#HorizonEU

HORIZON-CL4-2021-DATA-01-05:

Future European Platforms for the Edge: Meta Operating Systems

2021 – 2027

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Research and Innovation

Trend towards the Edge and Far Edge

Strong growth of DATA forecasted

- Through Industrial *IoT* + *Cyber Physical Systems* connecting local automation islands
- Central cloud storage raising energy profile and demands for transport networks

Growing need for COMPUTATION close to the data:

- Real-time / safety for **deterministic and highly reliable automation** + control processes
- **Data security / privacy** through reducing the cyber-attack exposure
- **Energy efficiency** / carbon footprint / environmental footprint
- Data Aggregation and analytics along the **Computing Continuum**

Data Processing in 5 years: 20% Cloud – 80% Edge

- A Decentralised Approach with distributed and embedded intelligence
- A (private) 5G networks for mobile automation, AGVs and integrated logistics

Technology Drivers

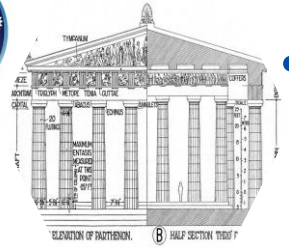
Reasoning '*on the go*' (Edge and Core)

Real-time response

Enhanced Secure Edge

Green solutions

Cloud-edge-IoT Orchestration

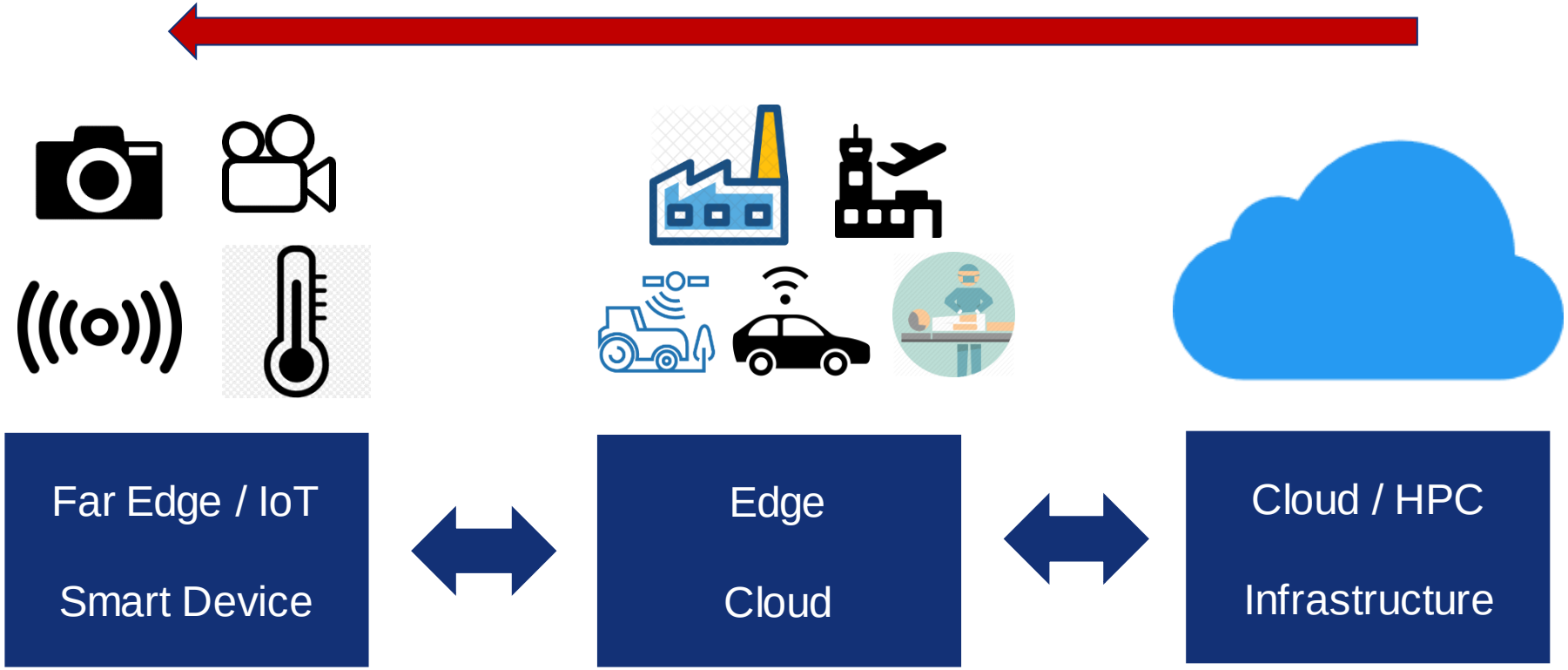


Seamless Service Architecture

European Commission

Cloud-Edge-IoT Orchestration

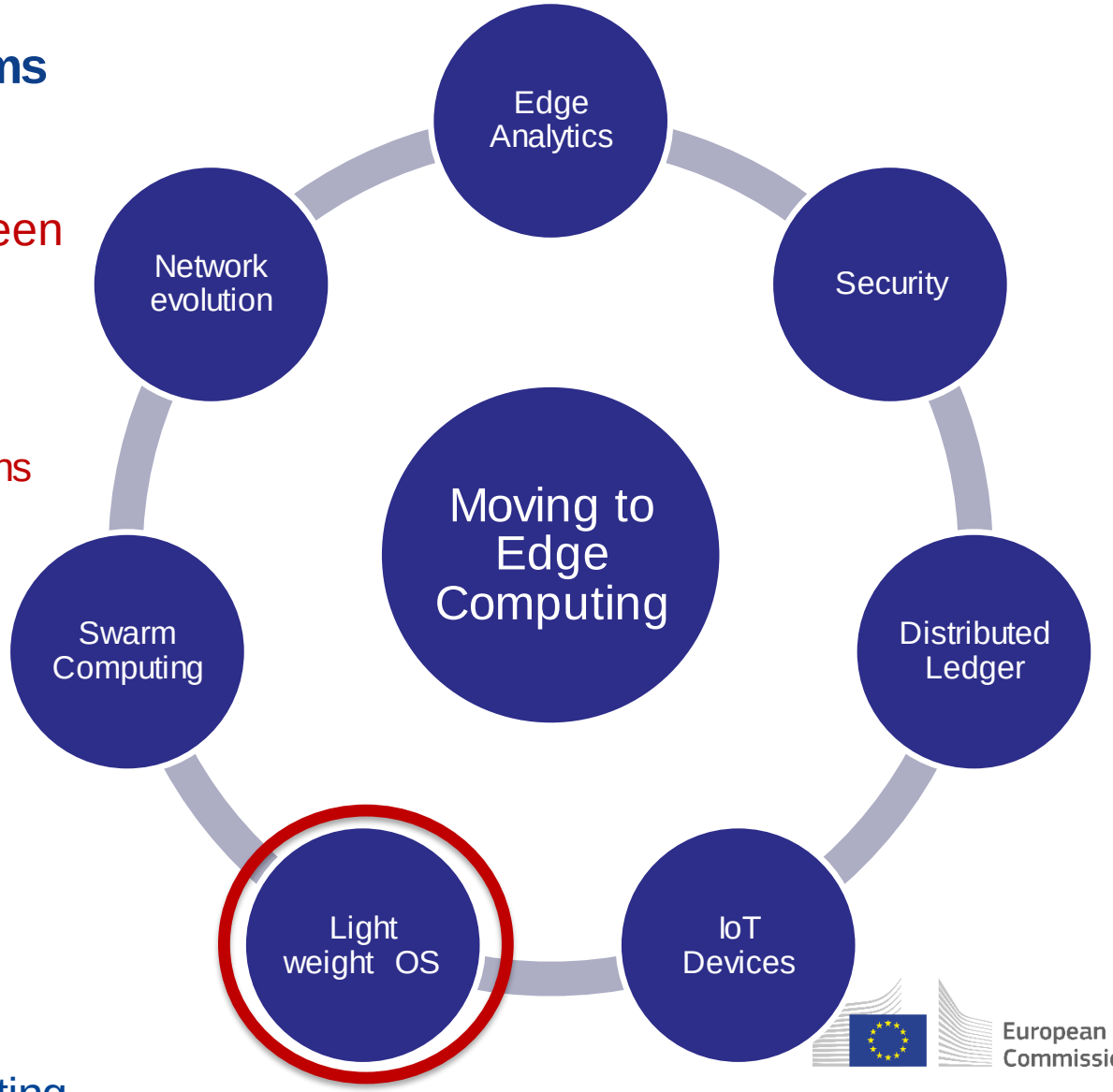
Trend/Paradigm Shift: from Cloud to Edge
Bringing compute resources closer to the data



Federating far edge resources ad hoc via 5G
to provide cloud resources close to the edge

To support future hyper-distributed Applications

- **Architecture, methods, tools, platforms**
  - A **glue between Cloud and Control**
  - **Light-weight OS** for orchestration between cloud-edge-devices
  - **NG internet-enabled automation**
    - Virtualizing computing + network functions
  - **Device integration** at system-level
    - multi-state analytics and digital twinning of underlying objects
  - Build on adhoc communication / not limited to 5G
  - AI training and inference at the edge



