Edge Central Value Add

The key features to get your EdgeX Foundry-based solutions to market quicker and with less business risk

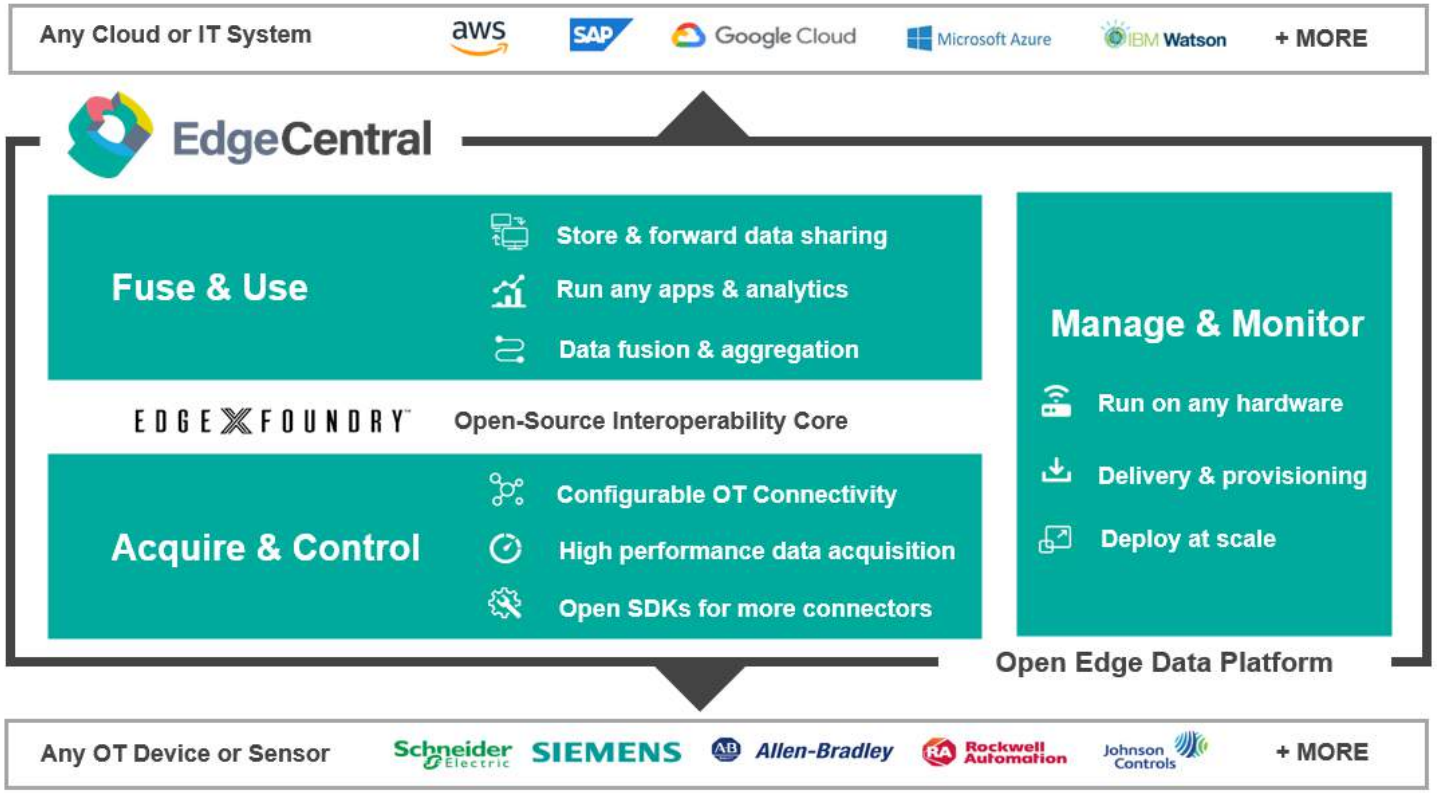
IOTech Edge Central

Industrial Grade Commercial Implementation of EdgeX Foundry

IOTech Edge Central

The full Edge Central product stack including EdgeX Core Services are delivered and supported by IOTech

- **Commercially-supported industrial-grade edge platform based on open-source EdgeX**
- **Many value-add features including**
  - Southbound Device Integration
  - Advanced Rules Engines
  - Time-Series Storage & Dashboards
  - Intelligent Alarm and Historian services
  - Northbound Cloud Connectivity
  - Intuitive, Dedicated User Interface
  - Edge Management and Orchestration
- **Fully EdgeX API compatible**
  - All services created for EdgeX will work with Edge Central



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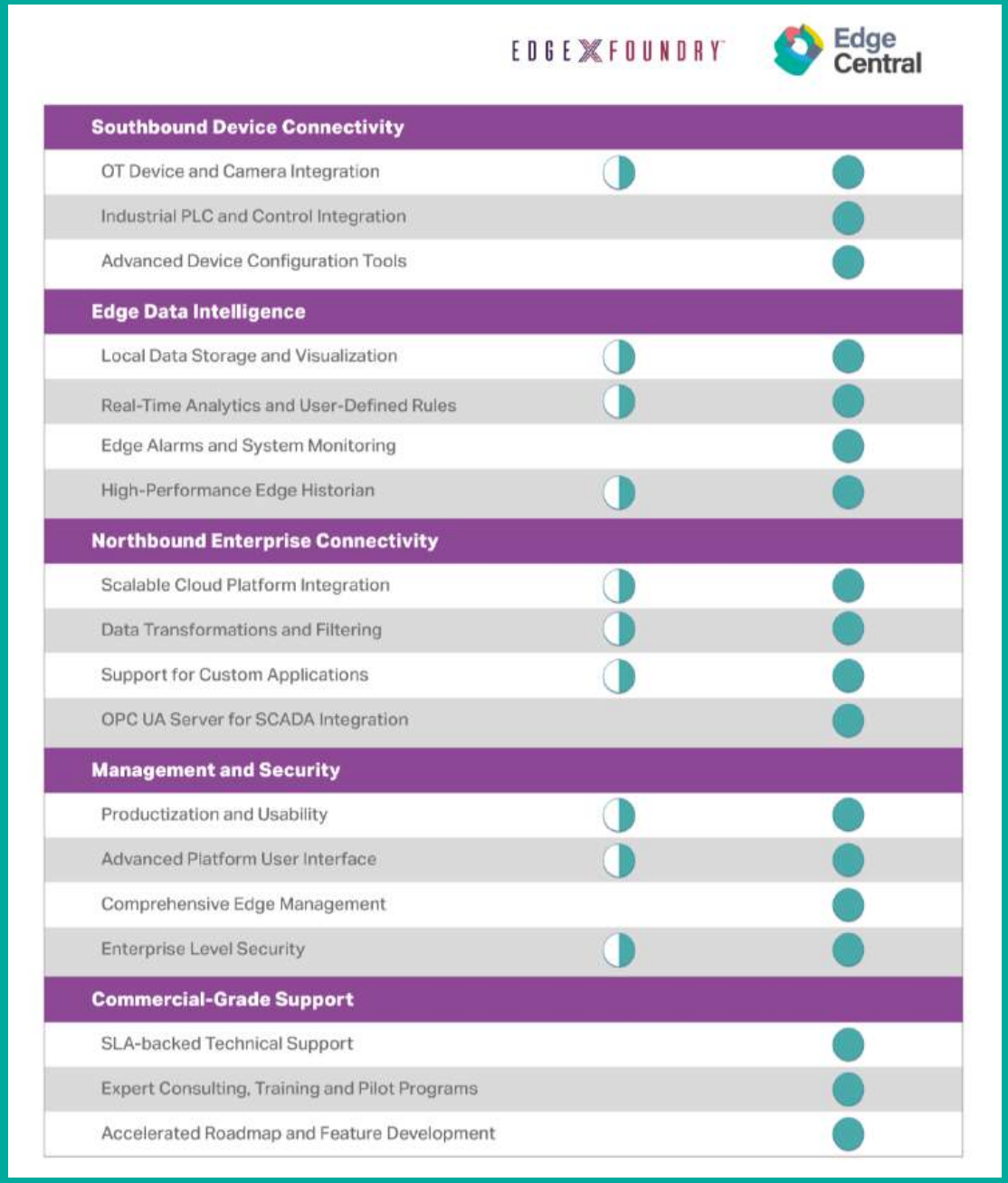
Edge Central Value-Add Summary

What Edge Central Delivers:

- Key value-add IP not available in open-source EdgeX Foundry
- Enterprise-grade support for reliable deployment in mission-critical environments

Key Business Benefits:

- Streamlined development workflows
- Accelerated time-to-market
- Lower operational and deployments risks
- Reduced total cost of ownership (TCO)



	EDGE X FOUNDRY	Edge Central
Southbound Device Connectivity		
OT Device and Camera Integration	◐	●
Industrial PLC and Control Integration		●
Advanced Device Configuration Tools		●
Edge Data Intelligence		
Local Data Storage and Visualization	◐	●
Real-Time Analytics and User-Defined Rules	◐	●
Edge Alarms and System Monitoring		●
High-Performance Edge Historian	◐	●
Northbound Enterprise Connectivity		
Scalable Cloud Platform Integration	◐	●
Data Transformations and Filtering	◐	●
Support for Custom Applications	◐	●
OPC UA Server for SCADA Integration		●
Management and Security		
Productization and Usability	◐	●
Advanced Platform User Interface	◐	●
Comprehensive Edge Management		●
Enterprise Level Security	◐	●
Commercial-Grade Support		
SLA-backed Technical Support		●
Expert Consulting, Training and Pilot Programs		●
Accelerated Roadmap and Feature Development		●

