MySQL 8 vs MariaDB 10.11
Comparison between two wonderful databases

Peter Zaitsev, Founder, Percona
Oct 5th, 2023
Interesting times in MariaDB Ecosystem
MariaDB Uncertainty

- Stock Price Warning
  - https://www.theregister.com/2023/07/05/mariadb_stock_exchange_compliance/

- Company Valuation Warning

- Runa Capital Buyout Proposal

- Azure Plans to Retire MariaDB
MariaDB Happenings

• AWS Joins as Diamond Sponsor Providing $500K
  • https://mariadb.org/aws-diamond-sponsor/

• Great Energy at Board Level
  • https://mariadb.org/bodminutes/2023-09-06/
“Amazon’s first suggestion is for increased MySQL compatibility for MariaDB, promoting user choice”.

“Amazon’s second suggestion is for MariaDB Server to provide infrastructure for AI through a vector storage engine, something Postgres is already looking at in their pgvector initiative.”

“MariaDB plc appointed a new CEO and new senior management, who have a very different and fundamentally positive attitude to Open Source and MariaDB Foundation.”
MariaDB is not MySQL

Started from the same roots MariaDB and MySQL diverged enough so they should be seen as two different, great databases
I pledge to be an equal opportunity offender. Both MySQL and MariaDB folks will find plenty to disagree with.
Development Model

MySQL

• Developed by Oracle Corporation
• Contributions are accepted
• Drop-ship Open Source (for Community Version)

MariaDB

• Community Server Released by MariaDB Foundation
• Enterprise Server Released by MariaDB PLC
• Development and Roadmap mostly driven by MariaDB PLC
• Contributions are encouraged
• Development is done more in Public
Future of Open Source MySQL Innovation?

“...the world’s two most popular databases are the Oracle Autonomous Database and Oracle MySQL,” said Oracle Chairman and CTO, Larry Ellison. “The Oracle Database once again delivered solid revenue growth in FY21. And while our Oracle Database business as measured by revenue currently dwarfs our MySQL database business—that is about to change because the latest version of Oracle MySQL has been upgraded to include a revolutionary new ultra-high-performance parallel processing query engine called HeatWave.”

Independent analysts have tested and confirmed that Oracle MySQL with HeatWave runs 10 to 100 times faster than Amazon’s version of MySQL called Aurora. This technological breakthrough is causing several of Amazon’s customers to start moving their Aurora workloads to Oracle MySQL. And industry analysts are telling us they are seeing a 10x increase in Oracle Cloud Infrastructure customer inquiries.

Both the Oracle Autonomous Database and Oracle MySQL with HeatWave technology have captured the technology high ground in the cloud database business—and that bodes well for the future of the Oracle Cloud.”

Larry Ellison, Chairman, CTO, Oracle
June 15, 2021
Oracle adds machine learning features to MySQL HeatWave

In addition to updating MySQL HeatWave's AutoML and Autopilot, Oracle will now offer a small shape for the service, targeting customers with smaller volumes of data.

By Anirban Ghoshal

Senior Writer, InfoWorld | MAR 23, 2023 10:59 AM PDT

AI Is Cloud Only Too...

About MariaDB Foundation

The cornerstones of the MariaDB Foundation mission are Openness, Adoption, and Continuity.

- We ensure the MariaDB Server codebase remains open for usage and contributions on technical merits.
- We strive to increase adoption by users and across use cases, platforms and means of deployment.
- We provide continuity to the MariaDB Server ecosystem, independent of any commercial entities.

The MariaDB Foundation is the global contact point for collaboration on MariaDB Server.

The Foundation is non-profit incorporated in Delaware, USA. and is funded by corporate and individual sponsors.

https://mariadb.org/about/#about-mariadb-foundation
MariaDB PLC vs MariaDB Foundation – Specifics

Why Would you Care?

