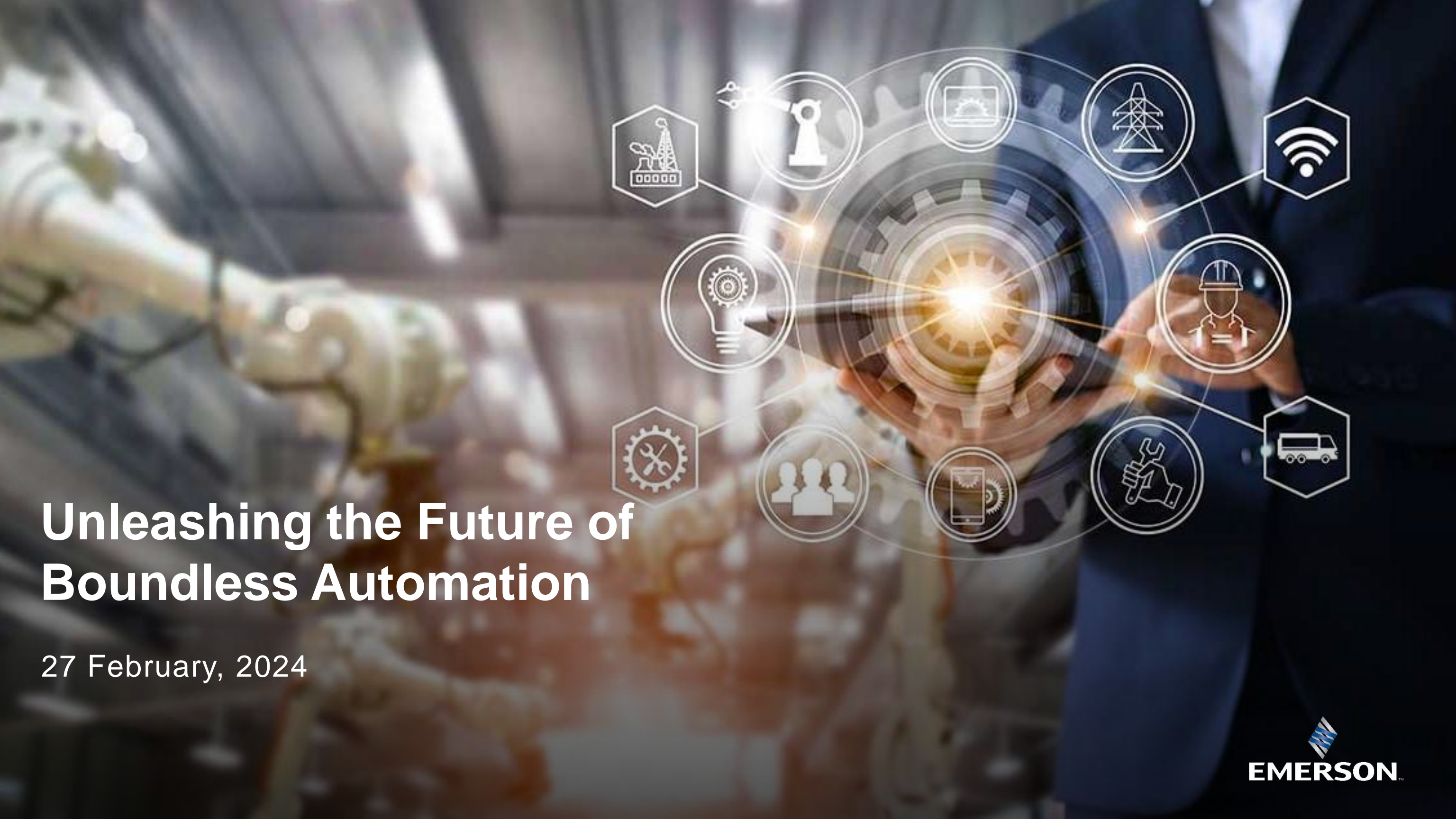


# Unleashing the Future of Boundless Automation

27 February, 2024





# Unleashing the Future of Boundless Automation

27 February, 2024

# Evolution of Automation

## Intelligent Field



**HART**  
COMMUNICATION PROTOCOL

## COTS\* Equipment



**DELTA V**

## Distributed Field



## Wireless



## Future



**Next Generation  
Automation**

**30+ Years**

\* COTS = Commercial Off The Shelf

# Early Digital Transformation Efforts Have Uncovered Barriers

Breaking down data silos for digital success

CIO

Mining the 'Messy Middle' of Data Analytics

IndustryWeek

Manufacturers Are Drowning In Data – They Need A Lifeline

EMS NOW

ERP TODAY

Cleaning up the data swamp

From Raw Data to Meaningful Insight

AUTOMATION  
COM

Data lacks context and is proving difficult to integrate

---

Plant data sources are siloed

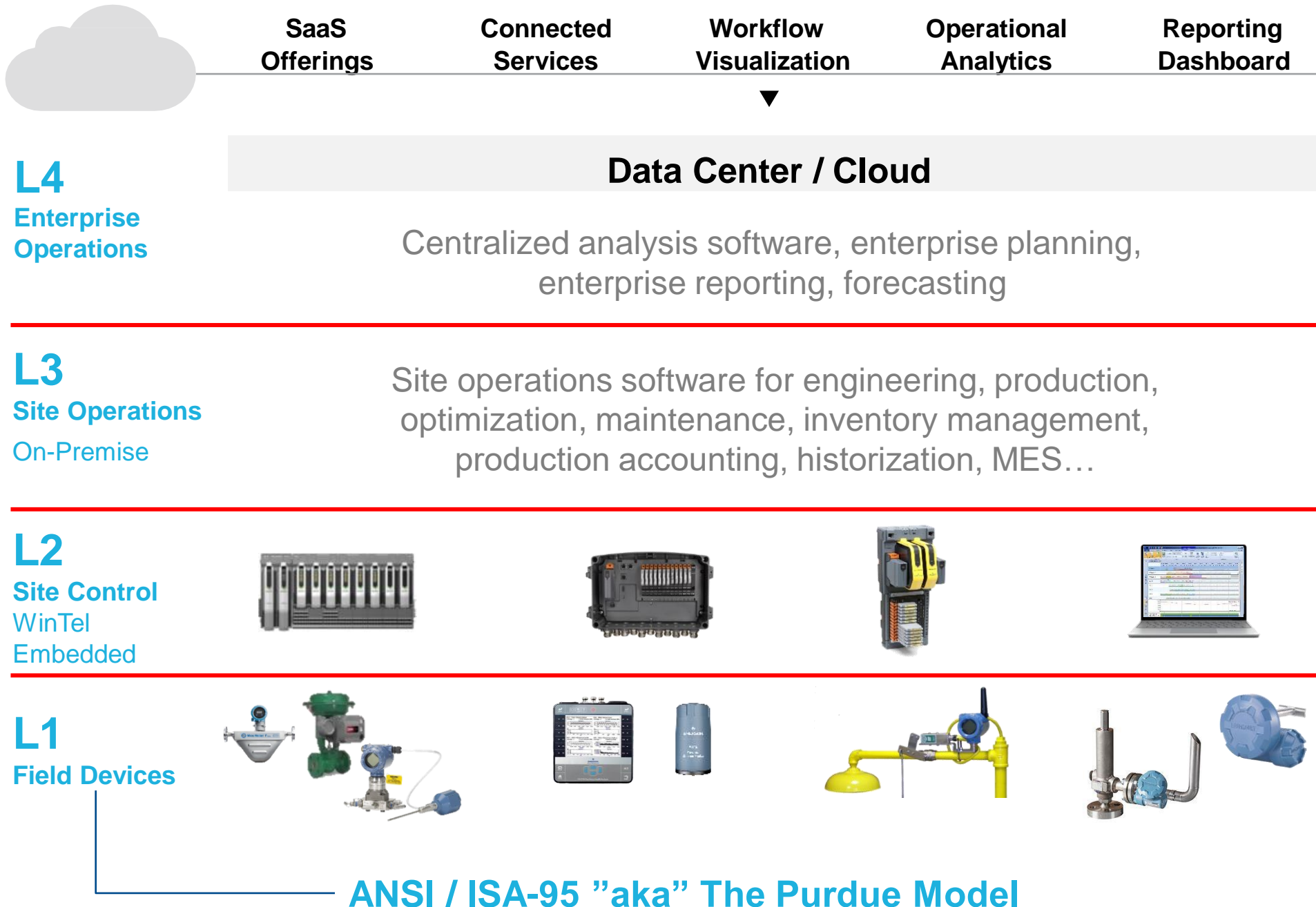
---

The promise of AI & ML analytics is not being realized

---

Domain experience needed

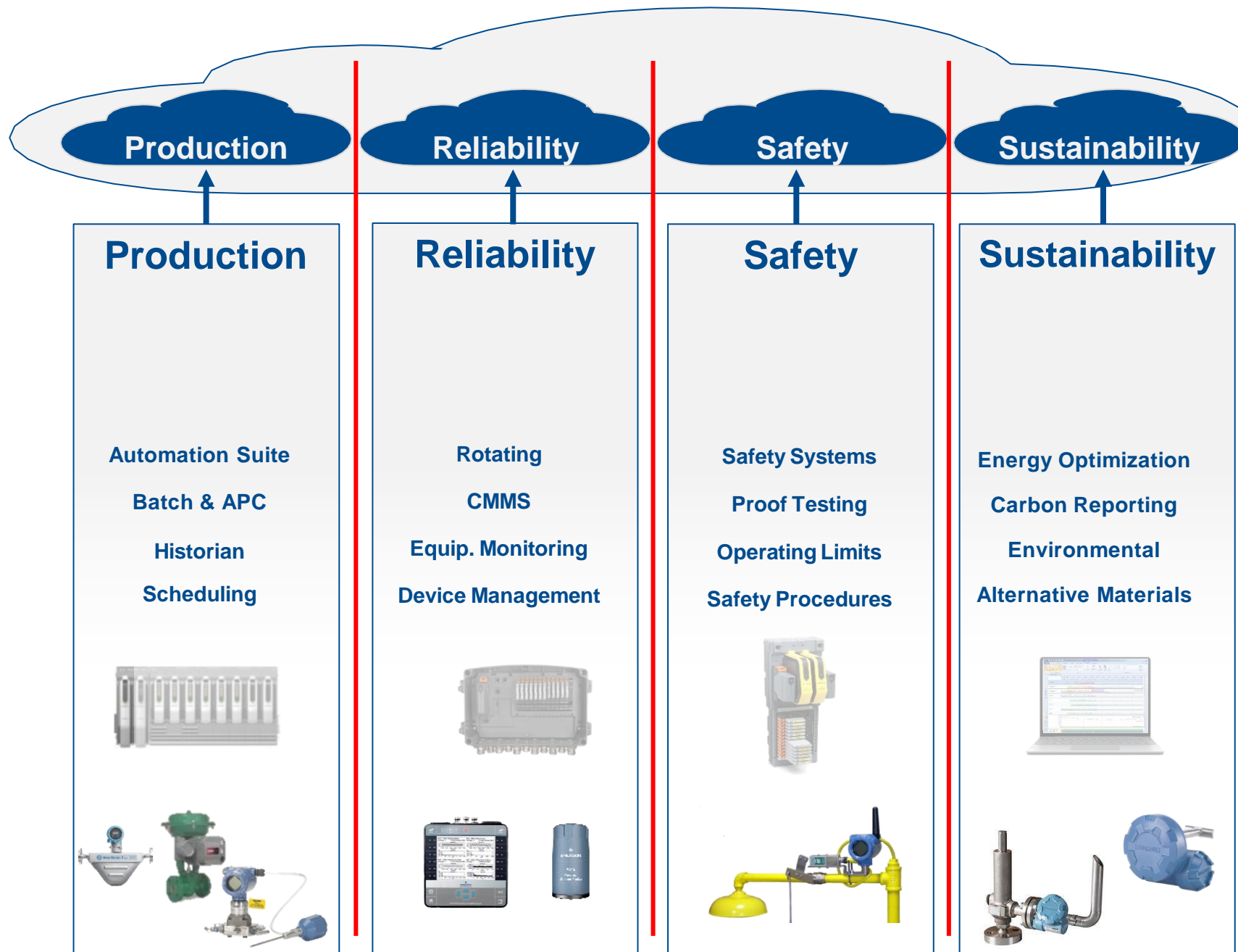
# Traditional Automation Architecture is Built on Rigid, Physical Technology Layers