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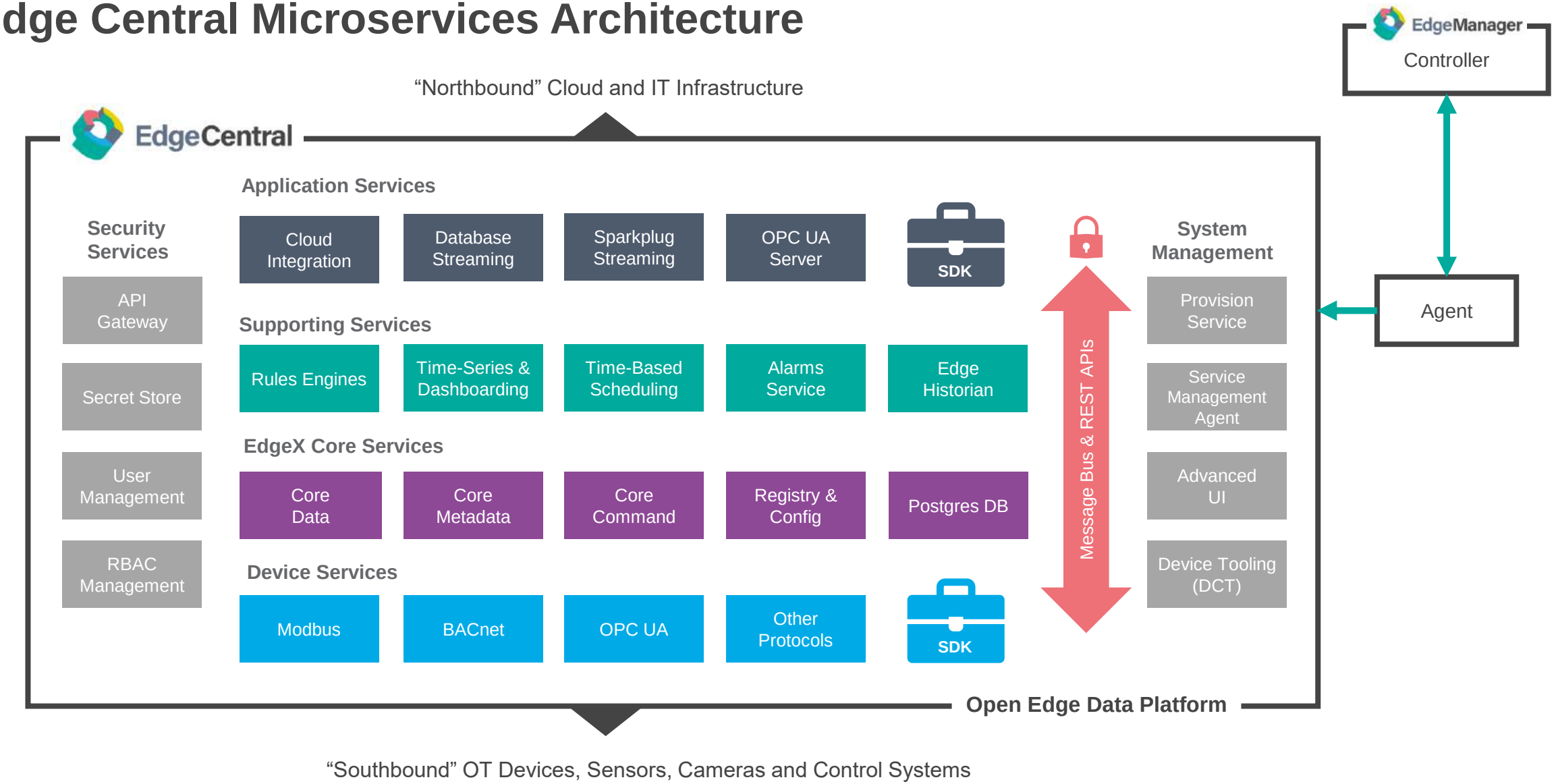
Edge Central Microservices Architecture



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IOTech – A Leading Contributor to the EdgeX Community

- **Founding member of EdgeX**; led the Technical Steering Committee since its inception in 2017
- **Key code contributor**
  - 3,000+ commits
  - 500,000+ lines of code contributed
- **Key driver of main EdgeX functionality** including:
  - Core Services
  - Device Service SDKs
  - Test and QA Infrastructure
- **Active leadership in the EdgeX community**:
  - **James Butcher** – TSC Chairman
  - **Cloud Tsai** – Technical Working Group Lead
  - **Brad Corrion** – Linux Foundation Representative
- Have won multiple innovation and contribution awards from the EdgeX Foundry community
- **We don't just support EdgeX — we helped build it**

Southbound Device Connectivity

OT Device and Camera Connectivity (1/3)

Enhanced, Production-Ready Device Services

- Optimized versions of core open-source EdgeX Foundry Device Service
- Performance-tuned for real-world industrial workloads
- Fully hardened and ready for deployment
- Extended features set such as automatic discovery where possible and Change of Value (COV) support
- Built using EdgeX Device SDKs so fully compatible with EdgeX Foundry
- Backed by full commercial support

Modbus RTU & TCP

ASHRAE BACnet™ IP & MSTP

{ REST }

MQTT.ORG

ONVIF®

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OT Device and Camera Connectivity (2/3)

Modbus RTU & TCP

Modbus is a widely used open comms protocol for delivering data between control systems and devices

IOTech Value-Add

- Reimplemented in C - faster, lighter, more scalable compared to the Go-Lang EdgeX version
- Batch/multi read operations for input statuses, coils, input registers and holding registers
- Batch/multi write operations for coils and holding registers
- Support more complicated parsing in Int64, Uint64, Float32, Float64 with byte swap and word swap
- Support Uint8, int8 and String data types
- Support for reading individual Boolean bits from input registers and holding registers
- Support for writing individual Boolean bits to holding registers
- Support for the base address mechanism required for communication with some Modbus devices
- Supports scanning to automatically onboard Modbus devices to the platform
- Tested and deployed on wide variety of real Modbus devices
- IOTech technical support and expertise

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OT Device and Camera Connectivity (3/3)

BACnet IP & MSTP

BACnet is a widely used open protocol for standard comms between control systems and devices in Building Automation

IOTech Value-Add

- Automatic discovery and onboarding of devices with extensive options to control and optimize the process
- Configurable device scanning to automatically created device profiles including controls for selective filtering of objects and data points
- Batch/multi read and write operations for faster data rates
- Supports devices with additional data types (Octet String, Bit Strings, Enumerated data, Date, Time)
- Supports devices with objects (arrays and priority levels)
- Supports BACnet Change of Value (COV) for subscription-based updates
- Support for BACnet/IP Broadcast Management Device (BBMD) communication between IP subnets
- Tested and deployed on wide variety of real BACnet devices
- IOTech technical support and expertise

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Industrial PLC and Control Integration (1/3)

- Large and expanding set of device service connectors for industrial use cases and deterministic real-time process control
- Require only simple configuration, not coding
- **No EdgeX versions available**

OPC UA

EtherCAT

EtherNet/IP

SIEMENS S7

CAN

PROFINET

WebSocket

Bluetooth Low Energy

zigbee

GPS

SDK

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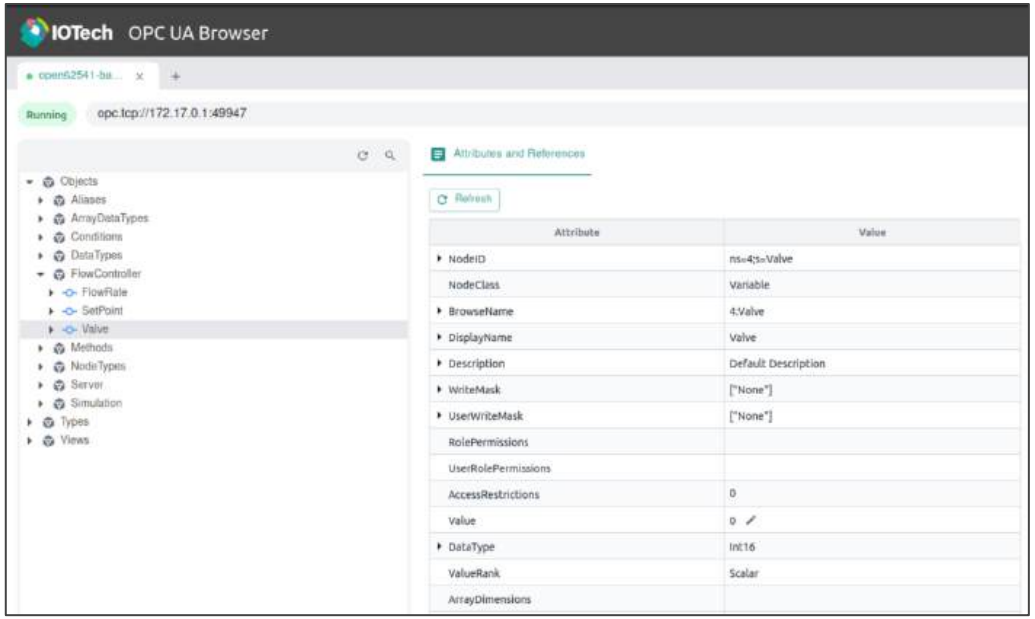
Industrial PLC and Control Integration (2/3)

OPC UA is an open communication protocol that has become one of the most dominant and widely-used protocols in the Industrial IoT

IOTech Value-Add

- Reading and writing data to/from a node present on an OPC UA Server
- Support for UA_Boolean, UA_SByte, UA_Byte, UA_Int16, UA_UInt16, UA_Int32, UA_UInt32, UA_Int64, UA_UInt64, UA_Float, UA_Double, UA_String and UA_DateTime data types
- Secure connectivity with options for specifying usernames & passwords, encryption levels, and private keys & certificates (from the OPC UA SecureChannel Service Specification)
- Automatic and configurable monitoring of OPC UA node values and events (from the OPC-UA Subscription and MonitoredItem Service Specifications)
- Support for the discovery and automatic connectivity of OPC UA Servers when ran with an OPC UA Local Discovery Service (from the OPC UA Discovery Service Specification)
- Configurable device scanning to automatically created device profiles including controls for selective filtering of OPC UA nodes and objects
- Support for browsing an OPC UA Server address space and automatic data flow to located OPC UA nodes (from the OPC UA View Service Specification)
- IOTech-only OPC UA browser tooling
- Tested and deployed on wide variety of real OPC UA use cases
- IOTech technical support and expertise



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Industrial PLC and Control Integration (3/3)

SIEMENS S7

Siemens S7 refers to the Siemens SIMATIC S7 series of programmable logic controllers (PLCs) which are widely deployed across industries such as manufacturing, energy, and automation

IOTech Value-Add

- Singular requests including:
  - Data Block: Read/Write
  - Process Input Image: Read/Write
  - Process Output Image: Read/Write
  - Last Job Result: Read
  - PLC State: Read
  - Connection State: Read
  - Log Error Code: Write
- Multiple requests including:
  - Data Block: Read/Write
  - Process Input Image: Read/Write
  - Process Output Image: Read/Write
- Support for the following Siemens devices: S7-300, S7-400, S7-1200, S7-1500
- Tested and deployed on wide variety of real OPC UA use cases
- IOTech technical support and expertise

