

# MariaDB: The New M in LAMP?

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<http://bytebot.net/blog> / @bytebot on Twitter

SCALE10x, Los Angeles, CA, USA

20 January 2012

# whoami

- Chief Evangelist, MariaDB
- Formerly of MySQL AB/Sun Microsystems
- Past lives included FESCO (Fedora Project), OpenOffice.org

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# Aims

- Give you an update of what we've done with MariaDB
- Discuss the broader MySQL ecosystem

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# What is it?

- A branch of MySQL with more features?
- A branch of MySQL with better features?
- A fork?

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# MariaDB is...

- Community Developed
- Feature Enhanced
- Backward Compatible

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# Who's behind it?

- MySQL (database) owned by MySQL AB (company)
- Monty Program is just a sponsor of MariaDB
- maria-captains: 64% Monty Program, 36% community (+16% MP 3Q/2011)

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# When did this begin?

- Sun buys MySQL AB in January 2008
- Oracle proposes acquisition of Sun Microsystems in April 2009
- Widenius decides that beyond the engine (February 2009), focus on MariaDB, a complete database solution

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# Why MariaDB?

- MySQL - an open source product or project?
- MariaDB is an open source project

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# Aims of MariaDB

- 100% compatible, drop-in replacement to MySQL
- Stable (bug-free) releases
- GPLv2

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# Compatibility with MySQL

- There is no NDB cluster storage engine
- Client libraries, client-server protocol, SQL dialect, replication master-slave all similar
- Data files are supported as long as its similar between versions
- Tools are similar (some additional tools for Aria, PBXT)
- XtraDB enabled by default; InnoDB included, but not enabled by default
- <http://kb.askmonty.org/v/mariadb-versus-mysql-compatibility>

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# What's in MariaDB 5.1

- Released February 2010
- Create external buildsystem using Buildbot + VMs for test +builds
- Release filled with storage engines
  - XtraDB, PBXT, FederatedX, (M)Aria
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- Croatian collations
- Numerous bug fixes
- Test cases and coverage improvements
- Removal of mutexes
- Compiler warnings gone!

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# What's in MariaDB 5.1

- XtraDB  
(ENGINE=InnoDB)
  - enhanced InnoDB designed to better scale on modern hardware; backward compatible, scale better on many cores, use memory more efficiently
- [http://  
www.percona.com/docs/  
wiki/percona-  
xtradb:start](http://www.percona.com/docs/wiki/percona-xtradb:start)

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# What's in MariaDB 5.1

- PrimeBase PBXT
  - Transactional, foreign keys, ACID, MVCC (read w/o locking)
  - Row-level locking during (SELECT FOR) UPDATE
- Rollback transactions, recovery after restart very fast (identifies garbage making *undo* unnecessary)
- Write once w/log-based storage; write data to DB, without first writing in transaction log
- <http://kb.askmonty.org/v/about-pbxt>

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# What's in MariaDB 5.1

- *Extended statistics for slow query log*
  - based on *microslow* from Percona <http://kb.askmonty.org/v/slow-query-log-extended-statistics>
- *PROCESSLIST with microsecond precision*
  - TIME\_MS in INFORMATION\_SCH EMA.PROCESSLIST [http://kb.askmonty.org/v/time\\_ms-column-in-information\\_schemaprocesslist](http://kb.askmonty.org/v/time_ms-column-in-information_schemaprocesslist)

```
MariaDB [(none)]> select id, time, time_ms, command, state from information_schema.processlist, (select sleep(2)) t;
+----+----+-----+-----+
| id | time | time_ms | command | state   |
+----+----+-----+-----+
| 2  | 2   | 2002.822 | Query   | executing |
+----+----+-----+-----+
1 row in set (2.01 sec)
```

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# What's in MariaDB 5.1

- Table elimination
  - Query highly normalised data, it is sometimes possible to resolve a query without accessing some tables the query refers to e.g. <http://kb.askmonty.org/v/what-is-table-elimination>
- Pool of threads (MySQL 6 backport)
  - Use a limited set of threads to handle all queries vs one-thread-per-connection. Win if most queries are short running, and there are few table/row locks.  
<http://kb.askmonty.org/v/pool-of-threads>

# What's in MariaDB 5.2

- Released November 2010
- MariaDB 5.2.10 (MariaDB 5.1.60 - changes up to MySQL 5.1.60)
- Pluggable authentication
  - authentication of users handled by plugins
  - mysql\_native\_password (20 byte) and mysql\_old\_password (8 byte) included by default
  - CREATE USER foo IDENTIFIED VIA mysql\_native\_password USING 'pass'; == CREATE user foo IDENTIFIED BY PASSWORD 'pass';
- Use socket\_peercred - if already logged in via Unix credentials, MariaDB will trust it
- <http://kb.askmonty.org/v/development-pluggable-authentication>
- **Now with a PAM authentication plugin!**
  - <http://kb.askmonty.org/en/pam-authentication-plugin>
- *User Statistics (userstatsv2)*
  - Percona, Google, Weldon Whipple. Understand server activity better, identify database loads <http://kb.askmonty.org/v/user-statistics>
- Client, user, index, table statistics

