ORACLE

MySQL Cluster

Web Scalability, 99.999% Availability

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MySQL Cluster

Safe Harbour Statement

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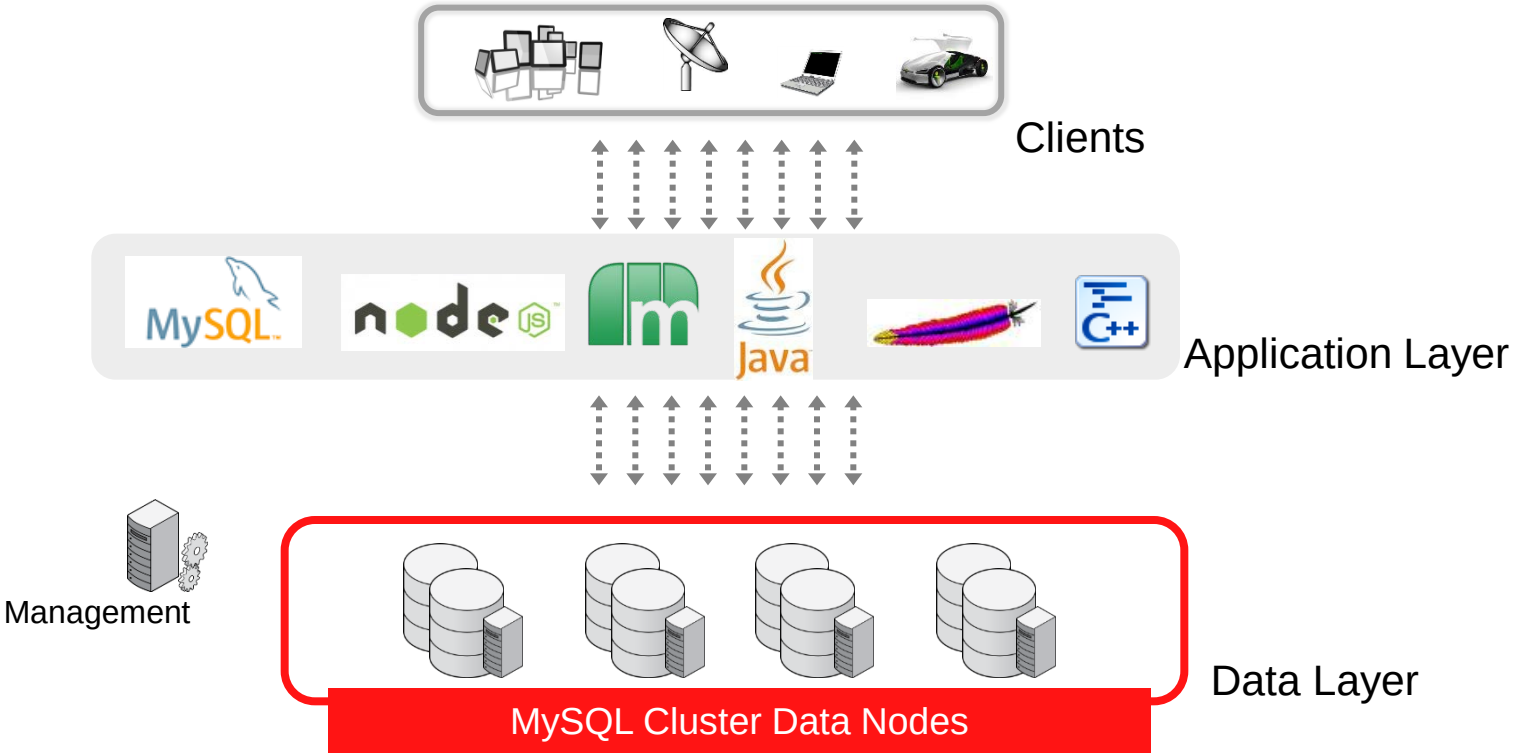
MySQL Cluster: Overview

HIGH SCALE, READS + WRITES	• Auto-Sharding, Multi-Master • ACID Compliant, OLTP + Real-Time Analytics
99.999% AVAILABILITY	• Shared nothing, no Single Point of Failure • 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

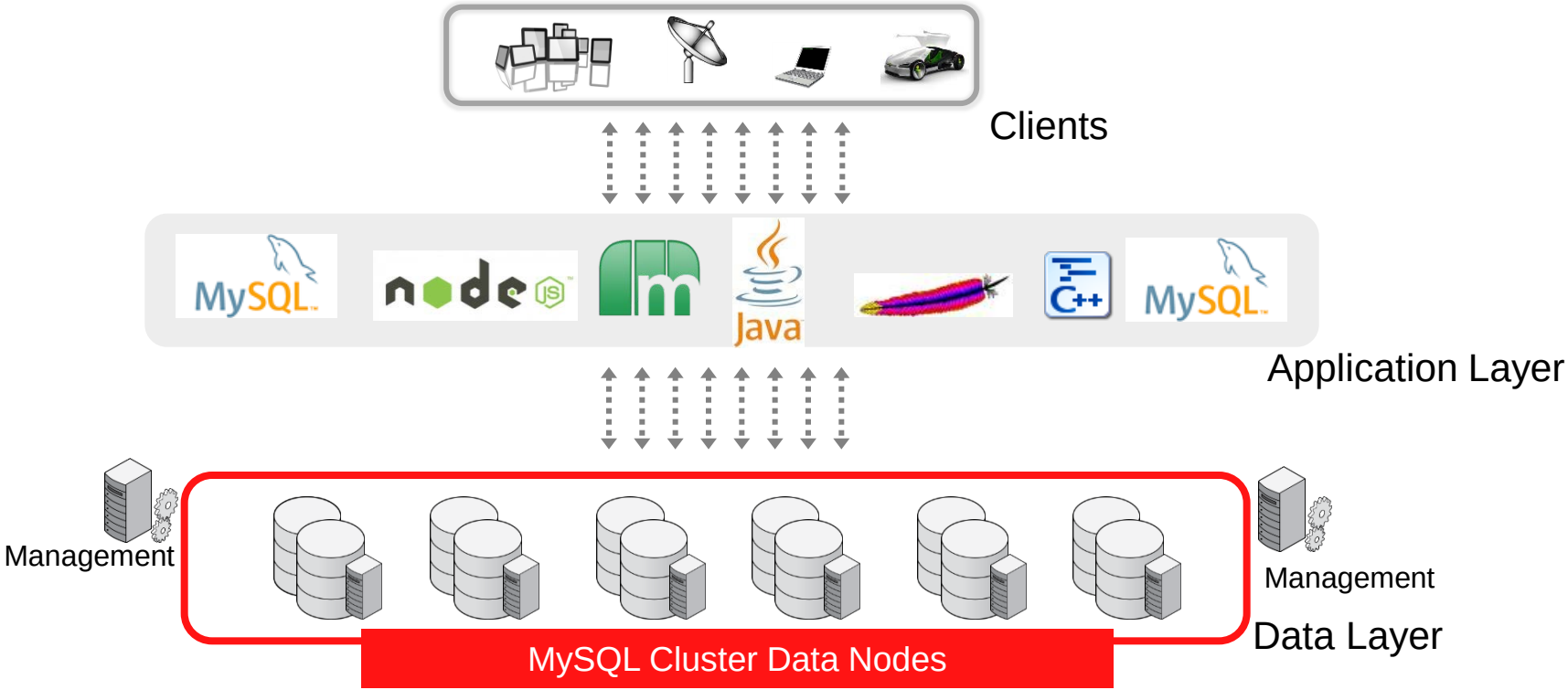
Who's Using MySQL Cluster?

