

NEMO

Next Generation Meta Operating System

INTEGRATING NETWORK & SERVICE MANAGEMENT IN THE CLOUD-EDGE-IOT CONTINUUM



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Opportunities and challenges in AI, IoT, edge & cloud



AI market size is expected to reach \$407 billion by 2027

Forbes

64% of businesses expect AI to increase productivity

Multimodal AI

Generative AI

Data

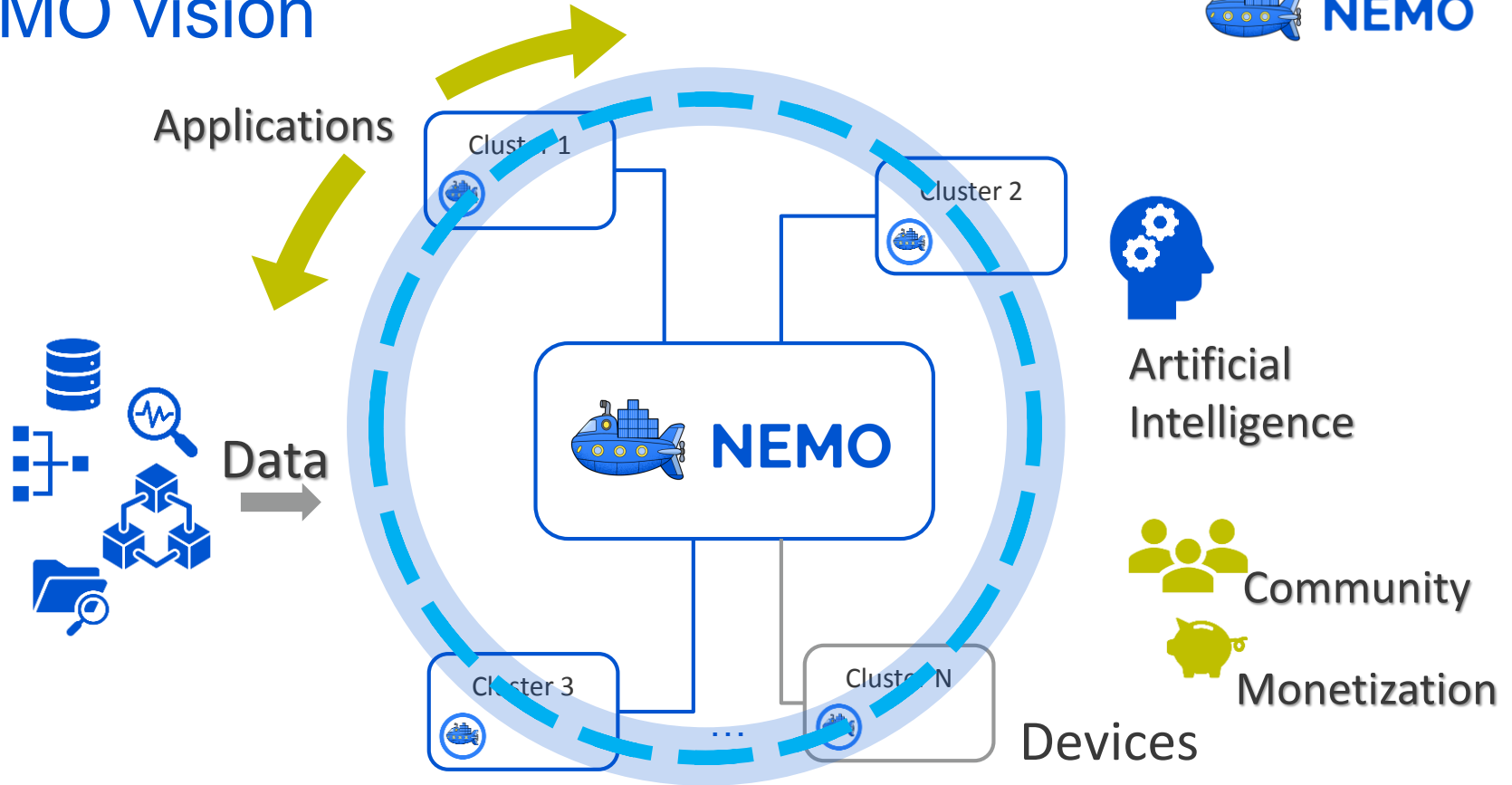
IoT

GPU shortages and cloud costs

Customized local models and data pipelines

Energy & Carbon efficiency

