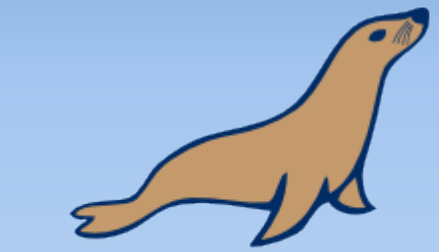
Why MariaDB?



MariaDB

What is MariaDB?

- A drop-in replacement to MySQL with enhanced features
- Uses the same connectors so is 100% compatible with MySQL
- Useful for high performance, data centre styled environments
  - Instantly get more performance out of your queries with MariaDB

Why MariaDB?

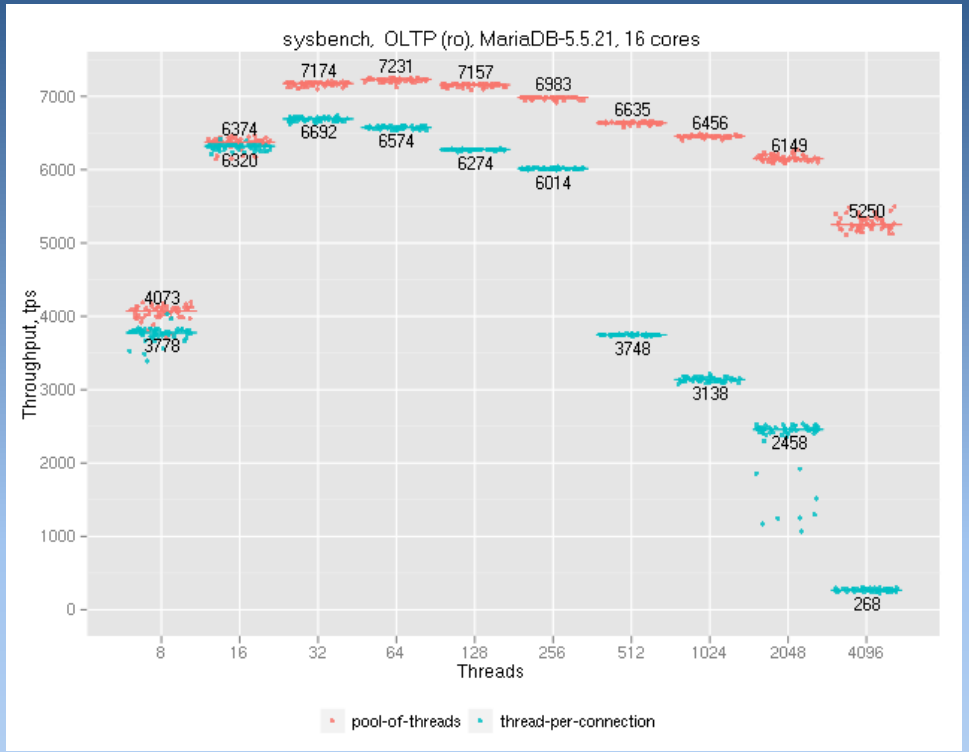
- MariaDB is truly open source
  - MariaDB has no closed source features; MySQL has an Enterprise-only Pluggable Authentication Module (PAM on Linux), Active Directory authentication plugins + thread pool + InnoDB hot backup
- Compatible with MySQL
  - if your application works with MySQL it will work with MariaDB
- Created by the people who created MySQL
- Technology innovation happens at MariaDB!

MariaDB 5.5 includes new features
that are not in MySQL including 5.6

High Performance	Developers	DBAs	NoSQL
Threadpool	Microsecond precision & type	Segmented MyISAM keycache	HandlerSocket
Group commit in the binary log	SphinxSE for full-text search	Authentication plugins - PAM, Active Directory	Dynamic columns
Non-blocking client library	Subqueries materialize	LIMIT ROWS EXAMINED	
	GIS functionality	Progress reporting	

