

What's an Edge Data Fabric and Why Zen is a Cornerstone for it

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Agenda

Anchor: our credibility in this space

What is an Edge Data Fabric?

Why would Zen be a cornerstone for it?

Why are we at an inflection point for the Edge where an Edge Data Fabric be necessary?

Innovation in Embedded Databases Since 1982

Softcraft/Novell Btrieve 1982-1997

- Enterprise Client Server Database
- ACID compliant SQL key-value DBMS
- Cross platform DBMS – NetWare, Windows NT

Pervasive PSQL 1998-2017

- Multi-core support
- Adds ACID NoSQL DBMS
- Defrag/Vacuum functionality and SQL Unicode support
- Embedded Zero-DBA functionality
- Windows/Linux/VMWare

Action Zen 2018-2021

- 64-bit Intel, 64-bit ARM
- Adds Windows IoT, Android, iOS, Raspberry Pi OS, Containers
- 64TB single data table
- JSON/RST API, BLOB
- Time-Series data functions
- AES 256-bit encryption

Sabre

Global Shop
SOLUTIONS
ERP SOFTWARE

Innovation in Motion
TSUBAKI

CULTURA
Technologies

 Wolters Kluwer

sage
software

 **Ashley**
HOMESTORE

 **Plurilogic**

infor

Rockwell
Collins

 **sistemi**
Professione Informatica

 **TAIFUN**
software

 **ACTIAN**

Edge Data Management in Context



What's an Edge Data Fabric

Wait, What's a Data Fabric?

Data fabric enables data that is **distributed across different areas** to be accessed in real time in a **unifying data layer**, under the **same management**. A data fabric is **agnostic to deployment platforms, data process, data use**, geographical locations and **architectural approach**. It facilitates the use of data as an enterprise asset. A data fabric ensures various kinds of **data can be successfully combined, accessed and governed efficiently and effectively**.

Edge Data Fabric Checklist

- ✓ Access to many different interfaces – HTTP, MQTT, Radio Networks, Mfg. Nets, etc.
- ✓ Run on multiple operating environments, most importantly POSIX compliant
- ✓ Works with key Protocols and APIs, including more recent ones like REST API
- ✓ Works on and with distributed file systems
- ✓ Provides JDBC/ODBC database connectivity
- ✓ Handles streaming data through standards such as Spark and Kafka

Why is Zen a Cornerstone for Edge Data Fabric?

Actian Zen Edge DB purpose-built for edge distributed data

Zero-DBA

Embedded

Nano-footprint

Variety of Data Types



Transactional



JSON



IT/OT



Video



Images



Audio

Universal Deployment



Mobile



IoT



Laptops/Desktops/Servers



VMs



Containers

Hardware Architecture Agnostic

intel. arm

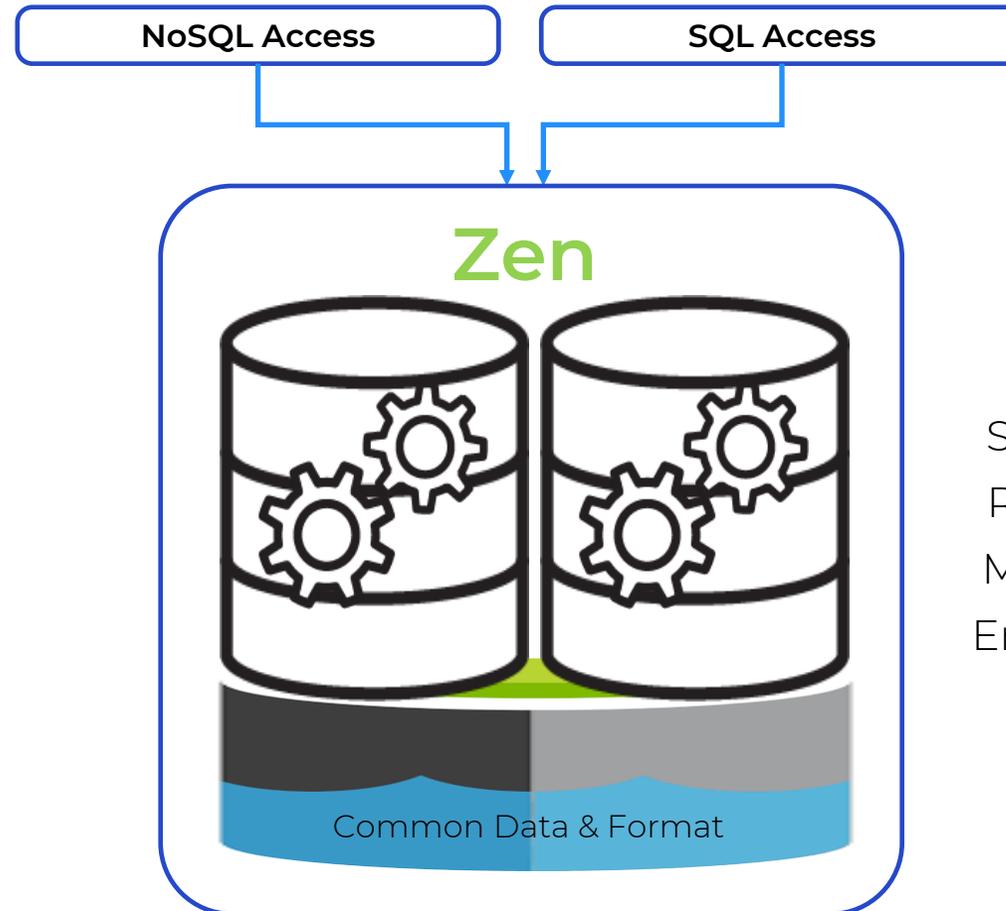
Actian Zen Edge DB purpose-built for edge distributed data

