Firebird™ Facts
The True Open Source SQL RDBMS

Firebird 1.5 is a full-featured SQL database engine. It is powerful, yet lightweight, with minimal configuration and administration needs. It's easily scalable from single-user, single-database usage up to company-wide enterprise purposes. A single Firebird server can handle multiple independent databases, each with multiple client connections. And best of all: it's **true Open Source**, thus free of any license fees even for commercial use.

Key Features

☐ **A.C.I.D. compliance:** The concept of "Atomicity, Consistency, Isolation and Durability" is what Firebird is built for.

☐ **MGA:** A special feature of Firebird is it's "Multi-Generational Architecture", that allows the engine to handle various versions of the same physical record at any time, so any transaction can have it's own version regardless of other concurrent transactions ("**readers don't block writers and writers don't block readers**"). This ensures OLTP as well as OLAP operation.

☐ **Stored Procedures:** Using Firebird's PSQL (Procedural SQL), one can easily create powerful Stored Procedures for processing data entirely on the server side. A special flavour are "**selectable Stored Procedures**" that can calculate data row by row in the server and can be used like a View or a "virtual table" from the client side, which is especially useful for reporting tasks.

☐ **Events:** Stored Procedures and Triggers can fire Events that can be monitored from a client on a configurable TCP/IP port for "**active databases**".

☐ **Generators:** The concept of Generators (a.k.a. Sequences) allows the easy implementation of **"AutoInc"** columns, but goes far beyond that. Generators are non-volatile Int64 counters that are independant of transactions and can be used in many ways.

☐ **Read-Only databases:** For distribution of databases on e.g. a **CD-ROM.** Esp. when used in combination with the **Embedded** version of the engine, this gives unbeatable ease of deployment.

☐ **Full transaction control:** A single client application can have multiple, concurrent transactions. The various available **isolation levels** can be fully controlled by the client on a per-transaction basis. The **Two-Phase-Commit** protocol allows guaranteed consistency across databases. **Optimistic locking** is also supported as well as multiple Transaction **Savepoints**.

☐ **Online Backups:** There is no need to shut down a database to back it up. A backup process takes a **snapshot** of the state of the database at the moment it starts, so users can continue working while a backup runs, allowing 24x7 operation.

☐ **Triggers:** Each table can have many separate row-level triggers that fire Before or After Inserts, Updates or Deletes. Inside a trigger, the full wealth of PSQL can be used to apply default values, ensure data integrity, raise Exceptions etc. New in Firebird 1.5 are "**universal triggers**": Here you can have one single trigger to handle Inserts, Updates and/or Deletes in a table all at once.

☐ **External Functions:** User Defined Function libraries (UDFs) can be written in languages like C, C++ or Delphi and can easily be plugged in to the engine itself via DLLs / SOs, enabling you to extend the functionality of Firebird "inside" the server.

☐ **Declarative Cascading Referential Integrity:** Ensures consistency and validity of n-level deep parent-child relationships between tables.

☐ **Character Sets:** Firebird implements many international Character Sets including Unicode with a variety of collations.

SQL Standard Compliance

Firebird has full **SQL 92 Entry Level 1 Support** and implements most of the SQL-99 standard, plus some very useful additions. This includes DML/DDL statements, FULL/LEFT/RIGHT [OUTER] JOIN syntax, UNION, DISTINCT clauses, subselects (IN, EXISTS), internal functions (AVG, SUM, MIN, MAX, **COALESCE**, **CASE**, ..), constraints (PRIMARY KEY, UNIQUE, FOREIGN KEY), as well as all common SQL data types. Firebird also implements Domain and Field level Check Constraints, Views, Exceptions, Roles and a fine-grained Grant management. See the **Release Notes** and the **Firebird Reference Guide** for more details.

Hardware Requirements

Firebird runs on almost any hardware. Even "small" hardware can do the job, esp. when used with Linux. As with any RDBMS, there are the usual aspects that influence performance: the amount of physical RAM (as little as 16MB will do for a start); the speed of the storage subsystem (like RAID systems) etc. Of course, the recommended hardware depends on what you want to do with the database, e.g. how large will it become, how many concurrent users do you expect andsoforth. You can start off with a minimal configuration and then power up the server later on as the need arises.

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Available OS Platforms

The most commonly used OS platforms for Firebird are **Linux** and **MS Windows** (incl. Terminal Servers and Citrix Mainframes), other supported platforms are **Mac OS X**, **Solaris** and **HP-UX**. Migration from one platform to another is painless and possible at any time: just backup a database on one OS using the Transportable Format, then restore it on any other.

Connectivity

Firebird supports a number of connectivity methods, including: **native Component Packages** for C/C++ and Delphi, **ODBC**, **JDBC** (JayBird), **PHP** Driver, **OLEDB** driver, **dbExpress**, **.Net** data provider and finally through direct **API** calls using fbclient.dll/.so.

Physical Limits

Firebird allows really huge databases. Databases can span multiple files, the size of each file is OS-dependant. The theoretical limit is currently **64TB** for a single-file database, so the practical limit is usually the operating / file system or available HD space.

Server engine versions

There are three different versions of the engine, all interchangeable and each with it's own strengths:

Classic Server (one instance per client connection; SMP/HT support)

SuperServer (all connections handled by one module; currently no SMP/HT support)

Embedded Version (the **entire engine in a single DLL / SO (!)** for single-user, single-database use)

All versions use the same db file format, so you can switch between all of them any time you like.

Licensing

Firebird is licensed under the IPL (InterBase® Public License) which has the same terms as the Mozilla Public License 1.1. Firebird is **completely free to use and deploy** to your customers. You don't need to release the source code for your own product, regardless of your licensing model. If you modify the engine, however, you must provide public access to the source code of your modifications.

Tools

A large amount of tools is available for Firebird, some free, some commercial. There are admin tools, tools for developers, UDF libraries, Connectivity tools and more (see the links section below).

Support and Resources

On **www.firebirdsql.org**, the home of Firebird, there are many useful links about the project.
The company IBPhoenix offers various contracts for professional support by people with long-term experience. On their website **www.ibphoenix.com** there is also a wealth of tech infos, how-tos and in-depth documentation available.

Community

There is an ever growing community of Firebird users and various newsgroups to supply instant online support. On the project homepage there is a full list of all newsgroups about Firebird (see below).

History

Firebird is based on the source code of InterBase® 6.0 that was released as Open Source by Borland® in August 2000. The story of InterBase® goes back as far as 1984, so in total there are close to 20 years of relational database experience in the product.

Firebird Links

Download: You can download Firebird here: http://sourceforge.net/project/showfiles.php?group_id=9028

Documentation: Detailed documentation links: http://firebird.sourceforge.net/index.php?op=doc

License: The complete IPL: http://www.ibphoenix.com/main.nfs?a=ibphoenix&page=ibp_ipl

Tools: See links on http://www.ibphoenix.com/main.nfs?a=ibphoenix&page=ibp_contrib_download

Community: A collection of newsgroups is available on http://firebird.sourceforge.net/index.php?op=lists

FirebirdSQL Foundation
Supporting Firebird development

The FirebirdSQL Foundation

One driving force behind the Firebird project is the **Firebird**SQL **Foundation**. This is an open group of individuals and companies sponsoring the development of Firebird by means of collecting funds and giving grants to developers to help evolve and continue the project. The Foundation gladly accepts new members, either corporate or private, as well as sponsors for the funding of the project.
Join the Foundation on http://www.firebirdsql.org/foundation/