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MySQL Technical Update: SCaLE 2012

Dave Stokes MySQL Community Manager

Safe Harbor Statement

The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions.

The development, release, and timing of any features or functionality described for Oracle's products remains at the sole discretion of Oracle.



Agenda

- Oracle's Strategy and Investment in MySQL
- What's New in MySQL
- PHP centric stuff
- Other goodies
- Q&A



UNMATCHED INVESTMENT

InnoDB

PERFORMANCE IMPROVEMENTS

REPLICATION

EMBEDDED

CLOUD

WINDOWS

HUNDREDS OF EXPERTS

ORACLE DRIVES MySQL

INNOVATION

STRATEGIC

WORLD-CLASS SUPPORT

MySQL CLUSTER

WEB

NoSQL

LINUX

MySQL ENTERPRISE EDITION

LARGEST MySQL ENGINEERING & SUPPORT ORGANIZATION

Oracle's Investment in MySQL

Rapid Innovation

Make MySQL a Better MySQL

- #1 Open Source Database for Web Applications
- “M” in most complete LAMP stack
- Embedded

Develop, Promote and Support MySQL

- Improved engineering, consulting and support
- Leverage 24x7, World-Class Oracle Support

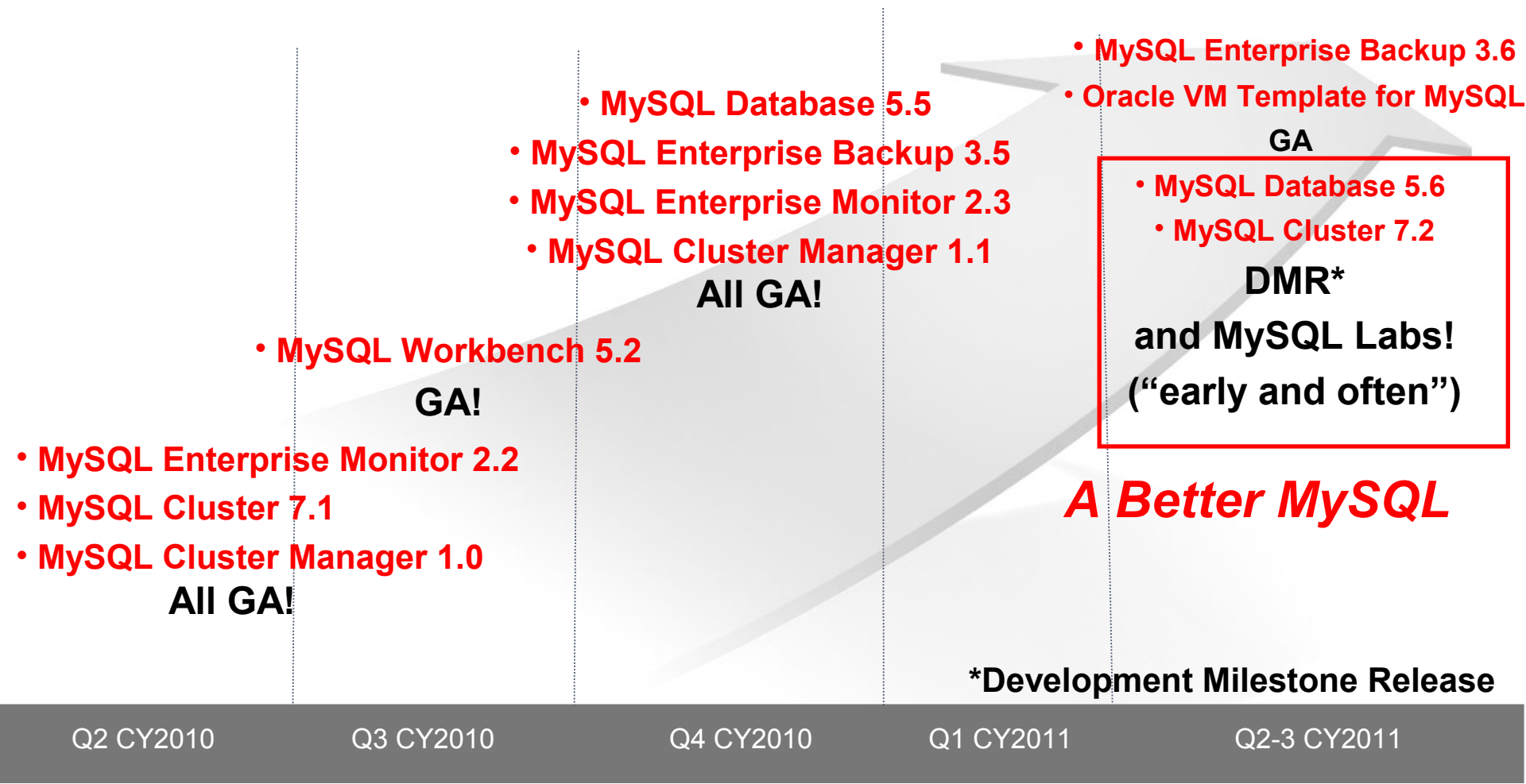
MySQL Community Edition

- Source and binary releases
- GPL license



More Product Releases Than Ever Before

Oracle Drives MySQL Innovation



MySQL: Open Source (GPL)

Available to download and use under the GPL:

- MySQL Database (Community Server)
- MySQL Cluster
- MySQL Workbench Community Edition
- MySQL Utilities (in Python)
- MySQL Connectors
- MySQL Proxy
- Documentation (free to use, not covered under GPL)
- Forums

Set your ambitions high!



Industry Leading Customers



Google™
eBay flickr
Zillow.com^{Beta}
Your Edge in Real Estate
travelocity
WIKIPEDIA
mixi
facebook
YouTube
YAHOO!

Web



sage ingonico
Check Point
SOFTWARE TECHNOLOGIES LTD.
SafeNet
Symantec.
NetQoS
Adobe

OEM / ISV's



SurfControl®
Zimbra™
F-SECURE®
Go Daddy®
SOFTWARE
RIGHT NOW
TECHNOLOGIES

SaaS, Cloud



SFR Deutsche Telekom CISCO
Comcast® ERICSSON
Alcatel-Lucent telenor

Telecommunications



LAFARGE TOYS R US
AP Associated Press
LEADER PRICE
SHINSEI BANK

Enterprise 2.0

Rely on MySQL

Tough Questions

...performance issues?

...servers down?

...expensive, slow queries?

...security policies, change?

Where/When/How to Tune?

...Developers productive?

...Replication synch issues?

..version of MySQL to run?

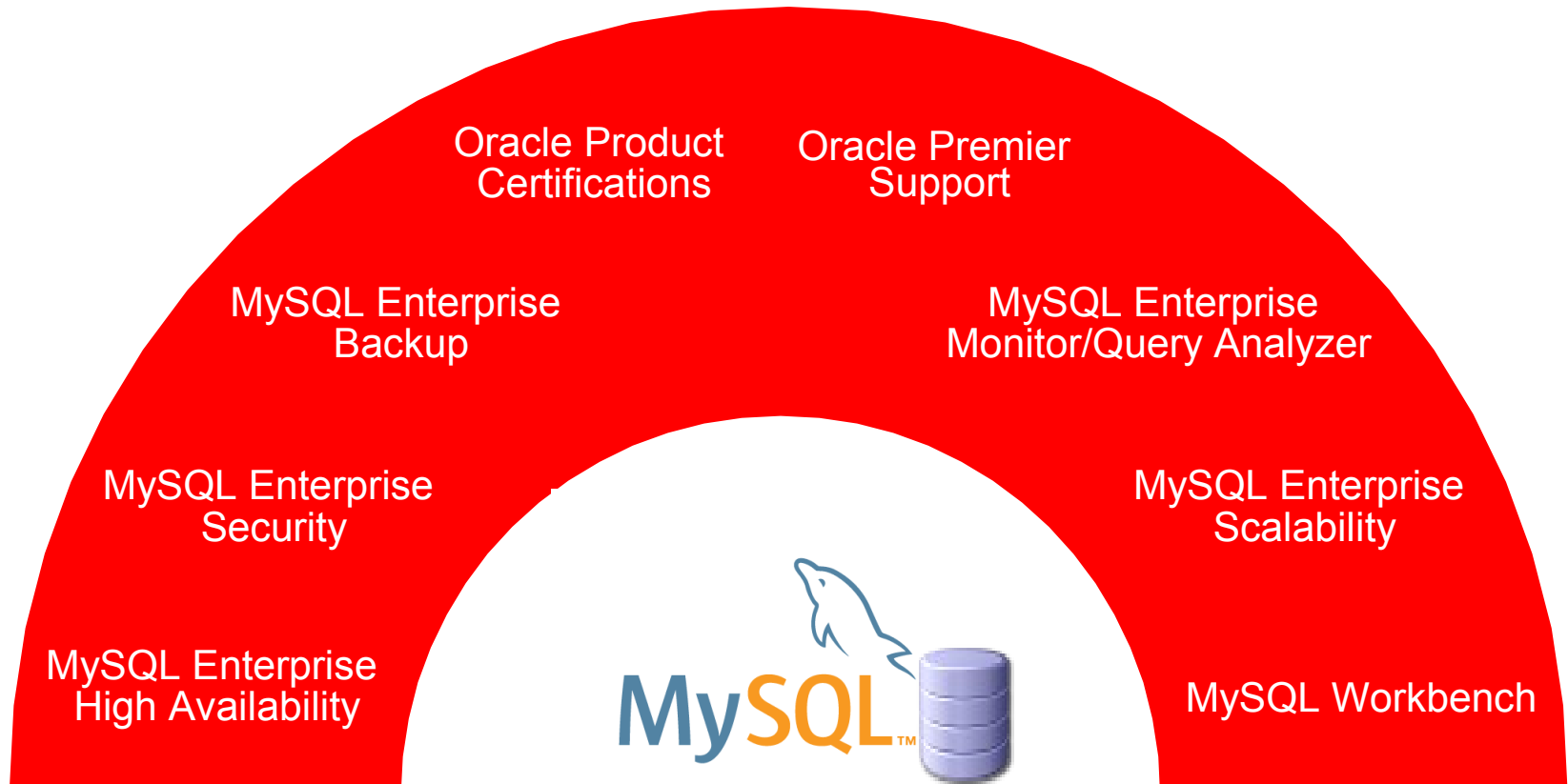
...will systems scale?

...can I recover?

...managing Oracle and MySQL databases?

MySQL Enterprise Edition

Most secure, scalable MySQL Database, Online Backup, Development/Monitoring Tools, backed by Oracle Premier Lifetime Support



MySQL Database

Performance, Reliability, Ease of Use

Support for common development languages/platforms



Connectors

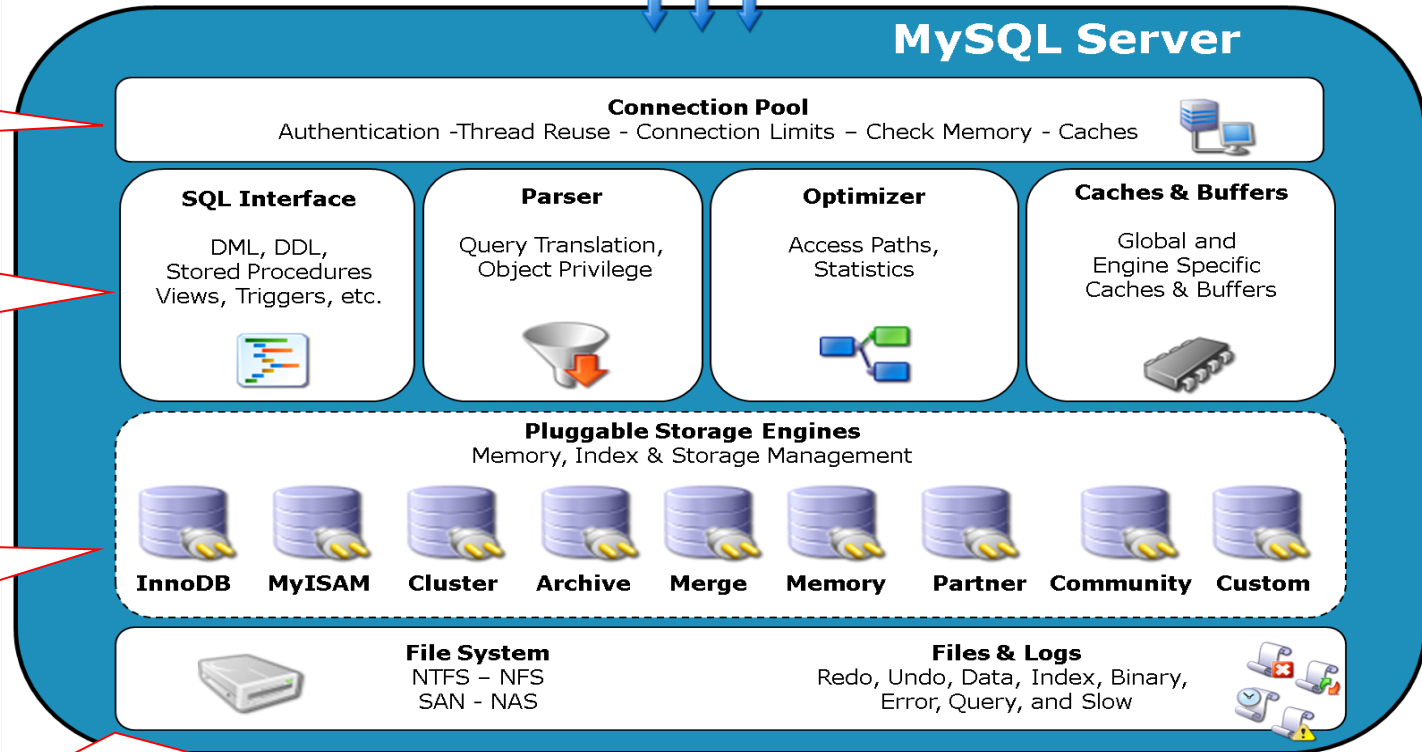
Native C API, JDBC, ODBC, .NET, PHP, Python, Perl, Ruby, VB

