

EtherNet/IP and Margo™

Complementary, non-overlapping layers for industrial edge interoperability

October 21, 2026

Core message

EtherNet/IP owns deterministic OT field-device communication. Margo owns interoperable edge-compute infrastructure. The opportunity is harmonization at the boundaries, not competition.

Key Messages for ODVA

Complementary, not competing	EtherNet/IP and Margo address different layers and should reinforce each other.
Clear scope split	EtherNet/IP: OT field-device real-time process data. Margo: edge compute infrastructure and workload lifecycle.
Fill the interoperability gap	Margo targets gaps not yet covered by existing efforts; it should not reinvent proven standards.
Open dialogue	Margo already discusses alignment with adjacent ecosystem initiatives and would welcome similar ODVA engagement.
Alignment themes	Device fleet management, firmware update, cybersecurity and trust are natural discussion areas.

ODVA discussion | EtherNet/IP and Margo are complementary, non-competing layers

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1 I Margo Project and architecture

What Margo is, why it exists, and how the main architecture elements fit together.

VISION



Margo establishes interoperability between industrial apps and devices, ensuring apps and devices compliant with Margo can be seamlessly incorporated into fleet managers that support Margo.
This enables vendors to build Margo-compliant solutions which end users may select from,
to deploy, manage, and observe their fleet throughout its lifecycle, in their multi-vendor ecosystem.

These apps can run on devices from various vendors or can target particular devices while maintaining the ability to be managed at scale.

These devices can run apps from various vendors or can be purpose built to host particular apps while maintaining the ability to be managed as scale.

These fleet managers can orchestrate apps and/or devices from various vendors.

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What is the Margo Project?

Open collaboration

Margo is an open collaboration hosted by the Linux Foundation, focused on edge interoperability for industrial automation ecosystems.

Mission and deliverables

The mission is supported by a reference implementation, open standard and compliance testing toolkit for interoperable fleet management of edge applications and devices.

Why it matters

Industrial plants face lifecycle-management complexity as compute devices and apps from many suppliers increase across industrial sites.



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Margo architecture scope: applications, devices and fleet management

Application ecosystem	Application packages, application descriptions, components, registries and catalogs.
Fleet management	Workload Fleet Manager and management interface to configure, deploy and manage workloads across registered edge devices.
Edge execution	MARGO-compliant edge compute devices host workloads, management agents, container orchestration platforms and device operating systems.
Observability and status	Common approaches for diagnostics, observability data and state reconciliation support fleet operations.

Margo specifies the edge infrastructure interoperability layer, not OT real-time process-data semantics.

Margo architecture at a glance

Application supply layer	Application Package | Application Description | Components | Application / Component / Container Registries
Fleet management layer	Workload Fleet Manager | Desired State | Management Interface | Device/Fleet status
Edge execution layer	MARGO-compliant edge compute device | WFM client | Kubernetes / Docker / Podman | Running workloads

ODVA relevance: this is the adjacent layer above field-device real-time process data communication.

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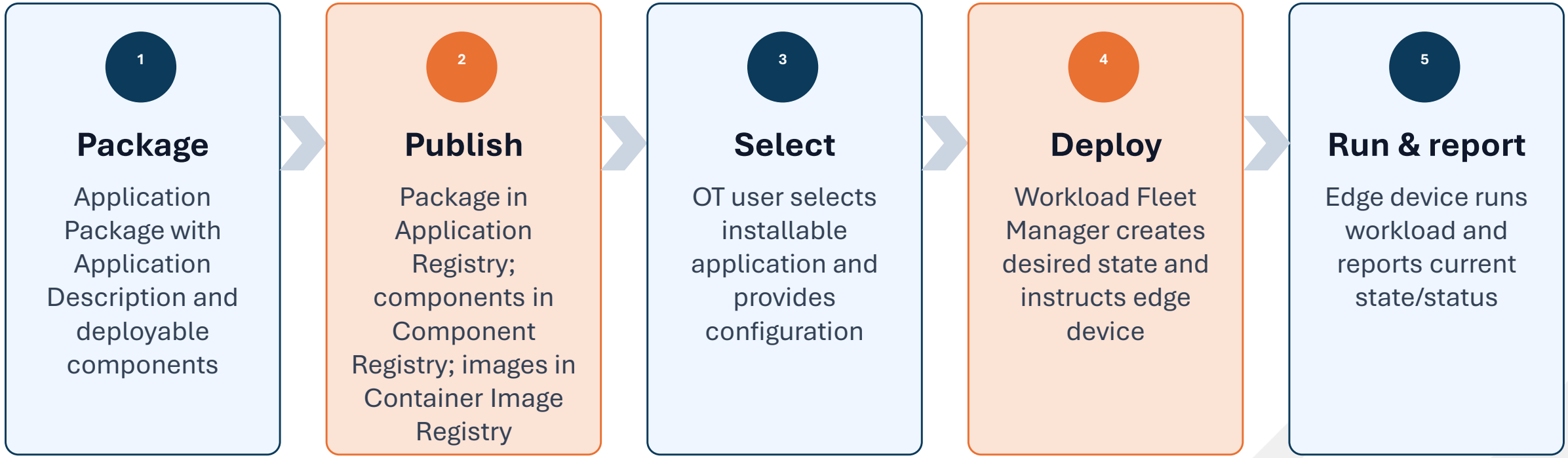
Interoperable orchestration at scale of edge applications and devices for industrial automation ecosystems

