GIGASPACES
innovate with confidence

A Deep Learning Approach to Automatic Call Routing

Rajiv Shah
Director of Solution Architect and Professional Services

2019

About GigaSpaces

We deliver the fastest big data analytics processing platform to run your analytics & machine learning in production, at scale

INSIGHTEDGE

300+
Direct customers

50+ / 500+
Fortune / Organizations

5,000+
Large installations in production (OEM)

25+
ISVs

GigaSpaces Select Customers

OEMs / ISVs / Partners

ABOUT THE USE CASE

This use case shows how to modernize existing software architecture for an efficient call center routing workflow

USE CASE BENEFITS:

- Enhance Customer Experience with automatic routing that prevents customers from being buried in a hierarchical menu
- Reduce Average Handle Time for optimized efficiency

BUSINESS CHALLENGES

Improve Customer Experience	Reduce Costs: lower AHT	Enhanced System Agility
Faster call routing to the correct agent means a more satisfied customer	Faster call resolution: Faster routing + Routing to correct agent	Higher agility when adding new categories or departments

TECHNICAL CHALLENGES

Performance

Event Driven Architecture based on prediction criteria is required for optimal performance supporting peak events

Simplification

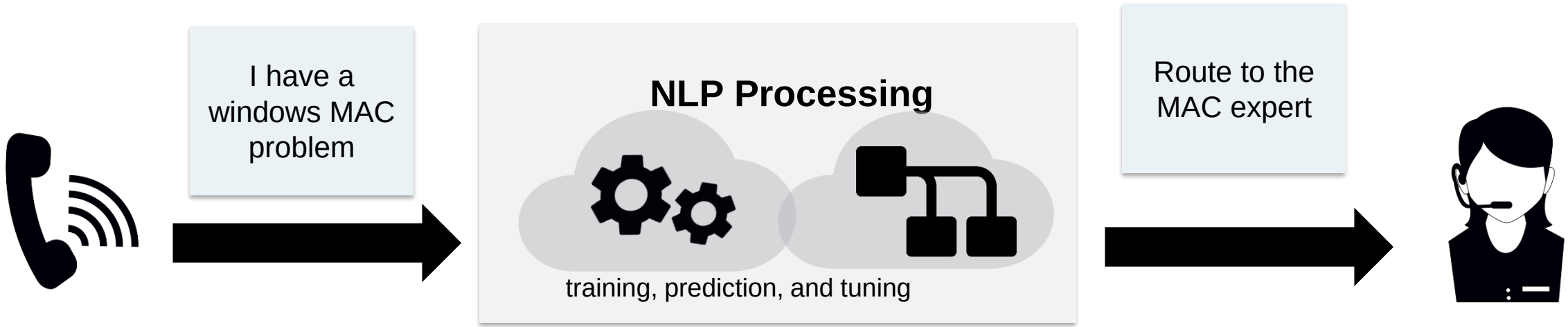
Leveraging existing opensource frameworks such as BigDL in a unified platform simplifies architectural complexity

Continuous ML Training

Continuous model training based on previous transcribed calls + automatic training of alternative models ensure models with higher scoring

Stop Pressing 0 Or *

Automatic routing to the right agent for the perfect personalized experience



User speaks using web interface

Browser converts speech to text and sends to controller

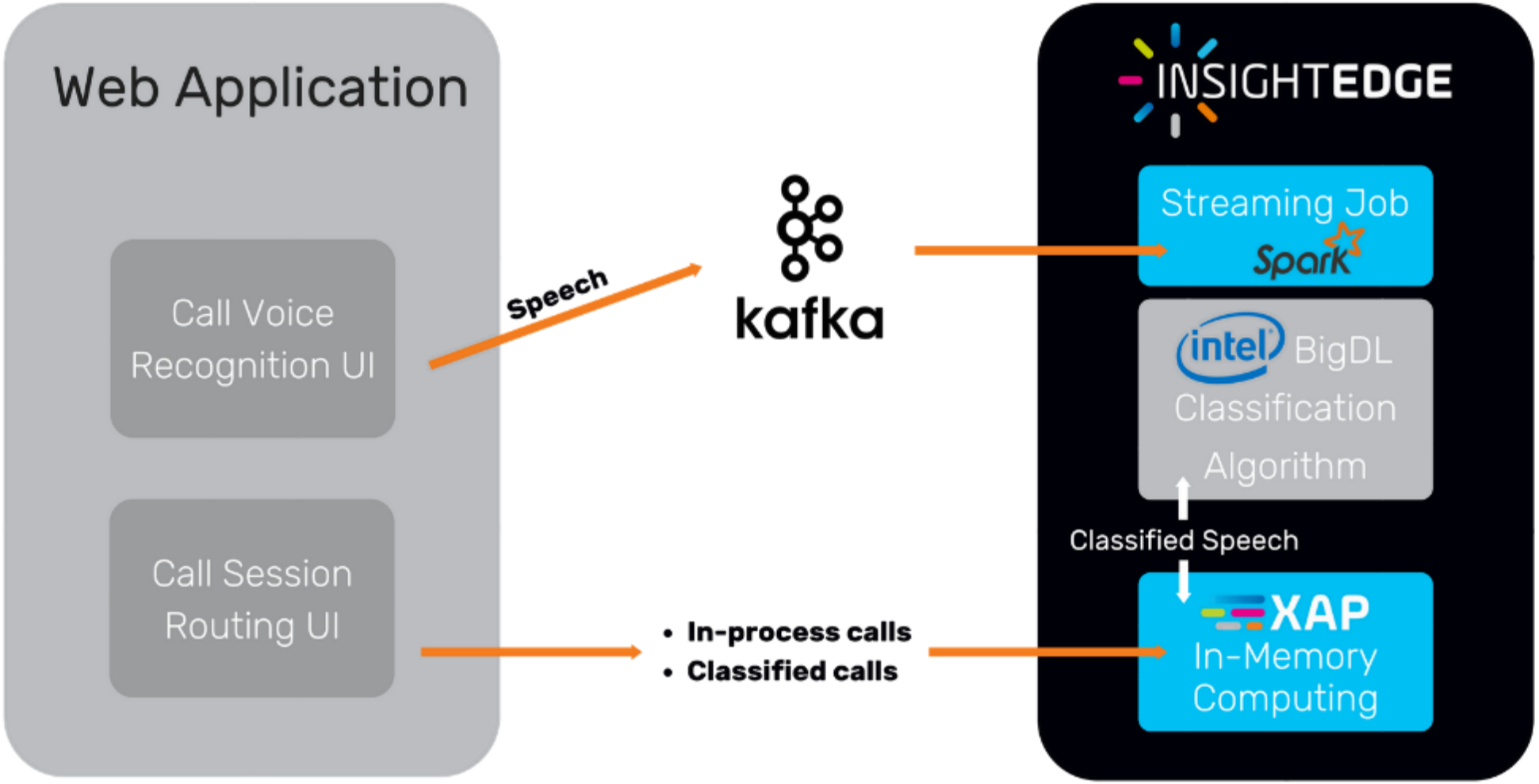
Controller writes data to InsightEdge and to Kafka topic

Spark job listens on Kafka topic and using BigDL model, creates prediction

BiGDL writes Prediction to InsightEdge data grid

InsightEdge event processor listens for Prediction data and routes call session

Operationalizing AI Example – Automatic Call Routing



LIVE DEMO: Instant Insight to Action

- Run Deep Learning with BigDL on transactional data in real-time for instant insights
- Trigger transactional workflows based on prediction criteria and scoring for real-time business impact
- Simplify architecture, eliminate GPU requirements & reduce component and cluster sprawl for optimal performance & TCO

Automatic Call Routing

Call session assistant

Search...

Help

See the brain behind it!

Insightedge Web-UI

Spark Jobs

Model: TextClassification
Training time: 10 min

Accuracy: 0.787037

BigDL v0.2.0

Call Center BigDL/InsightEdge module

Click on the microphone icon and begin speaking.

In-process calls (Powered by Intel BigDL) 0

Id	Text

Call sessions 4

Id	Category	Agent Id	Time (ms)	Text
4	comp.sys.mac.hardware	1	64	My Mac is just s***
3	comp.os.ms-windows.misc	7	67	My Microsoft computer sex
2	comp.sys.mac.hardware	0	94	Hey I have a problem with my Mac
1	comp.os.ms-windows.misc	4	114	Hello I have a problem with my windows