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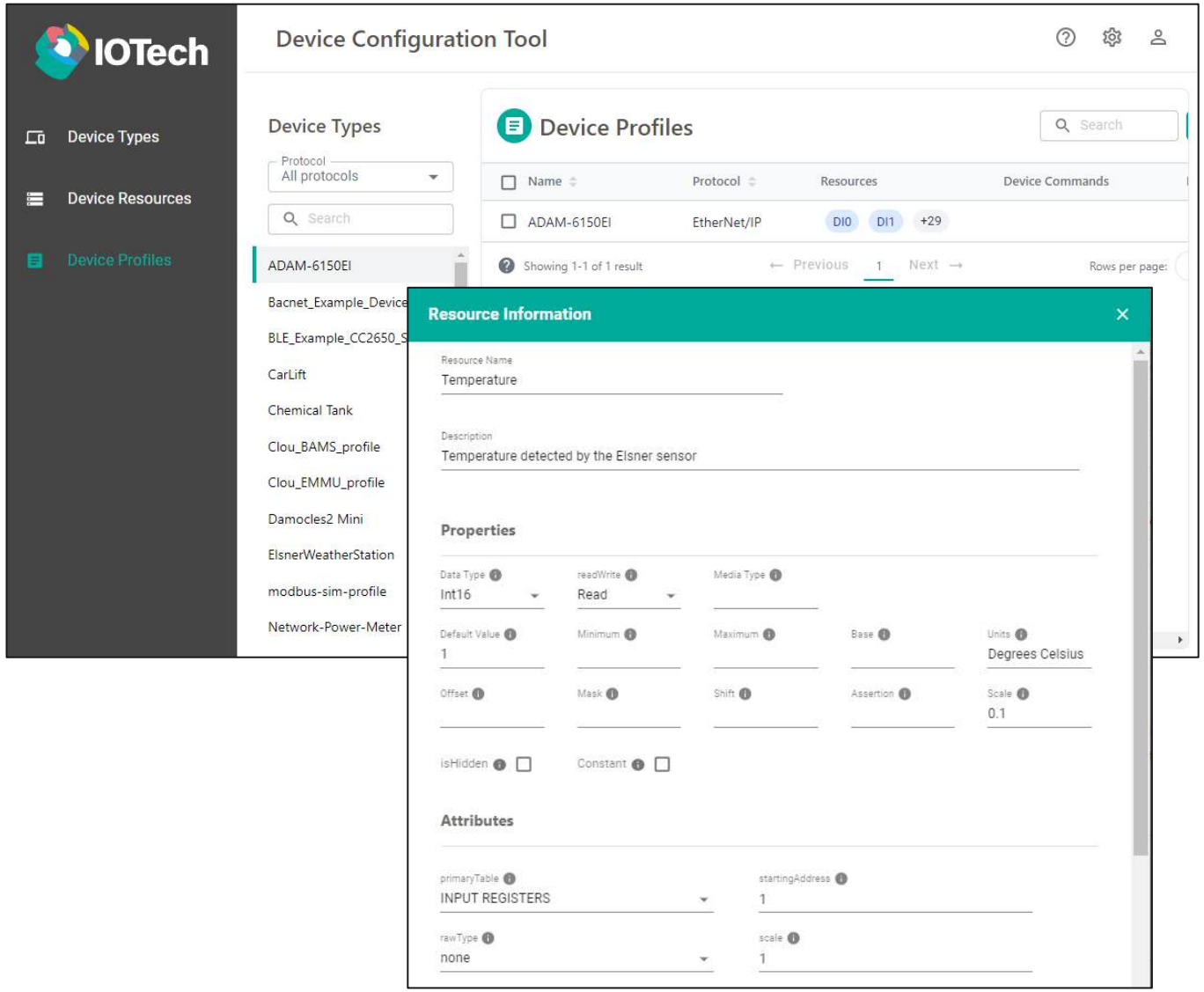
Advanced Device Configuration Tools

- **Graphical Tooling** for **easy creation and editing** of device configuration profiles
- **Wizard-based, intuitive interfaces** with protocol-specific menus
- **Enables fast creation, export, and deployment** of profiles for new devices and sensors
- **Supports CSV import of device capabilities**, auto-generating standard configuration profiles
- **Eliminates manual configuration**, reducing complexity and risk of error
- **Operators and technicians** can easily add support for new devices
- **Accelerates time to market** and reduces effort in device integration



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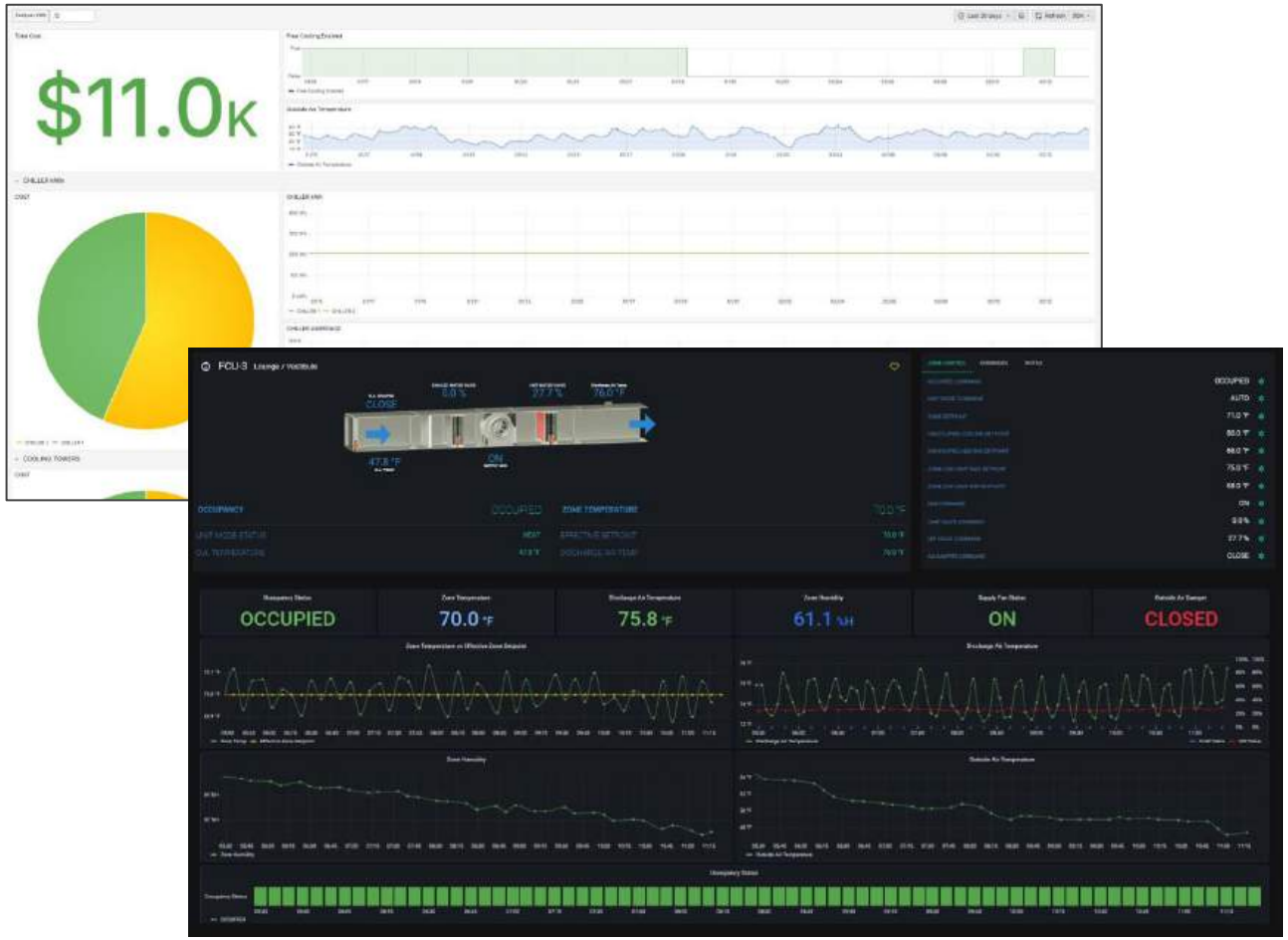
Edge Data Intelligence

Local Data Storage and Visualization

- **OT device data is normalized** and **aggregated** through EdgeX/Edge Central Core Services and stored in internal **PostgreSQL** database
- Additional **integrated time-series storage** with **InfluxDB** and **TimescaleDB** services for enhanced edge data retention
- **Reliable, user-configurable database streaming** via App Service pipeline functions
- **Built-in data visualization tools** with **Grafana** and native **InfluxDB dashboard** services
- **Customizable, real-time dashboards** deliver operational insights into data flow and system performance



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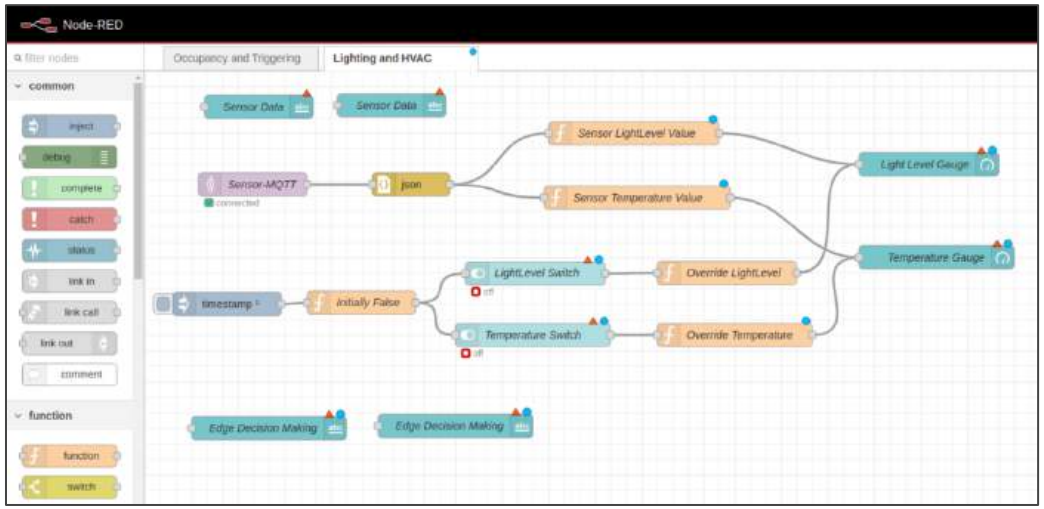
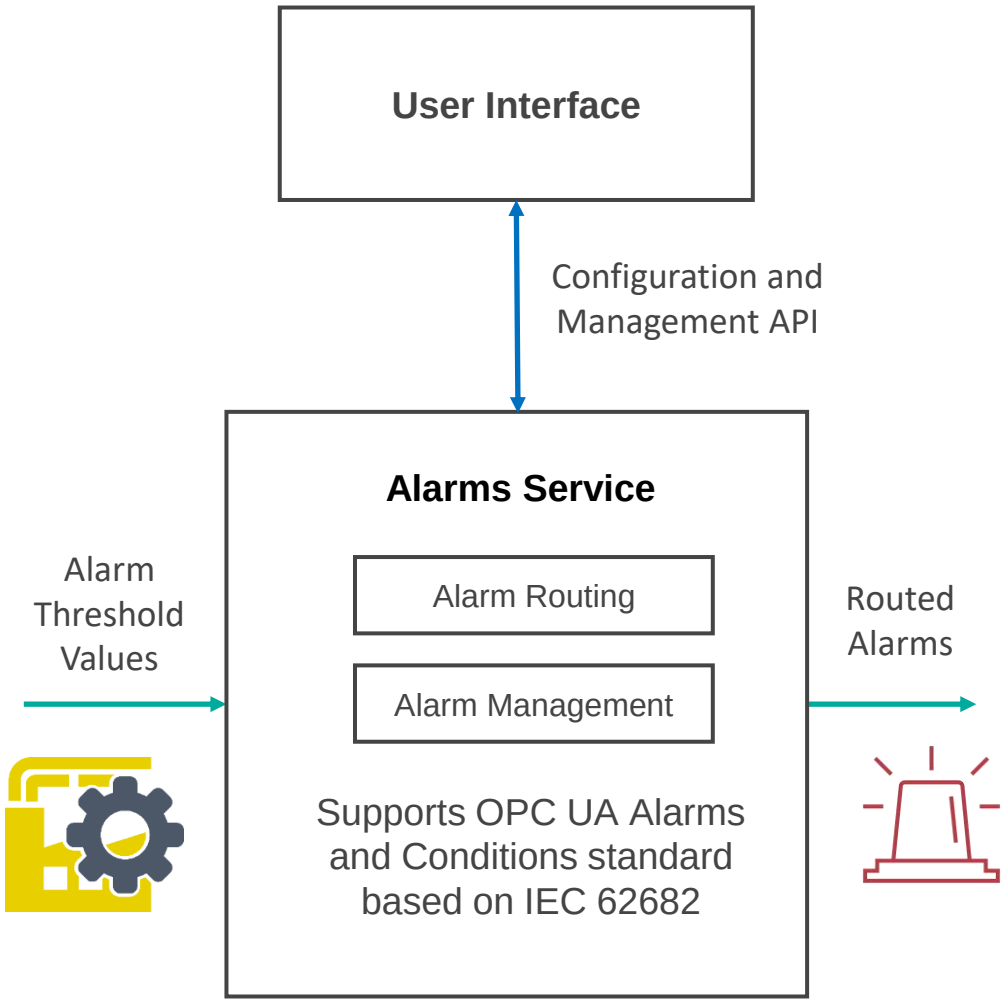
Real-Time Analytics and User-Defined Rules

