

An Overview of Rockall-DB

Rockall-DB Version 16.1

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Contents

1. Introduction.....	3
2. An Overview of Rockall-DB	3
3. Conclusion	4

1. Introduction

What would the world of Information Technology (IT) be like if transactional databases were much cheaper, easier to use, faster and smaller?

Clearly, if transactional databases were a cheaper there would be obvious direct cost savings. If they were easier to use, then less effort would be needed to develop new applications and maintain existing applications. If they were faster users could be more productive and such databases could provide better and timelier management information. Finally, if they were smaller then transactional databases could be used in low-end or embedded applications meaning systems could be more distributed and resilient in the face of failures or outages.

What we will discuss in this document is a mechanism for turning this dream into reality using a product called Rockall-DB.

2. An Overview of Rockall-DB

A Rockall-DB database is so different from most existing transactional databases (i.e. such as SQL Server and Oracle) that it is sometimes a little difficult to explain it.

Let's start with the performance of Rockall-DB. A typical request to Rockall-DB returns in microseconds not milliseconds (i.e. around 100 to 1,000 times faster than a traditional SQL database). The historical SQL programming language is replaced by a small number of simple native code function calls (i.e. such as `'OpenFile()'`, `'BeginTransaction()'`, `'EndTransaction()'` or `'CloseFile()'`). A Rockall-DB transactional database sits inside of an application rather than being remote from it. Consequently, transactional speeds of 10,000 to 100,000 transactions per second are typically easily obtainable. A Rockall-DB database can easily be paired with other products (i.e. such as IIS) and usually dramatically reduces the complexity of the overall application, especially for languages such as C++, C# or Java. In the case of products like IIS, there is no longer a need to use things like complex 'cookies' because this can be easily dealt with by a Rockall-DB database. Additionally, things like dynamic IIS content (i.e. the automatic completion of text boxes and dynamic lists) can also easily be supported due to the speed of Rockall-DB.

A number of well-known limitations of traditional databases are removed by Rockall-DB. The limitation on row sizes increases to around 25% of main memory meaning multi-gigabyte or terabyte rows can be created if necessary. This means that large array, structures, unions or other complex contiguous data structures can be efficiently, trivially and transactionally stored. Moreover, it is possible to store entire databases within a single row introducing the concept of nested databases. In short, it opens up a whole new range of opportunities for architects and software engineers.

The support of multi-level variable encryption in Rockall-DB means that different areas of a database (or even individual records) can be encrypted using different keys. Consequently, this dramatically reduces the impact of data breaches because a Rockall-DB database remains encrypted at all times except for the parts that are in main memory (which is user controllable). Consequently, making a copy of an

encrypted Rockall-DB database typically yields nothing but encrypted gibberish making Rockall-DB more secure than traditional databases.

A transactional database is typically a multi-megabyte piece of software that costs thousands of dollars, requires a team of specialist Database Administrators (DBAs) to support it and runs on a special high-end database server. The software for Rockall-DB is less than a megabyte, requires no Database Administrators (DBAs) to support it and runs on the same machine as the associated application. Consequently, Rockall-DB has a totally different cost structure to traditional databases and can save organizations millions of dollars in hardware, licensing fees, management costs and salaries.

3. Conclusion

Clearly, Rockall-DB is a complex technical product that needs be carefully evaluated by technical staff to assess its value to the business. However, it represents a minor revolution in the field of transactional databases and creates a large number of new opportunities in a wide variety of areas. It can scale from embedded devices, phones and tablets all the way up to multi-terabyte servers allowing IT systems to become easier to manage, faster, more decentralization, more resilient and more secure allowing the ‘iron grip’ of traditional centralized SQL databases to be broken and distributed to areas of the business where there is a more natural fit.