

Hazelcast In-Memory Platform

Faster, Smarter Applications

Secure, Resilient, Always-On

Run Anywhere – Edge, to Hybrid Cloud to Z
Platform

The Digital Enterprise



- ❑ **Always-On & Always Accessible**
- ❑ **Touchless & Invisible**
- ❑ **Self-Service & Autonomous**
- ❑ **Boundaryless & Secure**



Hazelcast & IBM – Partners from Cloud to Edge

Cross Cloud Pak OEM & Edge Ecosystem Partner

~3 years of integration engineering with IBM



- Hazelcast certified on Red Hat OpenShift & Cloud Paks
- Global OEM for Cloud Pak Executed (May 15th, 2020)
- Edge Ecosystem ISV

Cloud Paks – Middleware anywhere

A faster, more secure way to move your core business applications to any cloud through enterprise-ready containerized software solutions

IBM containerized software
Packaged with Open Source components, pre-integrated with the common operational services, and secure by design

Complete yet simple

IBM certified

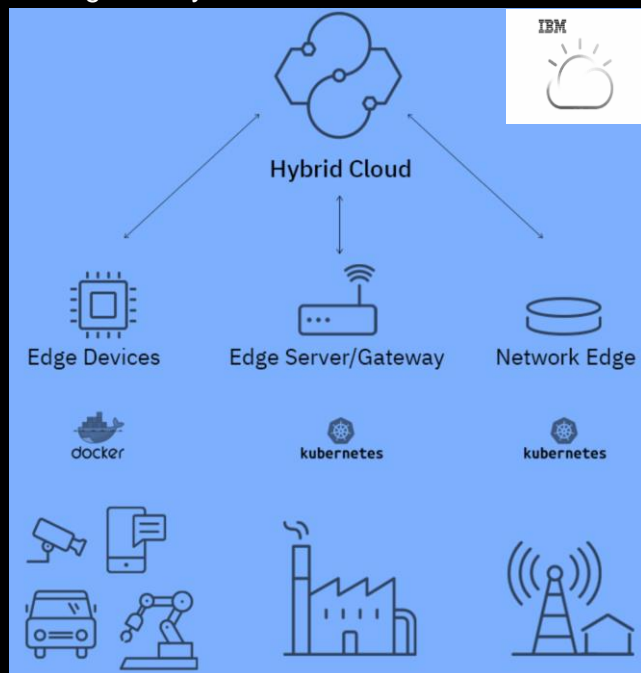
Run anywhere

Container platform and operational services
Logging, monitoring, security, identity access management

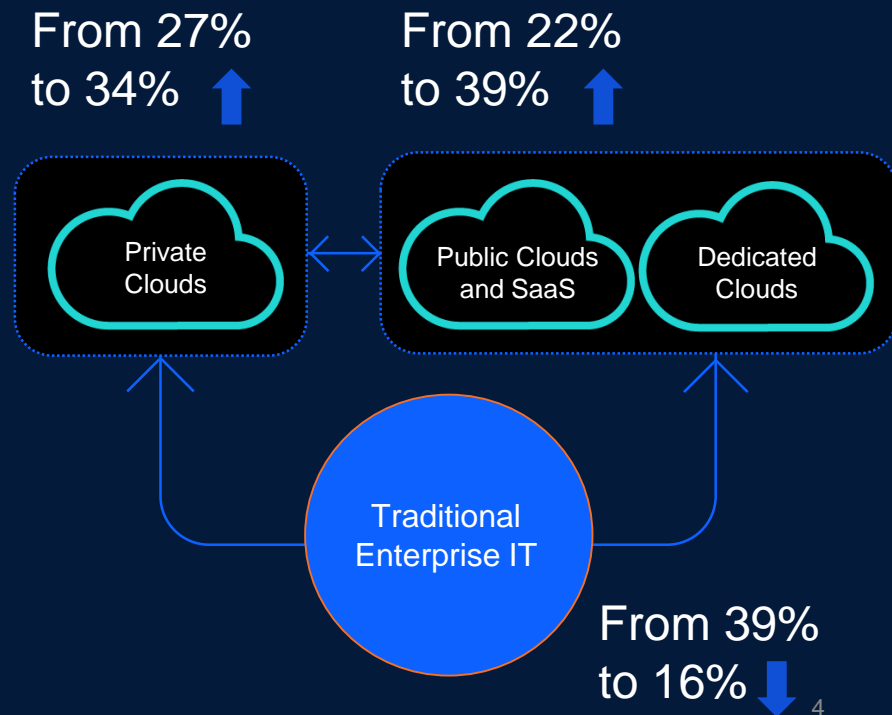
IBM Cloud, aws, Google Cloud, Oracle Cloud, Edge, Private, Systems

Cloud Paks – Accelerate your journey to cloud

Reduce dev time up to 84%*	Make data ready for AI in days	Eliminate 33% of integration cost	Reduce manual processes up to 80%*	Reduce IT op expense by up to 75%*
Cloud Pak for Applications <ul style="list-style-type: none">modernize applicationsdevelop cloud native appsdeliver apps on multiple clouds Building applications	Cloud Pak for Data <ul style="list-style-type: none">connect data for self-serve analyticsoperationalize AI w/ trust & transparencyAvoid lock-in, run anywhere with agility Predict outcomes, automate data tasks	Cloud Pak for Integration <ul style="list-style-type: none">integrate cloud and SaaSrespond to real-time eventscreate secure API portals Moving and integrating	Cloud Pak for Automation <ul style="list-style-type: none">automate tasks and mundane workensure consistent client experiencesvisualize ops data; optimize processes Automating work	Cloud Pak for Multicloud Management <ul style="list-style-type: none">dynamically monitor and resolve problemsdeploy and upgrade with compliancemanage end-to-end with security Managing hybrid environments



Hybrid multicloud is the reality, but you need a sound strategy



Only
20%

of enterprise workloads
have moved to the cloud

Between 2019 and 2021,
clients are migrating more
- but inconsistently

Source: McKinsey, IT as a service: From build to consume
"2019 State of the cloud report." RightScale. 2019.

A hybrid strategy unleashes the full potential of the cloud.

2.5X

more value than a
public-only strategy.

Sources of value

Business
acceleration



Architecture
development method
productivity



Infrastructure
cost efficiency



Regulatory
and risk



Strategic
optionality



IBM Cloud Paks & Hazelcast

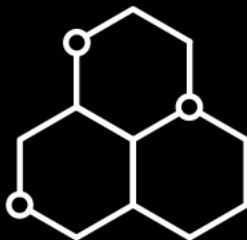
In-Memory Operational Computing Platform that is **simple** to

deploy | operate | scale | maintain



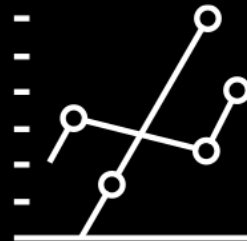
Accelerate Performance

Up to 3X faster throughput



Simple to Scale

Scale Elastically and Automatically



Always On

Automated Multi-Cluster Disaster Recovery

IBM Cloud Pak for Applications

Client and Partner Applications



hazelcast®

In-Memory Computing Platform

Unified User Experience

Accelerators and Governance

Self Service
Portal



Developer
Tools



Runtimes



Modernization
Toolkits



DevOps



Enterprise
Ready

Integration
and
Management
Extensions



Secure Engineering

IBM containerized software



Container platform and operational services



IBM
public cloud



AWS



Microsoft
Azure



Google
Cloud



Private



IBM Z
IBM LinuxOne
IBM Power Systems
IBM Storage



Endpoints



Watson AIOps

High level architecture

Client Operational Data

IBM & Strategic Partners:

IBM Netcool

IBM Monitoring



... and more

Other Integrations:



Watson AIOps Intelligence Layer



Slack



Microsoft Teams



MatterMost



Others



Client IT Ops / SRE teams



Deliver Analytics via ChatOps

Watson AIOps Intelligence Layer

Incident Resolution (reactive)

- Intelligent alerting & alert grouping
- Triaging
- Incident similarity
- Topology & blast status

Incident Analysis (predictive)

- Anomaly detection
- Root cause analysis
- Next best action recommendations

Incident avoidance (proactive)

- Change & version management
- Automated runbooks for next best action recommendations
- Code vulnerability analysis
- Explanation fort trust



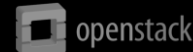
Cloud Pak for Data



Red Hat
Open Shift
Container Platform



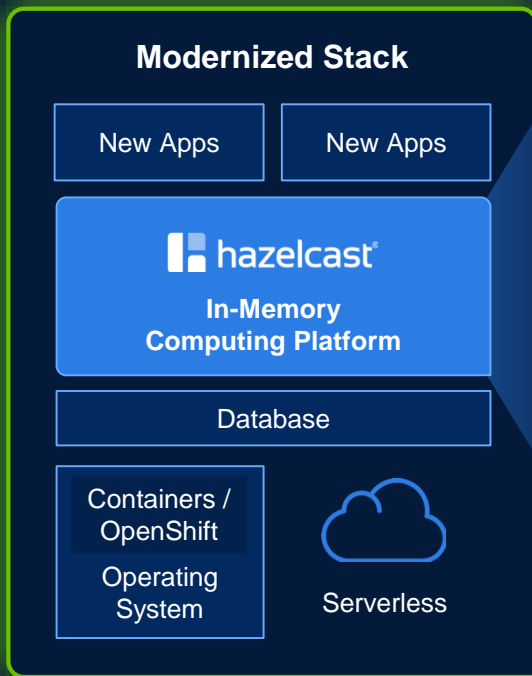
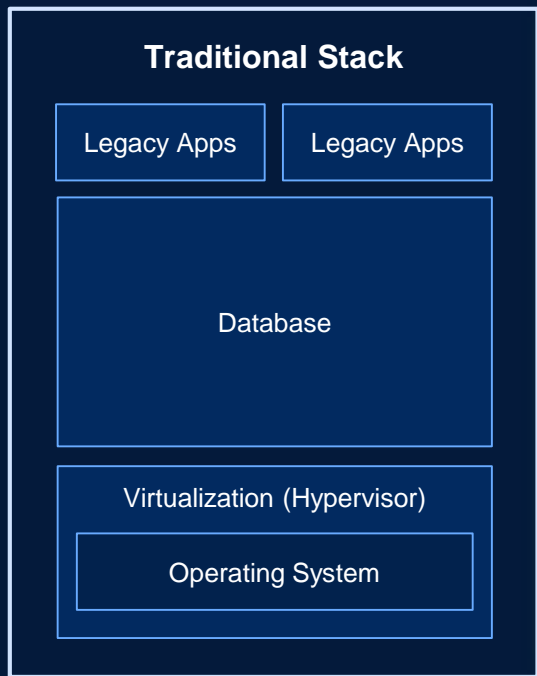
IBM Cloud







Google Cloud

IBM & Hazelcast = Performance at Scale – Simplified

Enabling the Digital Enterprise



BENEFITS

-  High-Throughput, Low-Latency
-  Integrated Batch and Stream Processing with In-Memory Storage
-  Simplified, Run-anywhere Deployments
-  Cloud-Native, Multi-Cloud

OUTCOMES

-  **Increase Revenue:**
Fast customer response times & accelerated insights for decision making.
-  **Decrease Risk:**
Continuous intelligence for better decisions.
-  **Reduce Operating Costs:**
Increase performance capacity of existing infrastructure

Runs Anywhere

Cost of Downtime



Lost revenue

88% of businesses lose \$300,000 per hour & 40% lose USD 1.5 million or more.¹



Regulatory penalties

Government regulation, monitoring and inspection add pressure to deliver continuous availability.

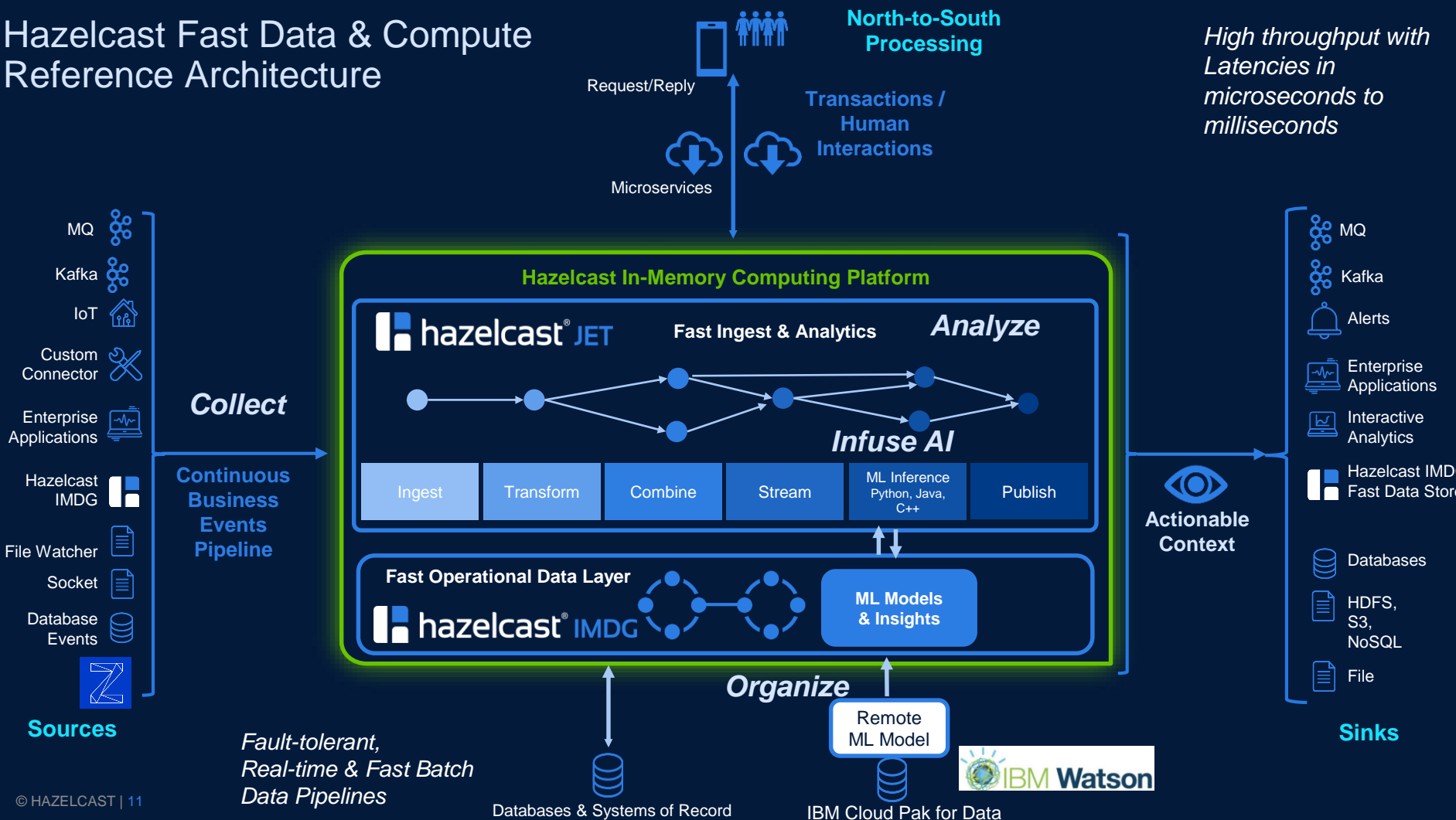


Damaged reputations

Customers expect 24x7 availability. If a digital service is unavailable, the backlash can be swift.

