



POSTGRES WITH APACHE® IGNITE™: FASTER TRANSACTIONS AND ANALYTICS

FOTIOS FILACOURIS
SENIOR SOLUTIONS ARCHITECT
FINANCIAL SERVICES

Fotios.Filacouris@gridgain.com

www.gridgain.com



[#gridgain](https://twitter.com/gridgain)



Expectations

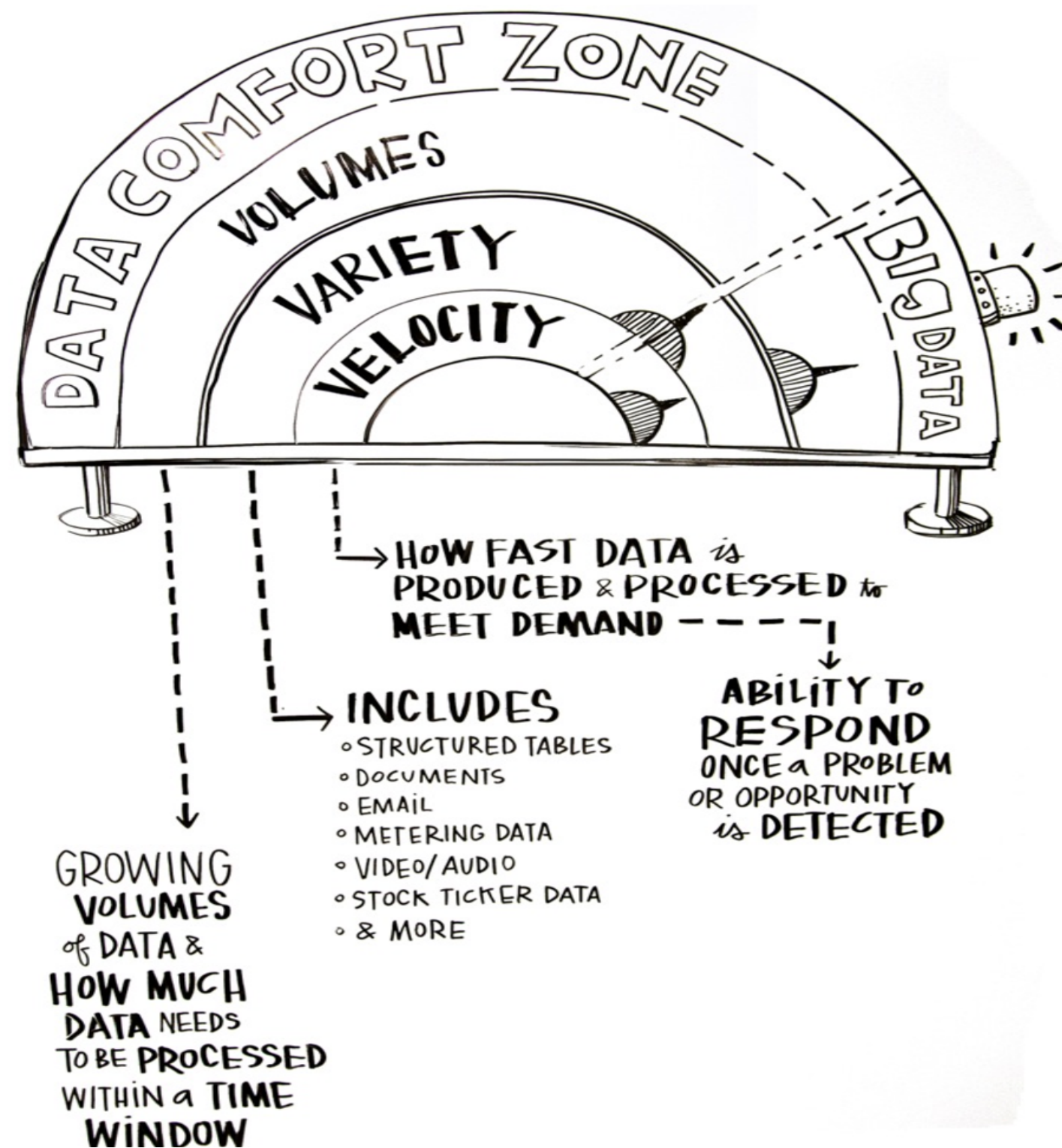
- Have worked with Postgres for a number of years
- Am not a DBA but have worked operationally with Postgres
- Work hand in hand with developers daily who try to solve problems
- Use cases and technical diagrams will focus on Apache Ignite In-Memory Computing Platform
- This is not intended as a deep dive feature wise for Postgres

Agenda

- Open Source Outlook
 - Data Challenges
 - Open Source Trends
- Postgres background
 - Brief History
 - Strengths
 - Weaknesses
- In Memory Solution: GridGain/Ignite
 - Feature overview
 - Supercharge Postgres
 - Quick Use Case
- Q & A

Open Source Outlook

The data problem...