MySQL Cluster Architecture



MySQL Cluster Architecture

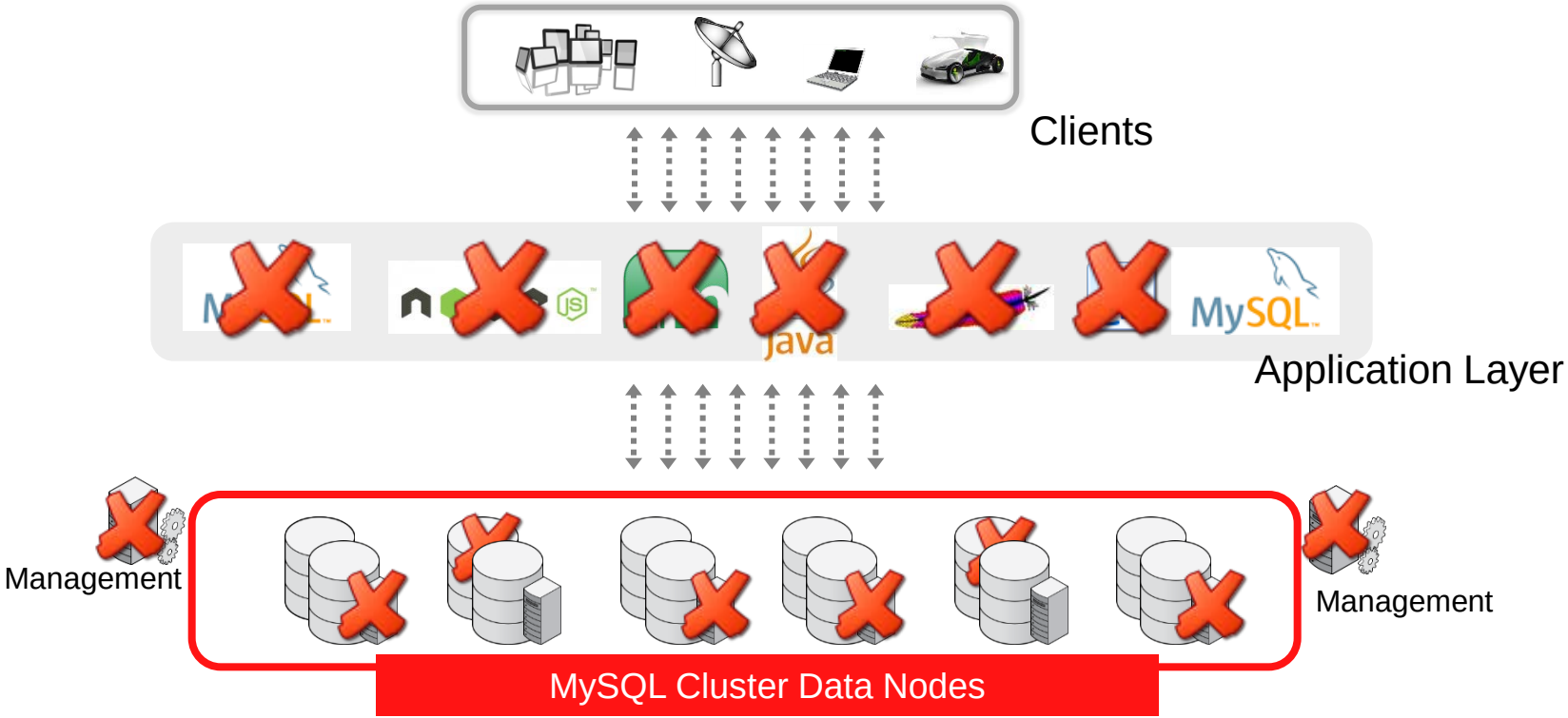
On-Line Scaling



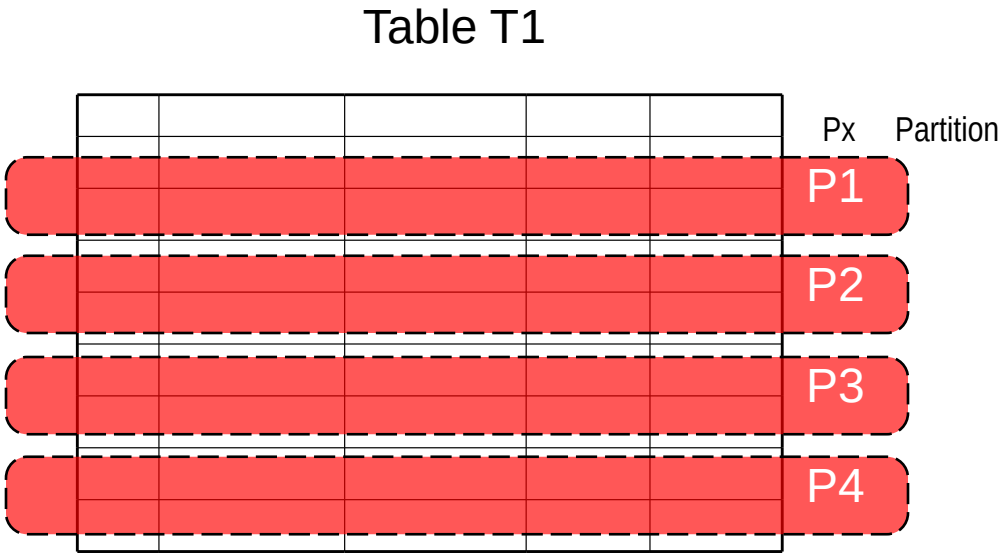

http://clusterdb.com/u/pi

MySQL Cluster Architecture

No Single Point of Failure