## Hierarchical automation networks

- Hard segmentation between OT / IT Systems
- “Here’s your data – now go away”
- Provides security constructs between the layers – “in-depth”
- Some function-specific hardware with associated software
- Restricts data flows

# Departments Specific Deployments Form Silos of Data



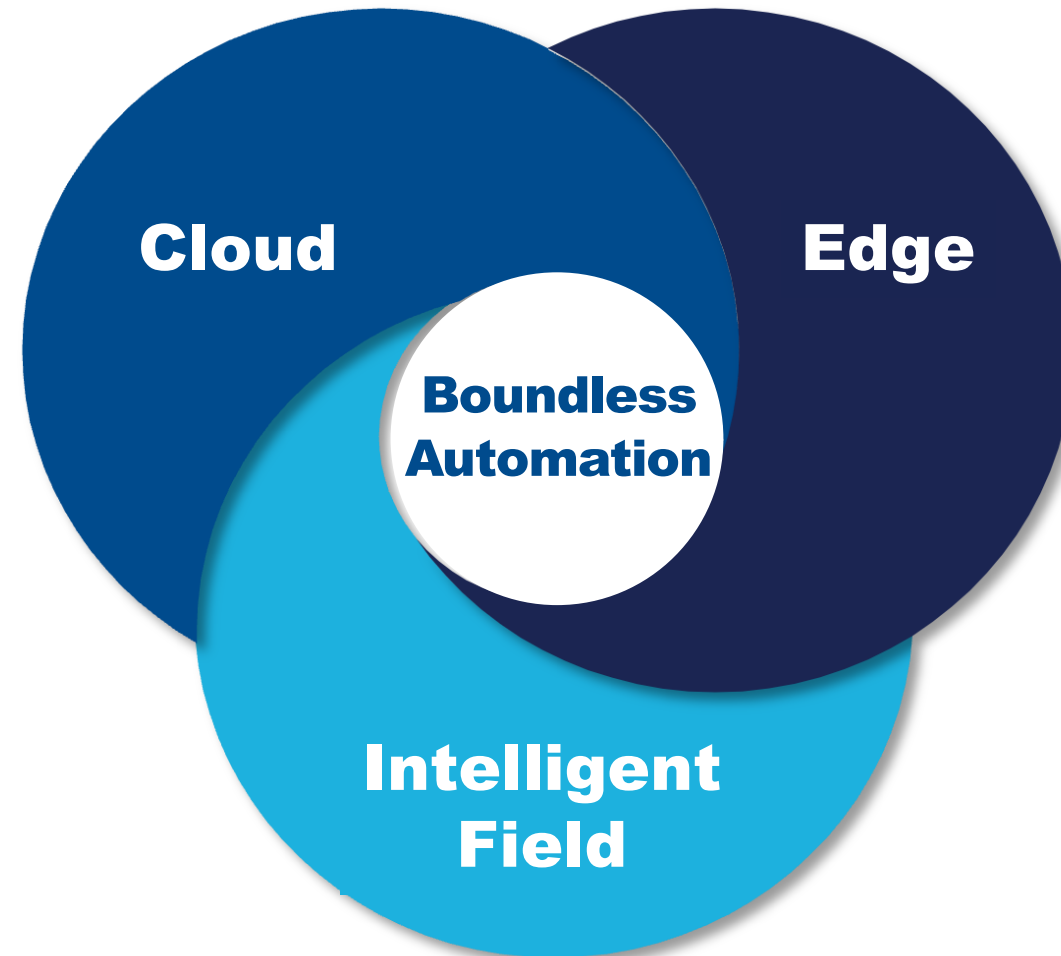
If not transformed,  
siloes plant data  
is siloes cloud data

Each department has  
specific technology stack  
& data models...  
designed for that department

For Digital Transformation,  
preparing data for cross  
functional analytics becomes  
the task...not actually doing  
analytics

# Introducing Boundless Automation™

Powering complex and enterprise operations and engineering



Modern, low-latency computing power, closest to its user

Easier access to more data from more sources, for diverse applications

Three modern computing domains aligned through a Unifying Data Fabric



# Industry Inflection Point: Next Generation Automation Architecture

## The Cloud

The Cloud provides infinite analytic compute power, enterprise collaboration, attractive lifecycle costs, on-demand support and service

## The Edge

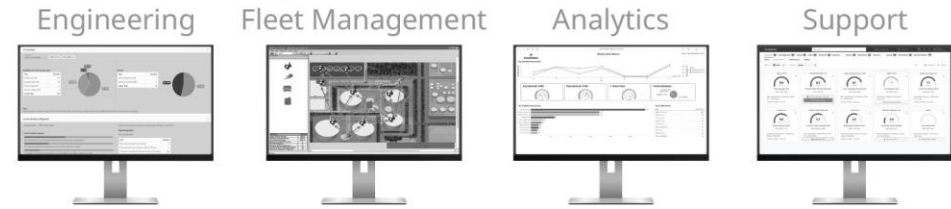
The Edge securely places modern, secure compute power and contextual data closest to its user; Requires IT / OT collaboration & innovation;

## Intelligent Field

Simplified access to more data from more sources and a greater diversity of applications. Streamlined connectivity from anywhere in the world.

## CLOUD

### Enterprise Operations Platform



Operations Anywhere



### Unifying Data Fabric

## EDGE

Production Reliability Safety Sustainability

### Software-defined Automation

Modern Computing Environment



IT/OT Innovation

### Unifying Data Fabric

## INTELLIGENT FIELD



Expanded sources, connectivity & applications

**Cohesive Software Environment:**

Unifying Data Fabric & Zero Trust security enables flexible software deployment across environments

# World Class Performance Comes From Shared Insights, Enabled by a Unifying Data Fabric

## Safety

Zero injuries.  
Zero incidents.



## Reliability

No unplanned downtime  
at minimal cost



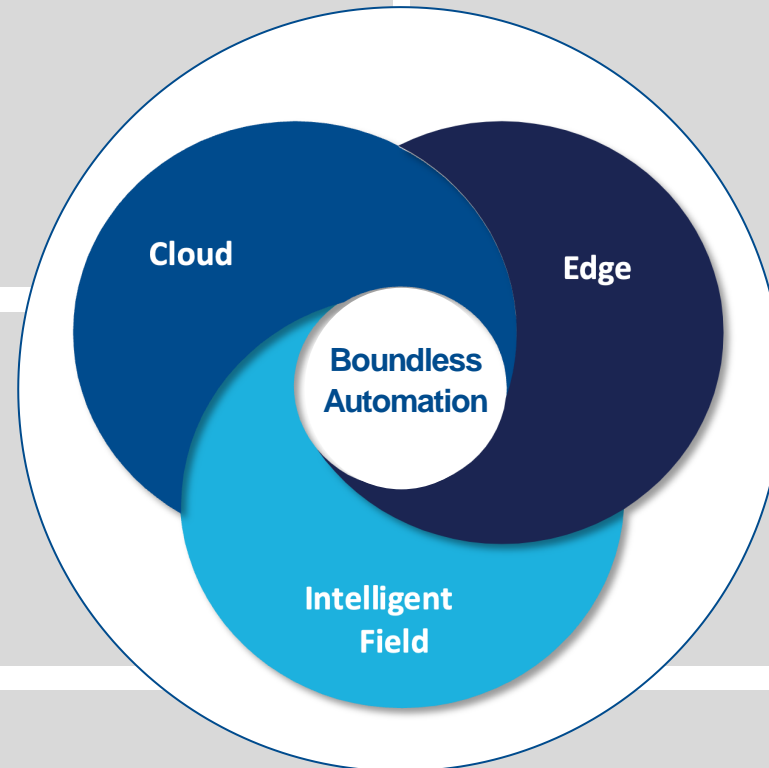
## Production

Production optimized to  
market conditions



## Sustainability

Recognized  
sustainability leader



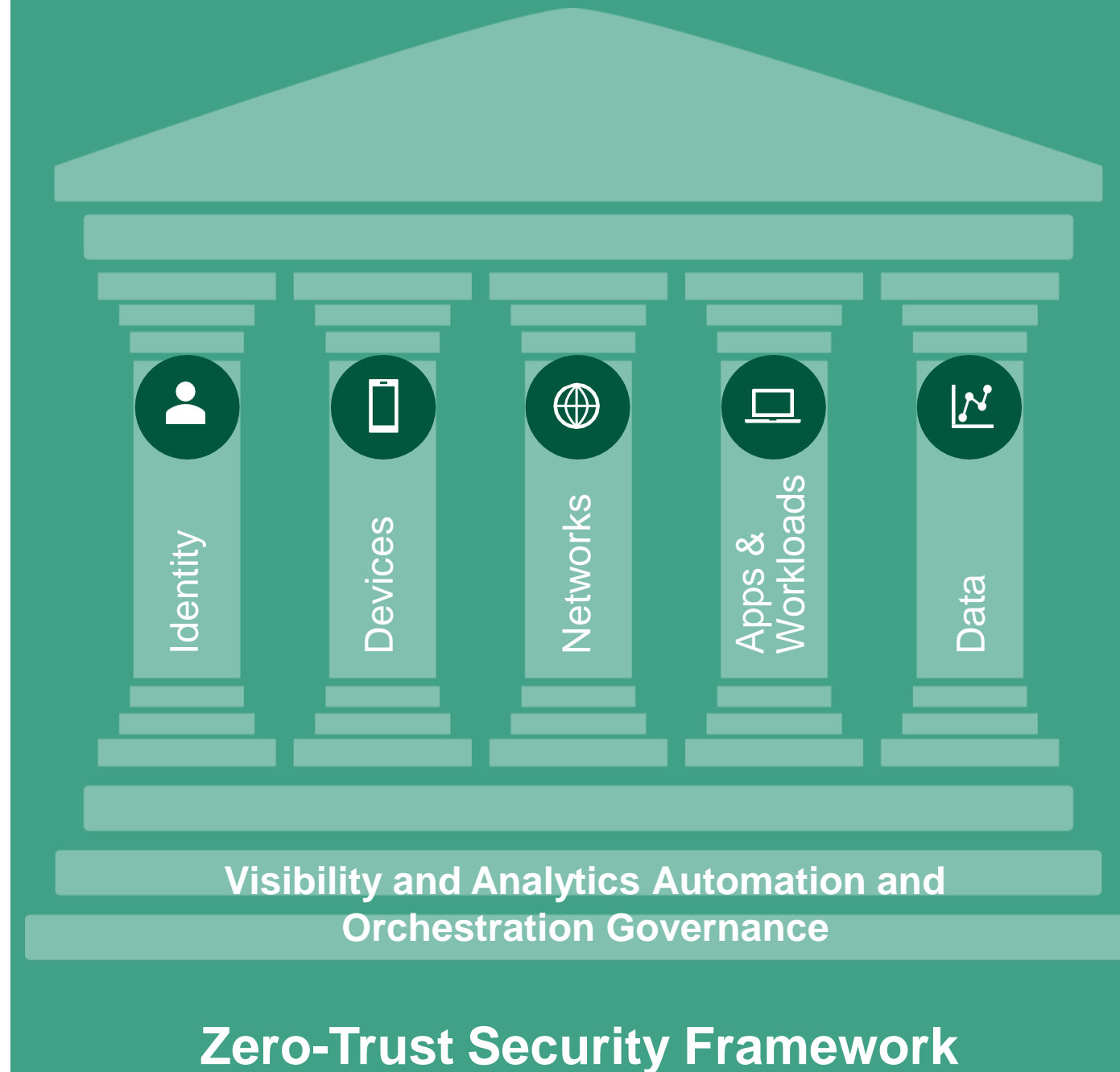
## Workforce

Empowered digital workers drive even more value

Optimizing operations requires insights across multiple domains,  
powered by secure, unified data access

# How a More Flexible Architecture Becomes More Secure: Zero-trust OT Security

- Zero Trust assumes network has been or will be compromised
- No user or asset is to be implicitly trusted
- Identity, context, and data-centric approach
- Minimize uncertainty in enforcing access decisions
- Access control enforcement is granular as possible



