

MariaDB 10.0 & What's New with The Project

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PERCONA
LIVE

Who are we

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- Michael “Monty” Widenius
 - Creator of MySQL
 - Project leader at MariaDB, founder of Monty Program Ab
 - CTO, MariaDB Foundation
 - monty@mariadb.org | twitter: @montywi
- Colin Charles
 - Chief Evangelist, MariaDB @ Monty Program Ab (soon SkySQL)
 - Formerly of MySQL
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Agenda

- MariaDB 10.0 series introduction
- Where we stand towards MySQL 5.6
- Features, including MariaDB Galera Cluster



What's MariaDB?

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- 38 months: major releases (5.1, 5.2, 5.3, 5.5, Galera Cluster) and 10.0 series
- Still community developed, feature enhanced & backward compatible
- maria-captains: 50% MP, 50% community including Sphinxsearch, SkySQL, Taobao, Percona, Codership, Facebook, & more...
- GPLv2 server

Goal hasn't changed

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- uninstall mysql-server
- install mariadb-server
- it should “just work!” (& be compatible)
- (or more recently, you just apt-get/yum install mariadb, and it removes mysql)
- MySQL compatible:
 - data on disk & on the wire is same
 - same file names, sockets, port

Why MariaDB 10.0?

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- The 5.5 merge took about a year (!)
- In MariaDB 5.5, we have over 1.5 million lines of extra code ~61MB diff
- MySQL 5.6 refactored with huge losses in commit history
- We're not a patch set against MySQL
 - MariaDB clearly does not depend on MySQL for future development

MariaDB 10.0: In a nutshell...

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- Built on MariaDB 5.5
- Backported features from MySQL 5.6
- Multiple new features

First, let's start with some history

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- MariaDB 5.1 (MySQL-5.1 base)
 - Table elimination, new storage engines, cleanup, better tests, pool of threads
- MariaDB 5.2 (MariaDB-5.1 base)
 - Virtual columns, extended user statistics, segmented MyISAM keycache
- MariaDB 5.3 (MariaDB-5.2 base)
 - Biggest changes to optimizer (faster subqueries, joins, etc.)
 - Microsecond precision, faster HANDLER (HANDLER RED 50% faster w/530,000 qps), dynamic columns
 - Better replication (group commit, etc.)
 - HandlerSocket

MariaDB 5.5 (MariaDB 5.3 + MySQL 5.5)

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- Opensource, more efficient threadpool
- Non-blocking client library
- New LIMIT ROWS EXAMINED option
- Extended keys for XtraDB/InnoDB
- New SphinxSE
- Lots of security fixes, new status variables, etc.

MariaDB 10.0

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Date	Version	Status
12 Nov 2012	10.0.0	Alpha
6 Feb 2013	10.0.1	Alpha
24 Apr 2013	10.0.2	Alpha
	10.0.3	Beta

Backported features

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- InnoDB including TRANSACTION READ ONLY
- PERFORMANCE_SCHEMA
- Online ALTER TABLE (in-progress)
- Optimizer
 - ORDER BY...LIMIT optimization (shows only few rows of a result set)
- Re-implemented:
 - Error messages (w/system error string)
 - CURRENT_TIMESTAMP as DEFAULT for DATETIME columns
 - Global Transaction ID (10.0.2 – MDEV-26)
 - Parallel replication
- New (optimizer)
 - EXISTS-TO-IN optimization

Only in MariaDB 10.0: Multi-source replication

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- Work from Taobao
- Many users partition data across many masters... now you can replicate many masters to a single slave
- Great for analytical queries, complete backups, etc.