NEMO vision

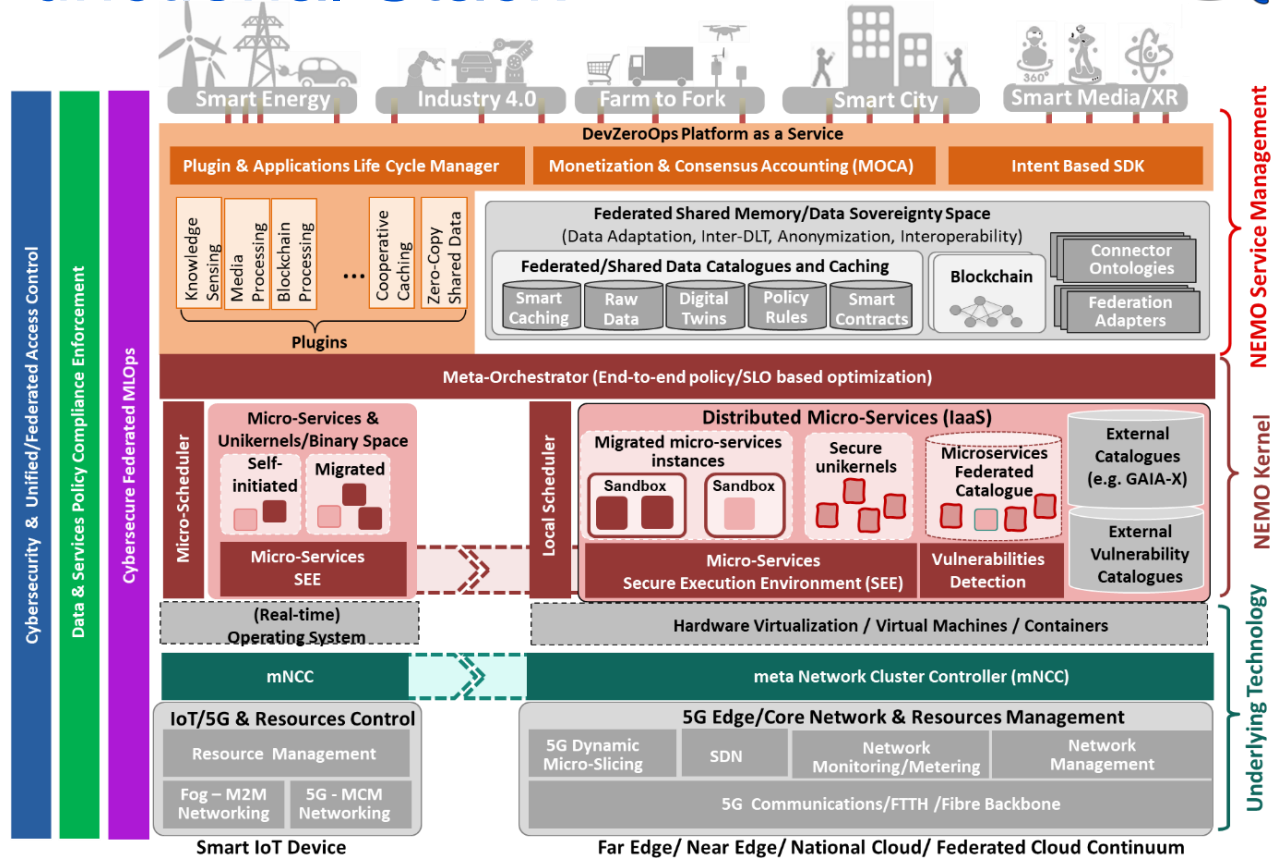


NEMO aims to build the **meta-Operating System (metaOS)**, which will enable **multi-cluster** and **multi-network orchestration** of **containerized workloads** across the **IoT, edge and cloud continuum**.

As a (meta-)OS, NEMO will be **user-centric**, facilitating users to develop and deploy on top of NEMO.

Moreover, NEMO will **enable** cloud and infrastructure providers to **integrate** their computing and networking resources **into NEMO's infrastructure**.