COMMUNITY MEMBERS

8gears Container Registry
ABB B&R
ARMADA
atym
avassa
BECKHOFF
Belden
Capgemini
CODESYS
COPA-DATA
cosmonic
DELL Technologies
DIANOMIC
edgenaut
EMERSON
FLECS
GALEO
Globant
hilscher
IGNISFORMA
intel
IronFlock
Kalkitech
KUBERMATIC
logiccloud
Microsoft
MITSUBISHI ELECTRIC
Red Hat
Rockwell Automation
SALZ AUTOMATION
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SIEMENS
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Margo workload lifecycle: from package to running workload



For ODVA: the lifecycle model can coexist with EtherNet/IP; it manages compute workloads, not cyclic field-device process data.

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2 I Scope Clarity

Two layers, two responsibilities, one opportunity for harmonization.

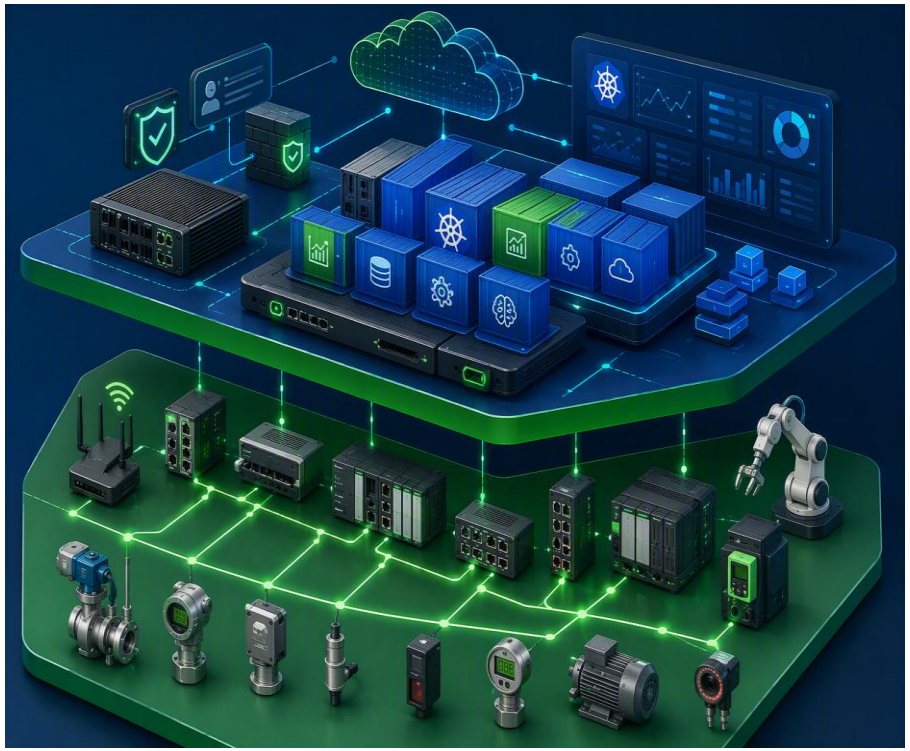
EtherNet/IP and Margo address different layers

EtherNet/IP scope

OT field devices, deterministic communication, real-time cyclic process data, CIP services and conformance-tested multi-vendor device interaction.