Only in MariaDB 10.0:

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- SHOW EXPLAIN for <thread_id> gets the query plan for a running statement
- Faster ALTER TABLE with unique keys for Aria & MyISAM
- Per-thread memory usage (Taobao)
 - INFORMATION_SCHEMA.PROCESSLIST has MEMORY_USAGE & EXAMINED_ROWS now
 - SHOW STATUS has memory usage too

Only in MariaDB 10.0: CassandraSE, LevelDB support

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- MariaDB as a “data platform”
- Integration with NoSQL/Big Data DB, Apache Cassandra cluster, seen as a storage engine to MariaDB
- Combine (join) data between Cassandra & MariaDB & Oracle (via CONNECT)
- Write to Cassandra from SQL (SELECT, INSERT, UPDATE, DELETE)
- LevelDB (in-progress)

Only in MariaDB 10.0: Engine independent persistent statistics

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- InnoDB has persistent statistics in MySQL 5.6; we have an engine-independent version
- These statistics aren't limited by the SE API, and are used by query optimizer to choose best execution plan for each statement
- Statistics collected for non-indexed columns too (unlike InnoDB's)

Dynamic columns

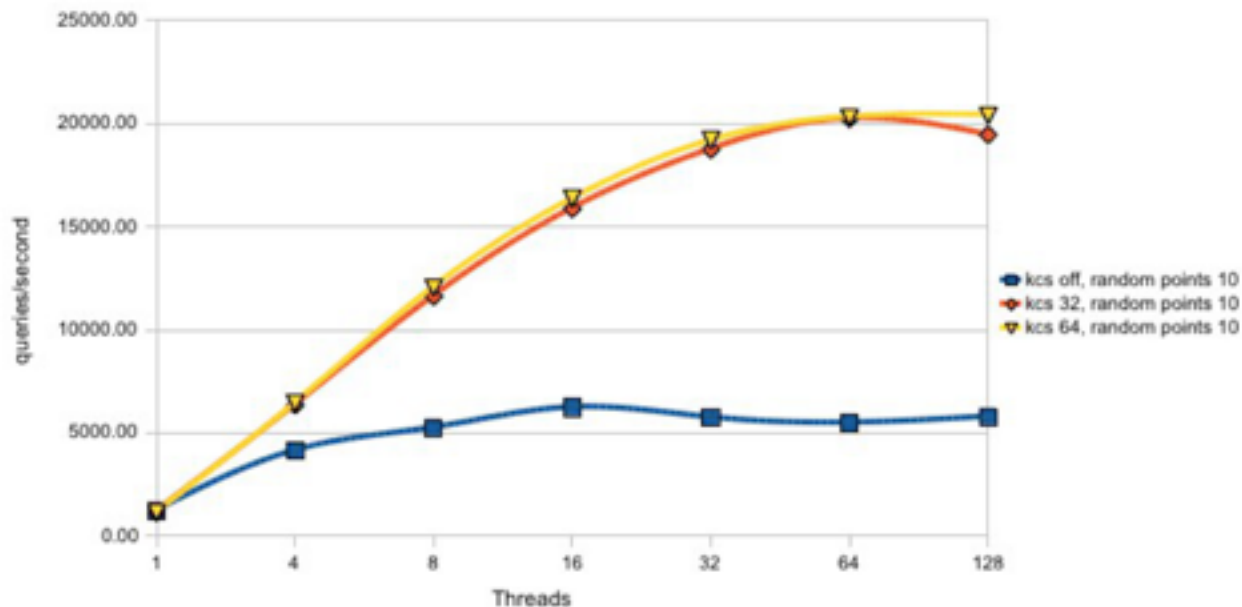
16

- Store a different set of columns for every row in the table (kinda NoSQL-like)
- Database interoperability is now a major feature; CassandraSE makes use of this
- Can now request a row in JSON format
- And yes, you can name columns finally ;)

