



MySQL

(, MySQL Global Business Unit)

ORACLE®



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Over 3.5 Years of MySQL Innovation

MySQL Cluster 7.3

MySQL Workbench 6.0

MySQL Migration
Wizard

MySQL 5.6

MySQL 5.5

MySQL Cluster
Manager

Windows installer & Tools

MySQL
Applier for
Hadoop

MySQL Enterprise Monitor 2.3/3.0

MySQL Utilities

MySQL Enterprise | **Backup**
Security
Scalability
HA
Audit

MySQL Workbench 5.2

MySQL Cluster 7.2
MySQL Cluster 7.1

MySQL Enterprise
Oracle Certifications

Driving Innovation AND Quality

- **191** Worklogs for MySQL 5.6
- **1991** Bugs Fixed in 5.6
- **3763** Bugs Fixed in Total Since MySQL 5.5 GA
- **911** New MTR Tests in MySQL 5.6
- **Tripled QA Team** - 400 Man/Year Database QA Experience

MySQL 5.6: The Best Release Ever

"MySQL 5.6 is probably the version of MySQL with the biggest bundle of new features."

Giuseppe Maxia

"MySQL 5.6 is an impressive release with features that make it much easier to scale MySQL and take advantage of modern hardware."

Mark Callaghan

"I am very excited and thrilled to use the latest release of MySQL 5.6 in production. This is probably the most notable and innovative release from many years, if not ever. Oracle developer teams did great work for MySQL 5.6, so we have to give Oracle credit for that."

Marco Tusa

"MySQL 5.6 is the largest MySQL code size increase in a MySQL version ever. The last time we saw anything like this was with the merging of MySQL Cluster in 4.1. At the very least, Oracle is paying people to write lines of code to extent that nobody has before."

Stewart Smith

"MySQL vs MariaDB performance. The obvious take away is as expected, upgrade any 5.5 installations to 5.6."

Brian Aker

**HUNDREDS OF MYSQL DEVELOPMENT ENGINEERS,
SUPPORT EXPERTS AND CONSULTANTS, INCLUDING
ORIGINAL ARCHITECTS OF THE SERVER,
INNODB AND MYSQL CLUSTER**

INVESTING AND GROWING THE TEAM

**BY FAR, THE LARGEST DEVELOPMENT TEAM
IN MySQL'S HISTORY**

The Open Road to MySQL 5.6

Predictable Releases for the MySQL Community, Allowing Feedback

DMR1*
April 2011

Optimizer:

MRR, ICP, File Sort

InnoDB:

Split Kernel Mutex, MT
Purge

Replication:

Crash-Safe, Multi-Thread
Slave, Checksums

Memcached API

New P_S

Partitioning

Improvements

DMR2
Oct 2011

Optimizer:

BKA, New
EXPLAIN, Traces

InnoDB:

Dump/Restore
Buffer Pool

More P_S

DMR3
Dec 2011

Optimizer:

Sub-Queries

InnoDB:

Full Text Index,
Read-Only
Optimizations

Condition
Handling

Fractional
Seconds

DMR4
April 2012

Optimizer:

JSON EXPLAIN,
Sub-Queries

Replication:

GTIDs

TIMESTAMP &
DATESTAMP

More P_S

DMR5
Aug 2012

InnoDB:

TT, Online DDL,
Memcached API

Replication:

Binary Log Group
Commit

Password
Mgmt

More
Partitioning

RC
Nov 2012

New Server
Defaults

More
Partitioning

More GTID,
TT

*Development Milestone Release

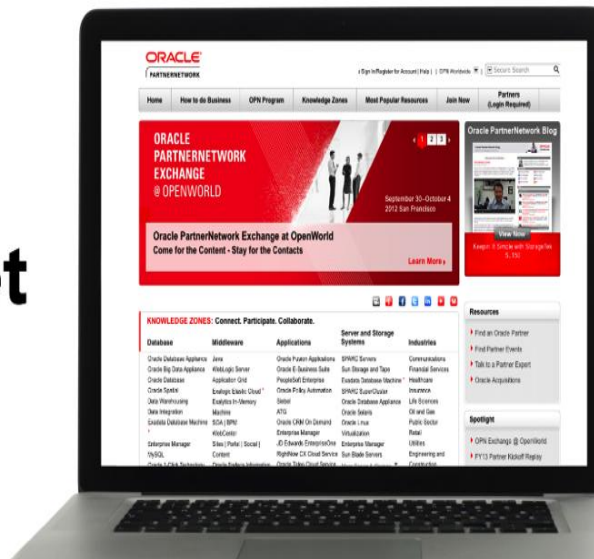
MySQL Makes Sense for Oracle

- Complete Solutions
- Best of Breed at Every Level
- On Premise and in the Cloud
- MySQL: Web, Mobile & Embedded