Open Source Trends

- Open Source adoption is prevalent
- Data becomes more relevant
- Containerization is real
- Common API'S become more powerful

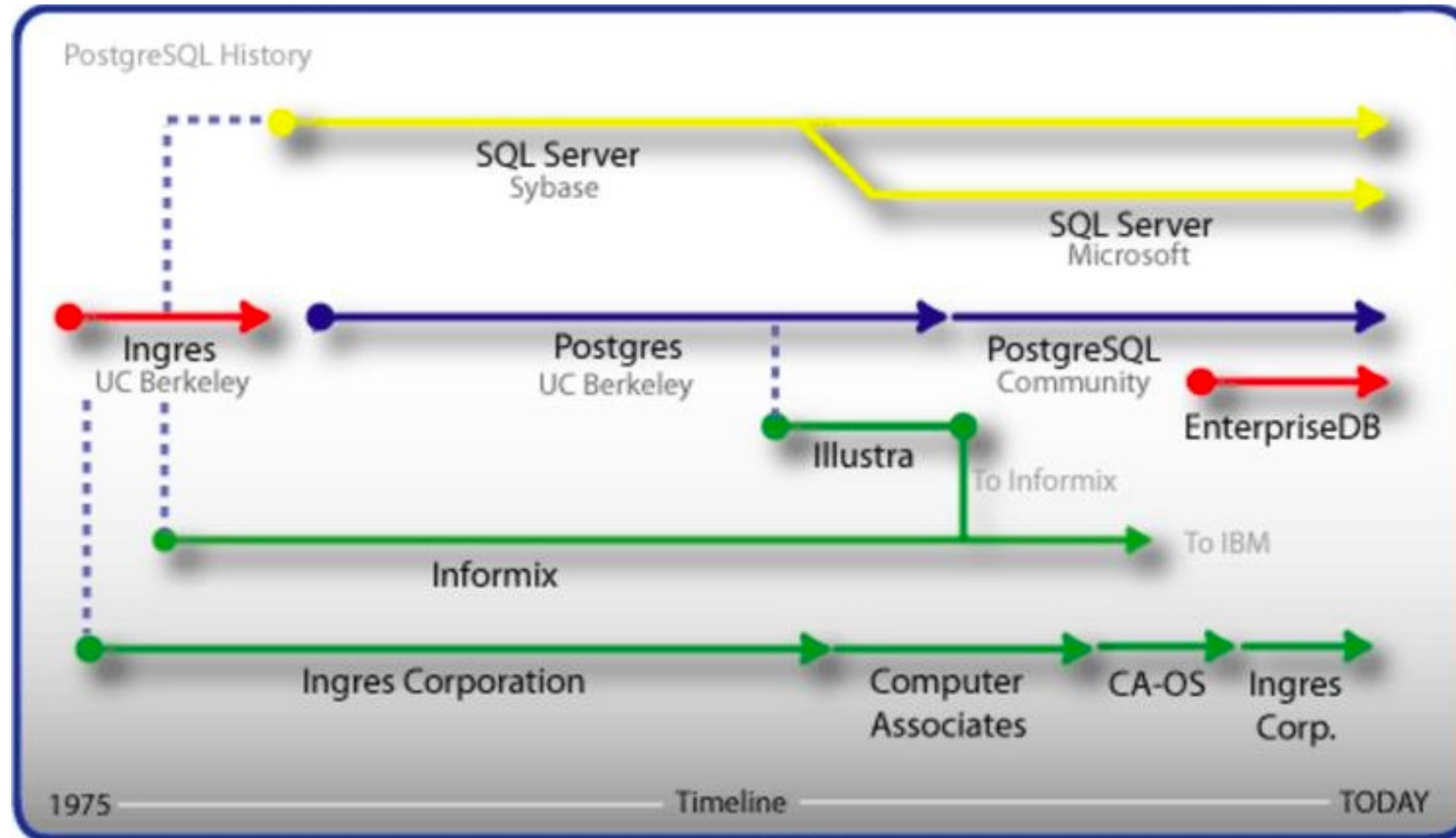


A little ditty on Postgres...

