

A Beginner's Guide to MariaDB

Colin Charles, Monty Program Ab

colin@montyprogram.com

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

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

O'Reilly MySQL Conference & Expo - 12 April 2011

Aims

- Give you an update of what we've done in the past year (plus since project inception)
- Discuss the broader MySQL ecosystem

Monty Program

What is it?

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

Monty Program



MariaDB is...

- Community Developed
- Feature Enhanced
- Backward Compatible

Monty Program

Who's behind it?

- MySQL (database) owned by MySQL AB (company)
- Monty Program is just a sponsor of MariaDB
- MariaDB: Open Database Alliance, Percona, PrimeBase, Open Query, etc.

Monty Program

When did this begin?

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

Why MariaDB?

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

Monty Program

Aims of MariaDB

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

Monty Program



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 and InnoDB plugin are included, but not enabled by default
- <http://kb.askmonty.org/v/mariadb-versus-mysql-compatibility>

Monty Program

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*
 - *Croatian collations*
- Numerous bug fixes
- Test cases and coverage improvements
- Removal of mutexes
- Compiler warnings gone!

Monty Program

What's in MariaDB 5.1

- Percona XtraDB
(ENGINE=InnoDB)
 - enhanced InnoDB designed to better scale on modern hardware; backward compatible, scale better on many cores, use memory more efficiently
- See InnoDB & XtraDB Architecture & Performance Optimization slides from Peter Zaitsev at tutorial on Monday
- [http://
www.percona.com/docs/
wiki/percona-
xtradb:start](http://www.percona.com/docs/wiki/percona-xtradb:start)

Monty Program

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>
- Wednesday, 04/13/2011 - Ballroom D - 10.50am - Update on the PBXT Storage Engine by Paul McCullagh

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_SCHEMA.PROCESSLIST` http://kb.askmonty.org/v/time_ms-column-in-information_schemaprocesslist
- *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 <http://kb.askmonty.org/v/pool-of-threads>

What's in MariaDB 5.2

- Released November 2010
- MariaDB 5.2.5 (MariaDB 5.1.55 - changes up to MySQL 5.1.55)
- 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>
- *User Statistics (userstatsv2)*
 - Percona, Google, Weldon Whipple. Understand server activity better, identify database loads <http://kb.askmonty.org/v/user-statistics>

What's in MariaDB 5.2

- *Virtual columns*
 - PERSISTENT (stored - default) & VIRTUAL (generated-only)
 - <http://kb.askmonty.org/v/virtual-columns>
- Segmented MyISAM keycache
 - mitigates thread contention for key cache lock, with notable 250% performance improvements <http://kb.askmonty.org/v/segmented-key-cache>
- New storage engines: *OQENGINE*, *SphinxSE*
 - INFORMATION_SCHEMA.PLUGINS now has PLUGIN_MATURITY & PLUGIN_AUTH_VERSION columns
- CREATE TABLE can be extended via storage engine API
 - Add additional attributes per index, field or table
 - <http://kb.askmonty.org/v/extending-create-table>