Efficient multi-threaded session handling

Full DML, DDL parsing, cost based **optimizer**, caching of queries and result sets

Flexible Storage Engine options for application specific storage needs

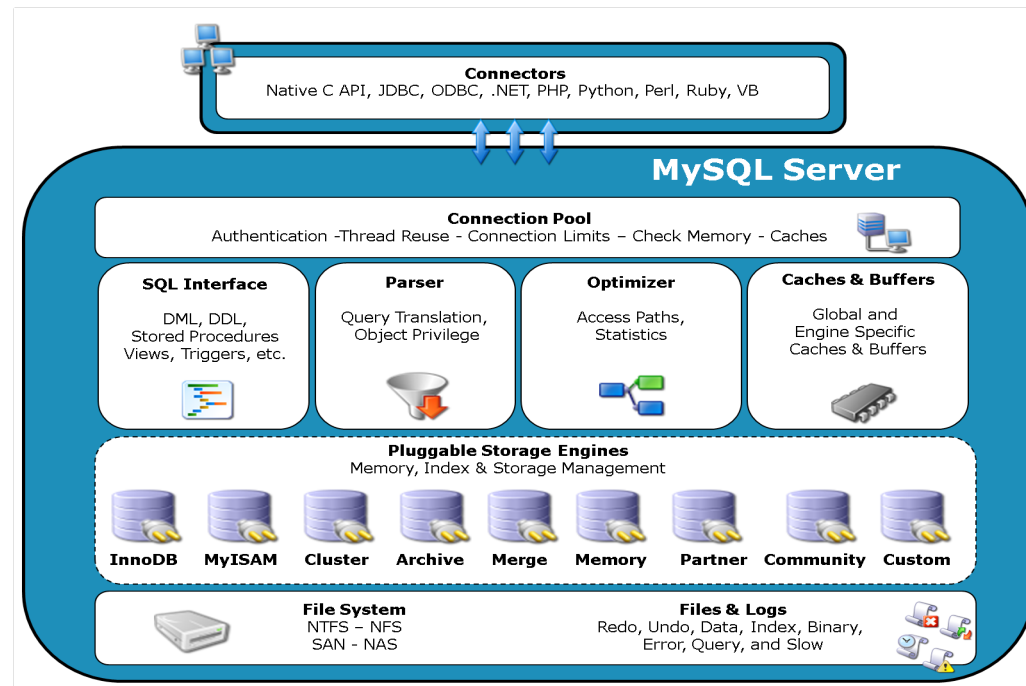
Flexible logging and physical storage options



MySQL Database

InnoDB - Transactional by Default

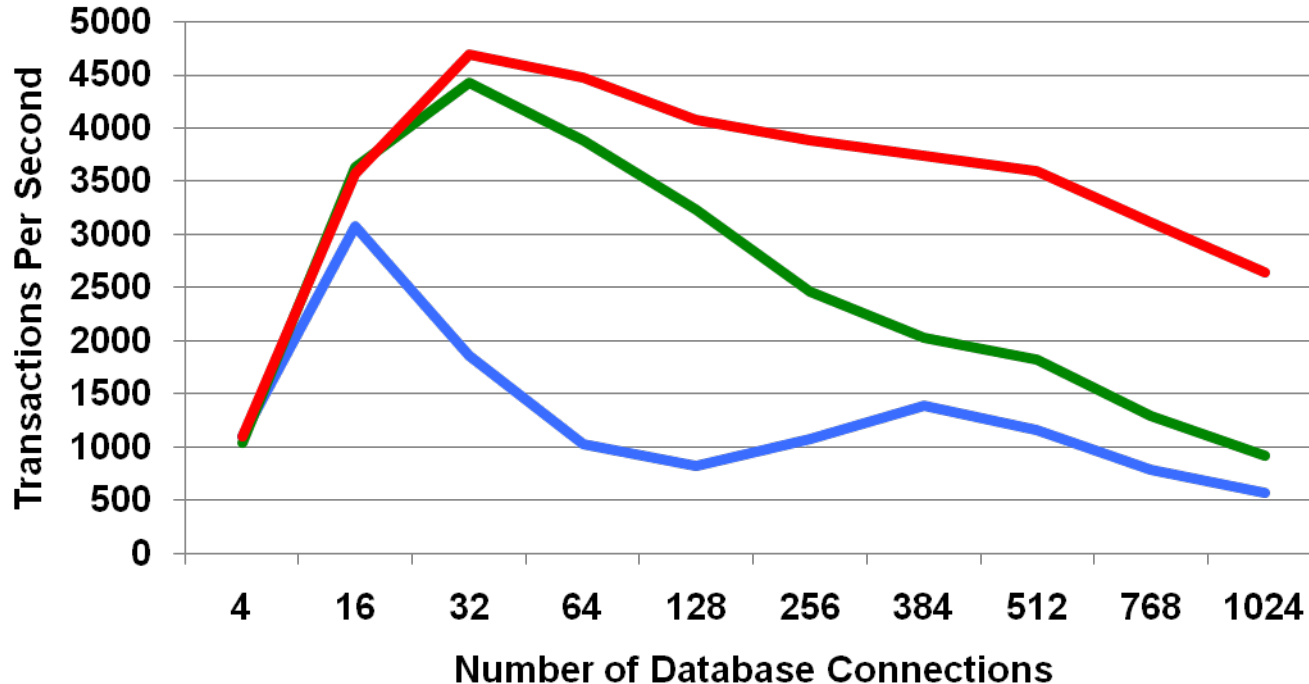
- Default Storage Engine for MySQL 5.5 and above
- ACID-compliant transactions, MVCC
- Row-level locking
- Two phase commit
- Efficient indexing
- Fast DDL operations
- Table compression
- Automatic crash recovery
- Referential integrity
- Online backup
- More



MySQL Database

SysBench Benchmarks - Linux

MySQL 5.5 vs. 5.1 - Read Write



MySQL 5.5.6
(Default InnoDB)

MySQL 5.1.50
(InnoDB Plug-in)

MySQL 5.1.50
(InnoDB built-in)

370% performance gain

for MySQL 5.5 over 5.1.50; at scale

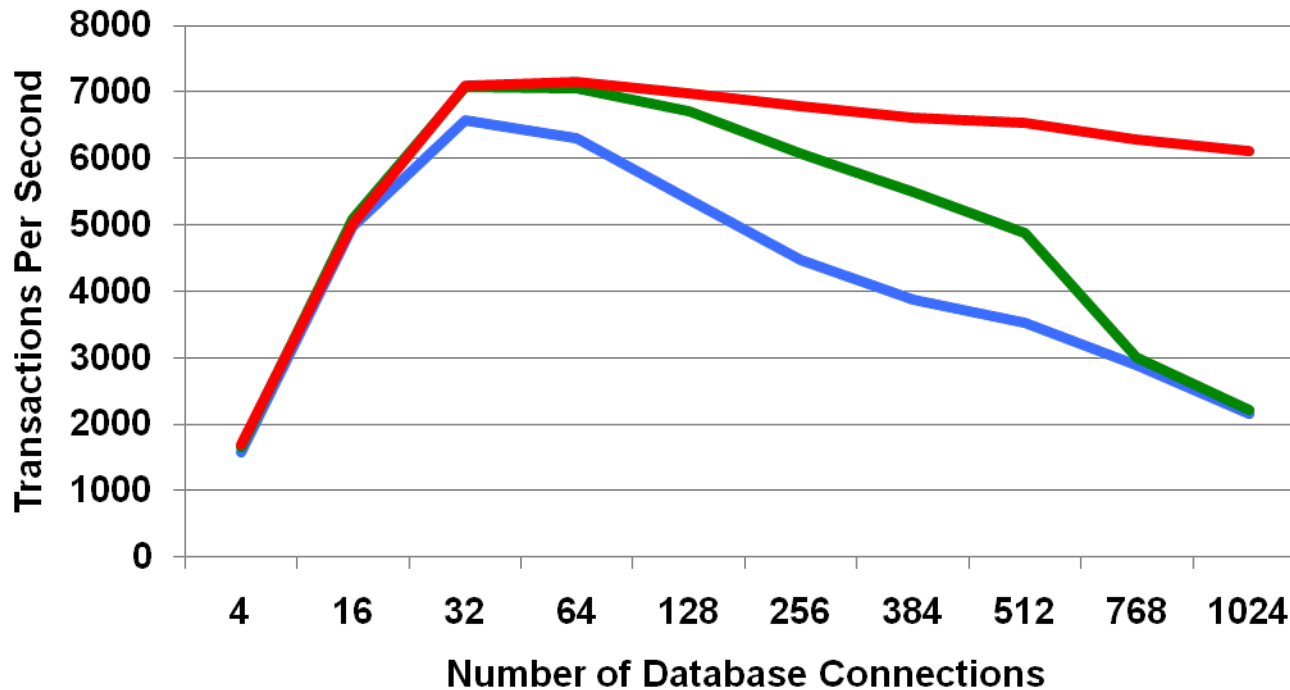
Intel Xeon X7460 x86_64
4 CPU x 6 Cores/CPU
2.66 GHz, 32GB RAM
Fedora 10

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MySQL Database

SysBench Benchmarks - Linux

MySQL 5.5 vs. 5.1 - Read Only



MySQL 5.5.6
(Default InnoDB)

MySQL 5.1.50
(InnoDB Plug-in)

MySQL 5.1.50
(InnoDB built-in)

200% performance gain
for MySQL 5.5 over 5.1.50; at scale

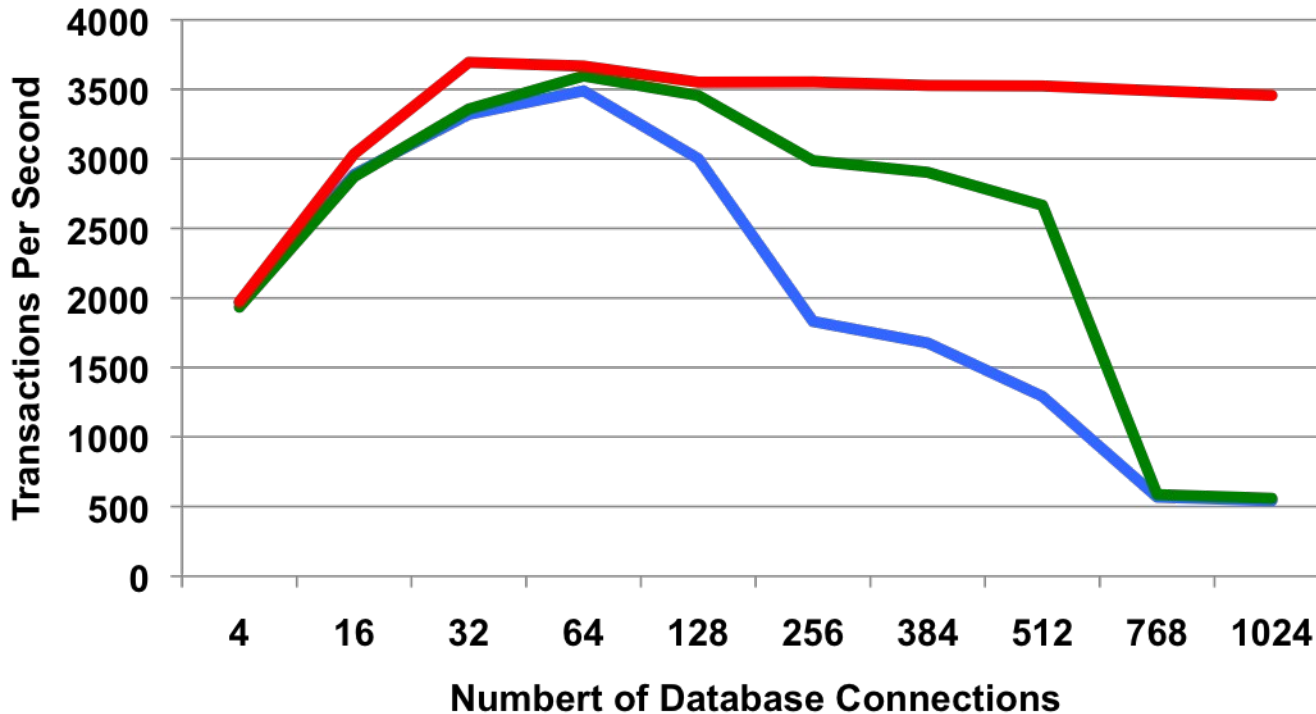
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MySQL Database

SysBench Benchmarks - Windows

MySQL 5.5 vs. 5.1 - Read Only



MySQL 5.5.6

(Default InnoDB)

MySQL 5.1.50

(InnoDB Plug-in)

MySQL 5.1.50

(InnoDB built-in)