RESULTS

Performance

Average ~50ms routing

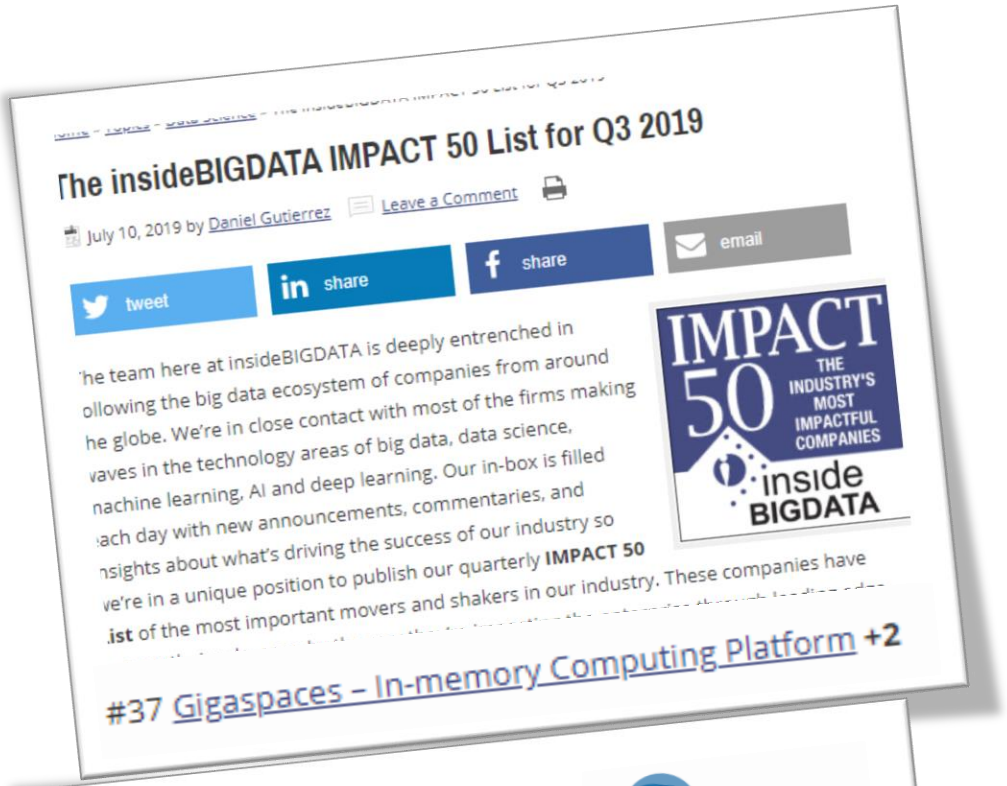
Accuracy

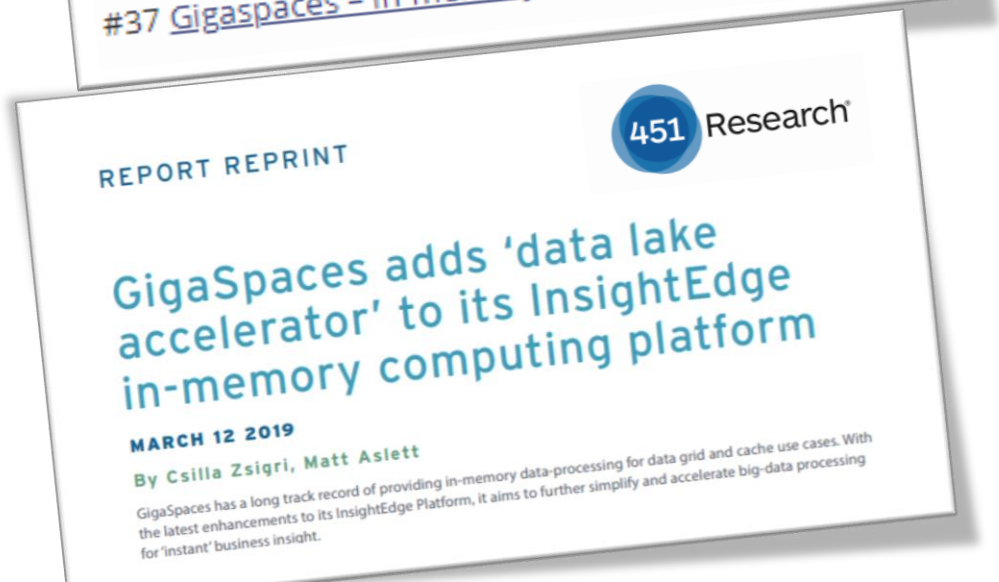
Between 75%-85% accuracy

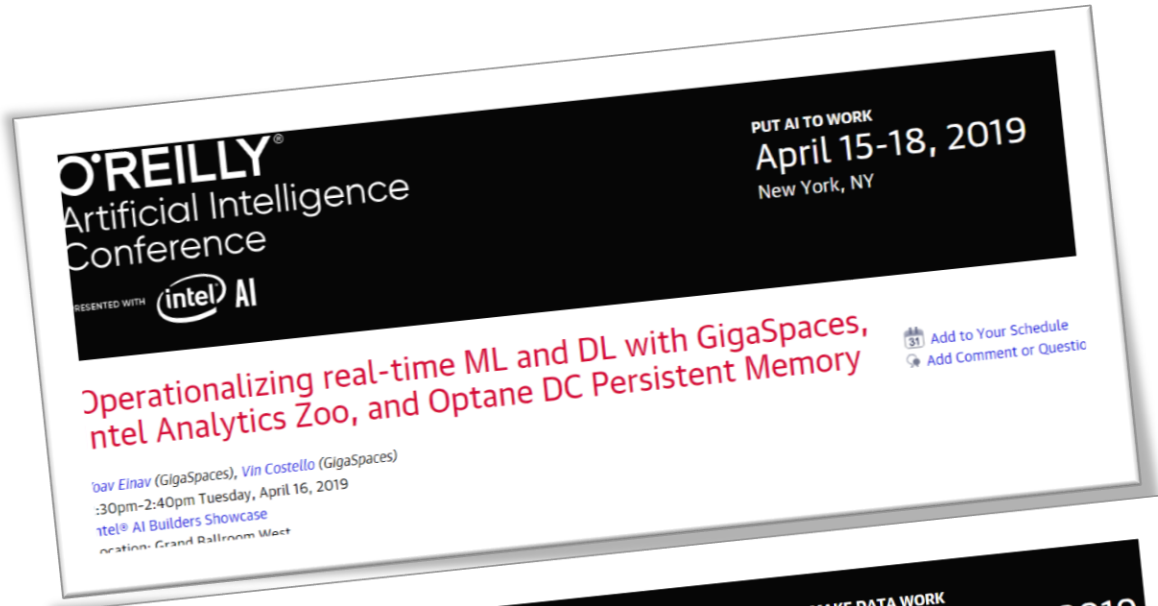
Continious Training

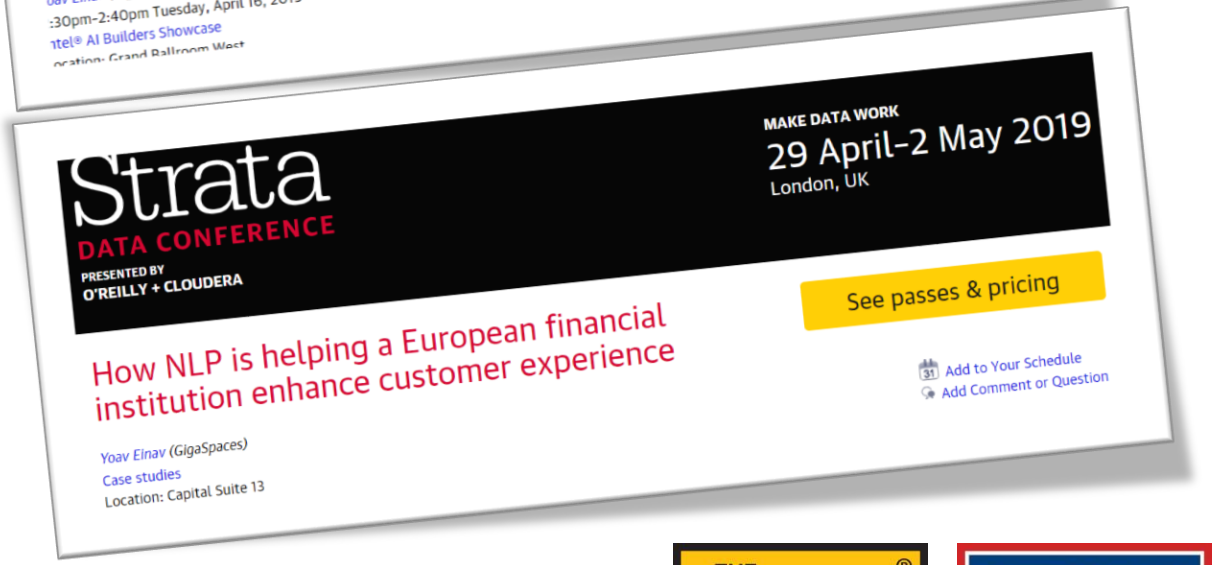
Background processing and training of ~10 minutes to create a new model

GigaSpaces Coverage









GigaSpaces Competitive Edge

Data Analytics: Undeniable Value to your Business

Dynamic Pricing
Helps grow sales by **30% annually**

Predictive Maintenance
Reduces maintenance costs by up to **75%** per mile (transportation example)

Optimized Operations
Saves **$100sK** in annual savings (banking example)

Personalized Recommendation
Increases conversions by **up to 20X** for brick & mortar stores via location-based promotions

Risk Analysis
Reduces loan losses **by 10-30%**

Fraud Analytics
Reduces losses by **3 to 5%** in mature environments and by **over 30%** in evolving contexts

Call Center Automation
Increases efficiency by **over 90%**

The Velocity of Business

"To prevent fraud, anomaly detection needs to happen against 500,000 txn/sec in less than 200 milliseconds"

"A typical e-commerce website will experience 40% bounce if it loads in more than 3 seconds, including personalization offers"

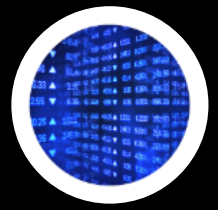
"A call center receives 450,000 calls/day, each call needs to be routed in less than 60 milliseconds"

FINANCIAL SERVICES

ECOMMERCE

TELCO

Use Cases Spanning Industries Benefit from Near Real-time AI Decision Support Systems Built on GigaSpaces



FINANCIAL SERVICES

- Fraud
- Credit risk scoring
- Customer 360
- Customer churn

INSURANCE

- Usage based insurance
- Customer 360
- Customer churn
- Claims management

RETAIL ECOMMERCE

- Personal recommendations
- Intelligent inventory mgmt.
- Customer 360
- Locations-based promotions

TRANSPORTATION

- Predictive maintenance
- Fleet management
- Customer 360

INDUSTRIAL IOT

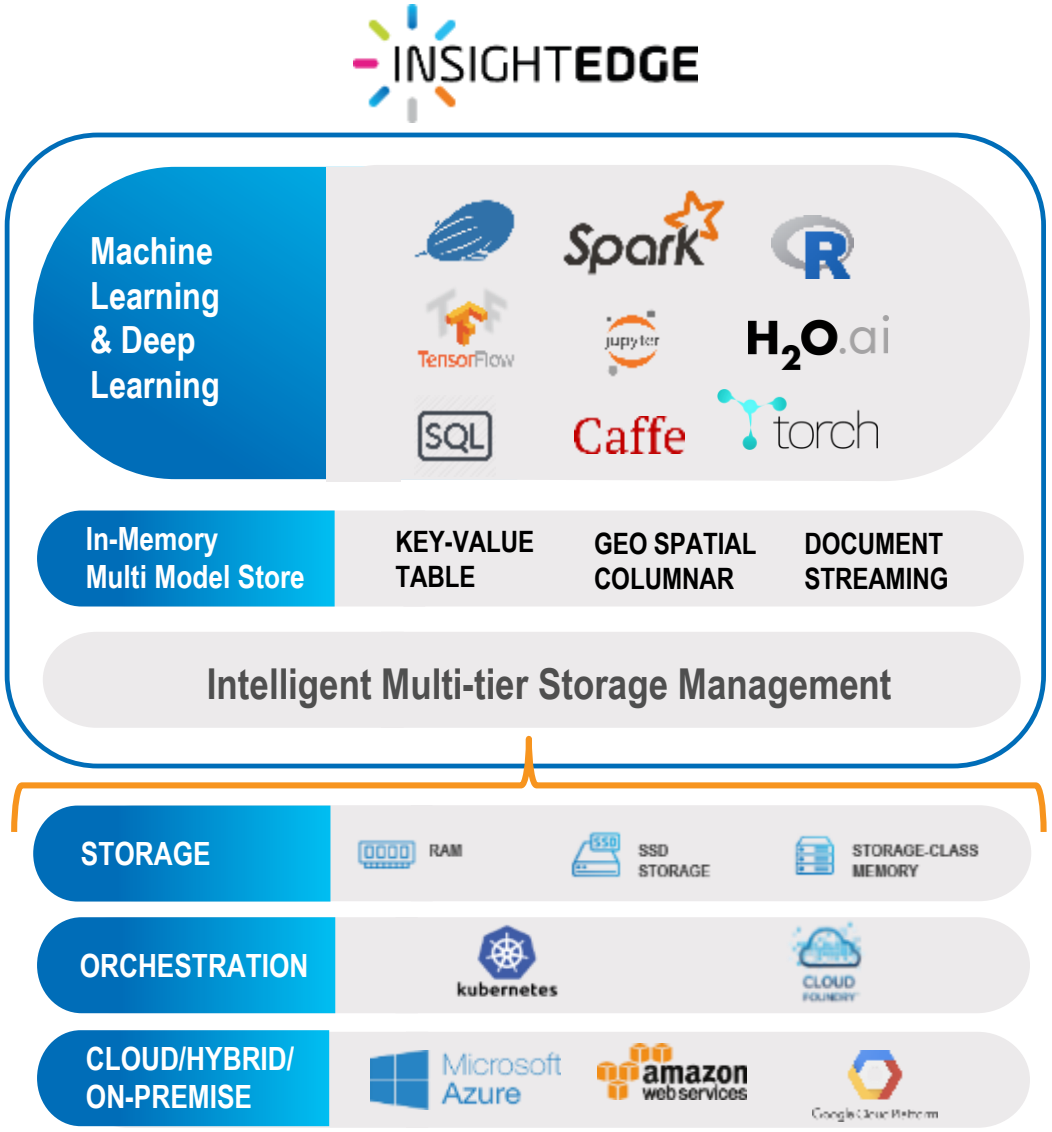
- Inventory planning
- Customer 360
- Predictive maintenance

MEDIA/ TELCO

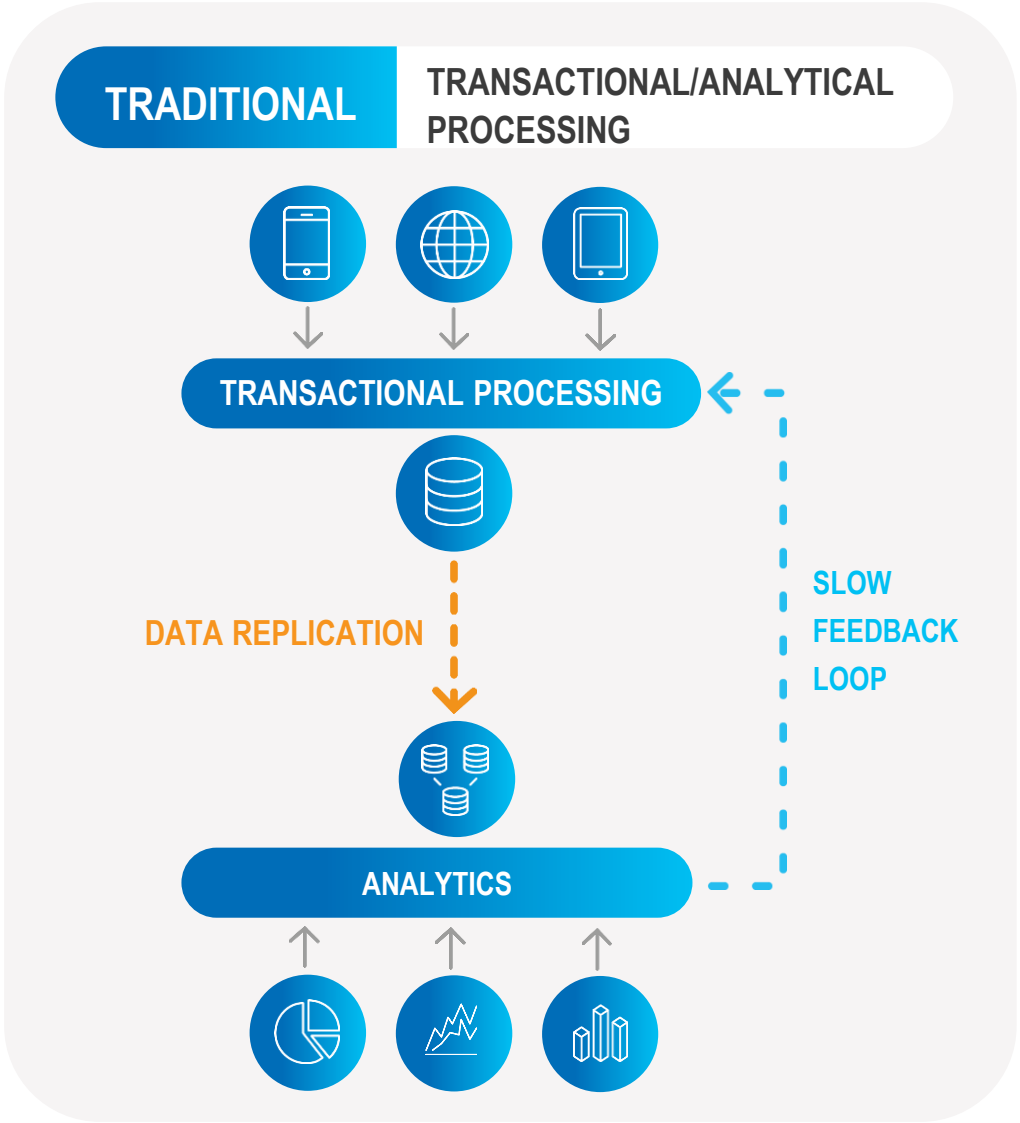
- Customer 360 (incl. churn)
- Intelligent call center routing
- Data Center Infrastructure Monitoring (DCIM)
- Predictive maintenance

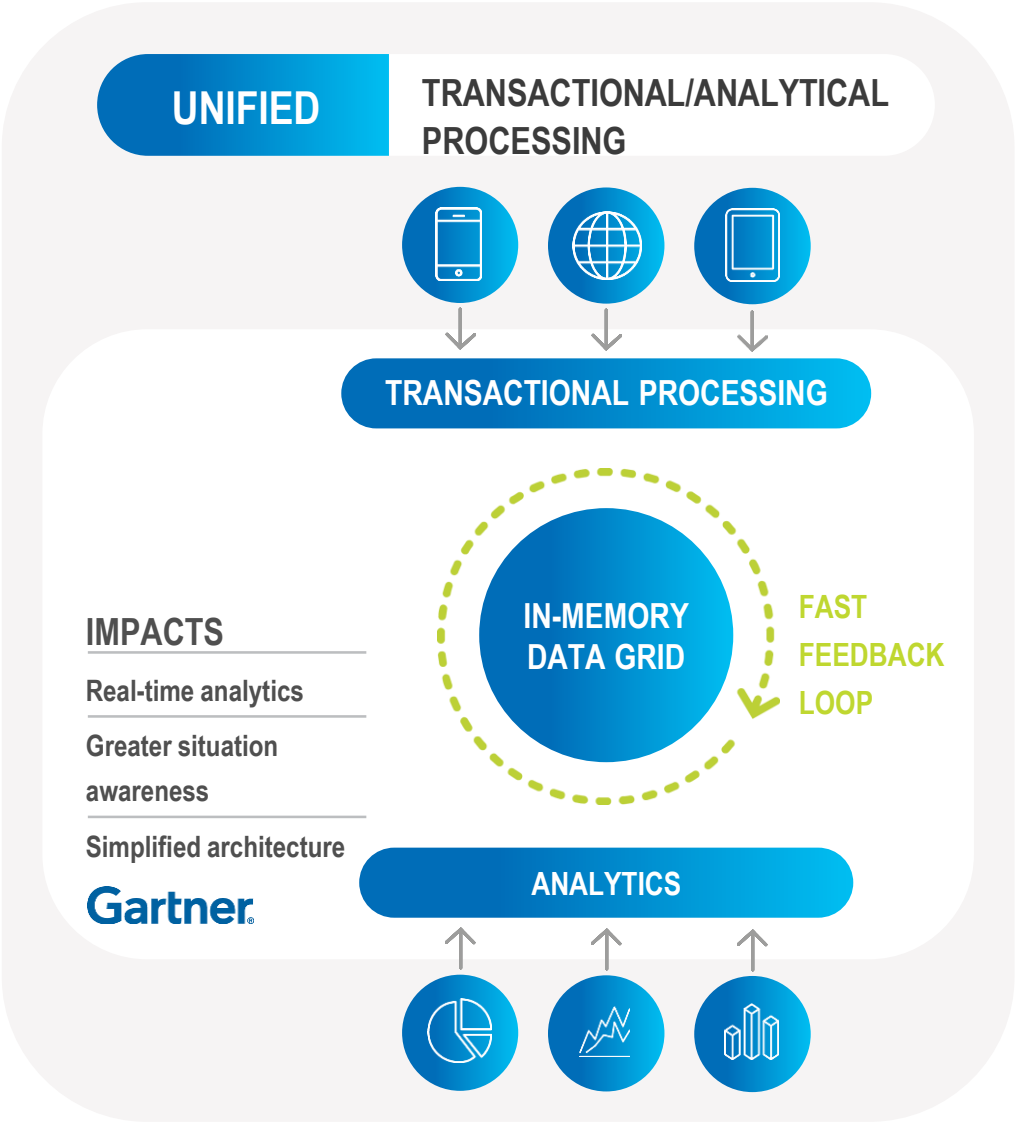
InsightEdge: Unifying Real-Time Analytics, AI and Transactional Processing in One Platform

- Rich ML & DL support
- Extreme performance
- Fully Transactional
- ACID Compliance
- Enterprise-grade (Security, High Availability)
- Co-located Apps and Services
- Seamless integration with Big Data ecosystem
  - Data sources (Kafka/Nifi/Talend/etc.)
  - Data lakes (S3/Hadoop/etc.)
  - BI tools (Tableau/Looker/etc.)