• MariaDB Foundation is about serving MariaDB Community
• Develops Open Source Software around MariaDB
• MariaDB PLC is a Public Company providing Proprietary solutions around MariaDB (Software, SaaS)

Relationship details are Super Complicated
MariaDB Foundation responsible for “MariaDB Server”

Many other components such as Connectors, MaxScale, Xpand, ColumnStore are owned by MariaDB PLC (variety of licenses)

Majority of Roadmap Development is done by MariaDB PLC

MariaDB Knowledgebase while built by community is hosted by MariaDB PLC
MariaDB PLC
Governance

Alex Suh
Chairman of the Board

Alex Suh is a founding Managing Director with California Technology Ventures, LLC, a Southern California venture capital firm that focuses its investments in the fields of Life Sciences and Information Technology. Alex is the managing director that invests in Life Sciences as well as Information Technology.

Downloading from MariaDB.org
Takes to MariaDB Corporation Lead Capture
Is this about to change?

“The CEO likened this to the end of the Cold War. He noted that we now have the opportunity to end somewhat strange practices (such as users downloading MariaDB Server on mariadb.org suddenly ending up on mariadb.com), and expected that most matters can be resolved by the CEO within his normal mandate.”
Is this “Fair”? 

- MariaDB PLC Carries largest weight developing and Promoting MariaDB and supporting MariaDB Foundation
- MariaDB Foundation efforts benefit MariaDB Corporation more than other parties
What is Open Source?

MySQL
- Very Clear and Simple “Open Core” Model
- There is Community Version of “Whole Platform”
- MySQL InnoDB Cluster is Open Source
- Enterprise - Commercially Licensed Plugins and Tools
- No Components were re-licensed in Proprietary License
- Increasing Focus on Cloud Only Heatwave

MariaDB
- MariaDB Server is Open Source
- MariaDB Connectors are Open Source
- Other Parts of Solution, such as MaxScale are not
- MaxScale was Open Source but later re-licensed Proprietary (BSL)
- MariaDB Enterprise Server is “Open Source for Customers”
- Xpand Storage Engine (Clustrix Reborn) is Proprietary
Relationship between Open Source and Subscription Version

MySQL

- MySQL Enterprise is a Superset of MySQL Community
- Anything which runs on community can be run on Enterprise
- Aligned Release Schedule

MariaDB

- MariaDB Enterprise Server is extended subset of Community
- Some features available in Community Server are not available in Enterprise
- MariaDB Platform Enterprise has separate lifecycle
Cloud Native

- **New MySQL Operator (GA)** available from Oracle
- “Third Party” Kubernetes Operators for MySQL available from Number of Parties, Including Percona
- Using MariaDB SkySQL is MariaDB PLC approach to running MariaDB in the cloud
- Number of Third Party MariaDB Helm/Operator Projects exists
- Open Source **MariaDB Operator** is in development
MySQL and MariaDB Community Versions are available on a variety of clouds.

MySQL serves as a base for Amazon Aurora – the most popular “Cloud Forked” version.

MariaDB Corporation and Oracle offer DBaaS for their Enterprise Versions.

Alibaba Cloud offers enterprise version of MariaDB through Partnership.

Oracle Push on MySQL Heatwave – Cloud only solution now available in OCI and other major clouds.
ColumnStore Storage Engine available in MariaDB 10.5+ (Open Source)

MariaDB Enterprise ColumnStore is available as part of MariaDB Enterprise Subscription

MySQL Analytics Service in Oracle Cloud “Heatwave” (Cloud Only)
What is the Focus?

**MariaDB**
- Initially competed with MySQL on features
- Improving SQL Support (ie CTE, Windowing Functions)
- Now A lot of Focus on migration from Oracle, MS SQL
- Usability for Sysadmin/DBA (ie startup scripts) and Developers
- Cloud Integration (ie S3 Engine)

**MySQL**
- Focused on “Traditional” MySQL Use Case
- Improving SQL Support (ie CTE, Windowing Functions)
- Docstore and JSON
- Usability for Developers (ie MySQL Shell)
- Focus on Oracle Cloud rather than General Cloud
- Not focused on Advanced Oracle Features
- Is it because customers are not asking or because of Product Strategy?
Architecture and Approach

MySQL

• Started Painful refactoring of old codebase
  • InnoDB Data Dictionary, Vulcan Optimizer
• Prioritize Ease of use, limit choices
  • Focus on InnoDB storage engine
• Some needlessly complex decisions
  • Disconnected from Reality
• Make InnoDB better for many use cases
• Making things work for Oracle Cloud