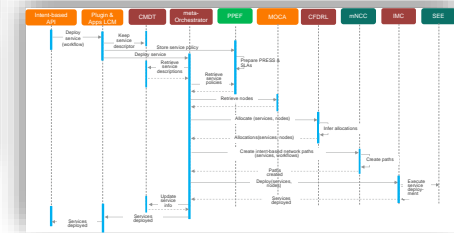
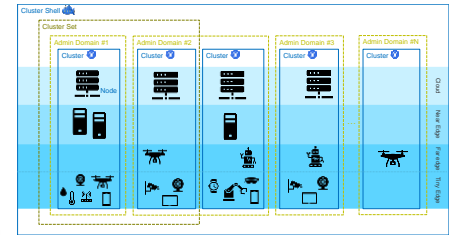
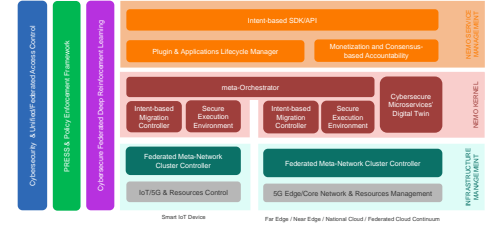
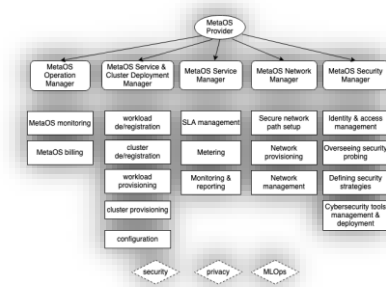
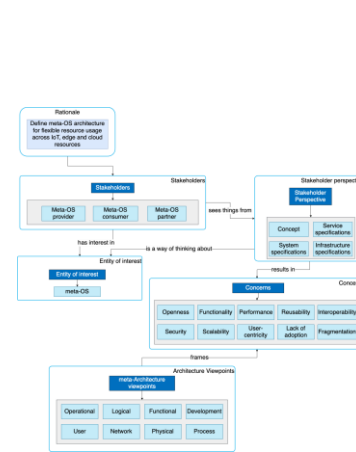
NEMO Functional Stack



MetaOS Meta-architecture



- **NEMO Meta-Architecture Framework (MAF)** as a reference for the description of metaOS architecture
- based on conceptual model defined in ISO/IEC/IEEE 42010 for architecture descriptions
- **NEMO meta-architecture**, following the proposed MAF (*Network, User, Logical, Functional and Process views*)