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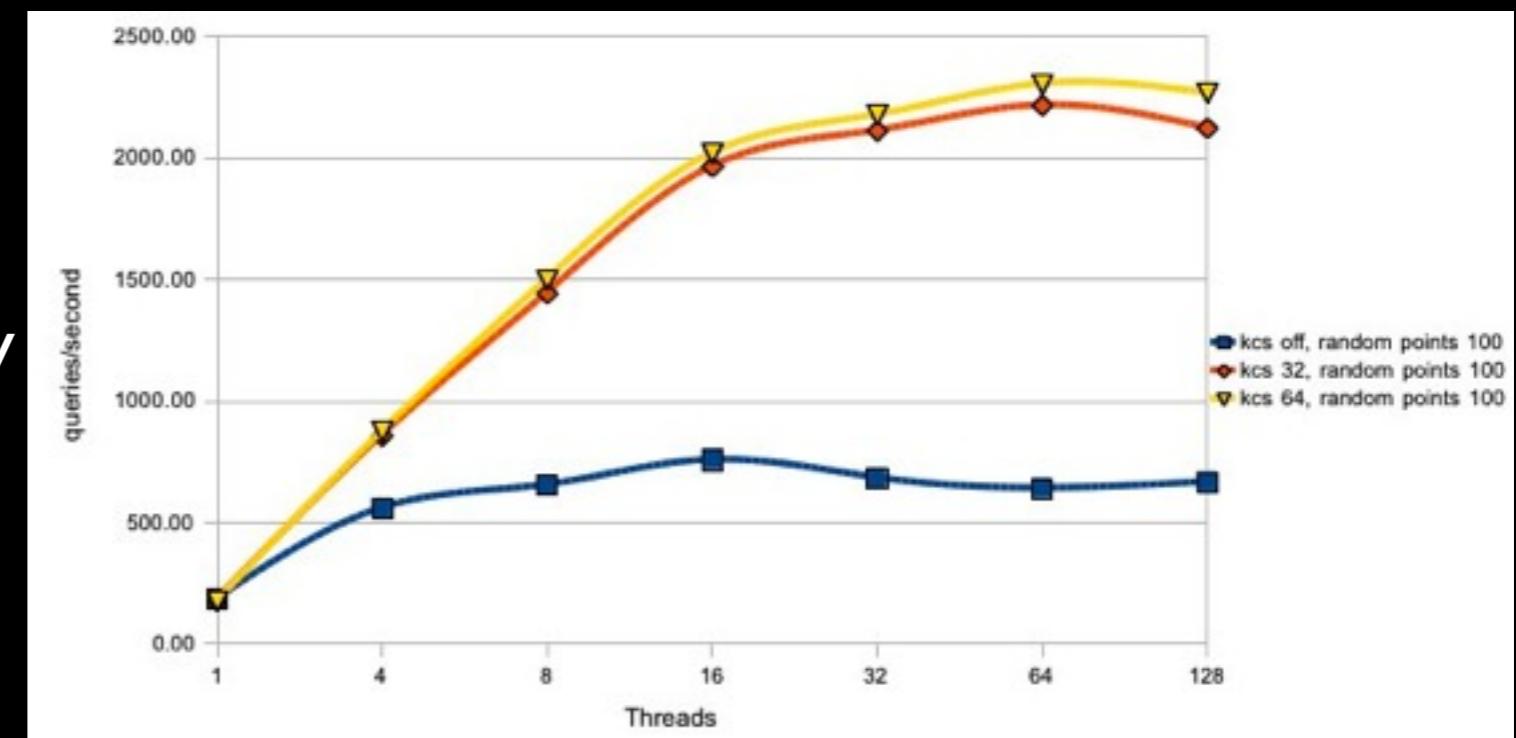
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# What's in MariaDB 5.2

- Segmented MyISAM keycache
  - mitigates thread contention for key cache lock, with notable 250% performance improvements

[http://  
kb.askmonty.org/  
v/segmented-key-  
cache](http://kb.askmonty.org/v/segmented-key-cache)

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# MariaDB 5.2: SphinxSE

- `CREATE TABLE tl (...) ENGINE=SPHINX CONNECTION='sphinx://localhost:9312/test';`
- `SELECT * from tl WHERE query='test it;mode=any';`
- matching modes, limits, filters, ranges supported
- monitor it - `SHOW ENGINE SPHINX STATUS;`
- can JOIN a SphinxSE search table and tables using other engines as well
- <https://kb.askmonty.org/v/about-sphinxse>