Traditional vs. Unified “Translytical” Processing





UNIFYING Analytics and Transactional Processing at SCALE & SPEED

INSIGHTEDGE

BI TOOLS

tableau looker Power BI Qlik

DATA LAKE

amazon web services S3 cloudera Microsoft Azure Blob Storage

DATABASE & DATA WAREHOUSE

PostgreSQL MySQL cassandra mongoDB. snowflake TERADATA

APPLICATIONS

MOBILE WEB IOT

SECURITY AND AUDITING

MANAGEMENT AND MONITORING

REST ORCHESTRATION

BI & VISUALIZATION

Grafana Apache Zeppelin

SQL/JDBC NOTEBOOK

ANALYTICS, MACHINE & DEEP LEARNING

APACHE Spark TensorFlow Caffe torch SQL

MACHINE LEARNING DEEP LEARNING STREAMING

APPS & MICROSERVICES

Java Scala {REST API} python R

SPARK JOBS MICROSERVICES (REST) EVENT PROCESSING

CORE

IN-MEMORY DATA GRID

MULTI MODEL STORE

OBJECTS, JSON, KEY-VALUE, TABLES, TEXT, GEO SPATIAL, GRAPH

EVENT PROCESSING

PERSISTENT MEMORY

CDC Engine

CR8

MAP/REDUCE

RPC &

MemoryXtend - MULTI-TIERED STORAGE

RAM SSD DATA LAKE

WAN GW - MULTI SITE REPLICATION

WAN GATEWAY

Apache ZooKeeper™ CLUSTER MANAGEMENT & SERVICE DISCOVERY

ON-PREMISE

CLOUD

Microsoft Azure amazon web services Google Cloud Platform

HYBRID

docker kubernetes RED HAT OPENSHIFT Container Platform

AnalyticsXtreme: Accelerating Your Data Lake by 100X for Real-time Analytics

Your data is immediately searchable, queryable, and available for analytics

- Single logical view for hot, warm and cold data
- Hot data resides on in-memory data grid and historical data on HDFS/Object Store
- Hot data is **mutable** and historical data is **immutable** (parquet)

Fast Access

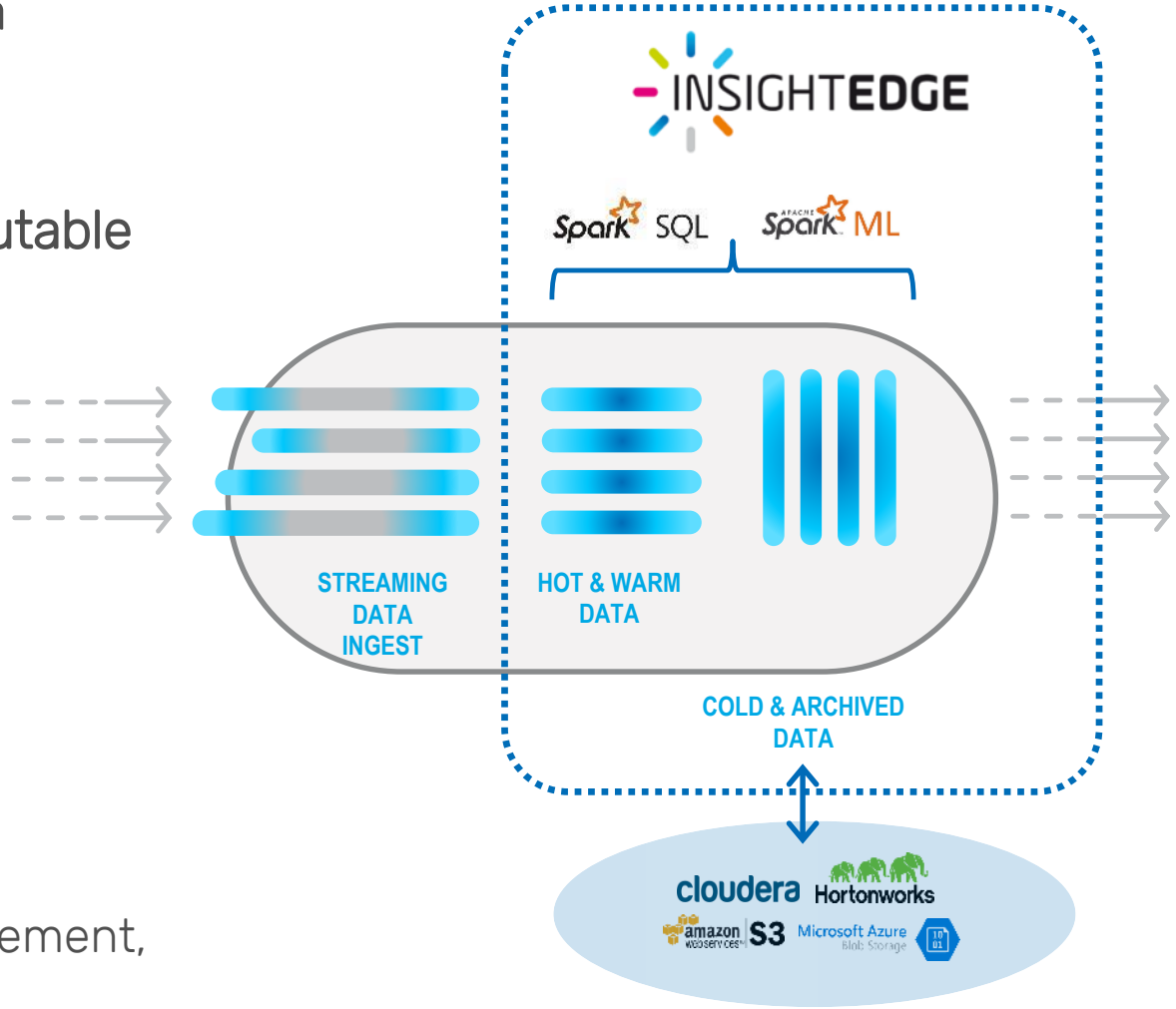
- Fast access to frequently used historical data

Access any data through a unified layer

- Analytics (Spark ML)
- Query (Spark SQL)

Automatic lifecycle management

- Automatically handles the underlying data movement, optimization and deletion



Ultra-low latency and high throughput transactional processing IMDG

Partitioned In-Memory Grid
Shared-nothing, linear scalability, elastic capacity

Co-Location of Data and Business Logic
Co-located ops, event-driven, fast indexing

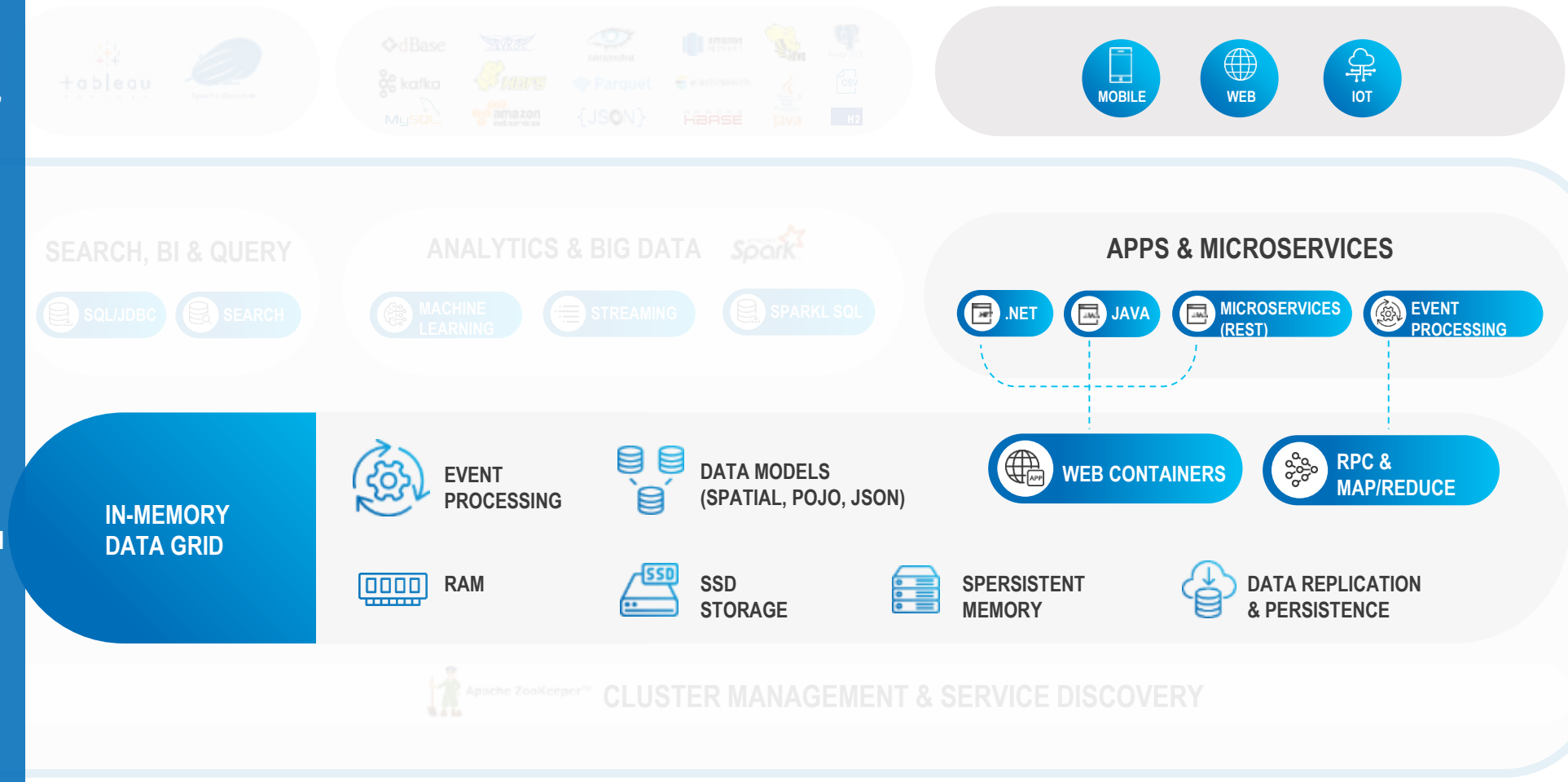
Event-Driven Processing and Map/Reduce

No Downtime
Auto-healing, multi-data center replication, fault tolerance

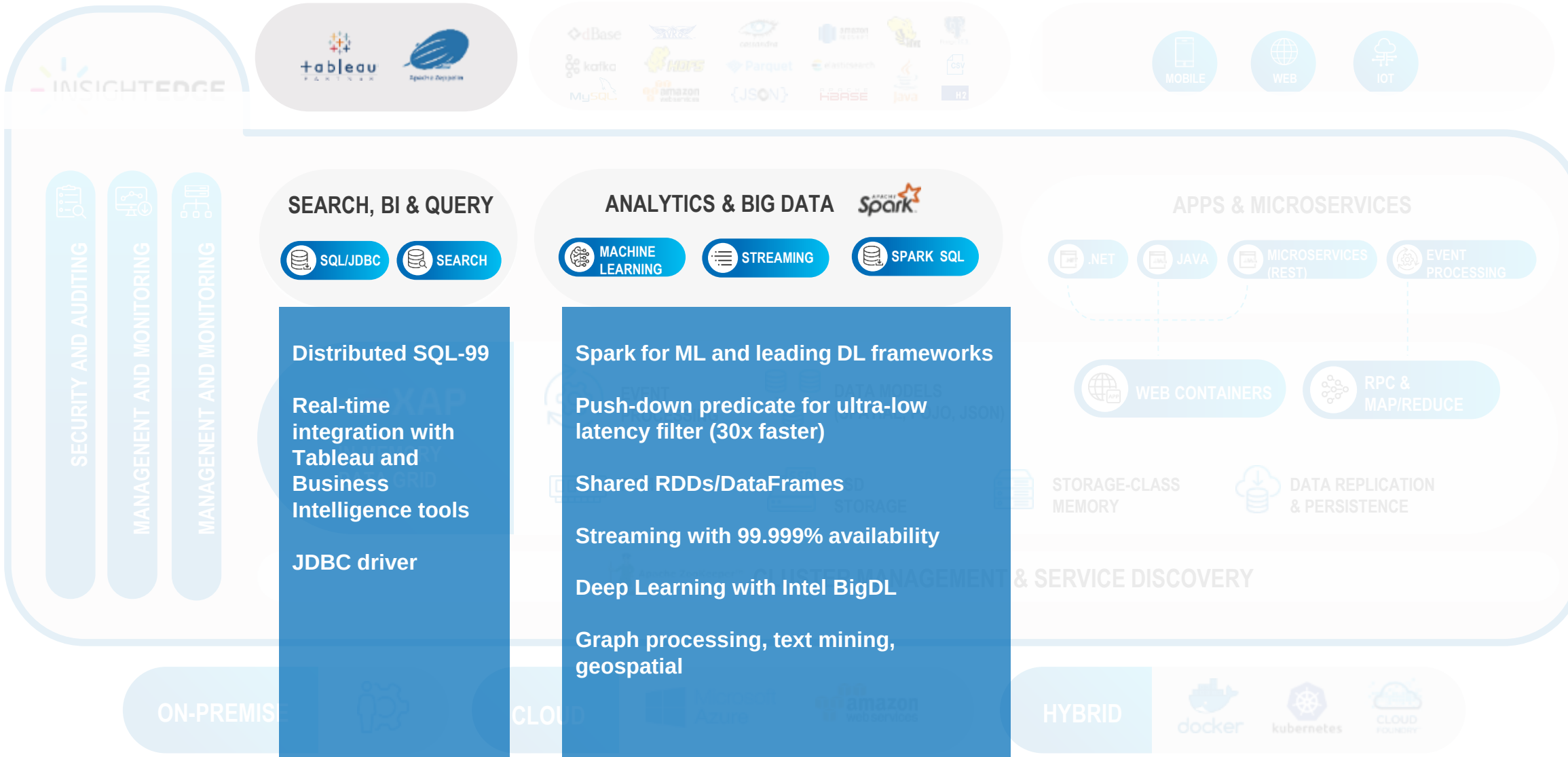
Fast Indexing Multi-Data Model
POJO, .NET, Document/JSON, Geospatial, Time-series

