UNIVERSAL DATABASE

Windows, UWP, Linux, Mac, Android, iOS
Client/Server, Cluster, Cloud, Standalone, Mobile, Embedded

www.windev.com
A universal database is a strategic resource.
The Relational Database Management System HFSQL allows you to manage this data safely.
The performance is remarkable.
Used on several millions computers the world over, the flexibility and the scalability of HFSQL allows real time responses to the most demanding mission critical applications.
Some knowledge of WINDEV, WEBDEV or WINDEV Mobile is useful if you’re not familiar with them, don’t hesitate to request their complete documentation for free.

HFSQL OVERVIEW

A UNIVERSAL DATABASE
HFSQL is a powerful RDBMS (Relational Database Management System).
HFSQL is available in 5 versions.
• local version (standalone or network)
• mobile version (embedded)
• Client/Server version
• cloud version
• cluster version.
HFSQL is suitable for all types of applications: business applications, 24/7 real-time critical applications, software, application servers, Web servers, standalone PC or mobile devices.
HFSQL is fully compatible with HyperFileSQL and Hyper File.

PERFORMANCE, SECURITY, OPENNESS, FLEXIBILITY
HFSQL is the ideal choice for a database engine.
Open: based on industry standards; HFSQL doesn’t lock you up into a proprietary technology.
Flexible: support for large volumes of data (tens of billions of rows in a table) is provided.
Platform independent: tables can be moved from a Client/Server implementation to a mobile implementation, from a Windows server to a Linux server, etc.
Scalable: you can freely switch from one user to several thousands of users; from a 2-tier architecture to a multi-tier architecture...
HFSQL works in heterogeneous environments: Windows, Linux, Mac, iOS, Android, TSE, Citrix, ADSL, VPN, Wi-Fi, 3G, 4G, in the cloud...
The forward and backward compatibility of tables is ensured.
Longevity of the publisher: PC Soft has been around for more than 25 years.
Performance, scalability: thanks to an optimized index and cache management, the speed is constant.
Secure access: protection against SQL injection is ensured via the automatic creation of secure UI.

REDUCED TCO
An important characteristic of HFSQL is its unlimited free deployment (see license).
There is no additional cost, neither for the number of CPUs on the server, nor for the number of client computers, nor based on the type of application (commercial,...) etc.
HFSQL comes as a complete product, with all its features.
The maintenance costs are very low.
The technical support is also free (as part of a WINDEV WEBDEV or WINDEV Mobile license). It is provided via email. The DBA and developers can also access very active professional newsgroups.

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HFSQL is available in 5 versions. These versions are binary compatible with each other.

**Local Version ("Classic" Version)**

The local version (standalone and network) offers performance, ease of deployment, installation and maintenance. This version is also called "Classic" version because it is the first version that came out, back in 1988. Compatibility with previous versions is complete (tables, index, relationships, constraints). This version is specifically designed for standalone computers and small networks.

- A common use for the Classic version is integrated into a software.
- The database is created and installed automatically on the end user’s machine.
- Its maintenance is also automatic.
- A HFSQL database can also be installed and used directly on a USB key.
- HFSQL Classic can be installed on machines running Windows (2000, 2008, 2012, Vista, 7, 8, 10...), MacOS, iOS, (Phone and iPad), Android and Linux.

**Client/Server Version**

The Client/Server version of HFSQL is the ideal version for managing large number of users and remote accesses. Local and remote accesses are supported. The installation is extremely simple, and the administration is easy though very powerful.

- HFSQL is not limited in the number of processors used, or memory.
- Load balancing is supported for better response time.
- The engine is auto-restart.
- HFSQL operates both in 32 bits and in 64 bits.
- Servers and clients can be mixed.
- The supported windows: Windows Server 2016, 2012, 2008, Vista, 7, 8, 10... in all their versions.
- Some of the supported Linux distributions: RedHat, Debian, OpenSuse, Ubuntu, Fedora, Mandriva, CentOS...