- **EdgeX enables local decision-making** with EMQX **eKuiper**, a lightweight, SQL-based IoT rules engine
- Edge Central delivers addition configuration options for eKuiper with examples and production-ready support
- Edge Central provides **advanced edge analytics** with **Node-RED**, a visual, flow-based toolkit for building custom logic and control
- Node-RED's intuitive UI allows users to create, test and deploy edge rules and data-driven workflows with ease
- Edge Central is a **pluggable and extensible platform** with open APIs for integrating third-party analytics, supported by IOTech
- Examples include seamless **vision inference** capabilities for real-time AI-based insights (e.g., object detection, people counting) using IP camera feeds as standard sensor input



Edge Alarms and System Monitoring

- Comprehensive **Alarms Service** providing a unified approach to alarm normalization and management across the edge
- Technology-agnostic design ensures **independence** from alarm source or underlying OT technology
- **Standards-based** implementation using **OPC UA Alarms & Conditions** and aligned with **IEC 62682**
- **Consistent handling** of alarm threshold data from all system sources, regardless of origin
- **Configurable alarm evaluation** based on OPC UA condition types, managed via IOTech's integrated OPC UA Server
- **Event-driven architecture** delivers alarms as real-time notifications - no polling required
- **Flexible alarm routing** to multiple endpoints including Email, Telegram, MQTT, and more



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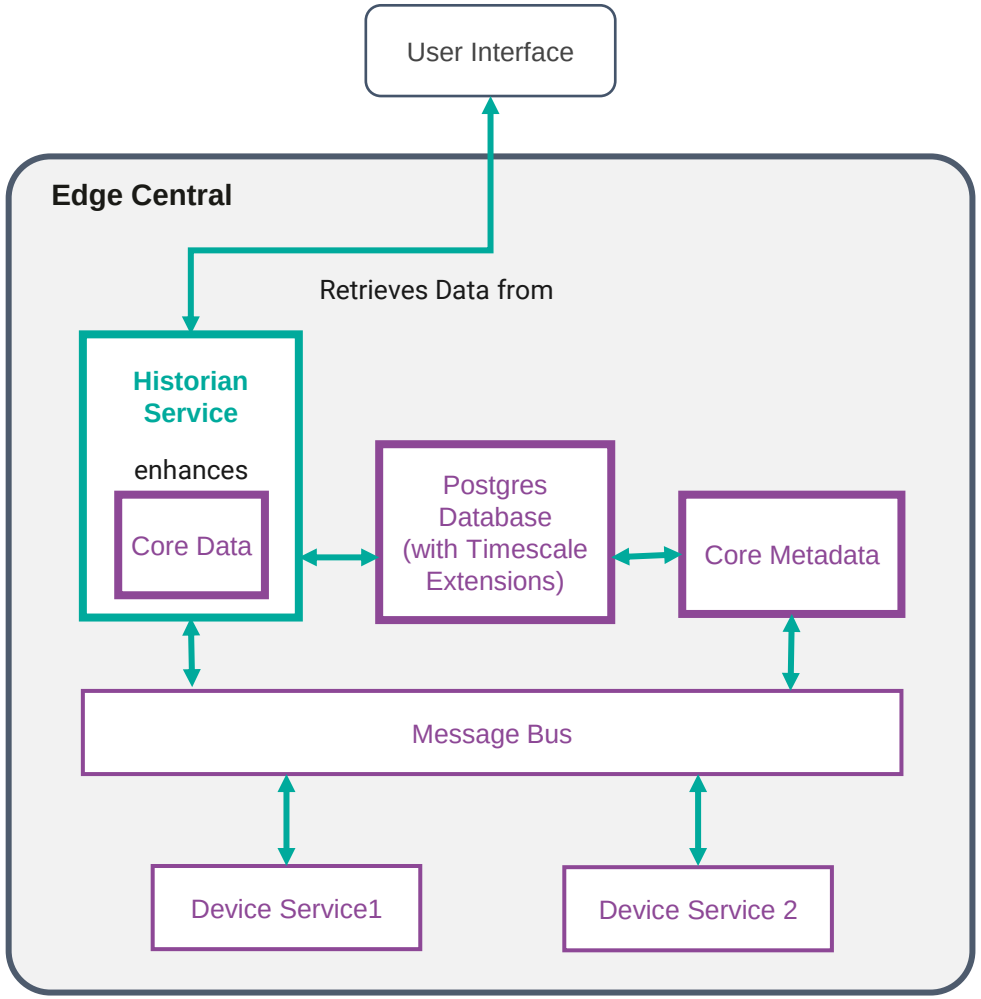
High Performance Edge Historian

- **EdgeX Core Data** supports **short-term buffering** - but is not suitable for high-performance long-term edge storage
- **Edge Central Historian** delivers **Long-Term Industrial Storage** - purpose built to meet legal and operational requirements for retaining telemetry and command data
- Designed for **Offline** and **Edge-Only environments** - ideal for remote deployments where cloud access is limited or unavailable
- **User-Controlled Management** - configure data frequency, retention policies, and access methods through flexible APIs and intuitive UIs
- Delivers **High-Performance Time-Series** Storage with **TimescaleDB** - efficiently handles large volumes of time-stamped data using PostgreSQL extensions optimized for industrial workloads
- Optimized for **High-Volume** Edge Data - tailored storage and access services maximize reliability and speed under edge constraints



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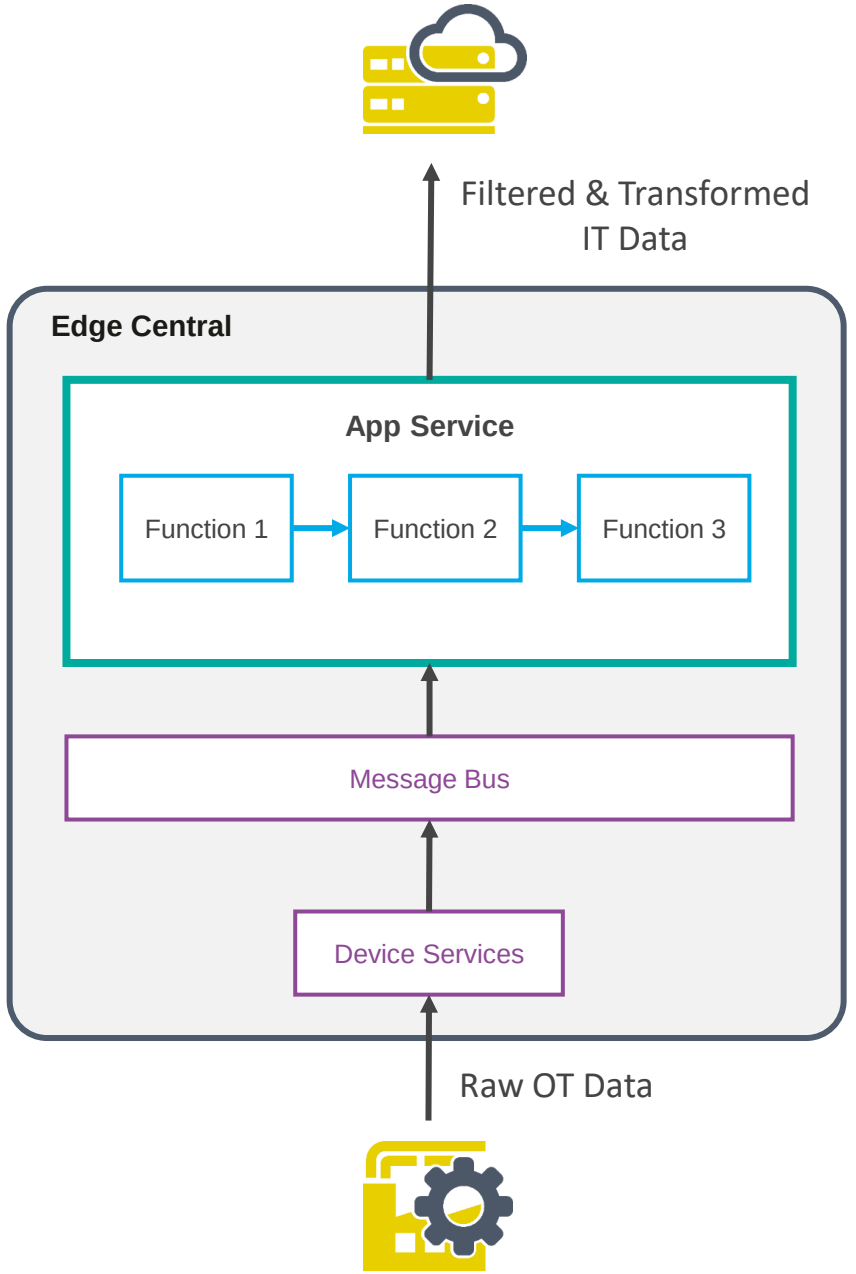
Northbound Enterprise Connectivity

Scalable Cloud Platform Integration

- The **EdgeX App Service** toolkit helps deliver data to northbound systems vendors via its configurable **MQTT** or **REST** streaming functions
- **Edge Central provides built-in connectors** to support data streaming to the main **cloud vendors** and their key services:
  - Amazon IoT Core
  - Amazon S3 Bucket
  - Azure IoT Hub
  - Azure Blob Store
  - Azure Event Hub
  - MQTT over WebSocket
  - HTTP with OAuth2 authentication
- **No coding is required** – simply configure cloud broker address, desired topic names and security certificates – and data will flow
- In addition to MQTT and REST, Edge Central supports **Kafka** and **Sparkplug** streaming for industrial IT/OT integration
- Edge Central supports **bi-directional** data flow between edge and cloud – a critical requirement for truly **hybrid edge and cloud** architectures