Margo scope

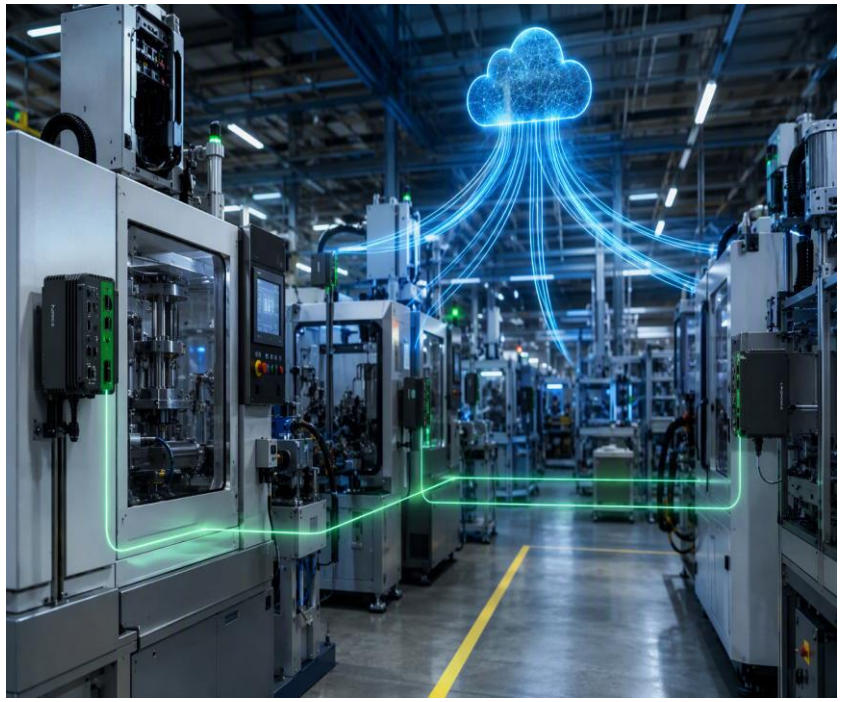
Edge compute infrastructure, workload deployment, lifecycle management, interoperability between edge applications, devices and orchestration software.



They meet at the industrial edge, but they do not need to occupy the same standards space.

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EtherNet/IP: deterministic OT field-device communication



- Enables Ethernet communication for digitization, IIoT and Industry 4.0 use cases.
- Supports UDP for real-time cyclic data transmission.
- Uses CIP for upper-layer industrial services such as control, safety, security and synchronization.
- Provides confidence through ODVA conformance testing and multi-vendor interoperability.

EtherNet/IP retains the real-time OT process-data role.

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Margo: interoperable edge compute infrastructure

- Defines interoperability mechanisms between edge applications, edge devices and orchestration software.
- Delivers through an open standard, reference implementation and compliance testing toolkit.
- Focuses on application/workload lifecycle management across heterogeneous edge platforms.
- Uses proven IT patterns where appropriate, while addressing industrial edge requirements.

Margo is an infrastructure interoperability layer, not a fieldbus.



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Margo compliant Apps that use EtherNet/IP

The hard part (ODVA Community)

- Having an idea about how to add value
- Making the data available in devices and controllers
- Getting that data from device to edge
- Getting that data from edge to cloud
- Presenting information in an actionable format

The easy part (Margo Community)

- Getting the app into every end-user's app store
- Reliably deploying the app onto any compatible vendor's edge device
- Updating and lifecycle management of every instance of the app
- Telemetry about app operation

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Adding value to the installed base

On prem software helper to replace hardware gateways

System Architecture

- Web-based device-specific app
- On-prem data gathering and in-cloud storage
- Functional enhancements every quarter

How Margo Helps

- Registry of the app in many marketplaces
- Headless deployment from cloud to edge
- Automated lifecycle management

A virtual gateway in each plant



Margo makes the on-prem service simple to deploy and upgrade

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Adding value to the installed base

On prem software helper to replace hardware gateways

System Architecture

- AI-driven machine learning algorithm
- Creating massive datasets of machine sensor readings
- Identifying developing anomolies

How Margo Helps

- Matching application demands (GPU) to edge device capability
- Enabling deployment at scale
- Allowing application enhancement while maintaining historical data