Segmented MyISAM keycache

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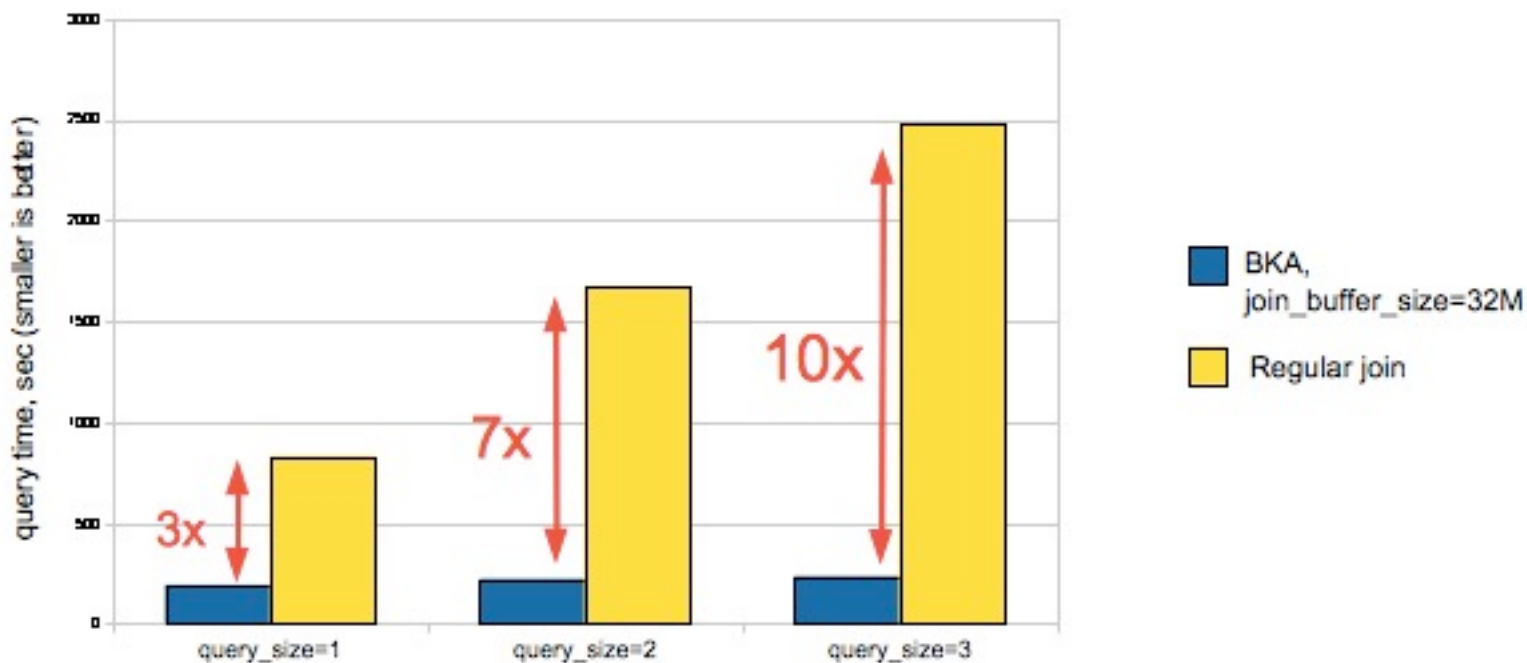
- Solves major read bottlenecks for MyISAM
- MyISAM usage with many readers