Automatic Data Partitioning



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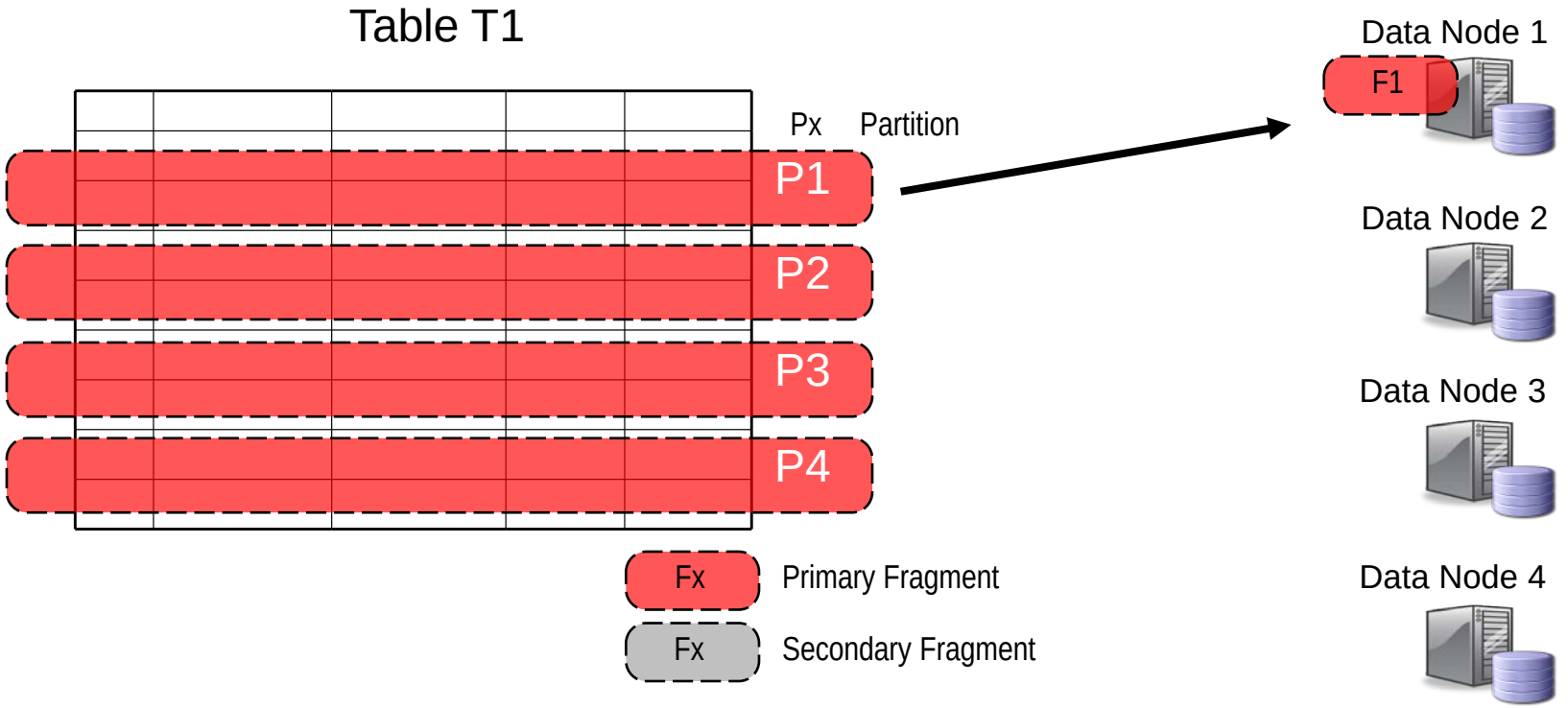

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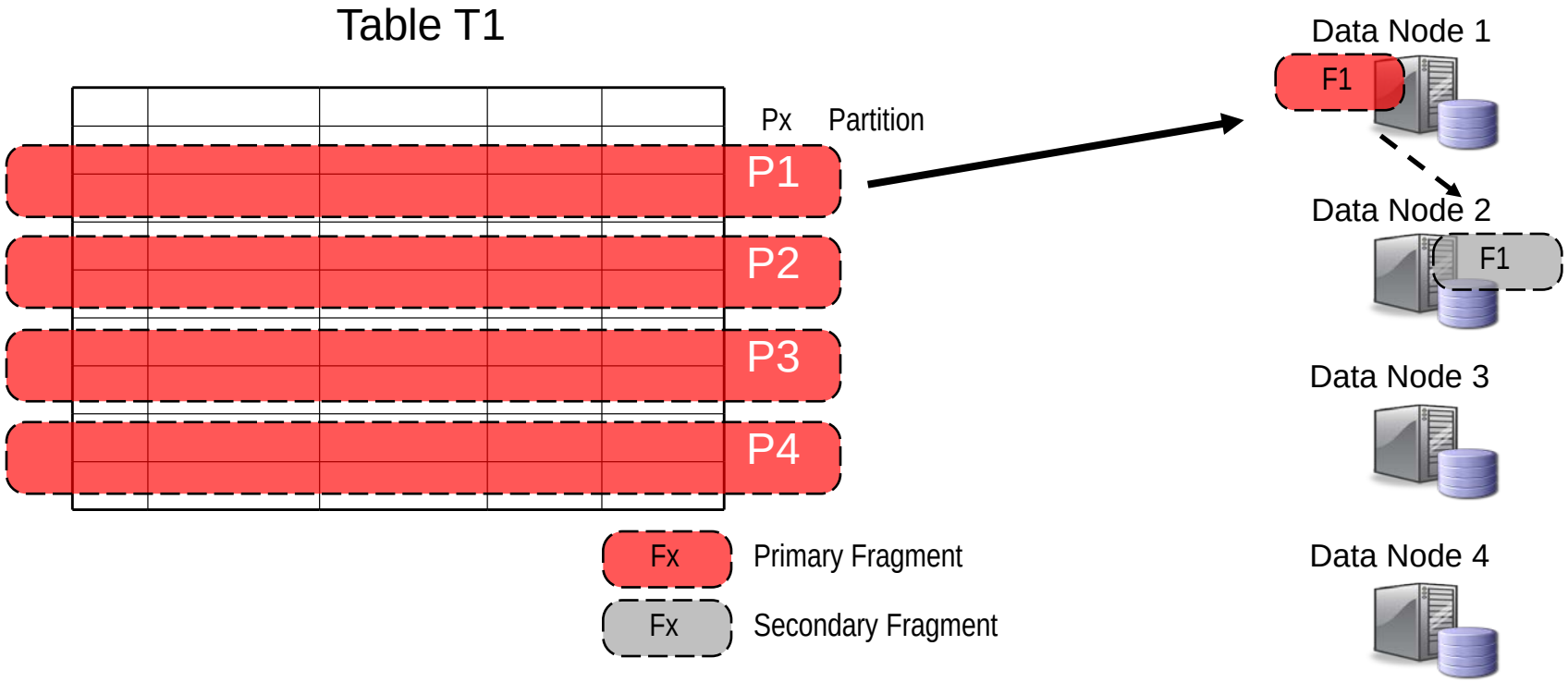