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# MariaDB 5.3: NoSQL

- HandlerSocket
  - direct access to InnoDB/XtraDB
  - no SQL, simple CRUD operations on tables
- Dynamic columns
  - different set of “virtual columns” for each row in your table
  - store different attributes for each item (see: e-commerce shops)

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```
MariaDB [test]> create table t1 (id int auto_increment primary key,
-> name varchar(40),
-> type enum ("shirt", "phone", "computer"),
-> price decimal(10,2),
-> dynstr mediumblob);
Query OK, 0 rows affected (0.05 sec)
```

```
MariaDB [test]> insert into t1 (name, type, price, dynstr) values
-> ("Funny shirt", "shirt", 10.0, COLUMN_CREATE(1, "blue", 10, "XL")),
-> ("nokia", "phone", 649, COLUMN_CREATE(1, "black", 2, "touchscreen")),
-> ("htc Desire hd", "phone", 579, COLUMN_CREATE(1, "black", 3, "Android")),
-> ("BM/Lenovo Thinkpad X60s", "computer", 419, COLUMN_CREATE(1, "black", 3, "Linux"));
Query OK, 4 rows affected (0.00 sec)
Records: 4  Duplicates: 0  Warnings: 0
```

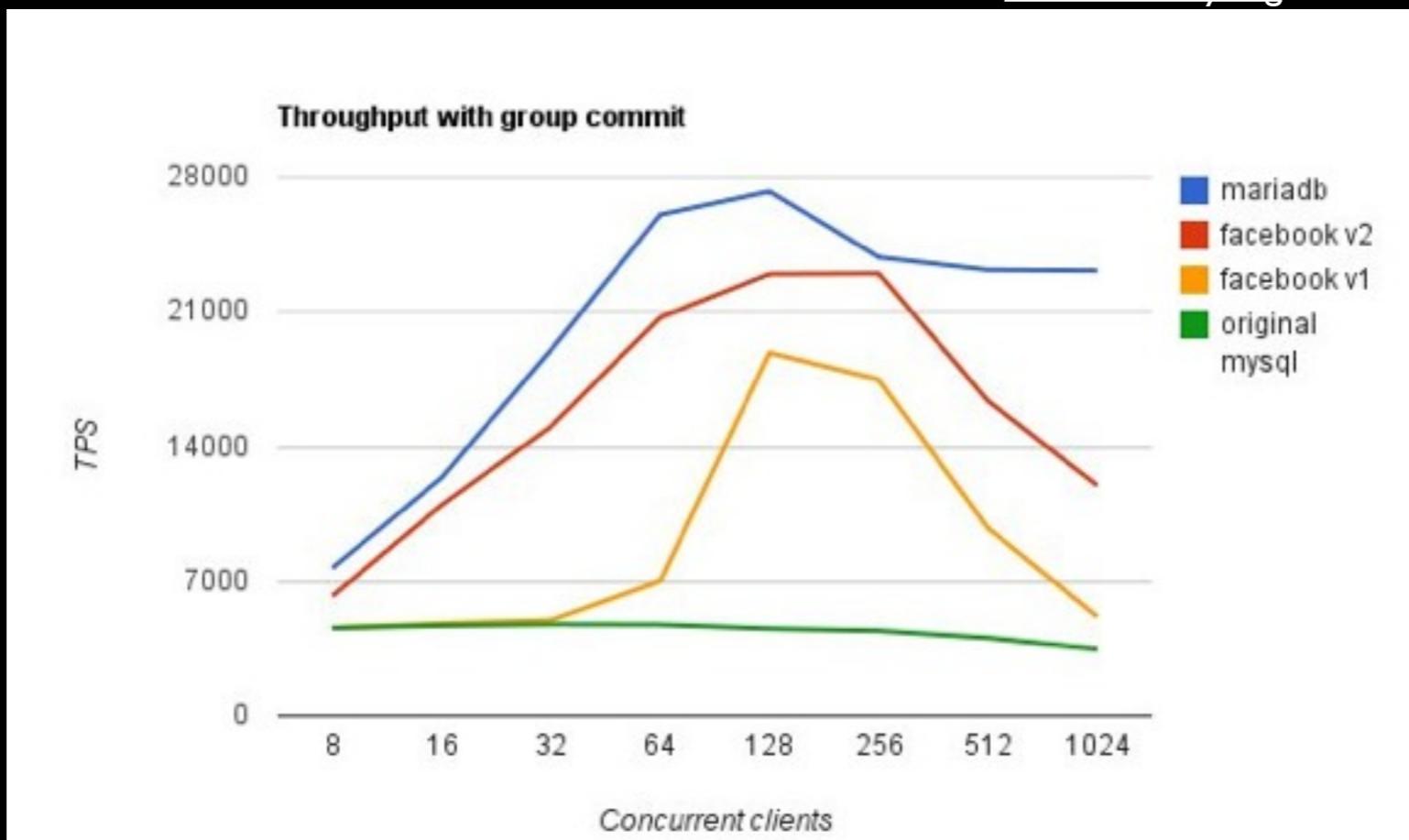
```
MariaDB [test]> select id, name, type, price, length(dynstr) as len, column_list(dynstr) as list from t1;
+----+-----+-----+-----+-----+
| id | name           | type   | price | len   | list    |
+----+-----+-----+-----+-----+
| 1  | Funny shirt    | shirt  | 10.00 | 17   | 1,10   |
| 2  | nokia          | phone  | 649.00 | 27   | 1,2    |
| 3  | htc Desire hd | phone  | 579.00 | 23   | 1,3    |
| 4  | BM/Lenovo Thinkpad X60s | computer | 419.00 | 21   | 1,3    |
+----+-----+-----+-----+-----+
4 rows in set (0.00 sec)
```