540% performance gain

for MySQL 5.5 over 5.1.50; at scale

Intel x86_64

4 CPU x 2 Cores/CPU

3.166 GHz, 8GB RAM

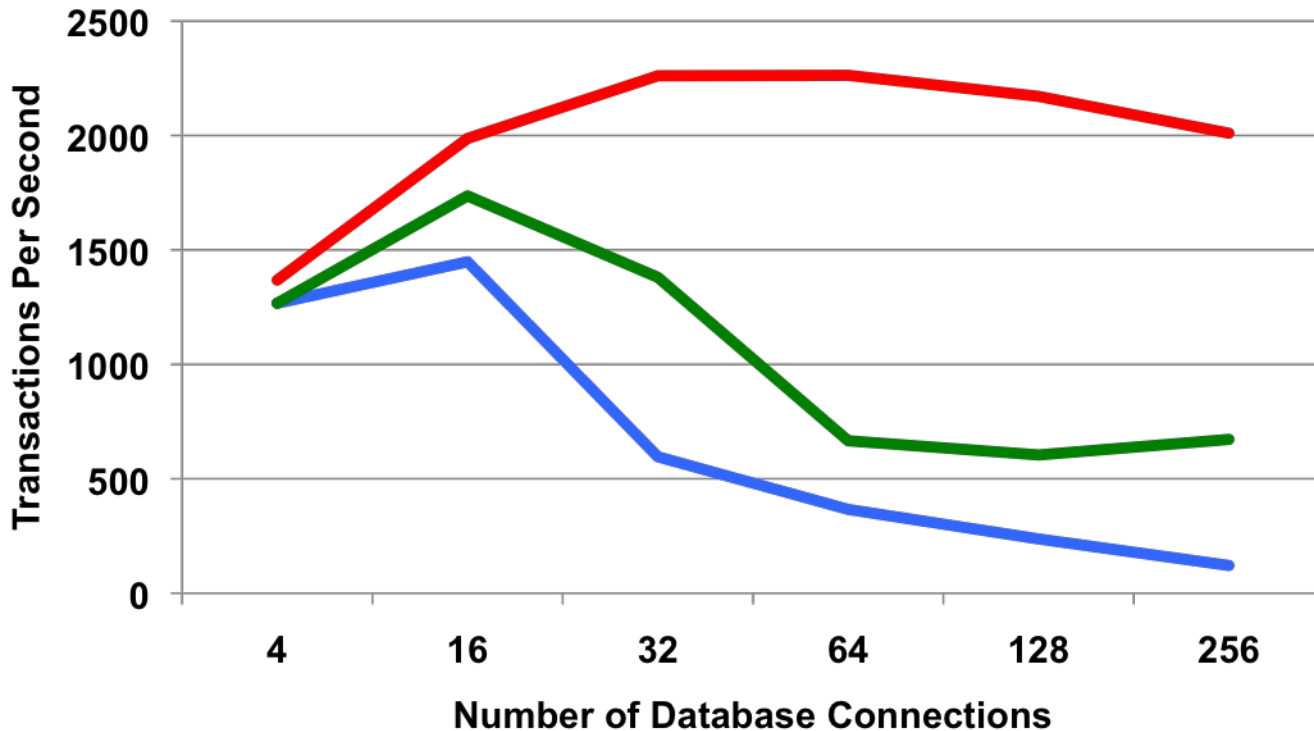
Windows Server 2008

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MySQL Database

SysBench Benchmarks - Windows

MySQL 5.5 vs. 5.1 - Read Write



MySQL 5.5.6

(Default InnoDB)

MySQL 5.1.50

(InnoDB Plug-in)

MySQL 5.1.50

(InnoDB built-in)

1560% performance gain

for MySQL 5.5 over 5.1.50; at scale

Intel x86_64

4 CPU x 2 Cores/CPU

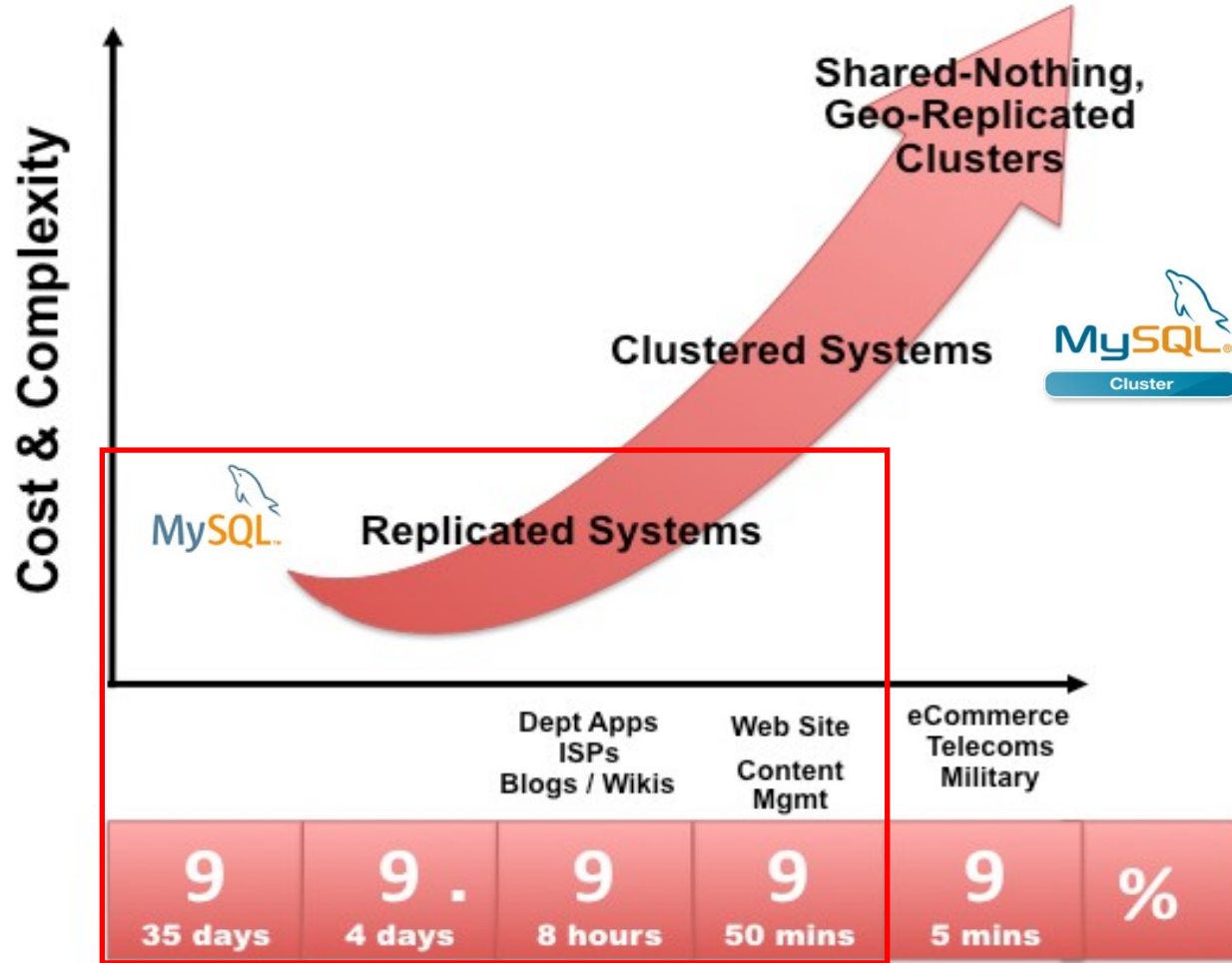
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Windows Server 2008

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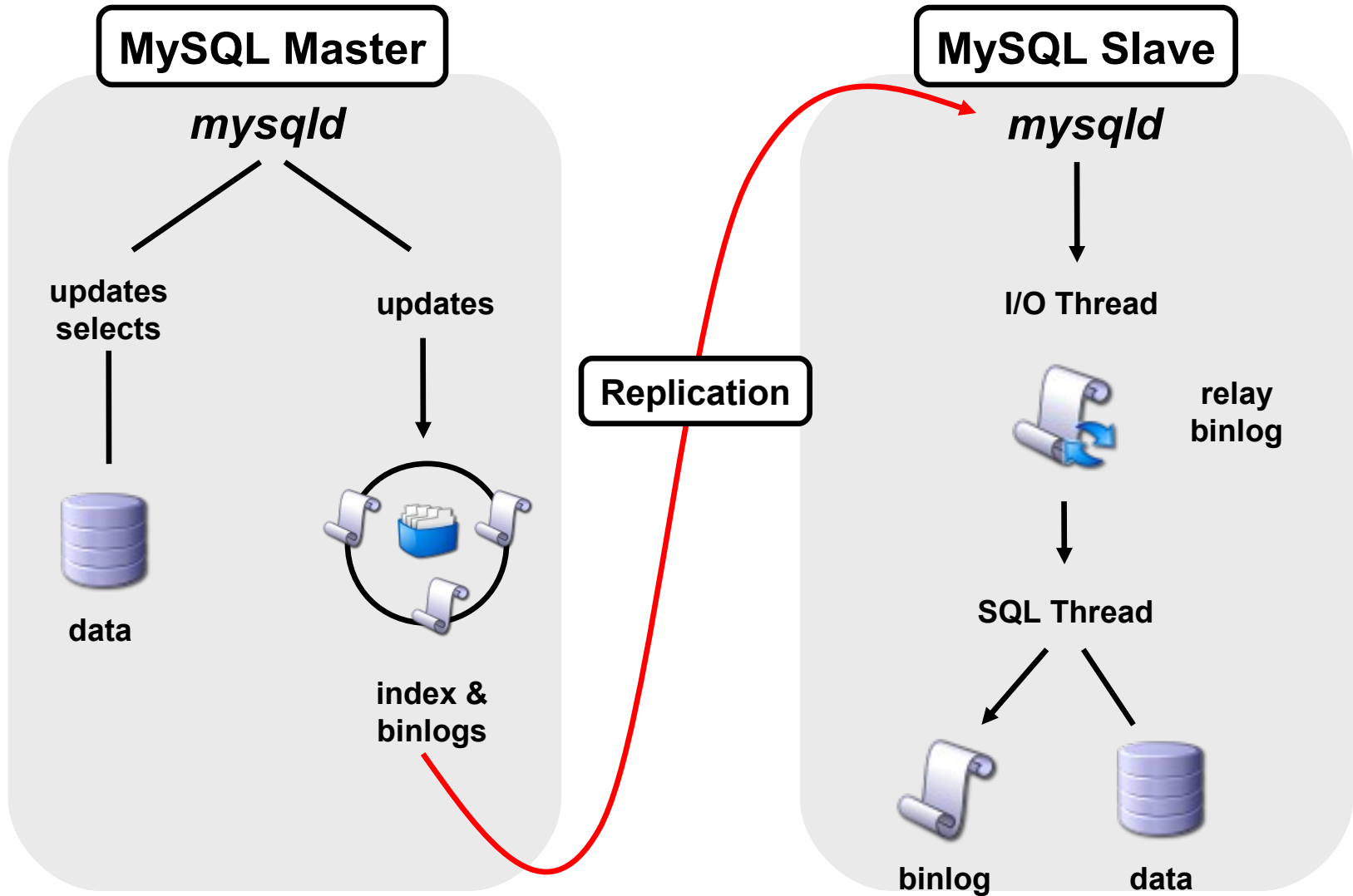
MySQL Database

High Availability with MySQL Replication



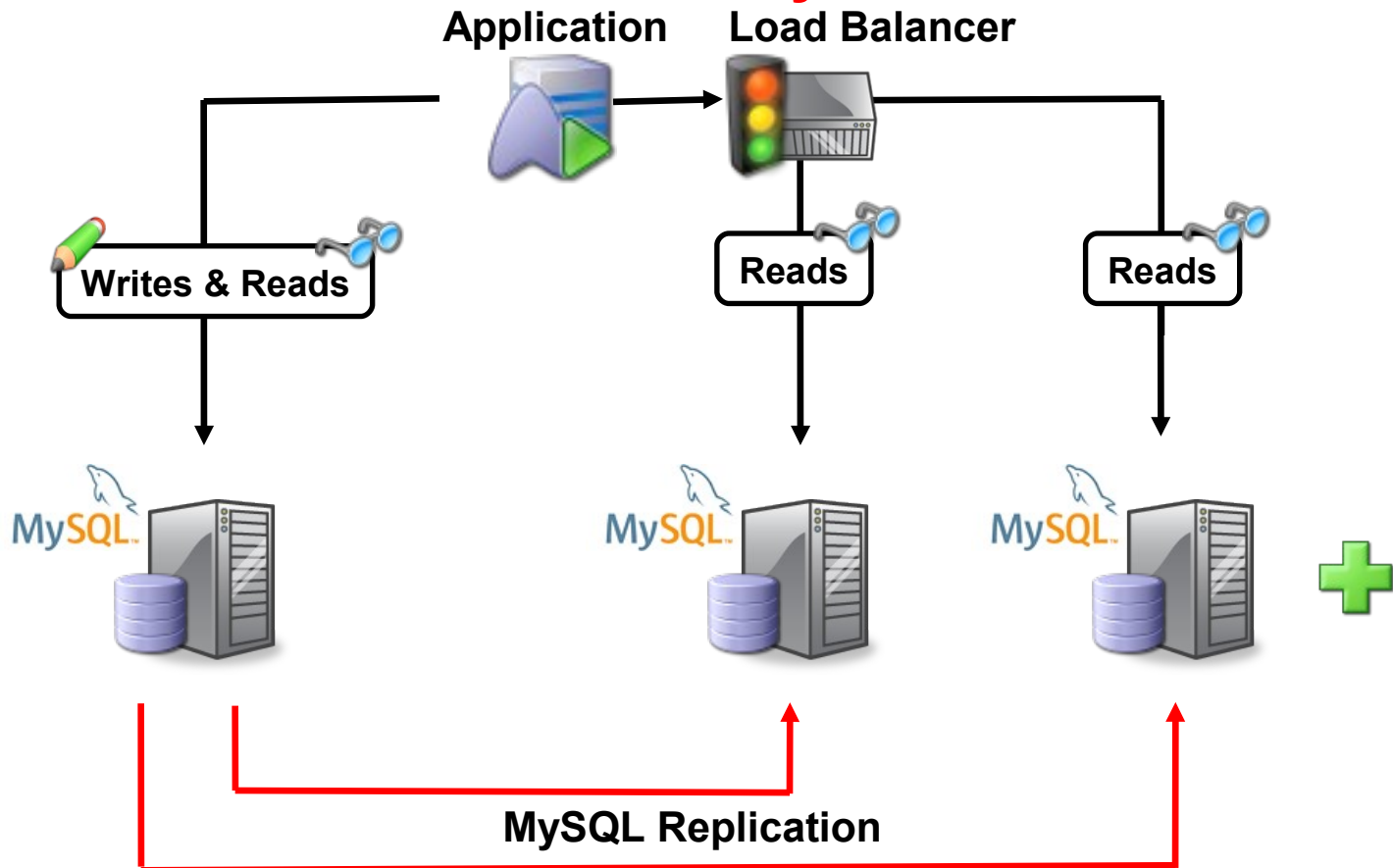
MySQL Database

Replication Internals



MySQL Database

Replication Enables Scalability



- Write to one master
- Read from many slaves, easily add more as needed
- Perfect for read/write intensive apps