[Source: Forrester and IBM report: The Real Costs Of Planned And Unplanned Downtime](#)

Hazelcast Fast Data & Compute Reference Architecture



1. Maximize Multicloud Application Transaction Processing Performance

Provide secure, reliable, elastically scalable, high-speed transaction processing with the ultra-low end-to-end latency for banks, payment processors, eCommerce and other firms, e.g.:

- >10,000 TPS with 99.999% uptime
- 3X faster than Redis
- Latencies remain predictably low and flat up to 5,000,000 TPS

Example Use Cases: Real-time fraud detection, Payment processing, payment authorization, FX pricing exchanges

2. Modernize Multicloud-to-Mainframe Infrastructure While Increasing Performance Capacity

- Maximize mainframe and application performance - increase overall transaction throughput and lower latency.
- Future-proof application infrastructures by optimizing MF dependencies and performance.
- Simultaneously increase business agility, reduce application infrastructure costs, and increase the performance capacity of the existing infrastructure by 3X-10X.

Example Use Cases: Mainframe & microservices-based application modernization, mainframe cost reduction, PSD2/Open Banking initiatives

3. Provide Competitive Advantage in eCommerce & Omni-Channel Customer Experience Applications

Deliver elastically-scalable, low-latency, customer-facing eCommerce & customer experience solutions to provide product visibility, speed purchases, increase upsell/cross-sell opportunities and maximize customer experience including during peak-customer demand.

Example Use Cases: Real-time inventory visibility/Availability to Promise, real-time eCommerce Product Catalog, omni-channel customer experience

4. Deliver Instant Situationally Aware Insights with 5G, IoT/IIoT, Edge Computing, enabled with AIOps

Provide a high-performance, low-latency processing backbone for Edge and IIoT applications to create value from situational-aware insights by placing intelligent compute power at the edge where data is generated and services are rendered.

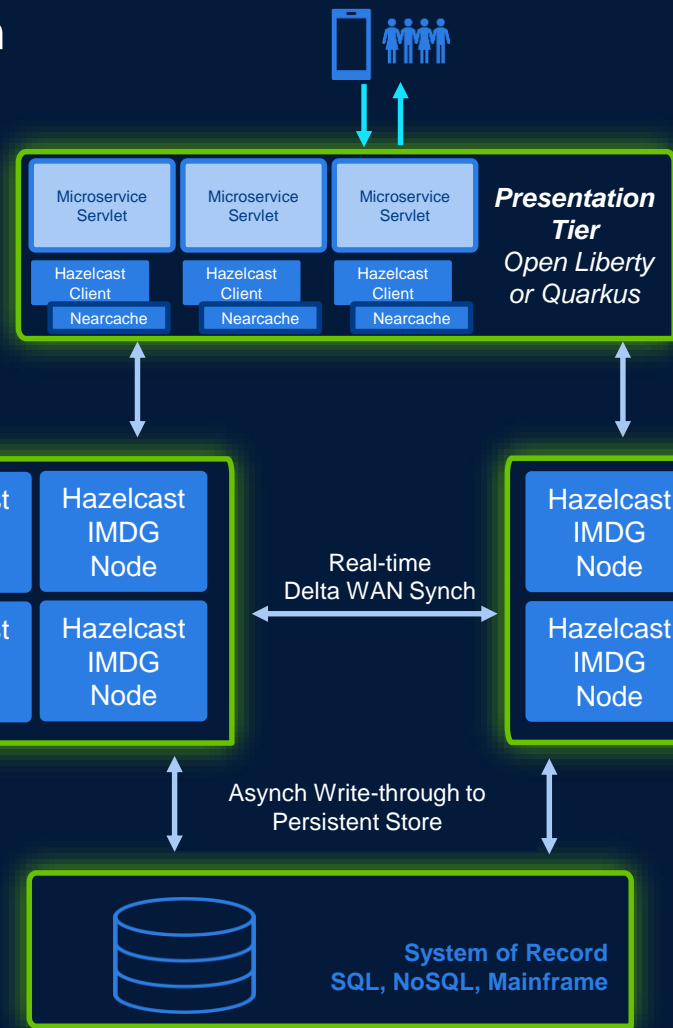
Example Use Cases: Field equipment monitoring, Asset Performance Management (APM), manufacturing operations, smart vehicles, connected cities, telco (cloudification of networks, software-defined networks).

Fast Data & Compute Grid in Cloud with Microservices Architecture



Multi-Region
Fast Operational Data Layer
Microsecond-Millisecond response
Delivering **99.999% uptime**

On-Grid Low-Latency Compute



Typically this architecture is replicated across multiple data centers or Cloud regions or in a hybrid Cloud model.



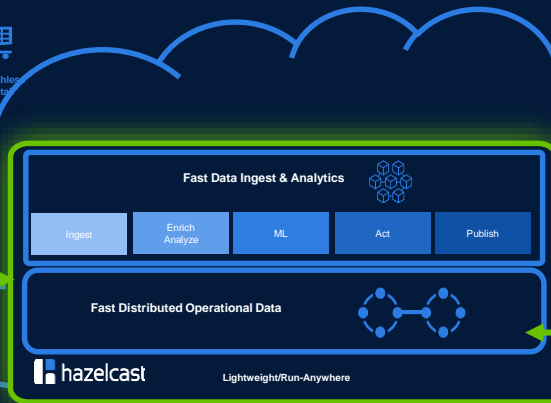
Boundaryless, Modern, Digital Compute & Data Layer Edge to Cloud to Data-Center

Hazelcast - *Fast Data & Compute from Edge-to-Hybrid Cloud*



Hazelcast in Edge

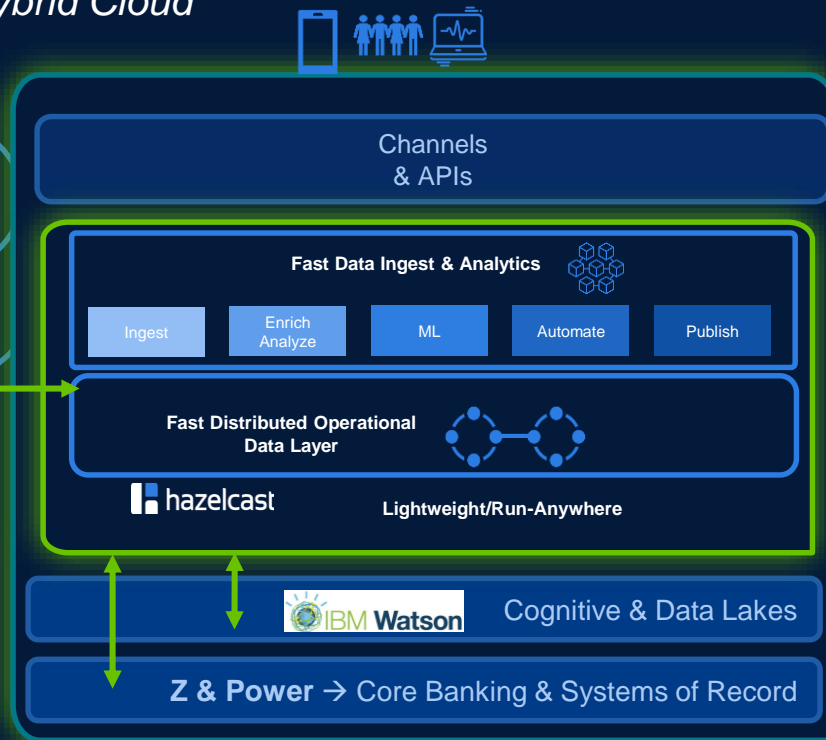
IBM Edge Application Manager
Deploy, Run & Manage Smart
Hazelcast Edge Applications