```
MariaDB [test]> SELECT name FROM t1 WHERE COLUMN_GET(dynstr, 1 as char(10)) = "black";
+-----+
| name           |
+-----+
| nokia          |
| htc Desire hd |
| BM/Lenovo Thinkpad X60s |
+-----+
3 rows in set (0.00 sec)
```

```
MariaDB [test]> SELECT COLUMN_GET(dynstr, 1 as char(10)) as colour, count(*) FROM t1 group by COLUMN_GET(dynstr, 1 as char(10));
+-----+-----+
| colour | count(*) |
+-----+-----+
| black  |      3 |
| blue   |      1 |
+-----+-----+
2 rows in set (0.00 sec)
```

# MariaDB 5.3: group commit

- Group commit for the binary log
- `sync_binlog=1,`  
`innodb_flush_log_at_trx_commit=1`
- [https://www.facebook.com/note.php?  
note\\_id=10150261692455933](https://www.facebook.com/note.php?note_id=10150261692455933)
- [http://kb.askmonty.org/en/group-commit-  
for-the-binary-log](http://kb.askmonty.org/en/group-commit-for-the-binary-log)



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# MariaDB 5.3: replication

- Checksums for binlog events (5.6 backport)
- START TRANSACTION WITH CONSISTENT SNAPSHOT works w/ binlog
  - obtain binlog pos. w/o blocking other queries
- mysqldump --single-transaction --master-data => non-blocking backup! (new slave provisioning?) Works w/XtraDB+PBXT
- row-based replication for tables w/no primary key

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# MariaDB 5.3

- Progress reporting for ALTER TABLE/LOAD DATA INFILE
- disk access: Index Condition Pushdown (ICP), Multi-Range Read (MRR)

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

- mytop included
- Optimiser changes
  - @@optimizer\_switch flags (default=off)  
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# MariaDB 5.3: Subqueries finally!

- DBT-3, 60M line item rows, 29GB XtraDB database
- optimizer\_switch='semijoin=on' / materialization=on

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 | dbt3af1.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 | i_c_acctbal | i_c_acctbal | 19 | <subquery2>.max(c_acctbal) | 1 |           |
| 2 | SUBQUERY | customer | index | <NULL> | i_c_nationkey | 5 | <NULL> | 149637 |           |
+-----+-----+-----+-----+
```