**Cloud Version**

HFSQL Client/Server is available in cloud version, from PCSCloud for instance.

- Installing a HFSQL database in the cloud frees you from all aspects of management and hardware maintenance.
- The cloud version is, for example, well suited for hosting databases used by mobile users.
- Billing is done based on actual consumption.

**Cluster Version (Server Farms)**

Thanks to the HFSQL cluster feature, a set of physical servers appears as a single server to the clients.

- The potential failure of a physical server does not prevent access to the database (high availability, fault tolerance).
- Servers automatically replicate each other in real time.
- The read load charge is distributed on all the servers.

MOBILE VERSION (EMBEDDED)

HFSQL is totally adapted to mobile devices of all types. HFSQL only requires a small amount of resources, and installs on all mobile devices (terminal, smartphone, tablet) that run on Windows CE, Windows 10 Mobile, UWP, iOS (Phone and iPad), Android.

- The installation is very simple, and the maintenance is automated.
- The performance is amazingly fast.
- It is fully compatible with the Local and Client/Server versions: tables, index, relationships, constraints.

Imagine, 512 GB on a memory card! Thanks to HFSQL you can now easily and for a low cost embed large size secure databases (up to 300 million rows) on mobiles, tablets, smartphones.

A Docker image is available.

Among the supported clients:
- 32-bit and 64-bit Windows
- Linux
- MacOS, iOS
- Windows CE and Mobile • Android
-...

HFSQL is totally adapted to mobile devices of all types.
**DATA AND INDEXES**

**DATA TYPES**
HFSQL supports all data types:
- Text, character
- Numeric (integer, real, decimal with 38 significant digits), Currency
- Date, time, duration, timestamp
- Boolean
- Array type column
- Blob ("memo", binary format: image, video, ...)

Powerful features are available:
- Unicode is supported, with support for linguistic sorts
- The sort order for different character sets is taken into account
- Default value
- Calculated items
- Management of NULL
- Timestamp...

**INDEX AND KEYS**
HFSQL manages keys and indexes for any type of column.
In order to ensure optimum performance, the server uses an optimization mechanism based on the data distribution, that gets automatically activated during idle times.
The following types of indexes can be created:
- Simple index
- Composite index
- Partial index
- Full text index.
HFSQL ensures data integrity by managing:
- Unique constraints
- Cardinality constraints
- Automatic Identifier
- Primary and foreign keys.

**FULL TEXT INDEX**
The "full text" search allows for very fast string (words or expressions) searches inside your data. It allows you for instance to find a word among one million rows in less than 2 ms (average for found occurrence).
This enables you to index, without programming, the texts found in a HFSQL database.
Results are ordered according to a relevance order ("ranking").
To perform searches on words stored in RTF or HTML documents, HFSQL ignores tags during indexing for these formats.
Texts can be contained inside text or blob type controls.
A full text index can index one or more columns, therefore a single search can be done on several columns at the same time.

**CAPACITY (VOLUMES)**
HFSQL ClientServer offers large storage capacity, in line with current and future storage models, as well as the ever increasing needs of enterprises.
During a recent roadshow, in front of more than 10,000 professional developers, PC SOFT demonstrated the use of a HFSQL database containing more than 20 billion rows: data searches started instantly!

329,000,000,000,000,000
329 millions of billions... This is the number of rows (records) that can be found in a HFSQL table: you’re safe!

**SQL**
HFSQL supports the ANSI SQL 92 standard.
The SQL supported by HFSQL also accepts a large number of additional and specific syntax for SQL Server and Oracle, among others.
HFSQL supports sub-queries and nested queries.
HFSQL supports union operators (union, cartesian, join, external join), aggregation operators (count, sum, avg, min, max, mean, variance), sort and group operators: group by, having, order by... The speed of the SQL engine is optimized.
It uses the most discriminating index for the queries.
The advanced management of memory caches also improves performance.
The engine automatically performs load balancing. If a client executes a large number of queries requiring a lot of resources (CPU, ...), the server automatically balances the load in order not to penalize the other clients.
Simultaneously with the SQL code, you can benefit from the functional richness of the WLanguage SQL.
The direct use of WLanguage functions and the call to stored procedures (developed in WLanguage themselves) are possible in your applications.
You’ll find at the end of this document the list of SQL functions supported by HFSQL, as well as other programming information (junior programming).

