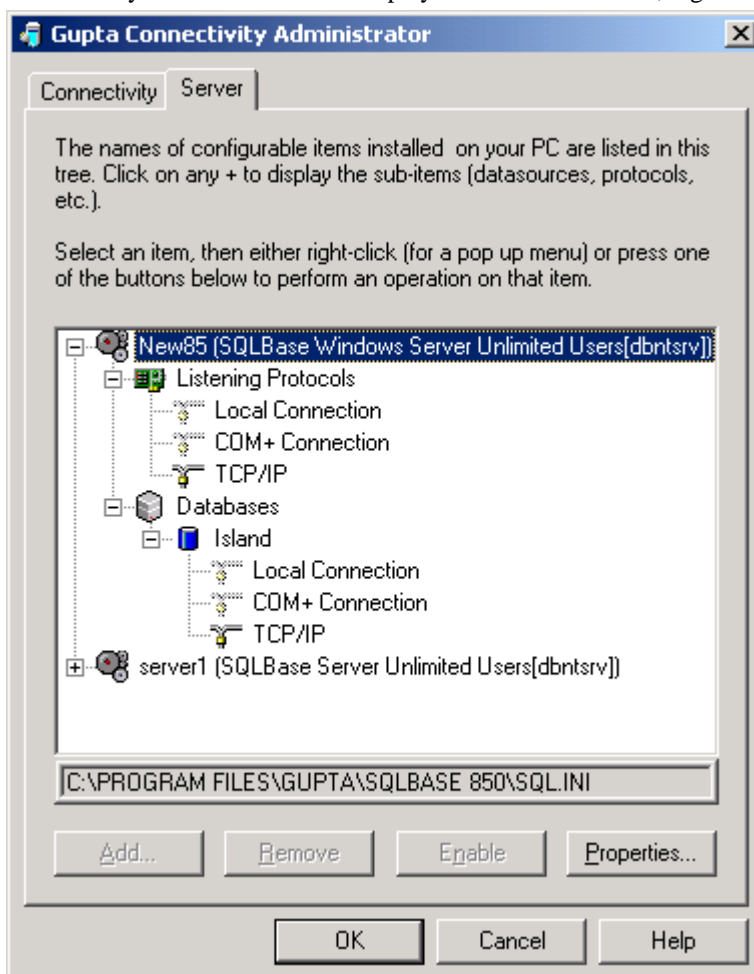
Note: This method is not absolutely required. If it is omitted, the SQL/API will look for the `SQL.INI` file using the search algorithms of earlier versions of SQLBase. However, if you wish to take advantage of version 8.5's ability to use a flexible name and path for the configuration file, then this method must be called before any other methods in the SQL/API are called.

If the caller provides just a file name without any location information, the API expects that file to be available in the current directory of the application. If the file is not available at that location, the call to `sqliniEx` will fail.

Programmers can call this method multiple times in a program. The requirement is that before a second or subsequent call to `sqliniEx`, method `sqldon` should have been called. If `sqldon` was not called prior, the call to `sqliniEx` will return an error.

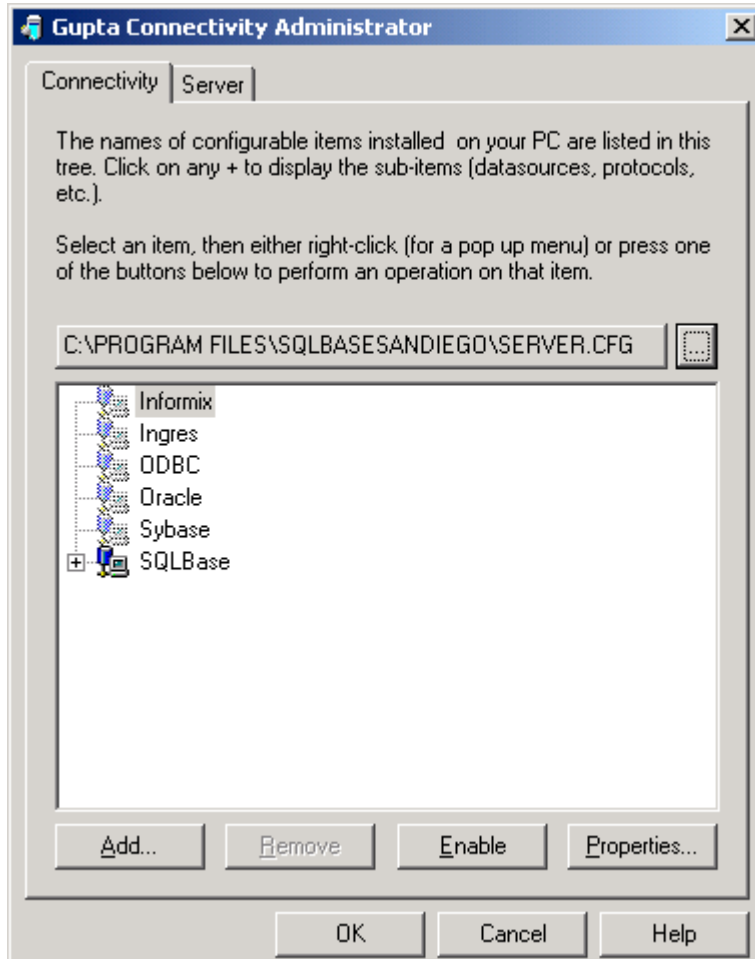
Connectivity Administrator

Connectivity Administrator now displays all installed servers, regardless of version.