# The Boundless Intelligent Field

Easier access to more data from more sources,  
for diverse applications

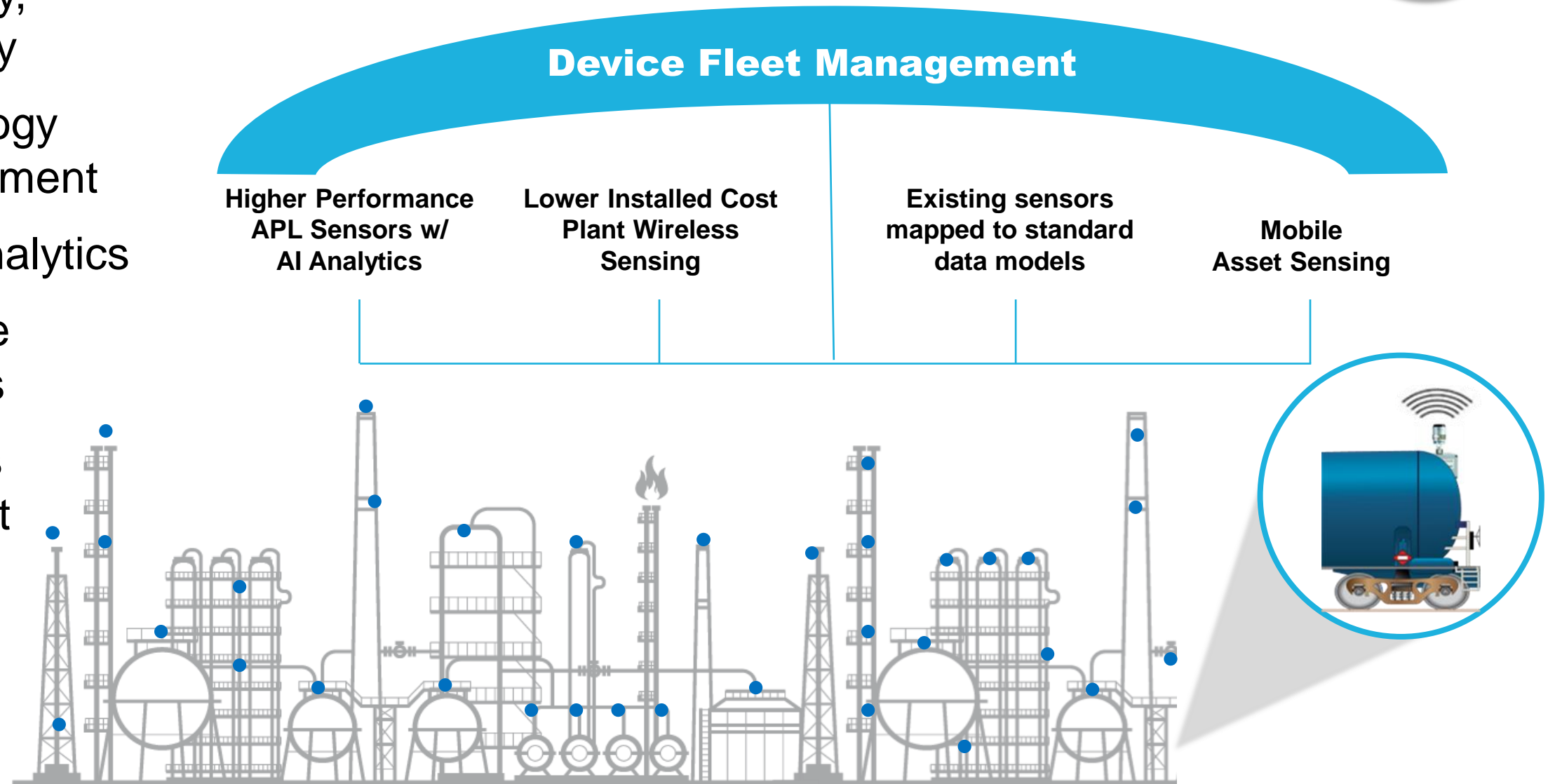
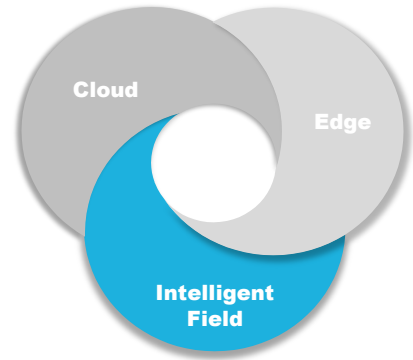


**Moazzam Shamsi**

Director,  
Global Solutions Architect

# What's Different in the Boundless Intelligent Field?

- New sensing for safety, reliability, sustainability
- New wireless technology enables global deployment
- Enhanced onboard analytics
- Seamless coexistence of connectivity options
- Common data models and fleet management



**SEAMLESS  
CONNECTIVITY**

**PROFI<sup>®</sup>  
NET**

**HART**  
COMMUNICATION PROTOCOL

**WirelessHART**

**OPC UA**

**ethernet-apl<sup>™</sup>**  
advanced physical layer

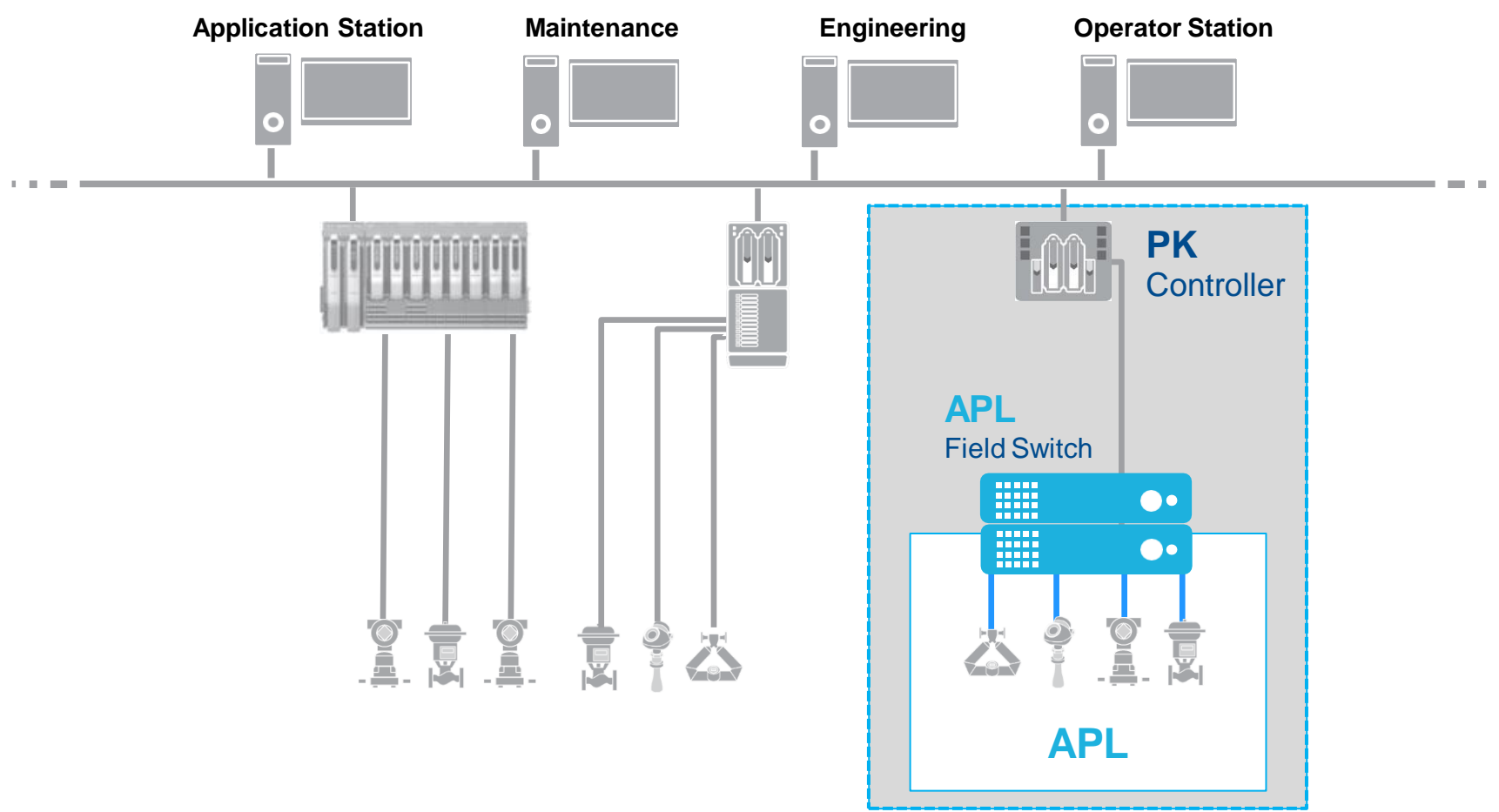
**5G**

New Introduction!

# Native PROFINET and APL on DeltaV PK Controller

## A Flexible Approach for I/O Integration & Communications

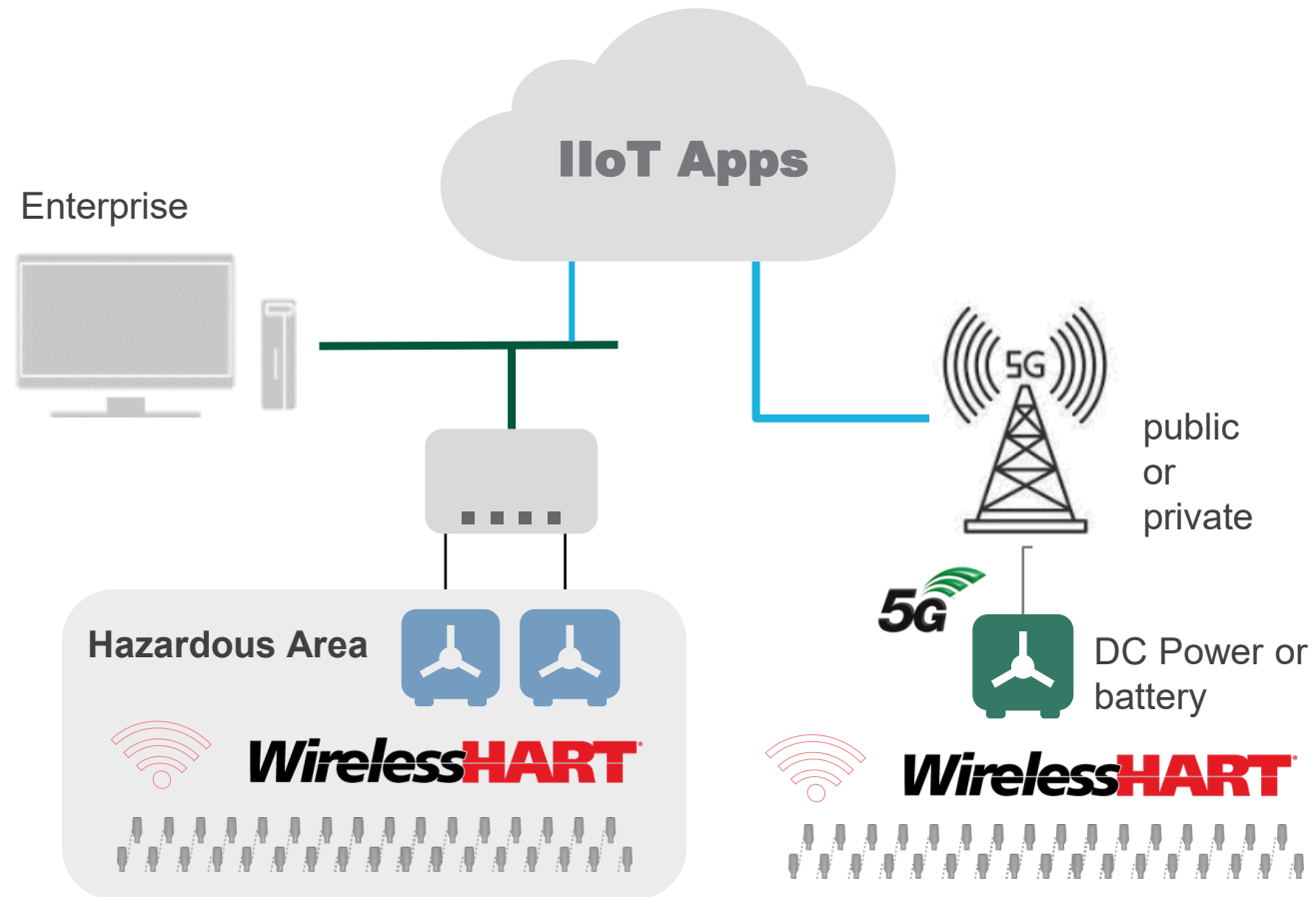
- Supports up to 250 devices
- Simplified installation
- Star, MRP ring, hybrid and APL networks
- Seamless connectivity with AMS (coming soon)
- Support for S2 redundancy (coming soon)
- Mix and match device types in one control strategy