Data Transformations and Filtering

- **EdgeX App Services** provide **flexible pipeline functions** that can be chained together to create customized apps tailored to specific export requirements:
  - **Protocol-Specific Formatting** – format data to match the requirements of various protocols and cloud services, ensuring seamless integration
  - **Enhanced Data Control** - implement fine-grained control over data flow, ensuring only relevant or necessary data is transmitted to target systems
  - **No-Code Setup** - Configure functions through intuitive UIs or REST APIs, eliminating the need for custom coding
- **Edge Central's additional built-in data processing functions** include:
  - **Filtering** - filter based on device name, resource name or values
  - **Transformations** – with scaling, offsetting, or unit conversion operations
  - **Enrichment** - add metadata or contextual information before exporting
  - **Compression** - compress data payloads to optimize bandwidth usage
  - **Encryption** - secure data using encryption methods before transmission



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Support for Custom Applications

- **Application SDK** support for **Go-lang** and **Python** is available in both EdgeX and Edge Central platforms
- In addition, the standard **REST APIs** and **MQTT** message bus interactions allow new applications to be created in any programming language
- Edge Central provides the following advantages:
  - SDK includes previously mentioned built-in data transformation and filtering functions, plus functions for **time series processing** and **cloud data streaming**
  - Integrated service management with new apps able to be auto-deployed and **managed by Edge Central tools**
  - Reduces development overhead with ready-to-use components
  - Commercial support and assistance from IOTech
- **Edge Central provides a more complete out-of-the-box experience for custom edge application development**

Golang

python

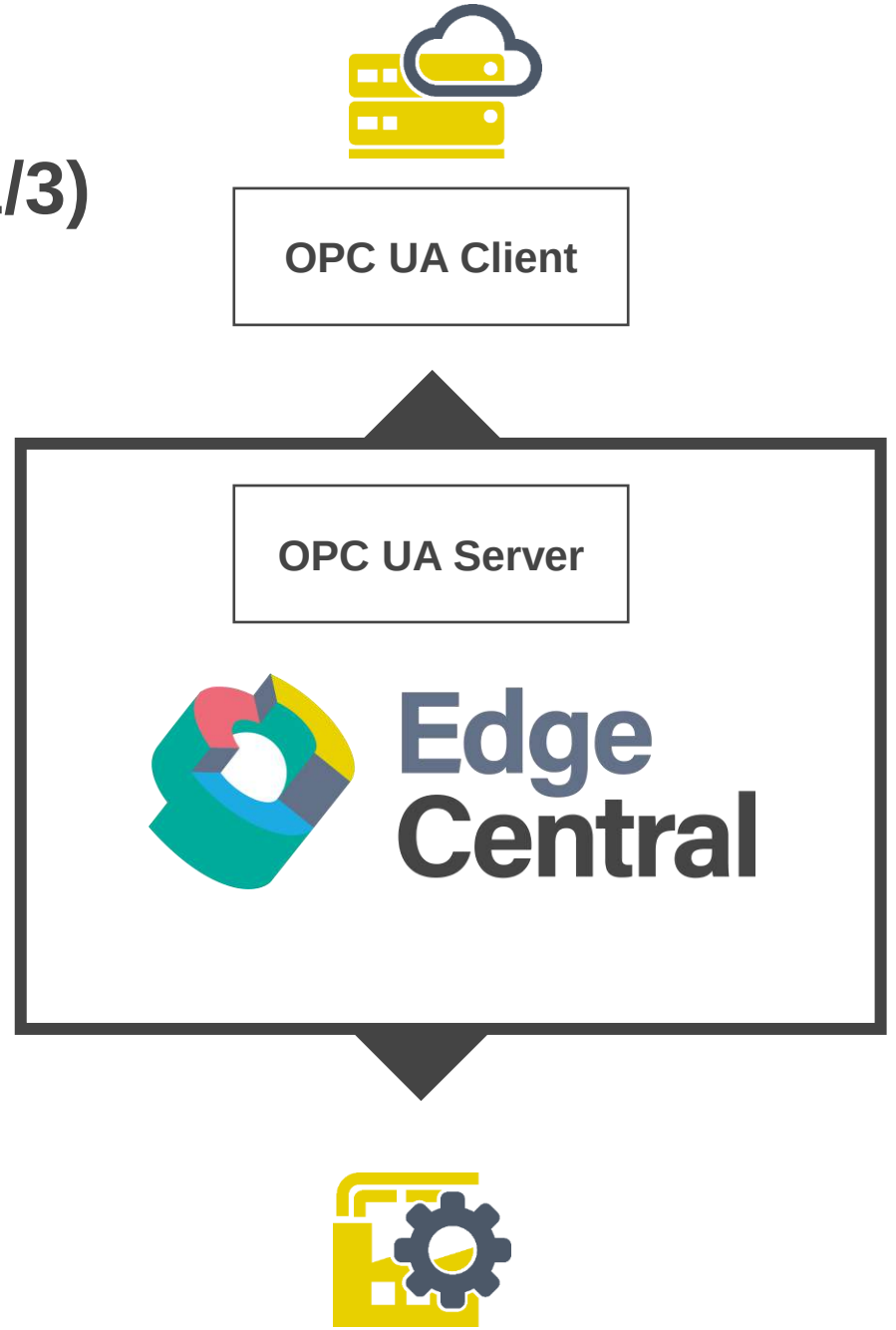
+ MORE

IOTech

OPC UA Server for SCADA Integration (1/3)

Edge Central's exclusive **OPC UA Server microservice** provides:

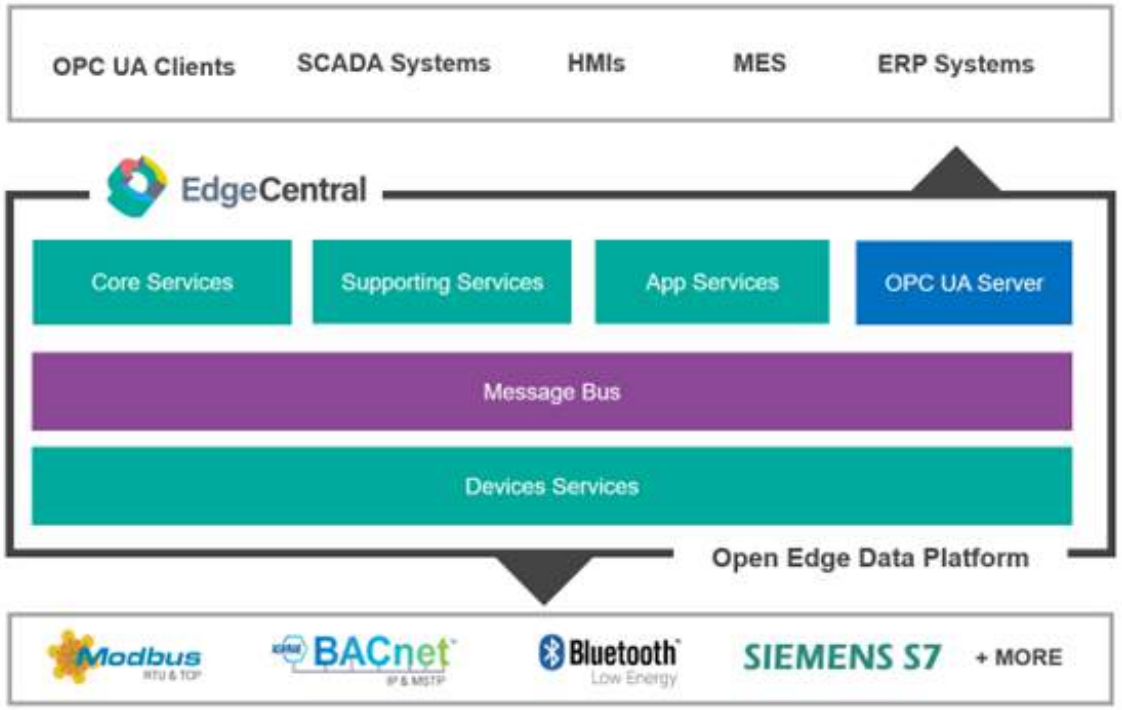
- **Standards-Based Data Access** - provides a reliable, vendor-neutral northbound interface for SCADA and industrial systems
- **Unified OT Data Namespace** - automatically aggregates all OT device data into a single structured OPC UA namespace for simplified browsing and integration
- **Auto-Generated OPC UA Nodes** - instantly creates nodes for each device and resource – eliminating the need for manual configuration
- **Full Bi-Directional Communication** - supports both read and write operations over OPC UA to enabling secure remote monitoring and control
- **Foundation for Interoperability**- powers key features such as alarm management, asset modelling, and secure data access across platforms



OPC UA Server for SCADA Integration (2/3)

Technical Capabilities of the Edge Central OPC UA Server:

- **Automatically detects** underlying devices being added, updated or removed so **always represents the current state** of the system
- Supported **OPC UA Service Set**: Discovery, SecureChannel, Session, NodeManagement, View, Attribute, Method, MonitoredItem and Subscription
- Supported **Security Policies**: None, Basic256, Basic128Rsa15, Basic256Sha256 and Aes128Sha256RsaOaep
- Supported **User Authentication**: Anonymous, Username / Password, Security Tokens and X.509 Certificates
- Supports **OPC UA Pub/Sub** mechanism for asynchronous data access with the server
- IOTech's **OPC UA Browser tool** enables exploration, visualization, and interaction with the OPC UA server
- Includes **OPC-UA Nodeset Loader** for importing Nodesets from XML, enabling users to define custom address spaces with ease



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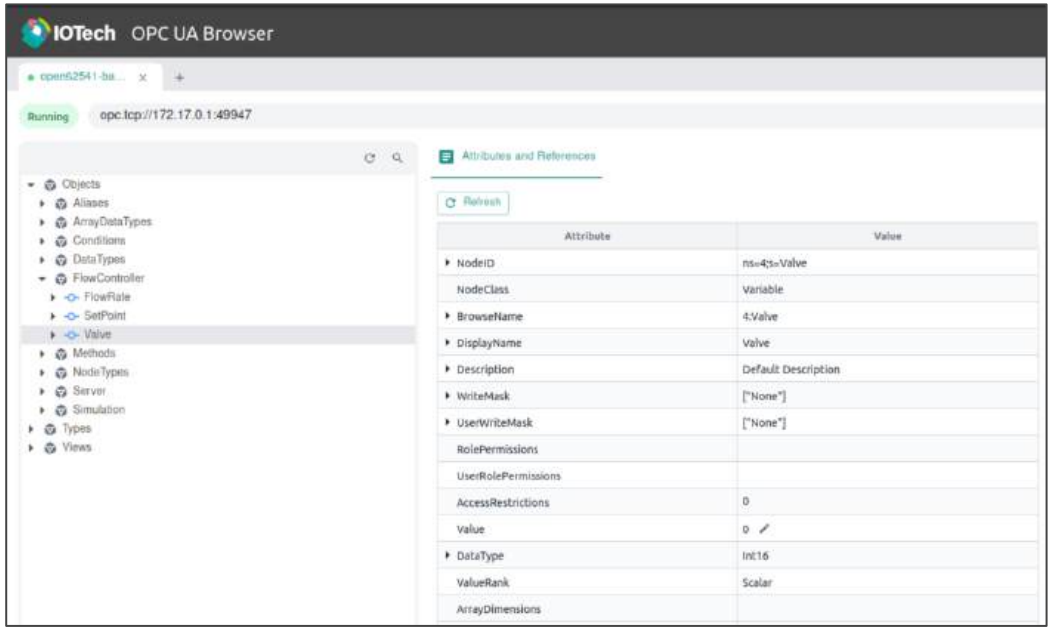
OPC UA Server for SCADA Integration (3/3)