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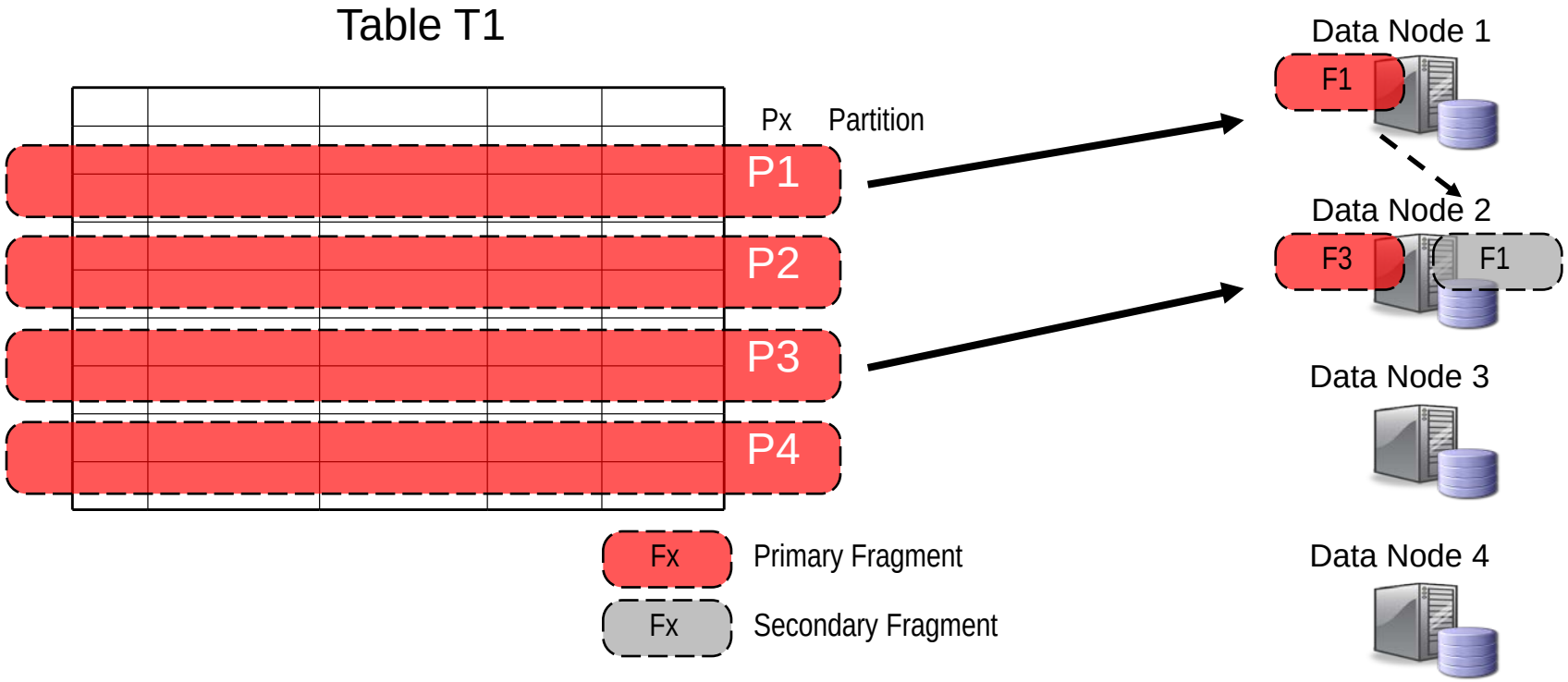