Seamless Integration with Java/Scala ecosystem

Cloud, Kubernetes, Docker Native



Co-located Analytics and AI with Transactional Processing



Distributed SQL-99

Real-time integration with Tableau and Business Intelligence tools

JDBC driver

Spark for ML and leading DL frameworks

Push-down predicate for ultra-low latency filter (30x faster)

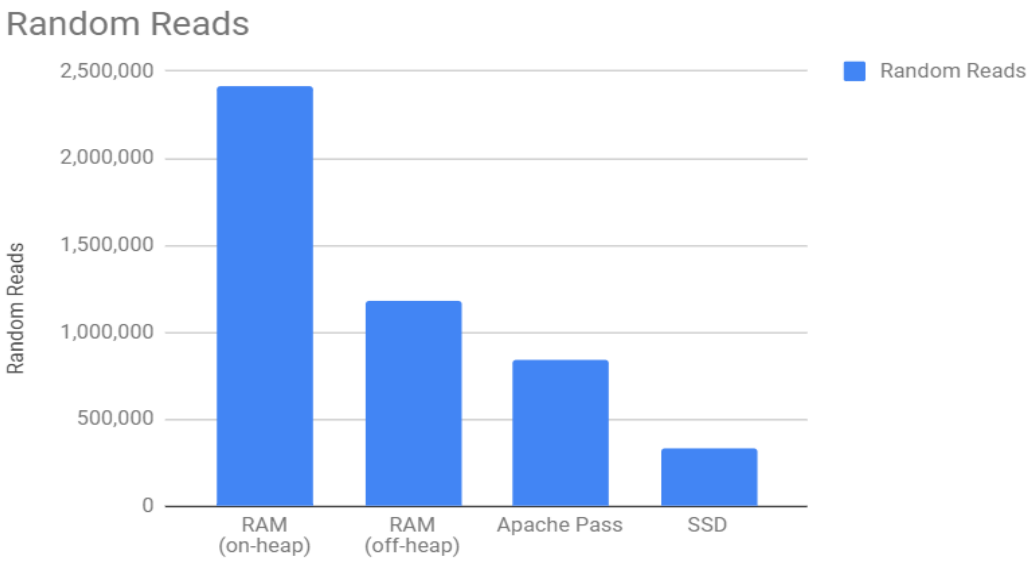
Shared RDDs/DataFrames

Streaming with 99.999% availability

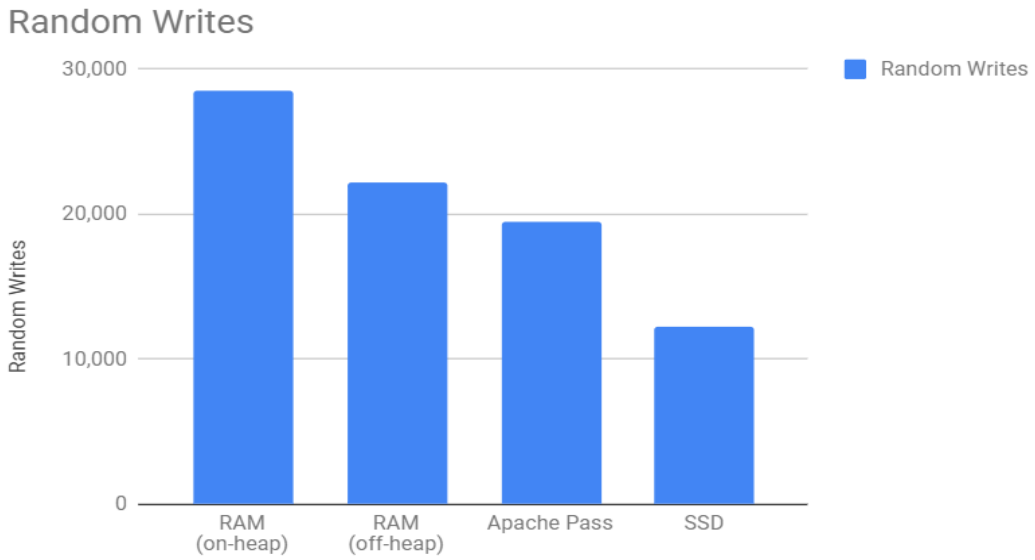
Deep Learning with Intel BigDL

Graph processing, text mining, geospatial

Benchmark (in IOPS)



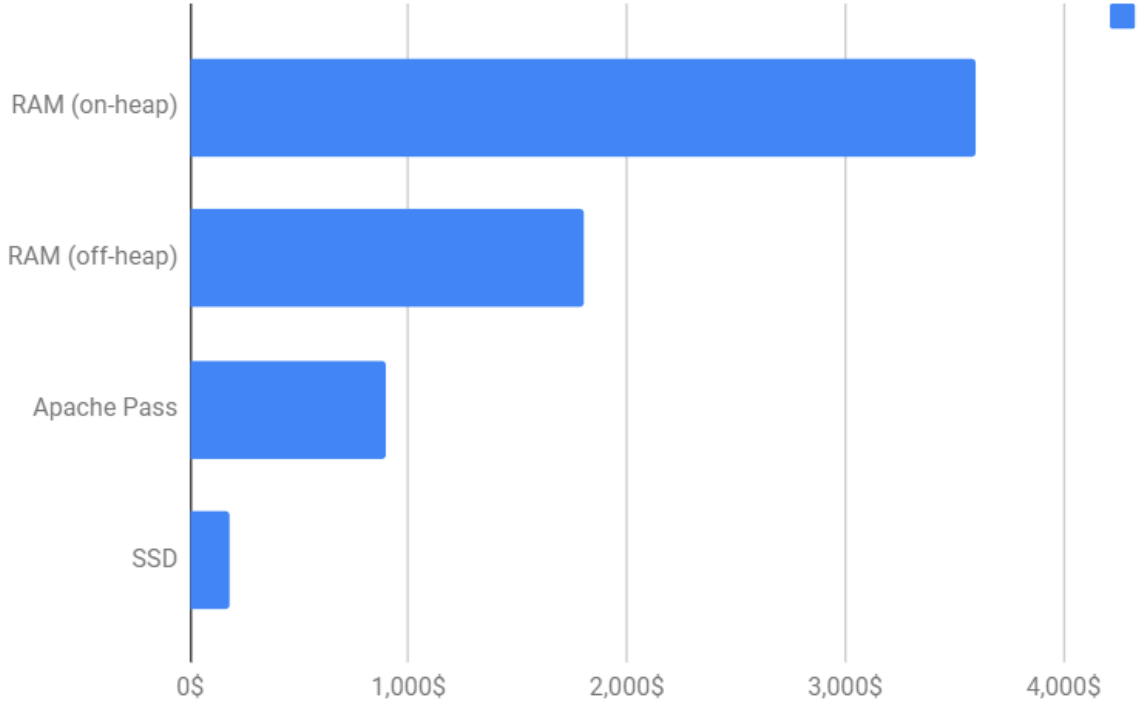
- Persistent Memory +249% than SSD
- RAM (off-heap) +350% than SSD



- Persistent Memory +159% than SSD
- RAM (off-heap) +180% than SSD

Costs Analysis

for 5GB usable data

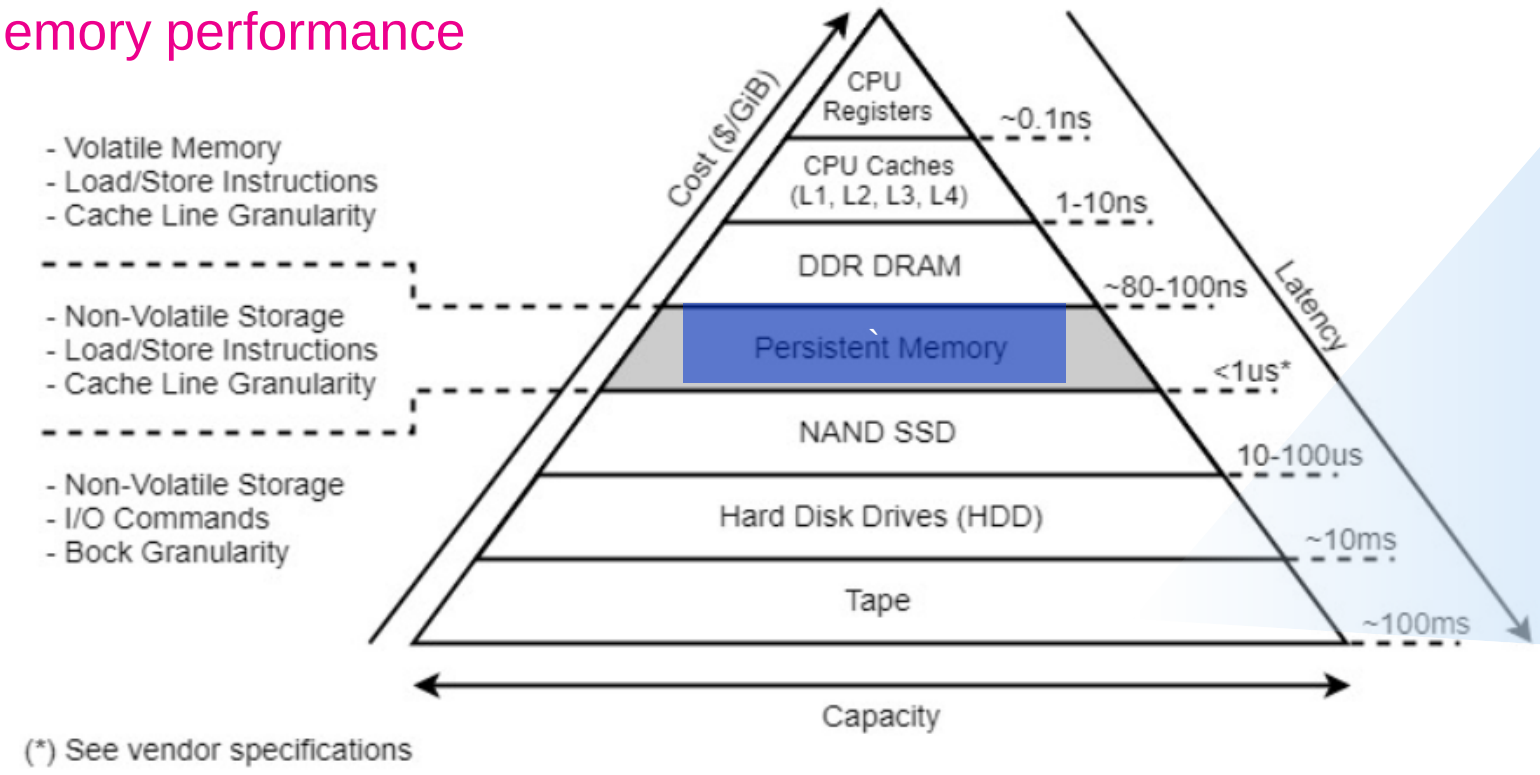


- CAPEX reduction of up to 50% with RAM off-heap vs. on-heap
- CAPEX reduction of up to 75% with AEP vs. RAM on-heap
- OPEX reduction by X10