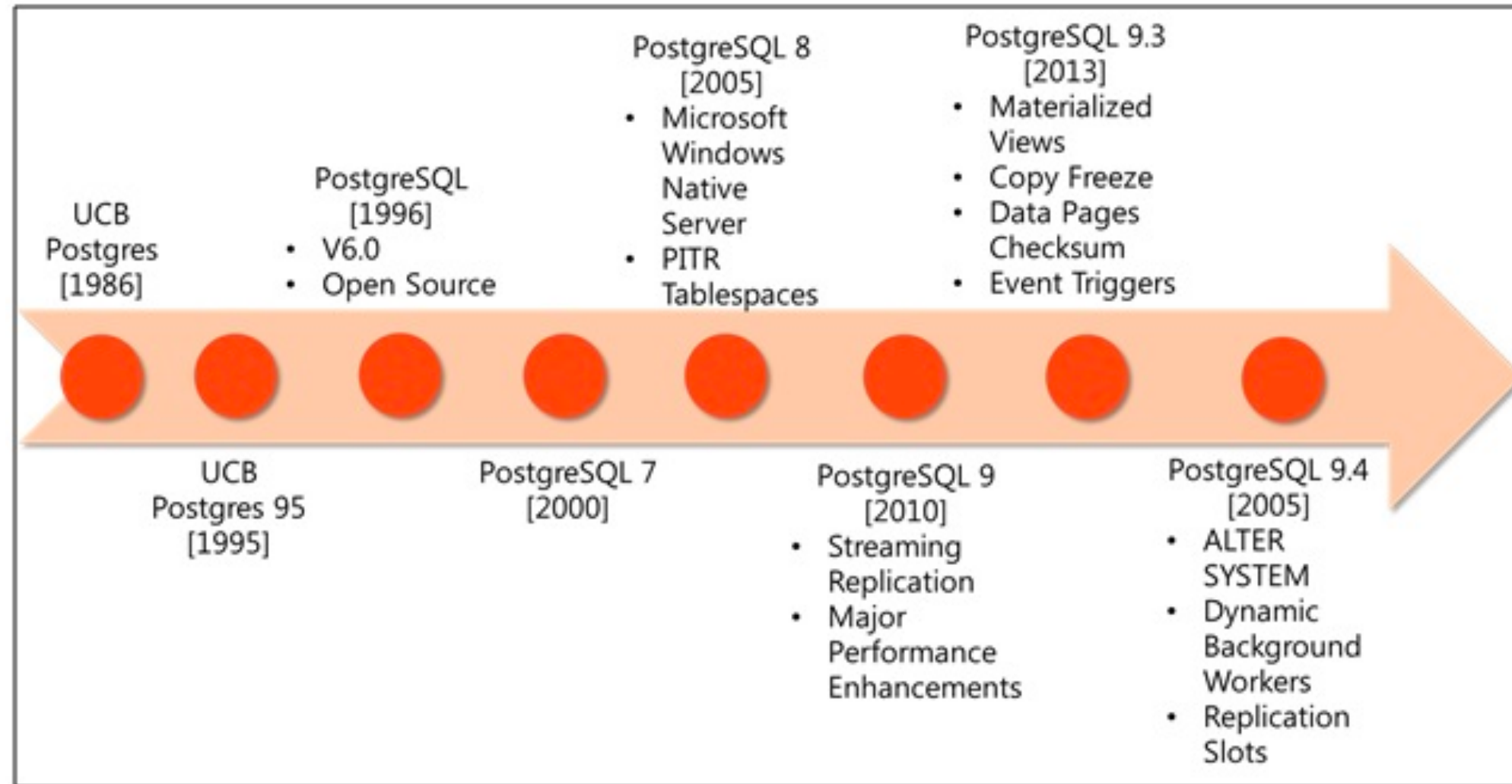


PostgreSQL
the world's most advanced open source database

PostgreSQL: A brief history



PostgreSQL: A version History



PostgreSQL: Strengths

- **Extensibility**: It is possible to extend PostgreSQL programmatically with stored procedures, like an advanced RDBMS should be.
- **Community ties**: PostgreSQL is supported by a an experienced community which can be accessed through knowledge-bases and Q&A sites 24/7 for free.
- **Third party tools**: Like any Open-Source project it has many open source tools for monitoring and management and design (PGAdmin)
- **Objective**: PostgreSQL is not just a relational database management system but an objective one - with support for nesting, and more.

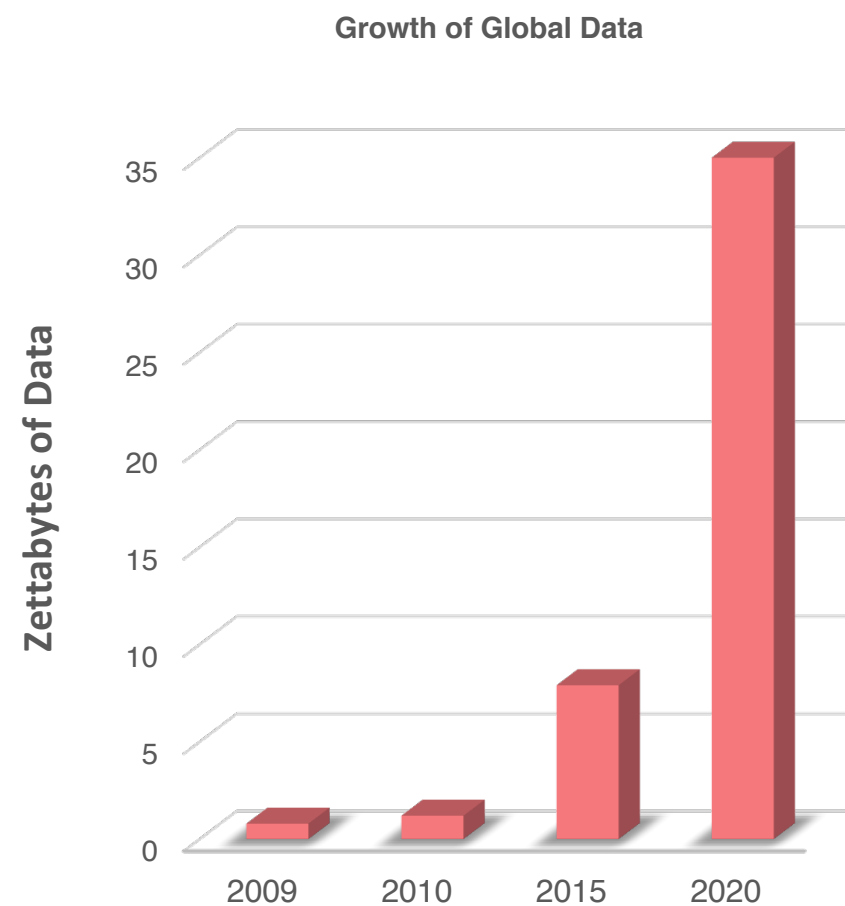
PostgreSQL: Weaknesses

- **Performance:** For simple *read*-heavy operations, PostgreSQL can be an over-kill and might appear less performant than the counterparts, such as MySQL
- **Replication:** Open Source Postgres does offer replication but it is very intensive and difficult to configure
- **Scalability:** Can only vertically scale machines, requires downtime.. Not suitable for Tier I production applications
- **Not Big-Data ready:** PostgreSQL lack of advancements in parallelism leave it un-suitable for large datasets where speed and scale is an issue