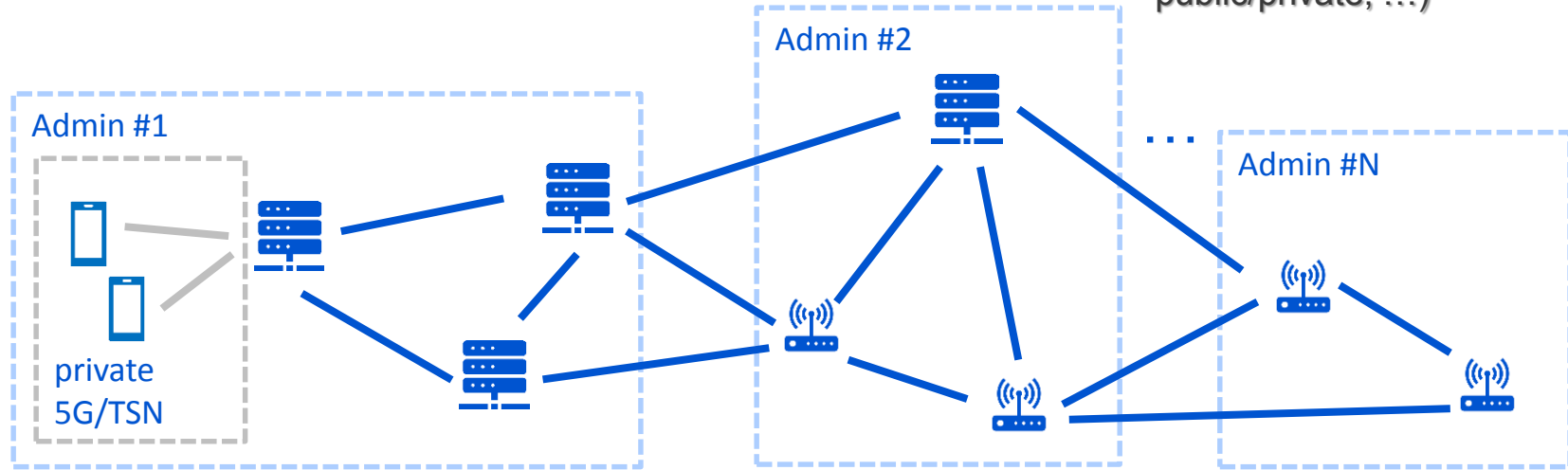


Federating Network Management

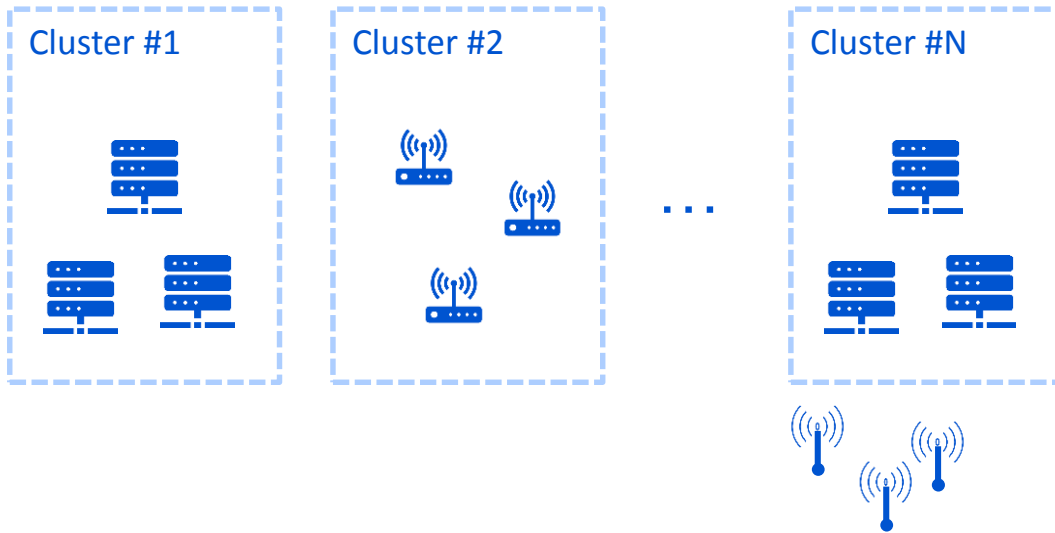


Federated meta Network Cluster Controller

- Intent-based
- Multi-domain
- Multi-path
- Multi-modal (5G, wired, public/private, ...)



Homogenizing workload orchestration



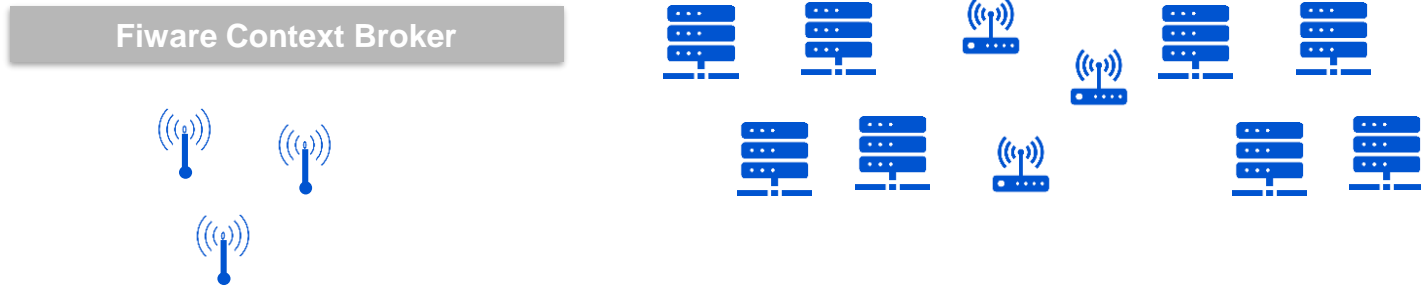
- homogenized workload orchestration
 - multi-cluster
 - multi-domain
- device diversity (IoT, edge, cloud)
- low-end IoT devices
- Observability
- Capitalizing on energy and carbon efficiency

Democratizing data

- Data integration
- Respecting data privacy and sovereignty



NEMO Intercommunication Module (pubsub)



Artificial Intelligence liberation



**Federated
MLOps as
a Service**



**Federated &
Reinforcement
Learning**

Cybersecure Federated Deep Reinforcement Learning



**Collaborative
Training**



**Intrusion
detection &
mitigation**

A platform aimed as community project



- Common API for external users
 - exposing NEMO interfaces
- Extensions as NEMO plugins
- Open source
- Open Calls? (Extensions and Use Case validation)

Thank you for your attention



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<https://meta-os.eu/>



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