Tiered Storage Architecture

Higher Performance – Optimized TCO

10X less expensive
than only RAM maintaining
in-memory performance



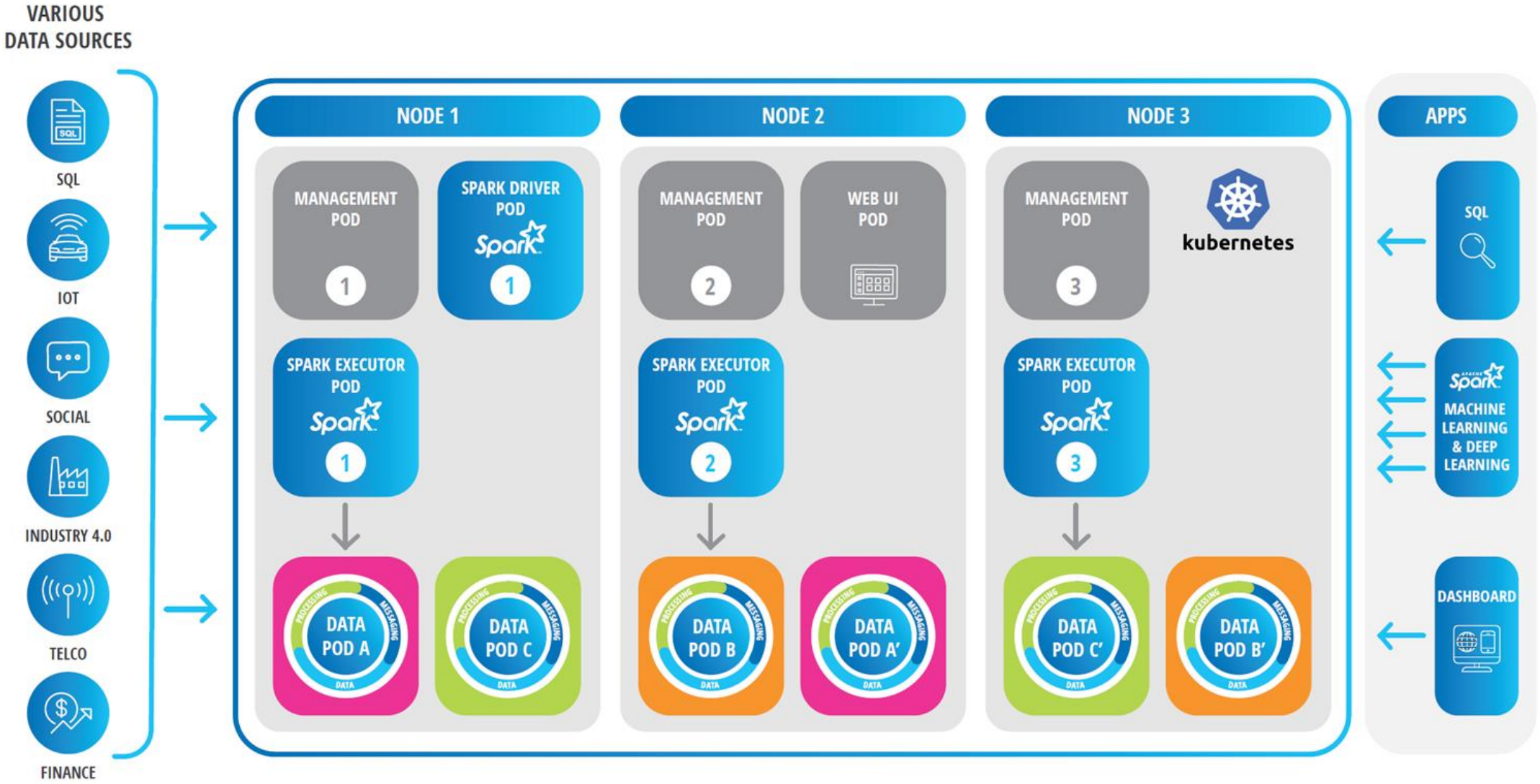
Define which data resides on which layer per class and per field

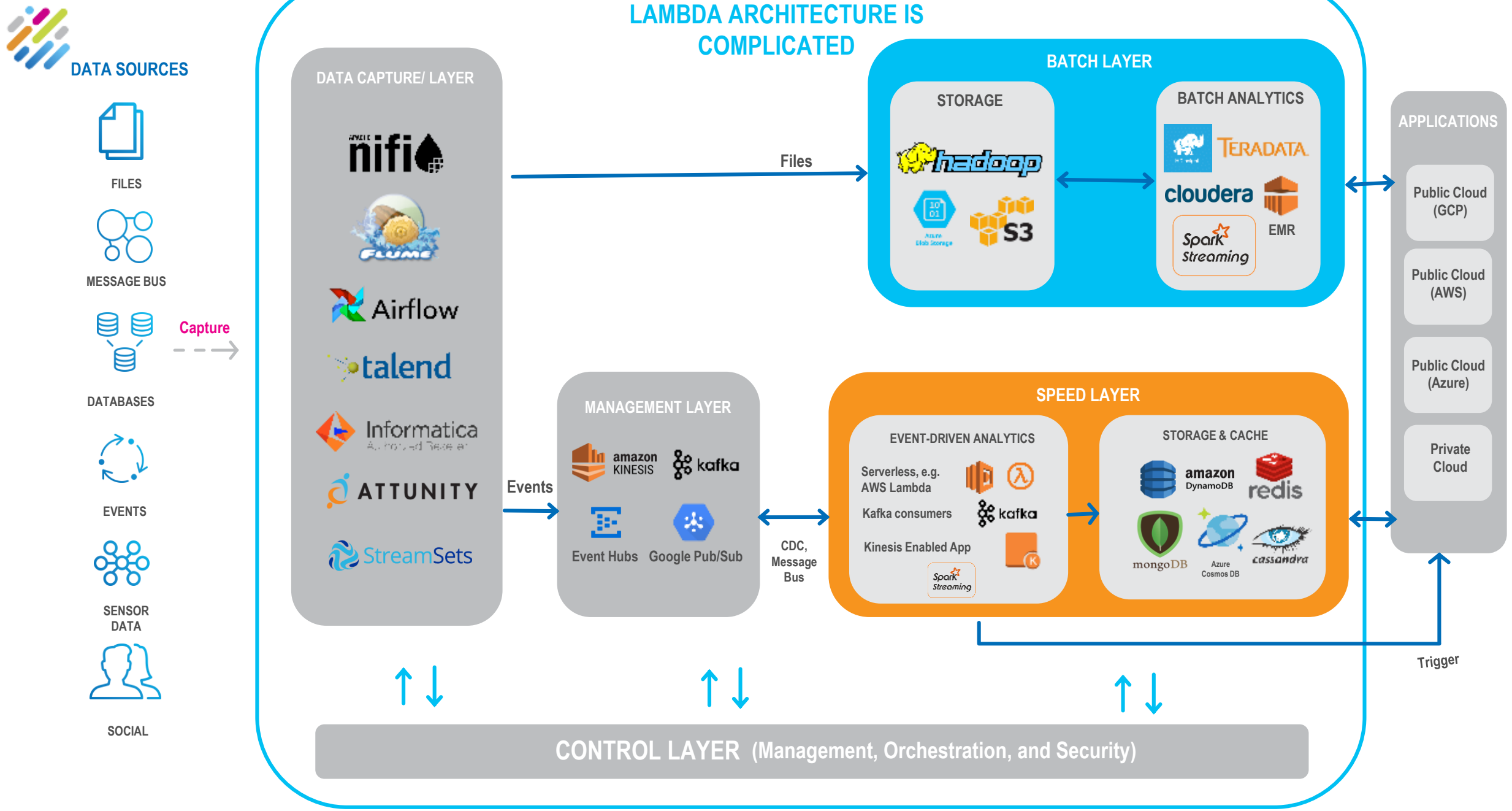
Figure 2: Memory-Storage Hierarchy with Persistent Memory Tier

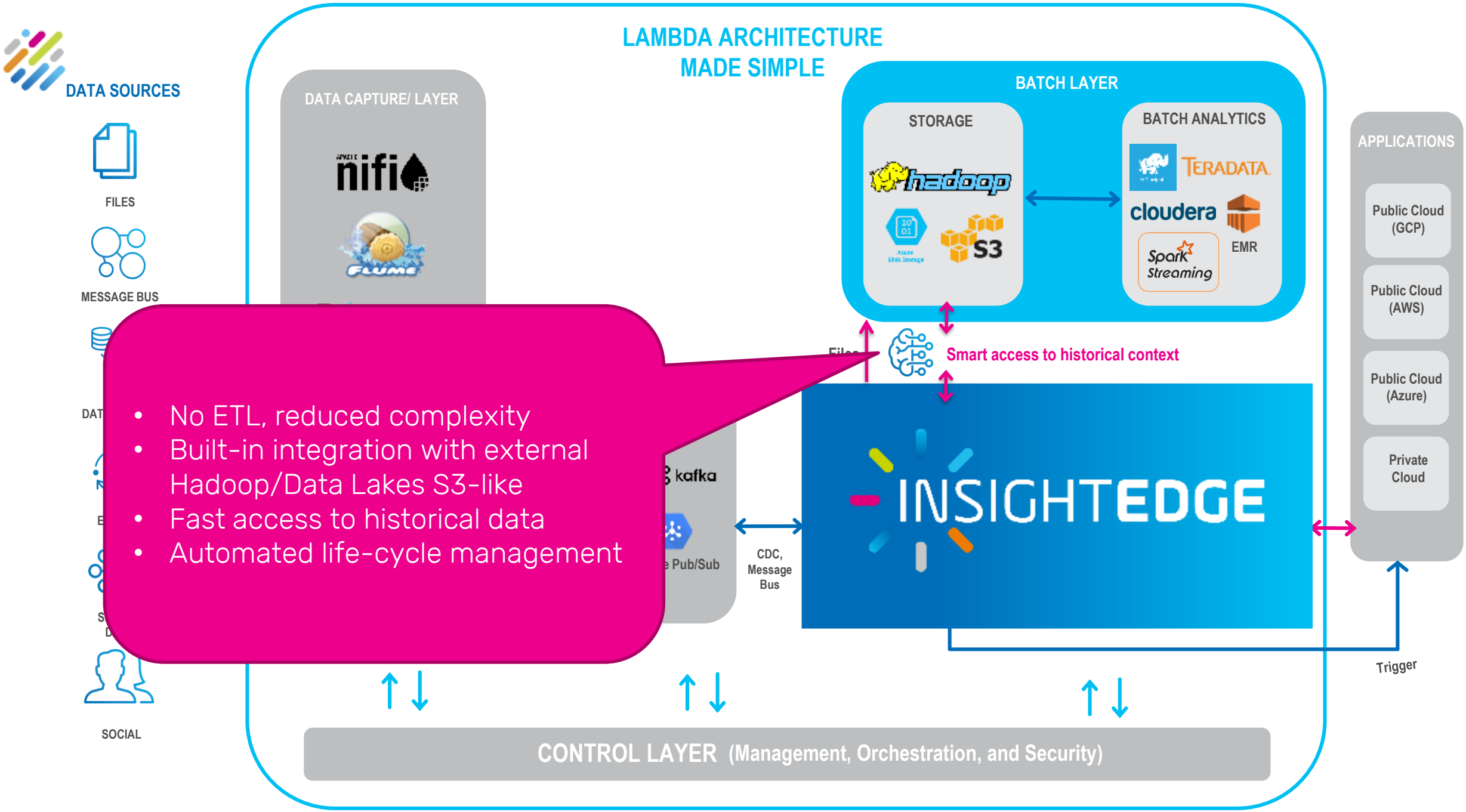
intel OPTANE™ DC PERSISTENT MEMORY

https://builders.intel.com/persistent-memory-developer-challenge

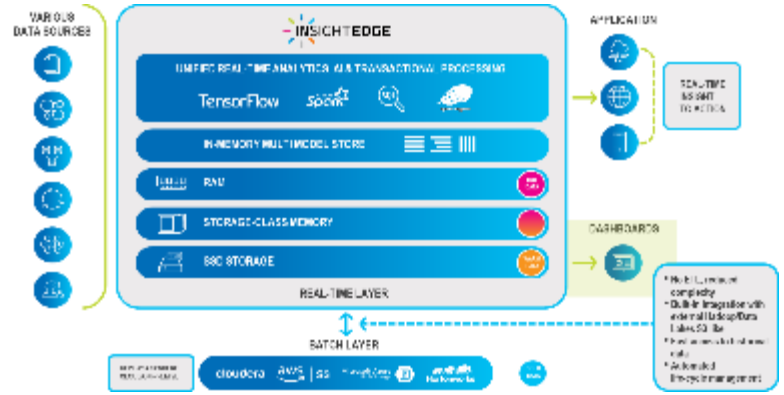
Kubernetes and Docker




DATA SOURCES
FILES
MESSAGE BUS
DATABASES
EVENTS
SENSOR DATA
SOCIAL
Capture
LAMBDA ARCHITECTURE IS COMPLICATED
DATA CAPTURE/ LAYER
nifi
FLUME
Airflow
talend
Informatica
ATTUNITY
StreamSets
Files
BATCH LAYER
STORAGE
hadoop
S3
BATCH ANALYTICS
TERADATA
cloudera
Spark Streaming
EMR
APPLICATIONS
Public Cloud (GCP)
Public Cloud (AWS)
Public Cloud (Azure)
Private Cloud
Events
MANAGEMENT LAYER
amazon KINESIS
kafka
Event Hubs
Google Pub/Sub
CDC, Message Bus
SPEED LAYER
EVENT-DRIVEN ANALYTICS
Serverless, e.g. AWS Lambda
Kafka consumers
Kinesis Enabled App
Spark Streaming
STORAGE & CACHE
amazon DynamoDB
redis
mongoDB
Azure Cosmos DB
cassandra
Trigger
CONTROL LAYER (Management, Orchestration, and Security)


LAMBDA ARCHITECTURE
MADE SIMPLE
DATA SOURCES
FILES
MESSAGE BUS
SOCIAL
DATA CAPTURE/ LAYER
nifi
FLUME
kafka
Pub/Sub
BATCH LAYER
STORAGE
hadoop
S3
BATCH ANALYTICS
TERADATA
cloudera
EMR
Spark Streaming
Smart access to historical context
INSIGHTEDGE
CDC, Message Bus
APPLICATIONS
Public Cloud (GCP)
Public Cloud (AWS)
Public Cloud (Azure)
Private Cloud
Trigger
CONTROL LAYER (Management, Orchestration, and Security)
• No ETL, reduced complexity
• Built-in integration with external Hadoop/Data Lakes S3-like
• Fast access to historical data
• Automated life-cycle management