High Performance: Threadpool

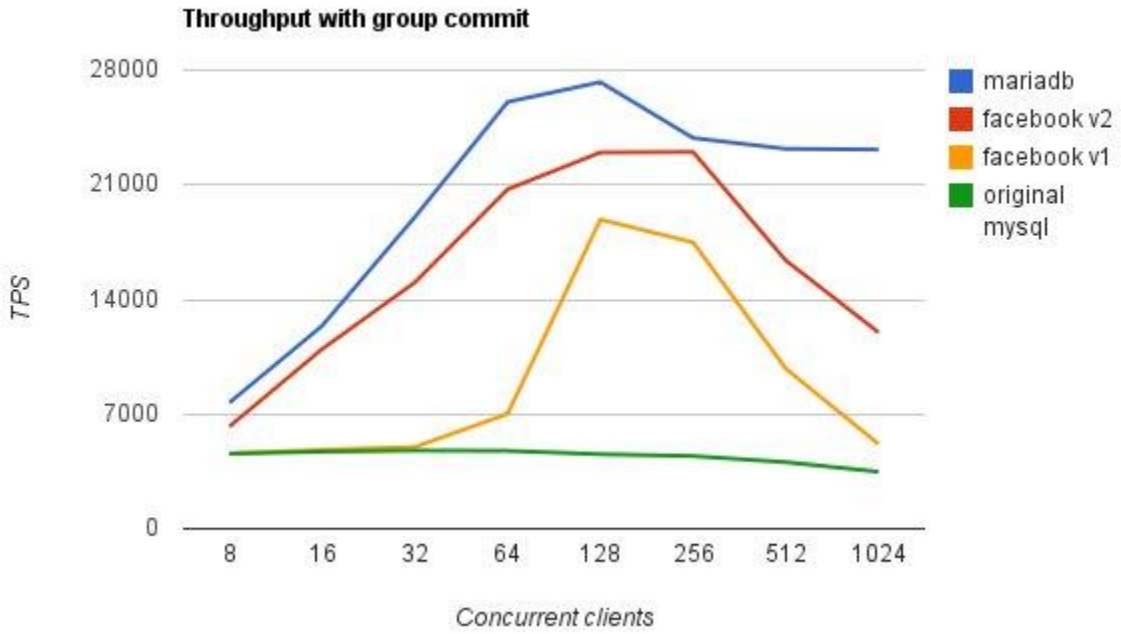
- Improves performance in cases where there are lots of short running queries



More benchmarks:
http://kb.askmonty.org/en/threadpool-benchmarks
More information:
http://kb.askmonty.org/en/thread-pool-in-mariadb-55

High performance: group commit in the binary log

- More performance for replication scenarios.
- The "D" in ACID stands for Durability. To ensure this, one needs to write to disk per transaction (call fsync()). Writing to disk is expensive. If you have more than 3 parallel running queries, you benefit from group commit as it can just call one write to disk.



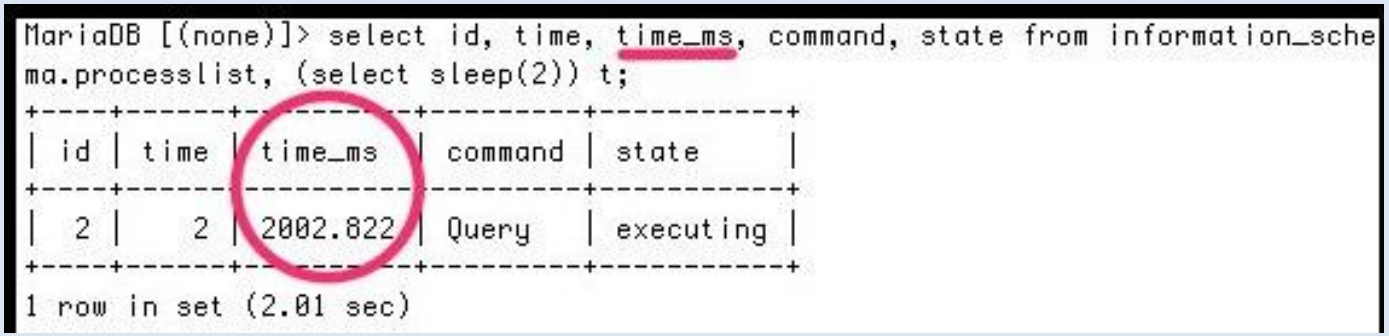
Benchmark by Facebook's Mark Callaghan: https://www.facebook.com/note.php?note_id=10150261692455933
More information: **http://kb.askmonty.org/en/group-commit-for-the-binary-log**