MySQL 5.6: A Better MySQL



New!

- MySQL 5.6 builds on MySQL 5.5 by improving:
 - Optimizer for better Performance, Scalability
 - Performance Schema for better instrumentation
 - InnoDB for better transactional throughput
 - Replication for higher availability, data integrity
 - “NotOnlySQL” options for better flexibility

Web Cloud Embedded On-Premise

Try it now:

dev.mysql.com/downloads/mysql

MySQL Enterprise Security

MySQL External Authentication

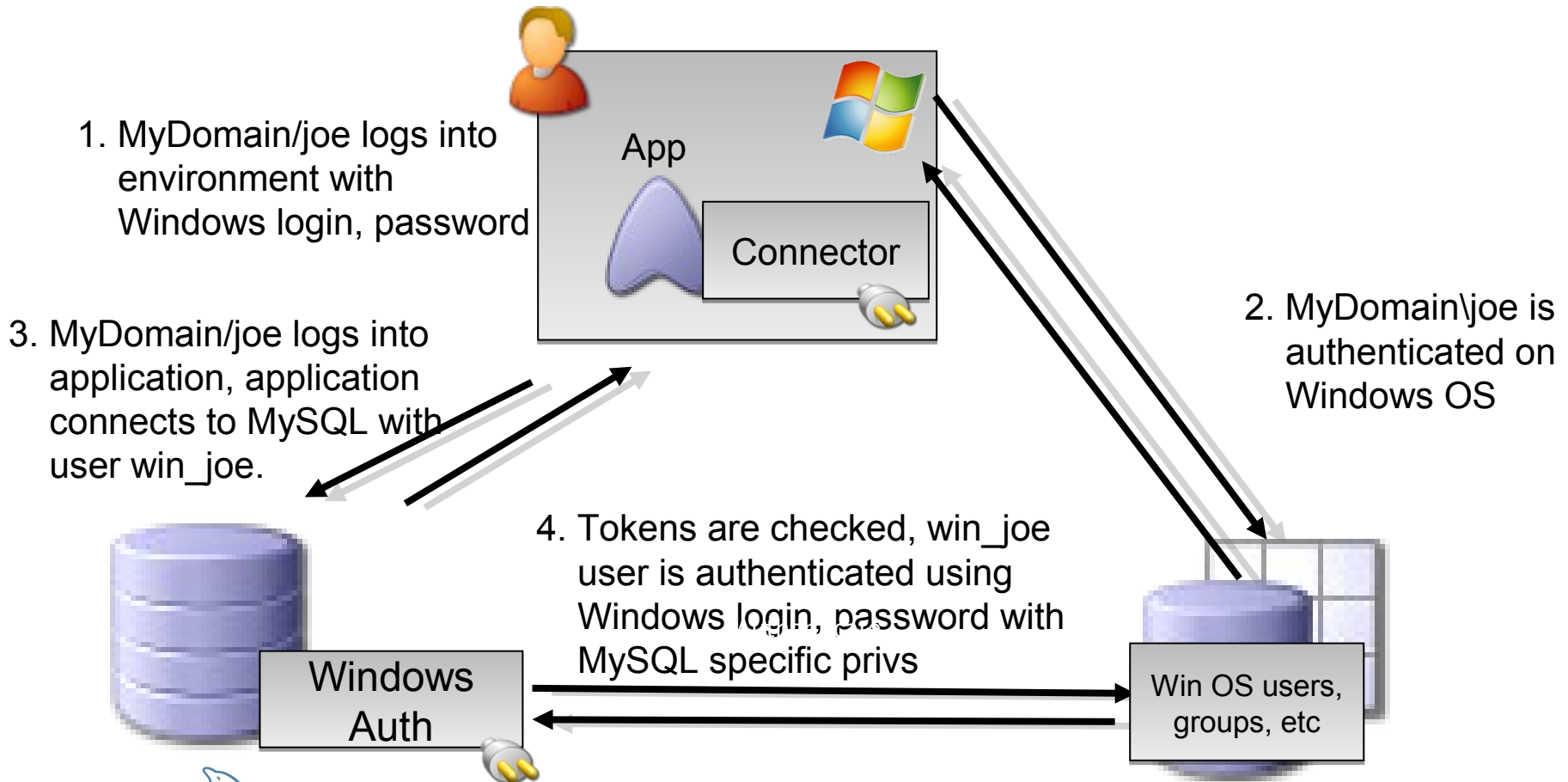


- PAM (Pluggable Authentication Modules)
 - Access external authentication methods
 - Standard interface (Unix, LDAP, others)
 - proxied and non-proxied users
- Windows
 - Access native Windows services
 - Authenticate users already logged into Windows (Windows Active Directory)
- Pluggable Authentication API

Integrates MySQL with existing security infrastructures and SOPs.

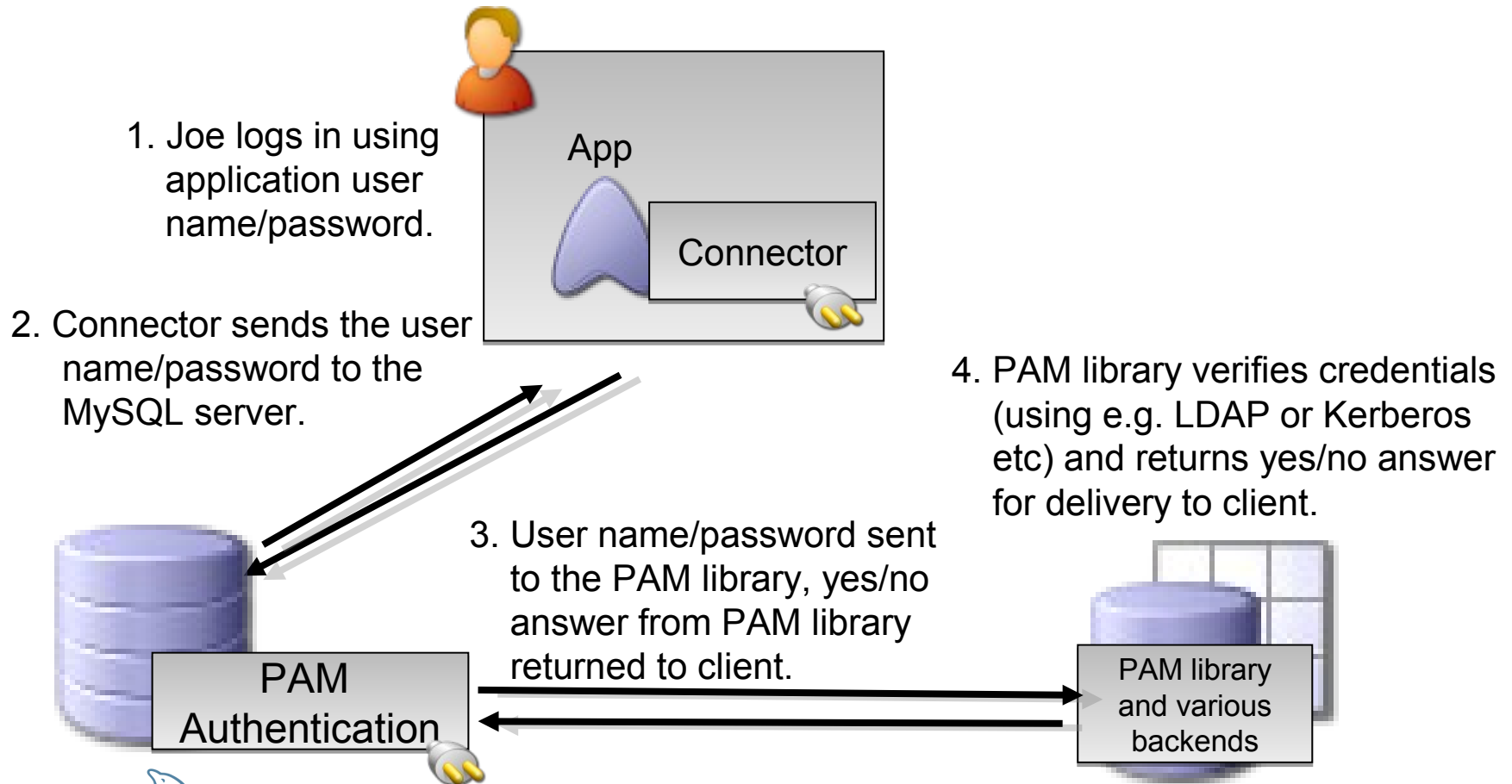
Windows Authentication

Example



```
CREATE USER win_joe  
IDENTIFIED WITH authentication_windows  
AS 'joe';
```

PAM Authentication Example



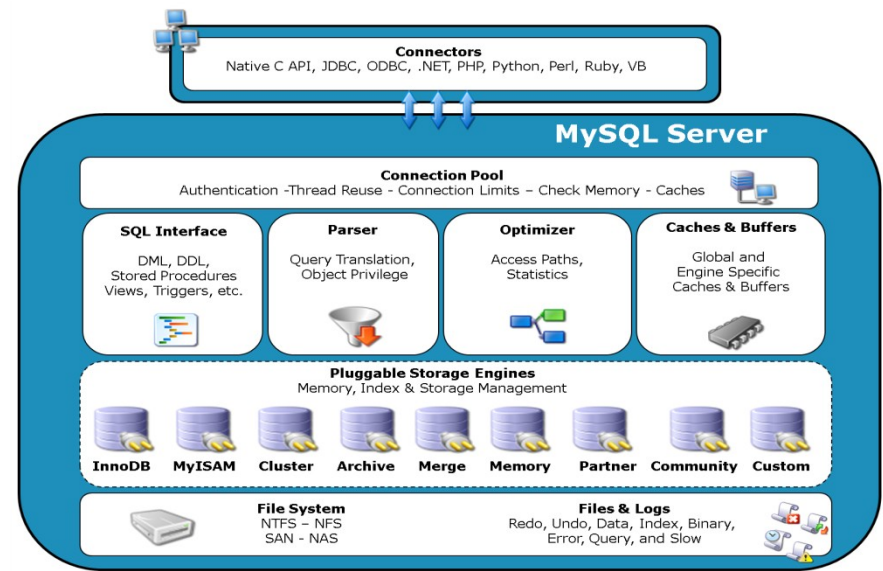
```
CREATE USER joe
IDENTIFIED WITH 'authentication_pam'
AS 'mysql';
```

MySQL Enterprise Scalability

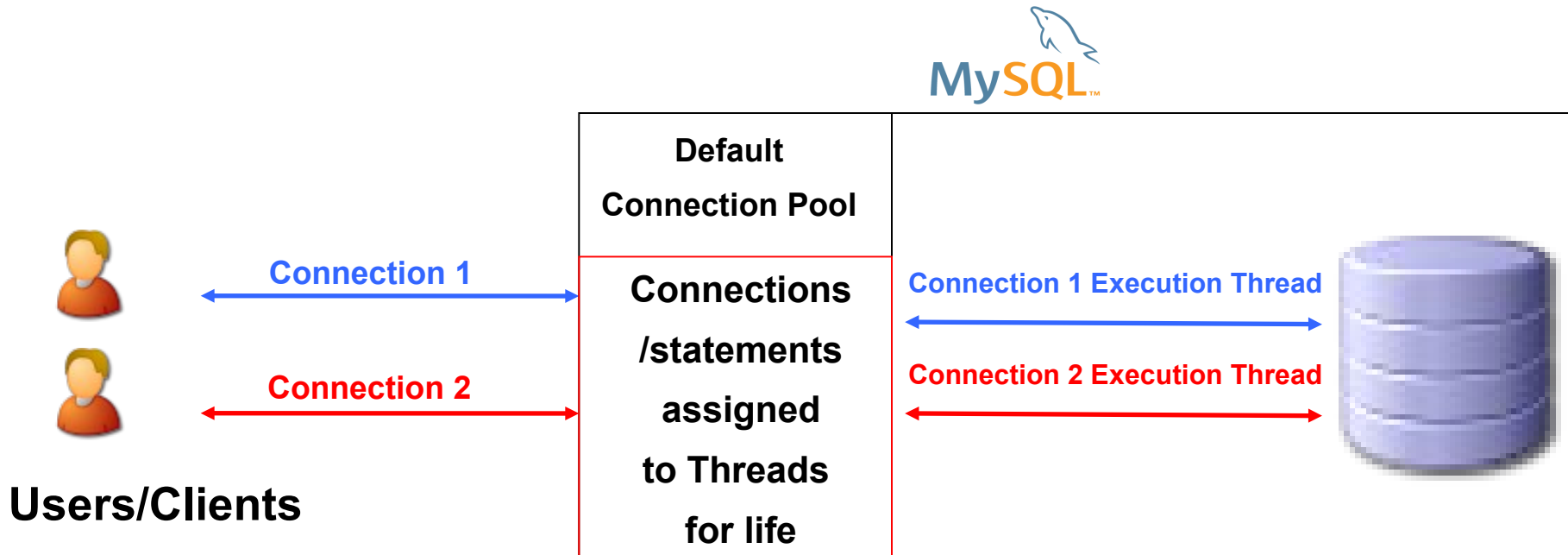
MySQL Thread Pool

New!