**FEATURES**
HFSQL offers a large number of features.
You’ll find the description of the main features below.
The entire online help for HFSQL is available on Internet at www.windev.com

**SEVERAL DATABASES ON THE SAME SERVER**
HFSQL classic supports the presence of multiple databases on the same server.
The databases are isolated.
Specific rights can be defined on each database.
This avoids having to use several servers.

**AUTOMATIC DATA MODIFICATION (DSS)**
Which developer hasn’t complained about having to write quick and dirty back to add a column or increase its size, add an index to an existing table or change the type of data in a column?
Writing these scripts is always tricky because they alter the data.
With HFSQL this will be things of the past.
HFSQL manages the evolution of the data schema transparently thanks to the DSS (Data Schema Synchronization) technology.
No more “hack jobs”!
No more scripts!
No more risky “Alter table” commands!
DSS automatically performs:
- The comparison and synchronization of the database structure and data against the reference schema
- The addition, deletion or renaming of columns
- The change of type, size
- The addition/deletion of key/index, additions/deletions of constraints
- The addition/deletion of triggers and stored procedures.
DSS can also be started via command line or programming.
This DSS feature can be executed live (hot), without disconnecting the users, transparently, without interfering with the applications running.

**INTENSITY: CONSTRAINTS, DELETIONS, CASCADING UPDATE**
It is easy to define integrity constraints.
The cardinalities can be configured: (0,1); (0,n); (1,1); (1,n); (3,n); etc.
Reflexive links are supported.
Constraints examples:
- Referential integrity: referential integrity will prevent an author from being deleted, as long as the data base contains at least one book referring to this author.
You cannot delete a row in a table if this row is linked to other table rows. For example: you cannot delete a customer if there are orders linked to this customer.
The referential integrity can be defined for each link, from the data model editor.
- Cascading deletion: If a row is deleted in a table, the corresponding rows in the linked tables are also deleted (this constraint can be enabled or disabled for each relationship).
The frequency of full backup and differen-
gramming, directly from the application. 

A backup can be triggered from the ad-
ministration tool, Control Center (instant 
view) stores the data on the drive.

"Materialized views" are also available.

An SQL view is a "virtual data source",
to ensure the integrity of a set of indisso-
ciable write operations performed on 
HFSQL tables.

HFSQL supports all the types of transac-
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A trigger brings a lot of security.

A stored procedure is also used to limit the 
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HFSQL supports locks at the row level.

This feature automatically manages dis-
connections happening between the client 
and the server.

Usually, this problem occurs with hardware whose connection with the server is not al-
ways on: mobile devices (Wi-Fi, 3G, 4G, ...)

A replication is easily defined via the repli-
cation wizard, or via programming.

Automatic row locking

HFSQL supports locks at the table level and at the row level.

Support for locks at the row level ensures better access security. This management is automatic.

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SECURITY
The integration, the automatic lock management, the Control Center... ensures by their very own existence a strong security. Security specific features are also available.