High performance: non-blocking client library

- Queries are run in parallel (to speed up operations) instead of sequentially
  - This could be multiple queries against a single server (to better utilize multiple CPU cores and/or a high-capacity I/O system on the server)
  - This could be queries against multiple servers (e.g. SHOW STATUS against all running servers afor monitoring, or a map/reduce-like operation against a big sharded database).
- more information: http://kb.askmonty.org/en/non-blocking-client-library

Developers: microseconds

- Full support for microseconds as a type (more precision)
- more information: http://kb.askmonty.org/en/microseconds-in-mariadb
- example: SHOW PROCESSLIST



Developers: SphinxSE for full-text search

- Sphinx is a fast full-text search engine integrated inside of MariaDB (faster than standard full-text search in MyISAM)
- Query your Sphinx search servers using plain old SQL (developers don't need to learn another query language)
- The recommended choice of Sphinx - http://sphinxsearch.com/
- more information: http://kb.askmonty.org/en/about-sphinxse

Developers: Subqueries materialize

- You don't have to rewrite your queries as JOINs any longer - most subqueries now return a fast result!
- Great for migrations from Oracle → MariaDB
- http://kb.askmonty.org/en/subquery-optimizations

Query: orders from customers with negative balance:

```
SELECT * FROM orders
WHERE o_custkey IN
      (SELECT c_custkey FROM customer
       WHERE c_acctbal < -500);
```

MariaDB 5.2 (any MySQL): 45 sec (slow)

```
+--+-----------+--------+-----+----------+----+------+-------------------------+
|id|select_type|table   |type |key       |ref |rows  |Extra                    |
+--+-----------+--------+-----+----------+----+------+-------------------------+
| 1|PRIMARY    |orders  |index|i_o_custkey|NULL|1493631|Using where; Using index|
| 2|SUBQUERY   |customer|range|c_acctbal |NULL|  10536|Using where; Using index|
+--+-----------+--------+-----+----------+----+------+-------------------------+
```

MariaDB 5.3: 0.43 sec (faster ~ 100x)

```
+--+-----------+--------+-----+----------+-------------------------------+-----+-------------------------+
|id|select_type|table   |type |key       |ref                            |rows |Extra                    |
+--+-----------+--------+-----+----------+-------------------------------+-----+-------------------------+
| 1|PRIMARY    |customer|range|c_acctbal |NULL                           |10536|Using where; Using index|
| 1|PRIMARY    |orders  |ref  |i_o_custkey|dbt3sf1.customer.c_custkey     |    7|Using index              |
+--+-----------+--------+-----+----------+-------------------------------+-----+-------------------------+
```

Query: find customers with top balance in their nations:

```
SELECT c_name, c_address
FROM customer
WHERE c_acctbal IN (SELECT max(c_acctbal)
                    FROM customer GROUP BY c_nationkey);
```

MariaDB 5.2 (any MySQL): > 1.5 hours (impossible)

```
+--+------------------+--------+-----+-------------+----------+-------+----+------+-------------+
|id|select_type       |table   |type |possible_keys|key       |key_len|ref |rows  |Extra        |
+--+------------------+--------+-----+-------------+----------+-------+----+------+-------------+
| 1|PRIMARY           |customer|ALL  |NULL         |NULL      |NULL   |NULL|149637|Using where  |
| 2|DEPENDENT SUBQUERY|customer|index|NULL         |i_c_nationkey|5      |NULL|  3117|             |
+--+------------------+--------+-----+-------------+----------+-------+----+------+-------------+
```

MariaDB 5.3: 3.2 sec (faster ~ INF)