Deeper Look at In-Memory Computing Platform

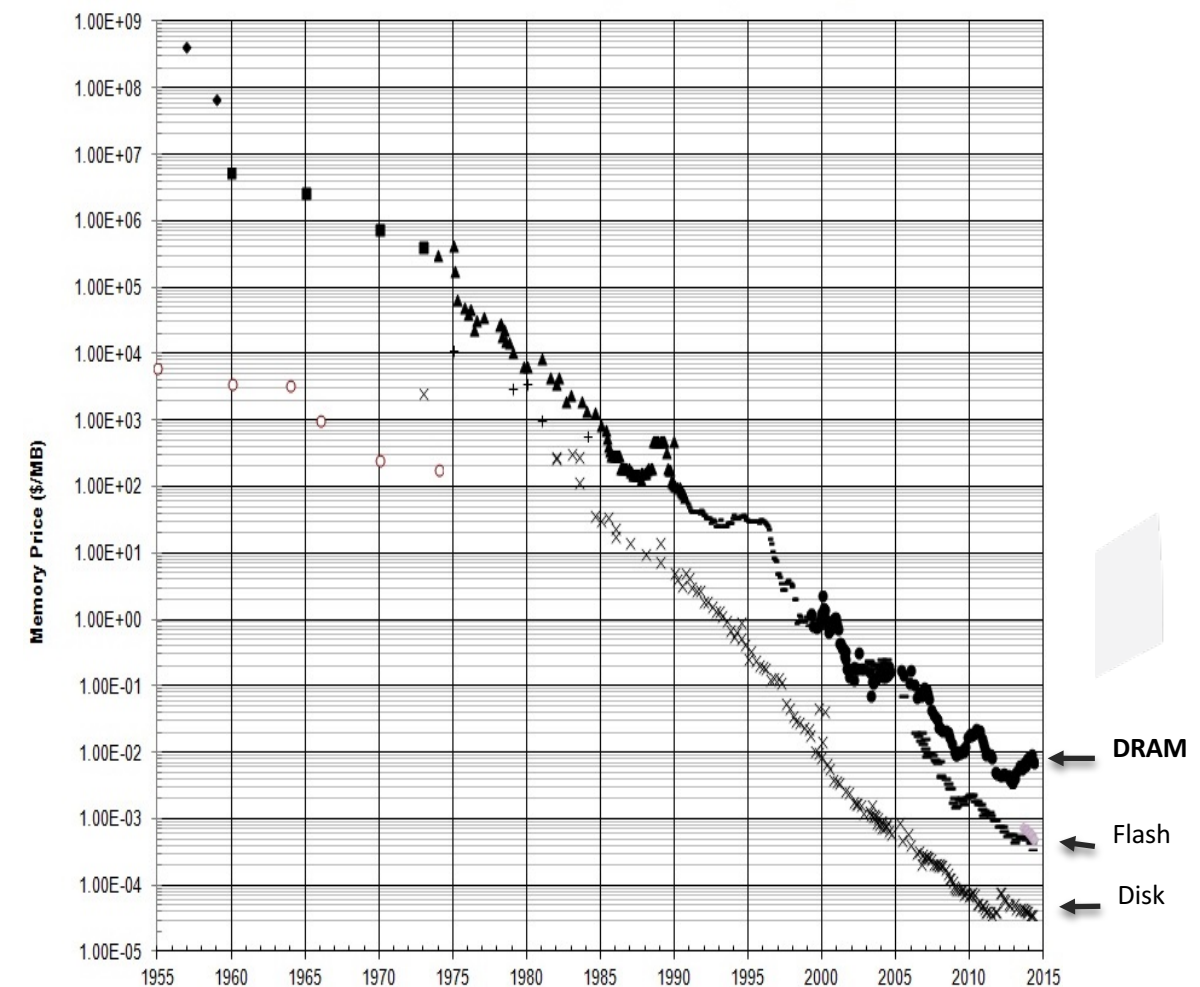
Why In-Memory Computing Now?

Data Growth Driving Demand



8 zettabytes in 2015 growing to 35 in 2020

Declining DRAM Cost



Cost drops 30% every 12 months

Evolution of In-Memory Grid Computing

- Move from Disk to 100% In-Memory (RAM)
- Leverage Clustered Memory and Parallel Distributed Processing
- Results: 100x Faster, 10x ROI Improvement
- Making “Big Data” Fast

“In-memory will have an industry impact comparable to web and cloud.”

“RAM is the new disk, and disk is the new tape.”