Hazelcast in Public Cloud

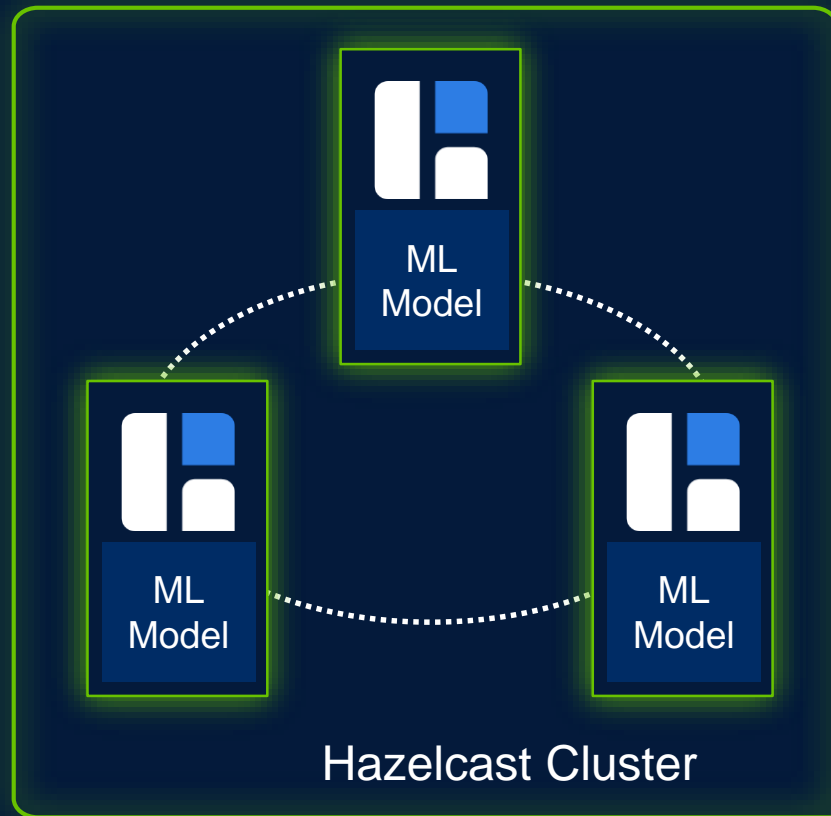
Hazelcast in Private Cloud
(Data Center)

Red Hat OpenShift, IBM CloudPak for Apps &
Cloud Pak for Multi-Cloud Management
Deploy, Run & Manage
Hazelcast in Hybrid Cloud



Real-time ML, Managed by Hazelcast Cluster

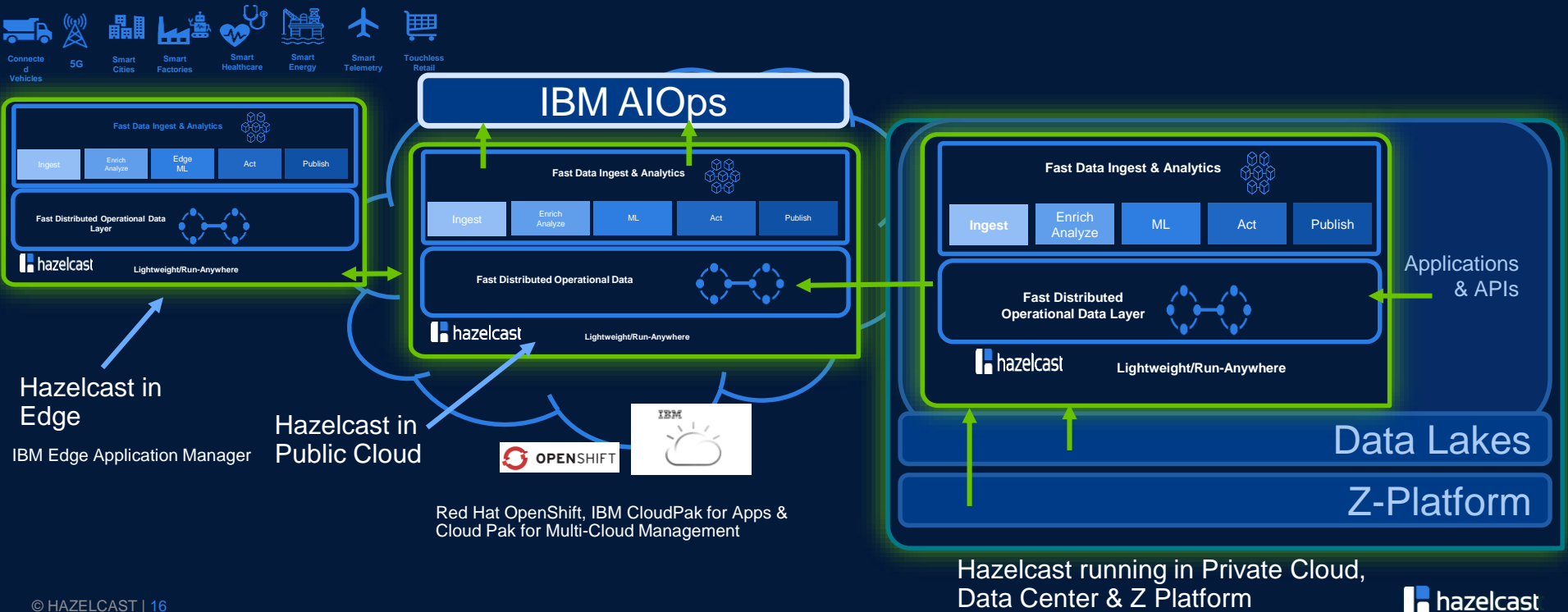
- Model gets created in Watson Studio
- Model deployed with the Job and managed by the Hazelcast cluster
- Scales Elastically with Resilient Execution
- Value in simplicity and performance
- Model deployment options:
 - Java
 - Python
 - C++