ACCESS RIGHTS: AUTHENTICATION FOR ESTABLISHING THE CONNECTION
The server has a user authentication system.
It checks that a user is authorized to connect, and then that he has sufficient rights to run his queries: for example, rights to delete rows when running a delete query. You can restrict access for a user based on his IP address or a DNS name.
The tuning of the rights is very granular at the server level, the database level or the table level.
You can choose to do it by programming or via a user-friendly interface.
You can define an expiration period for password.
You can define groups of users.
For the server:
- Rights to delete and add users or groups
- Rights to see the users and the groups
- Rights to create a database
- Rights to change the rights
- Rights to stop the server
- Rights to change your own password
- Rights to disconnect the client computers

ACCESS RIGHTS: DATABASE IMPORT
The use of the WINDEV window generator and WEBDEV page generator, with their edit controls that are automatically generated based on the data schema, makes attacks via "SQL injection" almost impossible, and it does so automatically.
The use of SQL queries created with the query editor brings the same level of security.
The data that the end user enters is automatically checked in real time as soon as it's entered, and it is not sent to the application if it's unexpected, erroneous or inconsistent.

ENCyclopedia

ENCRYPTION NOT POSSIBLE
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ENCyclopedia

ENCRYPTING THE DATA
Data access can be secured, and data itself can be secured. We can specify that the opening of the data requires a password.
The data itself can be encrypted.
Several encryption modes are supported:
- Standard on 128 bits
- RC5 12 rounds in 128 bits
- RC5 16 rounds in 128 bits
- If an attacker obtains an encrypted file (theft, copy, recovered from a recycled machine, on a lost computer, ...), he or she won't be able to use it.

DETECTING INCIDENTS
When the HFSQL server detects an incident (for example an inaccessible replicated server, or a schedule task that triggers an error), the server sends a notification of this incident to a list of specified email addresses.

OPENNESS
HFSQL is open to all the technologies, and is easy to integrate into your existing information system.

32 & 64 BIT ODBC DRIVER
The ODBC driver (32 or 64 bit driver, Windows and Linux) allows third-party applications to access the data stored on a HFSQL server, such as PHP, Python, Ruby, Access...

32 & 34 BIT OLE DB PROVIDER
The OLE DB driver (32 or 64 bit driver) allows third-party applications to access the data stored on a HFSQL server in a simple manner.
function allows you to access WinDev, WebDev and WinDev Mobile native environment and by programming.

Data binding is supported, visually in the code editor, automatically creating UI, controls, completion and therefore benefit from the automation of WinDev and WinDev Mobile environments, instantly recognized by the WinDev, WebDev and WinDev Mobile data schemas are also directly and write (in read, write) is optimized.

The HFSQL access is "native" in WinDev, WinDev is the #1 IDE in France.

WINDEV, WEBDEV and WINDEV MOBILE are Integrated Development Environments.

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HFSQL data schemas are also directly and instantly recognized by the WINDEV, WEBDEV and WINDEV Mobile environments, and therefore benefit from the automation and wizards of these environments: automatic creation of UI, controls, completion in the code editor.

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Tools

WDMP: DATA VIEWER
The WDMP tool lets you view, edit and modify data in a table. WDMAP is very useful in the test and debugging phase. WDMAP is used to filter and sort data, perform immediate export (to Words, Excel, OpenOffice, XML, ...)

WDFD: DATA COMPARISON TOOL
The WDFD tool lets you compare:
- the structure of 2 tables
- the data of 2 tables.
This can be very useful in the implementation step.

MONITORING ROBOT
The monitoring engine (which can be redistributed with your applications) lets you secure your servers.

The monitoring engine always monitors, and instantly detects new unauthorized connections with the server.

The server notifies you by:
- sending a configurable email message to the specified addresses (up to 20 addresses)
- message sent to a specific application (internal messaging,...)
- message sent to the integrated messaging system
- control screen (visual warning and sound)
- starting a WLanguage procedure
- third-party program (this program can for instance, send a configurable message via SMS to chosen numbers).

Among the monitoring parameters that can be specified, you’ll find:
- the frequency: test interval, from 2 minutes to 1 day
- repetition: in case there’s no answer from the monitored element, how often to retry and how long before triggering the warning
- text of the message to send
- the message’s medium (SMS, e-mail, ...)