Leverage leading BI Platforms



Tableau

Looker

Qlik

Power BI

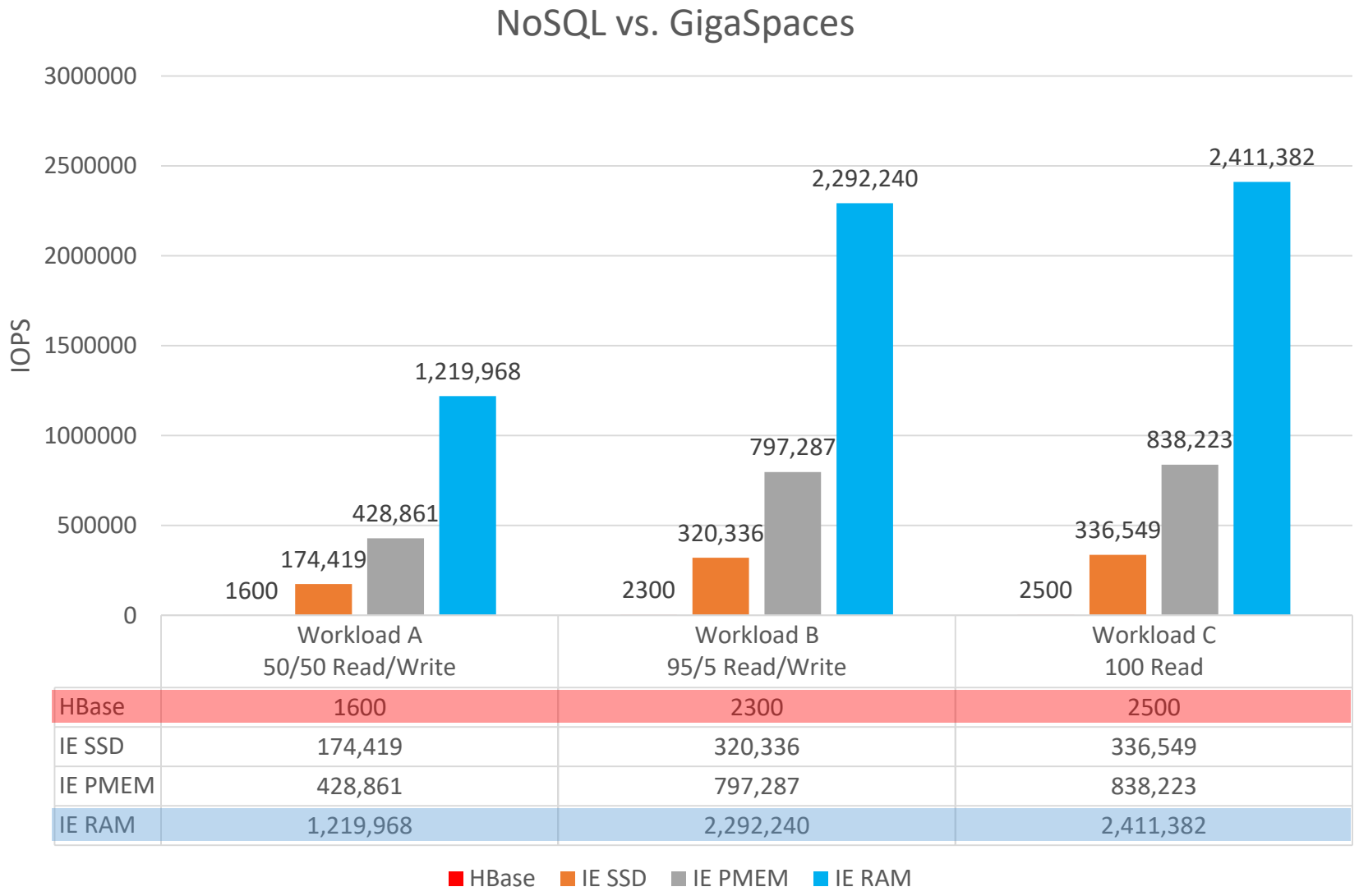
YCSB

Workload A: Update heavy
This workload has a mix of 50/50 reads and writes.

Workload B: Read mostly
This workload has a 95/5 reads/write mix.

Workload C: Read only
This workload is 100% read.

Per Node
Replication Factor: 2
Record size:1KB
RAM: 32GB
CPU: 16 cores
Disk: 1.2TB SSD



X100 Faster

451 Research

> GigaSpaces is now focused on in-memory data processing… The combination of Spark and XAP will enable GigaSpaces to target the new breed of real-time analytics and hybrid operational and analytic workloads.

FROST & SULLIVAN

> InsightEdge contains all the necessary SQL, Spark, Streaming, and Deep Learning toolkits for scalable data-driven solutions… our preferred solution components: the three-tier Kappa model, including Spark and Kafka, as implemented by GigaSpaces, in combination with its commercial InsightEdge platform.

Everyone Wants “Real-time Analytic Insights”
But Which Architecture Will Get You There?

CASE STUDY: Fast Global Fabric for Risk, Trading and Market Data

RISK

SOCIETE GENERALE

BUSINESS CHALLENGE:

- Prior to executing a trade, a credit check needs to run and guarantee that the counterparty is not exceeding their limit

TECHNICAL CHALLENGE:

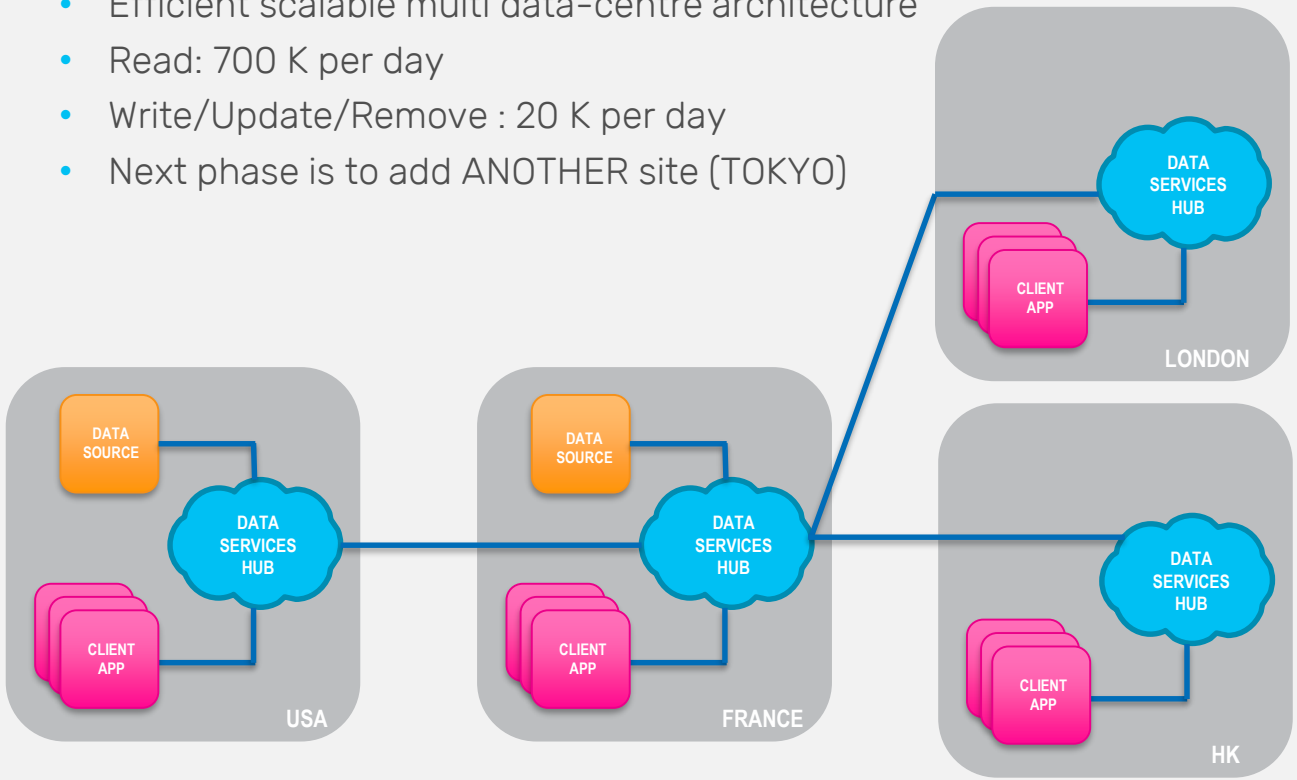
- Complete control over all eTrading platforms
- Regulatory enforcement set by RISK rules on **all** users trades on a daily basis
- Regulation analysis and checks
- Client onboarding
- Traversal framework
- Referential data for other apps

IMPLEMENTATION:

- All reservations, limits and client data is stored in the GigaSpaces in-memory platform
- All the requests are executed via the platform
- GigaSpaces is used in front of the database to speed up data access
- A worldwide deployment is done (Paris, NY and London) with GS asynchronous replication between each site to populate the data in NY and London

RESULTS:

- Three sites with 99.999 HA, replicated WW (Paris, London, New-York and Hong Kong)
- Reduced cluster and component sprawl
- Real-time risk analysis and credit checks complying with regulations
- Efficient scalable multi data-centre architecture
- Read: 700 K per day
- Write/Update/Remove : 20 K per day
- Next phase is to add ANOTHER site (TOKYO)



CASE STUDY: DYNAMIC PRICING & OPTIMIZATION

TRANSPORTATION

BUSINESS CHALLENGE:

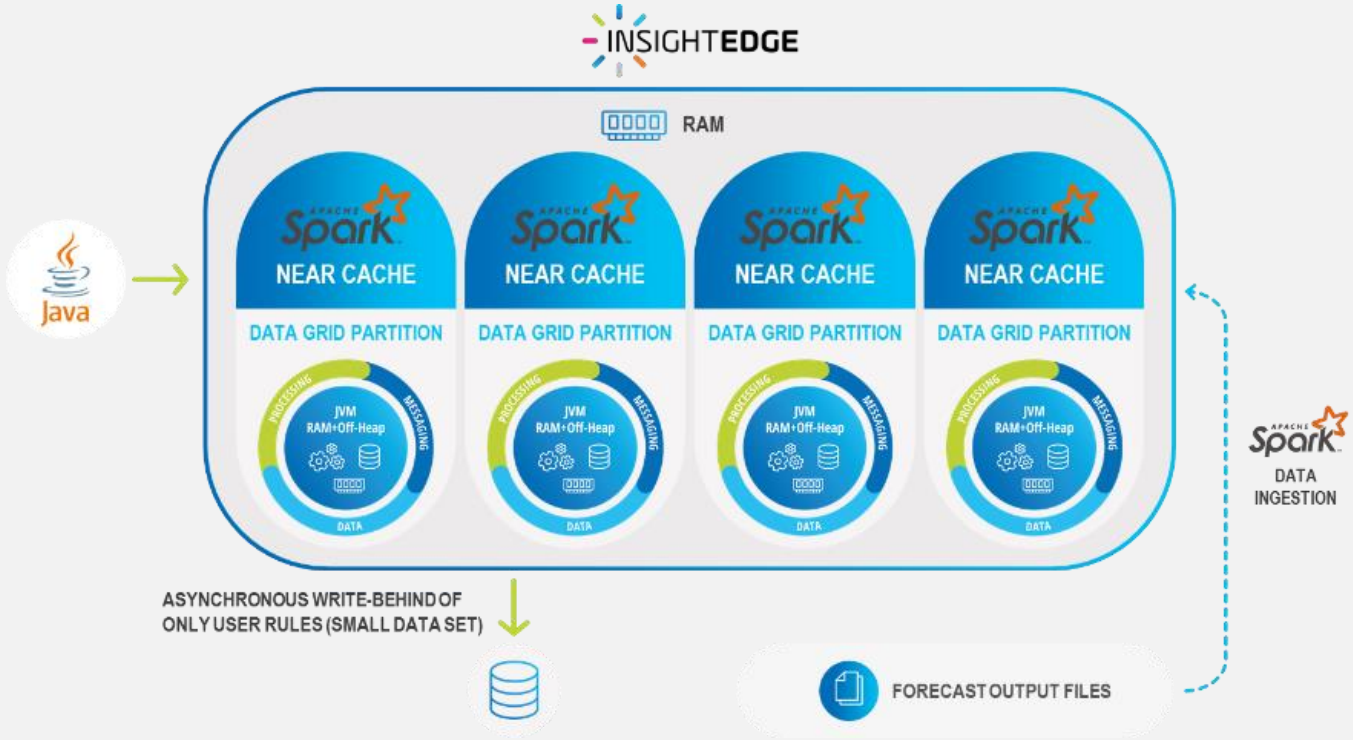
- Demand forecasting and price optimization in real-time based on threshold changes

TECHNICAL CHALLENGE:

- Ingest ~ billion of records in minutes
- Ability to query data from multiple geographies in real-time at low latency
- Ability to update with low latency multiple locations to adjust forecast and influence
- Cloud nativeness

RESULTS:

- Agility: Reduced forecasting ingestion from 3 hours to 8 minutes
- Live interactive querying and analytics through Spark SQL < 150ms latency



CASE STUDY: BOOKING AND FLIGHT AVAILABILITY

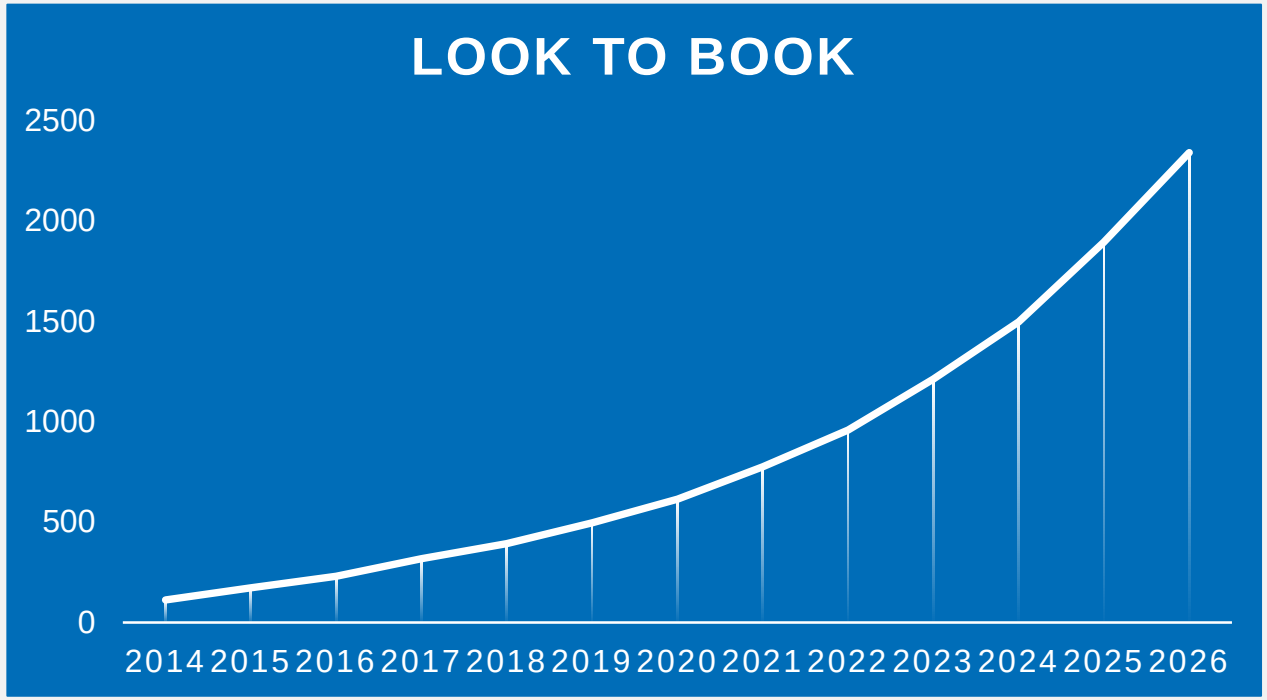
TRANSPORTATION

BUSINESS CHALLENGE:

- Flight availability forecasting real-time based on various factors: date, city pair, #seats requested, marketing class, Point of Sale (PoS), quota limits, traffic restrictions, etc.