Hazelcast Fast Data Plane for AI Ops - from Edge-to-HybridCloud

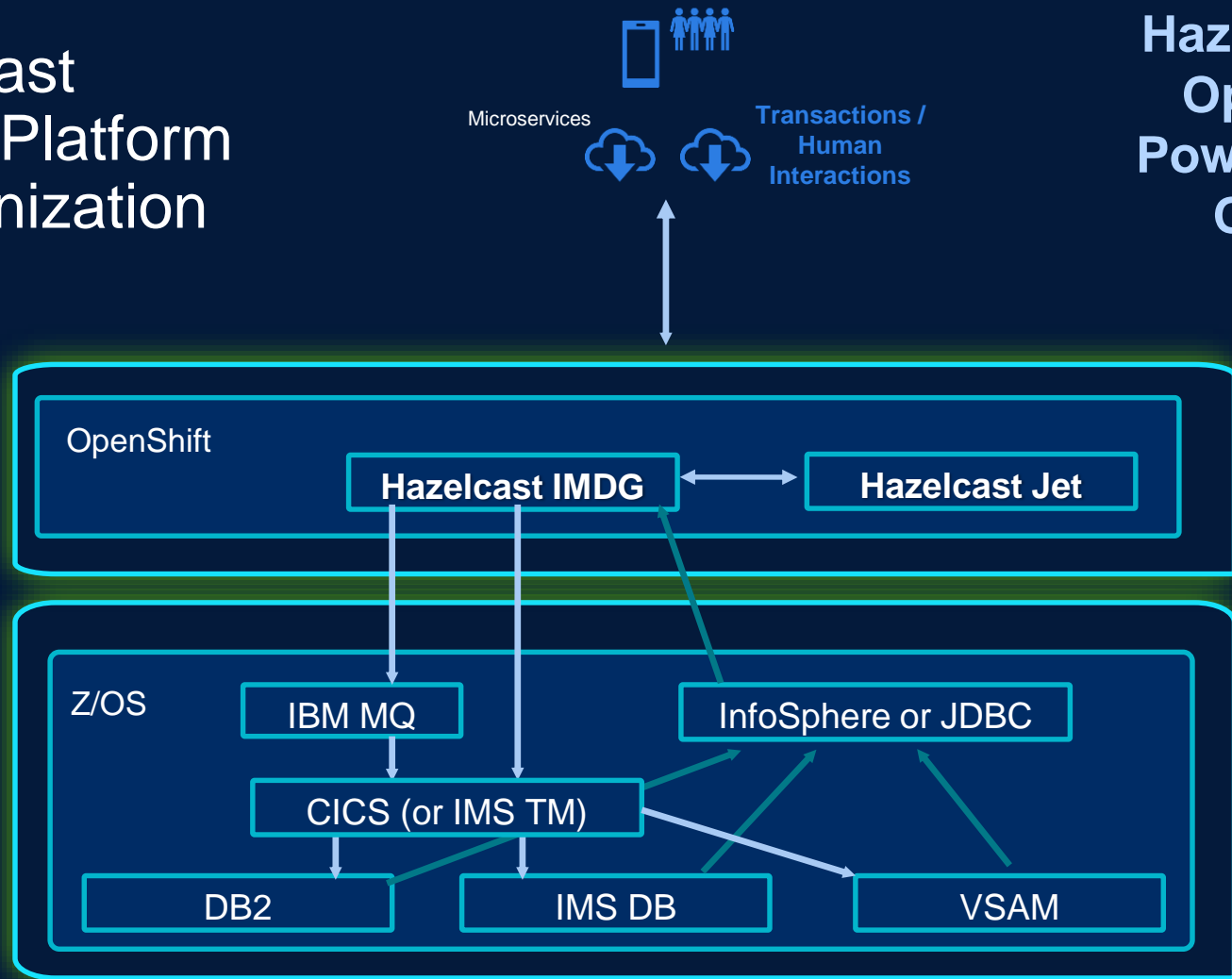
(Public, Multi-Cloud, Private Cloud)