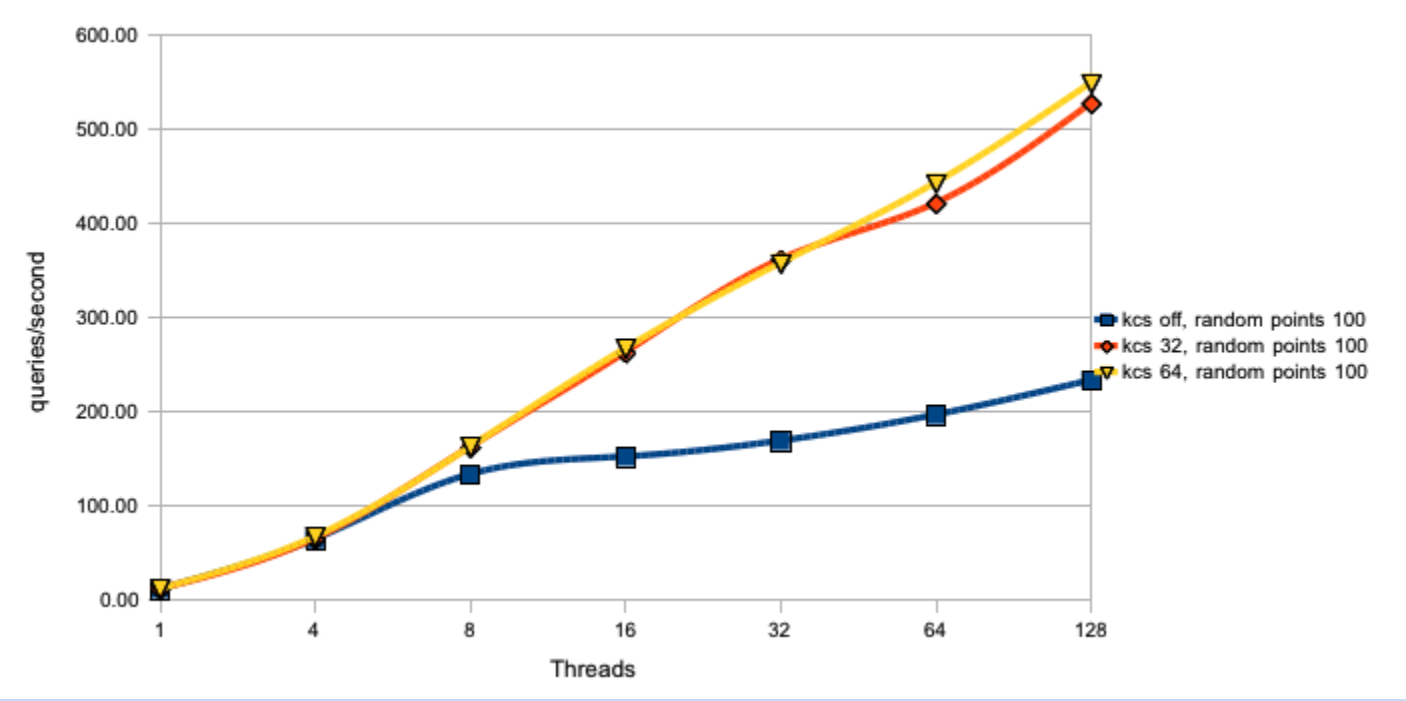
```
+--+-----------+----------+-----+-------------+----------+-------+-----------------------------+------+-------------+
|id|select_type|table     |type |possible_keys|key       |key_len|ref                          |rows  |Extra        |
+--+-----------+----------+-----+-------------+----------+-------+-----------------------------+------+-------------+
| 1|PRIMARY    |<subquery2>|ALL  |distinct_key |NULL      |NULL   |NULL                         |149637|Using where  |
| 1|PRIMARY    |customer  |ref  |c_acctbal    |c_acctbal |9      |<subquery2>.max(c_acctbal)   |     1|             |
| 2|SUBQUERY   |customer  |index|NULL         |i_c_nationkey|5      |NULL                         |149637|             |
+--+-----------+----------+-----+-------------+----------+-------+-----------------------------+------+-------------+
```