IOTech OPC UA Browser – Visualize & Explore OPC UA Data

- **Interactive Address Space Navigation** - explore the hierarchical structure of any OPC UA server to understand data organization and capabilities
- **Detailed Node Insights** - view and modify node attributes including NodeId, DisplayName, BrowseName, DataType, and Value
- **Reference Relationship Visualization** - understand how nodes are connected with visual representation of references and dependencies
- **Search & Filter Functionality** - Quickly locate specific nodes or data types, even in large, complex address spaces
- **Real-Time Monitoring via Subscriptions** - track dynamic changes like value updates, events, and alarms directly within the browser
- **Secure Connectivity** - supports secure connections using OPC UA client authentication and encryption protocols



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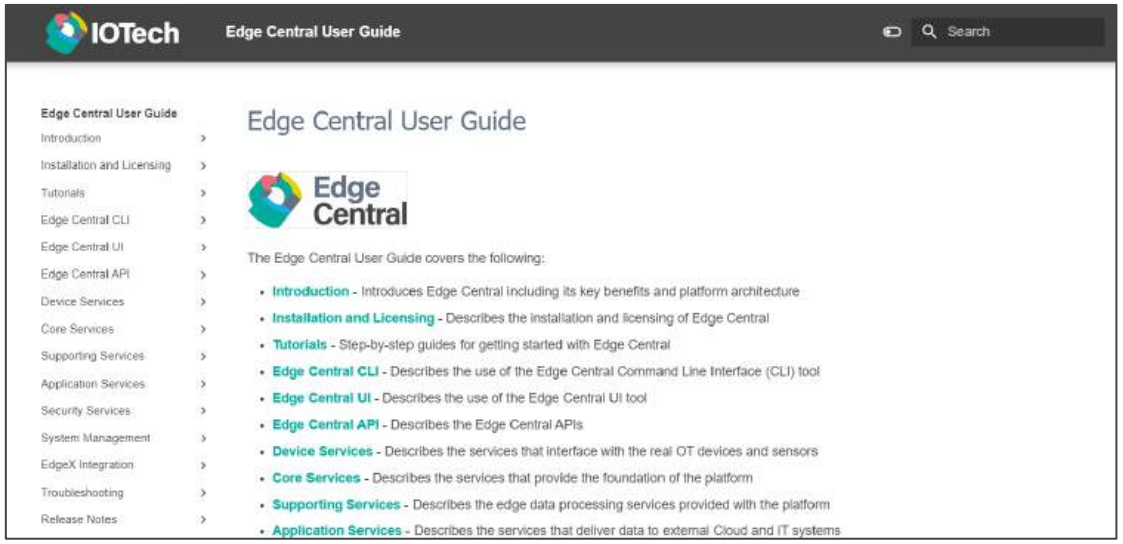
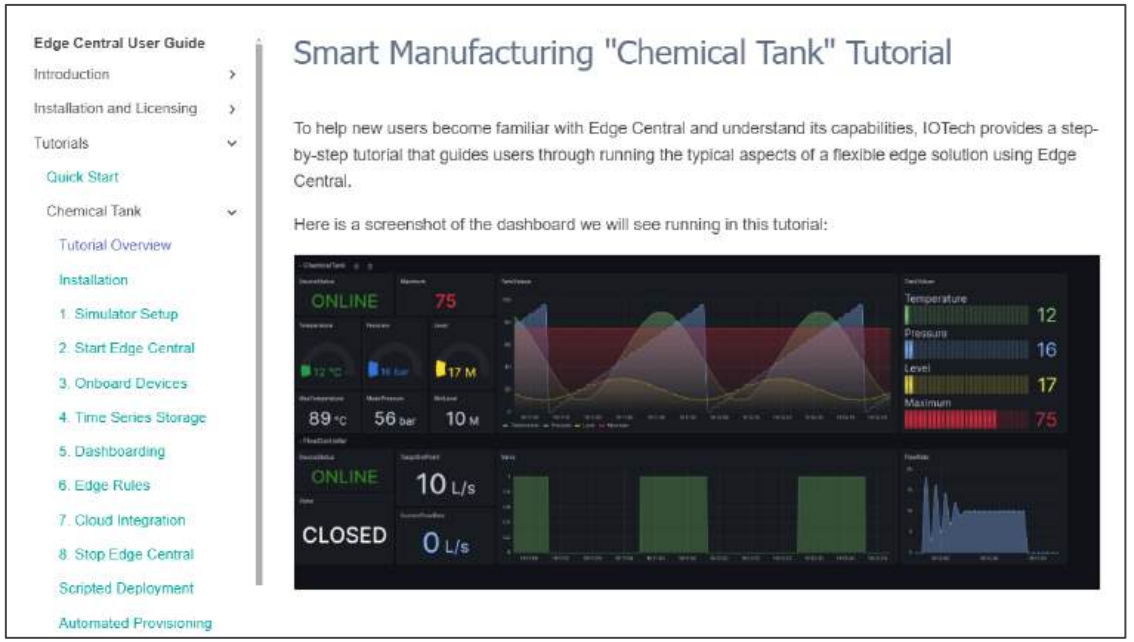
Management and Security

Productization and Usability

Get up and running faster with Edge Central's productized and commercial-grade experience:

- **Streamlined Product Installer** - Delivered as a Debian or RedHat package to eliminate complexity of assembling and configuring open-source components
- **Refined UX** – Start only needed microservices via the CLI and manage workflows through an advanced UI – minimal config file editing required
- **Extensive Documentation & Tutorials** – Continuously updated docs, tutorials and onboarding resources tailored for production teams
- **Built-In Integrations** - Ships with built-in support for major OT protocols, cloud services, and industrial systems—usually no need to build custom apps services or extensions
- **Faster Time-to-Value** - pre-tested components and best-practice defaults accelerate deployment over DIY assembly approach of EdgeX
- **Lifecycle & Security Management** - built-in service orchestration, health monitoring, credential security, and role-based access control
- **Commercial Support & Updates** - Backed by IOTech's commercial support, managed releases and product roadmap for long term reliability





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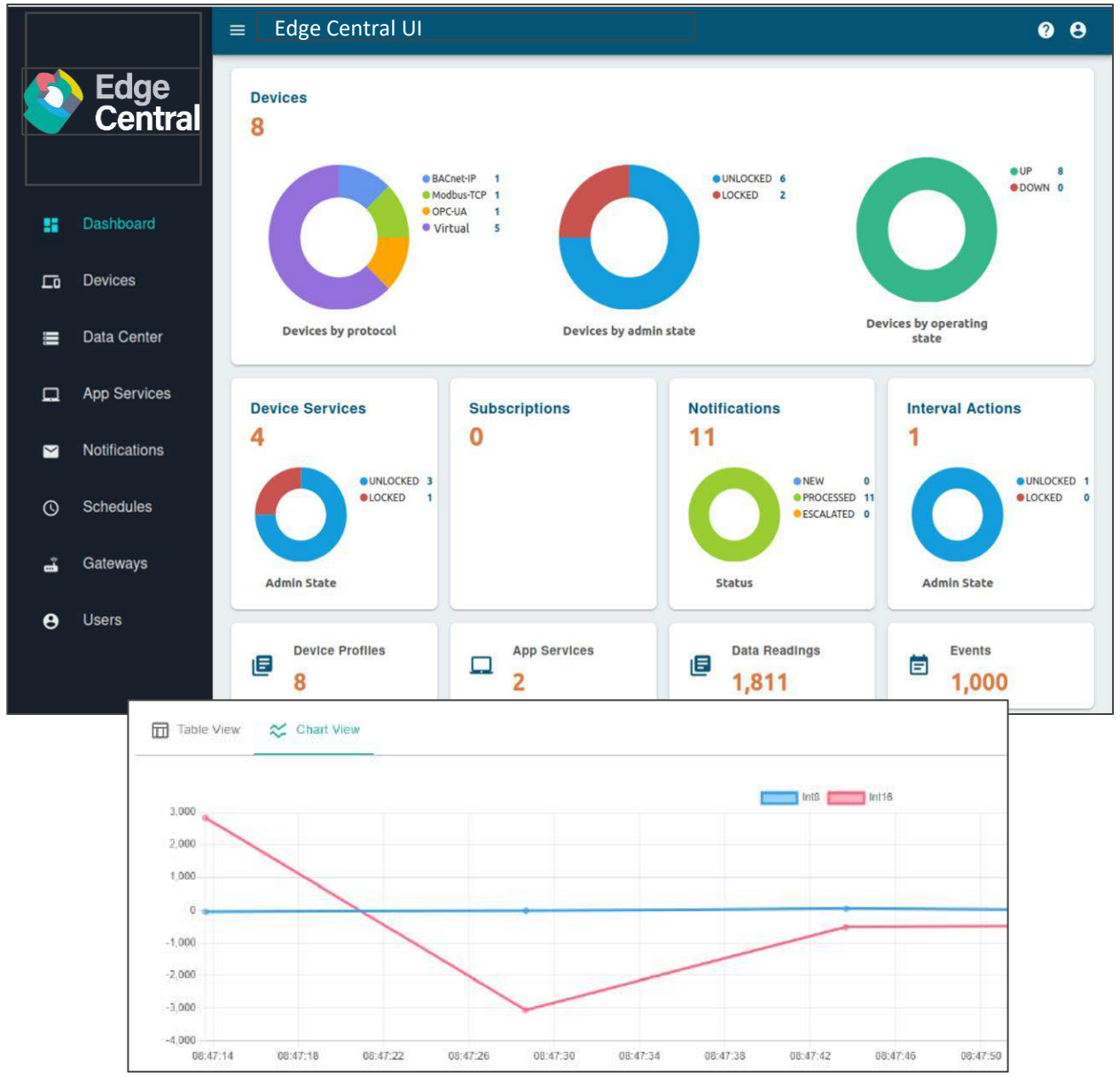
Advanced Platform User Interface

Edge Central User Interface – Key Benefits:

- **Intuitive Workflow Management** – Easily configure, deploy, and monitor microservices with a visual interface
- **Minimal Manual Configuration** – Reduces reliance on editing raw config files—do more through the UI
- **Fast Device Onboarding** – Clean design and guided interactions to add and discover new OT devices
- **Real-Time Insights** – Monitor system status, data flows, and device interactions at-a-glance
- **Seamless Service Control** – Start, stop, and manage services directly from the dashboard—no CLI needed
- **User Management and Access Control** – Tailored access and visibility based on user roles, improving security and usability
- **Integrated Debugging Tools** – Built-in logs, status indicators, and health checks simplify troubleshooting



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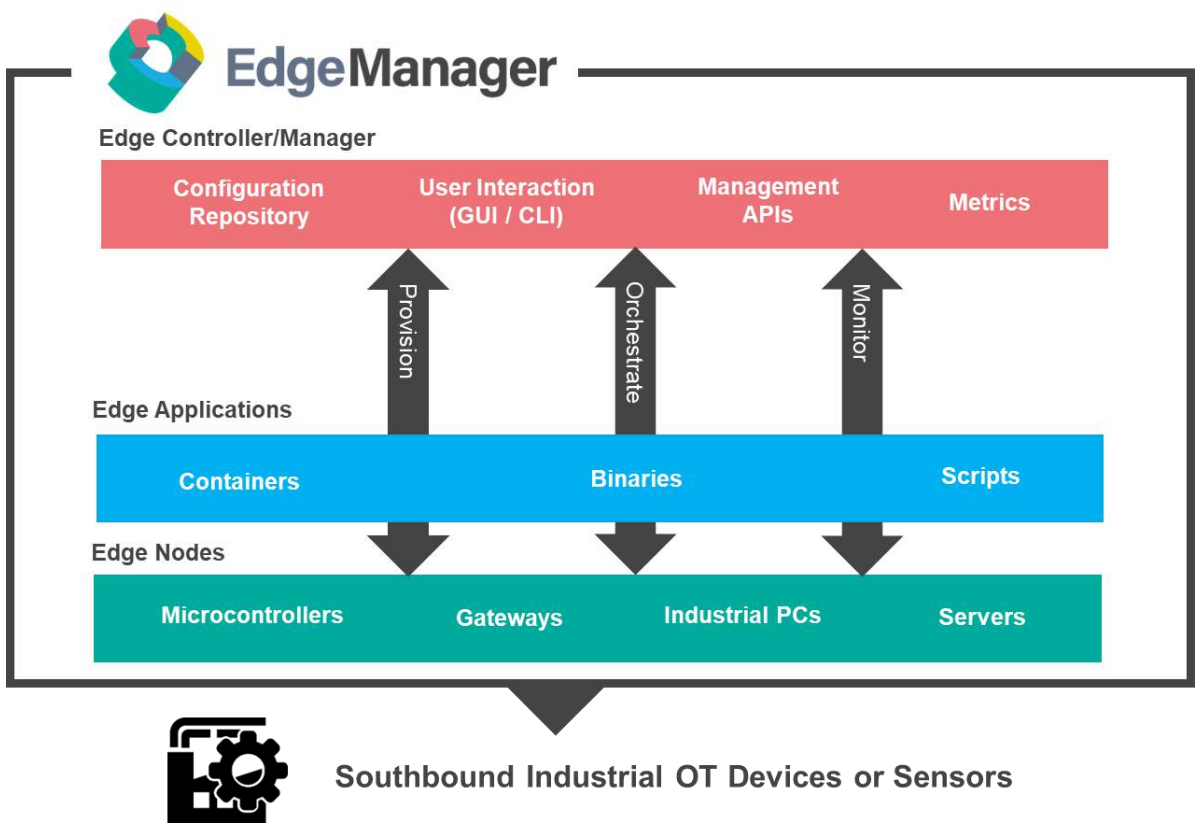
Comprehensive Edge Management (1/3)

- **EdgeX lacks any remote deployment or management capabilities**
- Edge Central's complementary **Edge Manager** product is a **complete edge orchestration and deployment solution**
- **Edge Manager Capabilities:**
  - **Secure, centralized management** of edge nodes, applications and OT devices
  - **Automated provisioning and onboarding** of edge nodes
  - **Orchestration of edge applications,** both containerized (like Edge Central) and native
  - **Scales efficiently** to thousands of nodes and applications
  - **Flexible deployment** running on-premise or in the Cloud
  - **Accessible via both UI tools or APIs**
  - **Built-in monitoring and debugging** for node and app help



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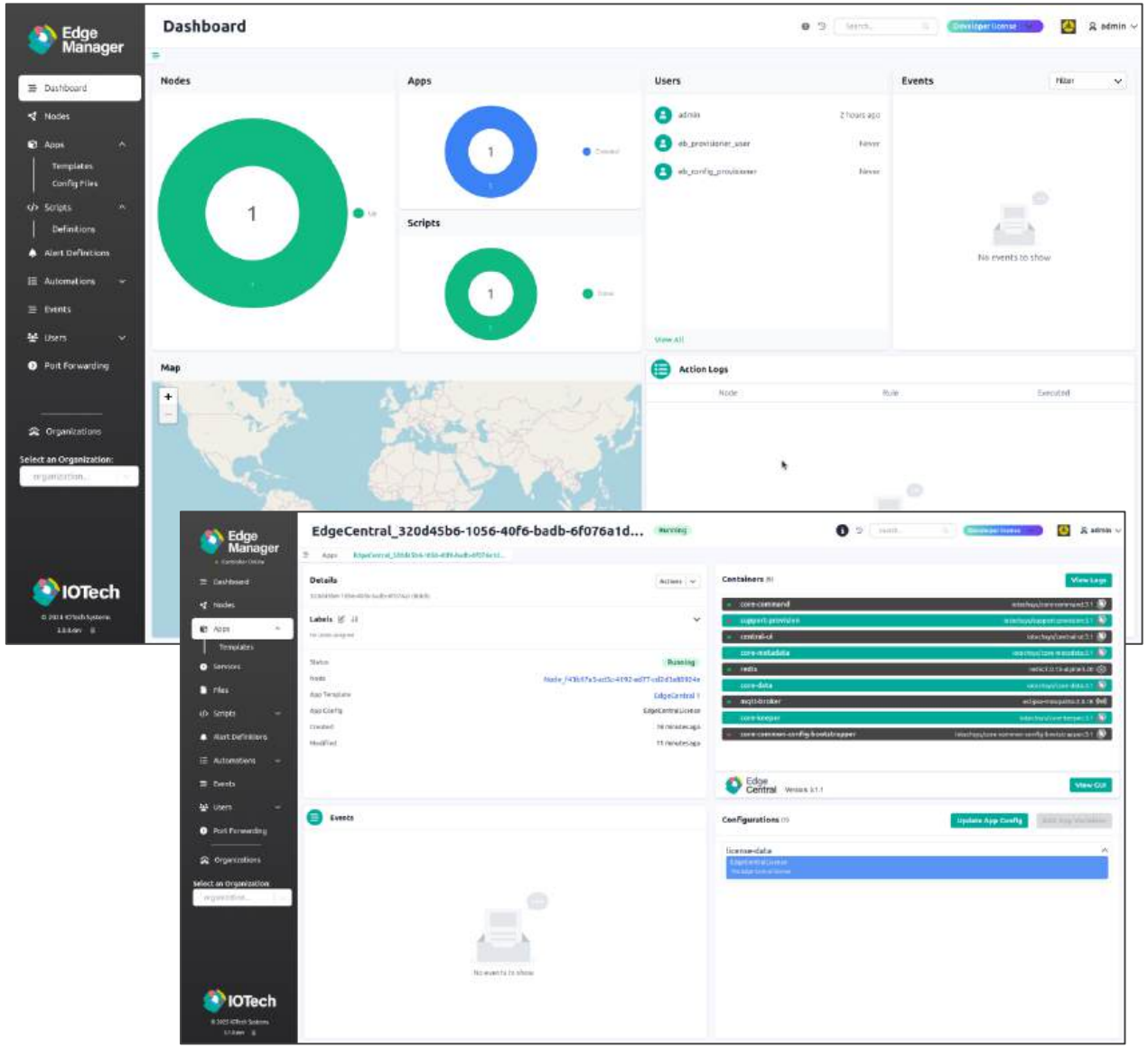
Comprehensive Edge Management (2/3)

Edge Manager UI – Simplified Control at Scale:

- **Intuitive interface** simplifies edge operations, making it easy for users to manage complex environments
- **Automates key workflows** with just a few clicks – no need for deep technical expertise
- **Full feature access** ensures the UI supports the entire range of Edge Manager capabilities
- **Flexible interaction** with support for both command-line tools and REST APIs when deeper integration or scripting is needed
- **Modern architecture** built on technologies like React delivers high performance, broad compatibility, and future-ready scalability



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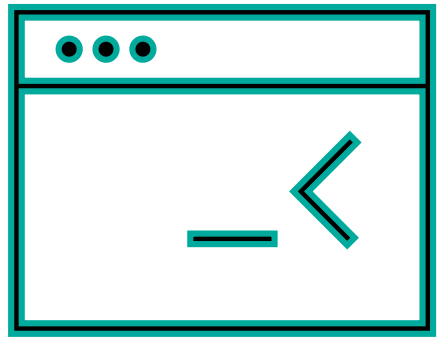
Comprehensive Edge Management (3/3)

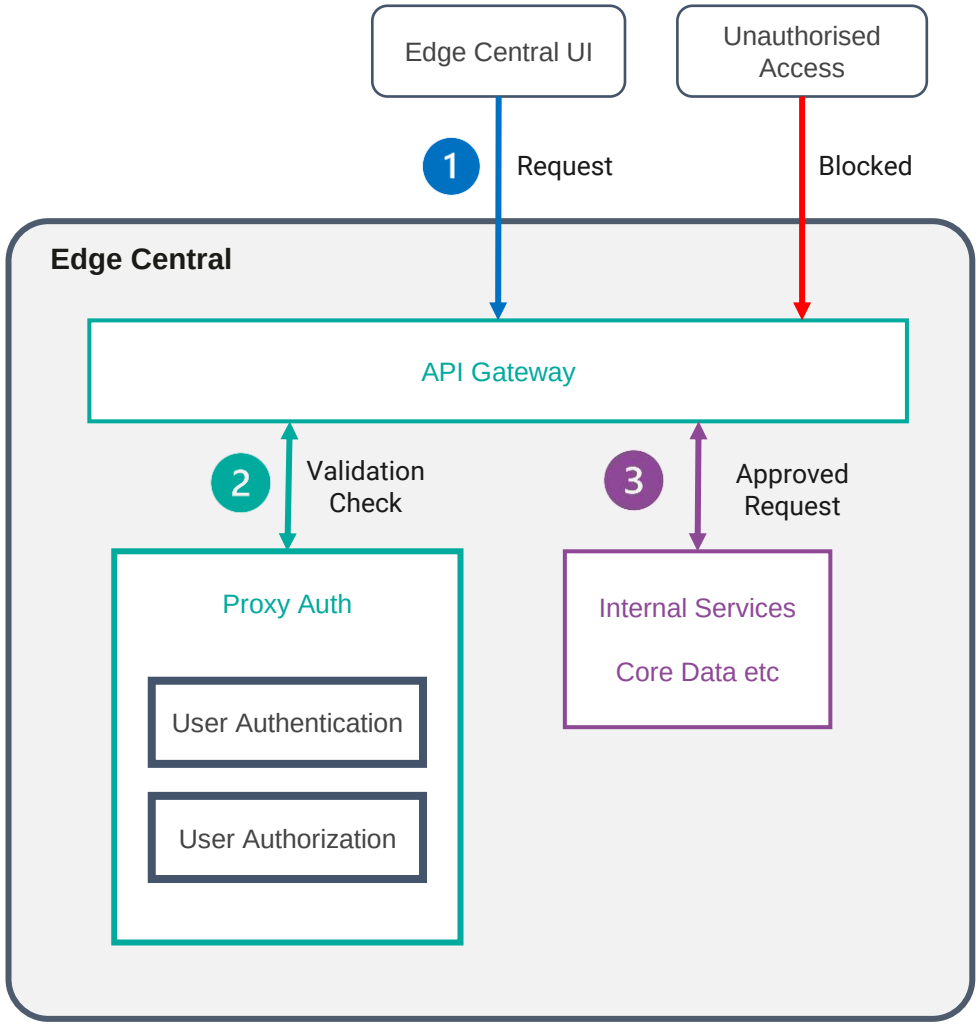
Edge Central itself delivers a dedicated “Provision” microservice for streamlining the device and application provisioning process