USER ASSISTANCE FOR UNEXPECTED ERRORS
In a WINDEV application, the assistant to the end user is automatically provided on HFSQL aspects in the case of the following errors:
- detection of the non-protected concurrent accesses
- duplicates
- non respect of the integrity constraints
- wrong password
- disconnection
- lock.

If one of these errors occurs, the application automatically displays a relevant help window.

MODELING A DATABASE
Defining a database schema is easy thanks to the powerful visual editor provided: the data model editor.

WINDEV, WEBDEV and WINDEV MOBILE NATIVE ACCESS
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CURSOR IN WINDEV AND WEBDEV
Bi-directional cursors are automatically created for reading queries.

Native programming in WINDEV and WEBDEV is greatly facilitated by a set of highly advanced automations and wizards. Relationships between tables are automatically detected.

The access to database control is easily defined using a clear and intuitive syntax: table name, column name (for example: Customer.name).

PERFORMANCE TUNING, AUDIT
The Profiler and the Dynamic Audit let you analyze an application's performance, thus verify that the data access is programmed in an optimum way.

Tuning allows you to optimize queries, check indexes, set up statistics, monitor the server and control the memory, the CPU use, disk space, connections, etc.

The SQL Explan function allows you to monitor the order in which a query is run.
MULTICONTEXT
You can use several contexts and several different connections on the same database at the same time.

FRONT END, BACK END, 3-TIER...
By default, WINDEV AND WEBDEV support all architectures.

RELATIONAL OBJECT MAPPING
WINDEV proposes powerful functionalities to manage and update classes automatically from the database schema.
WINDEV allows an easy implementation of Relational Object Mapping.
Besides, WINDEV supports the 9 types of UML diagrams.
The class diagram can be generated automatically from the classes of the project.

QUERY EDITOR: SQL OR GRAPHICAL
Query creation is done in SQL or in WLangauge 5GL.
The queries can be directly coded, or generated by the query editor (Reports & Queries).
This editor comes with WINDEV and WEBDEV, and can be freely distributed to the end users of the applications you've created.

The query editor is used to optimize the database description (schema) by detecting and defining the necessary indexes for the best runtime performance of queries.
The query editor displays the query graphically, generates it in natural language, and then it generates the SQL code!
This way there's no risk of error. The query is also generated in schematic form (animated graphic).

RAD: AUTOMATIC WINDOW GENERATOR FROM TABLES
The GUI (UX / UI) windows, pages, controls,... (as well as the code) can be generated automatically.
The generated UI take into account the table's definitions.
For example, if a column is a numeric type column, with a maximum length of 8, only data of this type will be authorized in input in the corresponding control.
It will be impossible for the end user to enter a text or a number of greater length.
An error message automatically comes up, and the erroneous value entered will not be sent to the application or site.
The necessary sophisticated controls are generated via RAD and are of course available to create the UI “by hand”. They’re available by simple drag/drop.
Here’s the list of controls:
- formatted edit controls
- display control (static)
- tabs
- drop-down list box
- combo boxes
- auto-filled combo box

Examples of UI generated by WINDEV

Everyday language
Display all LastName, FirstName, BusPhone, MobilePhone, eMail, Zip, City, OrderNum, OrderDate, InvoiceNum and InvoiceDate such as LastName is equal to LastNameParam AND FirstName is equal to FirstNameParam AND Zip is equal to ZipParam OR OrderNum is equal to OrderNumParam AND OrderDate is equal to OrderDateParam OR InvoiceNum is equal to InvoiceNumParam AND InvoiceDate is equal to InvoiceDateParam.

Creating a query is simple: using the wizard, choose the columns to include, specify the selection conditions, then the query is automatically generated in optimized SQL code.
The editor can also perform a reverse-analysis of existing queries.
A query can use the result of another query as its source.