Extend AI Ops reach to Edge and Z Platform



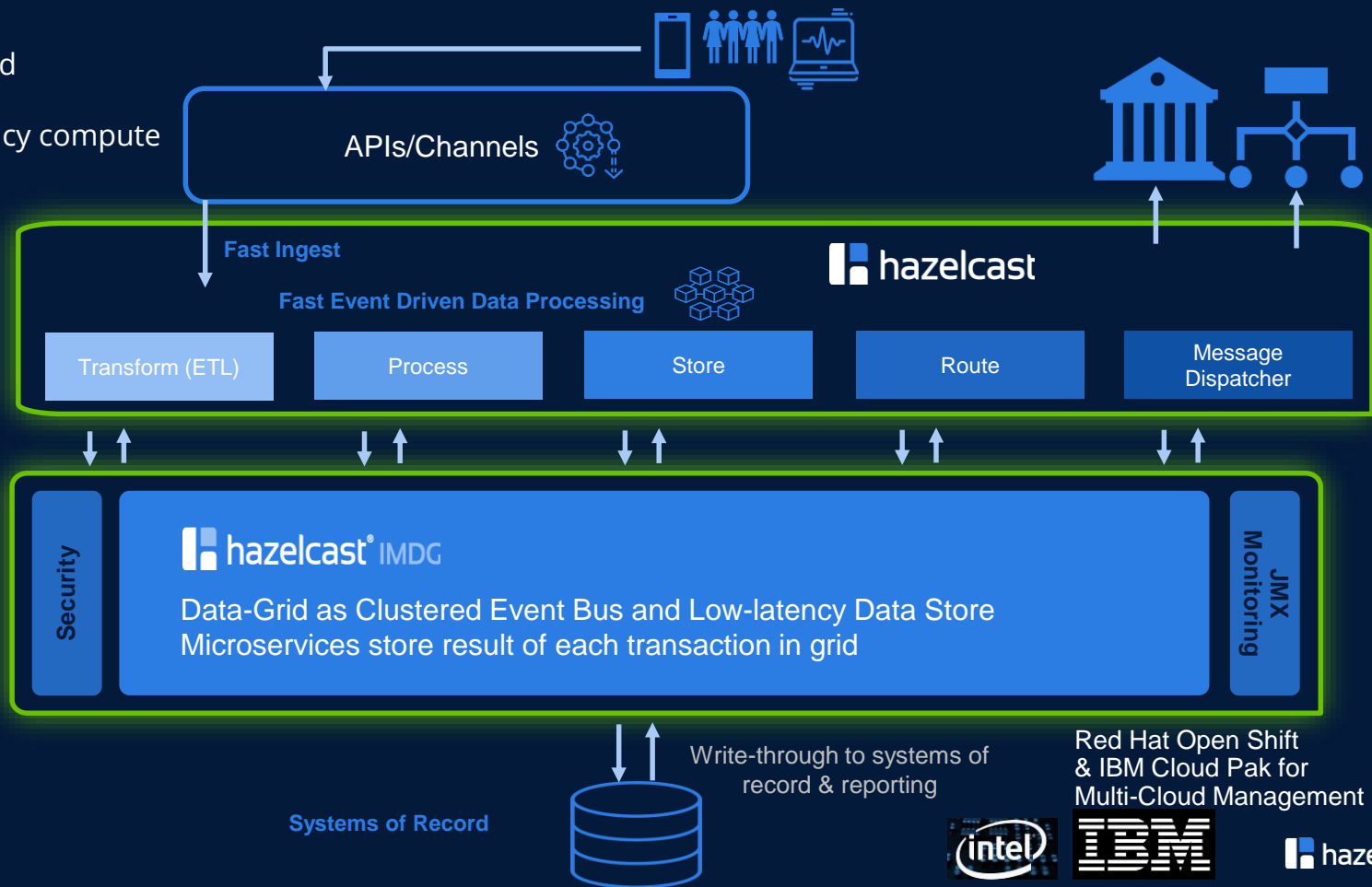
Hazelcast IBM Z Platform Modernization

Hazelcast on
OpenShift
Power or Intel
Or on Z



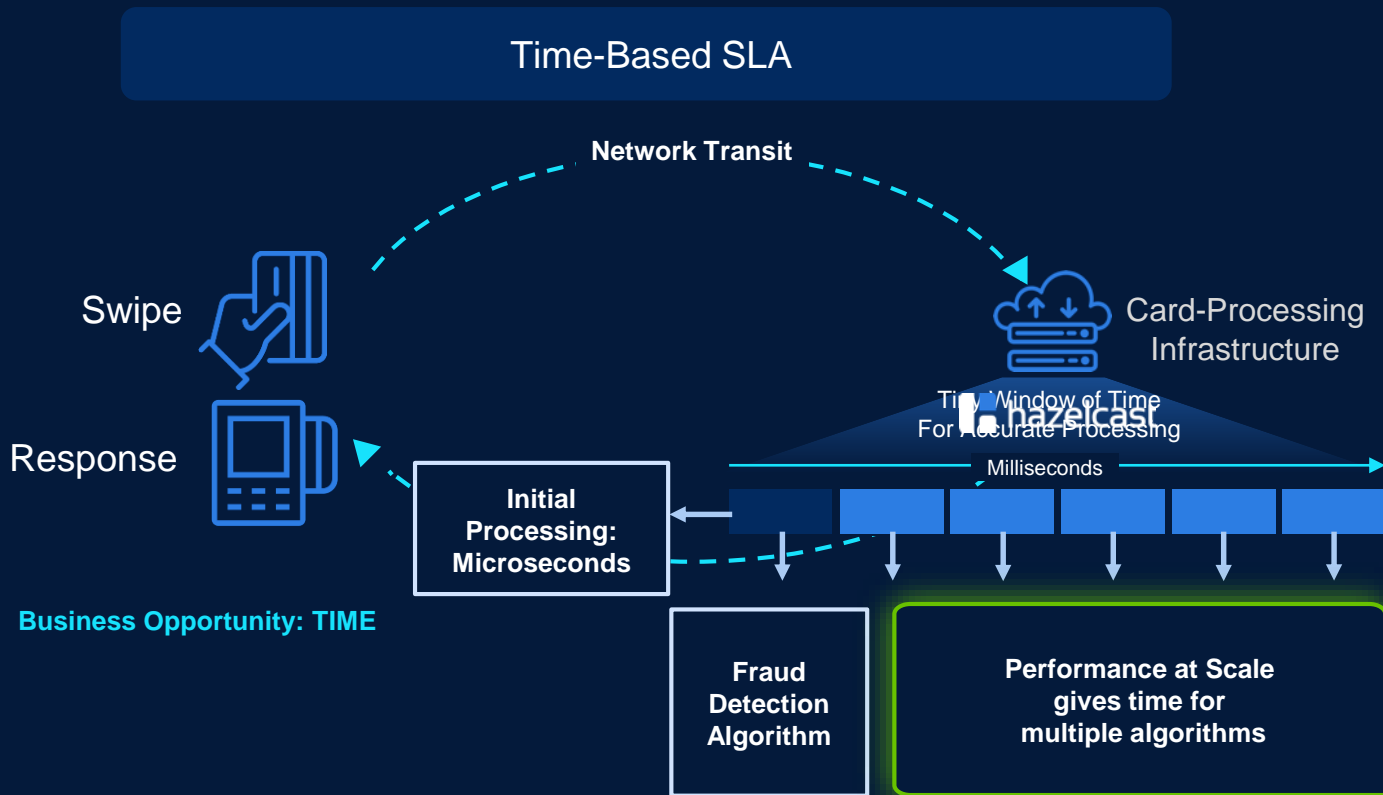
Digital Fast Payments or Trade Processing & Monitoring