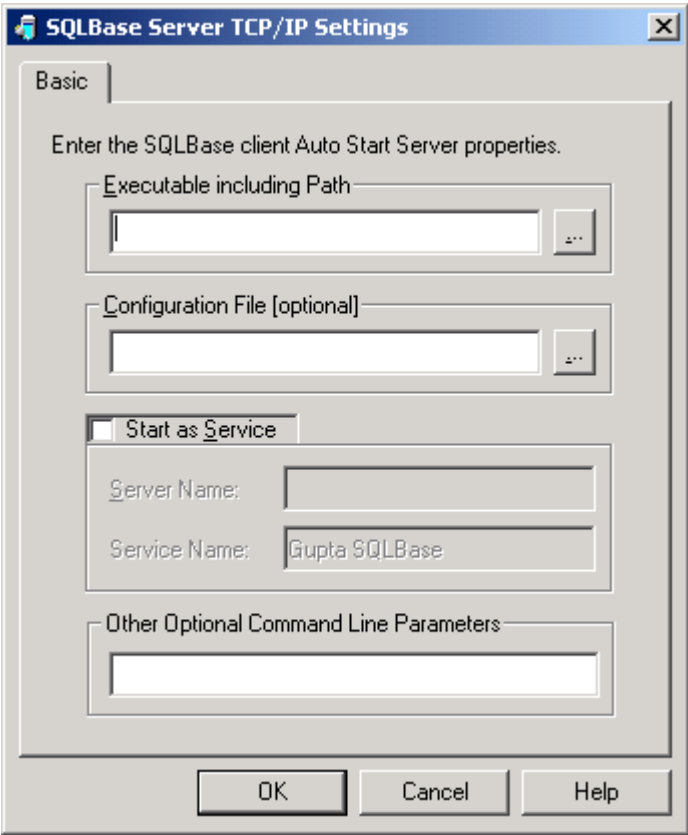
On the Client tab, a new pushbutton permits you to specify the name and path of the configuration file to be edited in your current session, should you wish to change it

from the default value chosen when Connectivity Administrator starts. In the example below, the path has been left unchanged, but the file name is now SERVER.CFG.

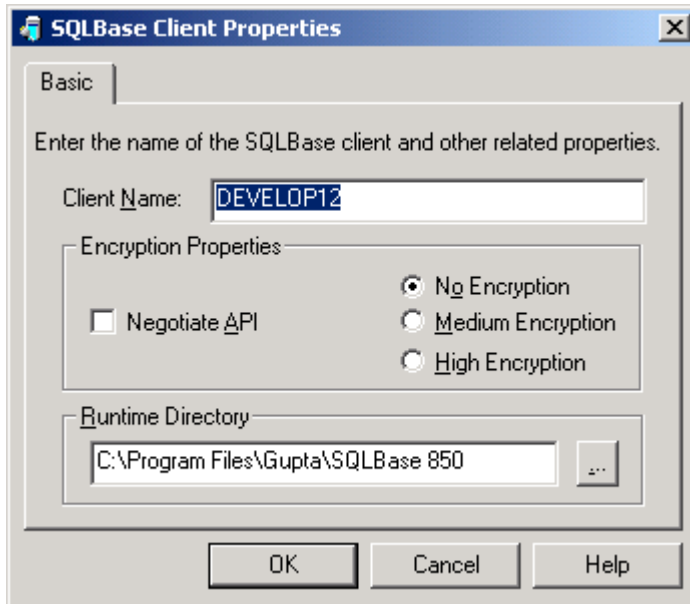


Connectivity Administrator has been enhanced to allow you to manage multiple servers on the client side for the local, SPX, and TCP/IP protocols. New right-click menu options on the Connectivity tab allow you to add server names to a specific protocol and to invoke the Properties dialog for a listening protocol. The 8.5

enhancement keyword AUTOSTARTSERVERPATH is accessible through this dialog, shown in the example below.



The client properties dialog has been enhanced to allow you to specify the runtime directory (new keyword CLIENTRUNTIMEDIR) where SQLBase executables can be found.