TECHNICAL CHALLENGE:

- Various internal systems (Reservation, Shopping, eCommerce Systems)
- Open API for external systems: Airlines, Global Distribution Systems (GDSs) and BOTs (automated searching).
- Auto scaling and sub-sec latency
- Multi tenancy (small/med/large airlines)



RESULTS:

- Querying and analytics response time < 50ms latency
- High Performance with up to 200K transaction/sec
- Scaling Near Linear (X100)
- Increase throughput by X& and reduce network overhead by 10%

Ratio of Bookings per Availability Requests increases by 100

CASE STUDY: PriceRunner

Compares Prices for Millions of Offers in Milliseconds

eCommerce

BUSINESS CHALLENGE:

- PriceRunner receives prices from 18,000 different merchants and has 4.4 million unique visitors per month, needed to ensure real-time comparisons for their customers at high peak periods such as the night before Black Friday where traffic increases between 10-20 times the normal traffic.

TECHNICAL CHALLENGE:

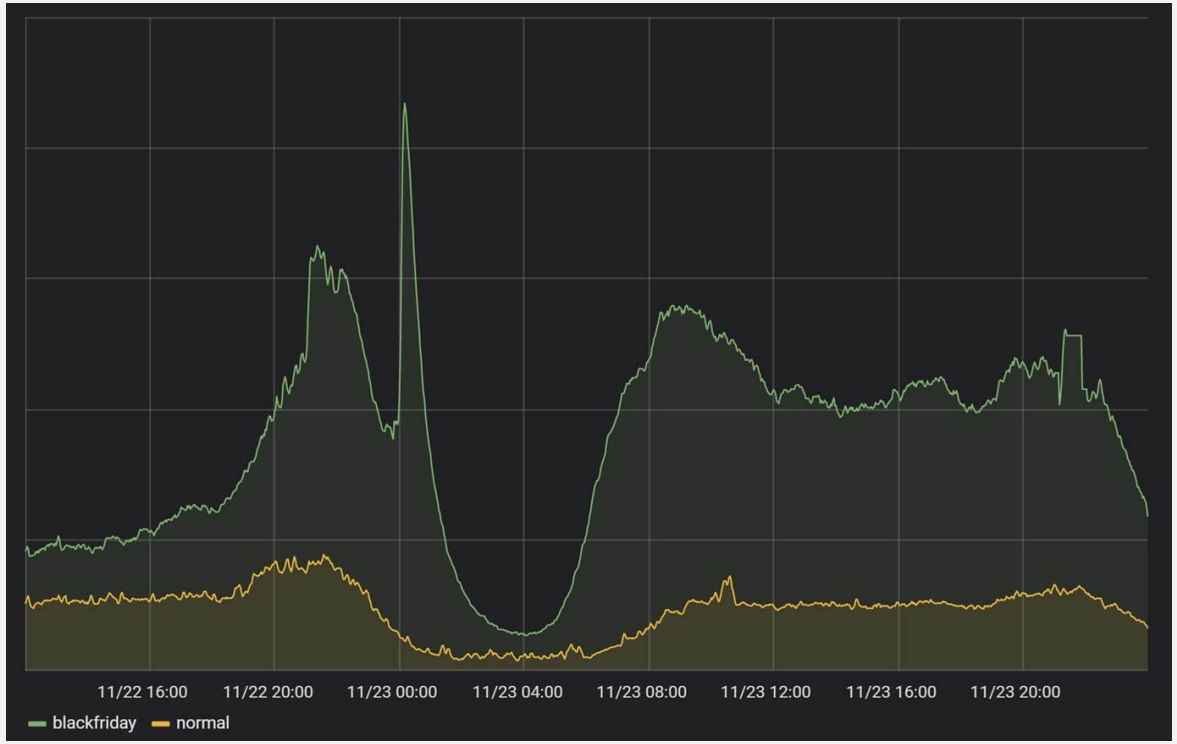
- Support scalability requirements at peaks without compromising performance
- No downtime
- Real-time analytics on transactional data
- Event-driven applications powering integrated applications
- Microservices architecture for rapid development and deployment

18,000 different merchants

200 million prices updates

1 Billion requests a month

5-8 millisecond performance



"Innovation is a key tenant of our strategy, and adoption of GigaSpaces InsightEdge real-time machine learning technology will highly differentiate our services by enabling us to run advanced analytics models on our hot data and instantly predict prices to improve the customer experience."

Roger Forsberg, CTO
PriceRunner

CASE STUDY: Real-Time Pricing Engine

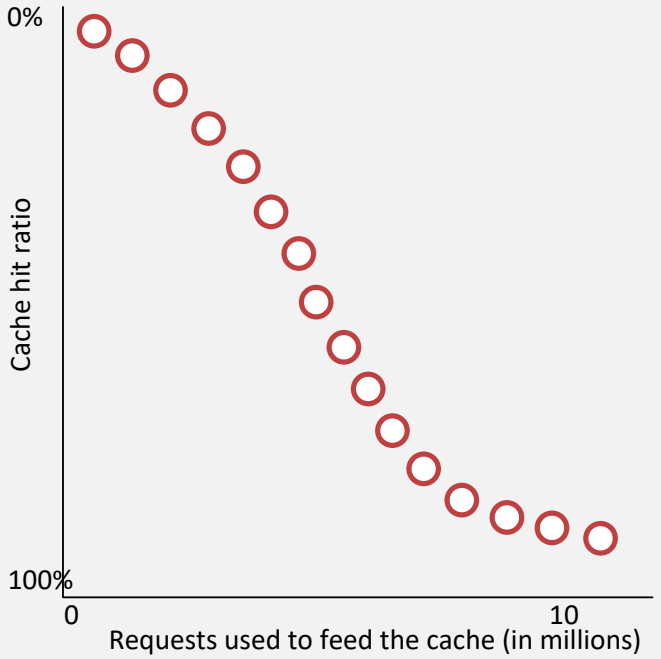
TRANSPORTATION

BUSINESS CHALLENGE:

- Dynamic pricing engine based on CO2 tax regulations for B2B and B2C
- Many car configurations are unique, but all parts are not significant for CO2 calculation

TECHNICAL CHALLENGE:

- The current pricing engine workload is around 60 to 80 calculations/s, expected to increase to 2000
- Pricing calculations are obsolete after 24 hours.
- Each C02 returned value must be exact
- All requests (both internal and external) must be equally treated



RESULTS:

- Querying and analytics response time < 100ms latency
- Reduce infrastructure footprint by a factor of X4-6
- Scaling up by X20

Pricing Requests increases **by 20x**

USE CASE: SMART AGENT ASSISTANCE

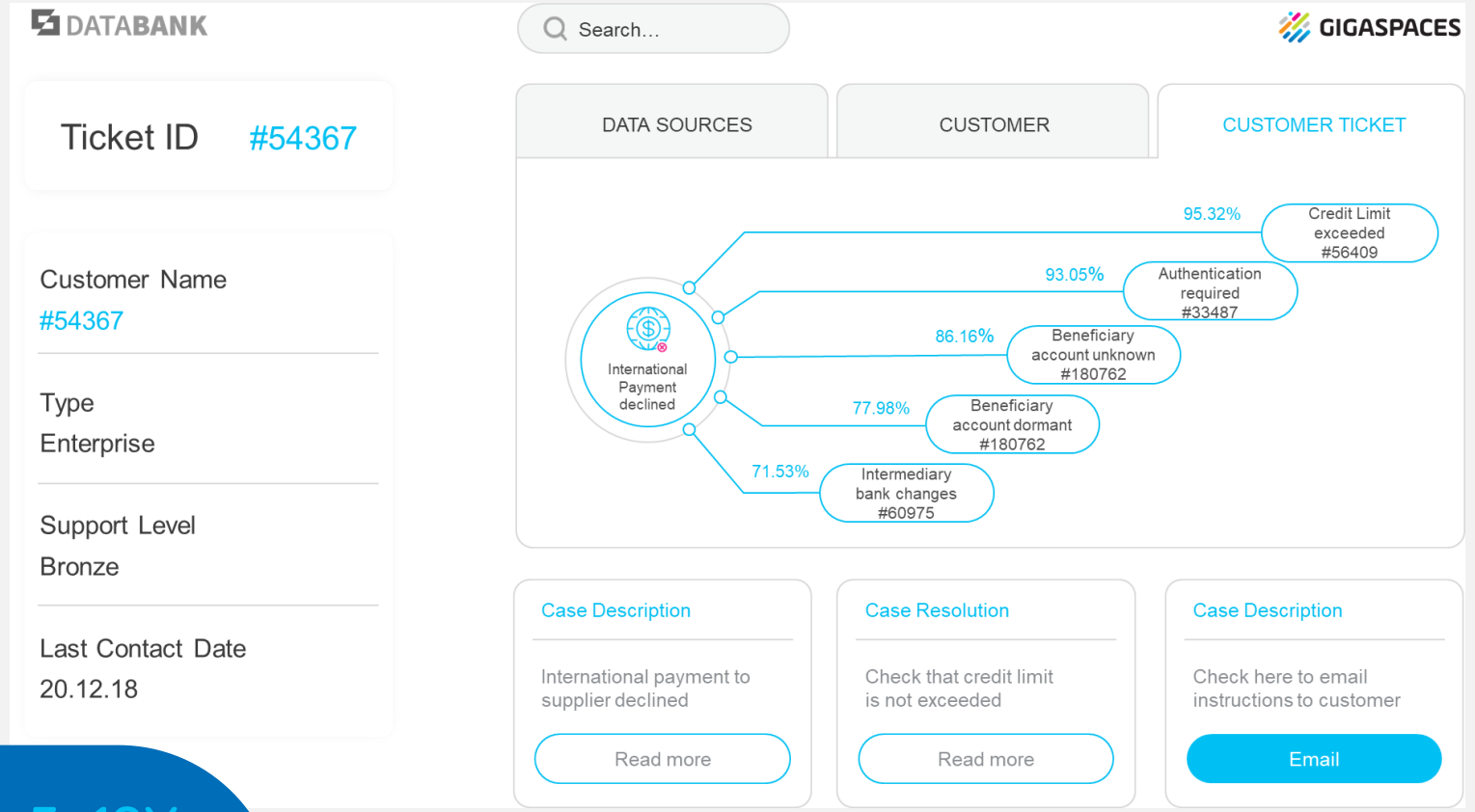
CONTACT CENTER

BUSINESS CHALLENGE:

- Enhance customer experience with quicker First Call Resolution
- Reduce Average Handle Time for optimized efficiency

TECHNICAL CHALLENGE:

- Ingestion of millions of CRM cases and data from other repositories into a unified analytics platform
- Leveraging ML models in real time
- Continuous model training



Reducing mean time to resolution by 5-10X
Average time of 50ms to search and find similar cases

CASE STUDY: Fraud and Money Laundering Detection in Real-time

FINANCIAL SERVICES

BUSINESS CHALLENGE:

- Detecting fraud on mobile payment applications in real-time
- Detecting the deposit of the same check in multiple accounts at different banks in real-time
- User experience: application availability 24×7
- TCO reduction: reduce dependency on expensive RDBMS (Oracle)

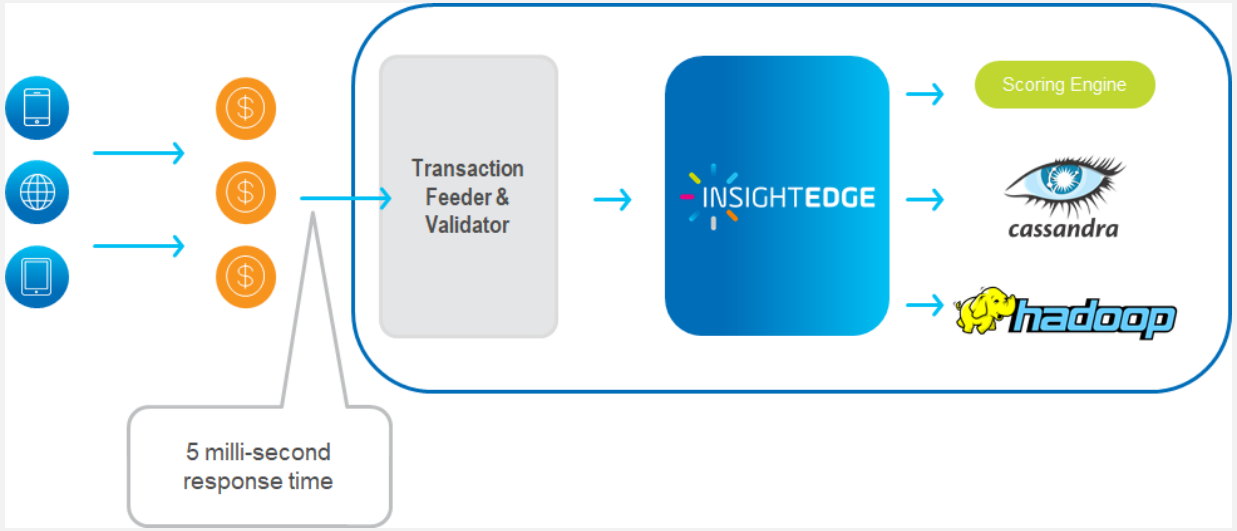
TECHNICAL CHALLENGE:

- IMC Platform to ingest 4 TB of data daily
- Fully consistent transactional In-Memory Map-Reduce
- Millisecond response
- Analyze and validate against a large dataset of live (multiple TB) in memory and archived data (to Cassandra NoSQL and Hadoop)

RESULTS:

- Sub-second response for accurate fraud detection to stop the transaction
- TCO Reduction: RAM and SSD for runtime data compared to Oracle DB or SAN
- Fault-tolerant, highly available, scaling on demand

Ingest **4 TB** daily
Handle **1.5M** events per second



CASE STUDY: Instant Payments for real-time transactions and high reliability to enhance the overall customer experience

FINANCIAL SERVICES

BUSINESS CHALLENGE:

- Enable and accelerate instant payment solutions and meet regulatory requirements on a global scale
- Automatically track purchases and other server-to-server communication in real time
- Store payment transactions, order information and other sales internally

TECHNICAL CHALLENGE:

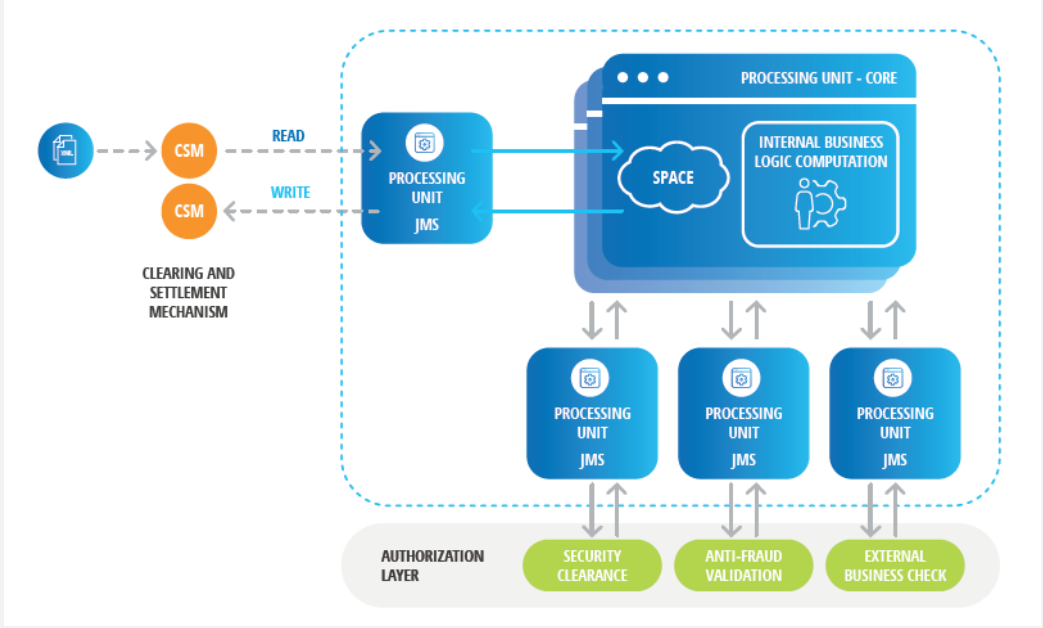
- Ability to handle added data volumes 15k payment/sec receipts introduced by management of new SEPA European payment regulation
- Assure no-downtime for mission critical service

RESULTS:

- Running low-latency payment and business logic calculations
- **No downtime** assured
- Real-time analytics and Machine Learning - preventing fraud and adherence to regulations
- Design to deployment in just a few months leveraging microservices architecture

Payment transaction in 500 milliseconds

End-to-end validation in seconds



CASE STUDY: PriceRunner

Compares Prices for Millions of Offers in Milliseconds

eCommerce

BUSINESS CHALLENGE:

- PriceRunner receives prices from 18,000 different merchants and has 4.4 million unique visitors per month, needed to ensure real-time comparisons for their customers at high peak periods such as the night before Black Friday where traffic increases between 10-20 times the normal traffic.

TECHNICAL CHALLENGE:

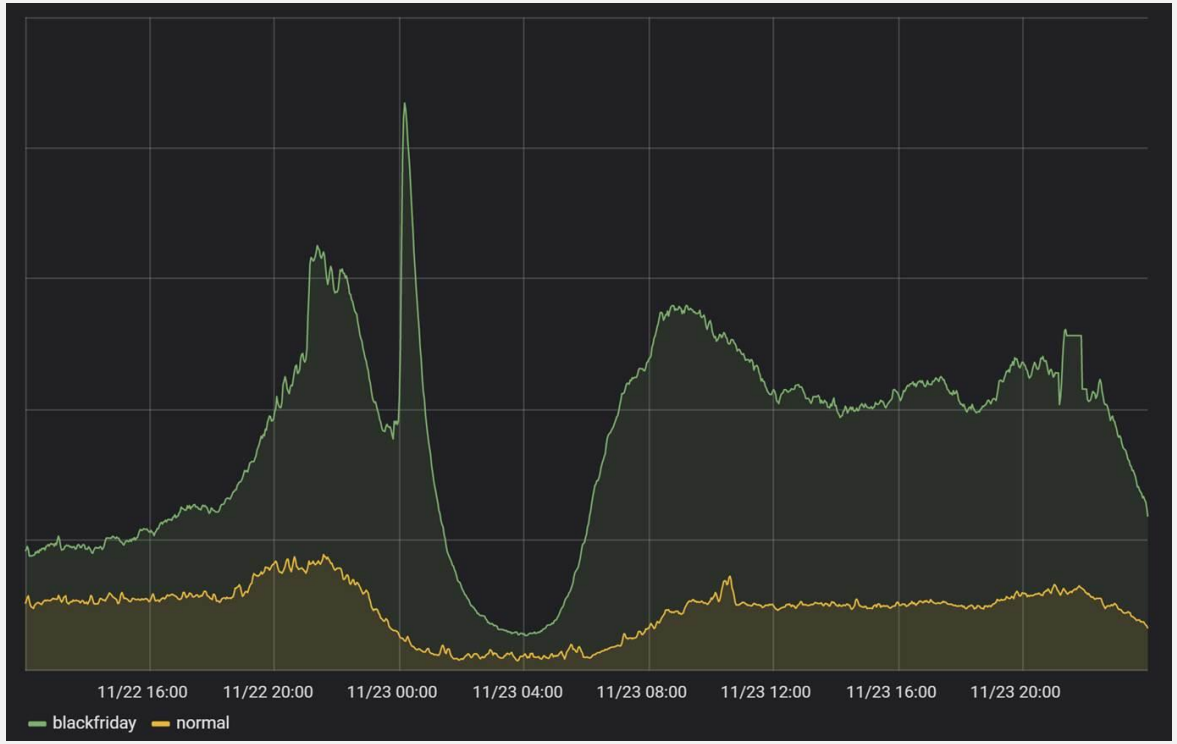
- Support scalability requirements at peaks without compromising performance
- No downtime
- Real-time analytics on transactional data
- Event-driven applications powering integrated applications
- Microservices architecture for rapid development and deployment

18,000 different merchants

200 million prices updates

1 Billion requests a month

5-8 millisecond performance



"Innovation is a key tenant of our strategy, and adoption of GigaSpaces InsightEdge real-time machine learning technology will highly differentiate our services by enabling us to run advanced analytics models on our hot data and instantly predict prices to improve the customer experience."

Roger Forsberg, CTO
PriceRunner

USE CASE: SMART AGENT ASSISTANCE

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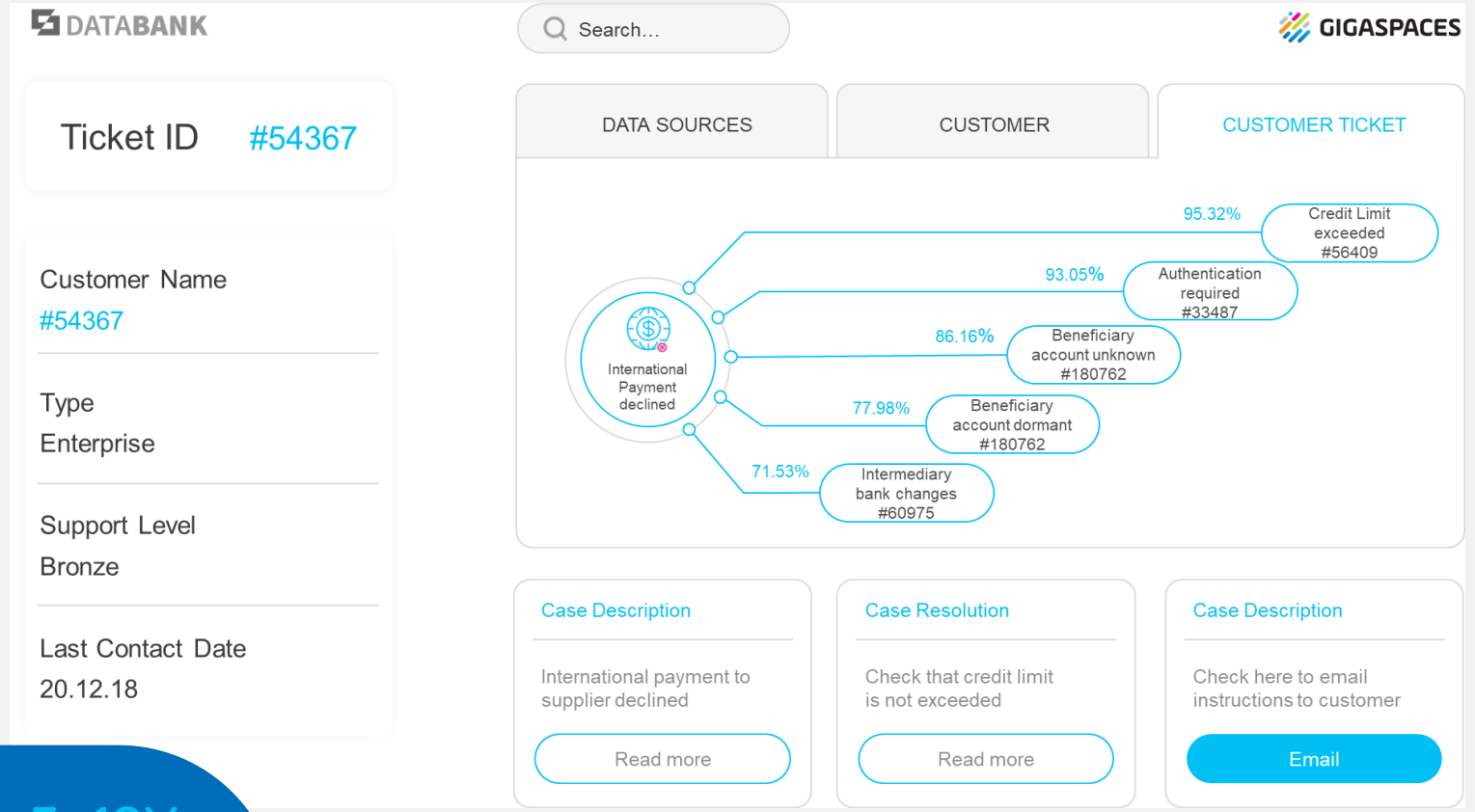

Reducing mean time to resolution by 5-10X
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INSTANT INSIGHTS TO ACTION

EXTREME PERFORMANCE

TCO OPTIMIZATION

MISSION CRITICAL AVAILABILITY

<1 sec from data to insight to action

millions of IOPS

10X less expensive than only RAM with In-memory performance

No Downtime at leading enterprise customers for

YEARS

And still counting

WHY GIGASPACES?

- Real-time insights
- Boost your performance
- Simplify your architecture
- Lower TCO / Enhance ROI

Enterprise Grade System of Record

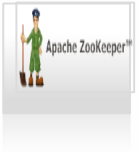
Optimized Data Replication:
Field-proven, reliable, high performance replication mechanism to replicate data between peer nodes in the data grid

Locking Support:
RDBMS locking and transaction isolation for robust and hassle-free data access

Data Partitioning:
Transparent content-based data partitioning to evenly and intelligently distribute data across your cluster

Multi-Site Deployment: Replicate and share data between multiple, geographically-distributed, active clusters for global activity

Transaction Support:
Full transaction support, including local, distributed and XA transactions



Network Segmentation Protection:
Ensure data remains consistent in case of network segmentations of all types

Write Behind:
Asynchronous and reliable propagation of data to any external data source

Security:
Role-based authentication for data and operations, Support for Kerberos, Spring, TLS and more

Advanced Querying & Indexing

Querying:
Sophisticated query engine with support for SQL and example queries

Indexing:
Predefined and add-hoc Property indexing for fast data access

Projection API
Customize the query's result set by defining which fields should be returned

Geospatial:
Enhance your data model with shapes and use spatial operations to find matches

Change API:
Update data by specifying only the required change instead of the entire updated object

Full Text Search:
Go beyond plain text with regular expressions, fuzzy search, proximity matching and more

Aggregations
Sum, Avg, Min, Max, GroupBy and more, or even your own user-defined aggregations

SQL Functions:
Abs, Round, Length, Upper, Lower and more, or even your own user-defined functions

Data Model Flexibility & Interoperability

Native:
Highly optimized, POJO driven API which exposes all the unique capabilities of the platform

.Net:
Native C# interface that enables any .NET application to access the data grid

JPA:
Support data grid access using the standard JPA API for seamlessly scaling your JEE data access layer

REST API:
Standard REST endpoint provides access to the data grid from any app, Platform and programming language

Document:
Completely schema-free data API that supports upgrading the application's data model on the fly

Cross Language Access:
support for heterogeneous environments, with seamless interoperability among them all

Key-Value:
Simple and intuitive Map-based interface for simple caching scenarios

Messaging & Event Features

Publish/Subscribe Messaging:
Propagation of any event that takes place in the data grid to listeners using the publish/subscribe paradigm

Durable Notifications
Fully durable pub/sub messaging for data consistency and reliability

Point-to-Point Messaging:
Support for implementation of complex workflows and triggering of processing logic across the data grid

FIFO Groups
Ensure in-order and exclusive processing of events belonging to the same group, while parallelizing across groups

Content Based Routing:
Routing of events to relevant cluster members based on their content

Workflow Support:
Implement complex workflows using event propagation and sophisticated event filtering

Collocation of Data and Business Logic

Spring on Steroids:
Deployment, provisioning and proactive management of any spring application, with or without a data grid

Master-Worker Support:
Intuitive and highly scalable master-worker implementation for distributing computation-intensive tasks

Code and Data Collocation:
Deployment of business logic and data as a single coherent unit for optimized performance

Dynamic Code Execution:
Dynamic code shipment and map/reduce- like execution across the grid for optimized processing and data access

Robust Remoting Support:
Built on top of the data grid to provide fault tolerance, service auto discovery, cluster wide invocations and more

Security:
Customizable security policy to control who can run dynamic code on the grid

Grid Health Transparency & Monitoring

UI Based Management
Web-based dashboard app for easy monitoring & management of deployed app. Enhanced data grid console for cluster wide queries or single Space instance queries.

REST Admin API:
Comprehensive and intuitive API for monitoring and controlling every aspect of your cluster and application

Event Tracking:
Trace Cluster Events as they happen for improved visibility & easier troubleshooting
(available through both admin API and UI)

Single Click Deployment:
Support for distribution, provisioning and management of application deployments across any number of hosts

Alerts:
Out-of-the-box identification & notification of risky situations (e.g., above-normal CPU utilization or data replication failure)

Application Dependencies:
Deploy modules as an application ensuring order of deployment

Event Containers Monitoring:
Trace embedded and remote event containers

Client side Cache Monitoring:
Discover client-side cache and views connected to your spaces

Extensible Metrics Framework:
Measure both space and user-defined metrics, integrated with any tool (InfluxDB and Grafana out of the box)

WAN Replication Monitoring:
Discover client-side cache and views connected to your spaces


THANK YOU
BUILD IT 〉
TRY IT 〉
GIGASPACES
innovate with confidence