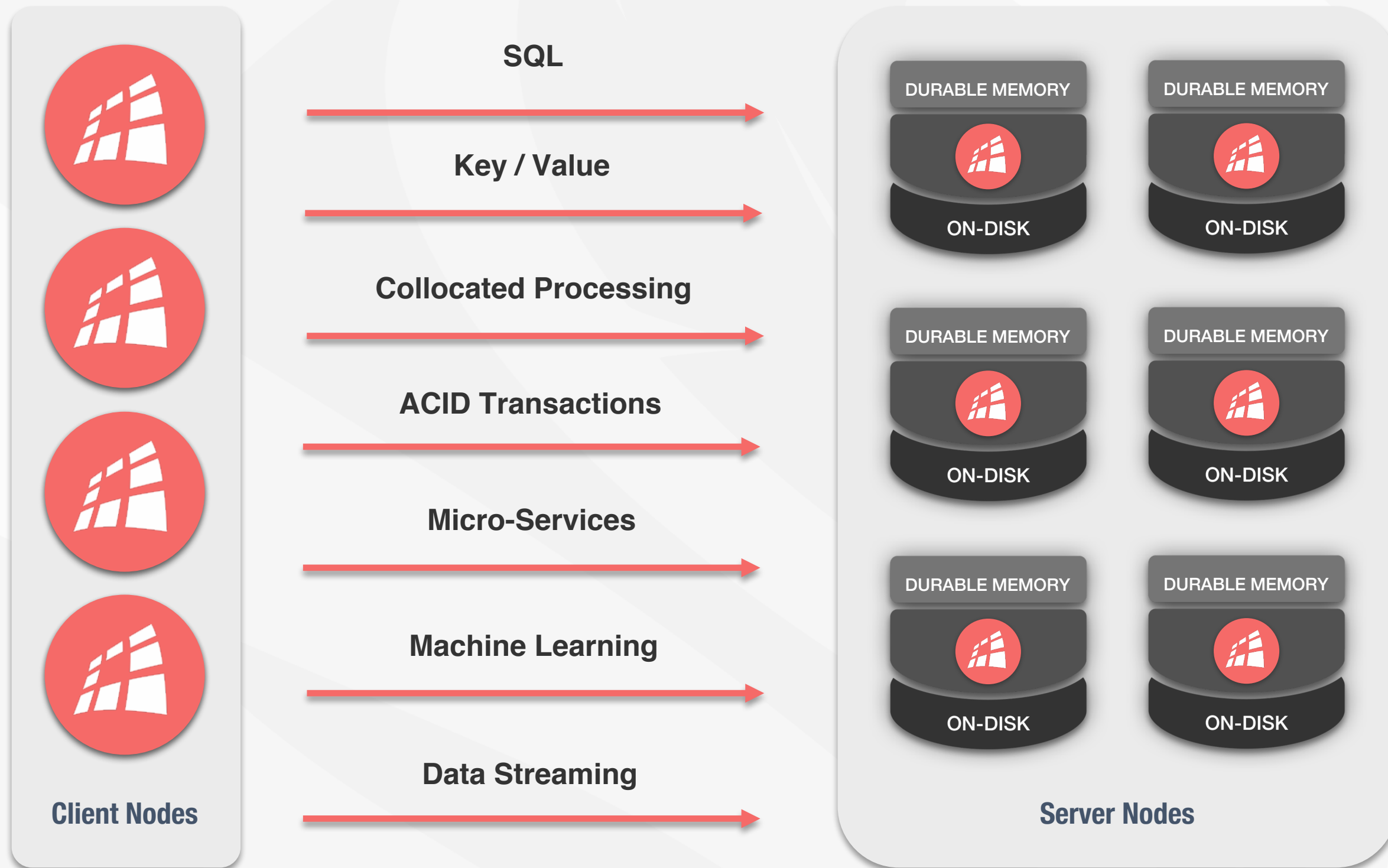
Gartner

In-Memory Computing Market:

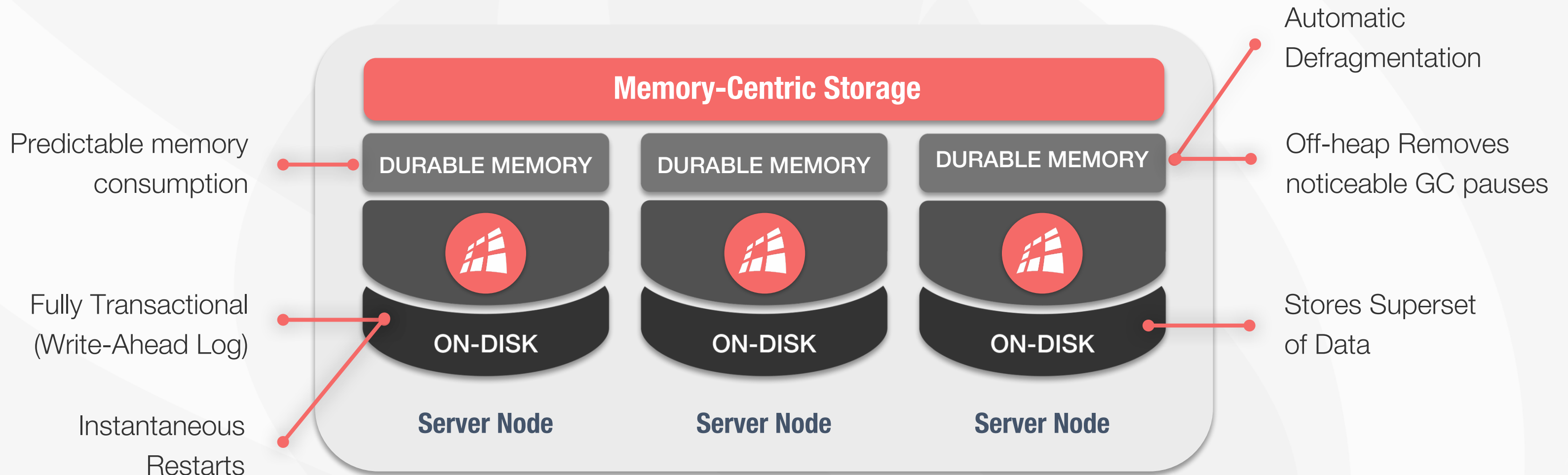
- \$10B in 2019
- CAGR 22%

Gartner

Feature Overview

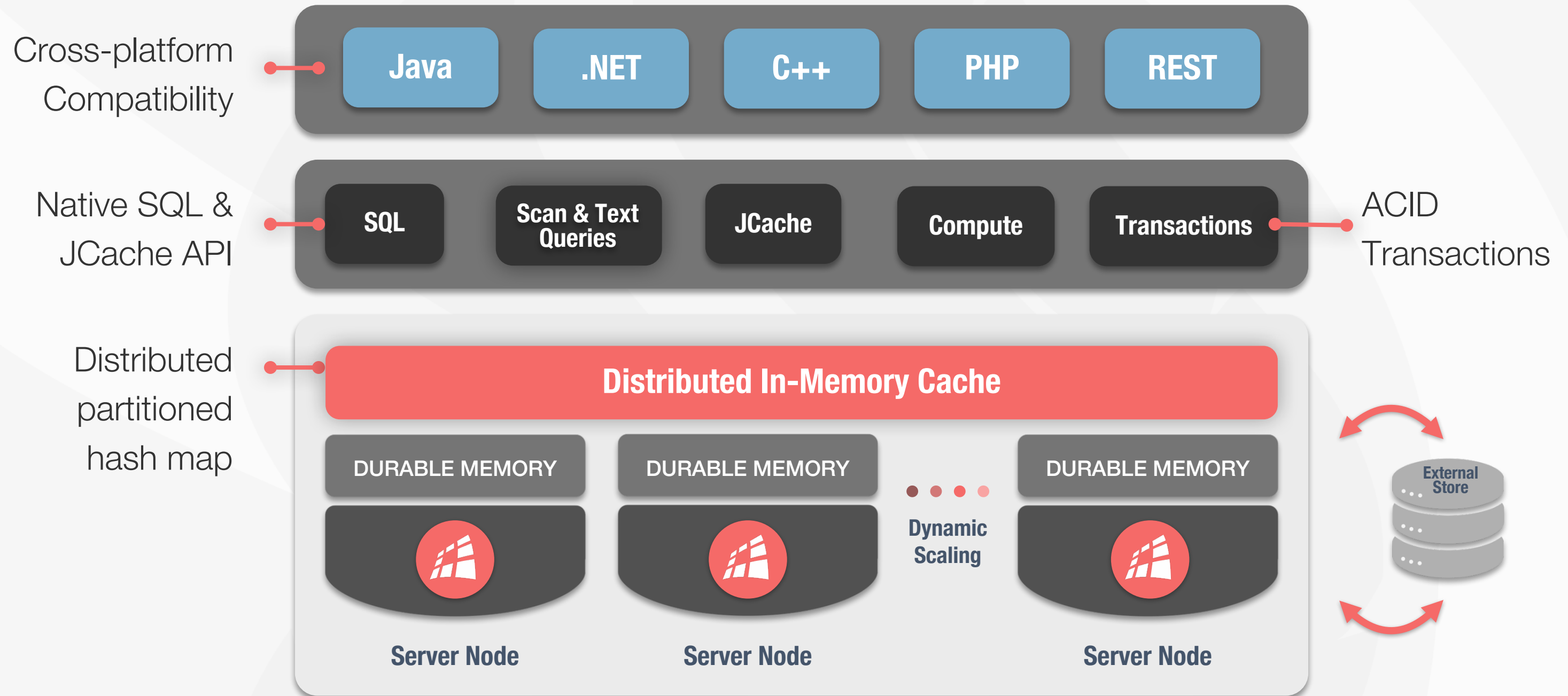


Durable Memory

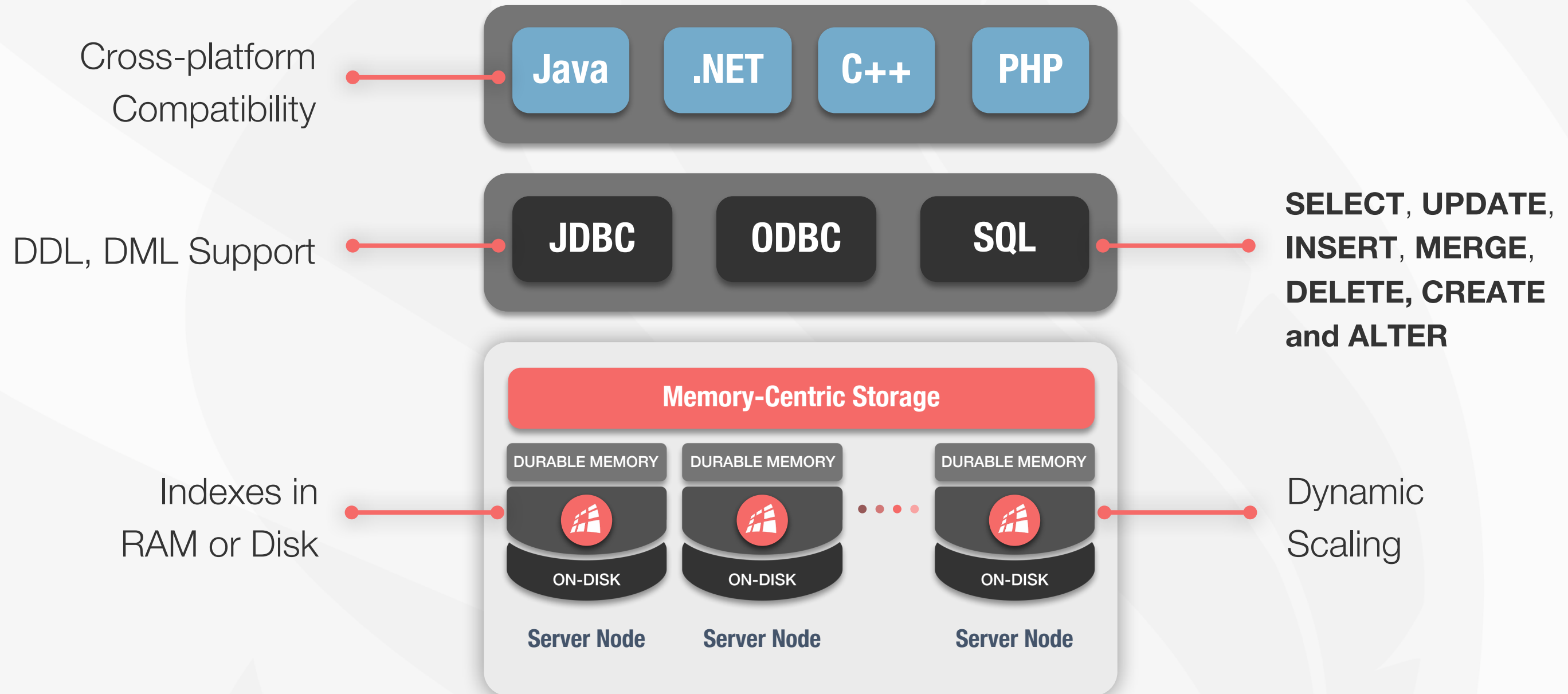


GridGain Server Cluster

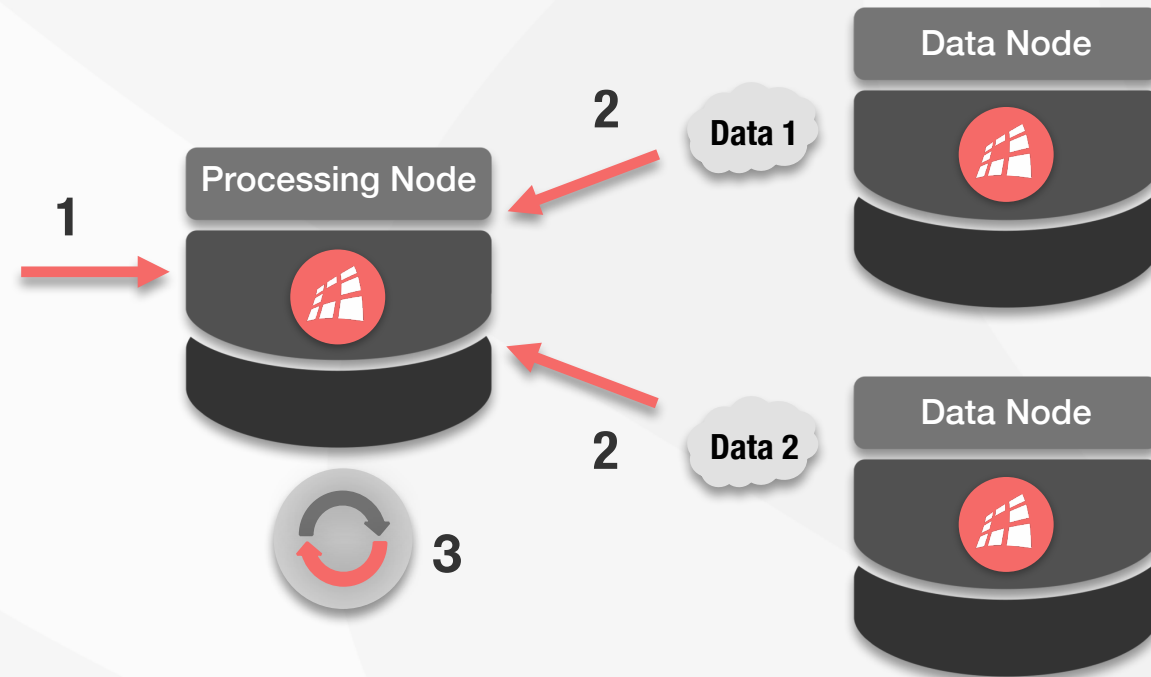
In-Memory Data Grid



Distributed SQL Database

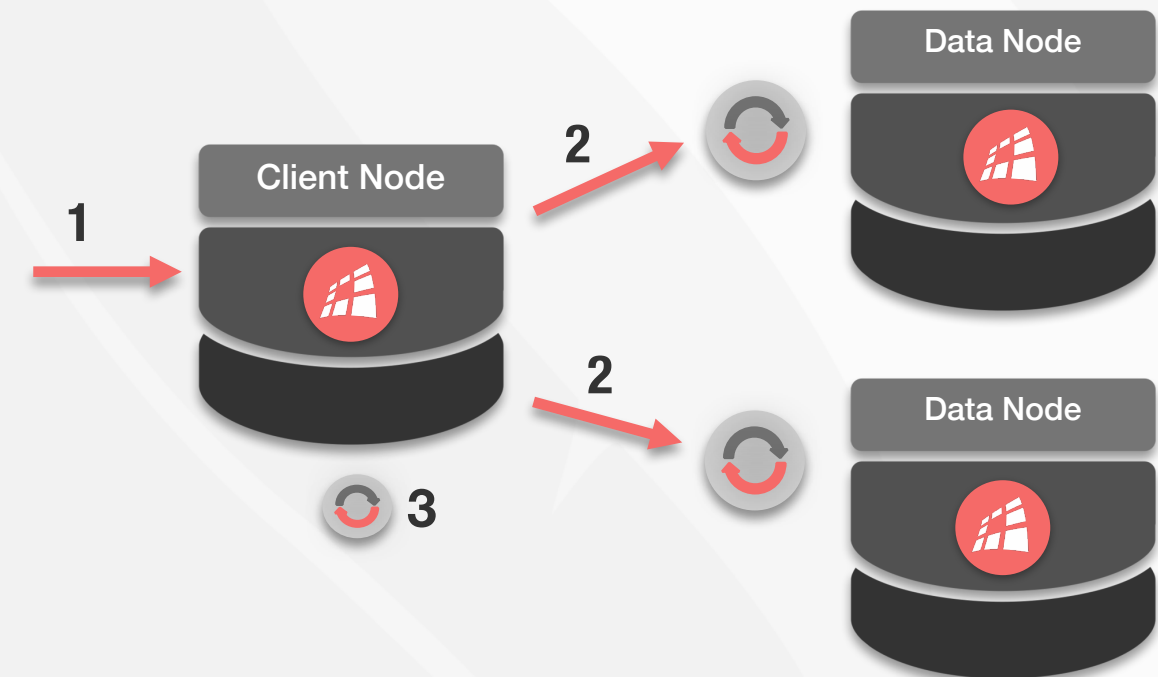


Client-Server Processing



1. Initial Request
