

# Accelerate MySQL for Demanding OLAP and OLTP Use Case with Apache Ignite

December 7, 2016

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# About the Presentation

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**Problems**

**Existing Solutions**

**Nikita Ivanov will show the power of  
Apache Ignite**

# About Percona

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We Exist to help you  
to succeed with  
MySQL and MongoDB

# Support Broad Ecosystem

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Percona  
Server for  
MySQL

MySQL

MariaDB

AWS for  
MySQL and  
Aurora

MongoDB

Percona  
Server for  
MongoDB

Google  
CloudSQL

# Percona Software – 100% Open Source

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Percona Server  
for MySQL

Percona Server  
for MongoDB

Percona  
XtraDB Cluster


Percona  
Xtrabackup

Percona Toolkit

Percona  
Monitoring and  
Management

# Services

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- Support
- More than Support (Percona Care,  PERCONA Care)
- Managed Services (Percona Care Ultimate)
- Consulting, Training

Build



Fix



Optimize



Manage



# My Conviction

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**There is no silver bullet  
in technology!**

# Why ?

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**All design decisions  
comes with their own  
benefits and drawbacks**

# Technologies not Technology

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**Large Scale applications  
tend to use more than  
one technology on data  
layer**

# Works especially well with Open Source!

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**Additional Components do not require hefty license fees**

**Easy to prototype and test out**

**Open Source Community is good at building bridges**

# Balance is Needed

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**Use as many  
technologies as you  
need, but no more**

# MySQL

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MySQL is no Exception.  
It is not Great for  
**Everything.**

# Some of the Problems

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**Hot Data**

**Highly Volatile Data**

**Large Data Volume**

**Analytical Processing**

**Full Text Search**

# Hot Data

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For example “Cache”

Large volume of simple requests

High overhead due to SQL

No good Memory focused Engine

Not Designed for very high Concurrency

# Solutions

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## MySQL

- MemcachedD interface
- Thread Pool

## External

- MemcachedD
- Redis

# Highly Volatile Data

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**Lots of updates, especially to a single row**

**Design around full Transactional ACID semantics**

**Disk Log based durability**

**Pessimistic Logging**

# Solutions

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## MySQL

- Data Design
- Configuration Tuning
- Parallel Replication

## External

- MemcachedD
- Redis

# Large Data Volume

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**MySQL is designed as single node system**

**Limited in CPU, Memory**

**Manual “Sharding” solutions are painful**

**Especially with complex queries**

# Solutions

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## MySQL

- Manual Sharding
- Vitess
- ProxySQL

## External

- Sharding for Memcached and Redis
- MongoDB
- Cassandra

# Analytics (OLAP)

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**MySQL does not support column based storage**

**MySQL optimizer is limited for complex queries**

**MySQL does not do parallel query execution**

**MySQL does not do distributed query execution**

# Solutions

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## MySQL

- Configuration and Schema Design (Limited)

## External

- Hadoop & Spark
- Vertica
- ClickHouse

# Full Text Search

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**Can handle basic Full Text Search**

**Does not scale well with data volume**

**No parallel processing**

**Limited search relevance options**

**Hard To do GIS searches; Facets**

**No language processing**

# Solutions

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## MySQL

- Small Scale search applications only
- Supported with Innodb tables since MySQL 5.6

## External

- Elastic
- Solr
- Sphinx

# New Solutions constantly appear

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**Always be on lookout  
for a better solutions!**

# Apache Ignite

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**Nikita Ivanov will show  
what you can do with  
Apache Ignite!**