- MySQL default thread-handling – excellent performance, can limit scalability as connections grow
- MySQL Thread Pool improves sustained performance/scale as user connections grow
- Thread Pool API

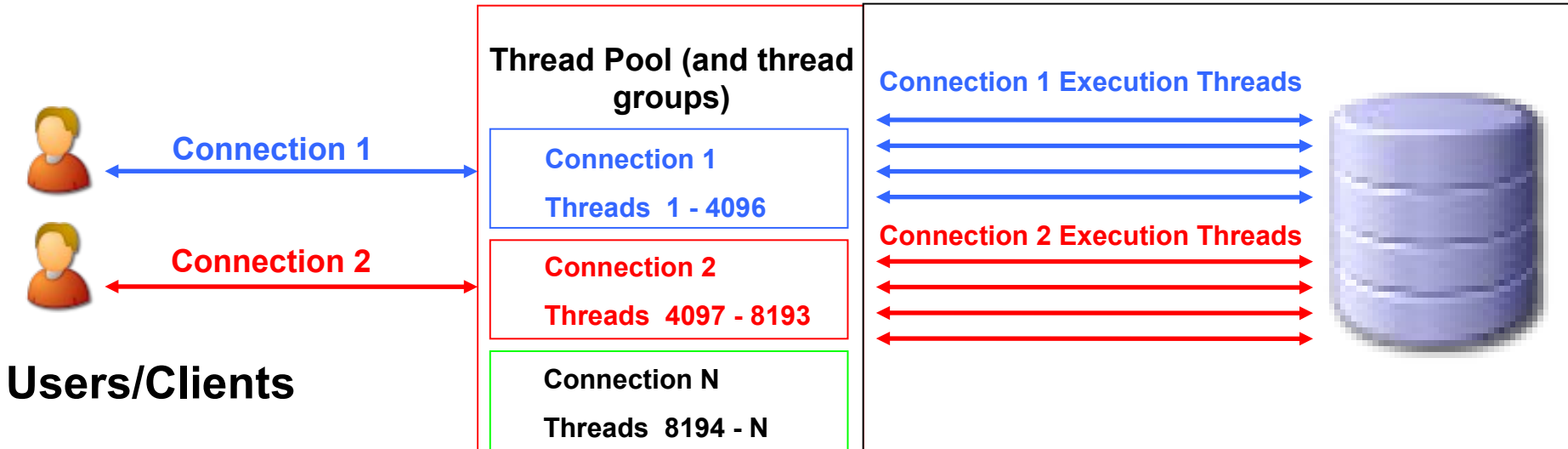


Default Connection Pool



- Connections assigned to 1 thread for the life of the connection
- Same thread used for all connection statement executions (single threaded)

With Thread Pool Enabled

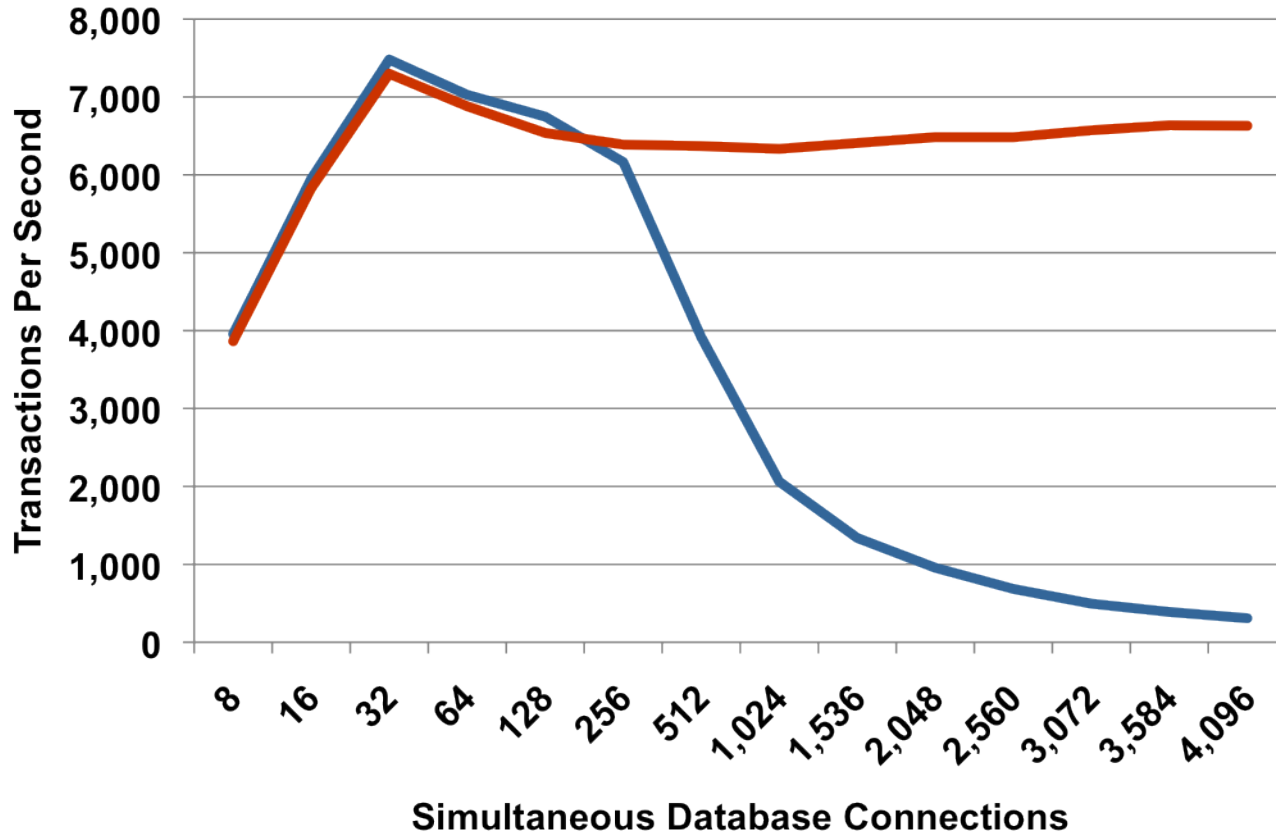


- Pool contains configurable number of thread groups (default = 16), each manages up to 4096 re-usable threads
- Each connection assigned to thread group via round robin

*Ensures **better, sustained performance** as user loads continue to grow.*

MySQL Enterprise Edition

MySQL 5.5 Sysbench OLTP Read/Write



MySQL Enterprise Edition

With Thread Pool

MySQL Community Server

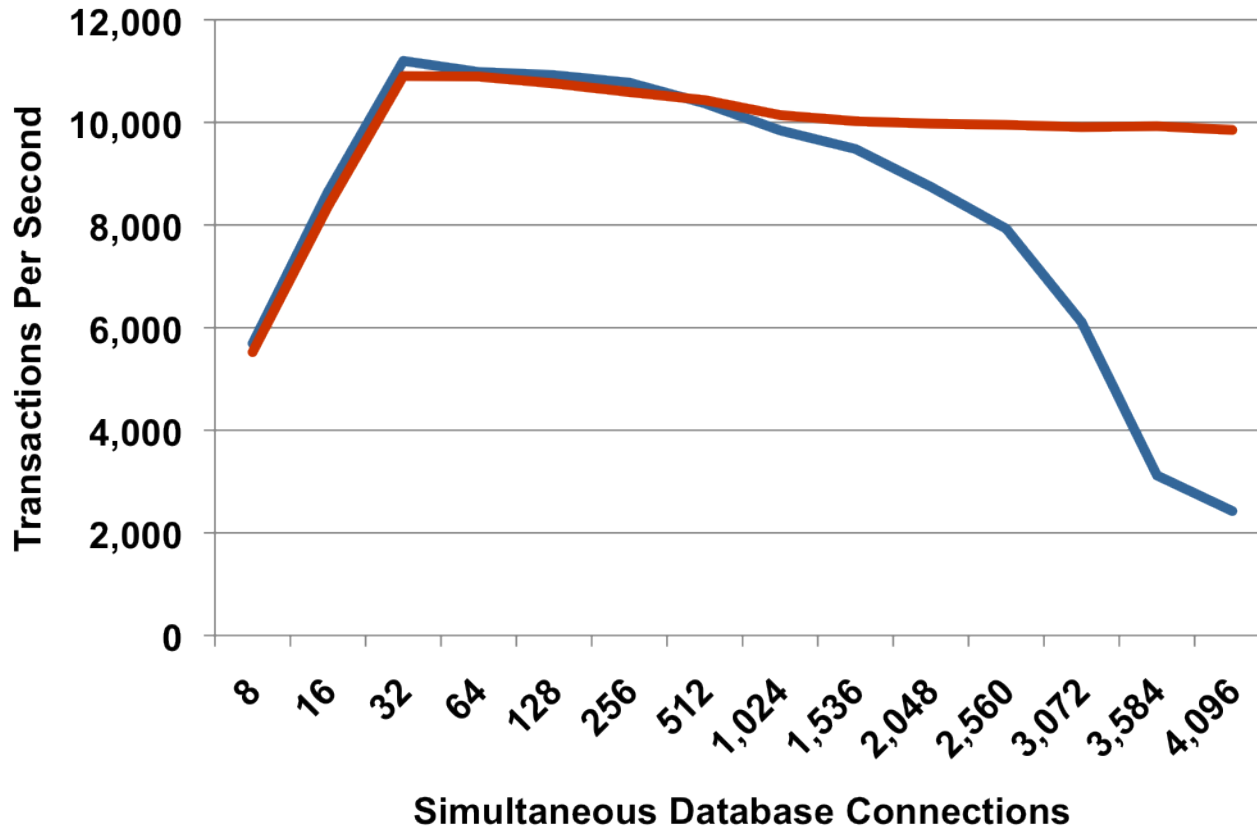
Without Thread Pool

20x Better Scalability with Thread Pool

MySQL 5.5.16
Oracle Linux 6.1, Unbreakable Kernel 2.6.32
2 sockets, 24 cores, 2 X 12-core
Intel(R) Xeon(R) X5670 2.93GHz CPUs
72GB DDR3 RAM
2 X LSI SCSI Disk (MR9261-8i) (597GB)

MySQL Enterprise Edition

MySQL 5.5 Sysbench OLTP Read Only



MySQL Enterprise Edition

With Thread Pool

MySQL Community Server

Without Thread Pool

3x Better Scalability with Thread Pool

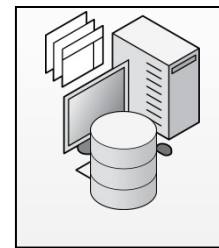
MySQL 5.5.16
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MySQL Enterprise High Availability

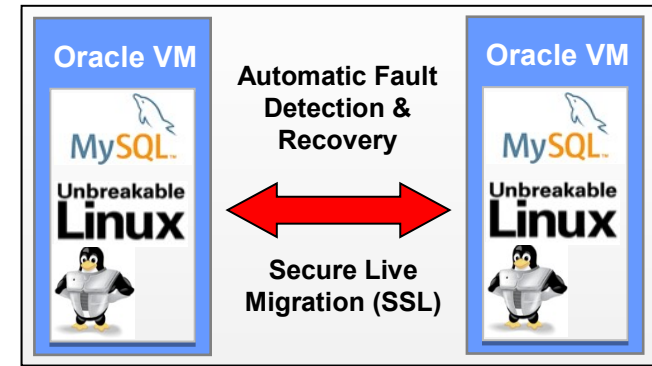
OVM Template for MySQL

New!