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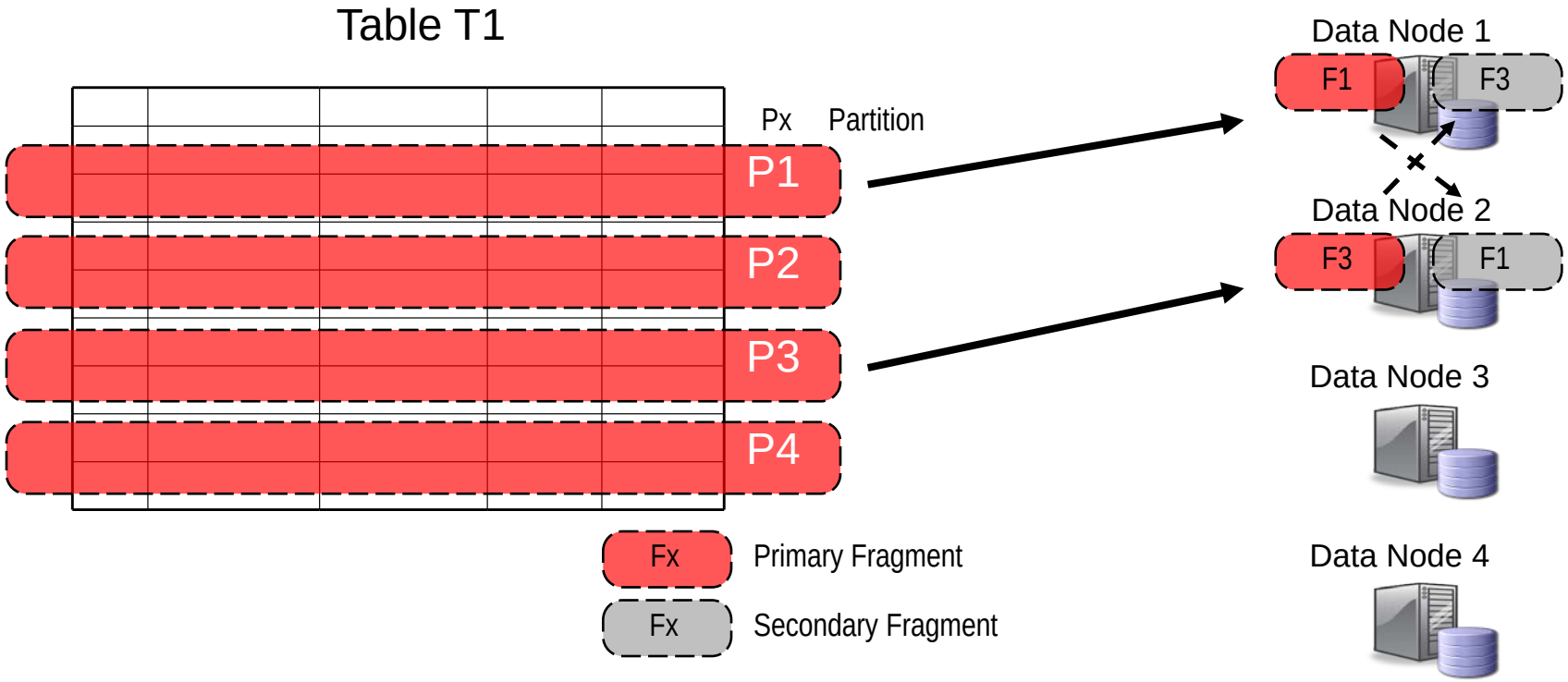

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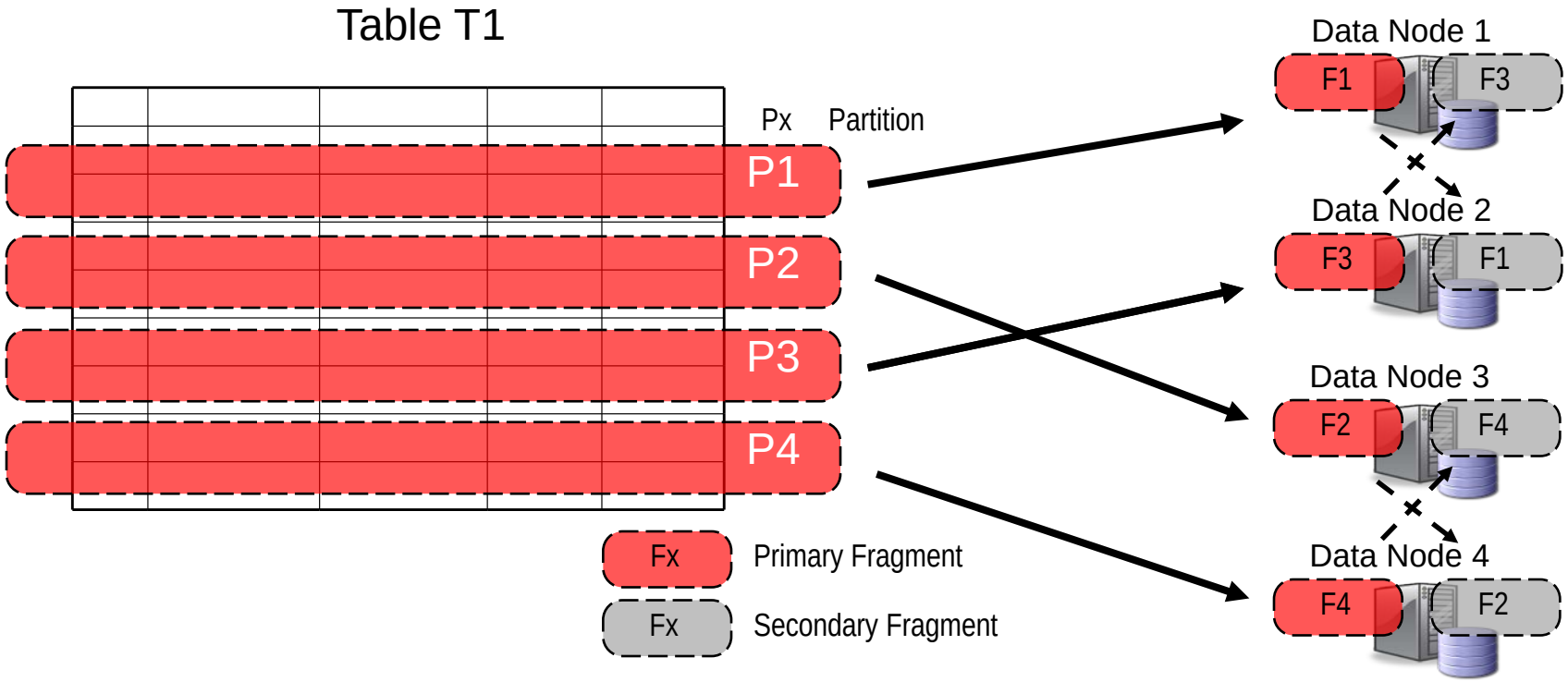