# Accelerate MySQL® for Demanding OLAP and OLTP Use Cases with Apache® Ignite™

December 7, 2016



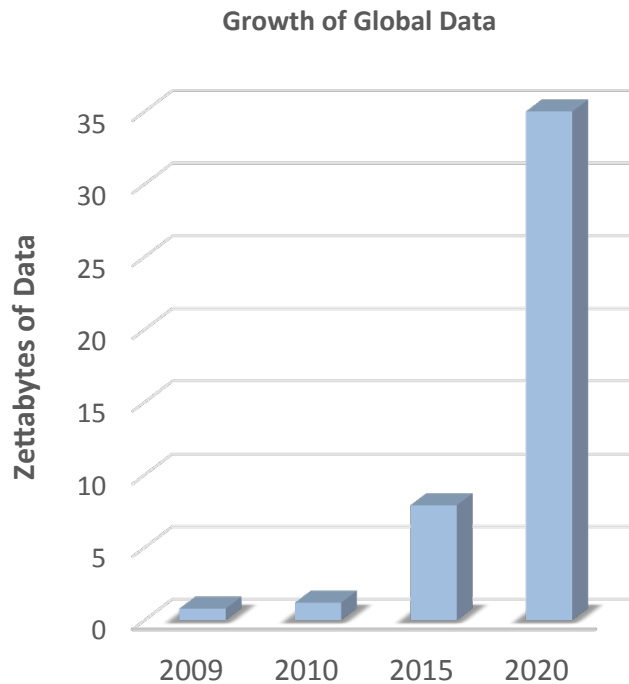
Nikita Ivanov

Founder & CTO, GridGain Systems  
Apache Ignite PMC



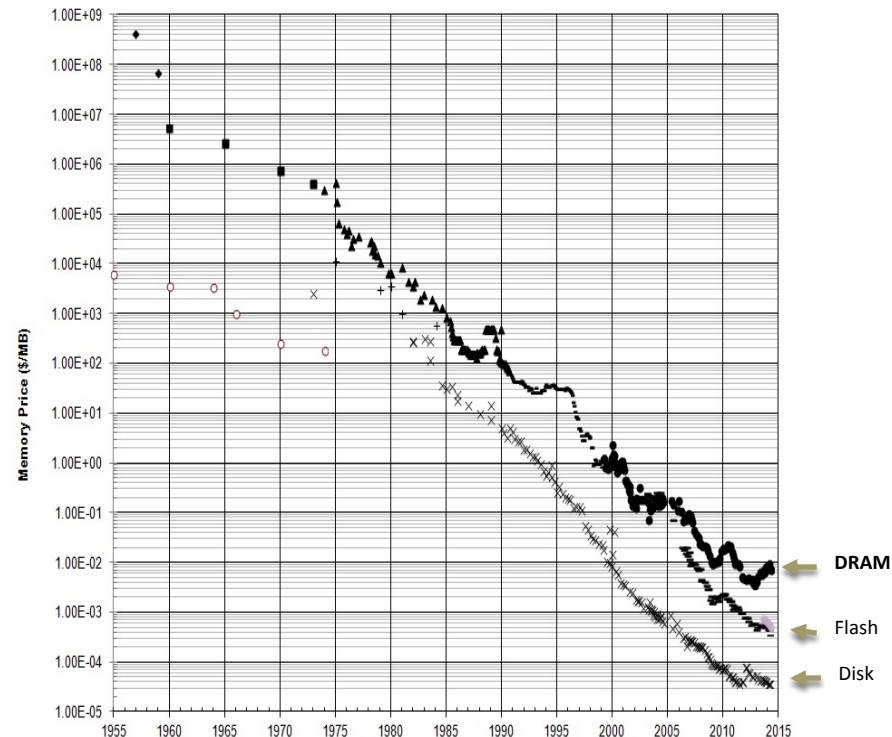
# Why In-Memory Computing Now?