Monty Program

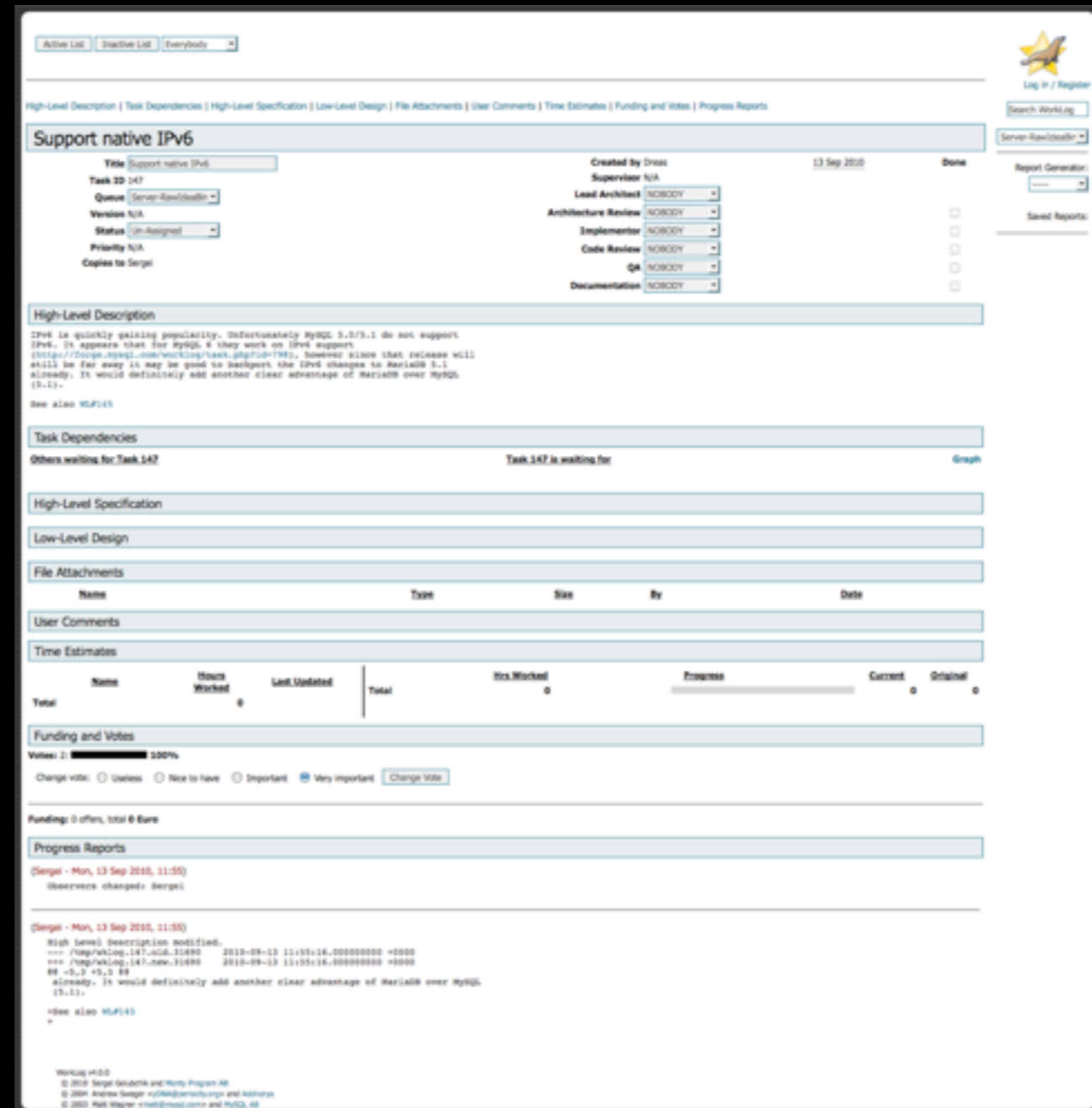
How open is MariaDB?

- Mailing lists: Launchpad
 - maria-developers@lists.launchpad.net
 - maria-discuss@lists.launchpad.net
- Code hosting: Launchpad
- <http://launchpad.net/maria>
- Bugs database:
 - <https://bugs.launchpad.net/maria/>
- #maria on FreeNode IRC