BKA speedups

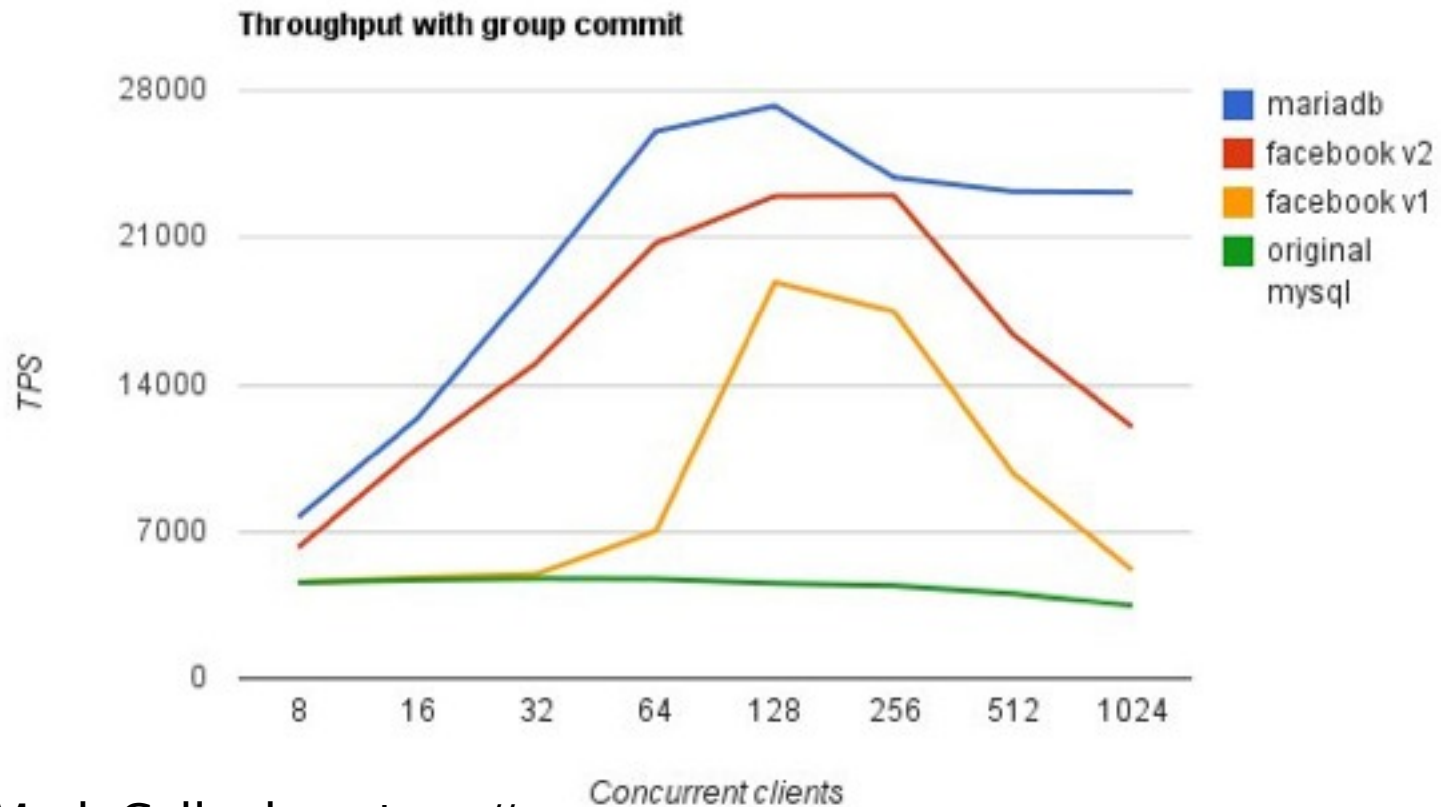
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```
select max(l_extendedprice) from orders, lineitem where  
o_orderdate between $DATE1 and $DATE2 and  
l_orderkey=o_orderkey
```



Group commit in the binary log

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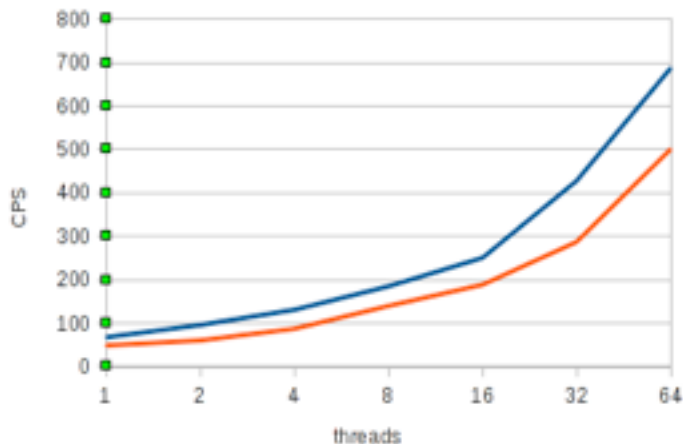
Source: Mark Callaghan, https://www.facebook.com/note.php?note_id=10150261692455933

Group commit even faster in 10.0

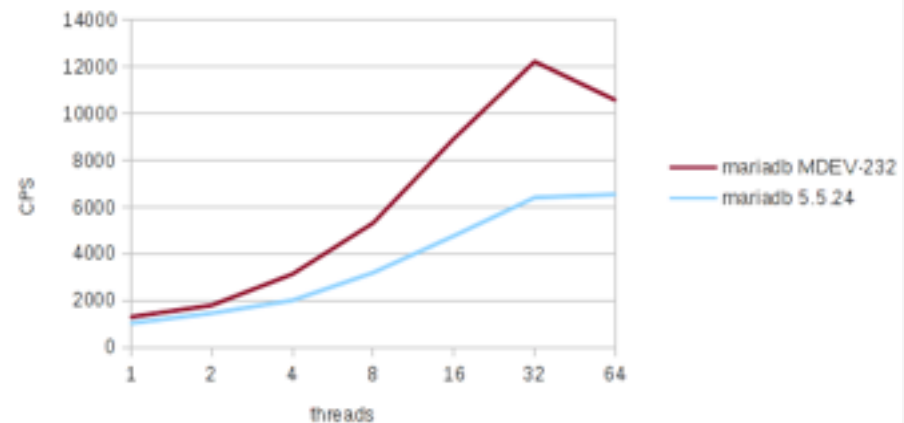
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- Slow fsync (removing checkpoint per commit saving 1-in-3 fsyncs)
- Fast fsync (reduced stall on LOCK_log gives speedup)

Slow fsync



Fast fsync

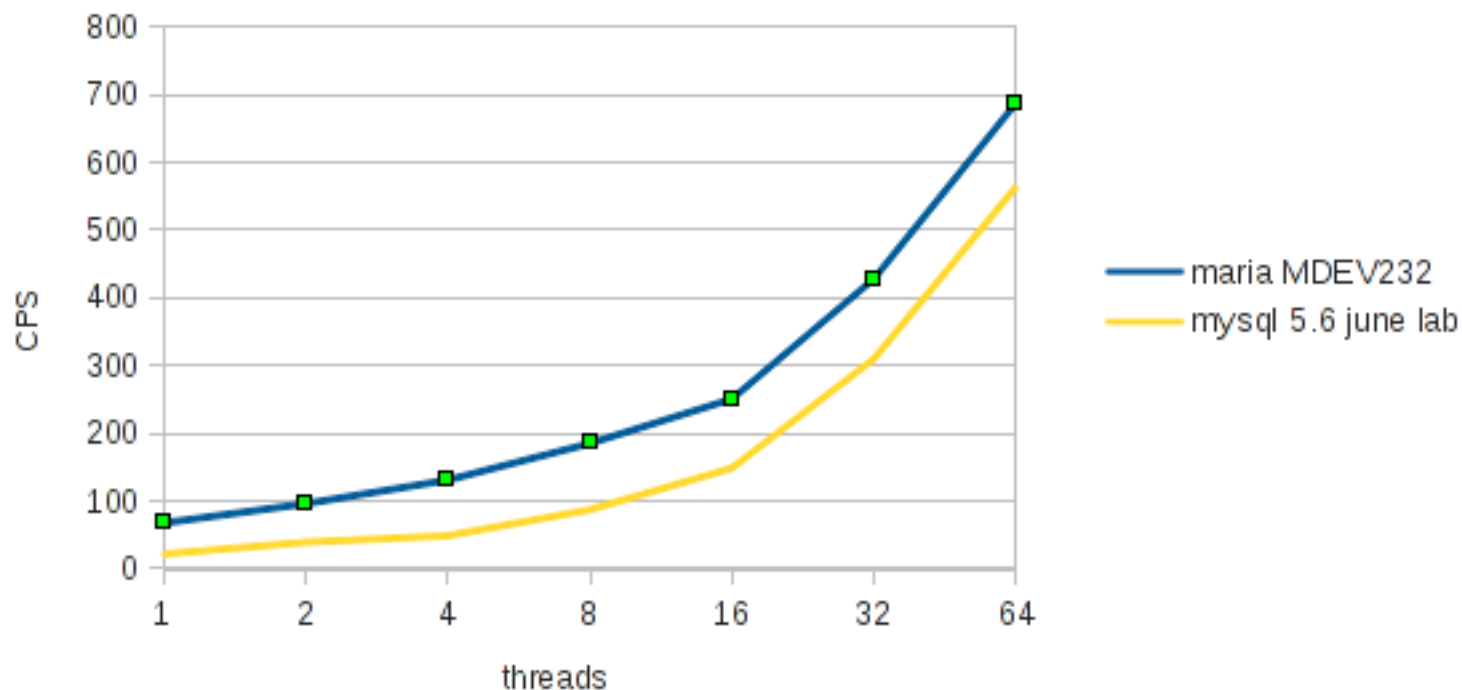


Group commit benchmark against 5.6

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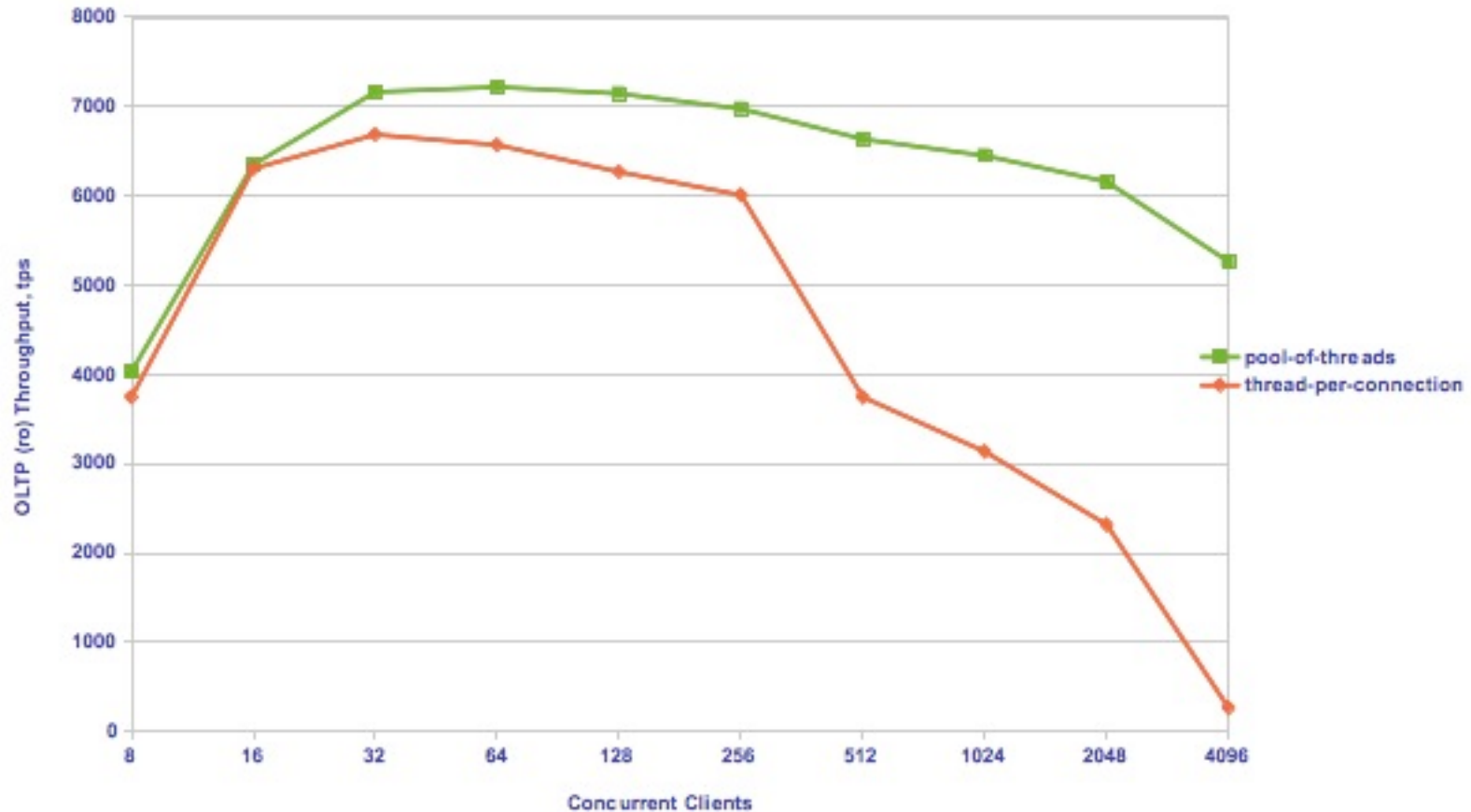
- MySQL 5.6 removes checkpoint per commit
- More complex thread scheduling, less grouping of commits
- Does not remove stall on LOCK_log, less grouping of commits

Slow fsync



Threadpool 5.5 vs 5.1

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MariaDB 10.0.2

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- Support for atomic writes on FusionIO DirectFS
- Optimizer collects & can use histogram-based statistics for non-indexed columns
- Better table discovery, so FederatedX has assisted discovery, Sequence engine (creates ascending/descending sequences, useful in joins)

Roadmap