2.3B Internet Users

Source: IDC



1.1B Global 3G mobile subscribers

Source: Mobithink



3B to 50B Devices

Source: Ericsson

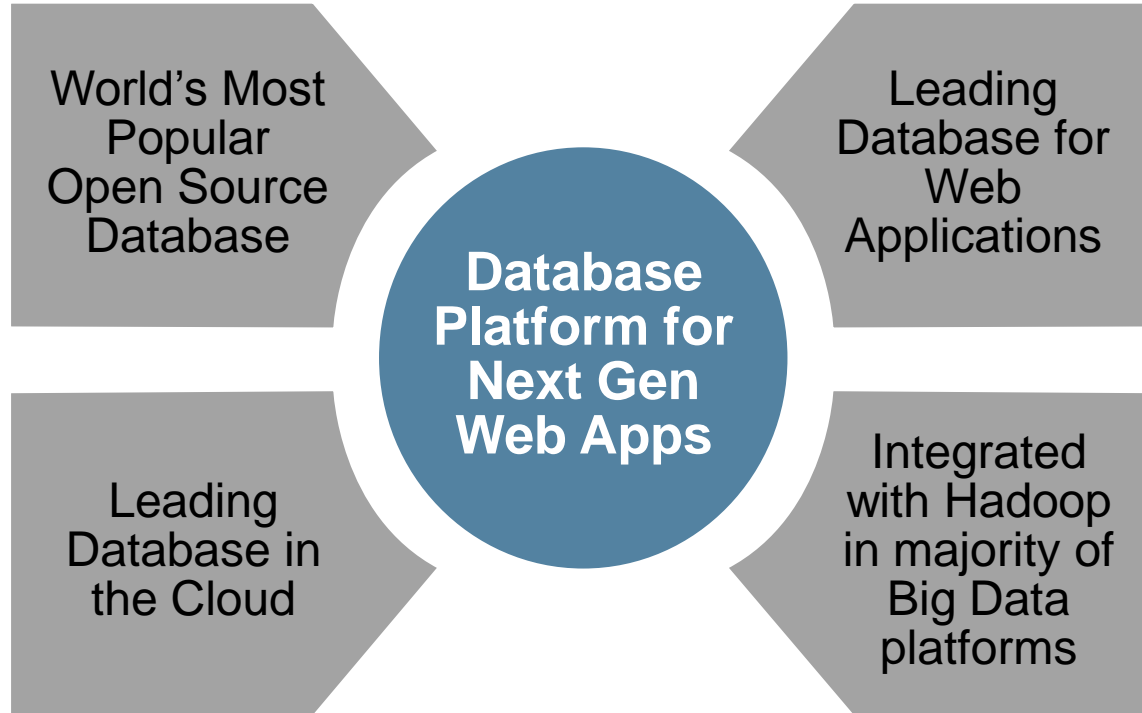


MySQL Connect

ORACLE

MySQL: Everywhere and Growing

Platform of Choice for Next Generation Web, Cloud & Embedded Applications



#1 Linux Career IT skill: MySQL *

Downloads & Sales Growth

Awards & Social Media Momentum

Best of both Worlds SQL+NoSQL

LAMP + Python + Node.js + Go +...

* Source: Linux Career IT Skills Watch update July 2013

Oracle Database and MySQL

Complementary

- Together servicing broader user needs
- MySQL well suited for Web-based & mobile apps, custom departmental apps and embedded apps – on premise and in the cloud



- Customers benefit by running MySQL and Oracle together



ORACLE MAKES MySQL BETTER FOR THE WEB, THE CLOUD & BIG DATA

- Performance & Scale-Out
- High Availability, Self-Healing & Data Integrity
- Provisioning, Monitoring & Resource Management
- Developer Agility
- Security

RECENT ANNOUNCEMENTS & WHAT'S NEW TODAY

MySQL 5.6: Best Release Ever!