Data Growth Driving Demand



8 zettabytes in 2015 growing to 35 in 2020

Declining DRAM Cost

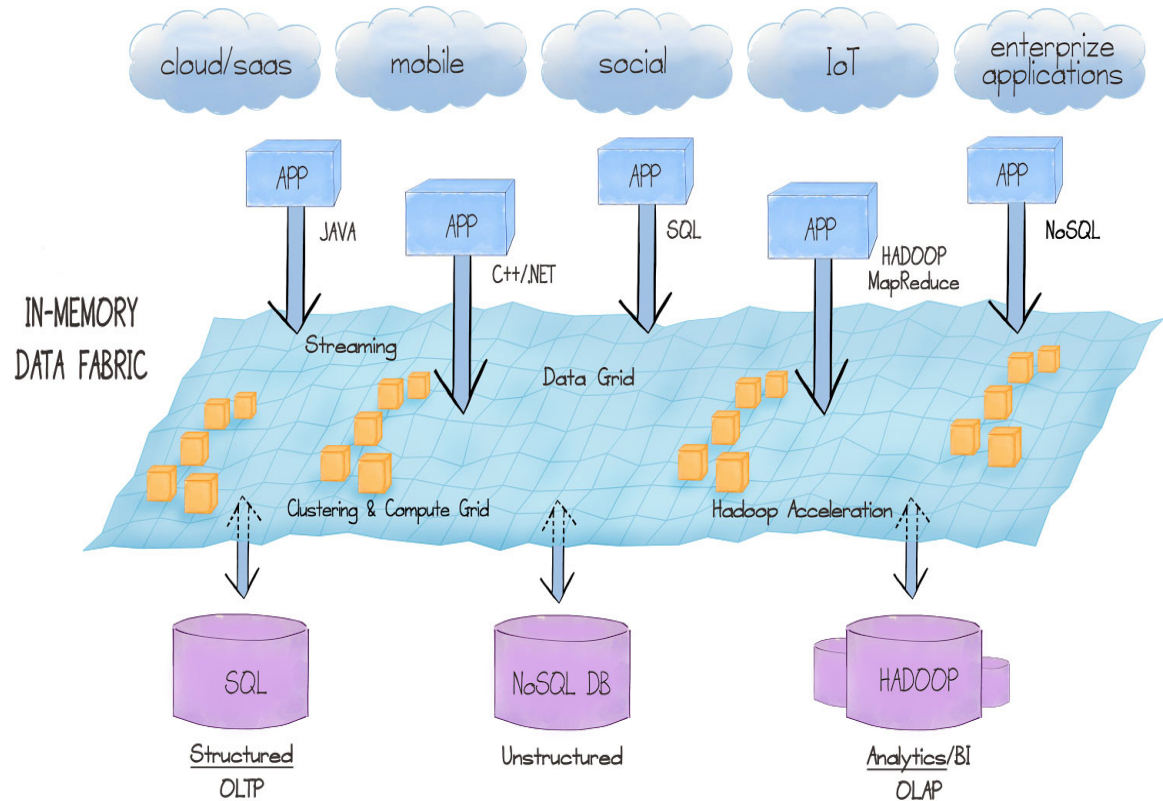


Cost drops 30% every 12 months

# In-Memory Data Fabric

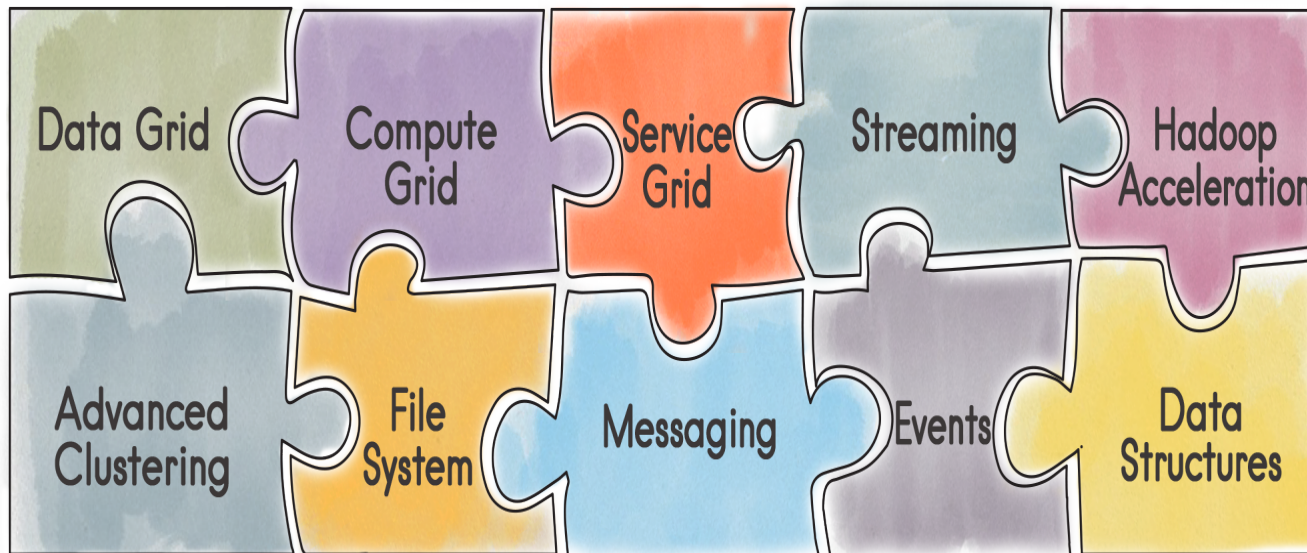
Ideal accelerator for SQL data stores and apps

