

MySQL Cluster Web Scalability, 99.999% Availability

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MySQL Cluster: Overview

HIGH SCALE, READS + WRITES	 Auto-Sharding, Multi-Master ACID Compliant, OLTP + Real-Time Analytics 					
00.000%	. Sharad nathing no Single Daint of Failure					
AVAILABILITY	 Shared Hothing, no Single Point of Palitie Self Healing + On-Line Operations 					
REAL-TIME	 In-Memory Optimization + Disk-Data 					
	 Predictable Low-Latency, Bounded Access Time 					
SQL + NoSQL	 Key/Value + Complex, Relational Queries 					
	 SQL + Memcached + JavaScript + Java + JPA + HTTP/REST & C++ 					
LOW TCO	Open Source + Commercial Editions					
	 Commodity hardware + Management, Monitoring Tools 					



MySQL Cluster Architecture



MySQL Cluster Architecture On-Line Scaling





MySQL Cluster Architecture

No Single Point of Failure



Table T1



Data Node 1

Data Node 2



Data Node 3



Data Node 4





















On-line Scheduled Maintenance





Multi-Data Center Availability

Geographic Replication



- DR and Data Locality
- Replicate complete clusters across data centers
 - Fully active/active
 - No passive resources
- Split individual clusters across data centers
 - Synchronous replication & auto-failover between sites

1.2 Billion UPDATEs per Minute



- NoSQL C++ API, flexaSynch benchmark
- 30 x Intel E5-2600 Intel Servers, 2 socket, 64GB
- ACID Transactions, with Synchronous Replication

Real-World Test Case

Query Execution Time Seconds



- Web-Based Content Management System
 - JOINs 11-tables, 33.5k rows
 - Returns 2k rows, 19 columns per row

MySQL Cluster 7.3 EA: Node.js NoSQL API



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

MySQL Cluster 7.3 DMR1: 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
 & NoSQL APIs
- On-line add and drop

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Shrewsbury	Shropshire ◄	Buckinghamshire	England			
Maidenhead	Berkshire 🗲	Berkshire	England			
Oxford	Oxfordshire <	Oxfordshire	England			

MySQL Cluster 7.2 and 7.3: Auto-Installer Early Access Feature

- Fast configuration
- Workload optimized



Best practices

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When to Consider MySQL Cluster

Scalability demands

• Sharding for write performance?

Latency demands

- Cost of each second?
- Uptime requirements
 - Cost per minute of downtime?
 - Failure versus maintenance?
- Application agility
 - Developer languages and frameworks?
 - SQL or NoSQL?





Next Steps

Learn More

www.mysql.com/cluster Authentic MySQL Curriculum: http://oracle.com/education/mysql

Try it Out

- dev.mysql.com/cluster
- Iabs.mysql.com
- github.com/mysql/mysql-js



MySQ

Cluster

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