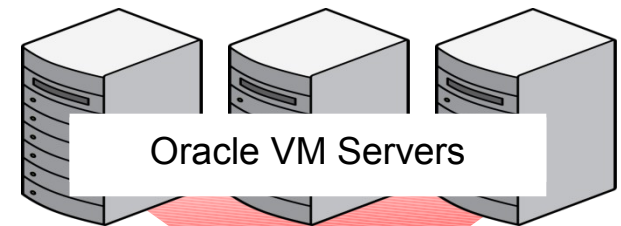
- Oracle Linux with the Unbreakable Enterprise Kernel
- Oracle VM
- Oracle VM Manager
- Oracle Cluster File System 2 (OCFS2)
- MySQL Database (Enterprise Edition)



Oracle VM Manager



Oracle VM Server Pool



Oracle VM Servers

ocfs2

SAN / iSCSI

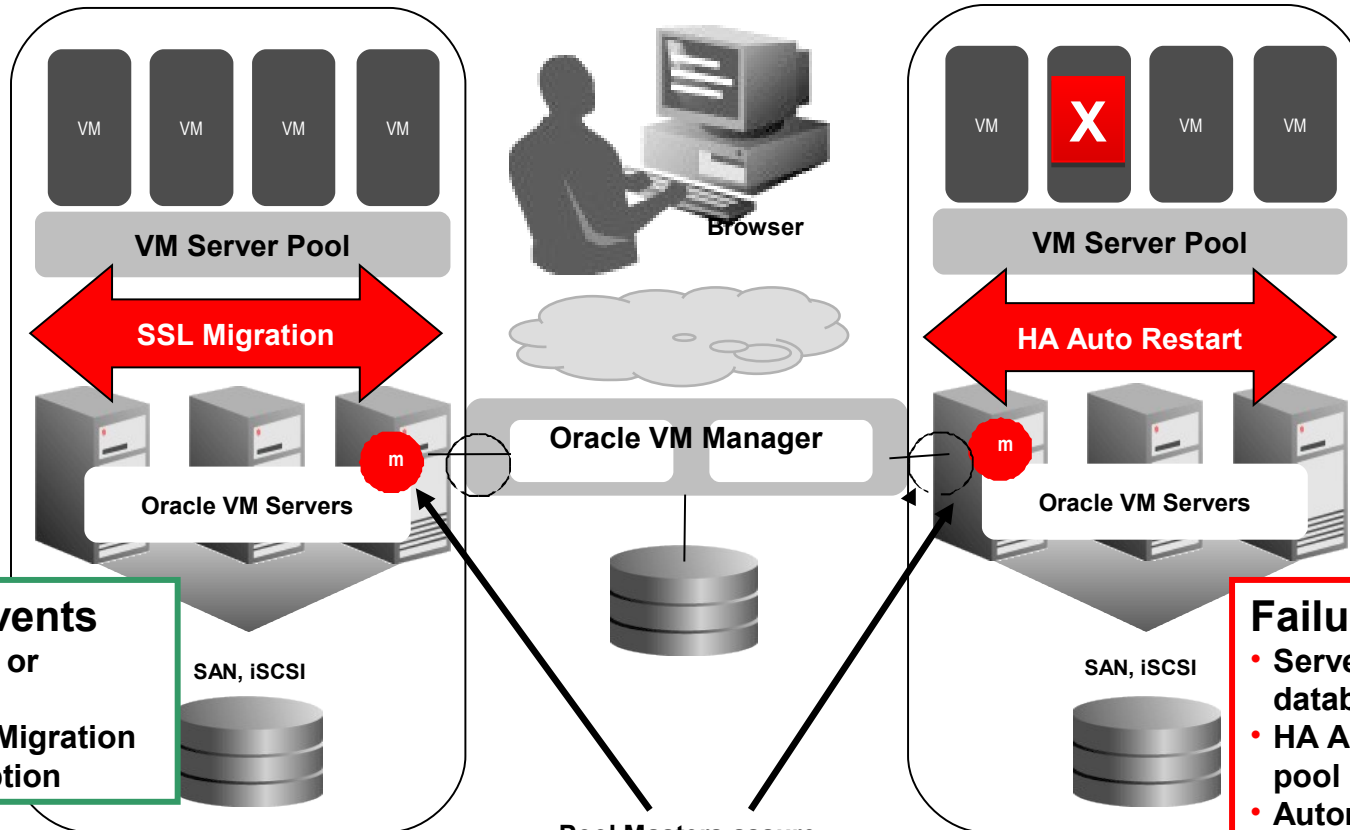


- Pre-Installed & Pre-Configured
- Full Integration & QA Testing
- Single Point of Support**

** Technical support for Oracle Linux and Oracle Virtual Machine requires Unbreakable Linux Network subscription..

MySQL Enterprise High Availability

Protecting Against Planned/Unplanned Downtime



- Planned Events**
- Maintenance or upgrades
 - Secure Live Migration
 - Zero interruption

- Failures**
- Server, VM or database failure
 - HA Auto-restart in pool
 - Automatic failure detection & recovery

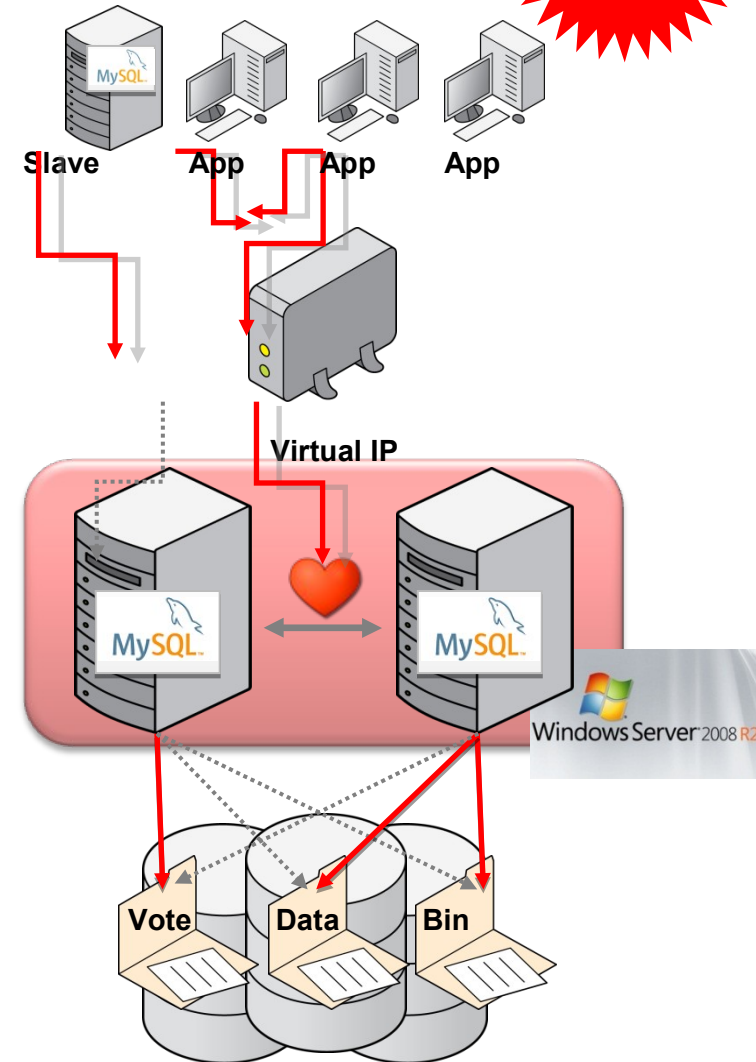
Pool Masters assure Secure Migration or HA restarts complete in the event of a Manager outage

MySQL Enterprise High Availability

Windows Server Failover Clustering

New!

- Windows Server 2008 R2, MySQL 5.5**
- Quorum (3rd vote), data (InnoDB + schema) & binaries (optional) stored in shared storage (testing iSCSI & FCAL)
- Failover:
 - Planned maintenance
 - MySQL service failure
 - Connectivity, Host failures
- Loss of service = couple of seconds + InnoDB recovery time
 - App sees temporary loss of connection and reconnects on same IP address
 - Replication slave recovers automatically
- Cluster managed through MS Failover Cluster Management snap-in GUI
- No new software/scripts required



** Technical support for Windows Server Failover Clustering must be sourced from Microsoft.

ORACLE

MySQL Enterprise Backup

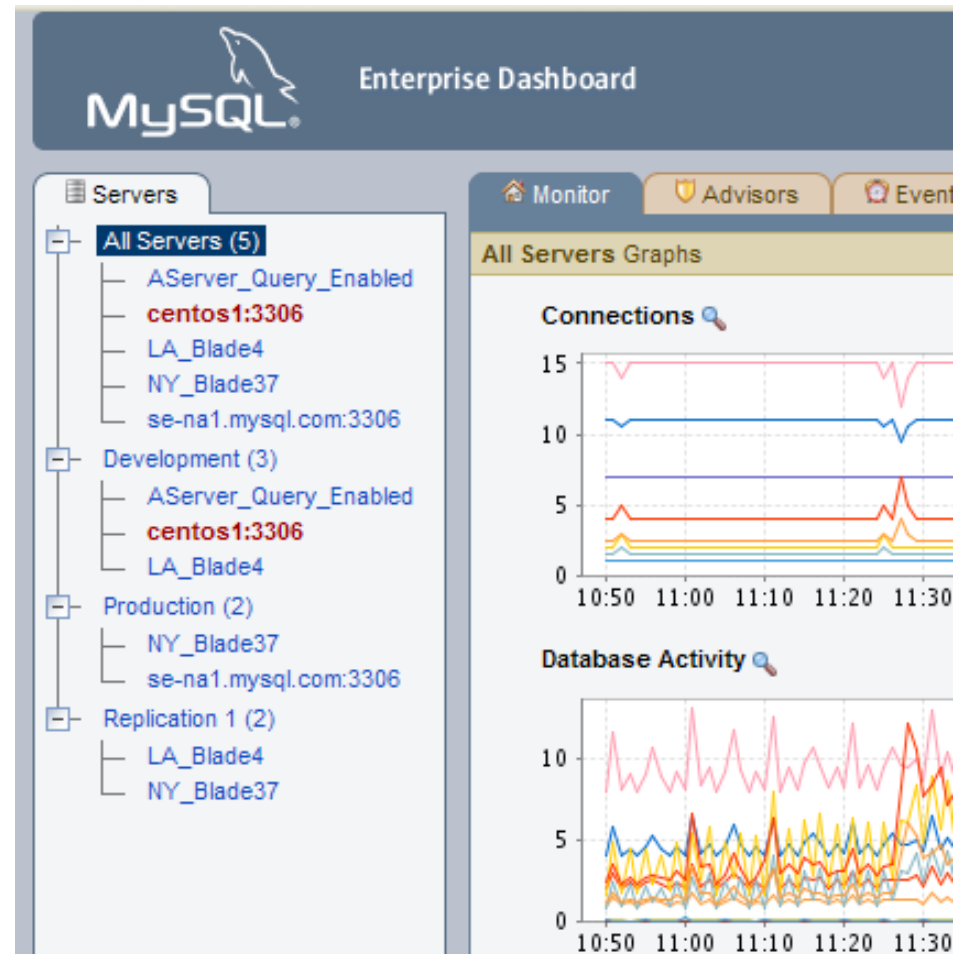
- Online Backup for InnoDB
- Full, Incremental, Partial Backups (scriptable interface)
- Compression
- Point in Time, Full, Partial Recovery options
- Metadata on status, progress, history
- Unlimited Database Size
- Cross-Platform
 - Windows, Linux, Unix
- Certified with Oracle Secure Backup



*Ensures **quick, online backup and recovery** of your MySQL apps.*

MySQL Enterprise Monitor

- Global view of MySQL environment
- Automated, rules-based monitoring and alerts (SMTP, SNMP enabled)
- Query capture, monitoring, analysis and tuning, correlated with Monitor graphs
- Visual monitoring of “hot” applications and servers
- Real-time Replication Monitor with auto-discovery of master-slave topologies
- Integrated with MySQL Support



A Virtual MySQL Tuning Assistant!

MySQL Expert Advisors



MySQL Cluster

- Monitors and Advises on status/ performance of MySQL Cluster Data Nodes.



Custom

- Built by DBA to Enforce Organization specific best practices.



Upgrade

- Monitors and Advises on Bugs/Upgrades that affect current installation



Administration

- Monitors and Advises on Optimal Configuration



Performance

- Monitors and Advises on Optimal Performance Variable Settings



Replication

- Monitors and Advises on Master/Slave Latency.