Zero-DBA

Embedded

Nano-footprint

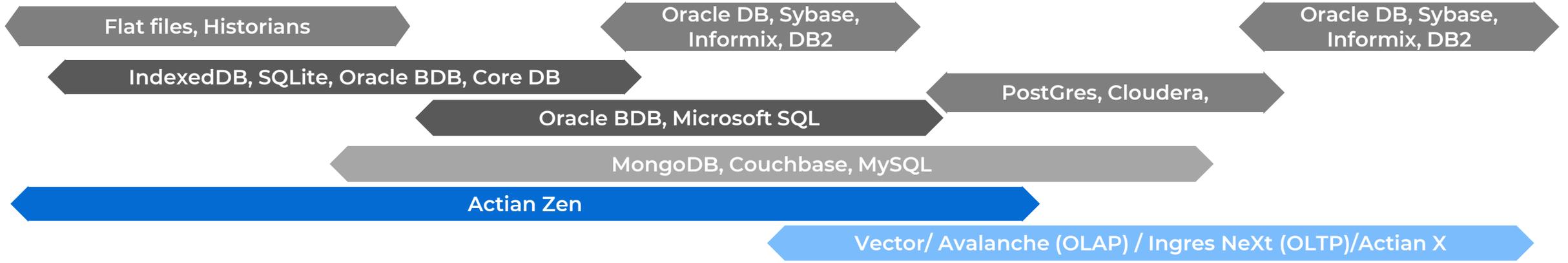
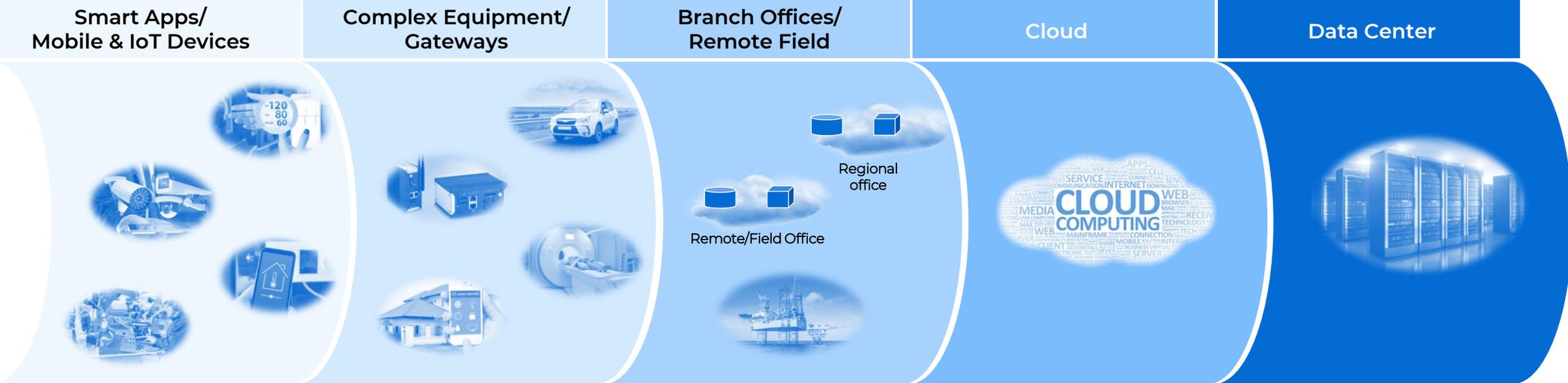
Best of Both Worlds