2. Fetch data from remote nodes
3. Process the entire data-set

Co-located Processing



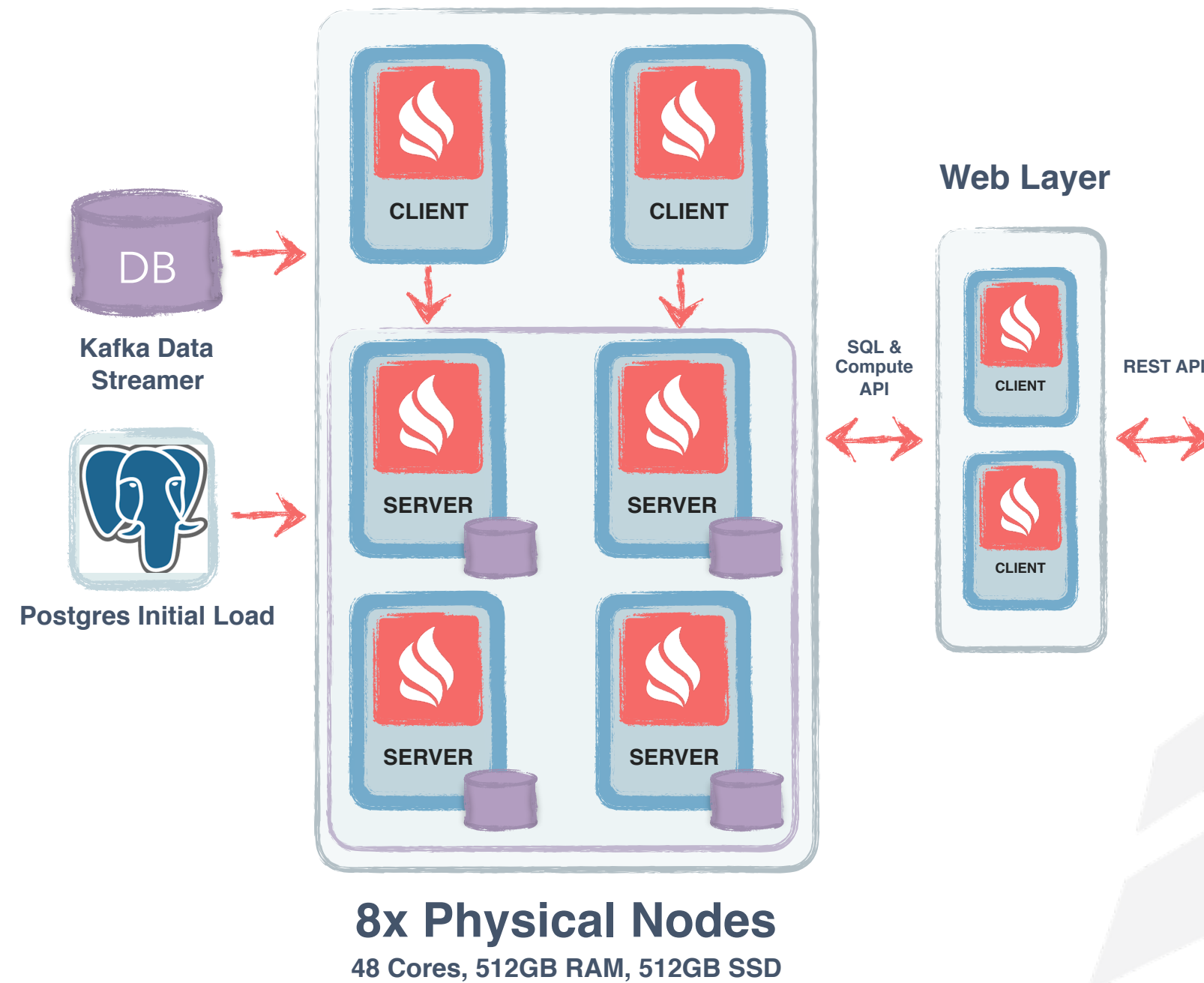
1. Initial Request
2. Co-locate processing with data
3. Reduce multiple results into one

How does this help Postgres?

- Can take Postgres workloads and scale
- Hot data should be stored in memory
- Unified API – leveraging the extensibility of Postgres with Binary Objects
- Can do OLAP in memory – collocated computations – Postgres falls short

Source: Roland Berger

Banking Use Case



If you want to know more...



- GridGain Enterprise Edition is based on Apache Ignite
- Open source is intended to provide an easy entry point for learning, testing and non-critical use
- Enterprise Edition customers benefit from many exclusive enterprise-class features along with support and indemnification



QUESTIONS??