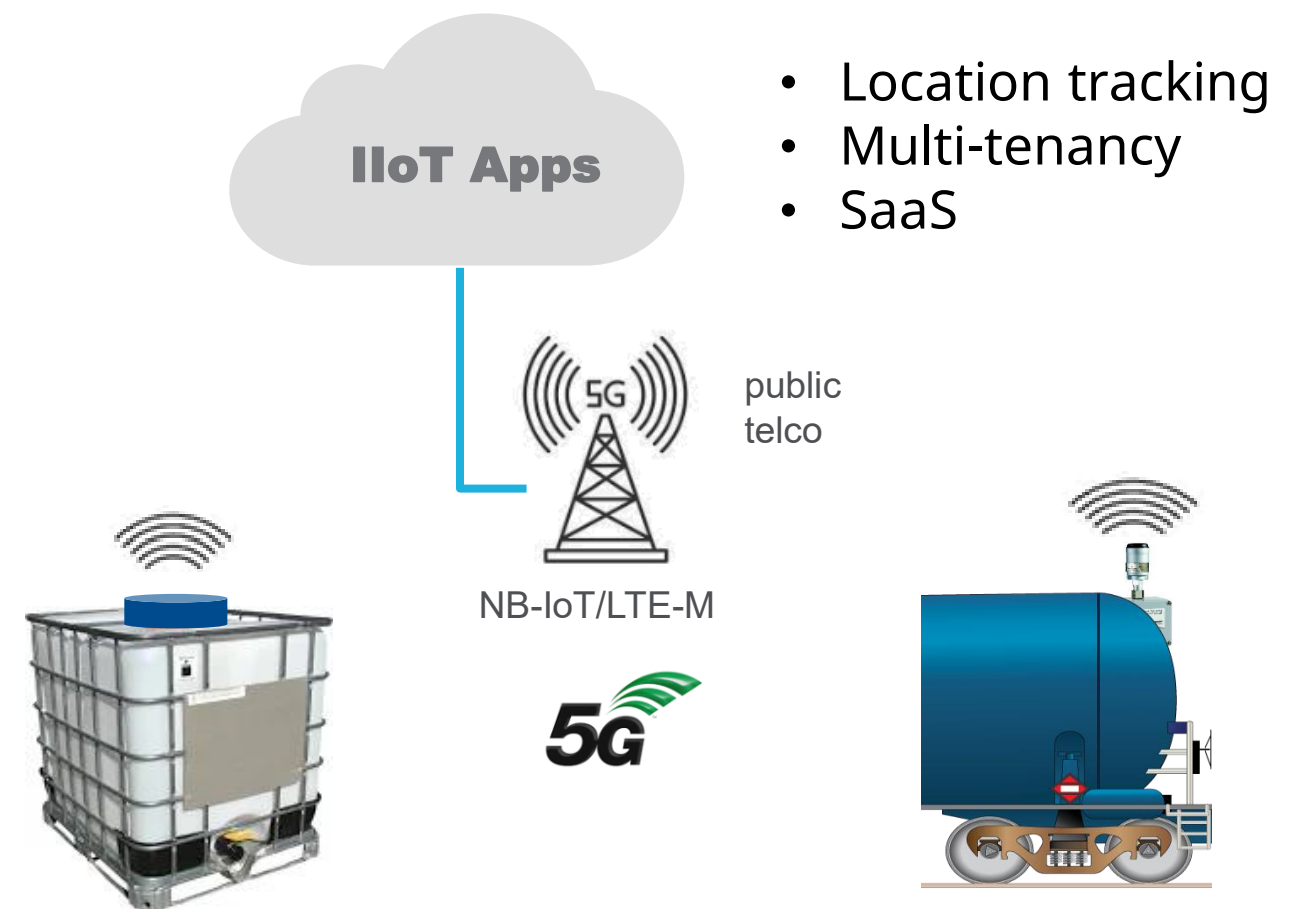
Native integration of PROFINET, Modbus TCP, OPC UA and EtherNet/IP on every DeltaV PK Controller

# Wireless Devices to “Drop-in Data” for Pervasive Monitoring

## Stationary High-Density IIoT



## Mobile Single Asset



## Customer Value

Increased density

Longer range

Reduced cost

Geographically dispersed mobile assets

Communicate anywhere

# Emerson 1410S Wireless Gateway and 781S Smart Antenna

## Expanded Capacity, Easier Data Access, and Enhanced Security

### Hardware Benefits

- Up to **400 WirelessHART** devices per 1410S gateway
- Intrinsically safe outputs to 781S for **Zone 0 installation**
- Enhanced Network Capabilities (future)
  - **Increased device capacity** above 200 devices per antenna
  - Improved 781S design for **longer wireless range options**

### Software Features

- Easy data access with **OPC-UA, Modbus, Ethernet/IP**, and more
- **Dual WirelessHART** antenna support
  - Provides **65% increase** in wireless area coverage

### Security

- Further **enhanced security architecture** using advanced verification mechanisms
- **Firmware updates** to stay up to date on cybersecurity

## Simplifying Wireless Network Expansion and Integration

New Introduction!



**1410S1**  
DIN-Rail Mounted



**1410S2**  
Modular Housing



**781S**  
Rugged Smart  
Antenna

**The Boundless Intelligent Field:** Easier access to more data from more sources, for diverse applications



# Fisher™ FIELDVUE™ DVC7K Digital Valve Controller

## First DVC With Embedded Edge Analytics

Analyze data in real time, at the device or anywhere

- Streamlined, flexible connectivity
- Accessibility from mobile devices or host systems
- Simplified onboard interface
- Proactive push alerts with corrective actions
- Flexible connectivity including *Bluetooth*® wireless technology

New  
Introduction!

Real-time analysis enables  
**Advice at the Device™**



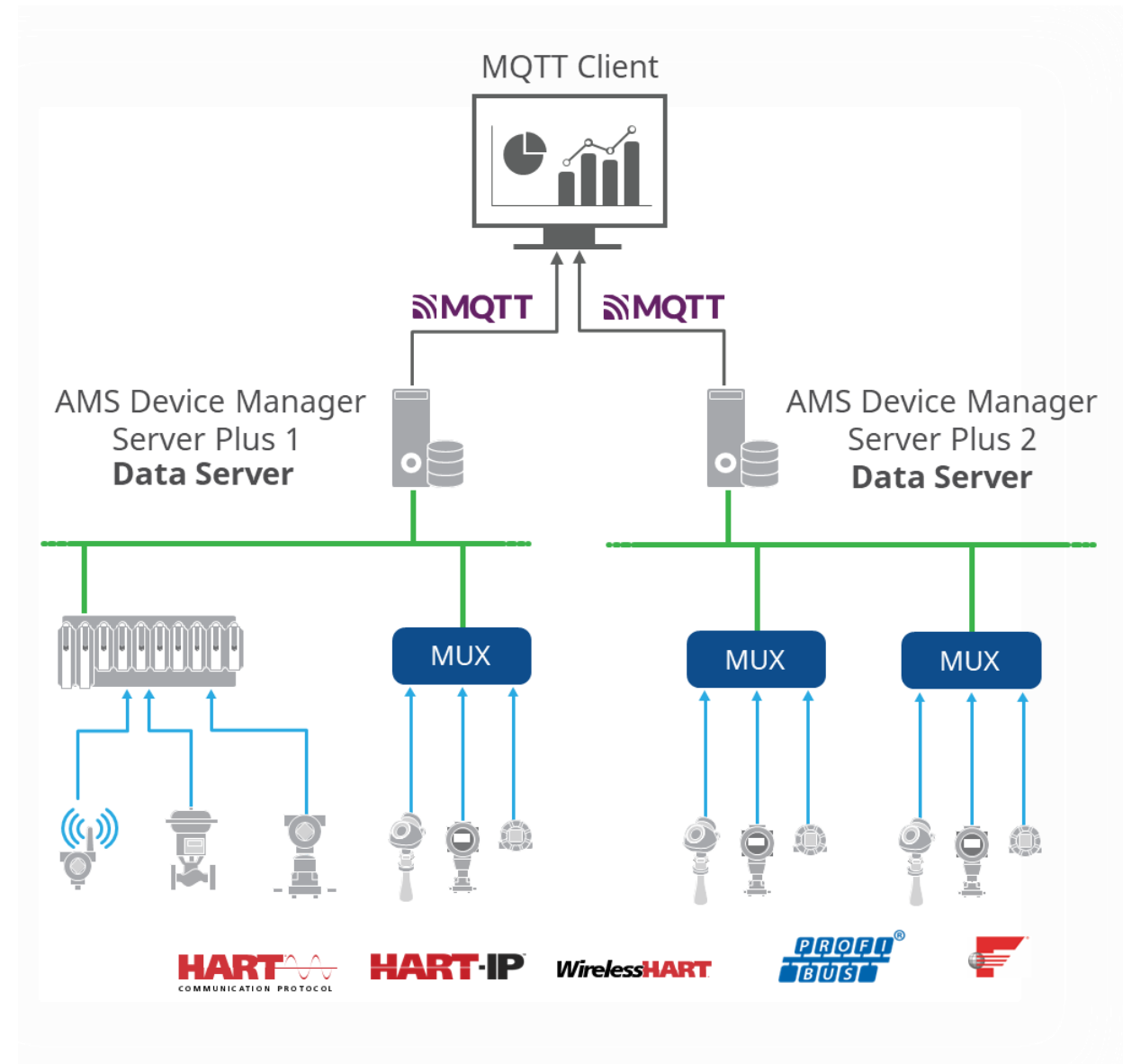
Fisher™ FIELDVUE™ DVC7K  
Digital Valve Controller

# AMS Device Manager Data Server

## Digital enablement tool for intelligent field devices

- Replicate AMS data outside the process control network
- Integration with other data sources for advanced analytics and machine learning
- Continuous, automated collection of field device information
- Centralized management program with a secure infrastructure
- Instrument diagnostics enabled early detection of underperforming equipment

Connect data from intelligent field to any application, simplifying maintenance, reducing complexity and democratizing data