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- MariaDB is already a superset of features in MySQL
- Merge is in 2 steps
 - 10.0.x
 - 10.1.x
- Plan is to have all important features of MySQL 5.6 by the time MariaDB 10.1.x is released as stable
 - For all practical purposes MariaDB 10.1.x will be a drop in replacement to MySQL 5.6

GPL client libraries

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- LGPL client libraries for C & Java
- Works with MariaDB/MySQL/Percona Server
- Developed by Monty Program Ab & SkySQL Ab, released as LGPL 29 Nov 2012
- ODBC is in the works, sponsors are welcome!

MariaDB Galera Cluster

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- MariaDB Galera Cluster is made for today's cloud based environments. It is fully read-write scalable, comes with synchronous replication, allows multi-master topologies, and guarantees no lag or lost transactions.
- Currently 5.5-based, we see this as important for 10.0 as well (merges will happen closer to GA)



TokuDB

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- It's now opensource
- Official MariaDB binaries out within days that includes TokuDB
- Tests & builds of TokuDB on multiple platforms (think greater distribution)

CONNECT storage engine

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- Made by Olivier Bertrand
- Read, write & update files in different storage formats:
 - .DBF (dBASE format)
 - .CSV
 - .INI
 - XML
 - ODBC

Benchmarks

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- “Lies, damned lies, and statistics” – Mark Twain