Security

- Monitors and Advises on Unplanned Security Changes/Loopholes



Schema

- Monitors and Advises on Unplanned Schema Change



Memory Usage

- Monitors and advises on optimal memory/cache settings

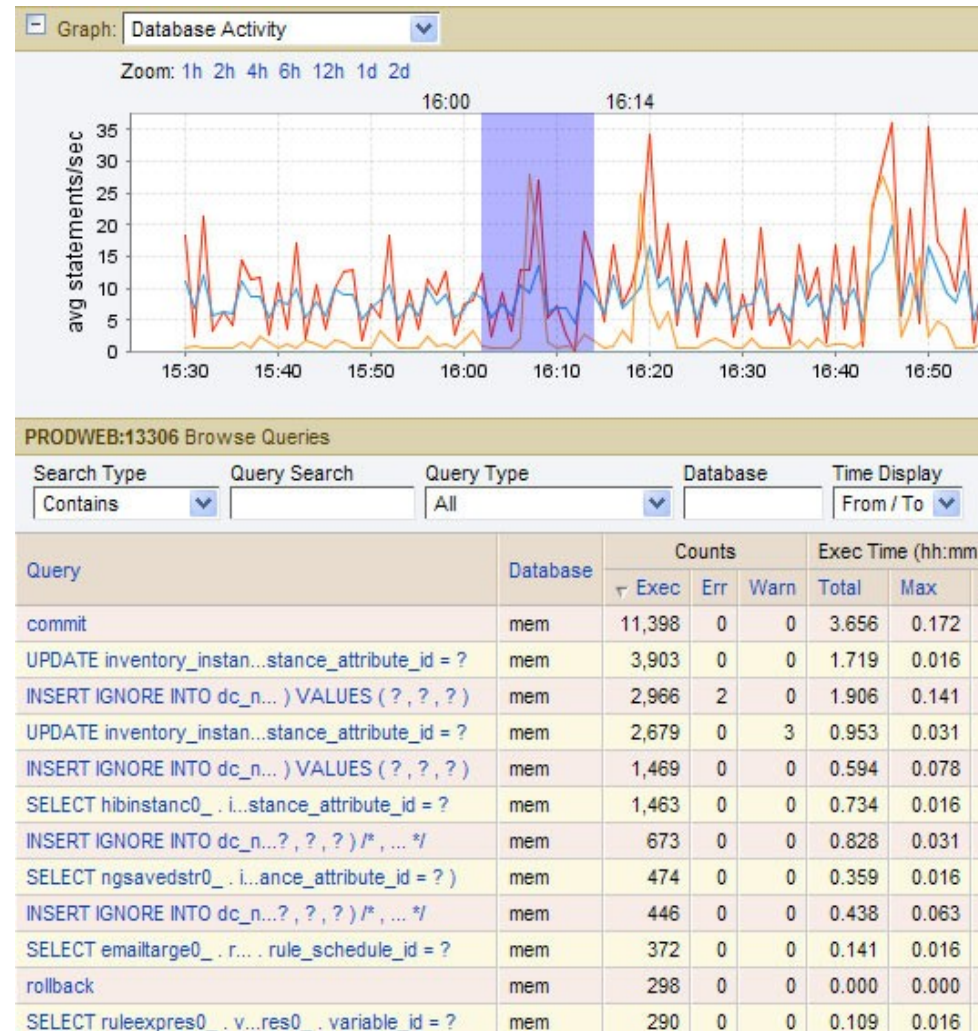
140+ Rules, 40+ MySQL, OS specific Graphs

Save you time writing, deploying, versioning, maintaining custom scripts. Find problems and tuning opportunities you cannot find yourself.

MySQL Query Analyzer

- Centralized monitoring of queries without Slow Query Log, SHOW PROCESSLIST;
- Enabled via MySQL Connectors
- Aggregated view of query execution counts, time, and rows
- Visual “grab and go” correlation with Monitor graphs
- Traces query executions back to source code

Saves you time parsing atomic executions from logs. Finds problems you cannot find yourself.



Query Execution Drill Downs

Sampled Query

[truncated](#) | [full](#) | [formatted](#)

```
SELECT
  hibinvento0_instance_id AS instance1_5_,
  hibinvento0_type_id AS type3_5_, hibinve
  hibinvento0_insert_count AS insert5_5_,
  (
    SELECT
      concat(inv_ns.namespace, '.', t.type
    FROM
      inventory_namespaces
      AS inv_ns JOIN
      inventory_types
      AS t ON (inv_ns.namespace_id = t.
    WHERE
      t.type_id = hibinvento0_type_id
  )
  AS clazz_
FROM
```

Example query exec
with variable
substitution

Trace query exec
back to source code

Source Location

```
at sun.reflect.GeneratedMethodAccessor26.invoke(Unknown :
at sun.reflect.DelegatingMethodAccessorImpl.invoke(Unknown
at java.lang.reflect.Method.invoke(Unknown Source)
at com.mysql.jdbc.ReflectiveStatementInterceptorAdapter.postI
at com.mysql.jdbc.NoSubInterceptorWrapper.postPro
at com.mysql.jdbc.MySQLIO.invokeStatementIntercepto
at com.mysql.jdbc.MySQLIO.sqlQueryDirect(MySQLIO.ja
```

Full exec EXPLAIN

Canonical Query Example Query Explain Query Graphs

Explain of a query that occurred during the Time Span (usually the slowest but not always).

id	select_type	table	type	possible_keys	key	key_len	ref	rows	extra
1	PRIMARY	hibinvento0_	const	instance_name,FKD4320F5BBDD9C29B	instance_name	771	const,const	1	
2	DEPENDENT SUBQUERY	t	const	PRIMARY,FKC2CE5FD6D77E2959	PRIMARY	4	const	1	
2	DEPENDENT SUBQUERY	inv_ns	const	PRIMARY	PRIMARY	4	const	1	

[hide](#)

[expand >](#)

Automated Replication Monitor

- Auto-detects, groups/maintains Master/Slave topologies
- Consolidated, real time status/synch check
- Notifications on Synch Issues
- Proactive vs reactive

Saves you time monitoring and collecting replication status/synch data from MySQL command line.



The screenshot shows the 'Replication Monitoring' section of a software interface. It features a table with columns for 'Servers', 'Type', 'Slave IO', 'Slave SQL', and 'Seconds Behind'. The table is organized into hierarchical groups: 'Basic (2)', 'Ringlet (2)', 'RingSpoke (4)', and 'Tree 3 (5)'. Each group contains individual server entries with their respective roles (master, slave, master/slave) and status (Running). The 'Seconds Behind' column shows '00:00:00' for all entries, indicating they are in sync.

Servers	Type	Slave IO	Slave SQL	Seconds Behind
Basic (2)	TREE	Running	Running	
master:10101	master			
slave:10100	slave	Running	Running	00:00:00
Ringlet (2)	RING	Running	Running	
Yang:10120	master/slave	Running	Running	00:00:00
Yin:10121	master/slave	Running	Running	00:00:00
RingSpoke (4)	MIXED	Running	Running	
ring1:10183	master/slave	Running	Running	00:00:00
ring2:10182	master/slave	Running	Running	00:00:00
ring3:10181	master/slave	Running	Running	00:00:00
ring3slave:10180	slave	Running	Running	00:00:00
Tree 3 (5)	TREE	Running	Running	
master:10153	master			
slave1:10150	slave	Running	Running	00:00:00
slave2master:10152	master/slave	Running	Running	00:00:00
slave2slave:10151	slave	Running	Running	00:00:00
slave3:10154	slave	Running	Running	00:00:00

MySQL Workbench SE

Database Design

- Visual Design, modeling
- Forward/Reverse Engineer
- Schema validation, Schema doc

SQL Development

- SQL Editor - Color Syntax Highlighting
- Objects - Import/Export, Browse/Edit
- Connections - Wizard, SSH Tunnel

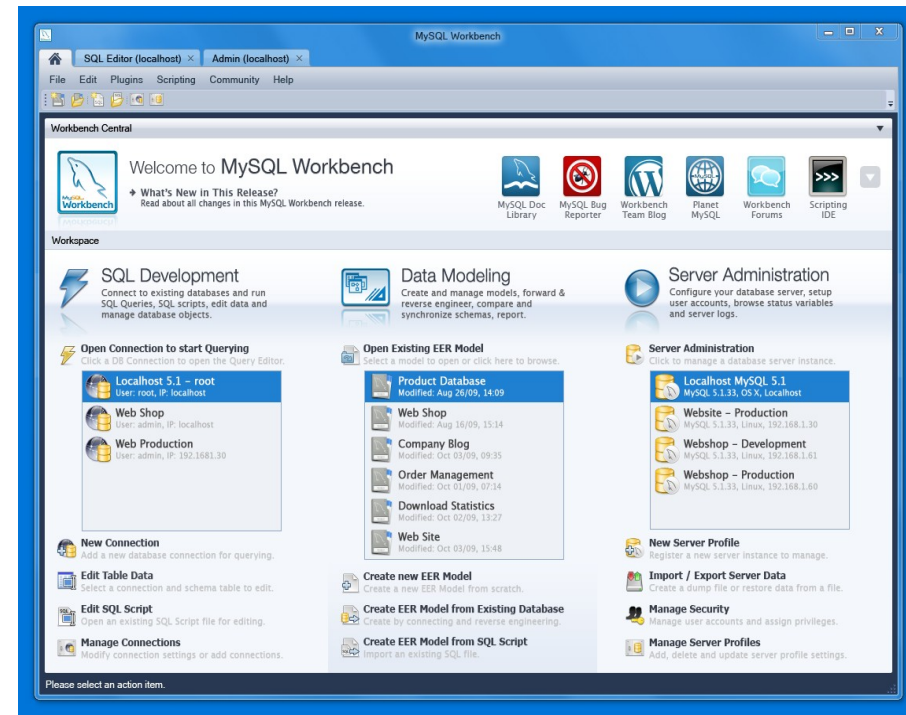
Database Administration

- Status, Configuration, Start/Stop
- Users, Security, Sessions
- Import/Export Dump Files

Scripting & Plug-in Support

UI Designed to match VS 2010

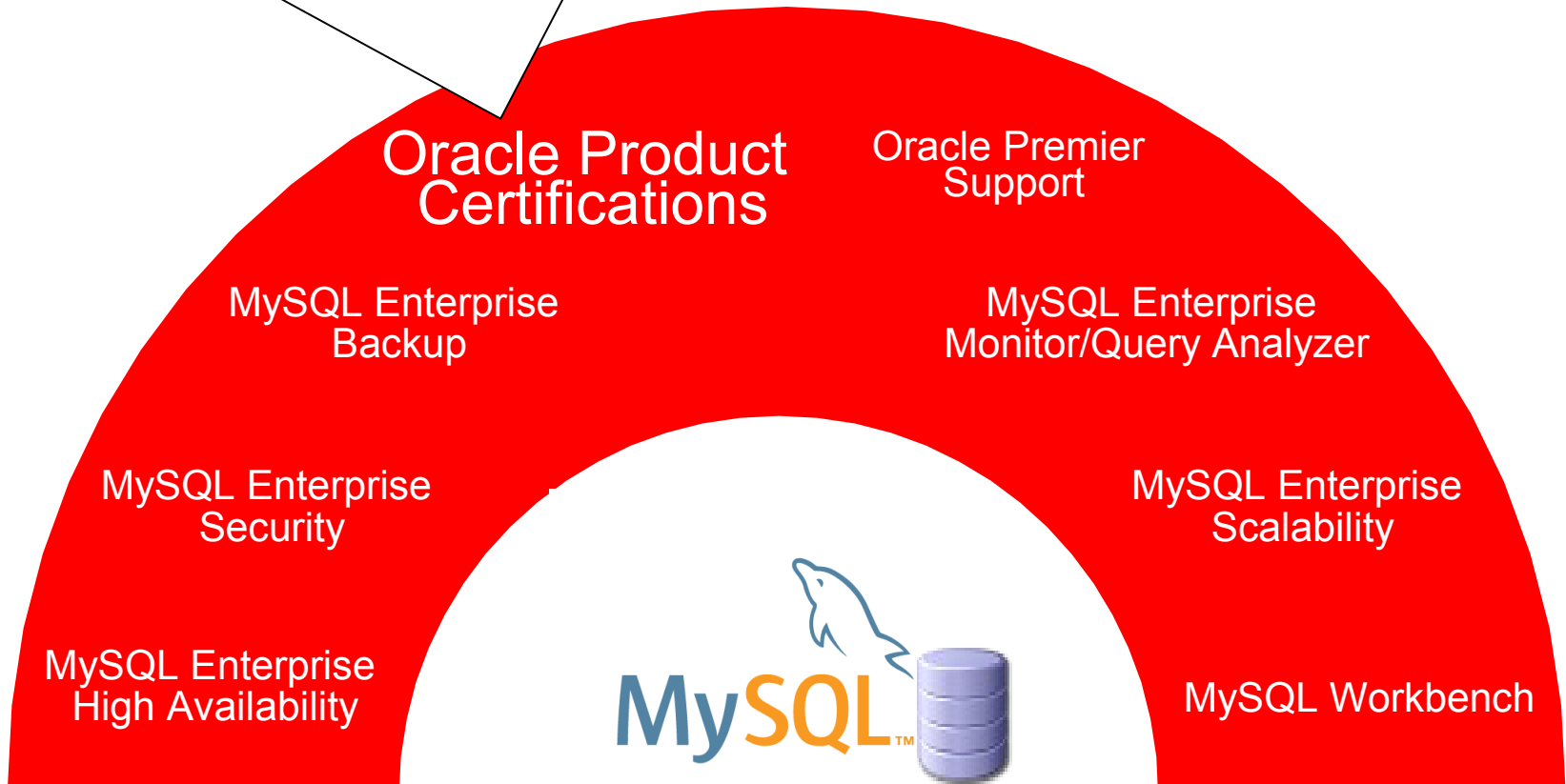
Saves you time developing and managing your MySQL apps.



MySQL Enterprise Edition

New!

Enables you to manage your Oracle and MySQL databases with Oracle tools/solutions you are already using.



ORACLE

MySQL Enterprise Oracle Certifications



- WebLogic Server
- Database Adapter for Oracle SOA Suite **
- Oracle Business Process Management **
- Oracle Virtual Directory
- Oracle Data Integrator
- Oracle Enterprise Performance Management
- Oracle Identity Analytics
- Open SSO STS, Open SSO Fedlet
- All ship with MySQL 5.x JDBC driver
- ** MySQL as a Metadata Repository option (in progress)

ORACLE®
FUSION MIDDLEWARE 11g



MySQL Enterprise Oracle Certifications

New!