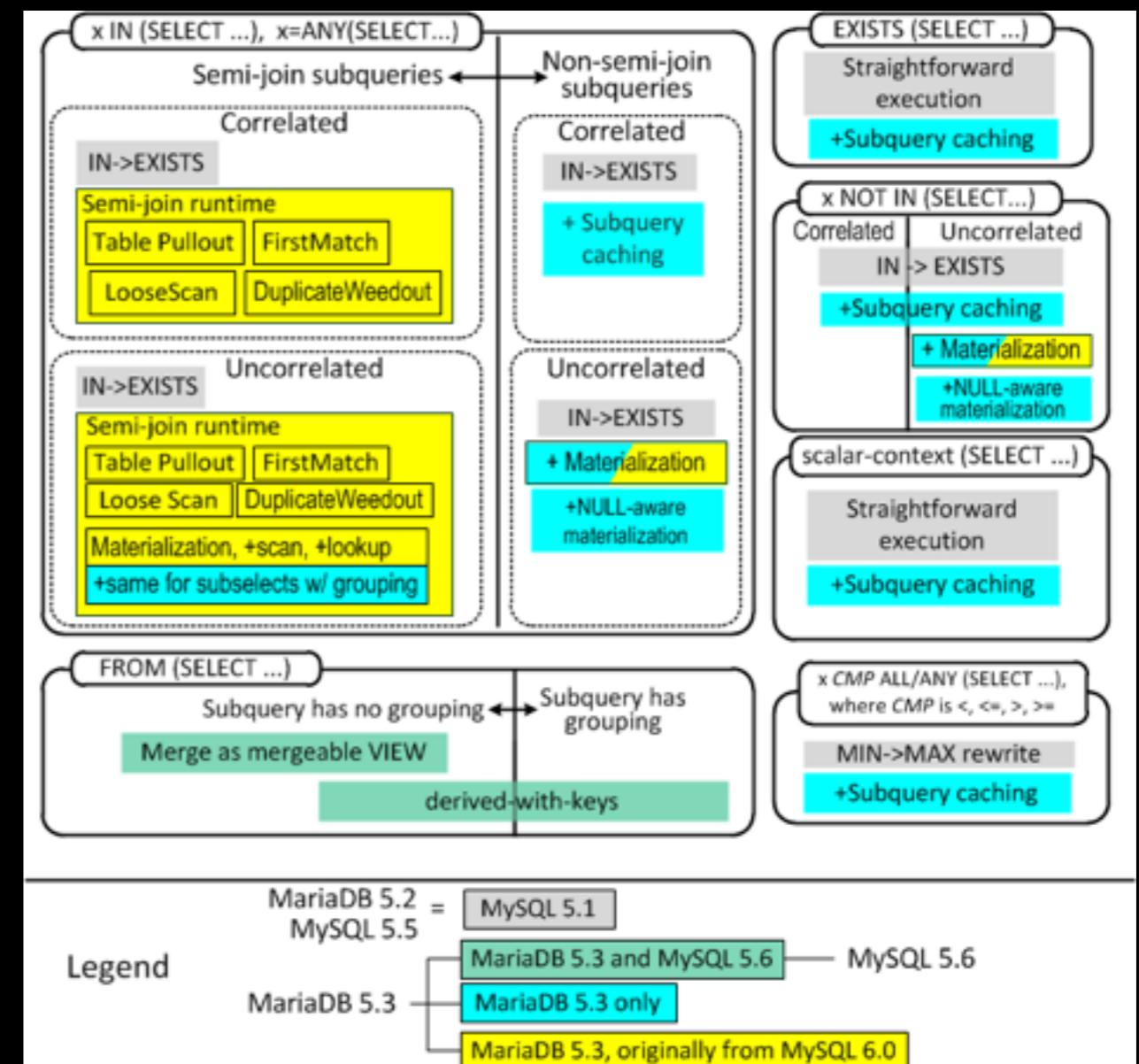
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# MariaDB 5.3:

# Subqueries

- Instant EXPLAIN
- <http://kb.askmonty.org/en/the-query-optimizer>

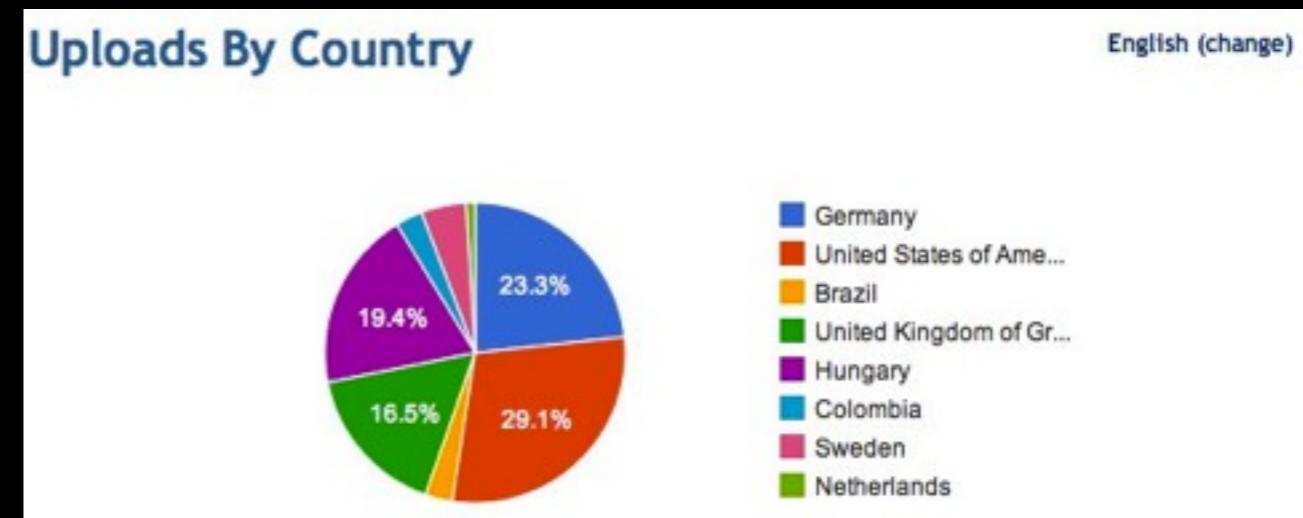


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# MariaDB 5.3: User Feedback Plugin

- New “phone home” plugin (works with Percona server, MySQL)
- disabled by default -- please consider enabling it (feedback=on)
- [http://mariadb.org/feedback\\_plugin/](http://mariadb.org/feedback_plugin/)



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# MariaDB 5.3 & 5.5

- MariaDB 5.3 - RC now
  - MariaDB 5.3.3 - 21/12/2011
- MariaDB 5.5 - Beta any day now
  - <https://launchpad.net/maria/5.5>

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# How open is MariaDB?