# The Boundless Edge

Modern, low-latency computing power,  
closest to its user

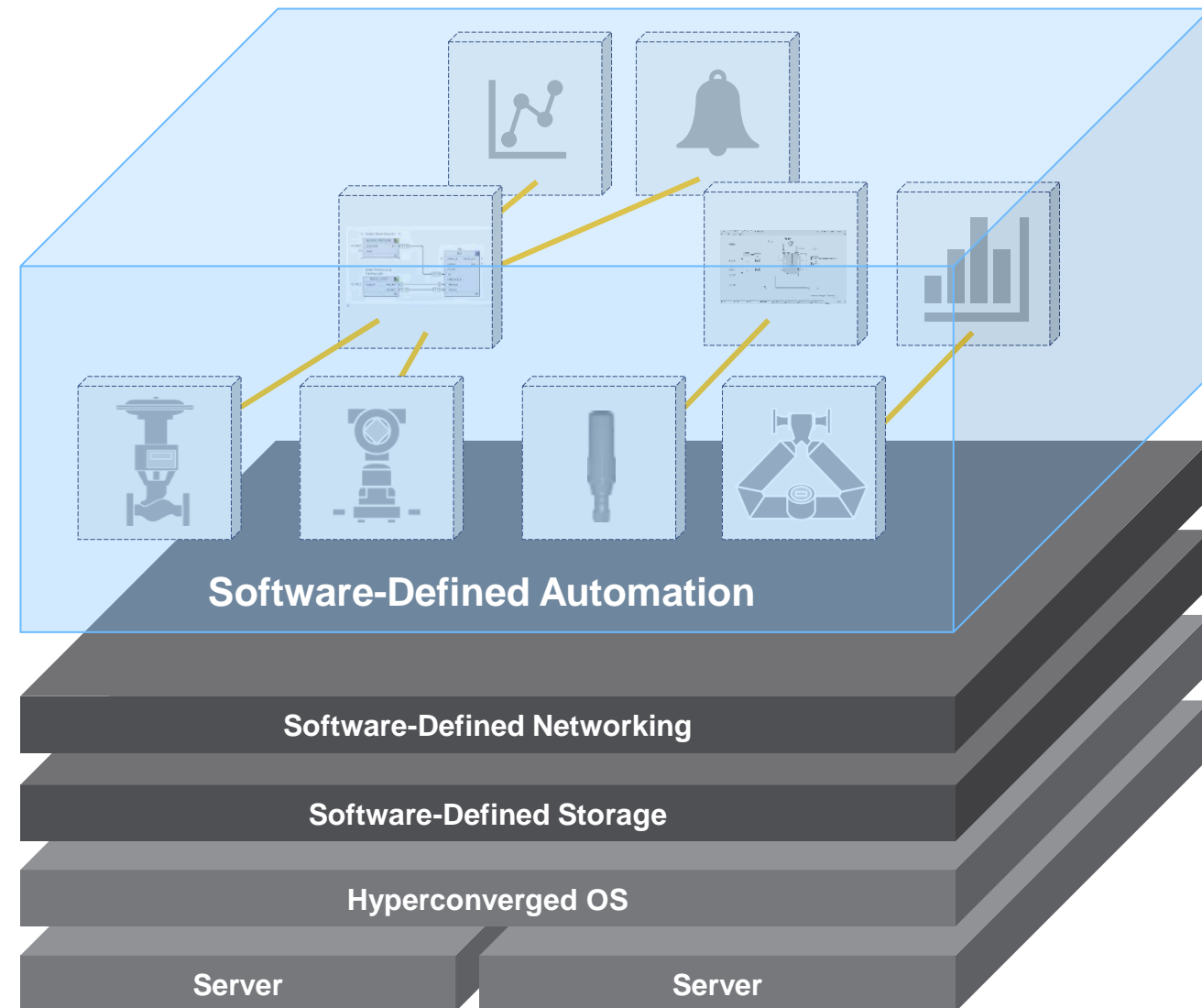


**Rolf Hemminga**

Vice President,  
Industry Sales  
Systems & Software

# What's Different in the Boundless Edge?

- Automation & control as unified software suite on modern compute platform
- Secure access via IT protocols to entire automation data – in context
- Unifying data fabric with other OT applications eliminates integration effort
- Containerization of software enables scalability and portability
- Fault tolerance & redundancy
- Zero trust security model
- Centralized deployment and administration



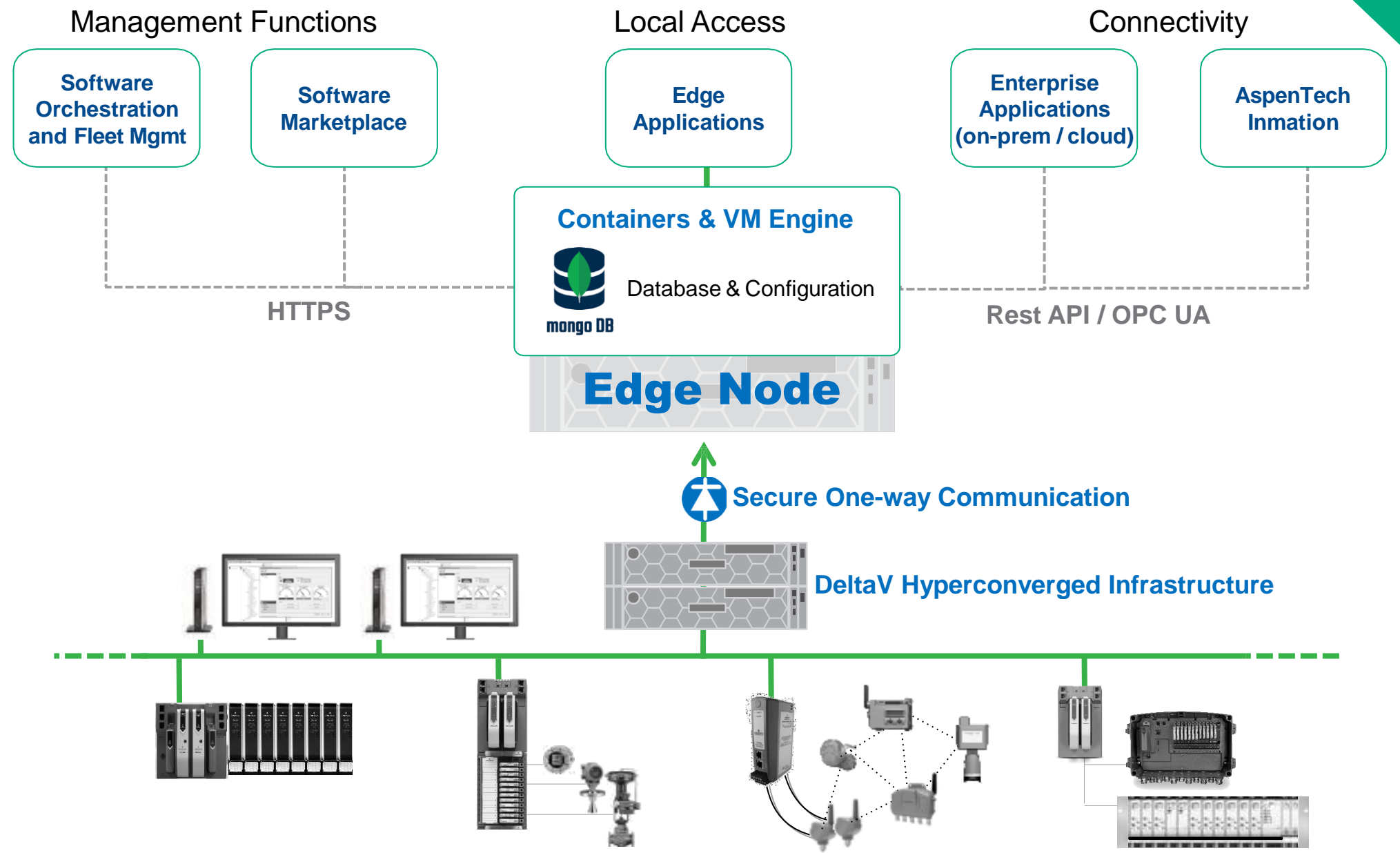
*Combines OT and IT Innovation*

New Introduction!

# DeltaV Edge Environment

## Enhanced OT connectivity and runtime capabilities

- DeltaV DCS runtime and configuration data
- Up to 300K parameters
- Aligns IT and OT technologies and policies
- Remote centralized fleet management



**The Boundless Edge:** Modern, low-latency computing power, closest to its user

# Ovation Grid Edge

Innovative distributed grid solutions are critical to achieving decarbonization goals

## Customer Challenges

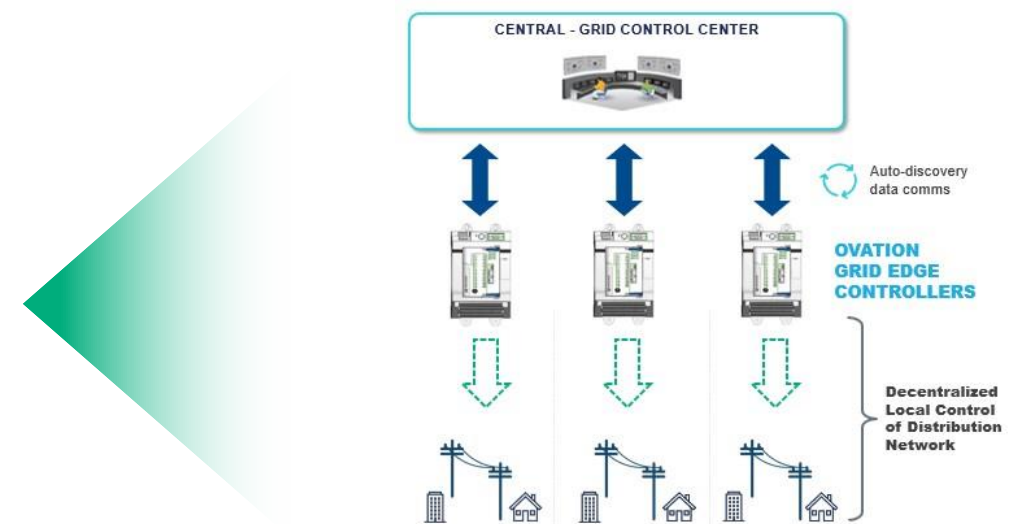
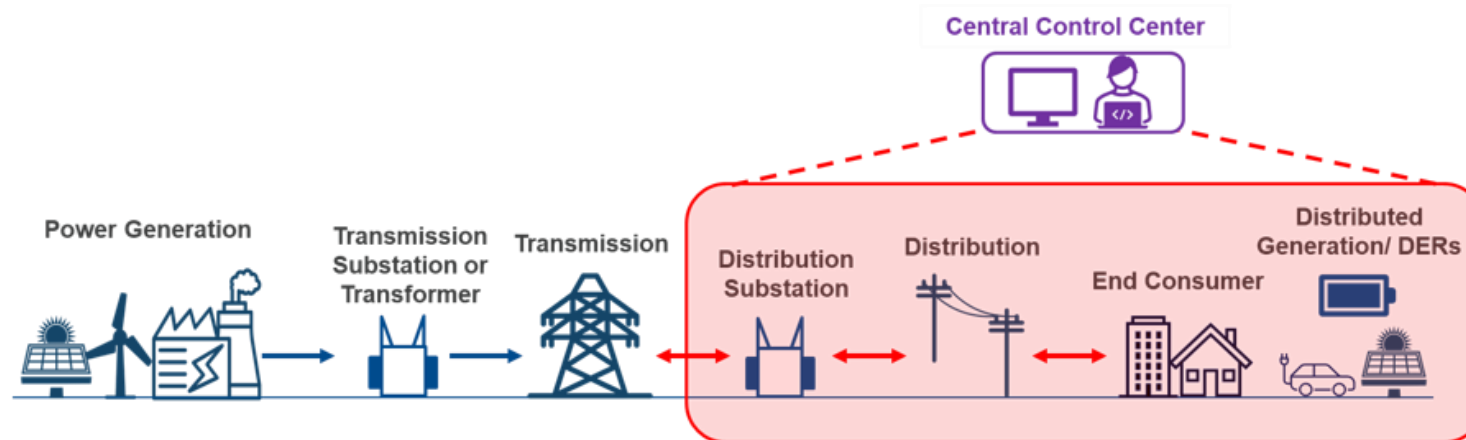
- Increasing demand and loads
- User generation flow
- New bidirectional communication
- More types of connected devices

## Emerson's Solution

- Real-time, high-resolution grid data
- Combines field device, control system and grid management
- Manages bidirectional flow

## Customer Value

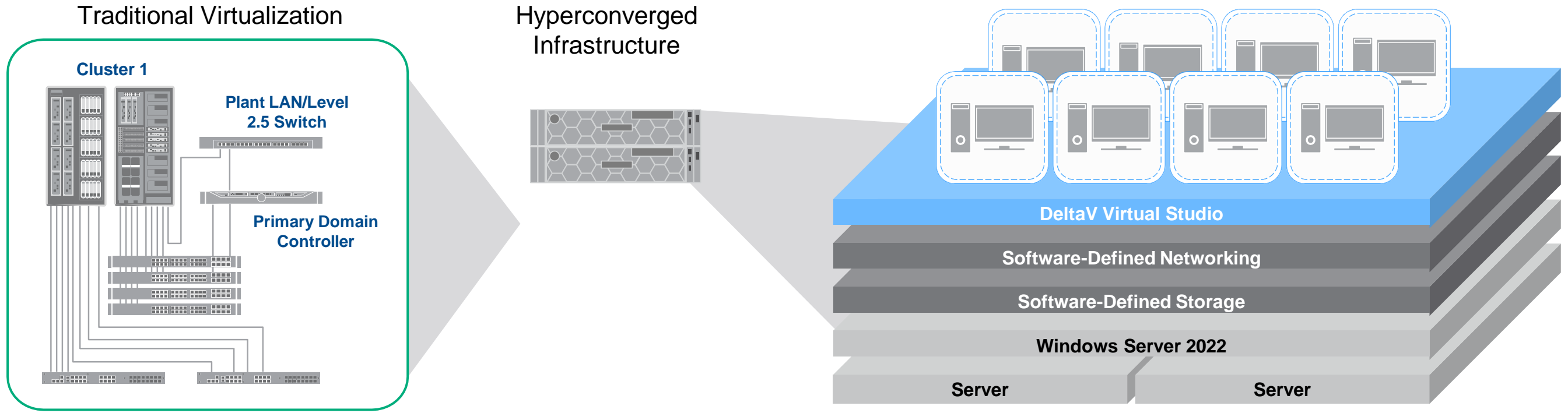
- Provides clear operational visibility
- Empowers teams to optimize operations across the grid
- Improves load and demand management