Deploying functionality to capable devices



Margo makes multivendor app lifecycle management reliable

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Virtual Device

Bringing Software-defined to EtherNet/IP Connectivity

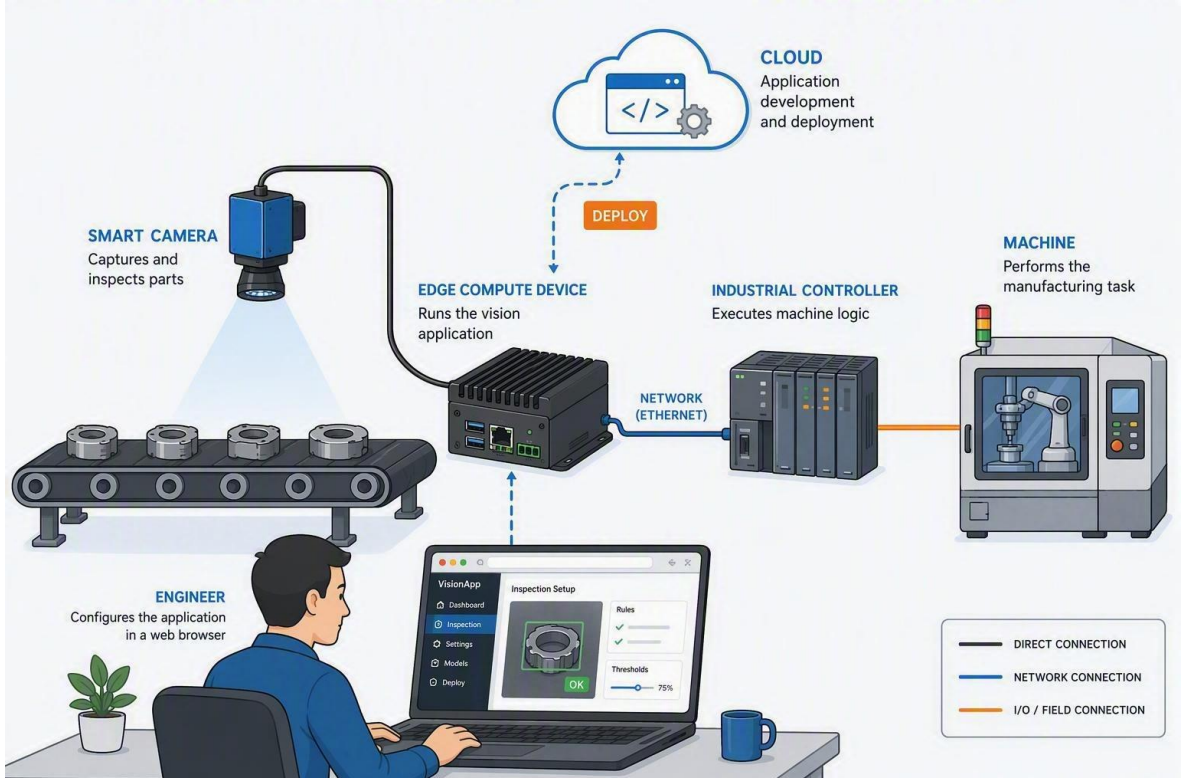
System Architecture

- Camera & app sold without compute
- User preferred edge device for app
- App supports CIP I/O functionality
- User configures app with web browser

How Margo Helps

- Margo allows lifecycle management at scale of the application, independently of its configuration of each instance
- Move from hardware-defined to software-defined