**Apache Ignite** is a leading open-source, cloud-ready distributed software delivering 100x performance and scalability by storing and processing data in memory across scale out or scale up infrastructure.



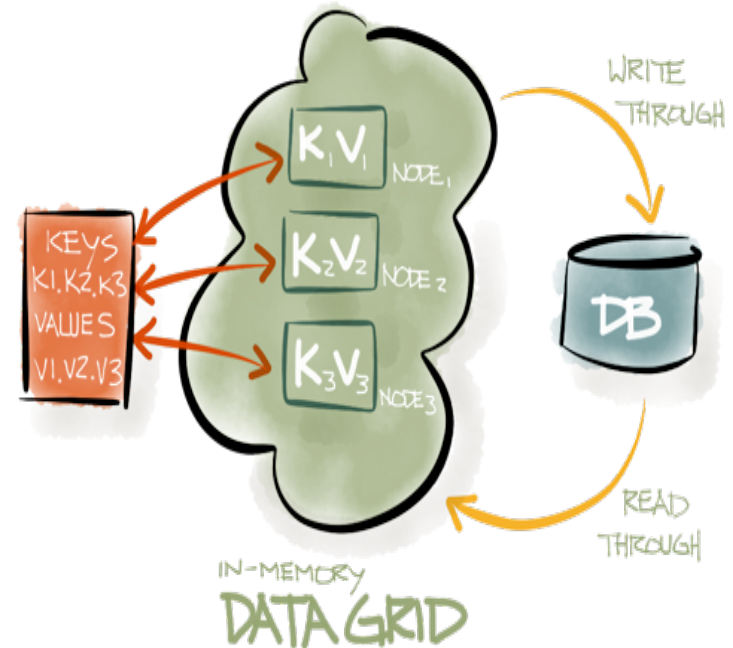
# In-Memory Data Fabric

Main components



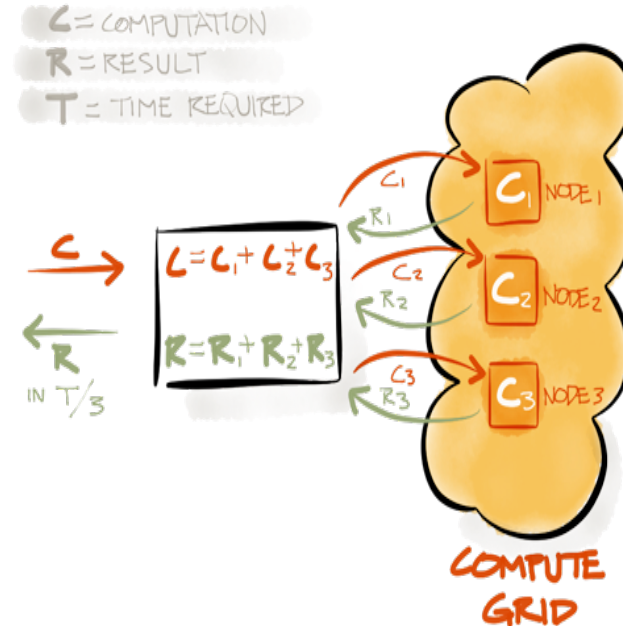
# In-Memory Data Grid

- Distributed In-Memory Key-Value Store
- Replicated and Partitioned data
- TBs of data, of any type
- On-Heap and Off-Heap Storage
- Highly Available In-Memory Replicas
- Automatic Failover
- Distributed ACID Transactions
- SQL99 queries and JDBC/ODBC driver
- Collocation of Compute and Data