**The Boundless Edge:** Modern, low-latency computing power, closest to its user

# Hyperconverged Infrastructure (HCI)-Based Virtualization

Easy, scalable virtualization with improved performance



- 50% reduction in deployment time
- Easy to expand, upgrade and maintain
- 20%+ performance improvement
- Reduced energy use and footprint

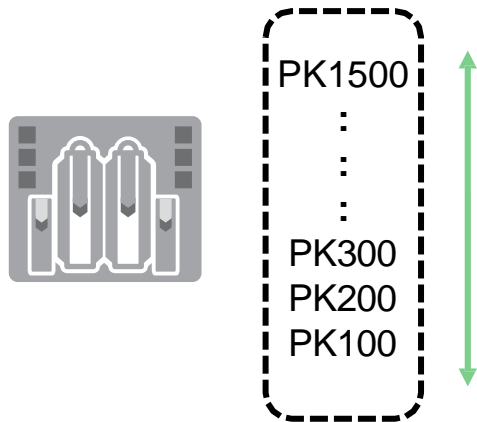
# Software Defined Control

Evolving towards a software-defined system with reduced footprint and easier upgrades

## DeltaV DCS

PK Flex

- Software-scalable PK
- Flexible subscription-based licensing
- Decouples HW and SW



Released September 2023

## DeltaV DCS

- Software defined controller
- Control for process and hybrid industries

Coming Soon

## Ovation DCS

- Software defined controller
- Control for power and water industries

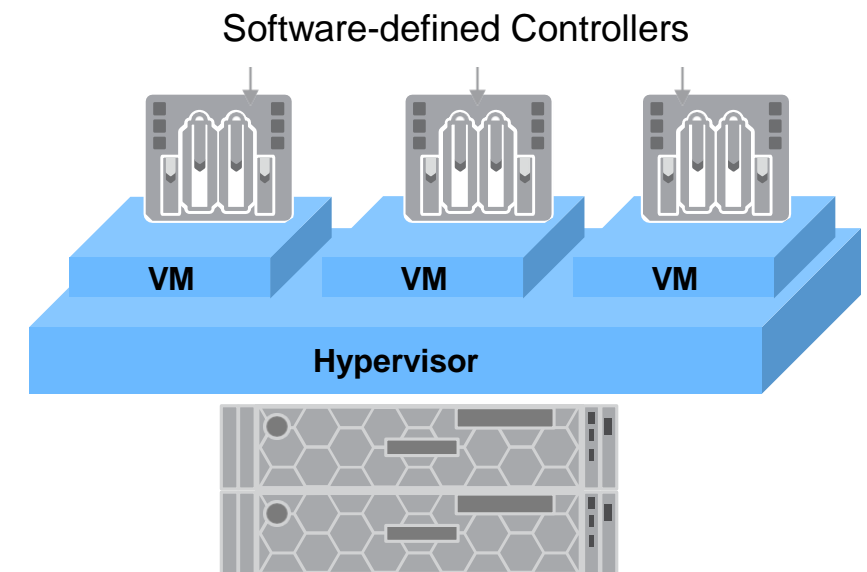
Coming Soon

Deployed on HCI hardware

High-availability

Subscription-based licensing

Hardware independent



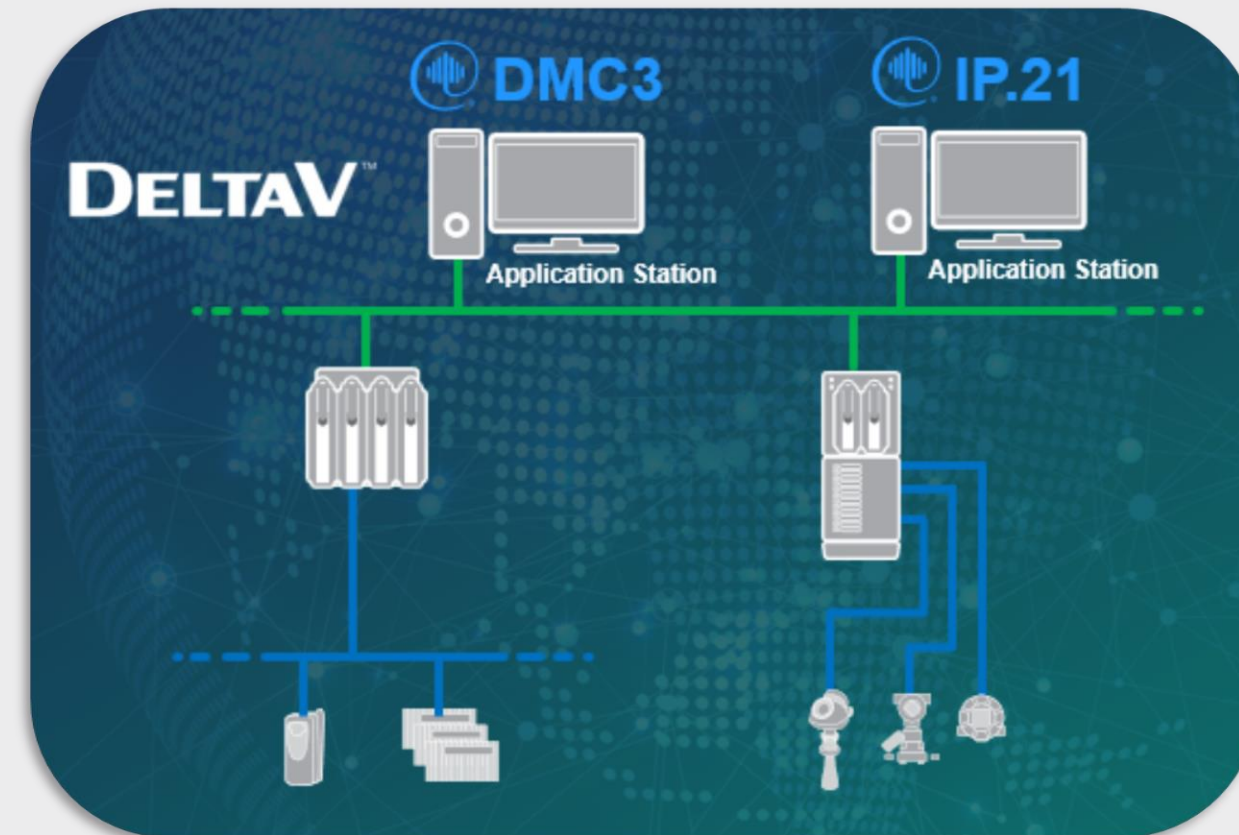


# Integration with AspenTech Solutions

## Optimizing production and driving operational excellence

- Integration of AspenTech's Historian, advanced control and analytics platforms on DeltaV
- Fast and easy deployment
- Scalability with expanded data sources and interfaces with IP.21 historian technology

Coming Soon



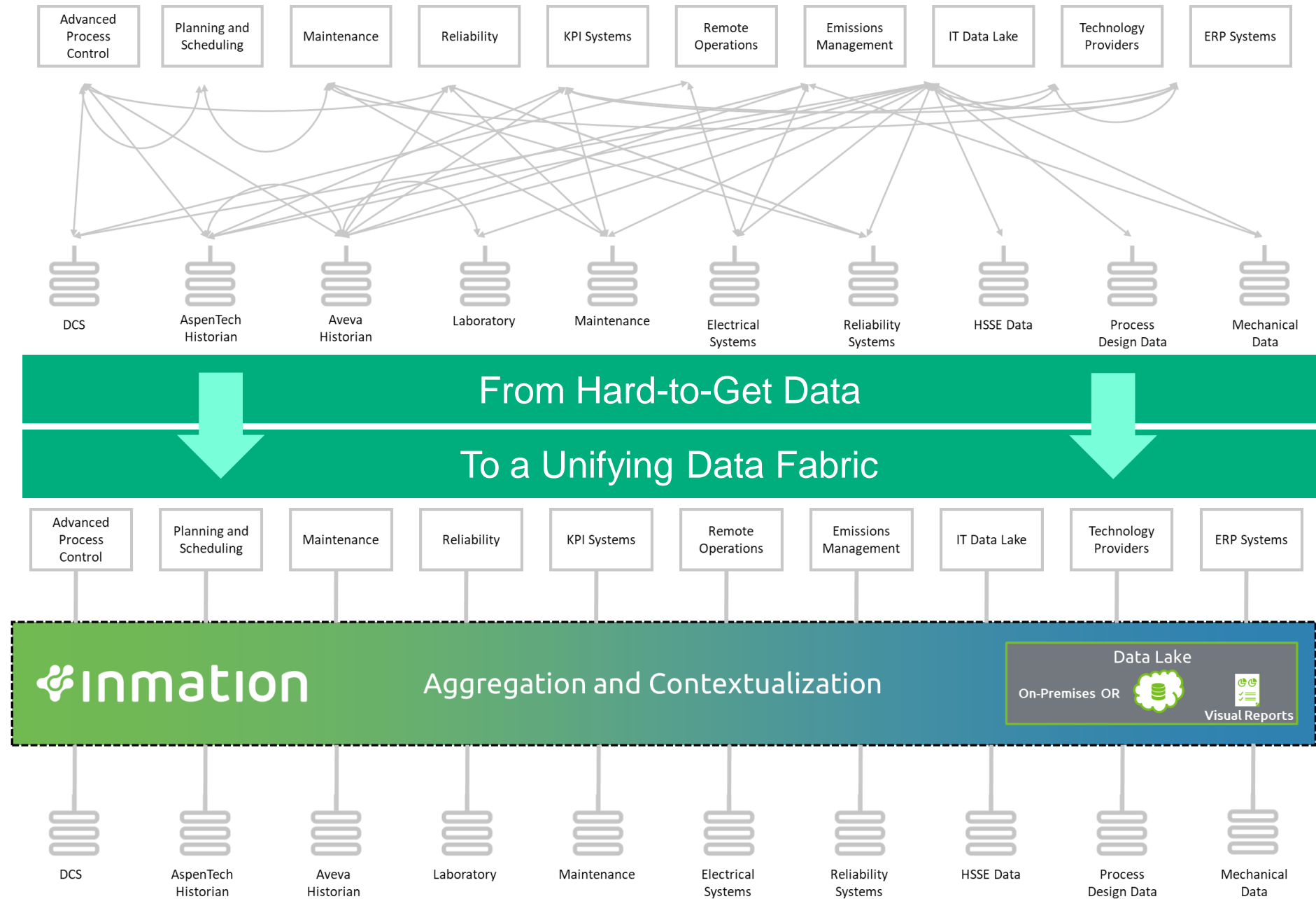
Driving synergies between Emerson and AspenTech portfolios to improve operations

**The Boundless Edge:** Modern, low-latency computing power, closest to its user

# AspenTech Inmation Addresses Key Industrial Data Challenges

- Decreases integration efforts
- Accelerate your green field projects
- Finds new Value for brownfield installations
- Increase overall capabilities for data access, integrity, and analytics
- Contextualizes data across the enterprise

## Aspentech DataWorks with Inmation



**The Boundless Edge:** Modern, low-latency computing power, closest to its user

# The Boundless Cloud

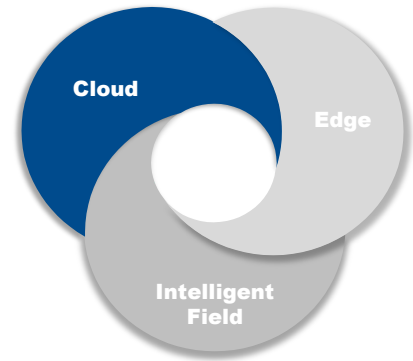
Powering complex and enterprise operations and engineering