Examples of UI generated by WINDEV
### REPORTING TOOL
(“REPORTS & QUERIES” TOOL)

The “Reports & Queries” tool is a report editor supplied with WINDEV and WEBDEV. It can be freely distributed to your end users, for any application created with WINDEV or WEBDEV. This report editor interfaces natively with HFSQL, and allows for easy creation of very sophisticated reports using data stored in HFSQL databases (or other databases). By default, the PDF format is supported, as well as page backgrounds, bar codes, labels, export to Word and Excel, ... and everything you need.

### PROGRAMMING: SQL AND 5GL LANGUAGE

**EASY YET POWERFUL PROGRAMMING**

The programming of the HFSQL database is both powerful and easy. This programming is done in SQL and/or in WLanguage SQL. Programming with the SQL language is universally known.

### GDPR: PERSONAL DATA PROTECTION

GDPR defines a set of restrictions regarding the collection, storage, treatment and manipulation of personal data, such as names, surnames, addresses, etc. Every time personal data is used, its storage or treatment must comply with the regulation.

For every item of a data file (column in a table), it is possible to indicate if the data used is personal data affected by the GDPR. An GDPR Audit window offers a general and detailed vision of the use of personal data on all the tables and elements of the project. Folders can be edited.

### RAD: TO GENERATE CODE

The code can be generated on demand by WINDEV and WEBDEV by using the RAD functionality, or by using the large number of wizards available for these environments.

The generated code can be modified later. RAD supports the pattern concept, which lets you define by yourself the generated code to be created.

### LIST OF SUPPORTED SQL STATEMENTS

Let’s see the list of supported SQL functions (this list is not exhaustive).

Each SQL function is not presented in details here.

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### Programming example

Example of a cube on HFSQL data

**ROLAP CUBE: PIVOT TABLE**

Decision makers love it! The Pivot Table control dynamically displays n dimensions coming from the crosstab of different files found in a database. For example: the volume of sales according to product family, products, regions, over time, with or without details. The end user can expand information, hide it. The pivot table performs the calculations: everything is automatic, no programming is needed to fill it.

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### LIST OF SUPPORTED SQL STATEMENTS

Let’s see the list of supported SQL functions (this list is not exhaustive).

Each SQL function is not presented in details here.

### GDPR: PERSONAL DATA PROTECTION

GDPR defines a set of restrictions regarding the collection, storage, treatment and manipulation of personal data, such as names, surnames, addresses, etc. Every time personal data is used, its storage or treatment must comply with the regulation.

For every item of a data file (column in a table), it is possible to indicate if the data used is personal data affected by the GDPR. An GDPR Audit window offers a general and detailed vision of the use of personal data on all the tables and elements of the project. Folders can be edited.

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### EASY YET POWERFUL PROGRAMMING

The programming of the HFSQL database is both powerful and easy. This programming is done in SQL and/or in WLanguage SQL. Programming with the SQL language is universally known.

### Programming example

Example of a cube on HFSQL data

**ROLAP CUBE: PIVOT TABLE**

Decision makers love it! The Pivot Table control dynamically displays n dimensions coming from the crosstab of different files found in a database. For example: the volume of sales according to product family, products, regions, over time, with or without details. The end user can expand information, hide it. The pivot table performs the calculations: everything is automatic, no programming is needed to fill it.

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LIST OF WFLANGUAGE COMMANDS

The WFLanguage lets you program cursors, or program all the processes you want.

The SQL WLanguage programming is very powerful and very intuitive.

For example, searching for a row (a record), and all the associated items.

The source programs are clear, easy to write and especially easy to maintain; this reduces the chance for errors, and makes the applications you develop more reliable, and faster.

The commands can be understood by any developer, even rookies!

Other example, the creation of a table is done in a line of code, without any script: hCreate.

Non-exhaustive list of WLanguage functions (SQL used by WINDEV, WEBDEV and WinDEV Mobile), with summary of their action.

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VOCABULARY

The vocabulary varies based on the interlocutors. The same concept is often described using different words.
Different standards, different practices, side by side!
Let’s see a small glossary of the terms used in databases.