# In-Memory Compute Grid

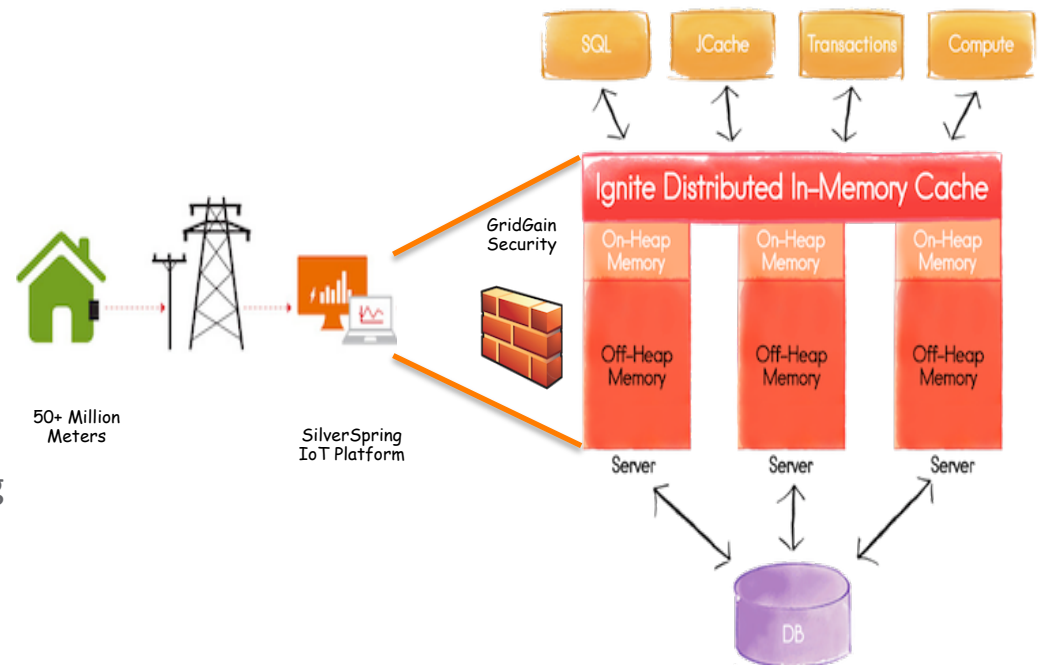
- Direct API for MapReduce
- Zero Deployment
- Cron-like Task Scheduling
- State Checkpoints
- Load Balancing
- Automatic Failover
- Full Cluster Management
- Pluggable SPI Design





Smart Metering and Utilities – delivers a comprehensive IoT platform

- **SilverSpring Requirements:**
  - 100x speed up of DB-based ops
  - Add scalability & elasticity
  - Use open source technologies
- **Why GridGain Used:**
  - Strong compute capabilities
    - Co-located in-memory processing
  - Demonstrated best
    - On-demand elasticity & scalability
    - ANSI-99 SQL Support
    - Transactional consistency



# Join Us at Percona Live!

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## MySQL, MongoDB, Open Source Databases

- April 24-27, 2017
- Santa Clara, CA
- Tutorials, keynotes and sessions from technical experts

## Use “WebinarPL” code to receive a 10% discount

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# More Information

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- GridGain Professional or Enterprise Edition for 30-Day Trial:  
<https://www.gridgain.com/resources/download>
- Apache Ignite: <https://ignite.apache.org/>

**THANK YOU!!!**