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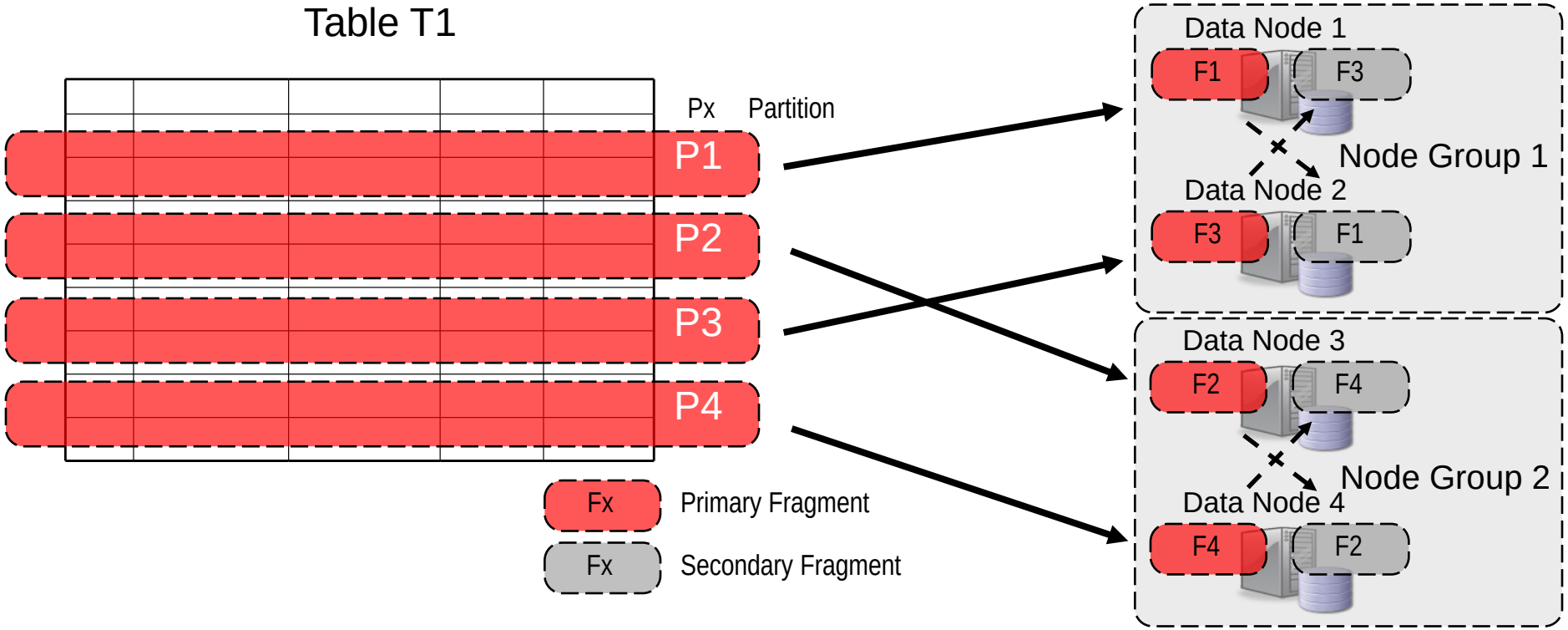

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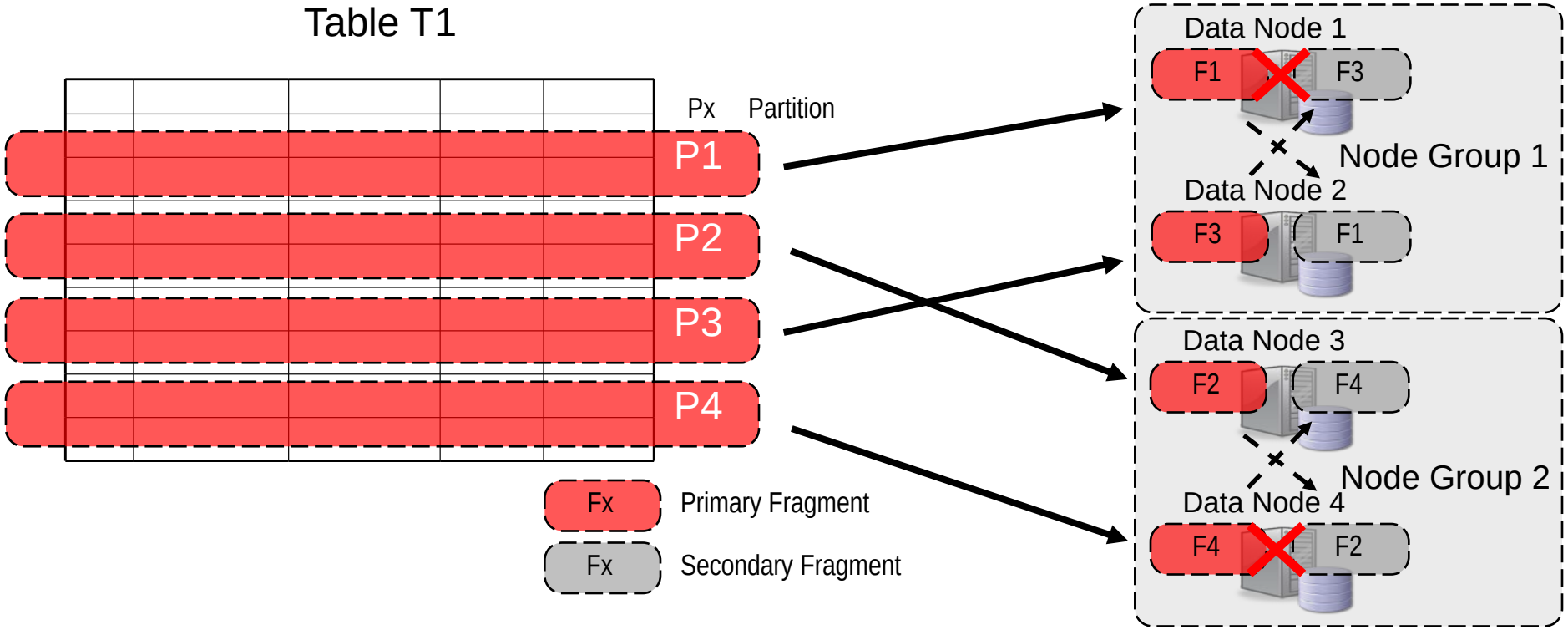