Analysis chart
Template of schema Table
Column, Field (a field is the intersection of a column and a row)
Line, tuple, row
Link
Lock
Primary key
Key with duplicates
Foreign key or key without uniqueness constraint
Input item
Window
Form
Control
Report
Viewing table
Scheduled task
Test memo
Binary Memo
Store procedure
UDF (User Defined Function)

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UDF (User Defined Function)

A database is a set of tables (files) linked via relationships (links).
A table (data file) is a set of data organized in columns (items),
made of rows (records) The intersection of a row and a column is a field (item value).
An index is a way to accelerate searches, queries and accesses to a table.
An index can be defined on a column (key item) or on several columns (composite key).
A primary key is a unique key that can’t be null.
A foreign key is a key that accepts duplicates, used jointly with a primary key to establish a relationship (link) between 2 tables.

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WHICH COMPANIES USE HFSQL?

Tens of millions of copies of HFSQL are deployed in over 100 countries. HFSQL is deployed on the most demanding web sites (Web, telecoms, enterprises, banks, hospitals, research, software publishers, administrators, government, etc.) that require high availability (24/7) with top performance in real time.

TESTIMONIALS

Here are some testimonials:

“HFSQL: light speed!”

“HFSQL completely delivers in terms of robustness and flexibility”

“HFSQL allows us to save several hundred millions of euros thanks to the fact that we don’t need individual licenses for the database”

“This represents close to a billion operations hosted and processed by HFSQL, corresponding to about 24 billions euros in debit operations”

“All the applications rely on the HFSQL database to ensure complete data security”

“The data is stored on our dedicated server with an HFSQL database that supports our entire Information Services”

“In terms of performance, HFSQL delivers. It’s always instantaneous”

“We’re managing more than one TB of data (with HFSQL) and we’re thrilled with the database performance”.

You’ll also find technical videos and testimonial videos on www.windev.com

HFSQL BENEFITS

SUMMARY OF THE MANY BENEFITS OF ADOPTING HFSQL:

• Feature rich
• Free
• Data schema description tool
• Easy to install
• Easy to embed
• Easy administration (auto-administered, auto-optimized)
• Powerful administration tools
• GDPR compliance
• Integrated with market leaders WINDEV, WEBDEV, WINDEV Mobile
• All-in-one solution with WINDEV and WEBDEV: RDS oriented, it generates the tables, processes, windows and reports
• Encryption of the data, tables and indexes
• Encryption at column, backup, network traffic level
• Compatibility: Windows (10, B, 7, Vista, Mobile, CE...), Linux, Mac, IOS, Android...
• Binary compatibility of the databases and indexes: local, network, mobile, embedded, client/server, cluster
• Stored procedures
• Hot and incremental backups
• Protection against SQL code injection
• Unicode
• Efficient language and character set management, sort order, granularity at the column level
• Easy replication
• Automatic reconnection
• Easy monitoring
• High availability cluster
• Performances
• Sustainability
• Audit, tuning functions
• Optimizing the queries
• Full text indexing support
• Blob, Lb
• Integrity constraints
• Automatic schema (DDS) maintenance, on an unlimited number of deployed databases
• Robustness for large volumes of data
• Low resource requirements
• Secure access
• Automatic load distribution among clients
• Ease of deployment and use
• Free technical support*
• All in English

ENVIRONMENTAL POLICIES: When HFSQL is used, the use of
- paper for printing, if any, is minimal.
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- PC SOFT, the paper supplier or the printer
- re ships all printed materials. For example printing 100, 000 copies of a 68-page documentation on glossy paper consumes 16 trees. 10 trees are replanted.
- Also, we favor (and collecting partially from re-usable packaging from furniture rails for in-
- ners) and from controlled bottlenecks cleaning

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PERFORMANCE, SECURITY, AVAILABILITY

RDBMS
Windows, UWP, Linux, Mac, Android, iOS
Client/Server, Cluster, Cloud, Standalone, Mobile, Embedded

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