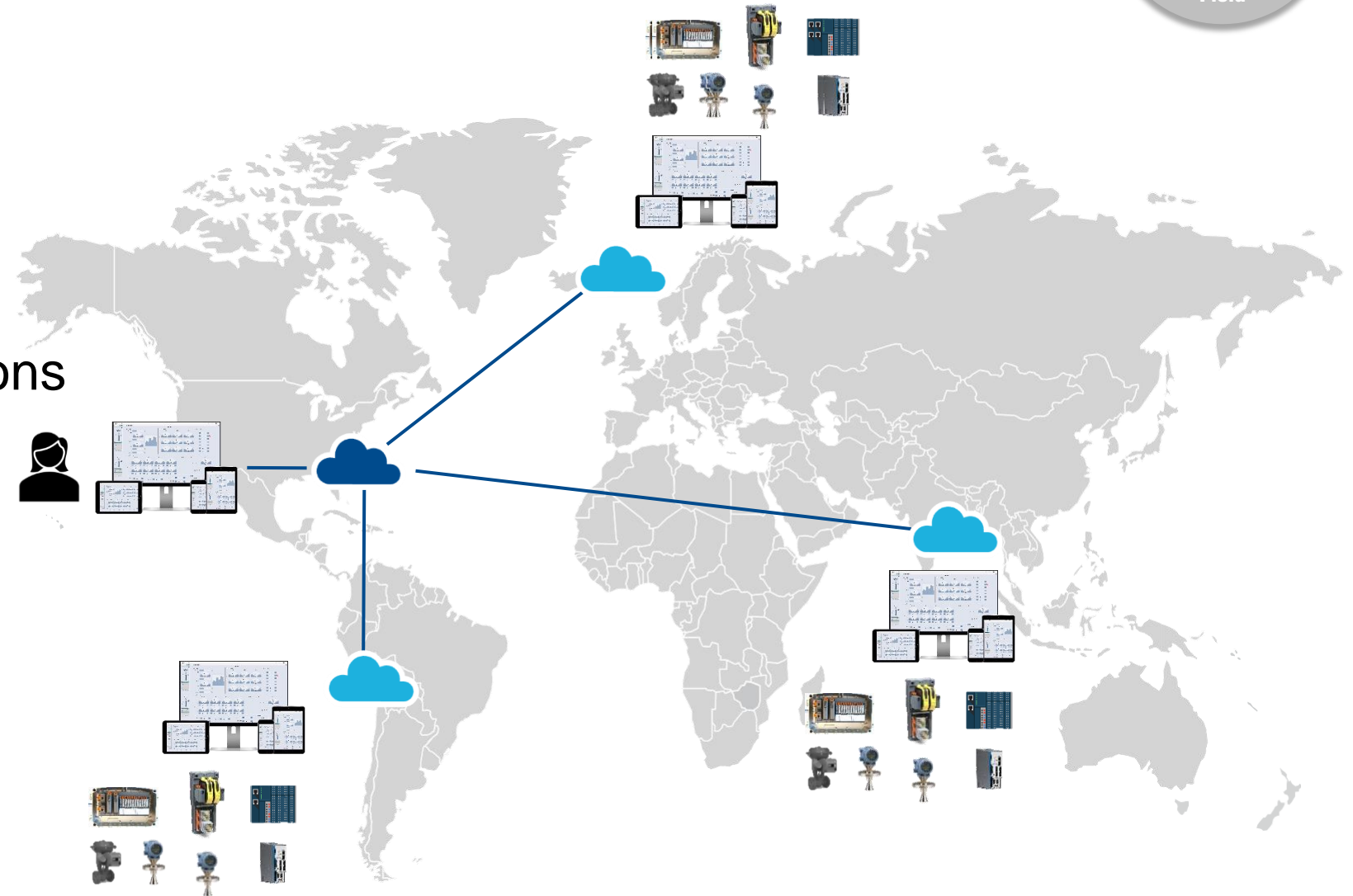
**Aarti Dange**

Customer Experience  
Leader

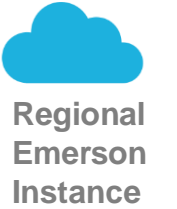
# What's Possible In the Boundless Cloud?



- Fundamental cloud benefits
  - Universal access
  - Elastic scalability
  - Outsourced infrastructure
  - “Unlimited” compute capacity
- Flexible deployment of automation functions
- Operational redundancy
- Universally accessible engineering environment
- Collaboration with external partners
- On demand, tailored support



# Enterprise Level Coverage, Capability, & Access



## Unifying data model enables easy enterprise application development

- Consolidated reporting and dashboarding
- Compare and contrast performance of many plants

## Integrate OT data with enterprise functions

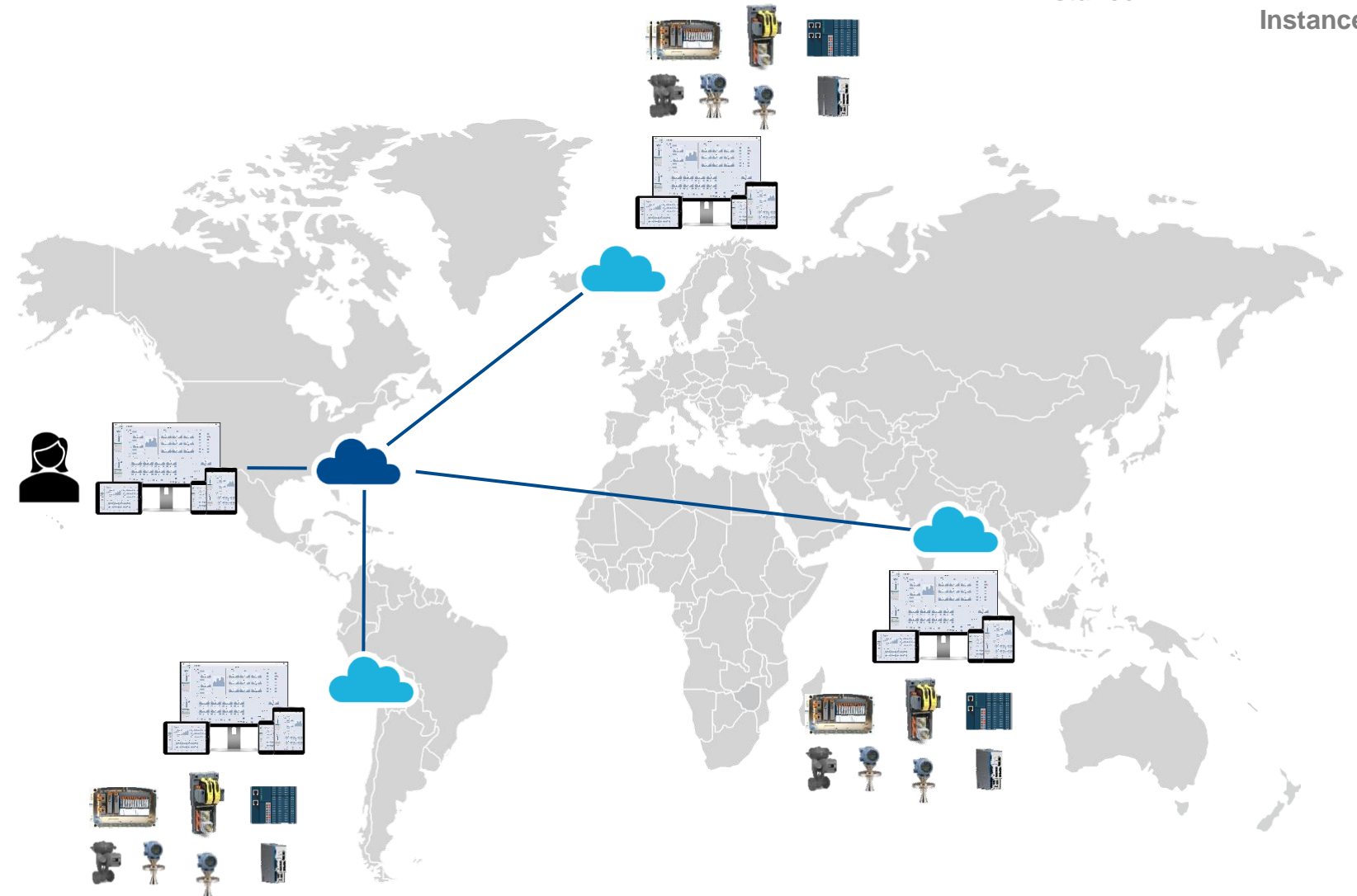
- Business level optimization

## Expertise leveraged across the enterprise

- Both in-house and external partners

## Operational redundancy

- Secure visualization anywhere



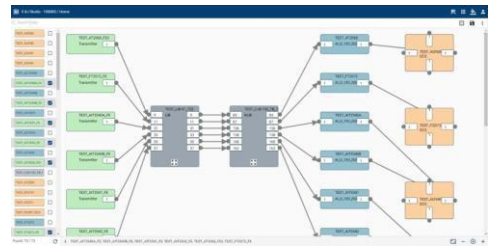
# Integrated Engineering Environment (IEE)

Leveraging cloud for improved project engineering

- Increased quality
- Easier acceptance of late changes
- Improved project speed and Efficiency
- Seamless collaboration
- Data sharing between Disciplines
- Secure by design

## E&I Studio

Browser-based I/O configuration



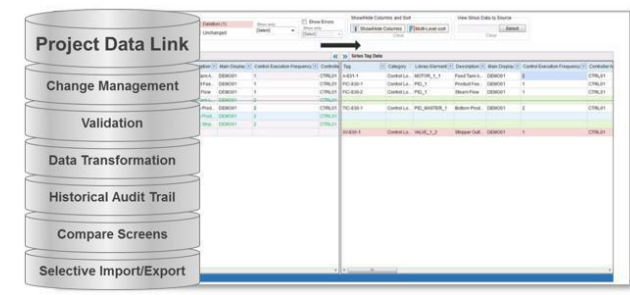
## Sequence Studio

Automated sequence data and configuration management



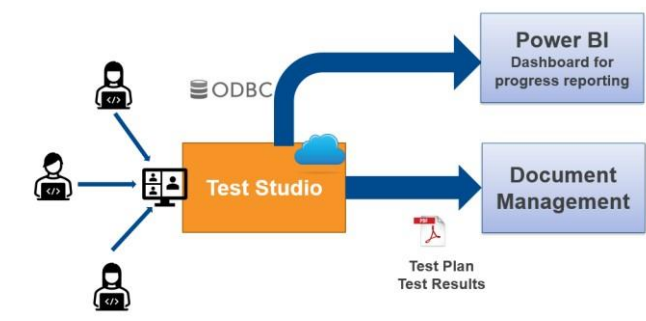
## Project Data Link

Common single instance of project data and configuration generation



## Test Studio

Enables remote FATs and digitized test management



# Guardian

Software and subscription lifecycle management and support

- Single sign-on (SSO)
- Software downloads
- Subscription management
- Personalized and enterprise dashboards
- AI-powered search and recommendations