IMPROVED PERFORMANCE AND SCALABILITY

- Scales to 48 CPU Threads
- Up to 230% performance gain over MySQL 5.5

IMPROVED INNODB

- Better transactional throughput and availability

IMPROVED OPTIMIZER

- Faster query execution and diagnostics for query tuning and debugging

IMPROVED REPLICATION

- Higher performance, availability and data integrity

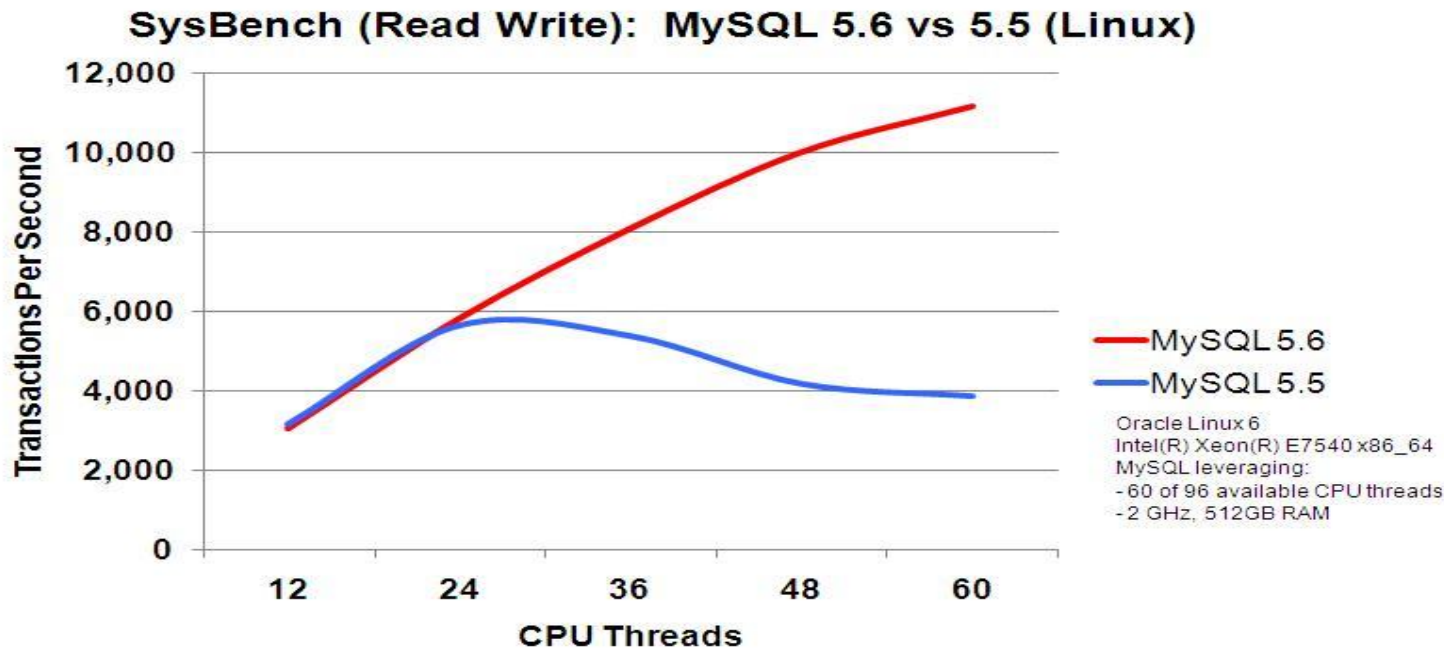
IMPROVED PERFORMANCE SCHEMA

- Better Instrumentation, User/Application level statistics and monitoring

New! NoSQL ACCESS TO INNODB

- Fast, Key Value access with full ACID compliance, better developer agility

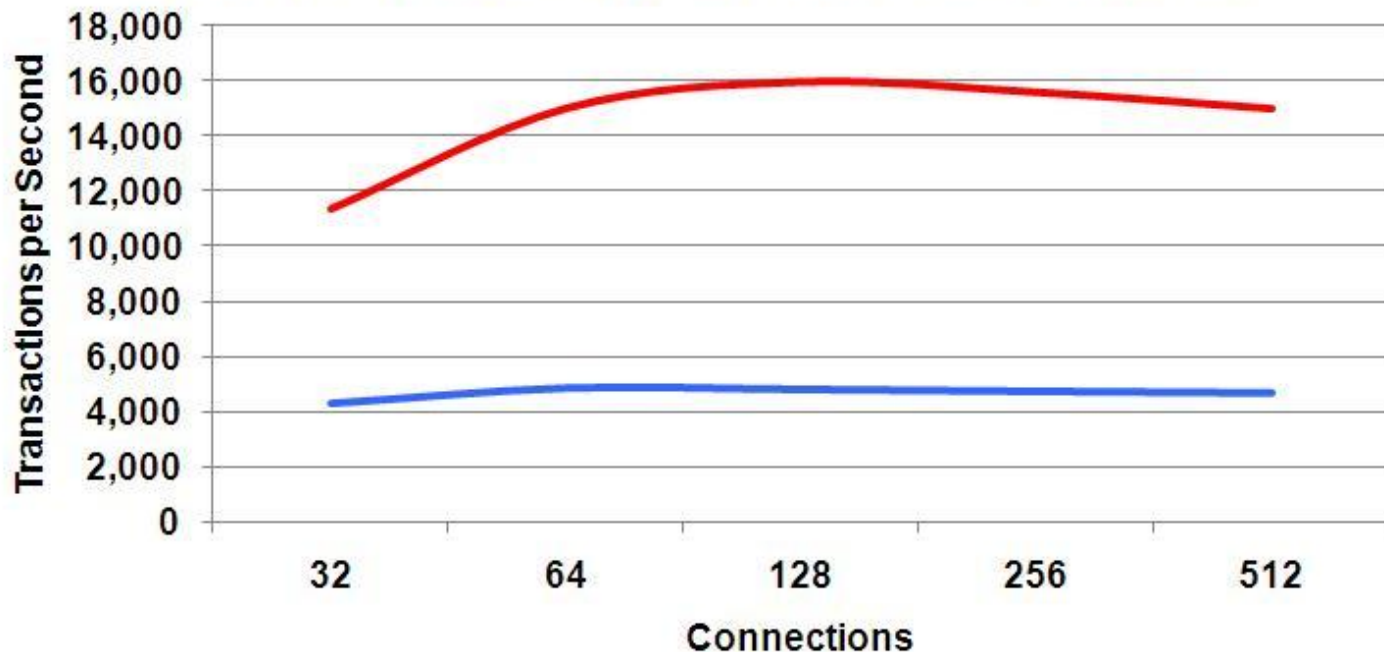
MySQL 5.6: Scalability



- Users can fully utilize latest generations of hardware and OS
- Scales as data volumes and users grow

MySQL 5.6 SysBench Benchmarks

SysBench (Read Only): MySQL 5.6 vs. 5.5 (Linux)



MySQL 5.6

MySQL 5.5

Oracle Linux 6
Intel(R) Xeon(R) E7540 x86_64
MySQL leveraging:
- 60 of 96 available CPU threads
- 2 GHz, 512GB RAM

Up to 234% Performance Gain

MySQL 5.6: Fast Adoption

High Quality New Features & Improved Performance

- Features highly anticipated by the MySQL Community
- High quality, and delivering numerous new capabilities
- Great performance improvements
 - InnoDB, optimizer, parallelism/threading, locking, io, connections, ...
- Developer features – Queries, Partitioning, NoSQL, Explain Plans, ...
- Even easier / less costly to manage
 - HA/Replication – simpler to maintain and manage
 - Improved monitoring and instrumentation (Performance Schema)

MySQL Database 5.7 DMRs

What's New



DMRs: Development Milestone Releases

- Fully Functional Release Candidate Quality
- Two to Four per Year
- Early Community Testing, Use, & Feedback
- Accelerates Rate of Enhancements
- Improves Quality

Now: MySQL 5.7.2 DMR

MySQL 5.7.2 builds on MySQL 5.6 by improving:



- **InnoDB** for better transactional throughput, availability
- **Replication** for better scalability and availability
- **Utilities** for dev/ops automation
- **Performance Schema** for better performance metrics
- **Optimizer** for better EXPLAINing query performance

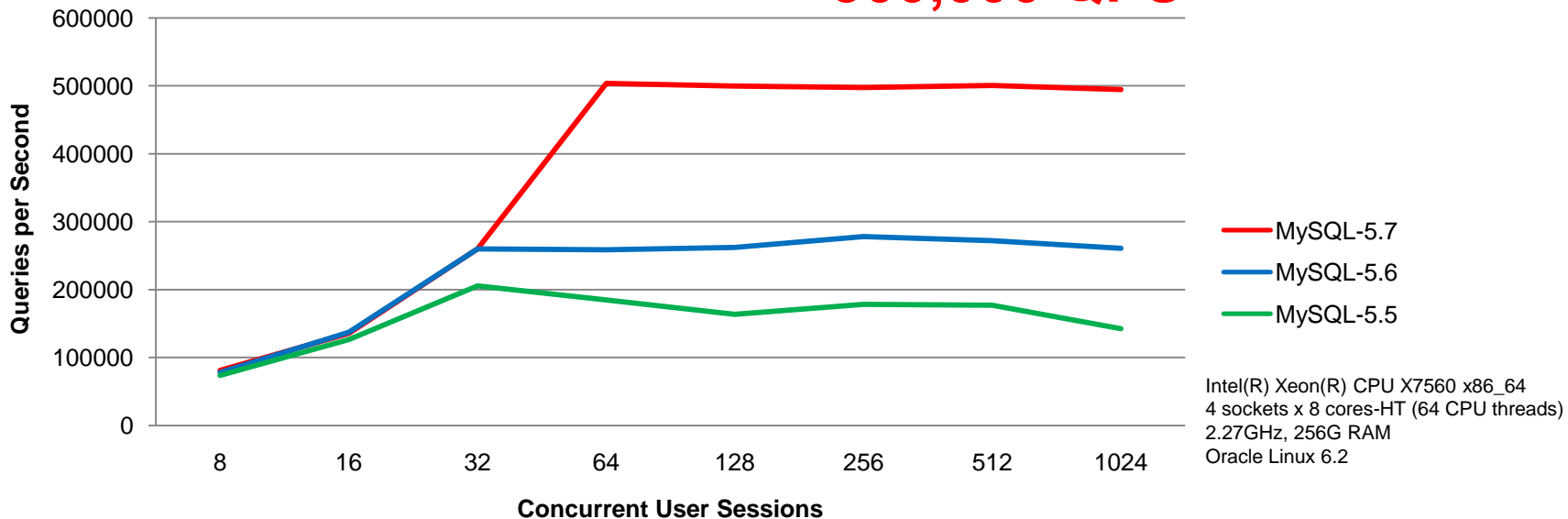
Available Now! Get it here:

dev.mysql.com/downloads/mysql/

MySQL 5.7.2 Sysbench Benchmarks

Sysbench Point Select

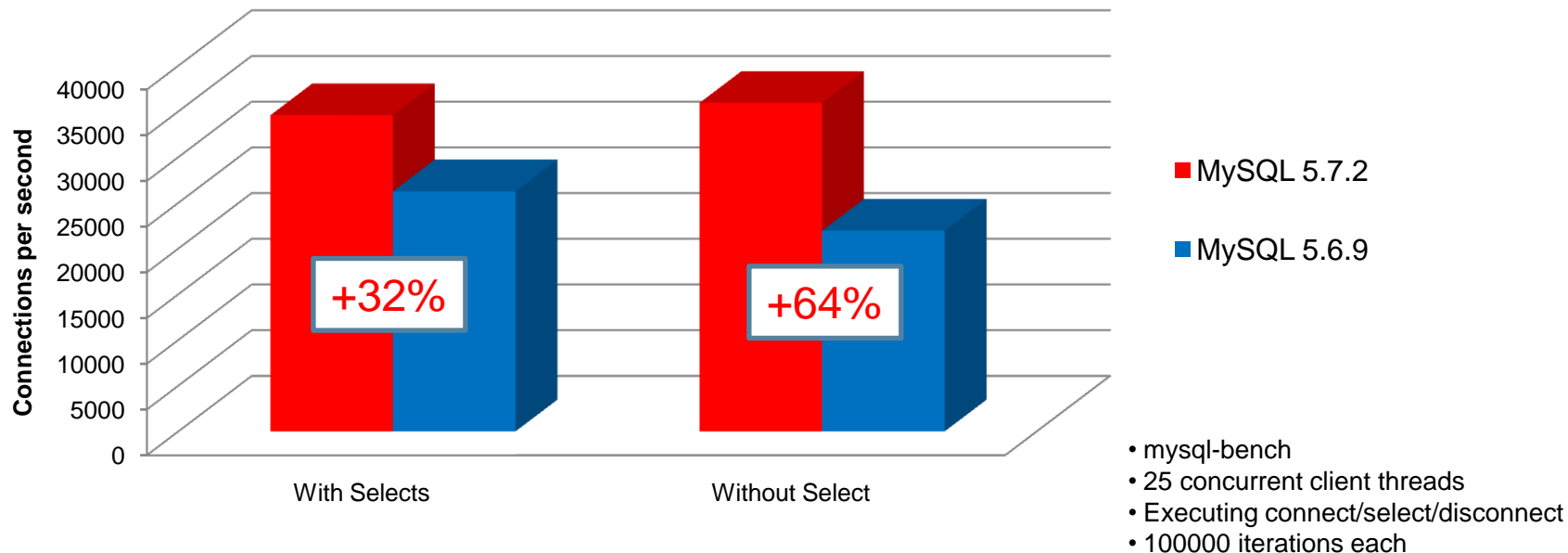
500,000 QPS



95% Faster than MySQL 5.6
172% Faster than MySQL 5.5

MySQL 5.7.2: Connections / second

Faster processing of new connections

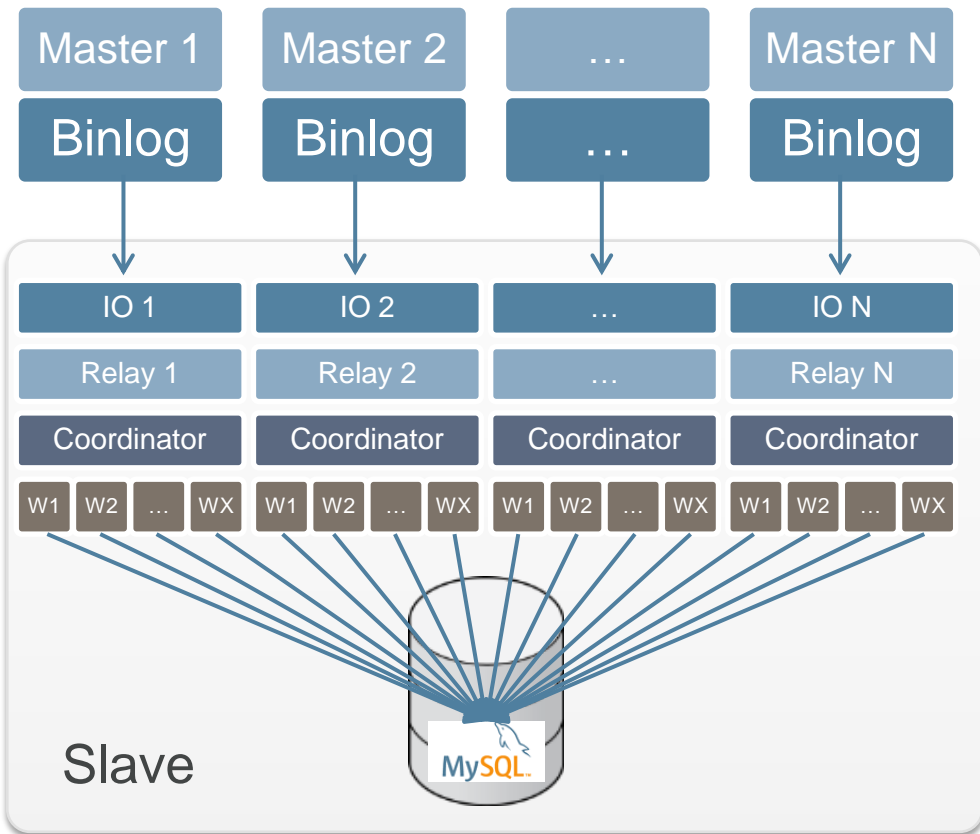


Built with input from Facebook

Offloaded THD initialization and network initialization to worker thread

Multi-Source Replication

labs.mysql.com



- Consolidate updates from multiple multiple Masters into one Slave
 - Consolidated view of all shards
 - Centralized point for backups
- Compatible with Semi-Synchronous Replication & enhanced MTS
- Control and filters will be per-source (filters global in labs)
- Application keeps data sets disjoint between sources

