Firebird White Paper

Time for a review: Is your database server the right solution or part of the problem?

Holger Klemt, March 2018

Our recent lecture on "Professional Database Management" led to many visitors questioning their own infrastructure. We are delighted to have received such great response to our offer of to perform a free Firebird database server performance test remotely.

But how can it be that even when utilizing modern and expensive server technology, that the Firebird database software does not seem to perform very well?

The system vendor has produced the server specifically for use as a database server, and for the price of a Volkswagen car, it is reasonable to have high expectations regarding the performance. At least that's what was thought when placing the order.

There is more than enough memory available and fast Xeon server CPUs with many cores at first glance cover all requirements that the software producer demands as a basis. Strangely enough however, hardly any of the memory is actually used by the Firebird database software, and the CPU cores are seemingly bored as well.

How can this be?

The server supplier is testing the server performance using various speed tests to prove the great server performance. For example, very large files can be copied back and forth in no time.

And that's exactly where the cause can be found. Modern data carriers, such as hard disks or RAID systems, are optimized to quickly process the ever-increasing amounts of data, which are usually stored in very large files. On the other hand, the Firebird server can work with very large files but has a completely different requirement profile. The file is not simply read/written from front to back, but it is distributed across the entire file size, with many small blocks being read and written back in completely different order.

Just imagine the good old times by remembering the handling of a telephone book. Younger readers may forgive me this archaic example; telephone books existed before the Internet age, and were very heavy books in paper form, with many pages, in which all participants were sorted by local area, last name and first name. The entire database in paper form could be easily transported from one place to another by moving the entire book. The edition for West Berlin 1986/1987 consisted of about 2,688 pages, divided into 2 volumes weighing 1-2 kg each, in spite of the very small print. **Just such large data packages can also be handled very well in digital form with the current expensive server technology available.** But in databases, especially in a Firebird database, it is not necessary to transfer the entire data package, but instead retrieve content on hundreds of different pages and output in the order desired by the user, according to various criteria. Try to

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find someone in the phone book whose surname you do not know exactly: in the pre-internet era the telephone book collection for Germany was distributed in about 80 telephone books, which occupied a total of about 70,000 pages. So have fun searching, without the aid of Google!

What makes the difference?

A server performance test that simulates the profile of a Firebird database should not just copy a huge file from A to B, but copy and delete hundreds of thousands, very small files, in 10 or more different windows simultaneously in different paths. A server that performs great with large data packets can become rather a standard or even sluggish performance server for these smaller fine-grained operations used by a Firebird database engine.

In order to carry out such a reproducible test, we have integrated a benchmark test into our IBExpert software. Since we know that not every customer has the know-how to use this benchmark in such a way that the result is really comparable, we offer our customers the opportunity to carry out this test together with us on their own server as part of a remote session.

The results are output in percent. A database server, which we sold to our customers 7 years ago, is used as a reference server and normalized to 100%. If a server attains 50% in the test, then every database operation on the tested Firebird server takes twice as long as on the reference server. Our current server range attains values up to 500%. **So if your server reaches 50%, then you can assume that every operation that takes 10 seconds on your server is completed on our server within just 1 second.**

Software with waiting times of 10 or more seconds, for example trying to retrieve information with such wait times during a customer call can become very annoying, and most likely frustrate the person involved. Your own personal assessment and impression of whether the response time of the software is acceptable or not, depends in part on whether you have already resigned to the low speed.

For the employer, on the other hand, the one minute each employee spends unproductively waiting is just as expensive as a productive minute. With hundreds of tasks each day, the increase in productive work is clearly noticeable for all employees when deploying an extremely fast server with minimal waiting times.

Our benchmark provides you with a guideline. As part of the many tests we have performed over the last few weeks, some customer servers achieved less than 10% performance. This means each database access on the tested server took fifty times longer than on the reference server. I can fully understand that employees lose all motivation. Replacing a company car with a tractor may at first glance significantly expand the operational profile, but rest assured that you will regret your decision after crawling along the freeway at top speed and trying to find a suitable parking space in the city center.

It is crucial to use the most technically suitable machine for the planned application profile. Less is often more and if you can get a Firebird server with maximum speed for about USD 4,900, then this investment is amortized faster than you think. It is not about replacing the existing server, but to complement it with a highly-optimized server especially for Firebird databases.

Would you like to face this comparison and measure the speed of your database server? This service is free and without any obligation. Just sign up, we will arrange an appointment with you:

- Telephone: **407-462-7283**
- E-mail: **contact@ibexpert.com**

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Please allow a maximum of 20 minutes for the test. You will immediately see the results compared to our IFS servers and the performance advantages you can expect in comparison to your current server.

P.S. But what's the reason for the inefficient use of CPU and memory?

In order to use the main memory properly, the configuration must be adjusted. We are happy to help you with our IBExpert and Firebird Standard Hotline: Support Standard Hotline 120 minutes.

No CPU load almost always indicates that the CPU needs to wait for the disk, or hard drive, or whatever has been installed, because this unit is too slow. Unfortunately, we cannot change the hardware used. But we can guarantee adequate CPU and memory utilization, when you purchase our IFS servers. Do you have any questions?

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