Product Support

Subscription Management

Lifecycle Software and Services

The Boundless Cloud: Powering complex and enterprise operations and engineering

# Cloud Powered AI Will Unleash Augmented Tools and Workflows

Enhance productivity and improve situational awareness



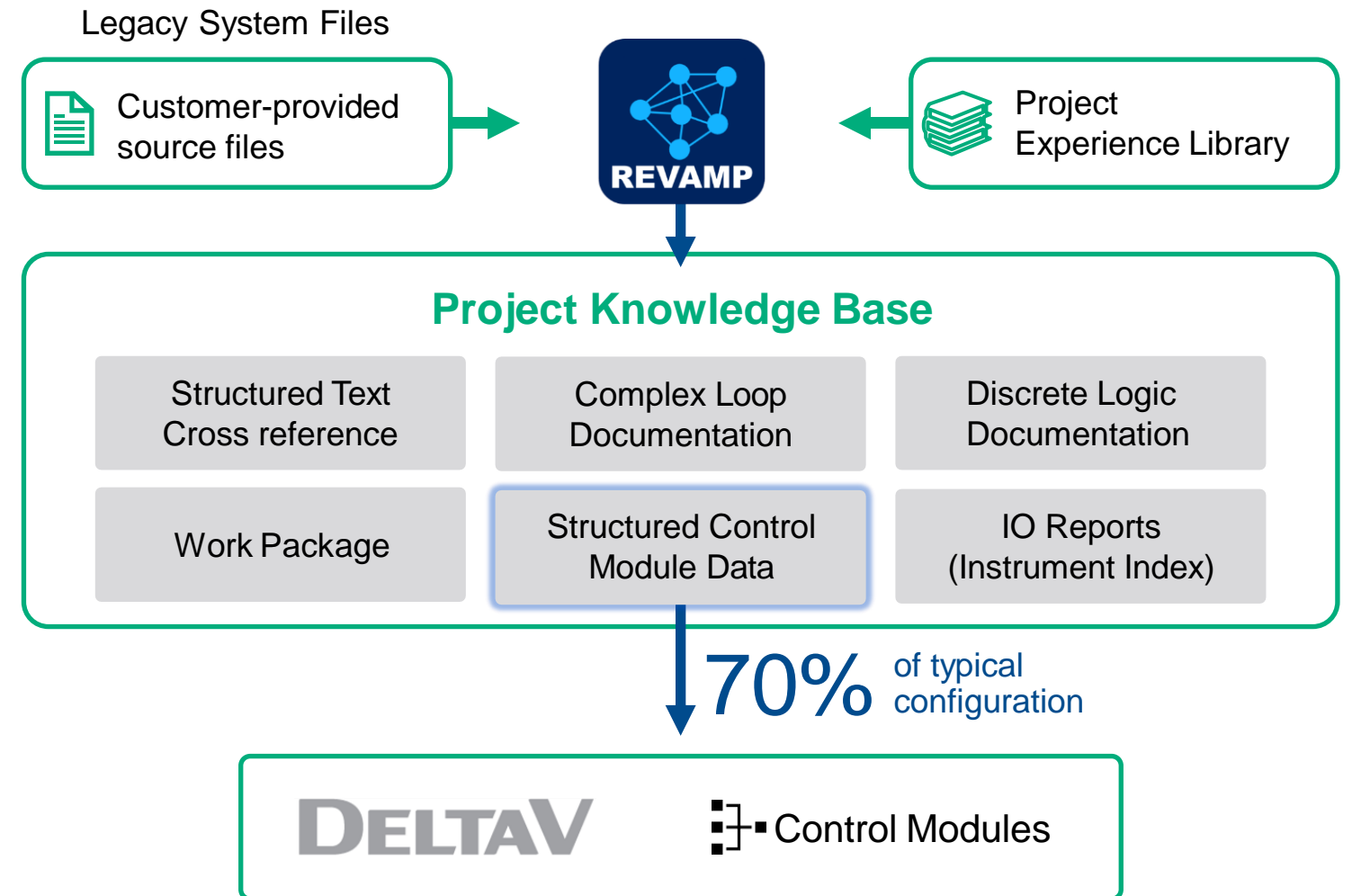
The Boundless Cloud: Powering complex and enterprise operations and engineering



# DeltaV Revamp

Cloud-based modernization of legacy DCS, PLC, and safety systems to DeltaV

- Generative AI copilot for project teams
- Near-instant analysis of project scope
- Automated migration of base layer of control
- Machine learning generated rules and recommendations
- Reduced risk and capital costs
- Improved schedule and efficiency



Fully integrated digital workflow leveraging the power of artificial intelligence

The Boundless Cloud: Powering complex and enterprise operations and engineering

# Market Needs Have Created an Inflection Point and Demand for a New Automation Paradigm

## Market Needs



Digital Transformation



IT / OT Convergence



Data Democratization



Remote & Autonomous Operations



Asset Optimization



Sustainability

## Modern Technologies



Cloud



Edge



AI / ML



Computer Vision



Wireless / Cellular



Virtual Reality

## New Automation Paradigm

Software-Defined  
Extensible  
Enterprise-Wide

Data Centric  
IT Friendly  
Visualization Anywhere

Secure by Design  
Simplified Network  
Flexible Subscriptions

# Industry Inflection Point: Next Generation Automation Architecture

## The Cloud

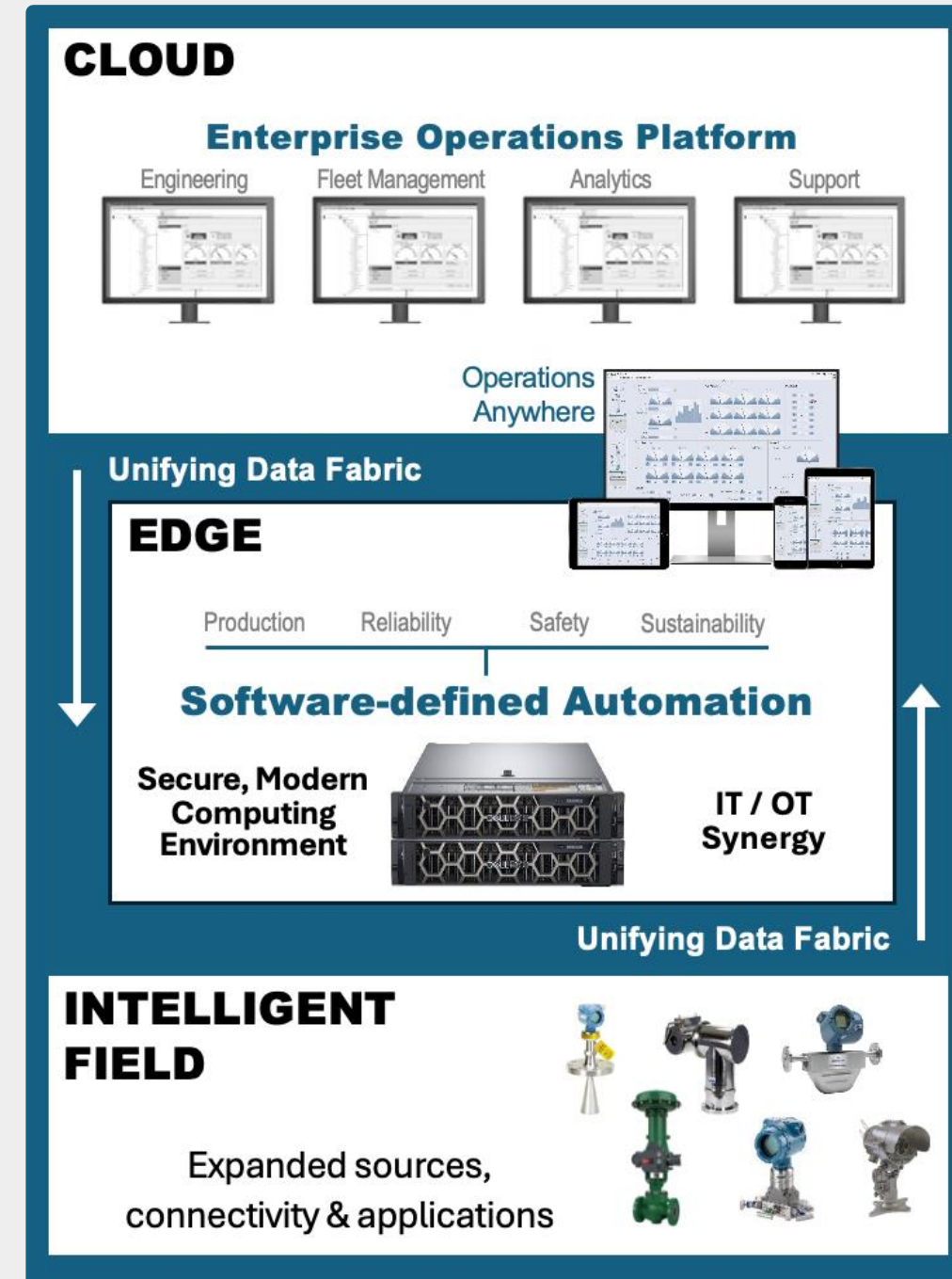
The Cloud provides infinite analytic compute power, enterprise collaboration, attractive lifecycle costs, on-demand support and service

## The Edge

The Edge securely places modern, secure compute power and contextual data closest to its user; Requires IT / OT collaboration & innovation;

## Intelligent Field

Simplified access to more data from more sources and a greater diversity of applications. Streamlined connectivity from anywhere in the world.



**Cohesive Software Environment:**

Unifying Data Fabric & Zero Trust security enables flexible software deployment across environments

# Emerson Is Introducing Many New Innovations to Deliver Boundless Automation

## Intelligent Field

## Edge

## Cloud

Profinet and APL

DeltaV IO.Connect

DeltaV HCI

DeltaV PK Flex SW Defined Control

Integrated Eng. Environment

Guardian

AMS Device Manager Data Server

Wireless Connectivity

DeltaV Edge Environment

Ovation Grid Edge

DeltaV Revamp

Native AI Tools & Workflows

## Simplifying Data Access

## Democratizing Data

## Powering Enterprise Operations

Boundless Automation liberates data to unleash the power of software

# Emerson's Expertise Accelerates Customer's Journey to Boundless Automation

## Value Roadmaps

Application and operations experts help customers prioritize areas to focus on for greatest value



## Training & Education

Industry's deepest and most accessible global training platforms available in person, virtually and on-demand



## Modern Technology Ecosystem

Industry's most comprehensive automation portfolio  
Partnerships for easier integration & simplified deployments



## Engineering Support

Thousands of Emerson digital automation experts around the world, ready to help



# Next Generation Industrial Automation Architecture

## Today

Siloed system architectures

---

Data islands

---

Cybersecurity defense in depth

---

Hardware-centric perception

---

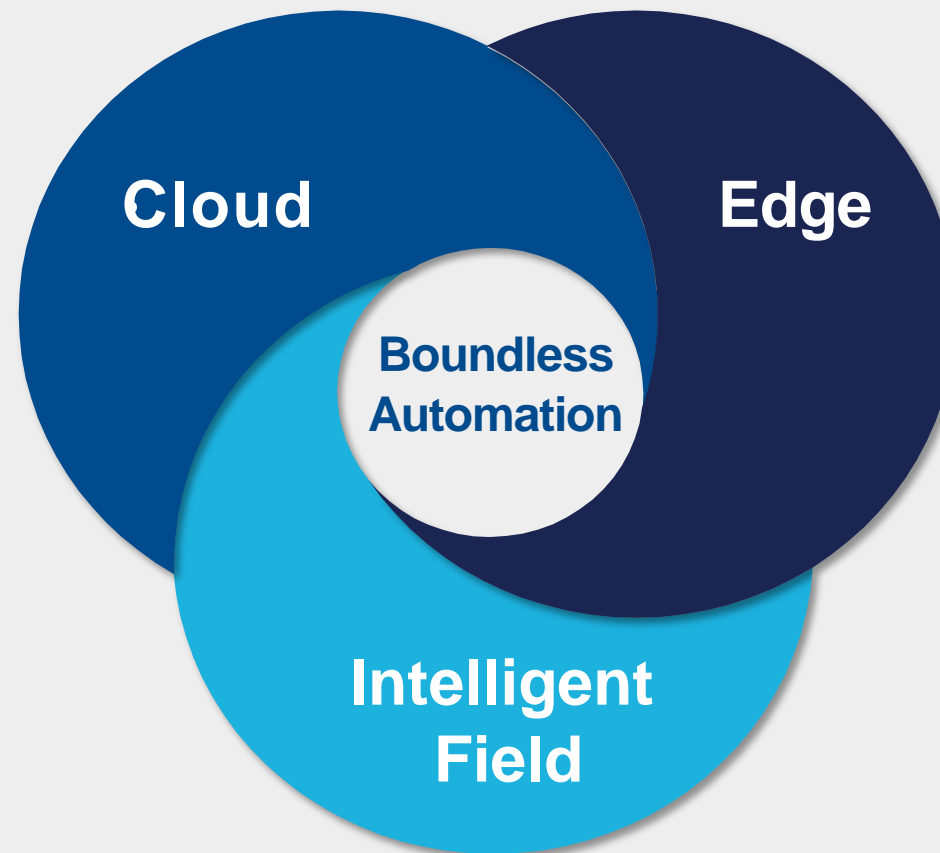
Device administration

---

Single-site operations

---

Mostly CAPEX



## Future

Cohesive software platform

---

Unifying data fabric

---

Inherently secure by design

---

Software-defined

---

Fleet management

---

Cloud-enabled enterprise operations

---

Mostly OPEX



**Thank You!**  
**Q&A**