MySQL Utilities

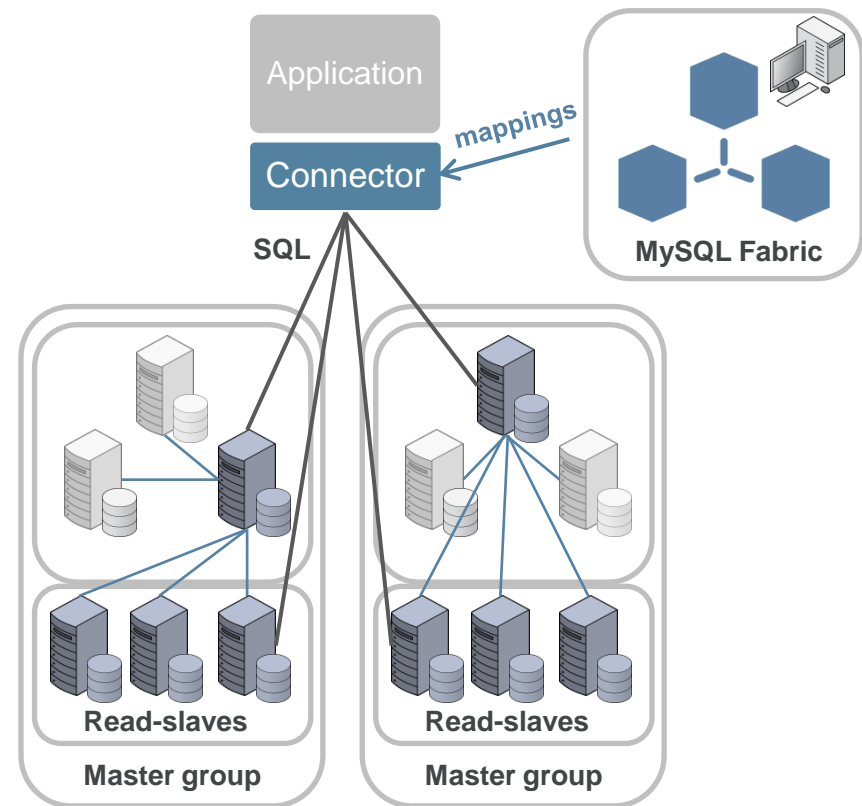
Powerful DevOps Management tools for MySQL

- New, standalone package: MySQL Utilities 1.3
- Automate common Dev/Ops tasks
 - Replication: provisioning, testing, **monitoring and failover** (now as daemon)
 - Database comparisons: consistency checking
 - Database administration: users, connections, tables, etc
 - Auditing
- Python scripts
 - Standalone or launched from MySQL Workbench
 - Available from dev.mysql.com
 - Extensible to include custom scripting; Python library for extensibility

MySQL Utilities - Fabric

Scale-out using Sharding

labs.mysql.com



- Scale-out through sharding
- Connectors
 - Python
 - Java
 - PHP
- Application provides shard key
 - Range or Hash
 - Tools for resharding
 - Global updates & tables
- Available in MySQL Utilities 1.4.0



MySQL Cluster



MySQL Cluster 7.3

Auto-Sharding, Extreme Performance,
Global Replication

GA Now!

[Learn More »](#)



- Foreign Key Support
- Connection Thread Scalability
- MySQL 5.6
- Auto-Installer
- NoSQL JavaScript for node.js

MySQL Cluster 7.3 GA: Foreign Keys

- Brings MySQL Cluster to a broader range of workloads
 - Packaged apps, custom projects
- Adds powerful functionality while reducing complexity
 - App logic & data model
- Enabled by default
- Enforced for SQL
- On-line add and drop

Child Table (towns)

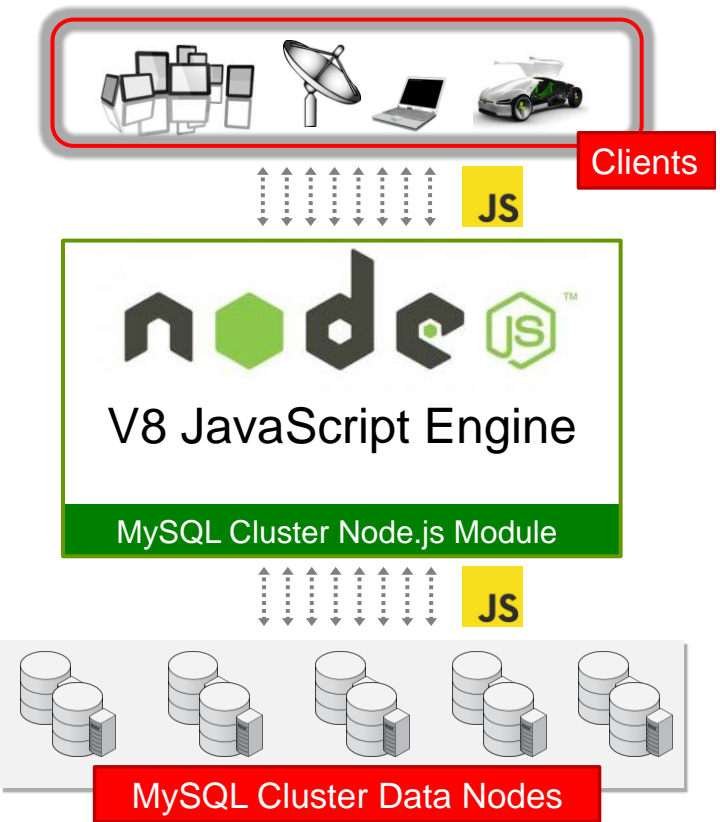
| town (PK) | county |
|------------|-------------|
| Reading | Berkshire |
| Shrewsbury | Shropshire |
| Maidenhead | Berkshire |
| Oxford | Oxfordshire |