 - <http://blog.mariadb.org/sysbench-oltp-mysql-5-6-vs-mariadb-10-0/>
 - <http://dimitrik.free.fr/blog/archives/2013/02/mysql-performance-mysql-56-vs-mysql-55-vs-mariadb-55.html>
- Yes, we’ve gotten Oracle to notice MariaDB :-)

Continued commitments

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- Security
 - Since about a year now, we're the go-to people for security
 - good track record
- We don't like regressions
 - <http://www.skysql.com/blogs/hartmut/nasty-innodb-regression-mysql-5525>
 - <http://www.skysql.com/blogs/kolbe/heads-no-more-query-cache-partitioned-tables-mysql-5523>
- We care about backward compatibility & introduce features carefully
- XtraDB innodb_adaptive_checkpoint=none|reflex|estimate|keep_average (no more reflex...)

Community involvement

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- Many features since MariaDB 5.2 have come from the community or are sponsored features (5.3, 5.5)
- Knowledgebase has 2,600+ articles in English
- Yearly downloads of half a million (more users from mirrors + distributions)
- Active mailing lists (stats on KB)
- Google Summer of Code 2013
- MariaDB User Groups

MariaDB is gaining popularity

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- Wikipedia (English, German), Wikidata running MariaDB 5.5
- Fedora, OpenSUSE shipping MariaDB as a default
- Slackware, Chakra Linux, ArchLinux have followed suit
- Many success stories at KB: Limelight Networks, Nimbuzz, Paybox, FictionPress, OLX, SlashGear, Web of Trust, SpamExperts, etc.