Database drivers and providers

Even though a user can have multiple SQL/API clients installed in a machine, only the most recently installed ODBC, OLE DB & .NET drivers and providers will be known to the system. All these drivers are registered with Windows upon installation, and each installation will overwrite previous information.

The OLE DB data provider has been enhanced to support multiple installs with a new property that supports specifying a configuration file before connecting to the data source. To make use of this feature, new property TDataSource.DBPROP_INIT_PROVIDERSTRING must be given a valid string value. The format of this string is:

```
INI=<Configuration File Name with full
path>;ims=<Value>;oms=<Value>
```

ims (input message buffer) and oms (output message buffer) must have values between 1 and 32000.

You may also specify the string in the UDL/Data Link property dialog box. The configuration file name with the above format could be entered as a value for "Extended Properties" in the "All" page.

SQLTalk

A new command-line argument for SQLTalk supports specifying a configuration file before starting a session. This choice is available in a dialog box that is accessed from menu items Options, Session Settings. You can also supply the file name as a command-line argument. Here is an example:

```
SQLTalk.exe "c:\program files\km.sql" "ini=c:\program files\sql.ini"
```

This particular example shows a SQL script as the first argument, and the configuration file as the second argument. Both are optional.

SQLBase Management Console

SMC has changed to reflect the existence of multiple installations. All the operations available in earlier versions of SMC (starting and stopping servers, etc..) are available with any of the installed servers. In addition, SMC allows you to search for SQLBase executables and register the executables found as Windows services. You can specify the name and location of the configuration file as part of the registration process. You can unregister existing server installations. You can also rename servers using SMC in version 8.5. The online help in SMC has full details on these new features.

SQL99 ANSI join syntax support

Version 8.5 offers extensive support for the SQL99 ANSI join syntax.

New keywords

Supported elements that are new to this version include:

Keywords NATURAL, JOIN, ON, and USING

Keywords INNER and OUTER

Keywords LEFT and RIGHT

Note: SQL99 ANSI clauses CROSS JOIN and FULL OUTER JOIN are not supported in SQLBase 8.5.

SQL99 ANSI join support is optional

These new keywords could potentially conflict with the names of tables, views, columns, or other database objects in your existing databases. For this reason, SQL99 ANSI join compatibility is optional, not automatic, for a specific SQLBase server. You can select it at installation, select/deselect it later through Connectivity Administrator, or control it using the new SQL.INI keyword "AnsiJoinSyntax".

Keyword Tool

If you are unsure whether these new keywords are already being used for other purposes in your existing databases, you can use the Keyword Check tool, new in version 8.5, to analyze those databases and detect potential keyword conflicts. You will find Keyword Check in the Gupta, SQLBase program group in the Start menu. Documentation for using Keyword Check is online at <http://www.guptaworldwide.com/products/sqlbase/keywordchecker2.asp>

API enhancements

The SQLBase API has been enhanced so that client applications can query whether the server to which they are connected is currently supporting SQL99 ANSI join compatibility, and use this information to construct their queries. Call function `sqlget` with parameter `SQLPAJS` to retrieve 0 (unsupported) or 1 (supported).

Multiple outer joins

If you elect to use ANSI join syntax, you may also use multiple outer joins in queries. This feature is not available when using SQLBase native syntax.

Database engine performance

SQLBase 8.5 is much faster at sorting than previous versions of SQLBase. You will notice improved query performance, particularly for queries using `GROUP BY` or other features involving sorting.

The maximum size of the database cache has been increased from 32,767 pages (a page is one kilobyte) to 1,000,000 pages. There is a minimum size requirement of 15 pages. If your system hardware has sufficient memory to support the increased cache size, you will see improved performance. To set the cache size, use Connectivity Administrator to edit the *cache* keyword setting in `SQL.INI`.

Other areas of improvement include lock management and query optimization.

SQL language enhancements

New function `@COALESCE` returns the first non-null value found in a list of two or more values. The values in the list can be mixed datatypes. The return value's datatype matches the datatype of the first value in the list. If every value in the list is null, the function returns NULL. For example:

Assume that the column `AUTHOR_NAME` does not contain a value of 'Chopin' and the `@DECODE` expression used below does not contain a default. In such a case, the

following expression returns the string ‘ABC’, the second value in the list, because the first value will evaluate to NULL:

```
@COALESCE(@DECODE(AUTHOR_NAME, 'Chopin', '007'), 'ABC', 'more')
```

JDBC Driver enhancements

In version 8.5 the JDBC driver is built with, and supports, JKD version 1.3.1.

Before the JDBC sample programs can be run, an additional SQL script must be run against the ISLAND sample database. For more information, see README.HTML in the samples/jdbc folder beneath your database server install folder.