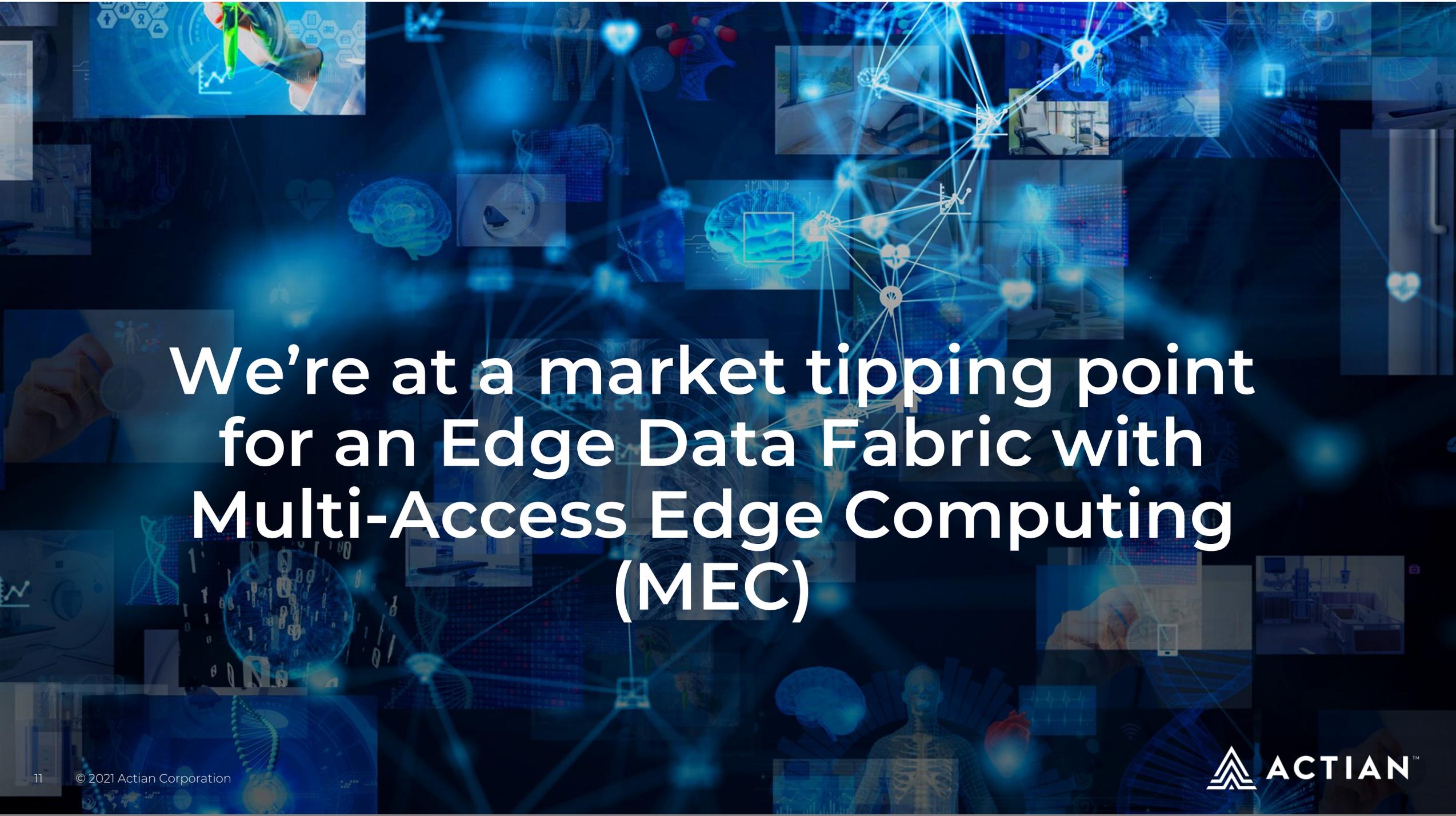


Modern Architecture

Separates Compute and Storage
Runs on OS, VM, or in Containers
Modular Client-Server: 5 – 200MB
Embeds in Apps, no DBA required
AES-256-bit encryption