Developers: GIS Functionality

- Spatial extensions that allow one to create, store and analyze geographic features
- OpenGIS specifications are met
- You do not need to use PostGIS for your mapping - give MariaDB a try!
- Watch the video if time permits: http://blog.montyprogram.com/screencast-mariadb-gis-demo/
- More information: http://kb.askmonty.org/en/gis-functionality

DBAs: Segmented MyISAM keycache

- Using MyISAM? Instantly get up to 250% extra performance by turning on this feature in my.cnf



DBAs: Authentication Plugins

- Enterprises that want to centralize user access can use authentication plugins to maintain a central directory of users that can utilize the database
  - Its like single sign on (SSO). If the user can login to Windows, and has permissions, the user can login to MariaDB without another username/password combination. Great for centralization!
- In Unix (Linux) environments, PAM is preferred
- In Windows environments, Active Directory is preferred

DBAs: LIMIT ROWS EXAMINED

- Sometimes SELECT statements examine too many rows and consume many resources. Allows you to terminate the execution of SELECT statements which examine too many rows.
- more information: http://kb.askmonty.org/en/limit-rows-examined

DBAs: Progress Reporting

- You can now follow the progress for long running operations/commands
- more information: http://kb.askmonty.org/en/progress-reporting

```
MariaDB [test]> alter table my_mail engine=maria;
Stage: 1 of 2 'copy to tmp table'  5.37% of stage done
```

NoSQL: HandlerSocket

- Significantly increase your queries per second by bypassing the SQL layer of MariaDB and do simple Create/Read/Update/Delete (CRUD) operations directly to the InnoDB storage engine.
- Lowers CPU usage and network traffic
- more information: http://kb.askmonty.org/en/handlersocket

NoSQL: Dynamic columns

- Create some "virtual columns" for each row in your table.
- Store a different set of columns for each row in the table
- more information (see very simple example of an e-commerce store): http://kb.askmonty.org/en/dynamic-columns

Case study: ERP5

- MariaDB is the default database in ERP5
- All implementations of ERP5 in 2011 for mission critical applications are based on MariaDB
- Sankei Chemical in Japan, which uses ERP5 to manage everything in the company from accounting to production management.
- SANEF Tolling UK (https://www.saneftolling.co.uk/), which uses ERP5 to manage payments and accounts of British citizens travelling on Northern France highways.
- Innov24 (http://innov24.com/), the social network of journalists and communication professionals in France.
- VIFIB (https://www.vifib.net/), a company which provides an open source distributed Cloud platform.

Case Study: SpamExperts

Quickly and efficiently migrating hundreds of servers from MySQL to MariaDB

SpamExperts has their own anti-spam filtering cloud which is provided as a software-as-a-service (SaaS) model.

After extensive testing, SpamExperts managed the efficient migration of **approximately 300 servers from MySQL to MariaDB within three hours**. “In the past we have run into various MySQL bugs. Despite the fact that we reported them, the bugs were still not solved after a year,” says Dreas van Donselaar Chief Technology Officer for SpamExperts B.V.

“MariaDB had the same bugs that we ran into with MySQL. However the big difference was that when we reported these bugs, they were quickly resolved within 48 hours!” exclaimed Dreas. **The quick turnaround time bolstered confidence in the quality of the MariaDB product and its support and development teams.**

http://kb.askmonty.org/en/spamexperts-migrating-300-servers-to-mariadb

Case Study: Paybox Services deploys MariaDB

Paybox Services is one of the major players in the market for online payment solutions in France. They have recently chosen the services of SkySQL Ab, and their team deployed MariaDB as the database of choice.

Paybox Services has a secure payment platform that accepts transactions via multiple channels, such as payment terminals, the Internet, mobile transactions, IVR-based transactions and even from call centres. Paybox has over 16,000 merchants, has a 25% market share of all e-commerce transactions in France and handles in excess of 110 million transactions per year.

Applications/frameworks recommending MariaDB

- Plone
- Drupal
- Kajona
- phpMyAdmin
- Zend Framework
- MediaWiki
- and many more