Parent Table (counties)

| county (PK) | country |
|-----------------|---------|
| Shropshire | England |
| Buckinghamshire | England |
| Berkshire | England |
| Oxfordshire | England |

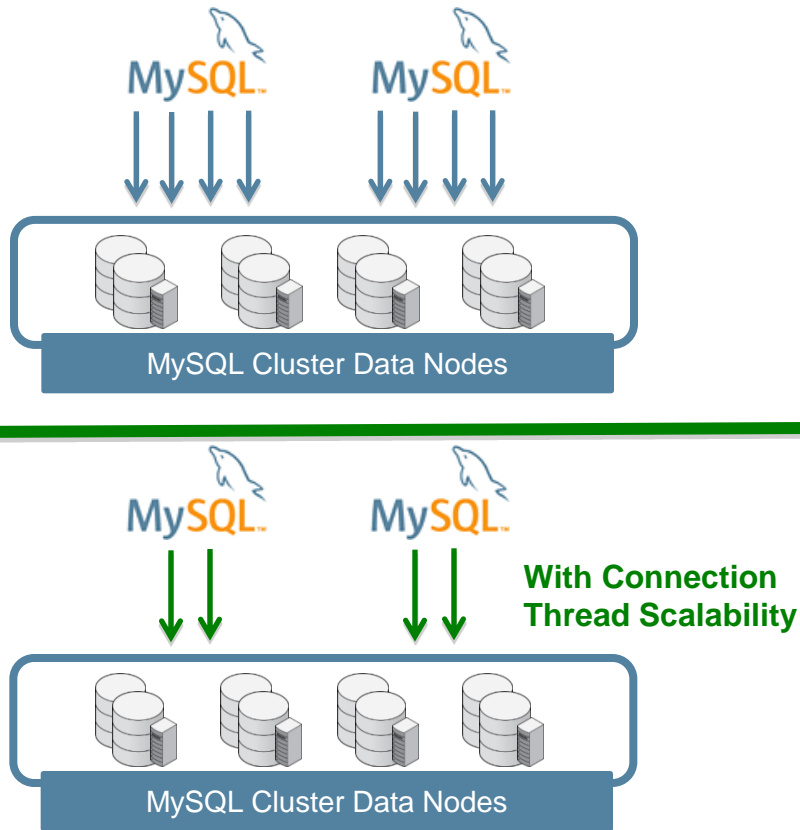


MySQL Cluster 7.3: Node.js NoSQL API



- Native JavaScript access to MySQL Cluster
 - End-to-End JavaScript: browser to the app & DB
 - Storing and retrieving JavaScript objects directly in MySQL Cluster
 - Eliminate SQL transformation
- Implemented as a module for node.js
 - Integrates Cluster API library within the web app
- Couple high performance, distributed apps, with high performance distributed database
- Optionally routes through MySQL Server

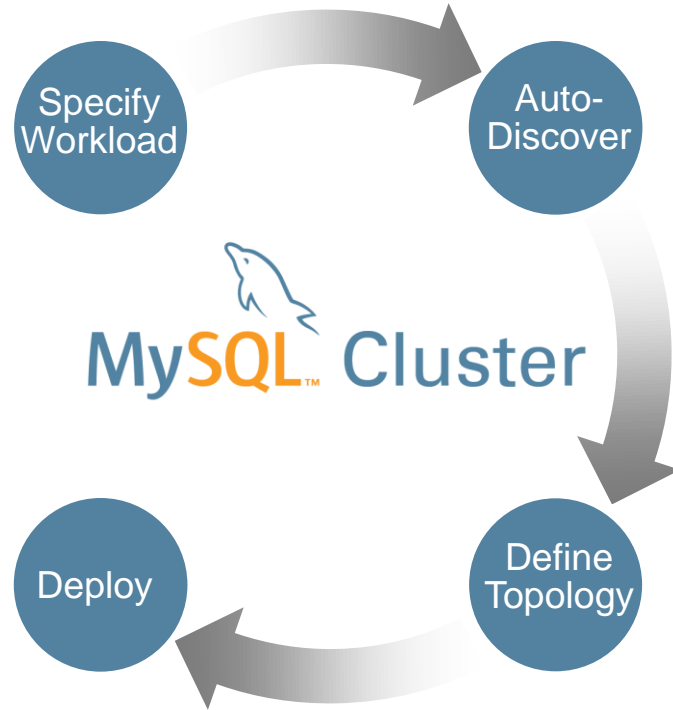
MySQL Cluster 7.3: Connection Thread Scalability



- Increases throughput of each connection to the data layer
 - More client threads can use each connection by splitting mutexes
- Reduces configuration complexity
- Increases cluster scalability
 - Each connection consumes one of 256 node ids
- Up to 7.5x higher performance per connection
 - SQL & NoSQL interfaces

MySQL Cluster 7.3: Auto-Installer

- Fast configuration
- Auto-discovery
- Workload optimized
- Repeatable best practices
- For MySQL Cluster 7.2 + 7.3



