Pivotal GemFire

Pivotal Big Data Road Show 2015

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Data Processing

- Spring XD
- Spark
- Pivotal HD

Advanced Analytics

- Pivotal Greenplum Database
- Pivotal HAWQ

Apps at Scale

- Pivotal GemFire
- Redis
- RabbitMQ
- Pivotal Cloud Foundry

Pivotal Big Data Suite
on Pivotal Cloud Foundry

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Who Is Using Gemfire?

"This isn't the online mass-scale case study that Pivotal has for GemFire – GE Research is using GemFire to handle 17 billion individual readings in memory. Another railway organization, China Railways, has 3TB of operational data in-memory and a further 400 TB archived. China Rail's size dwarfs even India Rail's – they process 4.6 million transactions per day and up to 40,000 per second. Finally CIRE, a payment processing organization is running 19 million payment transactions a month with over 4000 concurrent clients connecting via intermittent internet connections."

http://www.forbes.com/sites/benkepes/2015/01/05/pivotal-helps-india-railways-keep-on-moving-and-selling-tickets/

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Big Data Apps at Scale Have Unique Needs

Pivotal GemFire is the **distributed**, **in-memory NoSQL** database for big data apps for that need:

1. Scale-out performance

2. Consistent database operations across globally distributed nodes

3. High availability, resilience, and global scale

4. Powerful & Standards-based developer features

5. Easy administration of distributed nodes

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1. Scale-Out Performance

In-Memory Storage

RAM

Elastic, linear scalability

Ops / Sec

Nodes
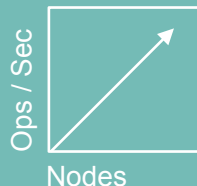
Optimized data distribution

China Railway Corporation

"The system is operating with solid performance and uptime. Now, we have a reliable, economically sound production system that supports record volumes and has room to grow"

Dr. Jiansheng Zhu, Vice Director of China Academy of Railway Sciences

- **4.5 million** ticket purchases & **20 million** users per day.
- Spikes of **15,000** tickets sold per minute, **40,000** visits per second.

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2. Consistent Database Operations Across Distributed Nodes

Performance-optimized persistence

Configurable consistency

Partitioned   Replicated   Disabled

Distributed queries & function execution

Indexing, triggers, event notification

Newedge

"Our global deployment of Pivotal GemFire's distributed cache gives me a single version of the trade – resolving hard-to-test-for synchronization issues that exist within any globally distributed business application architecture"
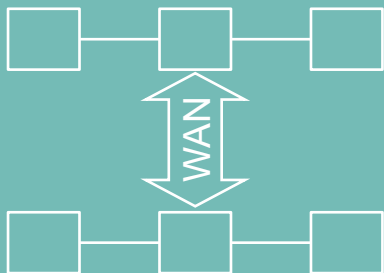
Michael Benillouche, Global Head of Data Management

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3. High Availability, Resilience, and Global Scale