Zen: Single, Secure, Scalable Solution for Edge Data Management



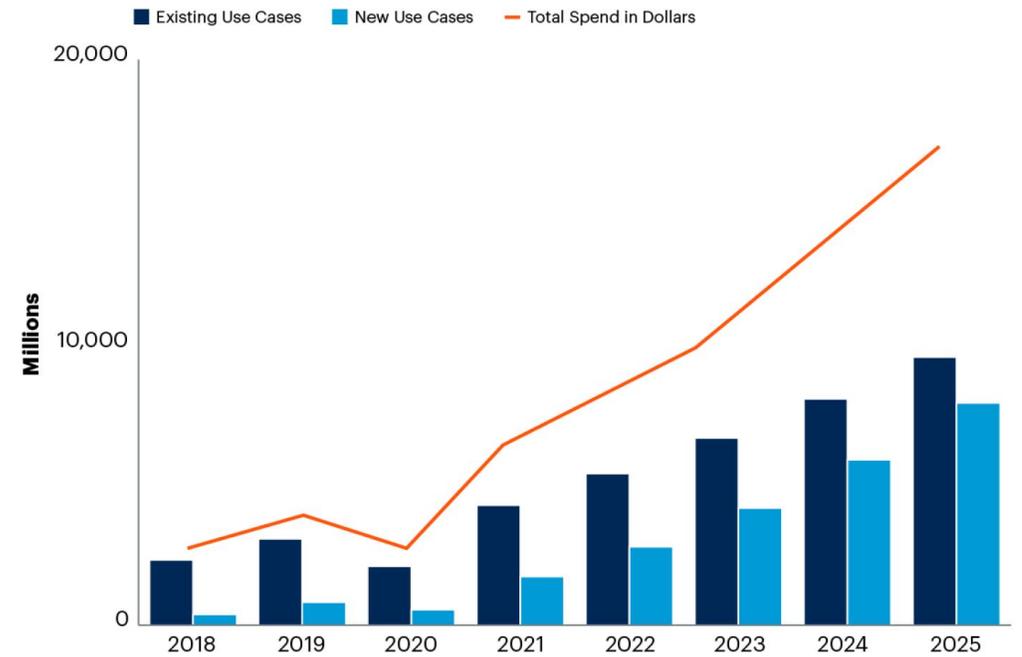


**We're at a market tipping point
for an Edge Data Fabric with
Multi-Access Edge Computing
(MEC)**

COVID-19 Was Just a Speed Bump

Figure 1: The Edge Infrastructure Opportunity

The Edge Infrastructure Opportunity

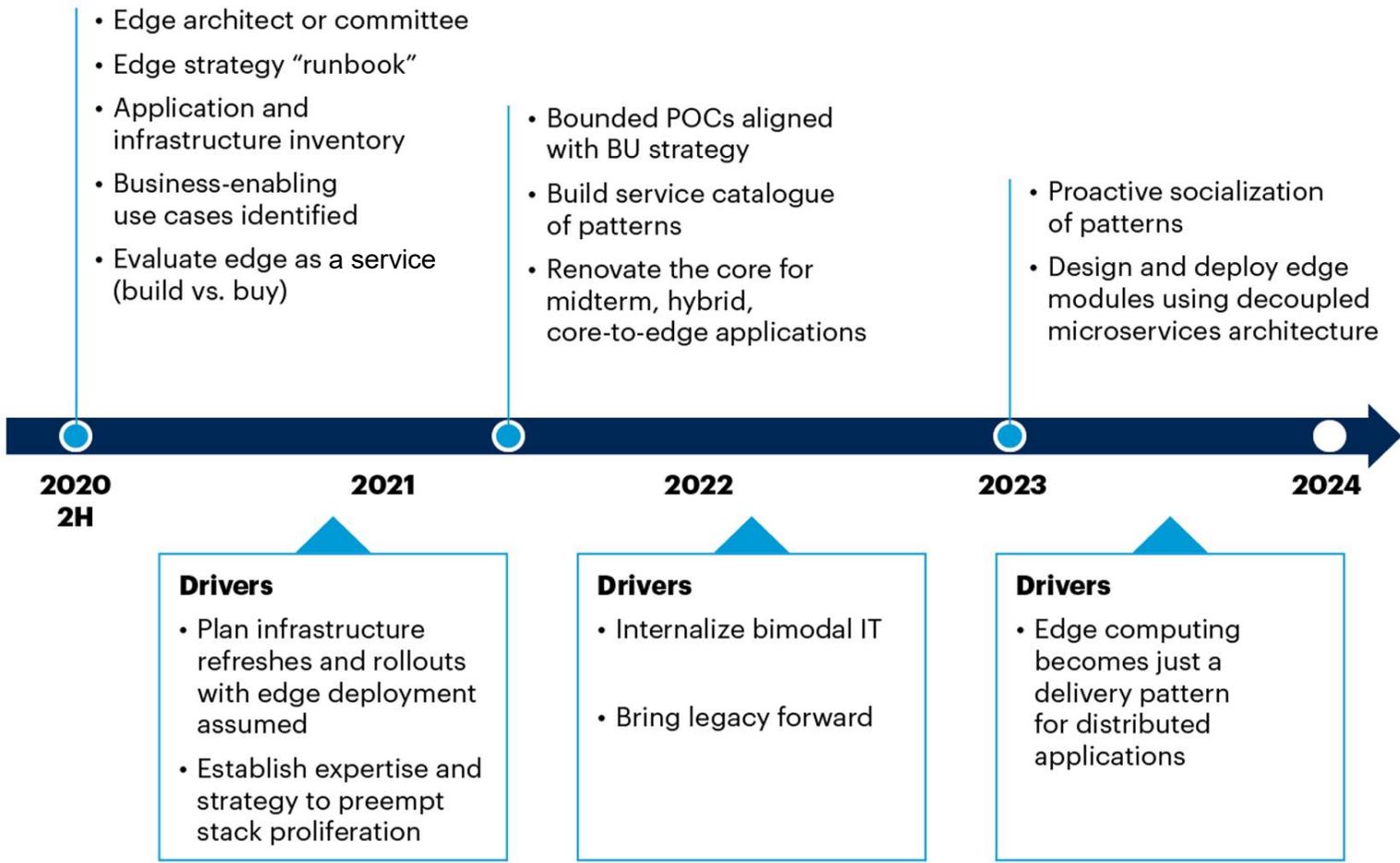


Source: Gartner (June 2020)

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Design-ins are Just Ramping Up

Strategic Roadmap Timeline for Edge Computing



Timeline indicates where to begin

Source: Gartner
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The Key Drivers for Edge Computing Have Changed

Old Edge Thinking

- Majority of data moves to the cloud
- Minimal edge processing
- Expected surge in bandwidth

New Edge Thinking

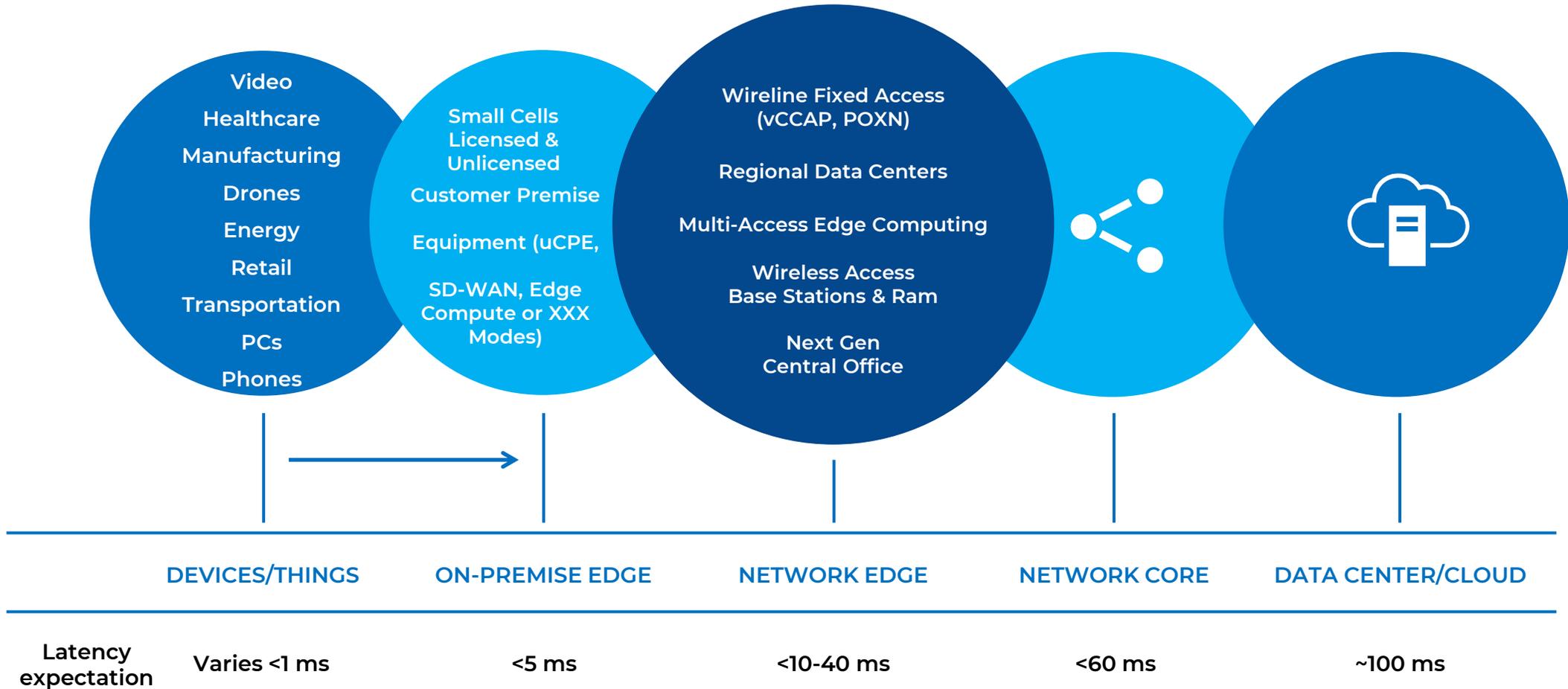
- Majority of data stays at the edge
- Unsupervised ML inference will be widespread
- Bandwidth surge offset by deluge of data