Monty Program

Worklog

- Funding (bounties)
- Votes
- <http://askmonty.org/worklog/>

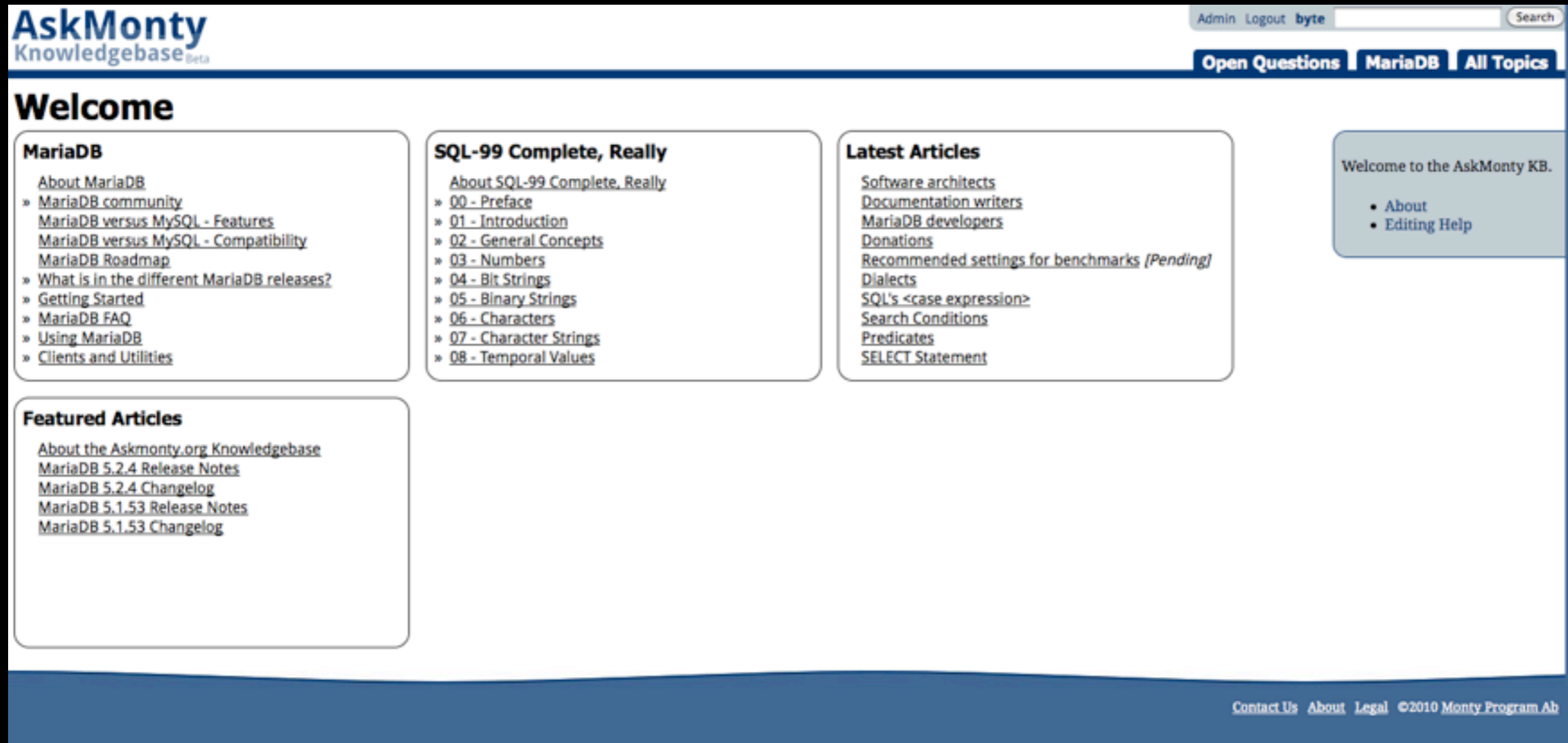


The screenshot shows the 'Support native IPv6' task page in the Worklog system. The page includes a navigation bar with tabs for 'Active List', 'Inactive List', and 'Everybody'. The main content area is divided into several sections:

- Task Details:** Title 'Support native IPv6', Task ID '147', Queue 'Server-BackEnd', Version 'N/A', Status 'Un-assigned', Priority 'N/A', and Copies to 'Sergei'. It also shows 'Created by Dross' on '13 Sep 2010' and a 'Done' checkbox.
- Assignments:** A table with columns for role and assignee, including Lead Architect, Architecture Review, Implementer, Code Review, QA, and Documentation, all currently assigned to 'NOBODY'.
- High-Level Description:** A text block explaining that IPv6 is gaining popularity but MySQL 5.5/5.1 do not support it, and that MariaDB 5.1 already does, adding an advantage over MySQL.
- Task Dependencies:** A section indicating that 'Task 147 is waiting for' other tasks.
- High-Level Specification:** A section for detailed specifications.
- Low-Level Design:** A section for detailed design plans.
- File Attachments:** A table with columns for Name, Type, Size, By, and Date.
- User Comments:** A section for user feedback and discussions.
- Time Estimates:** A table with columns for Name, Hours Worked, Last Updated, Total, Hrs Worked, Progress, Current, and Original.
- Funding and Votes:** A section showing 'Votes: 2' and '100%' funding, with options to change votes (Useless, Nice to have, Important, Very important).
- Progress Reports:** A section showing recent updates, such as 'Sergei - Mon, 13 Sep 2010, 11:55' where 'Serevets changed: Sergei'.