- Mailing lists: Launchpad
  - [maria-developers@lists.launchpad.net](mailto:maria-developers@lists.launchpad.net)
  - [maria-discuss@lists.launchpad.net](mailto:maria-discuss@lists.launchpad.net)
- Code hosting:  
Launchpad  
[fb.com/MariaDB.dbms](https://fb.com/MariaDB.dbms) |  
[@mariadb](https://@mariadb)
- <http://launchpad.net/maria>
- Bugs database:  
<https://bugs.launchpad.net/maria/>
- #maria on FreeNode IRC

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# Worklog

- Funding (bounties)
- Votes
- [http://askmonty.org/  
worklog/](http://askmonty.org/worklog/)



The screenshot shows a detailed view of a worklog entry for 'Support native IPv6'. The top navigation bar includes links for 'Active List', 'Inactive List', 'Everybody', 'Log In / Register', 'Search Worklog', 'Server-RevisionList', 'Report Generation', and 'Saved Reports'. The main content area is titled 'Support native IPv6' and contains the following information:

- Title:** Support native IPv6
- Task ID:** 147
- Queue:** Server-Development
- Version:** N/A
- Status:** Un-Assigned
- Priority:** N/A
- Copies to:** Sergei
- Created by:** Dross
- Supervisor:** N/A
- Last Archived:** NOBODY
- Architecture Review:** NOBODY
- Implementation:** NOBODY
- Code Review:** NOBODY
- QA:** NOBODY
- Documentation:** NOBODY

**High-Level Description:** IPv6 is quickly gaining popularity. Unfortunately MySQL 5.0/5.1 do not support IPv6. It appears that for MySQL 6 they work on IPv6 support. (<https://bugs.mysql.com/bug.php?id=1785>), however since that release will still be far away it may be good to backport the IPv6 changes to MariaDB 5.1 already. It would definitely add another clear advantage of MariaDB over MySQL. (5.1+).

**See also:** MySQL 5.1

**Task Dependencies:** Others waiting for Task 147. Task 147 is waiting for.

**Graph:** A link to a graph visualization of dependencies.

**High-Level Specification:**

**Low-Level Design:**

**File Attachments:**

Name	Type	Size	By	Date

**User Comments:**

**Time Estimates:**

Name	Hours Worked	Last Updated	Total	Hrs Worked	Progress	Current	Estimated
Total	0			0		0	0

**Funding and Votes:** Votes: 2 (100%)

Change vote:  Useless  Nice to have  Important  Very important [Change Vote](#)

**Funding:** 0 offers, total 0 Euro

**Progress Reports:**

(Sergei - Mon, 13 Sep 2010, 11:55)  
Observer changed: Sergei

(Sergei - Mon, 13 Sep 2010, 11:55)  
High-level description modified.  
--- /tmp/reproklog.147-108-31490 2010-09-13 11:55:16.000000000 +0000  
+++ /tmp/reproklog.147-108-31490 2010-09-13 11:55:16.000000000 +0000  
@@ -1,2 +1,3 @@  
already. It would definitely add another clear advantage of MariaDB over MySQL.  
(5.1+).