TBs of data synched
geographically
20K+ TPS low-latency compute
99.999% uptime

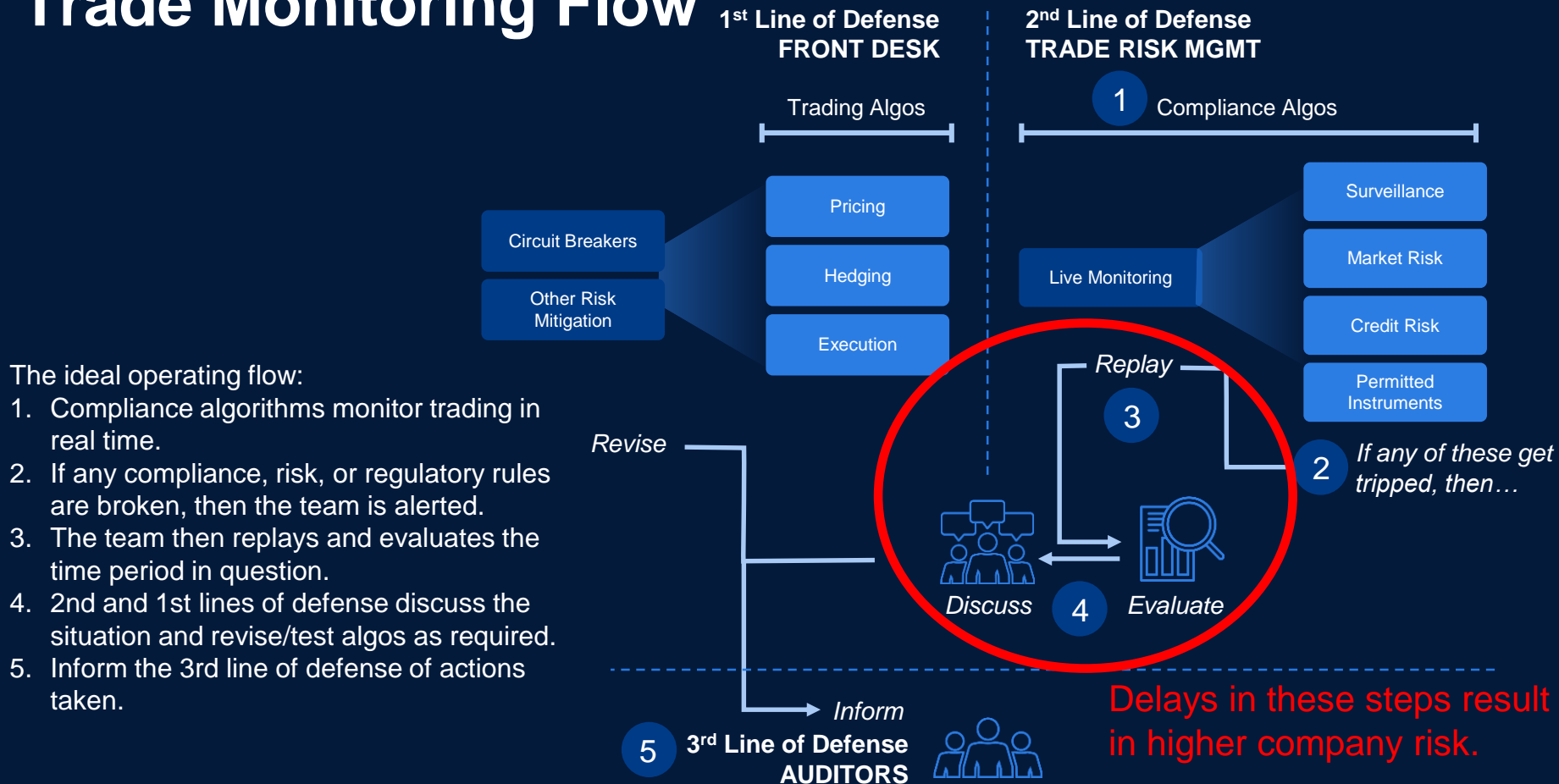


The Hazelcast Difference: Low Latency with Resilience

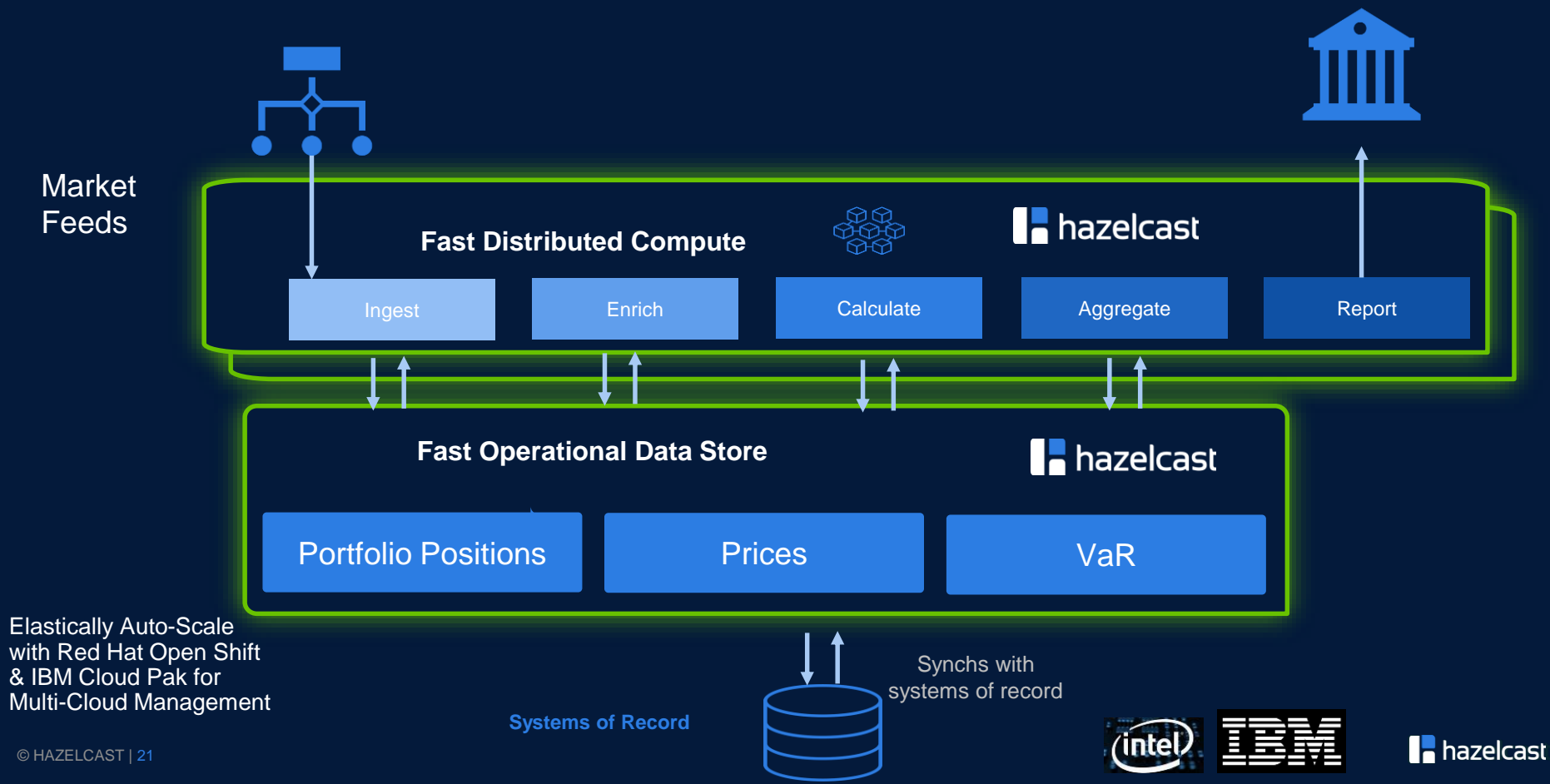
Example: Credit Card Processing



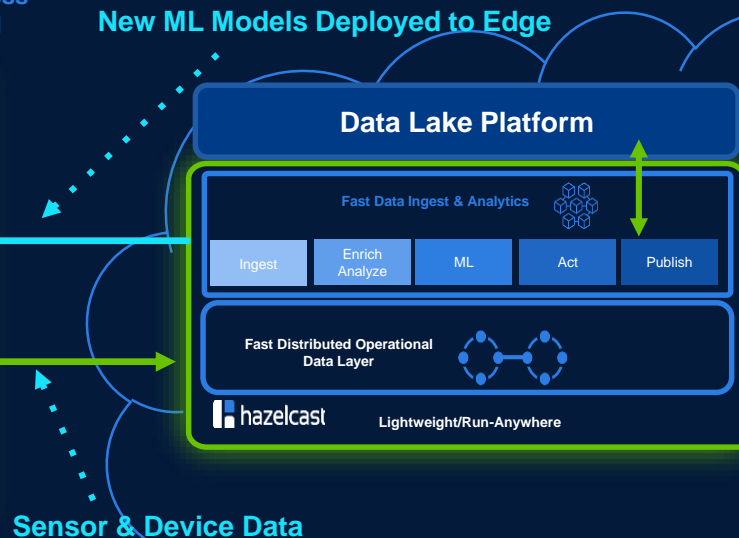
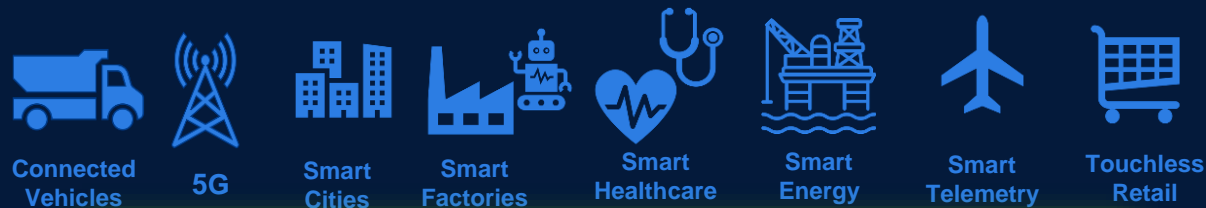
Trade Monitoring Flow