What Changed?

- Latency
- Bandwidth Paradox
- Data Privacy & Security
- Edge economics and ecosystem mimicking Cloud

Latency

Too much latency can cause damage and increase risk

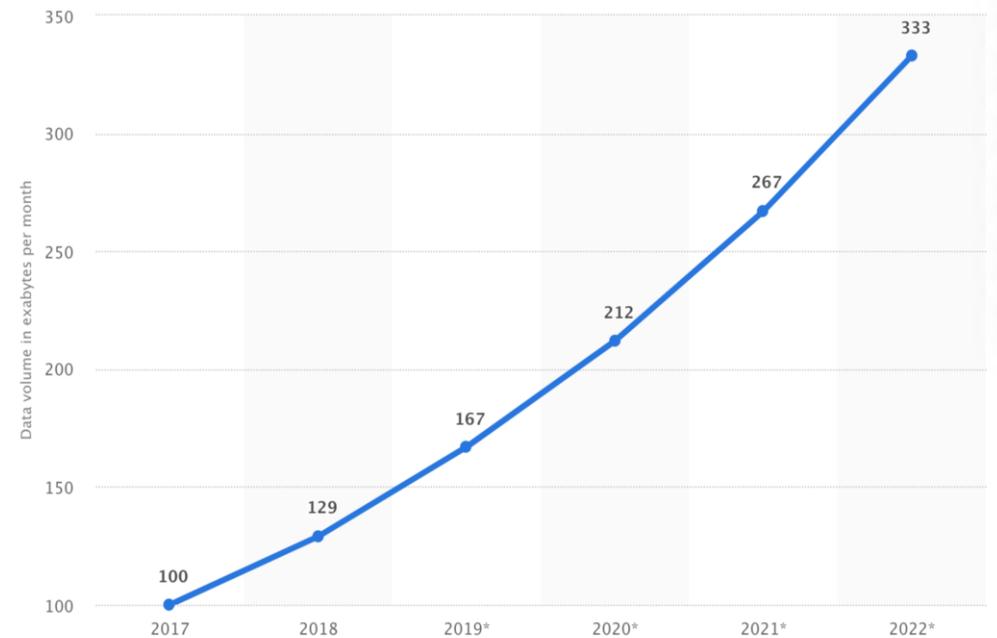


ms = milliseconds

The Bandwidth Paradox

- Edge data growth continually outpaces bandwidth increases
- Developers abandoned Load Size optimization skills after 3G
- 5G resource-rich devices may create a new wave of bandwidth scarcity
- It is estimated that 82% of IP traffic will be video content in 2022.
- SPs will need to rethink where they process data to reduce cost, improve quality, and create new revenue with value-added services

Data volume of global consumer IP traffic from 2017 to 2022
(in exabytes per month)



© Statista 2020

The timeline shows a forecast for the data volume of worldwide consumer IP traffic until 2022. In 2022, global consumer IP traffic is expected to reach 333 exabytes per month at a 27 percent compound annual growth rate. Consumer traffic includes fixed IP traffic generated by households, university populations, and internet cafés. Consumer IP internet traffic amounted to 100 EB per month in 2017.

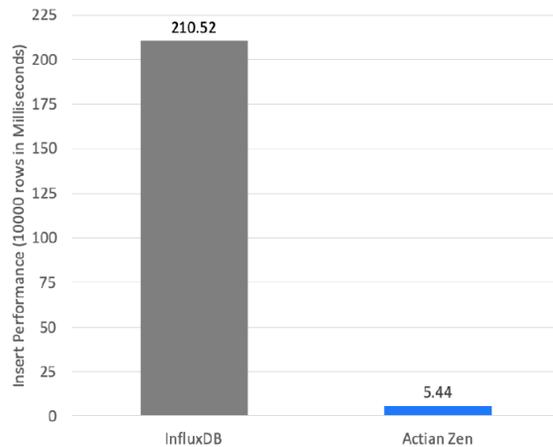
Data Privacy plus Data Security

- **50% of organizations** that are **subject to GDPR** will suffer from a lack of governance and visibility into mobile workflows
- Everything must be secured. It takes three minutes for an unsecured device to infect the network.
- By **2022, IoT security attacks** due to lack of insight into edge and third-party device providers will **increase** by **35%**
- What can be done from a data management perspective?
 - ✓ Encrypt at rest and in transit to reduce attack surface
 - ✓ Remove ETL between devices and tiers to eliminate attack vectors
 - ✓ Process at the edge, mask results, eliminate raw data to improve privacy
 - ✓ Use Industry standard DB technology and its inherent security to support better data governance at the edge