Deploying functionality to a heterogeneous fleet of devices



Margo makes multivendor app lifecycle management easier

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Virtual Controller

Managing the Device and Runtime, not just the App

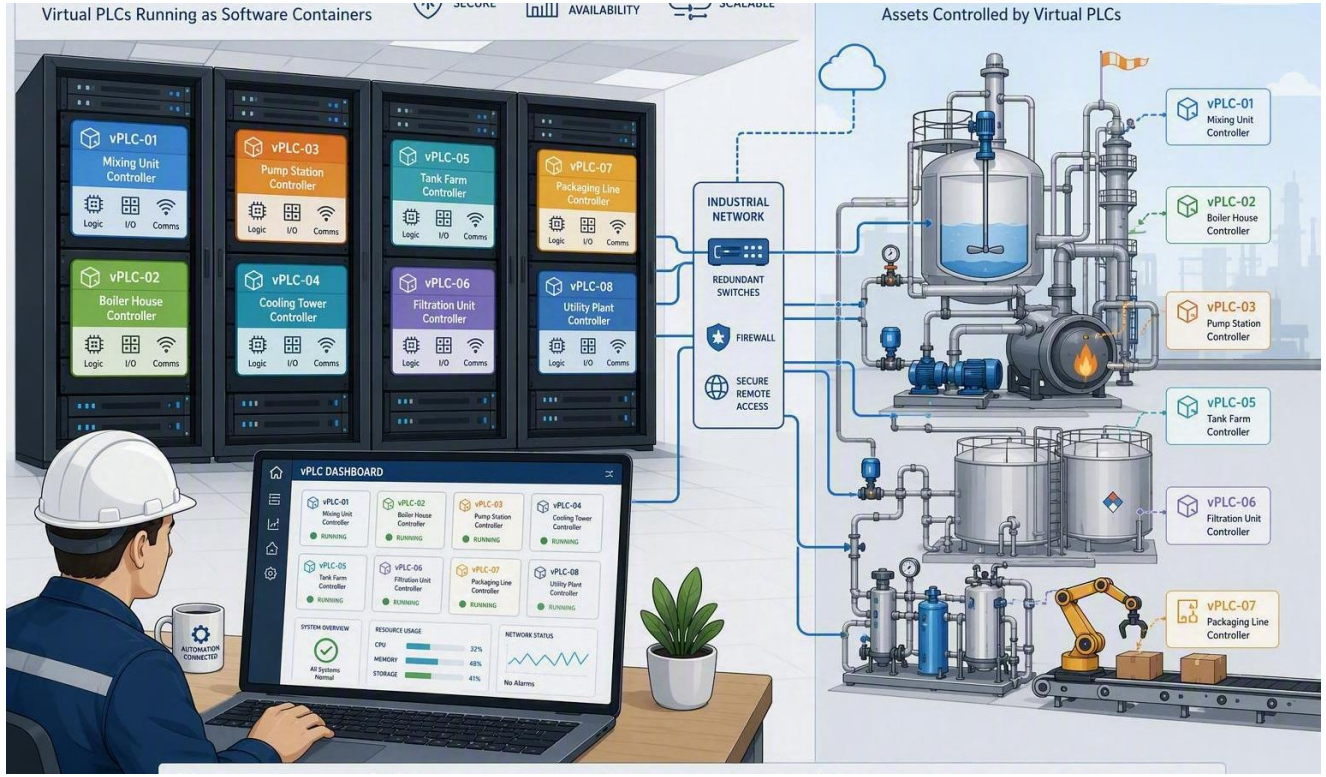
System Architecture

- Control Runtime and Device OS qualified for specific hardware platforms
- Control functionality distributed by system level tools

How Margo Helps

- Fleet management of edge devices and operating system configurations
- App Management
- Enabling Kubernetes clustering and redundancy

Managing a fleet of devices and their apps



Margo enables hardware predictability in software-defined systems

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Margo should fill gaps, not reinvent wheels

Where standards already work

Respect proven OT communication, security and device semantics. Avoid duplicating established specifications.

Where gaps remain

Interoperable deployment, lifecycle management and observation of edge workloads across multi-vendor compute infrastructure.

Where dialogue helps

Clarify boundaries, avoid conflicting assumptions and define reference integration patterns.

Principle for ODVA discussion: Margo should consume, complement and harmonize with relevant standards rather than competing with them.

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3 I Collaboration Model

Neutral dialogue with adjacent ecosystems, including ODVA.

Margo already seeks ecosystem alignment



- OPC Foundation
- Open Industry 4.0 Alliance
- Open Process Automation Forum

ODVA could be the next structured dialogue partner for EtherNet/IP-related boundary topics

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Proposed ODVA dialogue: harmonize the boundaries

Boundary clarity

What remains in EtherNet/IP/CIP and what belongs in edge compute orchestration?

Reference patterns

How should an edge workload interact with EtherNet/IP-enabled devices without duplicating protocol semantics?

Conformance expectations

Which integration claims should be testable, repeatable and vendor-neutral?

Terminology alignment

Avoid ambiguous terms such as device management, app management, fleet management and trust.

The goal is mutual reinforcement: EtherNet/IP remains strong in OT communication; Margo makes edge infrastructure easier to operate at scale.