Fast Risk Calculations with Cloud-scale



Hazelcast Fast Edge-to-Cloud Ingest & Edge Analytics



Touchless - Personalized Retail, Banking and Hospitality



Touchless
with
Smart Signs



Tap & Go
Smart
Payments



Online Channels

Smart Mobile-Aware Brick & Mortar

ML Models Deployed to Edge - Branch/ATM



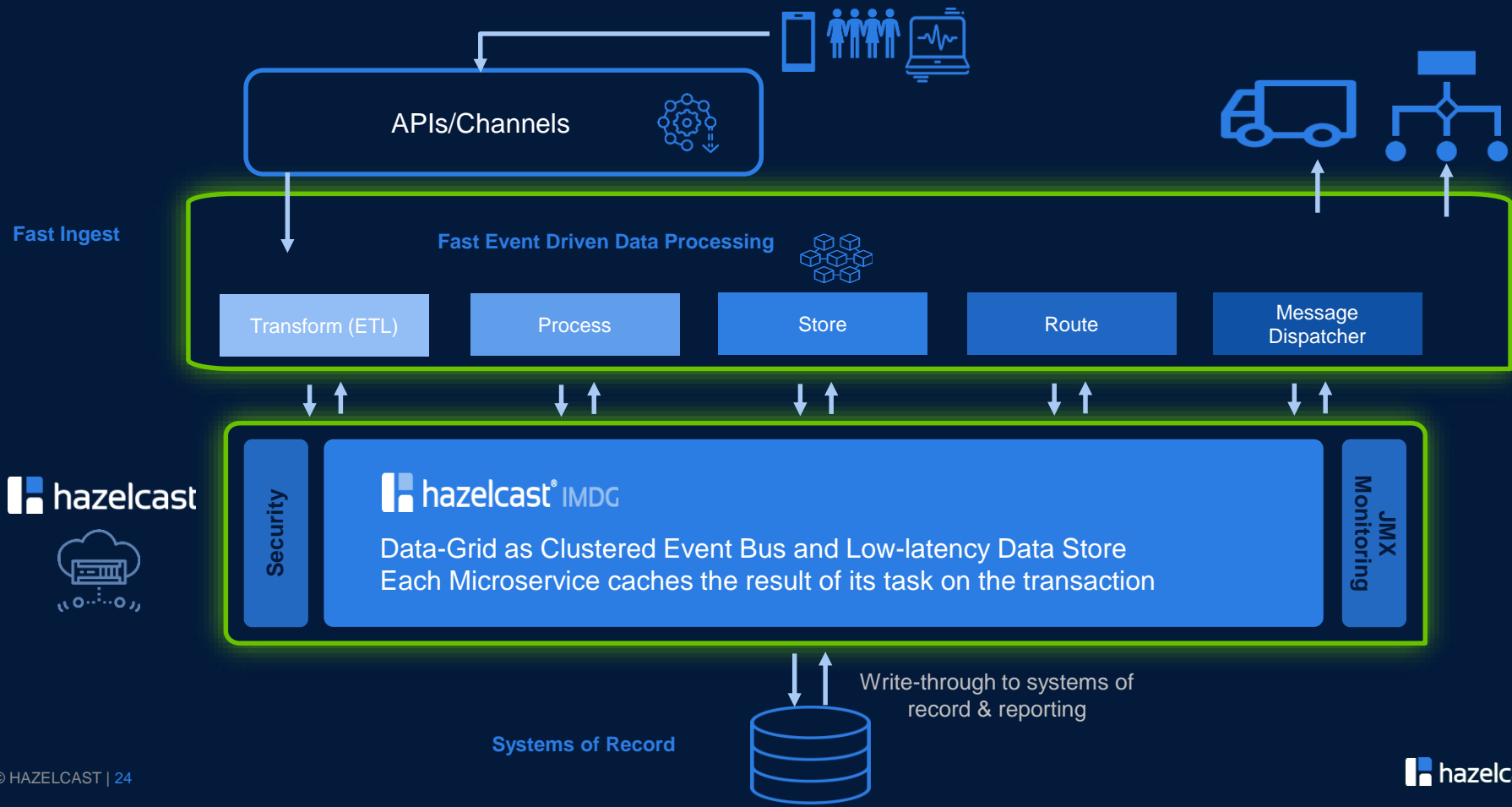
\$
€
£

Payments, Deposits, Transfers, P2P



IBM Edge Application Manager
Deploy & Manage Smart
Hazelcast Edge Applications

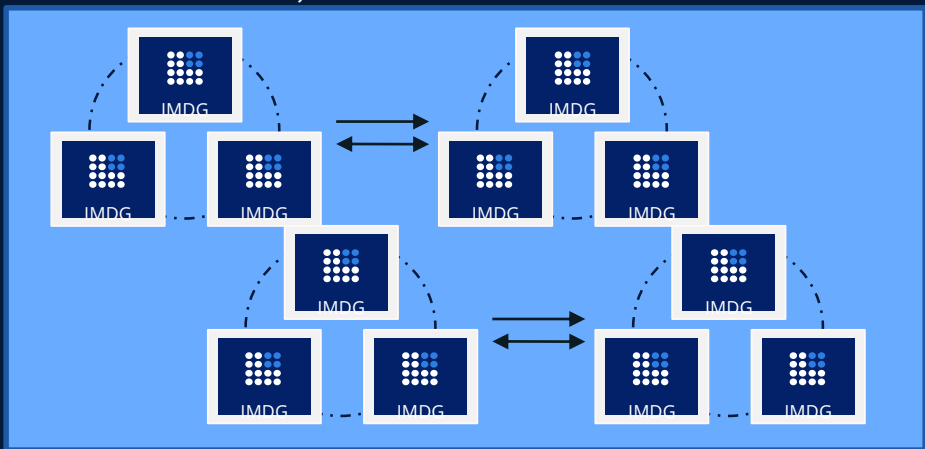
Digital Trade & Supply Chain Automation



Benefits - Zero-Downtime Banking Success

- Cross-cluster replication across geographies
- Globally available transaction data with millisecond response
- Low-latency data-aware compute on elastic grid
- Elastic scalability to support peak loads during extreme spikes

Fast, Zero-Downtime Data Plane



Low Latency Card Authorization

- Store 2TB of customer data and synch geographically
- 20K+ TPS distributed compute with low-latency
- 99.999% uptime architecture

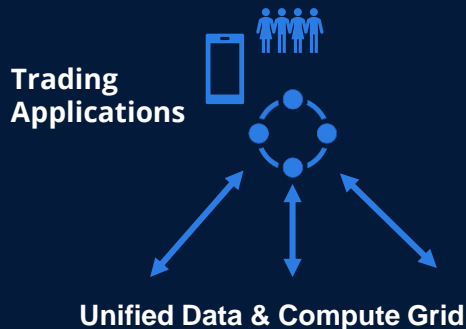
Instant Payments Hub

- 20,000 TPS
- 99.999% up-time

Benefits – Capital Markets

Low-latency data grid for fast access to market data, positions, etc.

- Low latency, data-aware compute on elastic grid.
Distributed low-latency calculation of prices, risks, etc.



FX Quotation Systems

- Sub-millisecond access, off heap data to eliminate garbage collection
- Fast distributed calculations of prices, margins and quotations
- Ensure zero-downtime SLA

Financial Market Data

- More predictable/accurate derived calculations with single source of market data
- Stable and always-on gateway access – allowing more concurrent system users, more quickly

Risk Calculation and Reporting

- Data-aware, co-located Computation accelerates risk processing
- In-Memory Access to Operational and Market Data

Benefits - Online Store – Retail/Tech



Unified Digital Customer Data Layer

Cross-cluster replication across geographies

Globally available online store data with millisecond response

Elastic scalability to support peak loads during extreme spikes

De-couple online store from back-ends for maximum resilience

Online Store - Phones

Time to report accurate order delivery date from 30 mins to 7 secs

1.2ms max application latency

Ensure zero-downtime SLA for new iPhone introductions

Online Retailer

Removed performance bottleneck for Apache Cassandra system of record – latency reduced from 300ms to ~2ms

Exceeds SLA target of 40ms and scales elastically to meet seasonal events like Black Friday, Cyber Monday

Hazelcast and Intel Deliver Together



More Uptime

2.5X faster restarts

Enables 99.999 Uptime & seamless upgrades/deployments with **Intel® “Cascade Lake” Xeon® Platinum 8180 processor** and **Intel® Optane™ DC persistent memory**.



Lower Latency

Ultrafast I/O & Encryption

can be achieved with Hazelcast solutions powered by Next-Gen **Intel Xeon Scalable** processors and NICs, that provide instant access to data.



More Data

Big data sets—structured and unstructured—can be used with Hazelcast solutions powered by **Intel Xeon Scalable** processors **Intel® Optane™ DC persistent memory modules**, without a decrease in performance

Why IBM & Hazelcast

- Unique: Joint & well integrated = Competitive advantage
- Modern & Innovative
- Enterprise grade & Resilient = Business Continuity
- Fast & Scalable & Secure = Lower TCO
- Agile & Easy to Manage = Faster Time-to-Market

Get Started

<https://www2.hazelcast.com/hazelcast-ibm-quick-start>

Your Enablement Team



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Get Started Fast

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