Cluster resilience & failover
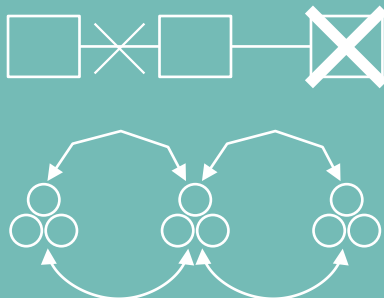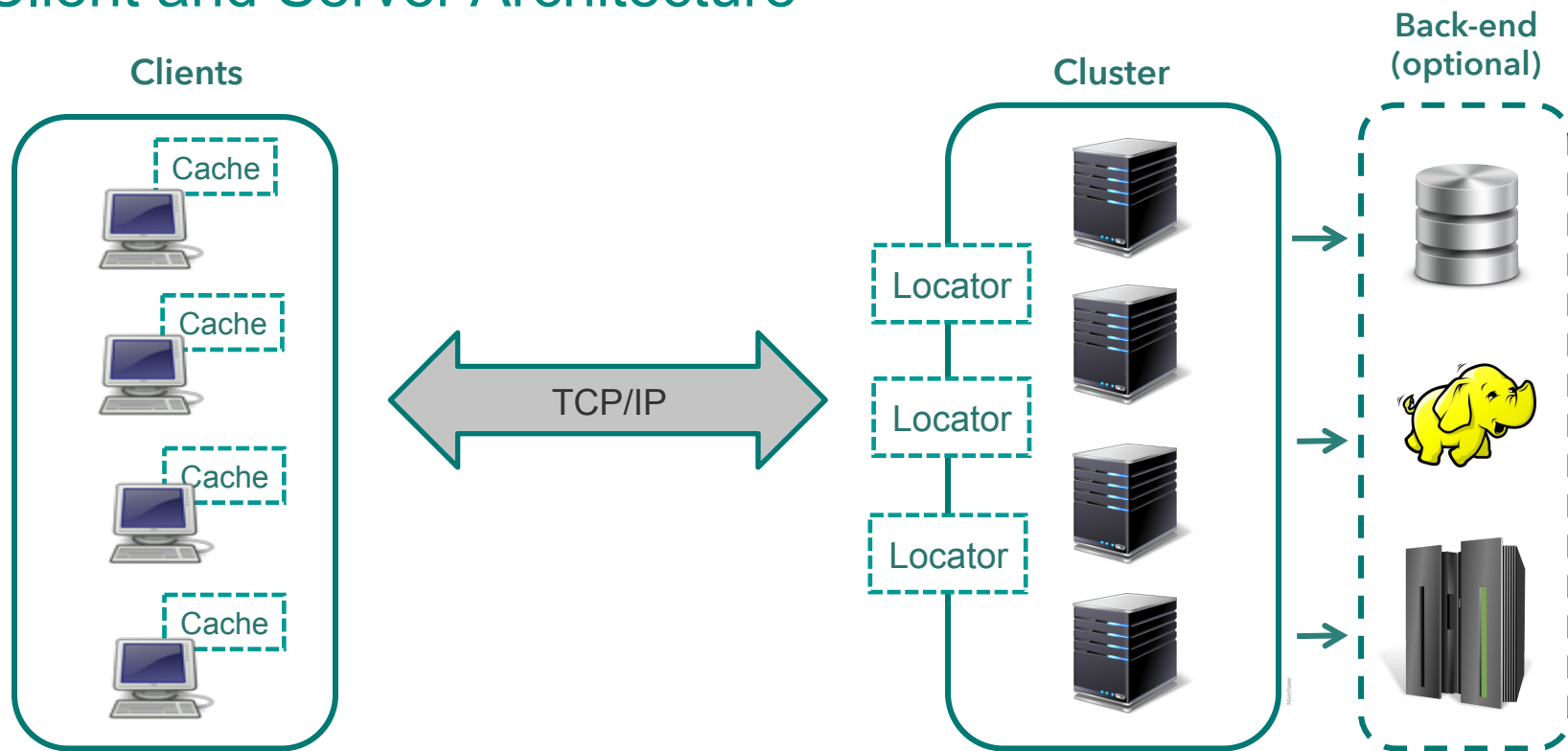
Cluster to cluster WAN connectivity

WAN

gire

"We can track and collect money at our 4,000+ kiosks and branches – even without a reliable Internet connection. GemFire provides the core data grid and a significant amount of related functionality to help us handle this unreliable network problem"

Gustavo Valdez, Chief of Architecture and Development

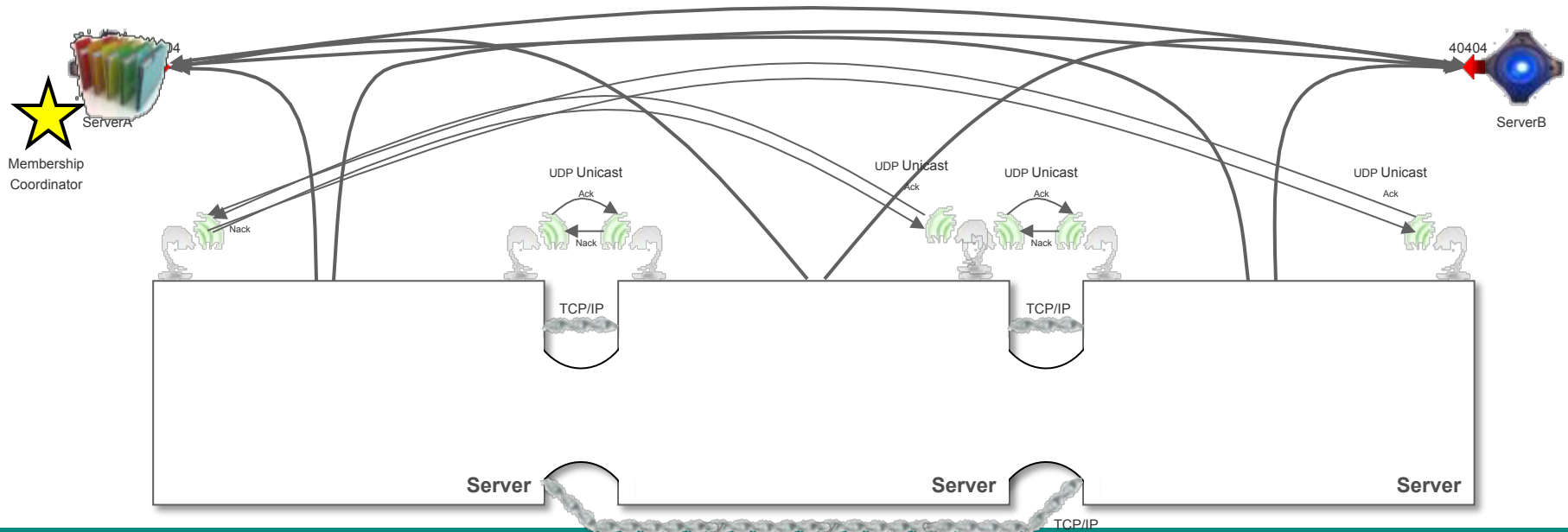- **19 million** payment transactions per month
- **4000+** points of sale with intermittent Internet connectivity