- **Automated Provisioning**: Facilitates automated device enrollment, reducing manual intervention and associated errors, leading to faster and more reliable deployments
- **Customizable Configuration**: Allows overriding default settings through environment variables or a configuration file, enabling tailored device provisioning processes
- **Separation of Concerns**: Supports distinct roles for operations and device management teams, enhancing deployment efficiency
- **Scalability**: Designed to handle large-scale device deployments efficiently, making it suitable for extensive IoT implementations
- **Utilized by Edge Manager to help with its deployment of Edge Central systems**



Enterprise Level Security

- **Standards-Aligned Security** – Enterprise must often meet key requirements from security frameworks like IEC 62443-4-2, ensuring protection against unauthorized system access
- **Beyond Basic Security** – While EdgeX provides core features like an API Gateway (JWT validation) and secure secret storage (passwords, certs etc), Edge Central enhances these with enterprise-grade capabilities
- **Key Security Enhancements in Edge Central:**
  - **User Authentication** – Supports both local user account creation and enterprise integration via **LDAP-managed identities**
  - **Role-Based Access Control (RBAC)** – Fine-grained authorization with API-level access control to enforce least-privilege principles
  - **Encrypted Communication** – **TLS secures the internal message bus**, ensuring data integrity and confidentiality in transit
  - **Edge Central UI** – provides TLS-protected logins, user/account management features, configurable access control, and built-in controls to prevent unauthorized feature access



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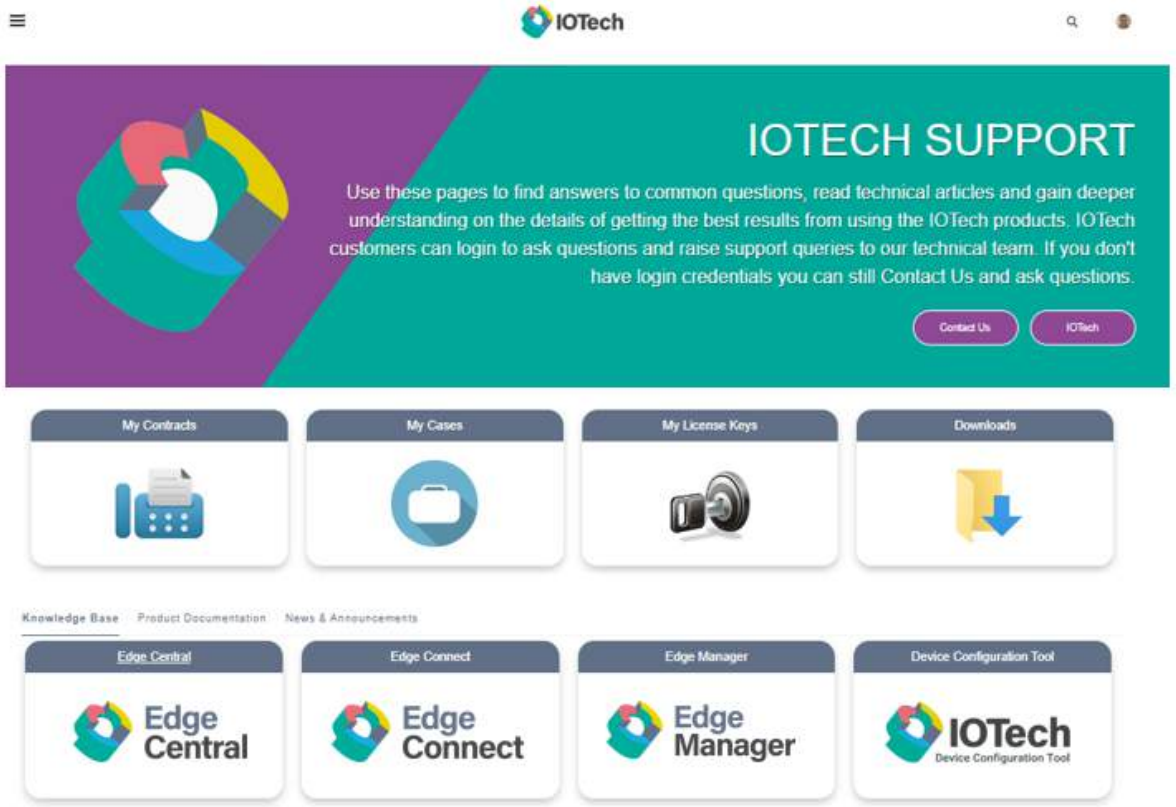
Commercial-Grade Support

SLA-Backed Technical Support (1/2)

Trusted and guaranteed commercial product support from the IOTech team

- Offering based on Salesforce Service Cloud
- Full first, second and third-line web-based support, with OEMs generally taking first-line support with their customers
- Support features:
  - Online help and assistance
  - Customer knowledge base and tutorial videos
  - Regular releases and upgrades
  - Service Level Agreements to match your project
  - Raise a case with online tracking
  - Dedicated support team
  - Onsite assistance as an optional extra



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SLA-Backed Technical Support (2/2)

Standard, Silver and Gold support options providing the necessary coverage for your project

SLA Option	Standard	Silver	Gold
Hours of coverage	8 x 5	12 x 5	24 x 7
Technical assistance	Yes	Yes	Yes
Support channel	Web	Web	Web and phone
Number of cases	Unlimited	Unlimited	Unlimited
Software maintenance updates	Yes	Yes	Yes
On-site assistance	No	No	Yes
Major software upgrades	Yes	Yes	Yes
Problem escalation	Yes	Yes	Yes
Problem acknowledgement and response times	Yes	Yes	Yes
Continuous effort for high severity issues	Yes	Yes	Yes

Expert Consulting, Training and Pilot Programs

Accelerate Edge Success with IOTech Professional Services

- **Expert Consultancy** – Leverage IOTech's deep OT, DRE, and EdgeX expertise to reduce risk and speed time-to-market
- **Rapid OEM Onboarding**– Fast-track integration of EdgeX / Edge Central software into your architecture with guided support:
  - API & integration analysis
  - Hardware porting and testing
  - End-to-end testing and performance validation
- **Tailored Solution Design** – Services to support pilots, rollouts, and co-development with your teams:
  - Architecture reviews and outcome planning
  - Use-case support and application development
  - Device connectivity and performance tuning
- **Hands-On Training** – Online or in-person training with practical exercises and modular content:
  - Intro to Edge computing, use cases, and IOTech products
  - Product configuration, deployment, and management
  - Building custom device/cloud integrations and applications

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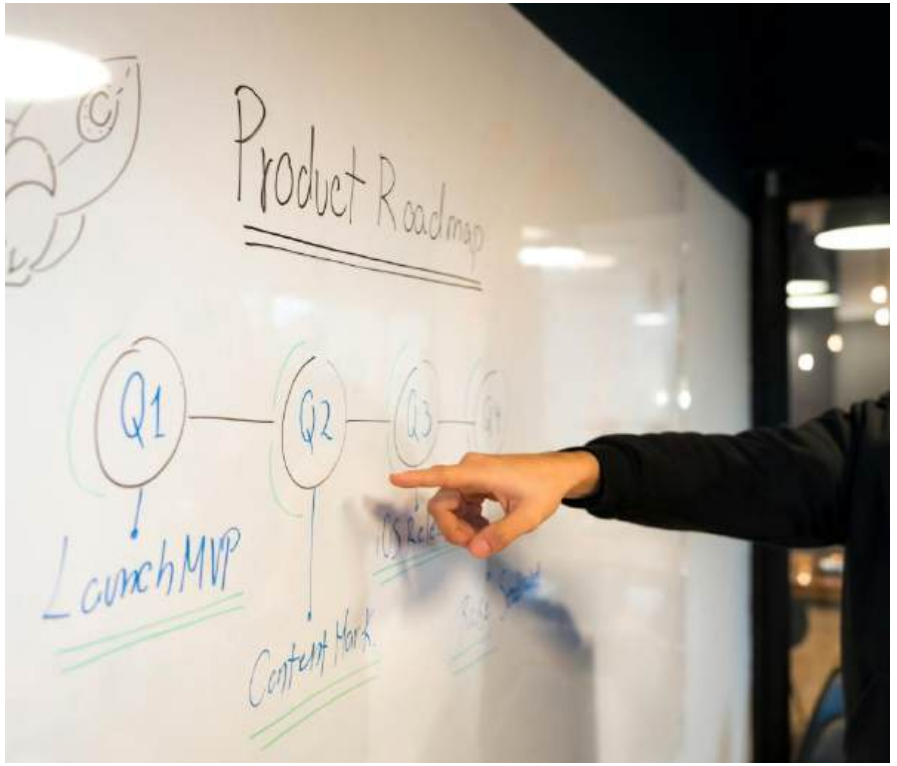
Accelerated Roadmap and Feature Development

- **Continuous Innovation** - IOTech actively enhances its products in line with a structured roadmap of core updates
- **Customer-Driven Flexibility** – We understand some customers need features not yet planned - or delivered sooner than scheduled
- **Roadmap Acceleration Services** – Engage with IOTech to fast-track development and prioritize features based on your own specific needs:
  - Support for new device types and industrial protocols
  - Development of new or enhanced platform services and edge applications
  - Integration of AI/ML or third-party solutions directly into the platform
  - Influence and provide contributions to relevant open-source initiatives (e.g., EdgeX Foundry)
  - Hardware and OS porting for specialized deployment environments



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Thank You