[See also:](#) MySQL 5.1

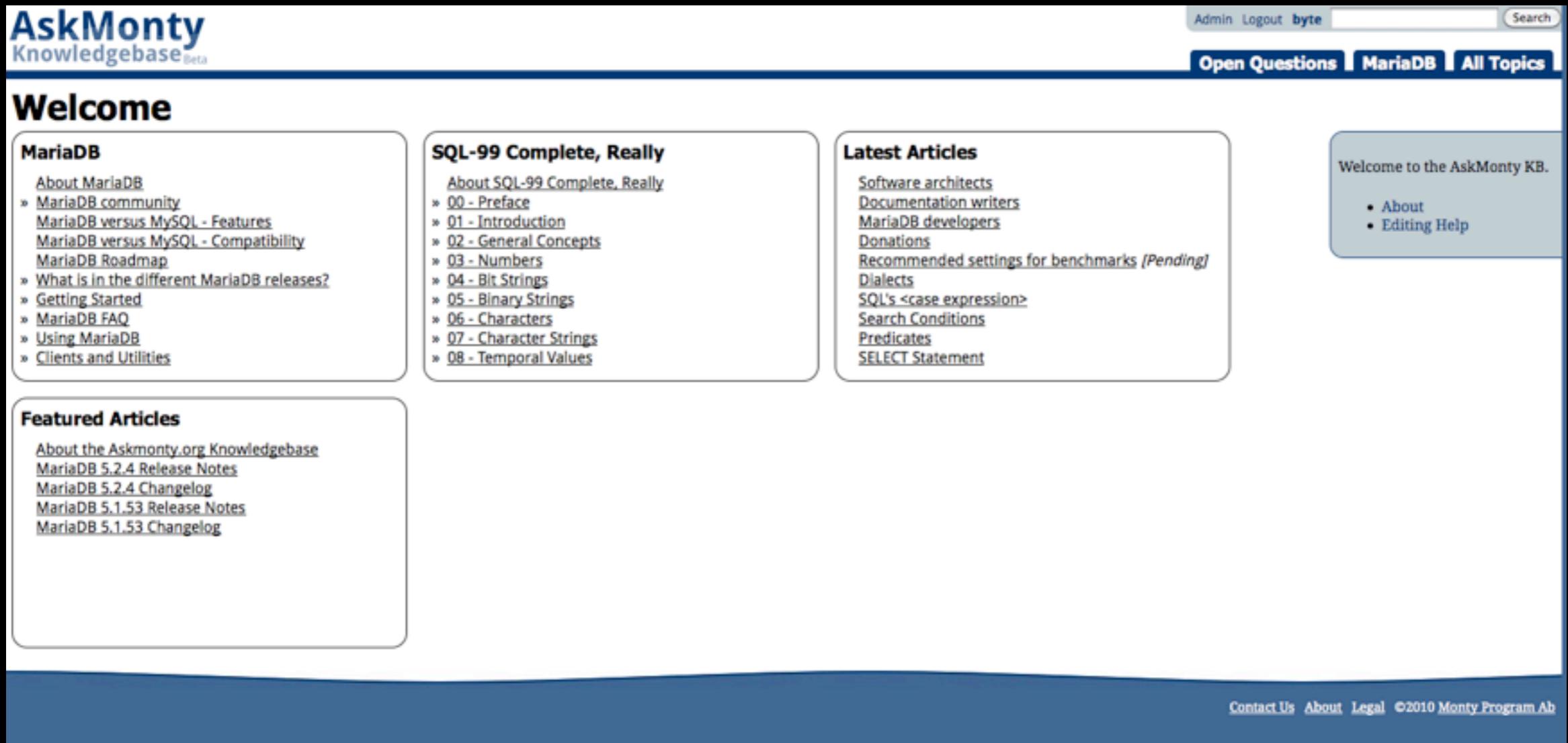
**Worklog v1.0:**  
© 2010 Sergei Grudinin and Monty Program AB  
© 2009 Andrew Shepler <[as@askmonty.org](mailto:as@askmonty.org)> and Monty Program AB  
© 2003 Matt Wainwright <[matt@mariadb.com](mailto:matt@mariadb.com)> and MySQL AB

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# Knowledgebase

- <http://kb.askmonty.org/>



The screenshot shows the homepage of the AskMonty Knowledgebase. At the top, there's a navigation bar with links for "Admin", "Logout", "byte", "Search", "Open Questions", "MariaDB", and "All Topics". The main content area has several sections: "Welcome" (with a "MariaDB" sidebar containing links like "About MariaDB", "MariaDB community", and "MariaDB versus MySQL - Features"), "SQL-99 Complete, Really" (with a sidebar containing "About SQL-99 Complete, Really" and numbered chapters from 00 to 08), "Latest Articles" (with a sidebar containing links like "Software architects", "Documentation writers", and "MariaDB developers"), and a "Featured Articles" sidebar (with links like "About the Askmonty.org Knowledgebase", "MariaDB 5.2.4 Release Notes", and "MariaDB 5.2.4 Changelog"). At the bottom, there's a footer with links for "Contact Us", "About", "Legal", and "©2010 Monty Program Ab".

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# Deployments, deployments

happy users: pap.fr, wabtec, Paybox Services, OLX, Jelastic, etc.

*“MariaDB had these 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!”* -- Dreas van Donselaar, Chief Technology Officer, SpamExperts B.V. after migrating over 300 servers from MySQL 5.0 to MariaDB 5.1.

*“We made the switch on Saturday – and we’re seeing benefits already – our daily optimization time is down from 24 minutes to just 4 minutes”* -- Ali Watters, CEO, travelblog.org

*“Migrating from MySQL 5.1 to MariaDB 5.2 was as simple as removing MySQL RPMs and installing the MariaDB packages, then running mysql\_upgrade.”* - Panayot Belchev, proprietor, Host Bulgaria on providing MariaDB to over 7,000 of their web hosting customers.

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# Getting MariaDB

- <http://mariadb.org/> is the site + downloads
- Get it via OpenSUSE build service
- Its in Gentoo, FreeBSD, Homebrew
- <http://kb.askmonty.org/v/distributions-which-include-mariadb>

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# The future?

