IMPACT REPORT

MariaDB revs transactional database platform, touts it as most feature-rich open source DB

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MariaDB Corp has called the new MariaDB TX 2.0 'the most feature-complete open source transactional database and proxy' – something it admits it couldn't claim for earlier versions. It also claims TX 2.0 to be on par, feature-wise, with more expensive proprietary offerings for most needs.

The 451 Take

Since it is the default database in Debian, openSUSE, Manjaro, Red Hat Enterprise Linux (RHEL), CentOS, Fedora, Arch Linux and SUSE Linux Enterprise – giving it a reach of over 60 million developers – it's little wonder that MariaDB can claim that there are over 12 million users of its MariaDB Server around the world. With its MaxScale database proxy, ColumnStore and other offerings, there are a growing number of reasons for more of those users to become paying customers. Harmonization of branding – TX for transactions and AX for analytics – and subscription options have made it simpler than ever for users to do just that.

Context

Founded by several people who were previously at open source database firm MySQL (which was bought by Sun Microsystems and then Oracle), MariaDB offers an alternative to MySQL that maintains good compatibility. MariaDB Server also supports the full ANSI SQL standard – something that NoSQL database vendors struggle to achieve. Indeed, NoSQL technologies, for the most part, also give up some consistency and durability characteristics in order to be able to scale out across clusters of machines.

MariaDB Server can be deployed on-premises, as well as on Microsoft and AWS clouds, and can be bought in Microsoft's Azure Marketplace or via AWS's Relational Database Service. Other clouds, including Rackspace and Pivotal Cloud Foundry, are also supported.

MariaDB can run on bare-metal servers, virtual machines and containers, as well as public and private clouds. It is available in all of the major Linux distributions, including Ubuntu, and is the default database in Debian, openSUSE, Manjaro, RHEL, CentOS, Fedora, Arch Linux and SUSE Linux Enterprise, giving it a reach of over 60 million developers around the globe.

The company doesn't disclose how many paying customers it has, but tells us it has about 100 staff. It says there are over 12 million users of the open source MariaDB database worldwide. Although MariaDB TX 2.0 has only just come out, MariaDB Server is in use at Google, Wikipedia, Tencent, Verizon, DBS Bank, Deutsche Bank, Telefonica and Huatai Securities, among others.

Technology

As mentioned, MariaDB Server maintains compatibility with MySQL. However, the company tells us that, now that it is witnessing such strong momentum, it is becoming more relaxed about just how compatible with MySQL it should remain. In fact, it says that, anecdotally, 99% of its effort goes into improving MariaDB Server and others of its own technologies, as opposed to MySQL compatibility. It also receives contributions to its technology from the MariaDB open source community, and it continues to enhance its compatibility with the SQL query language.

In addition to MariaDB Server, the company has MaxScale. That's a configurable database proxy that enables MariaDB to be scaled horizontally, with automatic load balancing between nodes. A database proxy allows databases and applications to be fully decoupled, enabling admin processes to run without affecting apps, and apps to evolve without hampering the underlying data. MaxScale provides not just sharding, but also failover, streaming, routing, caching and security.

In December 2016, the company announced that it had added analytics capabilities to its arsenal with MariaDB ColumnStore, offering a combination of transactional capabilities and analytics. ColumnStore uses some of the open source technology that was developed by InfiniDB, which filed for bankruptcy in 2014, but by then had developed a storage engine that could be slid beneath MySQL-compatible databases.

One of the key features of MariaDB TX 2.0 is that it brings together, for the first time, a number of technologies that are designed to offer a comprehensive transactional data platform. For companies that are more focused on using MariaDB Server as a data warehouse, the company has harmonized a range of technologies under the MariaDB AX brand ('A' being for analytics, 'T' for transactions). The AX suite includes MariaDB Server, ColumnStore, MaxScale database proxy, and the necessary connectors, tools and services.

The company says it has made a range of improvements to performance, compatibility and security in MariaDB TX 2.0. There are new versions of MariaDB Server (version 10.2) and MaxScale (version 2.1).