JDBC Driver setTransactionIsolation() functional behavior has been changed to map isolation as given below:

TRANSACTION_NONE	"RL"
TRANSACTION_REPEATABLE_READ	"RR"
TRANSACTION_READ_COMMITTED	"CS"
TRANSACTION_SERIALIZABLE	Not Supported
TRANSACTION_READ_UNCOMMITTED	Not Supported

JDBC Driver connect URL has been extended to specify the SQLBase IMS (InputMessageSize) and OMS(OutputMessageSize) values. These are optional. The new URL format will look like:

```
jdbc:sqlbase://localhost[:2157]/  
island;ims=dddd;oms=dddd
```

- ims and oms are case insensitive keywords
- ims and oms are optional parameters and can be any order and positioned after the database name, separated by semicolons.

The value of dddd should be greater than zero and less than or equal to 32000. If the value specified does not fall in this range, then default values IMS=2000 and OMS=1000 are set.

New API methods

The SQLBase JDBC driver now supports a larger number of JDBC 1.2 API functions. Here is a summary of the methods that are newly supported by SQLBase 8.5.

Class `SqlbaseStatement`

(inherits from `Statement`)

- `int getResultSetConcurrency`
- `int getResultSetType()`
- `Connection getConnection()`

Class `SqlBaseConnection`

(inherits from `Connection`)

- `Statement createStatement(int resultSetType, int resultSetConcurrency)`
- `PreparedStatement prepareStatement(String sql, int resultSetType, int resultSetConcurrency)`
- `CallableStatement prepareCall(String sql, int resultSetType, int resultSetConcurrency)`

Class `SqlBaseResultSet`

(inherits from `ResultSet`)

- `int getType()`
- `int getConcurrency()`
- `Statement getStatement()`

Class `SqlBaseDatabaseMetaData`

(inherits from `DatabaseMetaData`)

- `boolean supportsResultSetType(int type)`
- `boolean supportsResultSetConcurrency(int type, int concurrency)`
- `boolean ownUpdatesAreVisible(int type)`
- `boolean ownDeletesAreVisible(int type)`
- `boolean ownInsertsAreVisible(int type)`
- `boolean othersUpdatesAreVisible(int type)`
- `boolean othersDeletesAreVisible(int type)`
- `boolean othersInsertsAreVisible(int type)`
- `boolean updatesAreDetected(int type)`
- `boolean deletesAreDetected(int type)`
- `boolean insertsAreDetected(int type)`

- boolean supportsBatchUpdates()
- Connection getConnection()

OLE DB Data Provider changes

The OLE DB Data Provider datatypes have changed. The provider data type "long" has been renamed to "long varchar" and the type has been changed from DBTYPE_BYTES to DBTYPE_STR. The datatype for "number" has been changed from DBTYPE_NUMERIC to DBTYPE_R8, to be consistent with the SQLBASE ODBC driver. FLOAT type has been removed from the providers list. The default value of property DBPROP_UPDATABILITY has been set to 0. Client applications should set the value to one or more of DBPROPVAL_UP_CHANGE | DBPROPVAL_UP_DELETE | DBPROPVAL_UP_INSERT. Otherwise the methods return DB_E_NOTSUPPORTED depending on the value set.

OLEDB Provider now supports ODBC escape sequences in the SQL statement.

A new argument in the DBPROP_INIT_PROVIDERSTRING property allows you to specify a particular configuration file as part of the connection. The argument should take the form "ini=*filename*". The filename can include a path specification.

.NET Data Provider changes

.NET Data Provider now supports ODBC escape sequences in the SQL statement.

Enhancements to the .NET Data Provider now support scrollable result sets. To make use of this feature, new property SQLBaseCommand.ResultSetMode must be set to TRUE. The SQLBaseDataReader object now implements interface IEnumerable, with a single method, GetEnumerator, which returns an IEnumerator object. That object has methods MoveNext and Reset, and get/set property RowPos (current row of result set), which allow you to move to a specific row in the result set.

A new *ini* argument in the connect string allows you to specify a particular configuration file as part of the connection. A Visual Basic example of this is:

```
SQLBaseConnection conn = new SQLBaseConnection("data  
source=island; uid=sysadm; pwd=sysadm;  
ini=c:\\sqlbase\\sql.ini");
```

ODBC Driver changes

ODBC Driver property DBPROP_SQLSUPPORT value returned has been changed. For versions prior to 8.5 it always returns 0. For version 8.5, if the server is running

with ANSIJOINSYNTAX value set to 1, the value returned will be DBPROPVAL_SQL_ANSI92_ENTRY; otherwise it will be 0.

ODBC Driver property SQL_OJ_CAPABILITIES value returned has been changed. If the server is running with ANSIJOINSYNTAX value set to 1, then value will have the additional bit masks SQL_OJ_NESTED | SQL_OJ_FULL.

The ODBC Driver "Gupta SQLBase Data Source Properties" dialog box has been extended to allow you to optionally enter the configuration filename.

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