Single Architecture with optimized performance for all major data types and edge scenarios

38X faster than InfluxDB

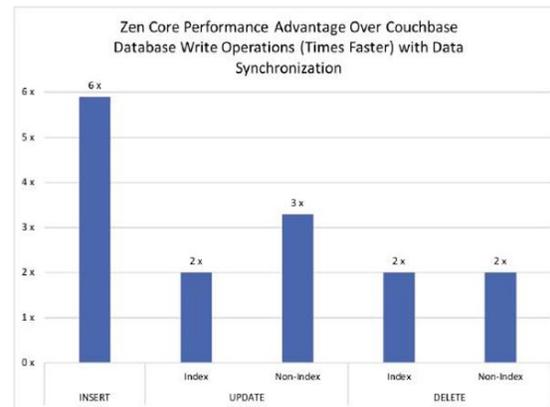
Time Series Data



3rd party benchmark, published April 2019

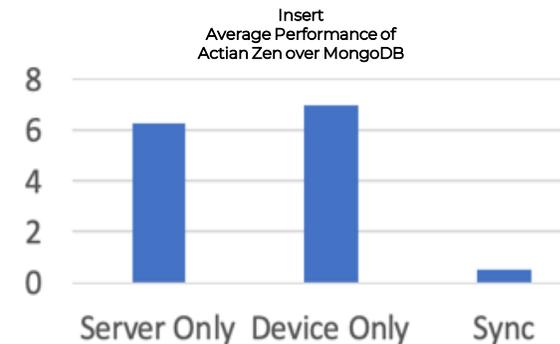
JSON/BLOB Data and Document Store

>3X faster than Couchbase



3rd party benchmark, published November 2018

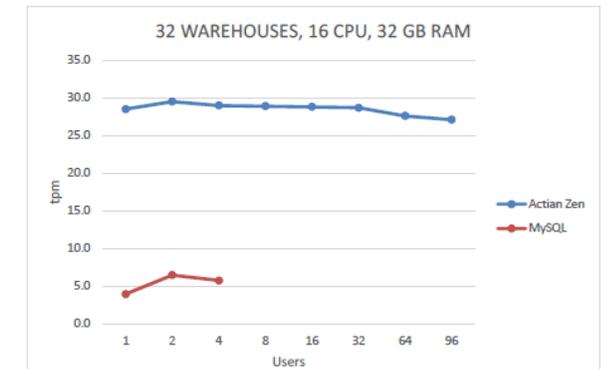
>6X faster than MongoDB



3rd party benchmark, published July 2019

Transactional RDBMS Client-Server

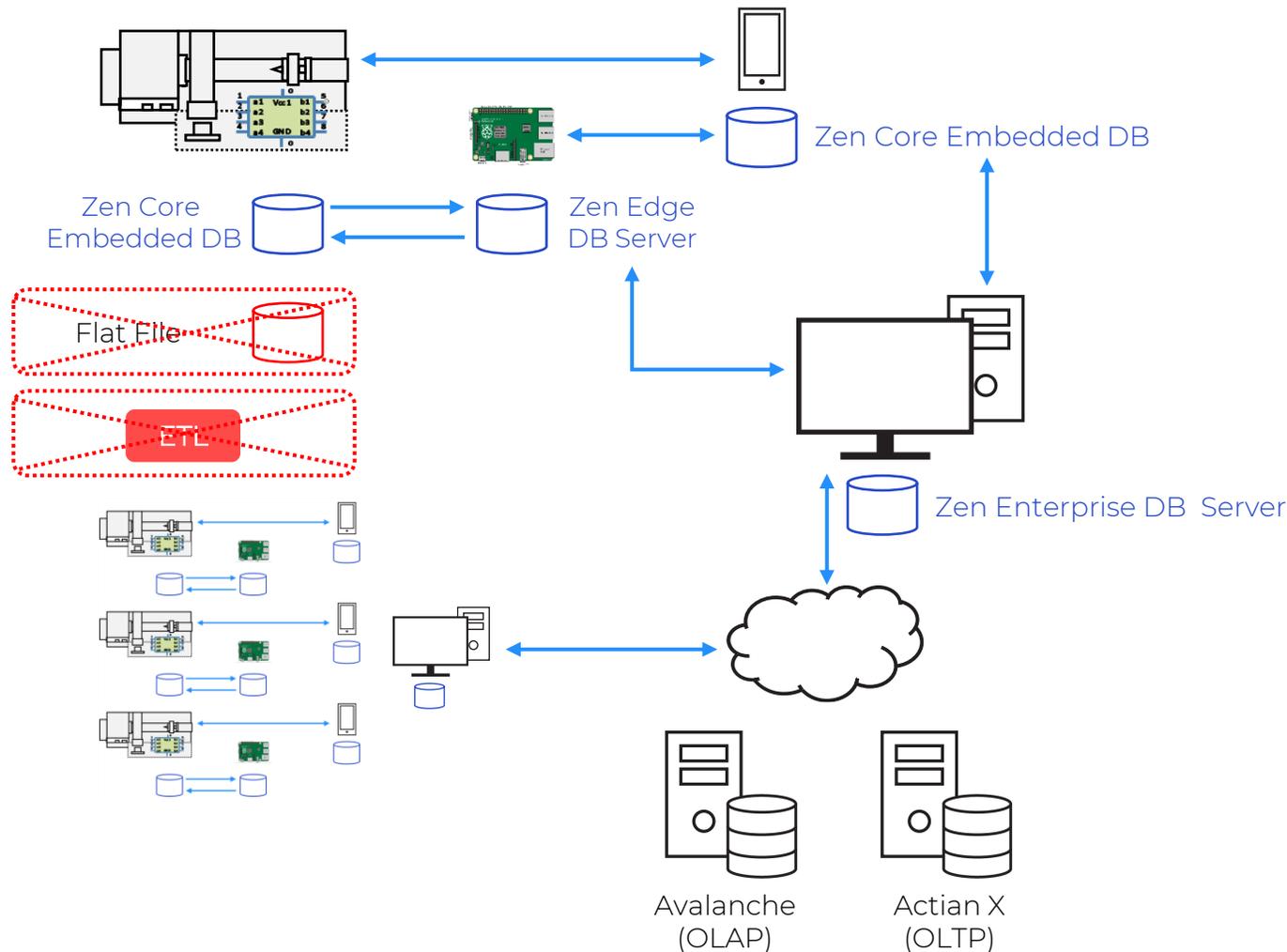
>5X faster than MySQL



In the case of the 32 TPC-C warehouses, we received errors with MySQL at 8 users.