- Oracle Linux
- Oracle VM
- Oracle VM Template for MySQL EE
- Oracle GoldenGate
- Oracle Secure Backup
- My Oracle Online Support

ORACLE®
FUSION MIDDLEWARE

ORACLE®
FUSION MIDDLEWARE
IDENTITY MANAGEMENT

ORACLE®
E-BUSINESS SUITE

ORACLE® 11g
FUSION MIDDLEWARE
GOLDENGATE

ORACLE®
MY ORACLE SUPPORT

MySQL™

ORACLE®
EXADATA

ORACLE®
VM

ORACLE®
DATABASE

Enables you to manage your Oracle and MySQL databases with Oracle tools/solutions you are already using.



Oracle Premier Support for MySQL

- 24 X 7 Problem Resolution Services
- Unlimited Support Incidents
- Knowledge Base
- Maintenance Releases, Bug fixes, Patches, Updates
- MySQL Consultative Support
- Staffed by experienced, seasoned MySQL Engineers



Tough Questions, Real Solutions

...performance issues?

- MySQL Enterprise Scalability
- MySQL Enterprise Monitor, Advisors, Query Analyzer
- MySQL Consultative Support

...expensive, slow queries?

- MySQL Enterprise Monitor, Query Analyzer

Where/When/How to Tune?

- MySQL Enterprise Monitor, Advisors, Query Analyzer
- MySQL Consultative Support

...Replication synch issues?

- MySQL Enterprise Monitor, Replication Monitor
- Oracle Premier 7x24 Support

...will systems scale?

- MySQL Enterprise Scalability
- MySQL Enterprise Monitor, Advisors, Query Analyzer
- MySQL Consultative Support

...managing Oracle and MySQL databases?

- Oracle Product Certifications

...servers down?

- Oracle Premier 7x24 Support
- MySQL Enterprise Monitor, Advisors
- MySQL Enterprise High Availability

...security policies, change?

- MySQL External Authentication
- MySQL Enterprise Monitor, Security Advisor

...Developers productive?

- MySQL Workbench SE
- MySQL Enterprise Monitor, Query Analyzer

..version of MySQL to run?

- Oracle Premier 7x24 Support

...can I recover?

- MySQL Enterprise Backup

And Now for the esoteric stuff



Mysqlnd - MySQL native driver for PHP

- Non-blocking, asynchronous queries
- 150+ performance statistics
- Since 5.3 used for Windows, default as of 5.4

Free PECL drop-in solutions for all PHP MySQL extensions:

- mysqlnd_ms - replication and load balancing support *new*
- mysqlnd_qc - client-side query cache (TTL) mysqlnd_uh - swiss-army-knife to hack mysqlnd with PHP

Better licensing, easier to build and distribute

Other goodies

- Unique to mysqlnd...
 - 150+ core performance statistics
 - 30+ query cache performance statistics
 - read-only variable concept for memory savings
 - debug and trace log
- ... find documentation: php.net/
- ... read development blogs: planet.mysql.com
- ... read more development blogs: planet-php.org
- ... follow on Twitter: [@phperror](https://twitter.com/phperror), [@Ulf_Wendel](https://twitter.com/Ulf_Wendel)

MySQL 5.6 – Milestone releases

Binlog API, Binlog Group
Commit, Global
Transactions Ids,
InnoDB Features,
InnoDB FTS,
InnoDB/Memcached,
Performance Schema

Cluster 7.2 with
Memcached

These binaries were created by MySQL testing servers..

They are provided solely for testing purposes, to try the latest bug fixes and generally to keep up with the development.

Please, *DO NOT USE THESE BINARIES IN PRODUCTION.*

Instead, install them on a spare server.

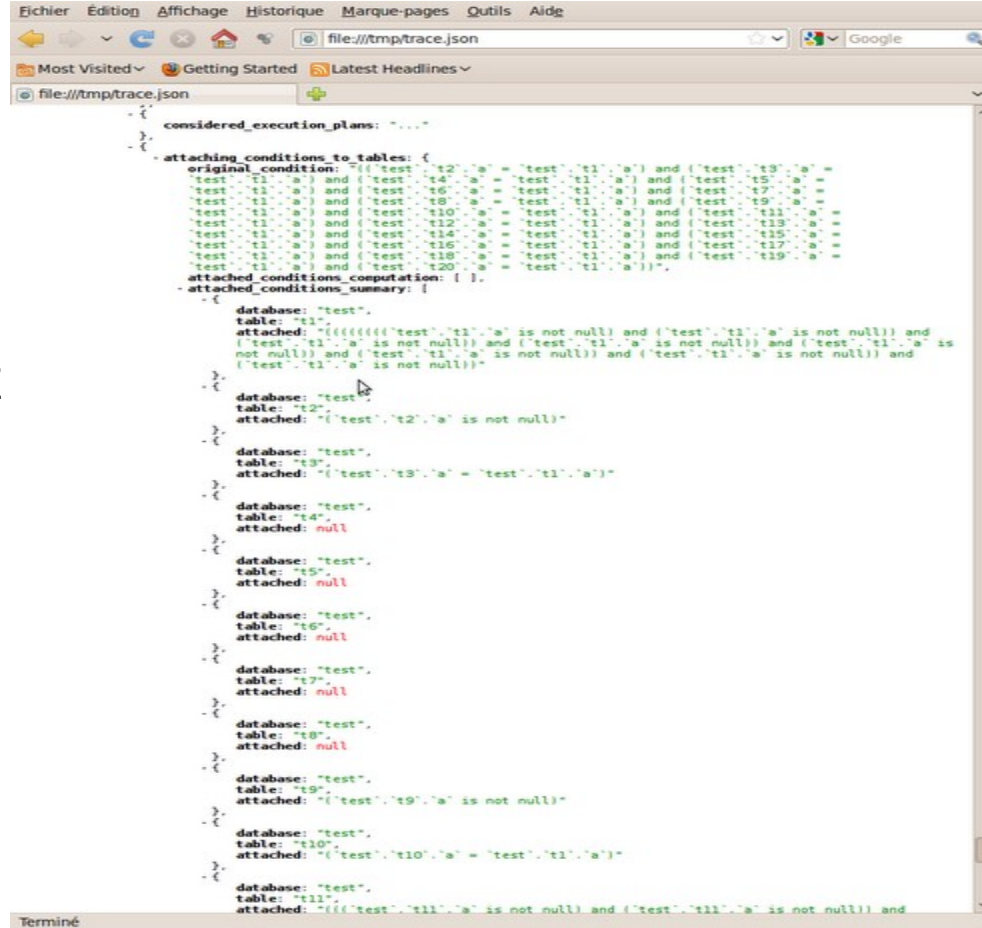
If you are looking for production ready binaries, please visit MySQL Downloads.

MySQL Software is provided under the GPL License

Optimizer Tracing – Beyond EXPLAIN

```
SET optimizer_trace="enabled=on";  
SELECT Name FROM City WHERE  
ID=999;  
SELECT trace into dumpfile '/tmp/foo'  
FROM  
INFORMATION_SCHEMA.OPTIMIZ  
ER_TRACE;
```

Provides details of optimizer steps in a JSON format. You can then tune



```
considered_execution_plans: "..."  
- {  
- }  
- {  
  "attaching_conditions_to_tables": {  
    "original_condition": "(('test'.t2.a = 'test'.t1.a) and ('test'.t3.a =  
    'test'.t1.a) and ('test'.t4.a = 'test'.t1.a) and ('test'.t5.a =  
    'test'.t1.a) and ('test'.t6.a = 'test'.t1.a) and ('test'.t7.a =  
    'test'.t1.a) and ('test'.t8.a = 'test'.t1.a) and ('test'.t9.a =  
    'test'.t1.a) and ('test'.t10.a = 'test'.t1.a) and ('test'.t11.a =  
    'test'.t1.a) and ('test'.t12.a = 'test'.t1.a) and ('test'.t13.a =  
    'test'.t1.a) and ('test'.t14.a = 'test'.t1.a) and ('test'.t15.a =  
    'test'.t1.a) and ('test'.t16.a = 'test'.t1.a) and ('test'.t17.a =  
    'test'.t1.a) and ('test'.t18.a = 'test'.t1.a) and ('test'.t19.a =  
    'test'.t1.a) and ('test'.t20.a = 'test'.t1.a))",  
    "attached_conditions_computation": [],  
    "attached_conditions_summary": {  
      "database": "test",  
      "table": "t1",  
      "attached": "((((('test'.t1.a is not null) and ('test'.t1.a is not null) and  
      ('test'.t1.a is not null) and ('test'.t1.a is not null) and ('test'.t1.a is  
      not null) and ('test'.t1.a is not null) and ('test'.t1.a is not null) and  
      ('test'.t1.a is not null)))",  
    }  
  }  
  "database": "test",  
  "table": "t2",  
  "attached": "('test'.t2.a is not null)",  
}  
- {  
  "database": "test",  
  "table": "t3",  
  "attached": "('test'.t3.a = 'test'.t1.a)",  
}  
- {  
  "database": "test",  
  "table": "t4",  
  "attached": null  
}  
- {  
  "database": "test",  
  "table": "t5",  
  "attached": null  
}  
- {  
  "database": "test",  
  "table": "t6",  
  "attached": null  
}  
- {  
  "database": "test",  
  "table": "t7",  
  "attached": null  
}  
- {  
  "database": "test",  
  "table": "t8",  
  "attached": null  
}  
- {  
  "database": "test",  
  "table": "t9",  
  "attached": "('test'.t9.a is not null)",  
}  
- {  
  "database": "test",  
  "table": "t10",  
  "attached": "('test'.t10.a = 'test'.t1.a)",  
}  
- {  
  "database": "test",  
  "table": "t11",  
  "attached": "((((('test'.t11.a is not null) and ('test'.t11.a is not null) and
```

Additional Resources

mysql.com

- MySQL Products and Editions
- TCO calculator
- White Papers
- Customer use cases and success stories

dev.mysql.com

- Downloads
- Documentation

Forums.MySQL.Com

Planet.MySQL.com

eDelivery.com

- Download and evaluate all MySQL products



MySQL Embedded Online Forum



Tuesday, January 31, 2012 9:00AM PST - 12:00 PM PST

<http://bit.ly/w1bOwX>

Think You Know MySQL? Get the Facts.

MySQL is even better than you think. According to the experts, it's easier to use and it's more capable than most ISVs / OEMs realize, and by taking a few tried-and-tested steps before shipping your MySQL-embedded products, you can lower your product's costs and increase its performance.

Join our expert-created and delivered MySQL Embedded Online Forum to learn:

- Why MySQL is a great embedded database for startups as well as the largest software, hardware, and appliance vendors in the world, and how its features ensure costs remain low throughout an application's life cycle.
- MySQL installation options that require minimal or zero end user effort and how to easily build them into your application
- How to secure MySQL embedded in applications, appliances, and devices
- Tips to simplify your integration with MySQL using the most popular MySQL Connectors and guidance on selecting the settings that will maximize your application's performance
- Why MySQL delivers excellent performance and how to go beyond the default settings to optimize MySQL's queries, reporting, and search capabilities

Agenda:

It Just Works! The Beauty of MySQL as an Embedded Database

Building MySQL Embedded for Simple Installation and Security

Craig Sylvester , Principal MySQL Sales Engineer, Oracle

Getting the Most Out of MySQL Connectors for Better Performance and Streamlined Integration

Matt Lord, Senior Principal MySQL Support Engineer, Oracle

Better than Great: MySQL Embedded Performance and Reporting

Alexander Rubin, MySQL Technical Consulting Manager, Oracle



MySQL Tech Tour Event

Santa Clara, CA

Thursday, February 9, 2012

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El Segundo, CA

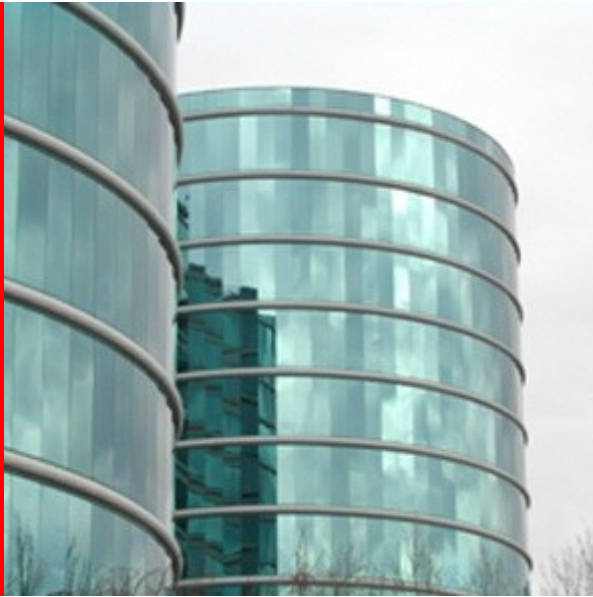
Wednesday, February 8, 2012

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&Src=7314534&Act=249&pcode=WWMK11042736MPP127](http://www.oracle.com/go/?&Src=7314534&Act=249&pcode=WWMK11042736MPP127)

Raleigh, NC

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&Src=7314534&Act=248&pcode=WWMK11042736MPP126](http://www.oracle.com/go/?&Src=7314534&Act=248&pcode=WWMK11042736MPP126)



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