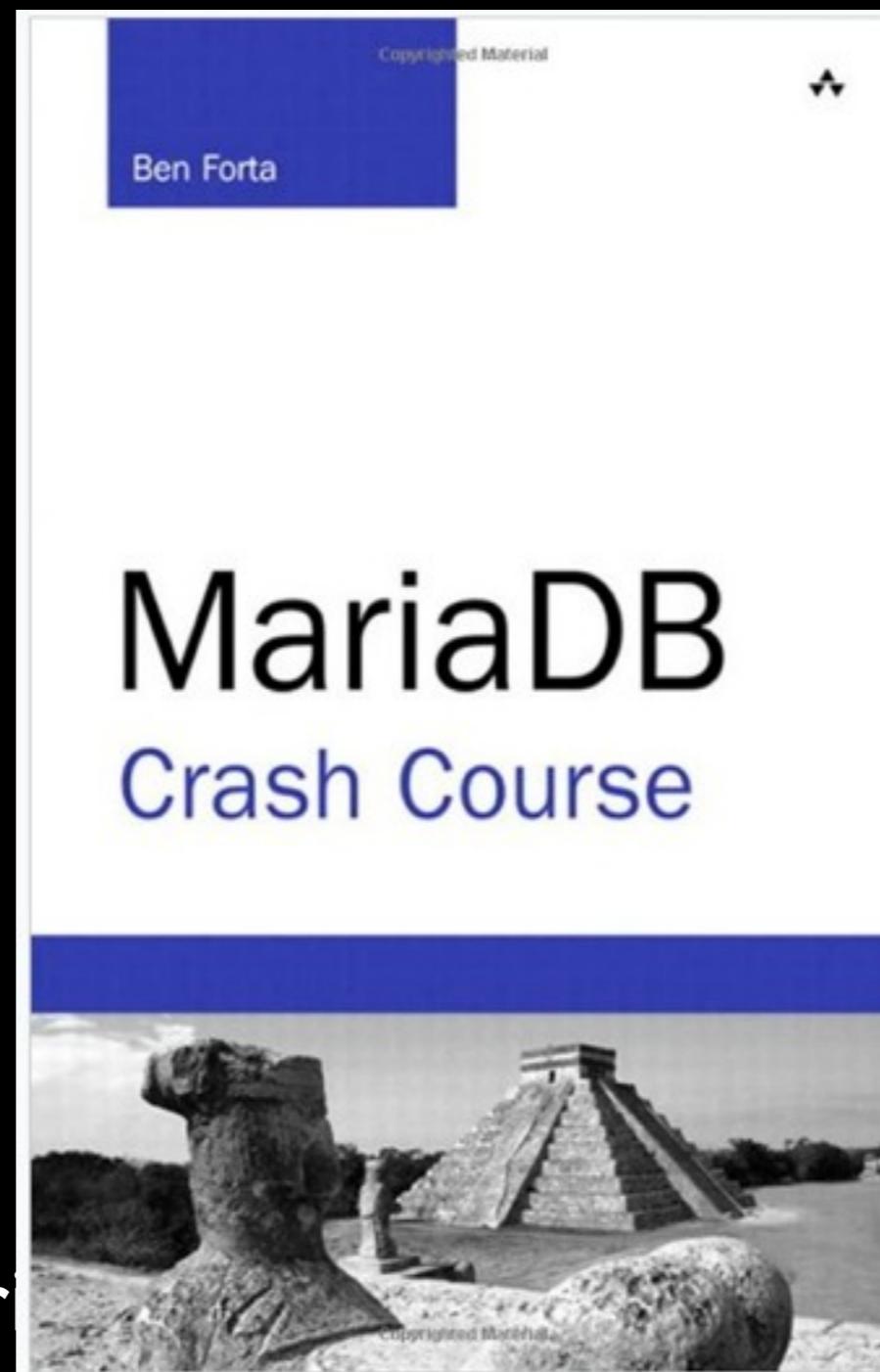
- GIS features making it into MariaDB 5.3
- Merging takes time
- Features (different implementations) make it into upstream
- Getting into distributions (Fedora/EPEL policies), Ubuntu/Debian, etc ?

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# We have a book



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Incentive Program

# Support

- Monty Program does NRE/engineering work for MySQL/MariaDB (not L1/L2 support)
  - Support via capable **service providers**
    - <http://mariadb.org/service-providers/>
    - SkySQL (here), FromDual, Open Query, SoftMethod GmbH, Percona
- fb.com/MariaDB.dbms | @mariadb
- Monty Program



# We're on social media

- facebook: [fb.com/MariaDB.dbms](https://www.facebook.com/MariaDB.dbms)
- twitter: [@mariadb](https://twitter.com/mariadb)
- google plus: search for mariadb

[fb.com/MariaDB.dbms](https://www.facebook.com/MariaDB.dbms) |  
[@mariadb](https://twitter.com/mariadb)

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# Q&A?

email: [colin@montyprogram.com](mailto:colin@montyprogram.com)

<http://montyprogram.com/> | <http://mariadb.org/>

twitter: @bytebot / url: <http://bytebot.net/blog/>