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Client and Server Architecture

Clients

Cluster

Back-end (optional)

Cache

Cache

Cache

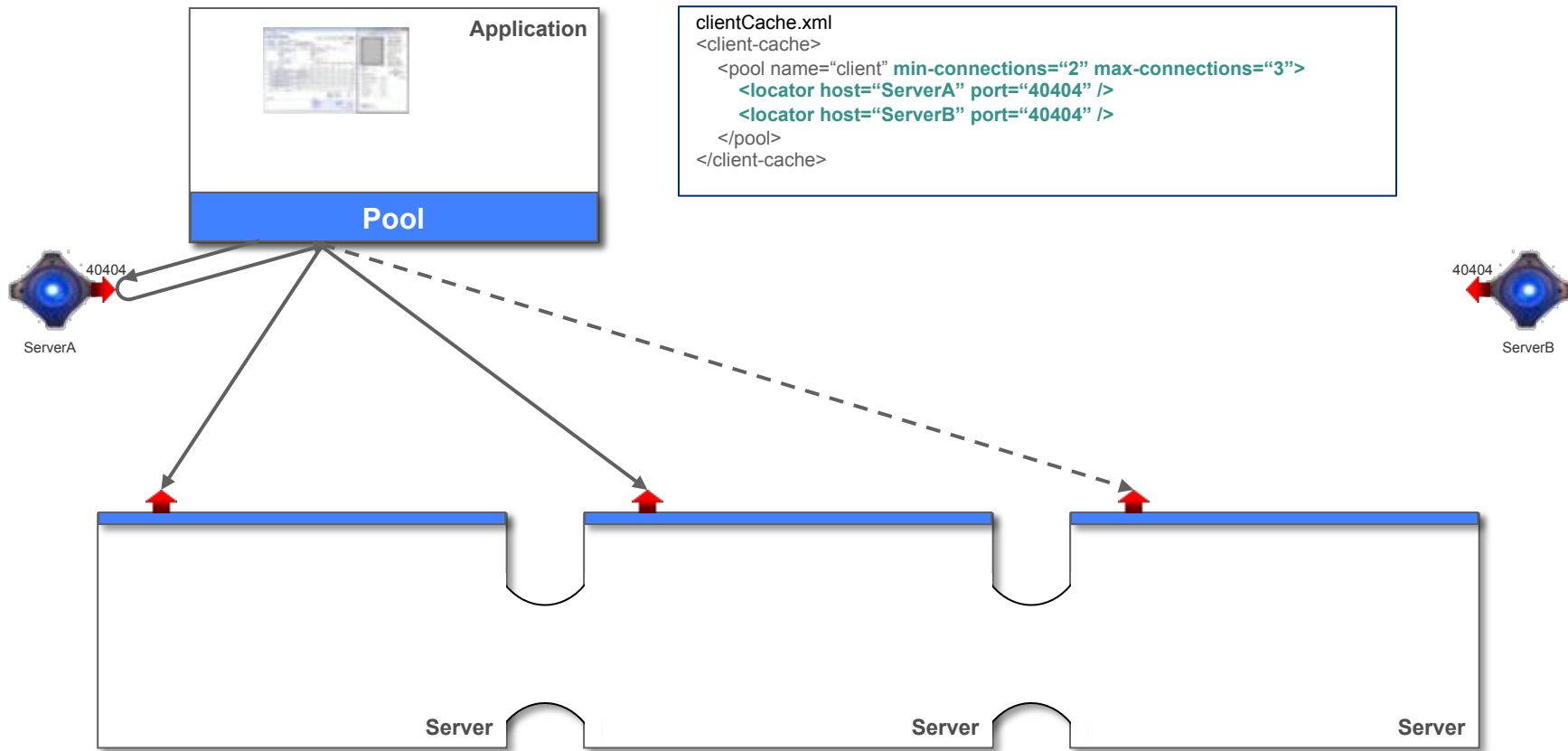Cache

TCP/IP

Locator

Locator

Locator

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Locators and Group Membership

gemfire.properties
mcast-port= 0
locators=ServerA[40404],ServerB[40404]