Further background:
Event Report Next Generation IoT and Edge Computing

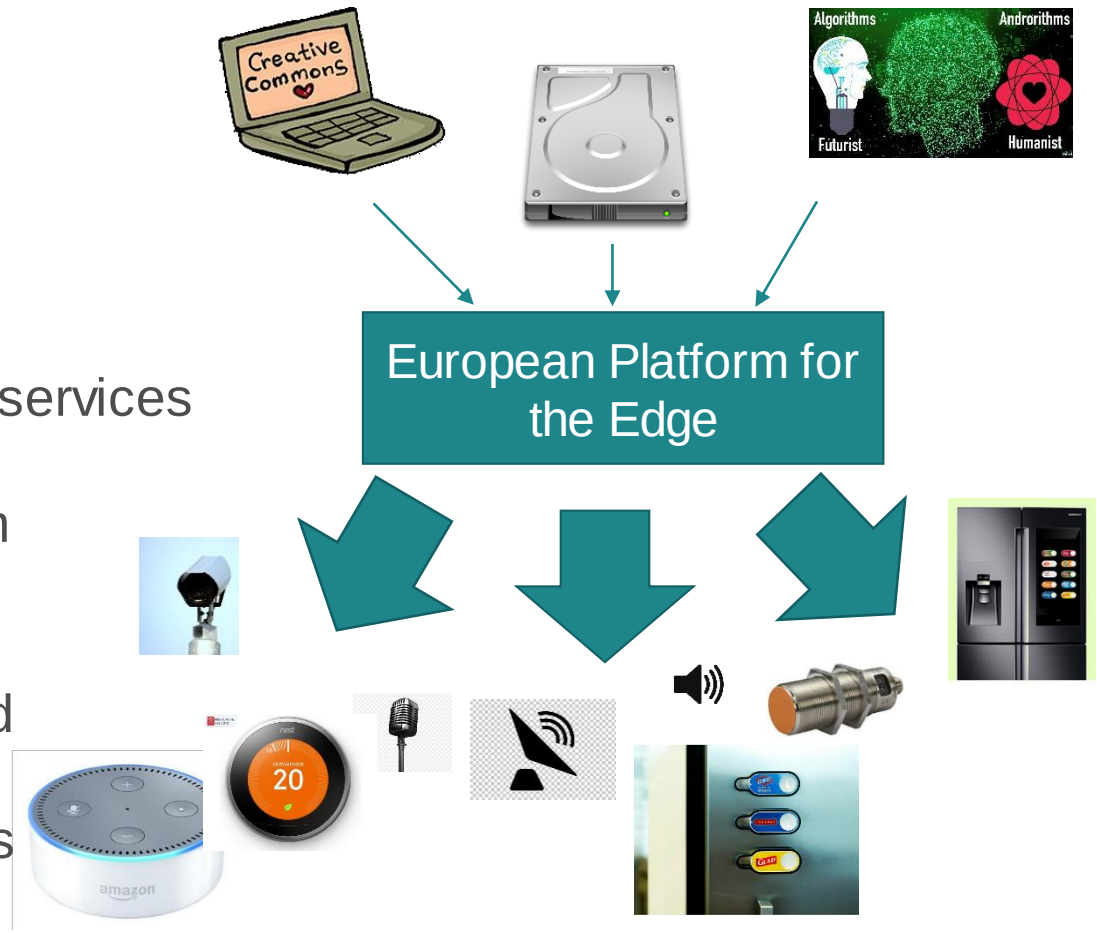
European Commission

Future European platforms for the Edge

From Cloud to Edge to IoT:

➢ Key elements

- Improve end-to-end response time
- Optimize operation of IoT systems and services
- Optimize the CO2 footprint, benefit from the use of renewable
- Orchestration across device-edge-cloud
- Validation in at least 3 different domains



HORIZON-CL4-2021-DATA-01-05:
Future European platforms for the Edge: Meta Operating Systems

- **Type of Action: Research and Innovation Action (RIA)**

Opening: 22 June 2021	Deadline: 21 October 2021
Budget: EUR 54 million	**EU contribution per project**: EUR 8 – 12 million

- **Scope: addressing R&I and strengthen EU's supply and value chains:** develop meta operating systems for the edge; (*) integrating relevant elements of computing, connectivity, IoT, AI and cybersecurity, (*) enable cloud and edge computing orchestrations by bringing computation, data and intelligence closer to where the data is produced (sensors and devices); (*) by which volume, variety, interoperability, and velocity should be handled efficiently and securely.
  Validation through proof of concept or prototype implementations for at least 3 different applications in domains such as mobility, logistics, manufacturing, energy and other utilities, buildings or farming
  .

https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/cluster-4-digital-industry-and-space_en

European Commission

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- **Expected Outcome:** Proposals are expected to contribute to (all) of the following expected outcomes:
  * **Next generation of higher-level (meta) operating systems** for the smart Internet of Things supported by advanced concepts such as ad-hoc clouds, time-triggered IoT, and decentralized intelligence .
  * **European Autonomy in data processing at the edge** by building open platforms + open APIs
  * Achieve **Trust in meta operating systems in industrial ecosystems** by open standards and open source

- **Cascading Grants:** The maximum amount to be granted to each third party is EUR 150.000 in order to allow third parties to support industry, in particular SMEs, in take-up of emerging edge topologies, for populating and validating relevant use cases through experiments
  * Market Perspective: Emergence of an open edge **ecosystem including midcaps, SMEs and start-ups** including business models to foster the up-take of an edge operating system,

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European Commission

Thank you!

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http://ec.europa.eu/horizon-europe

https://digital-strategy.ec.europa.eu/en/policies/next-generation-internet-things