3rd party benchmark, published July 2021

Processing on the Edge: Our solution with Actian Zen Edge DB



Zen approach to Edge

- Remove ETL overhead
- Reduce security attack
- Simplify design, test, deploy
- Improve performance
- Reduce support and maintenance
- Transparent, simple licensing

Faster, safer, cheaper integration

- Distributed and discrete apps use same NoSQL API/SQL calls and data file format
- Remove ETL integration costs and security vulnerability
- Yet support multiple protocols and vendors

Legend

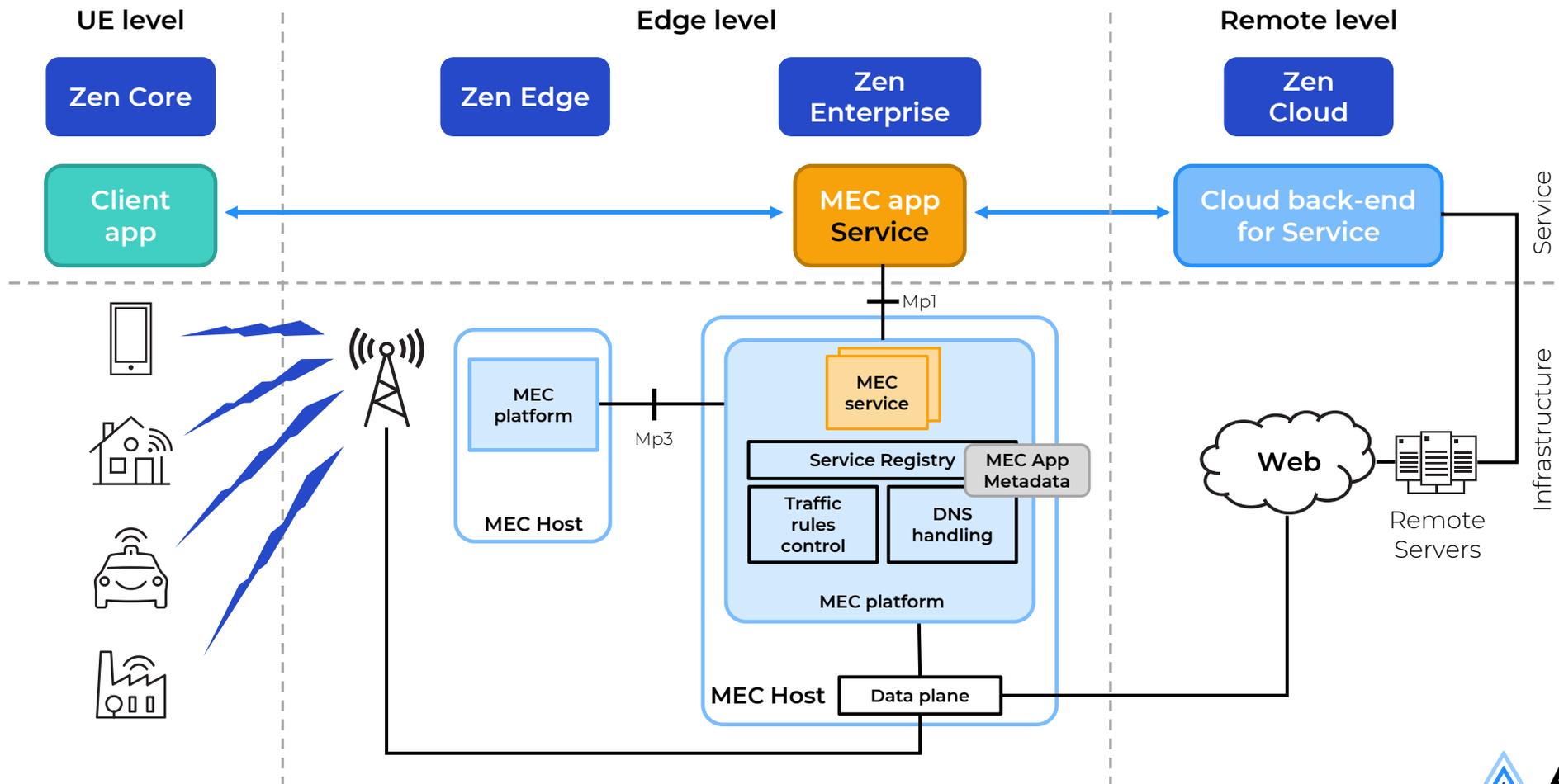
-  Pump
-  Smart Sensor
-  Gateway
-  Smart Phone
-  On Site Management