Connecting a Client to the Cluster

Application

```
clientCache.xml
<client-cache>
   <pool name="client" min-connections="2" max-connections="3">
      <locator host="ServerA" port="40404" />
      <locator host="ServerB" port="40404" />
   </pool>
</client-cache>
```

Pool

40404

ServerA

40404

ServerB

Server   **Server**   **Server**

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Replicated Regions Overview

Products

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Partitioned Regions Overview

Continuous Queries Overview

Application

onEvent(CqEvent event)

Region

Pool

String query = "SELECT * FROM /Customers WHERE balance < 0";

Cache Server

Update

cOQL   Region

Server

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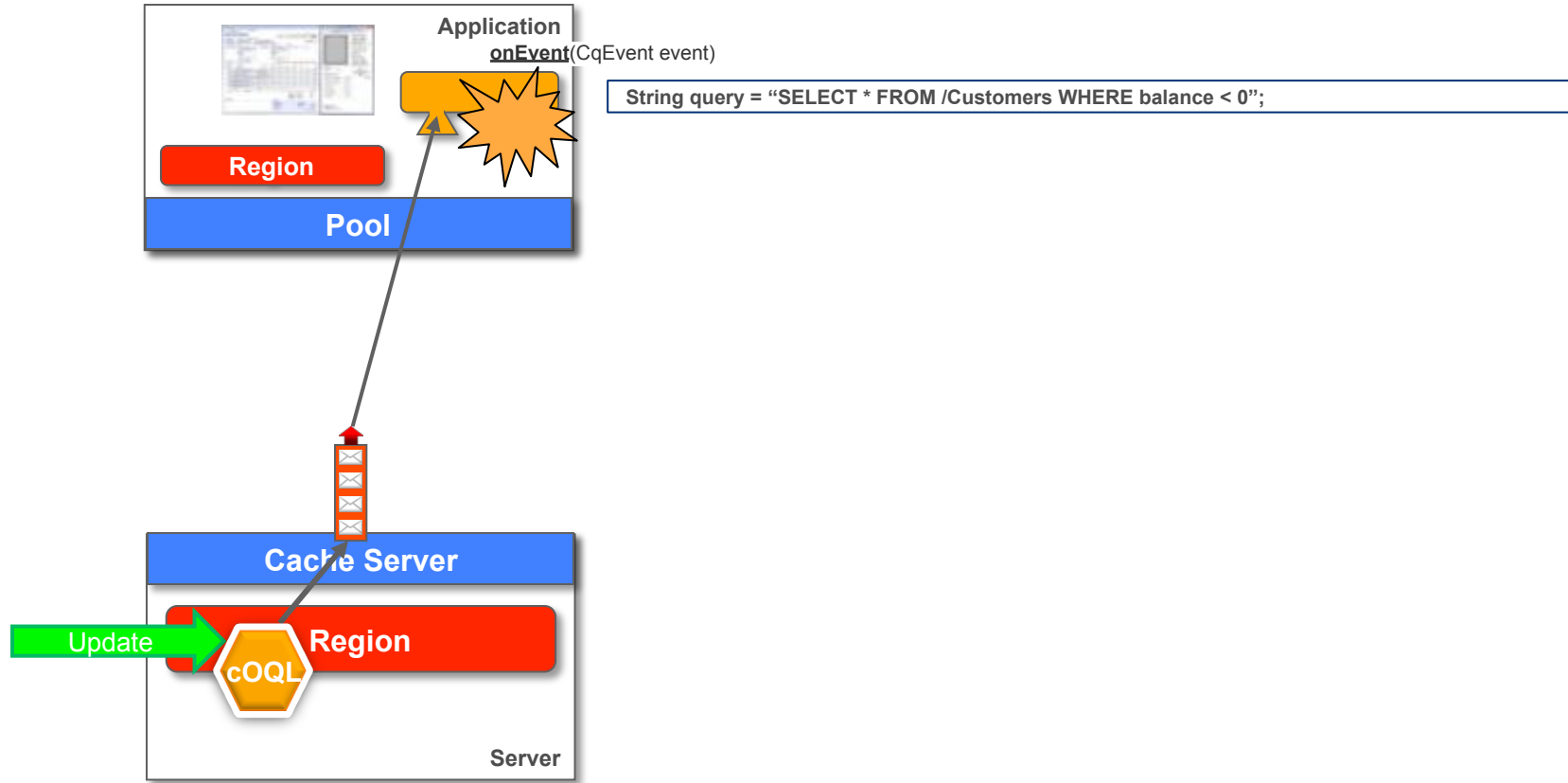
CQ Driven Dashboard Demo

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Lab

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QUESTIONS

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