On-line Scheduled Maintenance

Scale

Backup

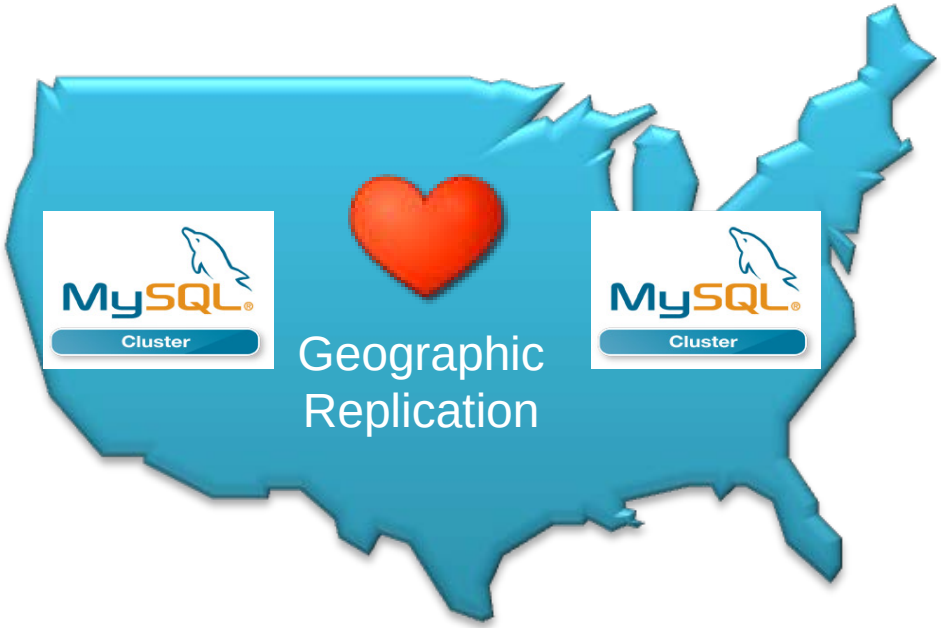
MySQL Cluster

Evolve

Upgrade

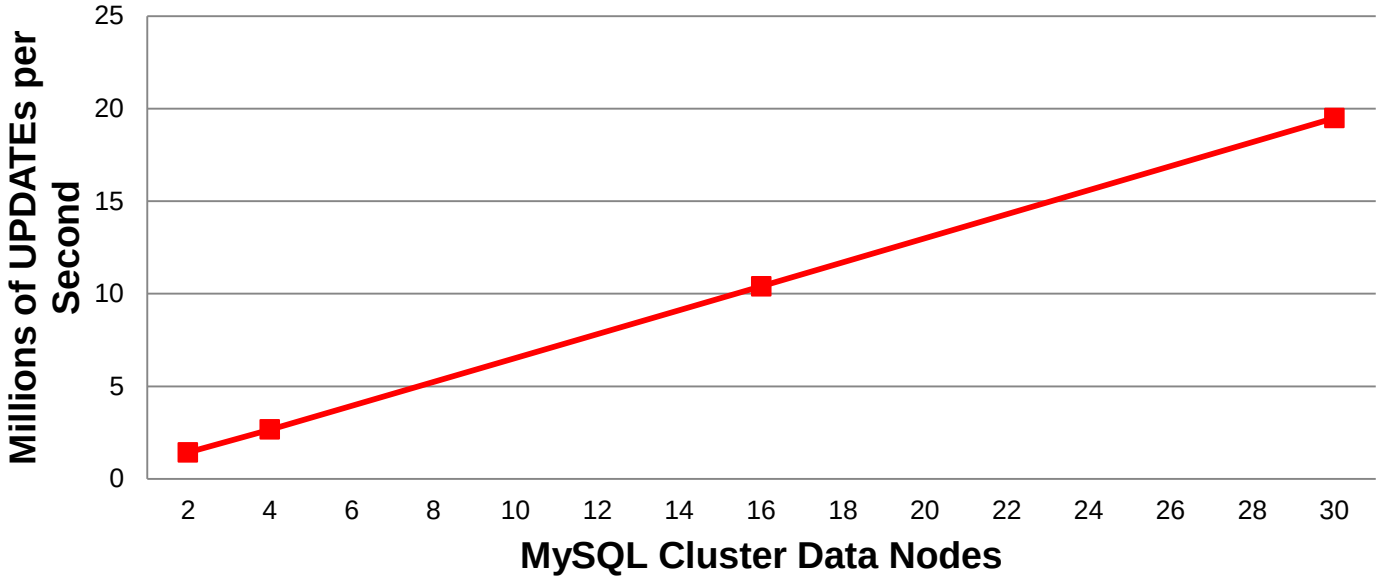
Multi-Data Center Availability

Geographic Replication



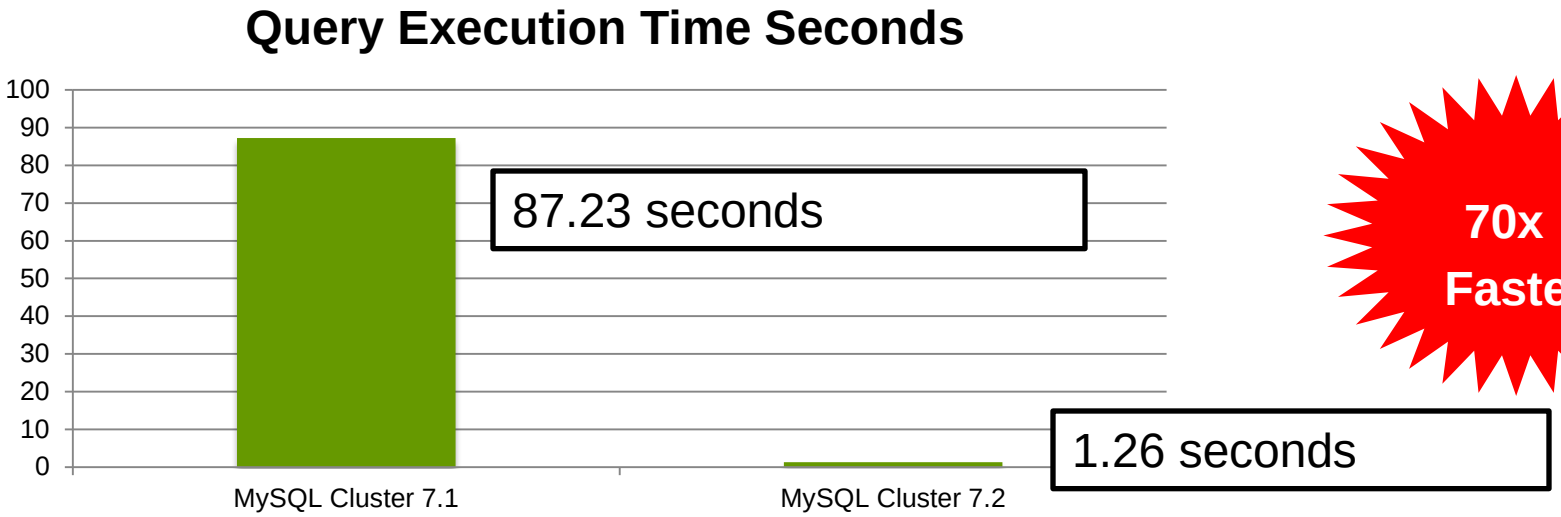
- DR and Data Locality
- Replicate complete clusters across data centers
  - Fully active/active
  - No passive resources
- Split individual clusters across data centers
  - Synchronous replication & auto-failover between sites