MySQL Workbench

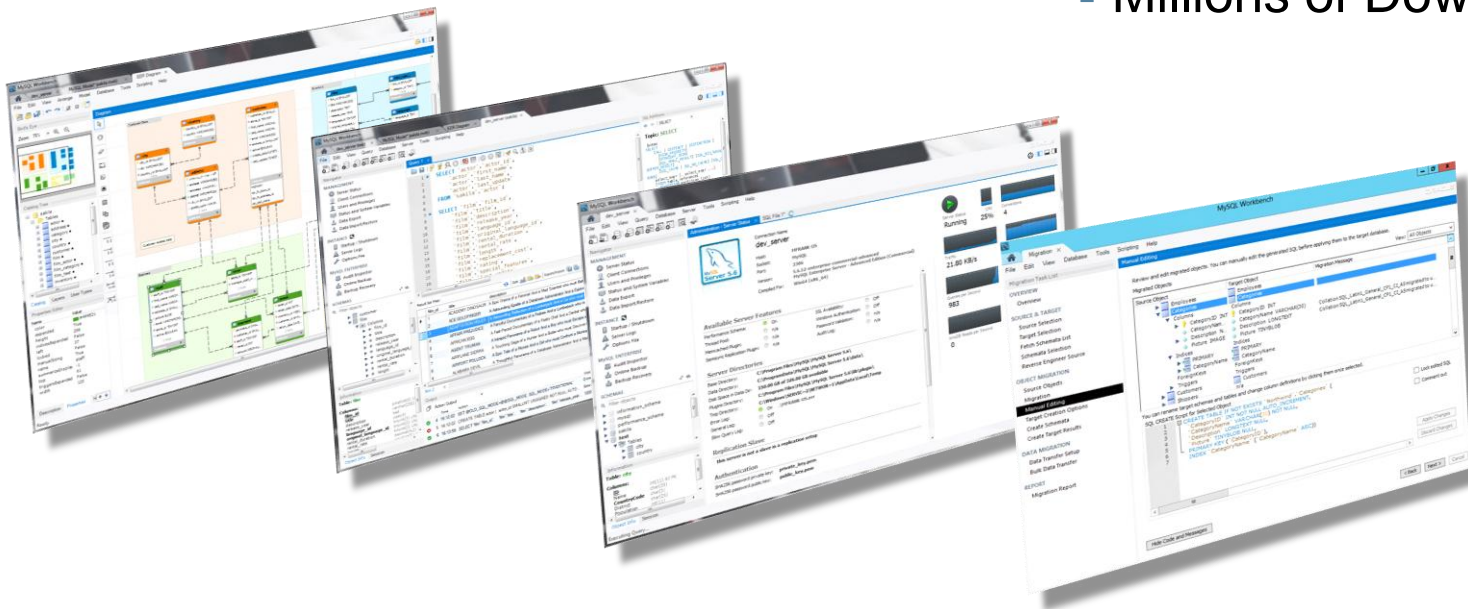


New! MySQL Workbench 6.0

Design, Develop, Administer, Migrate
Windows, Linux, Mac OS X



- MySQL Database IDE
- Millions of Downloads



New Design and Enhancements

-
- The screenshot displays the MySQL Workbench environment. The top toolbar includes icons for File, Edit, View, Query, Database, Server, Tools, Scripting, and Help. The main window is divided into several panes:
- SCHEMAS:** A tree view on the left showing the database structure, including 'performance_schema', 'sakila', and 'test'.
 - Query 1:** A SQL editor window containing the following query:

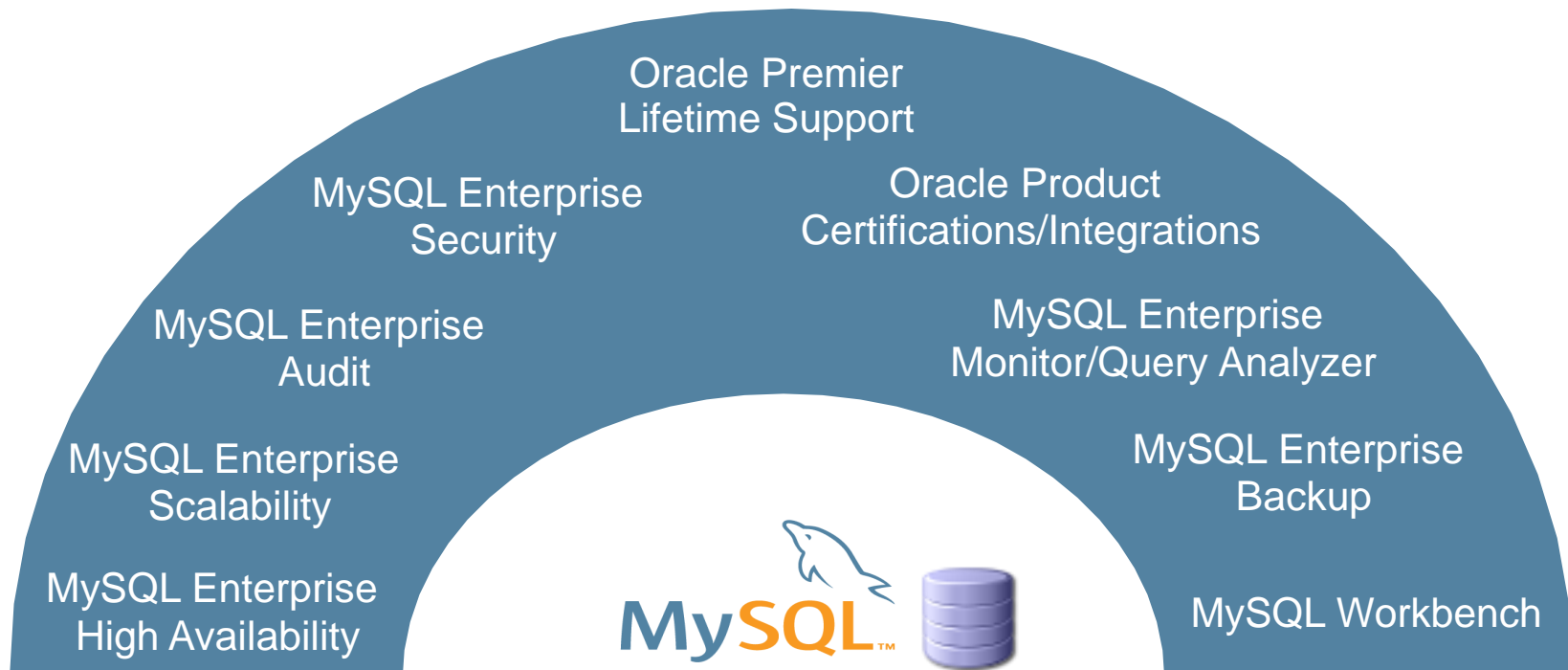

```
1 SELECT `actor`.`actor_id`, `actor`.`first_name`,
2       `actor`.`last_name`
3 FROM `sakila`.`actor`
4 SELECT * FROM sakila.actor;
```
 - Table View:** A pane showing the data from the 'sakila.actor' table. The columns are 'actor_id', 'first_name', and 'last_name'. The data includes actors like FENELLO GURNESS, NICK WAHLBERG, ED CHASE, JENIFER DAVIS, JOHNNY LOLLOBRIGI, BETTE NICHOLSON, GRACE MOSTEL, MATTHEW JOHANSSON, JOE SWANK, CHRISTIAN GABLE, ZERO CAGE, KAPIL BERRY, UMA WOOD, VIVEN BERGEN, and CUBA OLIVER.
 - CREATE INDEX Syntax:** A dialog box for creating an index. It shows the 'CREATE [UNIQUE|FULLTEXT|SPATIAL] INDEX index_name ON table_name (index_col_name1, ..., index_col_nameN) [index_type] [index_option] [index_option] ...' syntax. The 'index_option' dropdown is set to 'USING BTREE'. The 'index_name' field is empty, and the 'table_name' field is 'sakila.actor'.
- The bottom status bar indicates 'Query Completed'.