Knowledgebase

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



The screenshot shows the AskMonty Knowledgebase website. The header includes the AskMonty logo, navigation links for 'Admin', 'Logout', and 'byte', and a search bar. Below the header, there are tabs for 'Open Questions', 'MariaDB', and 'All Topics'. The main content area is divided into several sections: 'Welcome', 'MariaDB' (with a list of links), 'SQL-99 Complete, Really' (with a list of links), 'Latest Articles' (with a list of links), and 'Featured Articles' (with a list of links). A sidebar on the right contains a welcome message and links for 'About' and 'Editing Help'. The footer includes links for 'Contact Us', 'About', 'Legal', and a copyright notice for '©2010 Monty Program Ab'.

AskMonty Knowledgebase Admin Logout byte Search

Open Questions **MariaDB** **All Topics**

Welcome

MariaDB

- [About MariaDB](#)
- » [MariaDB community](#)
- [MariaDB versus MySQL - Features](#)
- [MariaDB versus MySQL - Compatibility](#)
- [MariaDB Roadmap](#)
- » [What is in the different MariaDB releases?](#)
- » [Getting Started](#)
- » [MariaDB FAQ](#)
- » [Using MariaDB](#)
- » [Clients and Utilities](#)

SQL-99 Complete, Really

- [About SQL-99 Complete, Really](#)
- » [00 - Preface](#)
- » [01 - Introduction](#)
- » [02 - General Concepts](#)
- » [03 - Numbers](#)
- » [04 - Bit Strings](#)
- » [05 - Binary Strings](#)
- » [06 - Characters](#)
- » [07 - Character Strings](#)
- » [08 - Temporal Values](#)

Latest Articles

- [Software architects](#)
- [Documentation writers](#)
- [MariaDB developers](#)
- [Donations](#)
- [Recommended settings for benchmarks *\(Pending\)*](#)
- [Dialects](#)
- [SQL's <case expression>](#)
- [Search Conditions](#)
- [Predicates](#)
- [SELECT Statement](#)

Welcome to the AskMonty KB.

- [About](#)
- [Editing Help](#)

Featured Articles

- [About the Askmonty.org Knowledgebase](#)
- [MariaDB 5.2.4 Release Notes](#)
- [MariaDB 5.2.4 Changelog](#)
- [MariaDB 5.1.53 Release Notes](#)
- [MariaDB 5.1.53 Changelog](#)

[Contact Us](#) [About](#) [Legal](#) ©2010 Monty Program Ab



Deployments, deployments, deployments

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



“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.

Monty Program

Getting MariaDB

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

The future?

- There is no “one” tree
 - MySQL, Percona Performance Server, MariaDB
- GIS
- HandlerSocket
- Merging takes time
- New config files?
- Row based replication improvements
- Group commit
- Tonnes of optimiser features
 - index condition pushdown, multi-range-read (MRR) table access (with keys & row ID sorting), block nested loop for outer joins, batched key access, classic hash join, numerous subquery optimisations (possible materialisation for non-correlated subqueries), merged derived tables, index merge enhancements
 - dynamic columns support

Monty Program

What else do we need?

- InnoDB focus
- Replication focus
- More benchmarks
 - <http://kb.askmonty.org/v/benchmarks>
- Spreading the good word

Your roadmap

- (past) What are the new optimiser features and how can I benefit from them - Sergey Petrunya - Ballroom G - 11.55am - 12/04/2011
- (past) Plugin development tutorial by Sergei Golubchik
- State of MariaDB keynote - Michael Widenius - 9am - 13/04/2011
- Group commit and related enhancements in the MariaDB binary log - 2pm - 13/04/2011 - Ballroom H
- Dynamic Columns - 3.05pm - 13/04/2011 - Ballroom G
- OQGRAPH Dealing with graphs and hierarchies in plain SQL - Antony Curtis - 10.50am 14/04/2011 - Ballroom D
- A BoF on Wednesday evening to plan MariaDB future features
- <http://kb.askmonty.org/v/plans-for-56>



Plugins & Storage Engine Summit

- Interested in plugins and storage engines for MySQL/MariaDB/Drizzle?
- Be at the summit!
 - April 15 2011, 10am-4pm, The Facebook Campus
 - Sign up here: <http://kb.askmonty.org/v/storage-engine-summit-2011>

Monty Program

Booth 411

- Expo Hall
- Auction for a t-shirt (signed) + dinner with Monty - proceeds go to Japan

Monty Program

Q&A?

email: colin@montyprogram.com

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

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