1.2 Billion UPDATEs per Minute



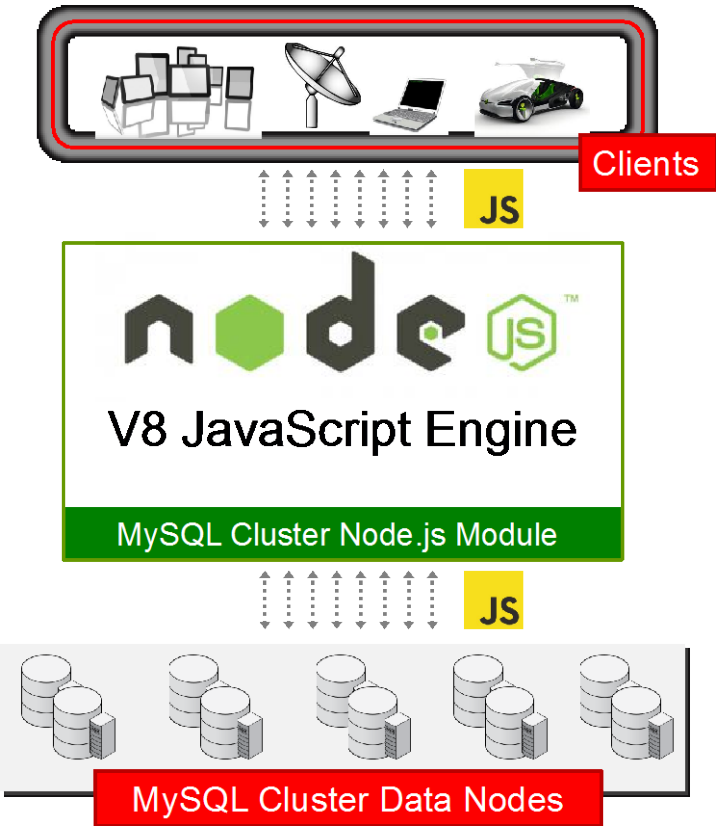
- NoSQL C++ API, flexaSynch benchmark
- 30 x Intel E5-2600 Intel Servers, 2 socket, 64GB
- ACID Transactions, with Synchronous Replication

Real-World Test Case



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

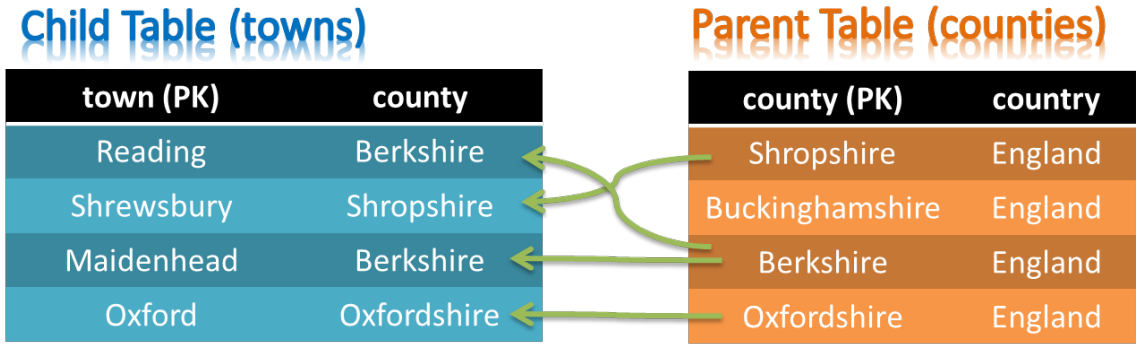
MySQL Cluster 7.3 EA: Node.js NoSQL API



- 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

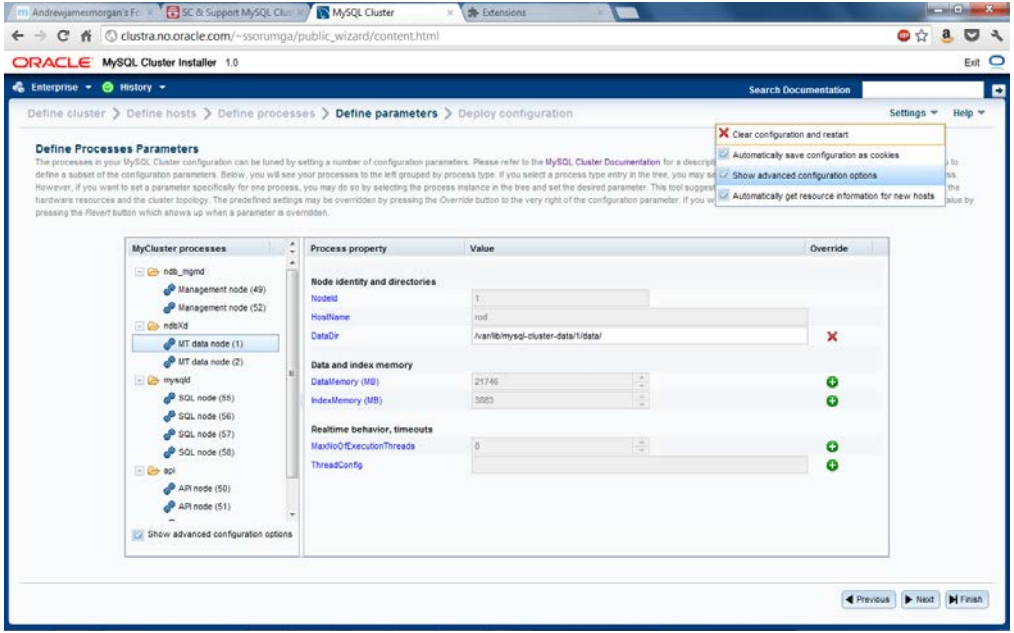


MySQL Cluster 7.2 and 7.3: Auto-Installer

Early Access Feature

New!

- Fast configuration
- Workload optimized
- Best practices



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
- labs.mysql.com
- github.com/mysql/mysql-js

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