MySQL Enterprise Edition



MySQL Enterprise Edition

Highest Levels of Security, Performance, and Availability



MySQL Enterprise Backup 3.9

Online Hot Backups

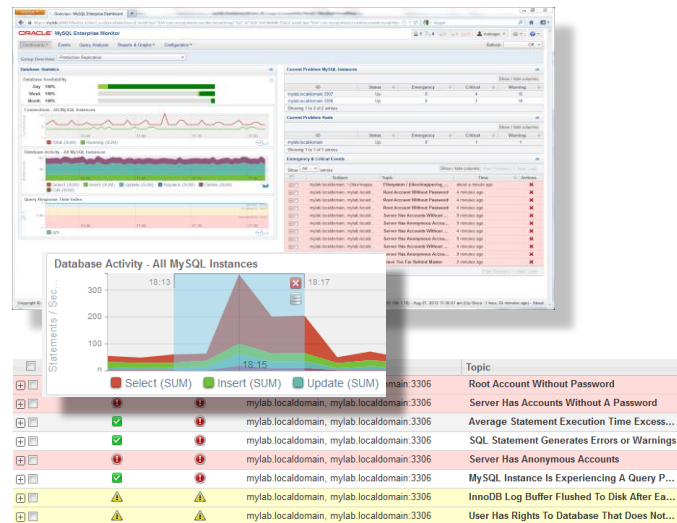


- **New!** Single Step
 - Restore Directly
- **New!** Full Instance Backup
 - Configuration, Settings
- **New!** Selective Backup Restore
 - Leverage Transportable Tablespaces
- **New!** Continuous Monitoring
 - % Complete, Bytes, Status
- **New!** Monitor Disk Space
 - Actions: Warn & Retry, Abort, Remove

MySQL Enterprise Monitor 3.0

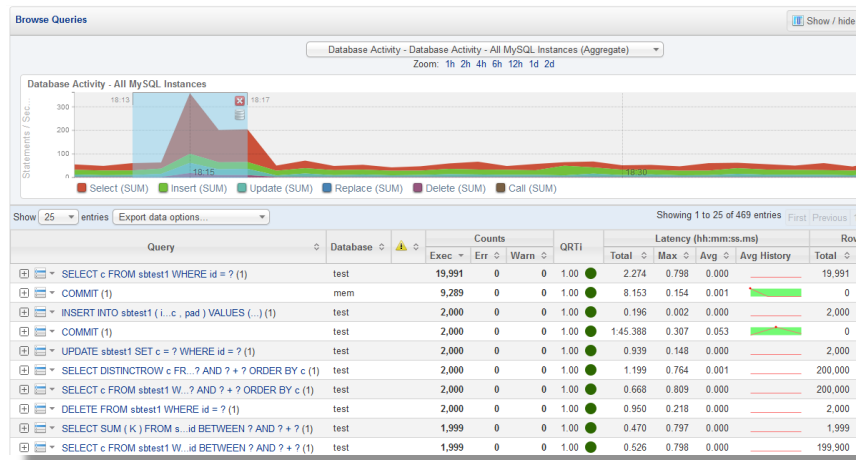


- Real-time MySQL performance and availability monitoring
- Visually find & fix problem queries
- Disk monitoring for capacity planning
- Cloud friendly architecture (no agents)
- Start monitoring MySQL in 10 minutes
- Remote agent option provides OS monitoring



MySQL Query Analyzer

- Real-time query performance
- Visual correlation graphs
- Find & fix expensive queries
- Detailed query statistics
- Query Response Time index (QRTi)



“With the MySQL Query Analyzer, we were able to identify and analyze problematic SQL code, and triple our database performance. More importantly, we were able to accomplish this in three days, rather than taking weeks.”

Keith Souhrada
Software Development Engineer
Big Fish Games

MySQL 기술지원 체계

Oracle Premier Support for MySQL

Largest team of MySQL Experts

Direct Access to the MySQL Support Engineers

Backed by the MySQL developers

Forward Compatible Hot Fixes

Maintenance Releases

24/7/365

Unlimited Incidents

MySQL Support in 29 Languages

Knowledge Base

MySQL 기술지원 체계

Oracle Premier Support for MySQL

Consultative Support

- Remote Troubleshooting
- Replication Review
- Partitioning Review
- Schema Review
- Query Review
- Performance Tuning
- Customer Code Review: Client APIs, Stored Routines
- Install Support

To Conclude

Innovations for the MySQL Community

- Oracle Delivers. Past 12 Months:
 - **GA:** MySQL 5.6, MySQL Cluster 7.3, MySQL Workbench 6.0, MySQL Enterprise Monitor 3.0, MySQL Utilities, MySQL Connectors...and more
 - **DMRs:** MySQL 5.7
 - **Labs:** Multi-source Replication, Fabric, Hadoop Applier for MySQL
- Try the Products and Give us Feedback!
- Have a Great Conference and Enjoy the Opportunity to Meet the Engineers behind MySQL

Contact Point (Korea)

- Sales : (min.whan.chang@oracle.com)
- Technical Consultant : (sumi.ryu@oracle.com)