Monty Program Ab + SkySQL Ab join forces

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- Monty Program Ab & SkySQL Ab have entered into a merger agreement
- Resulting company has best available development & support people in the MySQL ecosystem
- MariaDB Foundation ensures that there never has to be a new fork

MariaDB Foundation

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- Foundation is driver of MariaDB project
- Custodian of code, guardian of community
- Foundation can never be controlled by single entity or person
- Designed to be self-sustaining

MariaDB Foundation Goals

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- Increase adoption of MariaDB
- Ensure sustainable high-quality efforts to build, test and distribute MariaDB
- Ensure that community patches are reviewed and adopted
- Guarantee a community voice
- Keep MariaDB compatible with MySQL
- Maintain mariadb.org

MariaDB Foundation

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- More founders & sponsors are welcome
- Michael Widenius, CTO: monty@mariadb.org
- Andrew Katz, Legal Counsel: andrew@mariadb.org
- Simon Phipps, CEO: simon@mariadb.org
- Jeremy Zawodny (Craigslist), Mike Milinkovich (Eclipse Foundation) on Board

Coming up next

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- Merge SPIDER storage engine
- Column level encryption via MyDiamo from Penta Security
- New optimizations for Fusion-I/O
- You can shape the roadmap

Well supported

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- Everyone supports MariaDB from a support standpoint with the exception of Oracle
- Visit the Expo Hall: SkySQL, Percona, AccelerationDB, etc.
- Jelastick has it as PaaS too

- Can I replicate from MySQL 5.6 to MariaDB 10.x?
 - Yes
- Can I replicate from MariaDB 10.x to MariaDB 5.5?
 - Yes
- Can I replicate from MariaDB 10.x to MySQL 5.5/5.6?
 - No

FAQ on tools

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- `SELECT VERSION()` returns 10.0.1–MariaDB
- Version string in handshake packet will be 5.5.30–mysql–10.0.2–MariaDB (mysql#68187, MDEV–4088)
- Tools should start recognising MariaDB for additional feature–set (mytop, HeidiSQL, etc.)

Conclusion

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- MariaDB has 30 man years more of development on-top of MySQL 5.5 with many different features
- MariaDB is maintained by the people that created original MySQL code
- We have 1 million man years of QA (by using the community for QA)
- MariaDB is binary compatible with MySQL
- MariaDB is opensource, has more features, and have no commercial extensions

Resources

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- bugs: mariadb.org/jira
- maria-discuss@lists.launchpad.net
- maria-developers@lists.launchpad.net
- [fb.com/MariaDB.dbms](https://www.facebook.com/MariaDB.dbms)
- twitter: @mariadb
- google plus: +MariaDB
- #maria on irc.freenode.net
- <http://kb.askmonty.org/>



Q&A? Thanks



MariaDB

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