Innovation at the Edge

- ✓ Break down proprietary barriers and walled gardens
- ✓ Create a vibrant developer base by courting Enterprise and Mobile Application Developer communities
- ✓ Anchor store mall approach to building ecosystems
- ✓ Identify and successfully pilot key Edge use cases

Winning Equation: MEC + 5G + Cloud

Multi-access Edge Computing



MEC Key Data Management Requirements



Support reduction in latency (URLLC)

Large structured local data management
No ETL between network access points, gateways or edge cloud reduces transport latency
High performance operations for data processing and analytics on-device, peer to peer, and to gateway



MEC needs Global Application Portability

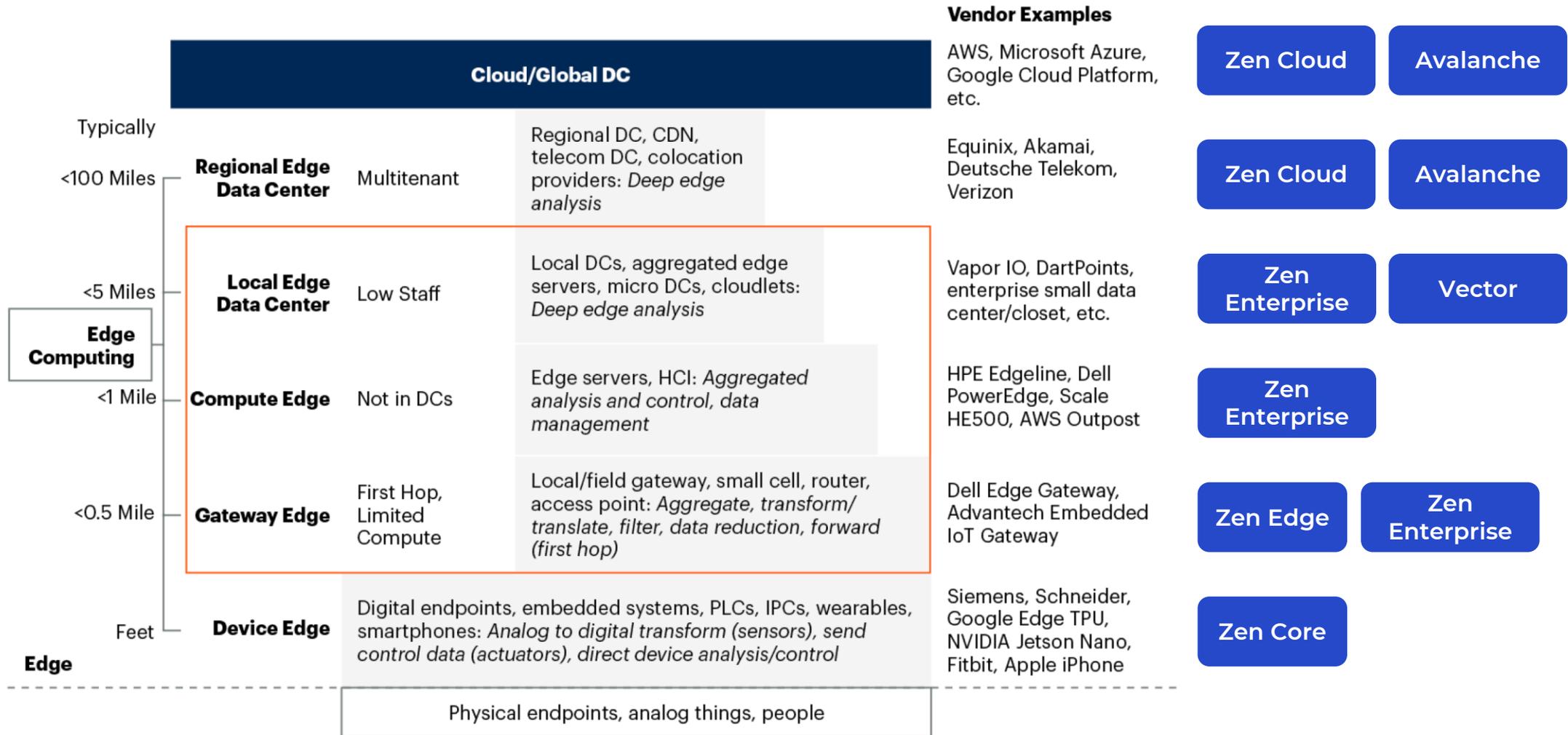
Run on any platform with sufficient/minimal compute resources – device, gateway, edge on-premises, edge cloud, cloud
Support for SQL and NoSQL to the same data tables from the same engine for simplicity and speed of operation
Run in a Docker container, on a VM, or on an OS no gaps for GAP (Global API Portability)!



Edge environment field support

Minimize need for human presence with Zero DBA (lights out in Telco/HW speak)
Support local analytics and visualization through standard APIs
Minimize service time intervals through OEM lifecycle and controlled remote updates

Mapping to Underlying Systems



Source: Gartner (June 2020)

Note: CDN = content delivery network; DC = data center; HCI = hyperconverged infrastructure; IoT = Internet of Things; IPC = industrial process controller; PLC = programmable logic controller

Action Zen is the OpenNESS Reference Architecture for Data Management



Optimized for



OPEN NETWORK EDGE SERVICES SOFTWARE

- OpenNESS is the Intel MEC platform
- Actian and Intel have certified Actian Zen Edge and Enterprise in Docker Containers
- For more info:
<https://networkbuilders.intel.com/commercial-applications/action>



Thank you!