On the performance side, the company has added support for the MyRocks storage engine. (MariaDB Server previously relied on MySQL's InnoDB storage engine or XtraDB, a MariaDB fork of InnoDB.) The MyRocks support is described as alpha at this stage.

MyRocks is a storage engine with sophisticated compression capabilities and support for SSDs. It was developed at Facebook to underpin web-scale deployments, and is based on the RocksDB embedded database for key-value data, which was itself a fork of LevelDB.

MariaDB argues that scalability and performance are central to any web, mobile or Internet of Things (IoT) applications, and we concur. It says that using MyRocks instead of InnoDB will offer double the compression, as well as faster replication and data loading.

While the company says that it is becoming less fixated on compatibility with MySQL, the company did additional work on compatibility with the SQL query language. This includes enhancements to query functionality, including common table expressions and window functions. For example, it notes that window functions are not expected in MySQL until version 8, so it's actually ahead here – hence the need to relax some of the compatibility restrictions that would prevent it from innovating as fast.

Common table expressions make complex queries easier to read, the company says, and easier to maintain by breaking queries down into simpler building blocks. Window functions can be used to eliminate expensive sub-queries and perform analytical queries on specific windows of data, making queries easier to read and improving overall query performance.

The company tells us that quite a few of its customers have been pressing for support for JSON (JavaScript Object Notation). MariaDB TX 2.0 adds a set of 24 JSON functions, enabling increased flexibility and speed for application developers.

On the security front, the company added data masking – the ability to mask sensitive data before returning query results. This protects data that is classified as personally identifiable, personally sensitive or commercially sensitive – common requirements for HIPAA/PCI compliance. There is also better protection from denial of service (DOS) attacks – newly introduced 'result set limiting' means that it's possible to specify a maximum number of rows or amount of data that can be returned in a query, prepared statement or stored procedure.

There are two subscription options: MariaDB TX Subscription, and a MariaDB AX Subscription for those wanting to use ColumnStore and MariaDB Server for data-warehousing use cases. MariaDB TX also offers a cluster option for distributed environments with high availability and active multi-master.

Competition

MariaDB's closest competition remains MySQL, now owned by Oracle. Far from allowing MySQL to wither on the vine, Oracle claims to have doubled engineering, sales and support staff, and to have tripled quality-assurance staff since it bought Sun in 2009.

There are plenty of rival relational databases from the proprietary side of the fence, such as Oracle Database, IBM DB2, Microsoft SQL Server and Actian Ingres. There's also SAP with its HANA in-memory database that is said to handle operational or analytical workloads.

We also expect MariaDB Server to be compared with TokuDB (acquired by Percona), which is also a MariaDB partner. It offers its own Percona Server distribution of MySQL while providing support and consulting for MySQL and MariaDB.

Those looking to boost the performance of MySQL (and Percona) databases might also look to a company like Deep Information Sciences and its adaptive storage engine, which dynamically adjusts algorithms at the storage layer. In the cloud, AWS's RDS gives a clue as to the likely competition MariaDB will face. Other databases supported by RDS include Amazon Aurora (which will only run in AWS clouds), Oracle Database, Microsoft SQL Server, PostgreSQL and MySQL. Oracle, IBM and Microsoft all have cloud database offerings of their own, too.

Other in-memory databases, such as MemSQL and VoltDB, can handle transactions as well as analytics. However, MemSQL is increasingly focusing on the data-warehousing opportunity, and has an in-memory and disk-based architecture in one.

SWOT Analysis

Strengths

It has a well-proven operational database in use at some of the largest transaction-heavy environments. With the release of MariaDB TX 2.0, the branding and subscriptions have been simplified to differentiate from MariaDB AX.

Weaknesses

At this stage, the MyRocks storage engine support is still in alpha, which may give some companies pause before pressing it into production, although it's ready for dev and test.

Opportunities

With the transactional expertise, scalability, security, streaming, high availability and routing capabilities of the MaxScale proxy, as well as numerous enhancements to MariaDB Server, MariaDB has more ways to win open source users as paying customers.

Threats

There are far larger operational database companies in the market, with many more years of investment in their technologies, and they are not resting on their laurels or likely to give up lucrative market share.

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