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4l Future Alignment Areas

Device fleet management, firmware update, cybersecurity and trust.

Potential alignment and harmonization areas

Device fleet management

How edge compute devices are onboarded, described, grouped and observed without conflicting with OT device identity and semantics.

Firmware update

How edge infrastructure lifecycle and field-device update expectations are described clearly and safely.

Cybersecurity

How identities, certificates, policy and secure communications are aligned across edge orchestration and OT communication.

Trust

How conformance, test evidence and operational state create confidence in multi-vendor deployments.

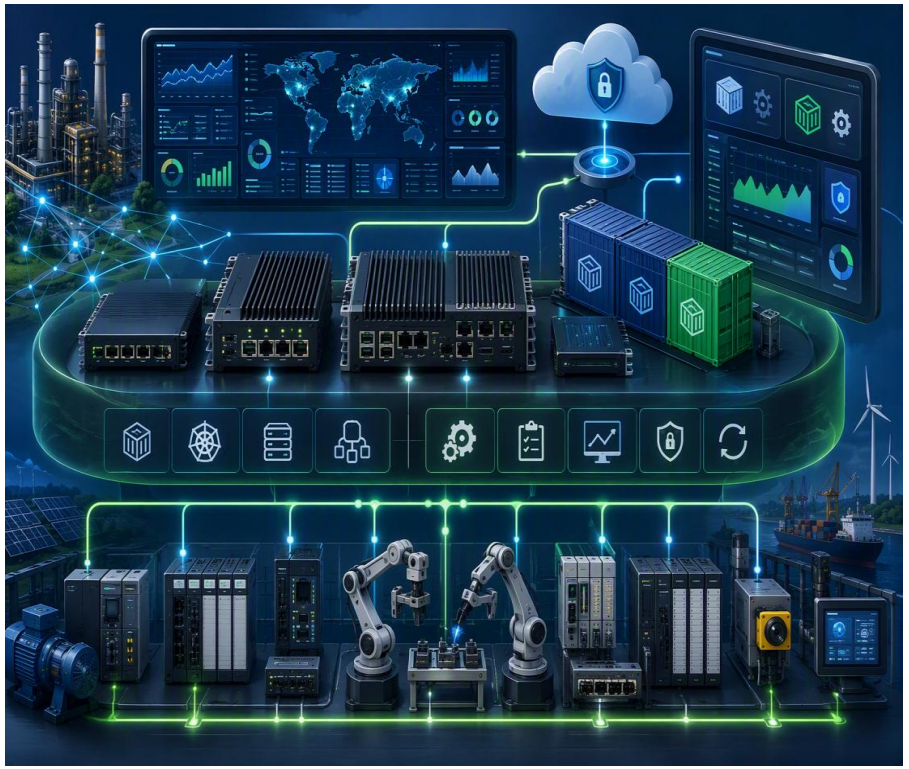
These are not proposed scope transfers. They are harmonization topics at the interface between edge infrastructure and OT systems.

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Alignment topic 1: device and workload fleet management

- Margo Workload Fleet Management uses a management interface to enable vendor interoperability between workload fleet management suppliers and device suppliers.
- Margo documentation says workload fleet managers can onboard and manage workloads on MARGO-compliant devices.
- Device capabilities reporting helps pair workloads with compatible edge devices by reporting exposed and accessible compute resources and characteristics.
- ODVA dialogue should clarify how this infrastructure view relates to EtherNet/IP/CIP device identity, semantics and conformance.



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Alignment topics 2-4: firmware update, cybersecurity and trust



Firmware update
Clarify how edge compute lifecycle updates coexist with OT field-device firmware governance and plant change-control expectations.

Cybersecurity
Align identity, certificates, policies and secure update assumptions across MARGO-managed infrastructure and EtherNet/IP/CIP environments.

Trust
Turn interoperability into auditable trust through clear scope, descriptors, test evidence and operational status.

Boundary rule: harmonize assumptions, do not duplicate specifications.

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Complementary layers. Shared industrial outcome.



EtherNet/IP should remain the trusted layer for deterministic OT field device process data. Margo should remain the interoperable layer for edge compute infrastructure. The valuable next step is an ODVA-MARGO dialogue on harmonized boundaries: device fleet management, firmware update, cybersecurity and trust.

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THANK YOU