MariaDB

• Pushing old codebase further
• Prioritize choice and flexibility
• Support multiple storage engines
• Its own philosophy of Making InnoDB better
• Development Team closer to practical operations
• MariaDB 11 for more breaking changes (like Optimizer)
<table>
<thead>
<tr>
<th>MySQL</th>
<th>MariaDB</th>
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<tbody>
<tr>
<td>MySQL 5.6 - GA Feb, 2013</td>
<td>MariaDB 10.0 - Stable Mar 2014</td>
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<tr>
<td>MySQL 5.7 - GA Oct, 2015</td>
<td>MariaDB 10.1 - Stable Oct 2015</td>
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<tr>
<td>MySQL 8.0 - GA Apr, 2018</td>
<td>MariaDB 10.2 - Stable May 2017</td>
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<td>MySQL 8.0.32 - Jan 2023</td>
<td>MariaDB 10.3 - Stable May 2018</td>
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<td>MySQL 8.0.33 - Apr 2023</td>
<td>MariaDB 10.4 - Stable June 2019</td>
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<td>MySQL 8.0.34 - Jul 2023</td>
<td>MariaDB 10.5 - Stable June 2020</td>
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<td>MySQL 8.1.0 - Jul 2023 (Innovation Release)</td>
<td>MariaDB 10.6 - Stable July 2021 [LTS]</td>
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<td>MariaDB 10.7 - Stable Feb 2022</td>
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<td>MariaDB 10.10 - Stable Nov 2022</td>
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<td>MariaDB 10.11 - Stable Feb 2023 [LTS]</td>
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<td>MariaDB 11.0 - Stable Jun 2023</td>
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<td>MariaDB 11.1 - Stable Aug 2023</td>
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</tbody>
</table>
• **MariaDB**
  • Now Follows [New Release Model](#) similar to Ubuntu
  • Quarterly Major Releases with 1 year of maintenance
  • LTS (Long Term Support – 5y) Releases every 2 years
  • No Major Changes in Minor Releases
  • Can do minor downgrades, keeping dataset intact

• **MySQL**
  • [Innovation and LTS Release](#) Model
  • MySQL 8 followed “Innovation Release” model so far
  • Plan to ship features and bug fixes in Innovation Releases
  • But Provide Bugfix Only releases for LTS Releases
  • Can’t do minor downgrades in current MySQL 8.0
Let’s Look at Some Specifics!
Client Protocol

MySQL
- Classic MySQL Protocol
- SRV DNS Records Support
- X/Protocol

MariaDB
- Classic MySQL Protocol
- Extensions for Progress Reporting
Interface Support

MySQL
- SQL
- Document Store
- MemcacheD

MariaDB
- SQL
- Handlersocket
JSON Support

MySQL

- Native JSON Datatype
- Efficient Partial Updates
- JSON Shortcuts

MariaDB

- JSON text stored
- Caught Up a lot with MySQL Recently
Replication

MySQL
- MySQL Group Replication
- MySQL GTID
- Clone Plugin for efficient provisioning

MariaDB
- Galera Replication
- MariaDB GTID
• **MySQL**
  - Nothing MariaDB Does not offer comes to mind

• **MariaDB**
  - `sql_mode=Oracle`
  - System Versioned Tables
  - `SEQUENCE`
  - `PACKAGES (Stored Procedures)`
Security

Significant Difference in Security and User Account Management
Dual Passwords  Reload TLS Context  Dynamic Privileges  Password Policies

Recent MySQL 8 Changes
Optimizer is different. Expect different execution plans and performance for complicated queries.
MySQL Compatibility

MariaDB picks the most important innovations from MySQL

- Performance Schema
- Ignored/Invisible Indexes
- Atomic DDL
- SKIP LOCKED (for InnoDB)
- Include Sys_Schema
UUID Data Type

“Lag Free” ALTER TABLE in Replication

GRANT TO PUBLIC (10.11)
Community…
Three of Them

User Community

Contributor Community

Vendor Community

https://peterzaitsev.com/there-are-three-open-source-communities-not-just-one/

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Thank you, Let’s Connect!

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https://twitter.com/PeterZaitsev
http://www.peterzaitsev.com