Fostering the Development of Next-generation Edge & Cloud Technologies in Europe
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Chair of the Cloud-to-Edge WG

CEO of OpenNebula Systems
Increasing Dependence on Cloud Computing

Cloud is a key enabling technology of strategic importance to Europe’s industry

- Data processing and sharing capacities required for data-driven innovation.
- Digital transformation of businesses and the public sector.
- New, added-value products and services.
- Uptake and effective execution of new technologies such as AI and IoT.

41% of enterprises use the cloud

73% are ‘highly dependent’ on cloud

Cloud Computing - Statistics on the use by enterprises (December 2021)
Strategic Dependency of **EU Cloud Market**

The EU is heavily dependent on non-EU cloud services, infrastructure, and technologies.

**Cloud Services**

- European share has declined from 26% to <13%

**Infra Software**

- None of top competitors are from EU
- Led by US companies

**Open Source Software**

- Marginal (<5%) role of EU Code
- Led by non-EU companies
- US-based foundations

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Source: Synergy Research Group (September 2022)

Source: Statista (October 2022)

Source: Stackalytics (January 2023)
Edge Computing Opportunity

Opening up new opportunities while disrupting current business models

- **2018**
  - 80% Centralised computing facilities
  - 20% Smart connected objects

- **2025**
  - 20% Centralised computing facilities
  - 80% Smart connected objects

- >10,000 edge nodes by 2030
- 75% of cloud uptake by EU enterprises in 2030

Source: European Strategy for Data

- Edge and Fog Computing
- European Sovereign Cloud Stack
- Open source Multi-cloud
- Highly-distributed Intelligence
- Optimal Workload Management
- Cloud and Edge Security Solutions
- Solutions for Smart Procurement
- Green and Sustainable Solutions
EU Cloud Alliance

**Aim**

Defining the enabling technologies for the next generation edge-to-cloud continuum

**WHO**

- To bring together **Businesses, Member States** representatives, and relevant experts.

**WHAT**

- To assist the European Commission in designing the detailed **business, investment and implementation plan** to deploy the **next generation cloud capacities** for the public and private sector to achieve the **2030 European Digital Compass** targets.

**HOW**

- To foster the development and deployment of the **next generation of secure, low-carbon, and interoperable cloud and edge services and infrastructure** for Europe as envisaged in the **European Data Strategy**.
EU Cloud Alliance Technology Focus

Achieve Technology Leadership in three main trends

- Increase **distribution and decentralisation of data processing capacities** across the **computing continuum**.

- Promote an **alternative European model** to the offerings of **cloud hyperscalers**.

- Meet the highest standards in terms of:
  - Data protection, security, climate neutrality.
  - Resource efficiency, interoperability and portability.
EU Cloud Alliance Timeline
Built on the European Data Strategy and endorsed by the Declaration on European Cloud

- **15 February 2023**: Publication of Industrial Roadmap developed by the Alliance Cloud to Edge Working Group
- **01 December 2022**: First General Assembly and official meeting of the Alliance Forum
- **16 December 2021**: First working-level meeting of the Alliance
- **14 December 2021**: CEO kick-off meeting of the European Alliance for Industrial, Data, Edge and Cloud hosted by Commissioner Breton
- **19 July 2021**: Official launch of the European Alliance for Industrial, Data, Edge and Cloud
- **07 May 2021**: 27 European CEOs submit the “European industrial technology roadmap for the next generation cloud-edge offering” to Commissioner Breton
- **05 May 2021**: Commission announced the European Alliance for Industrial, Data, Edge and Cloud in the updated European industrial strategy
- **15 October 2020**: 27 EU Member States declare their will to collaborate on building the next generation of cloud in Europe
- **19 February 2020**: Publication of the European Data Strategy
The work is facilitated by the European Commission’s Directorate-General for Communications Networks, Content and Technology (DG CONNECT).

The operational work is driven by an appointed Steering Committee and relevant Working Groups and Task Forces.

(+40 members so far)
WHO
● To bring together the main EU Industry players in cloud computing

WHAT
● To prepare a strategic cloud and edge technologies roadmap, which should be regularly updated after the first version is made available

● To identify investments for joint development and deployment of the next generation of European cloud and edge technologies that meet the needs of European businesses
Cloud to Edge WG Vision

Datacenter, Cloud, and Edge are part of the same Computing Continuum that integrates various types of cloud capabilities.

<table>
<thead>
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<th>Typical distance</th>
<th>&lt; 1 km</th>
<th>1-100 km</th>
<th>100-1000 km</th>
<th>&gt; 1000 km</th>
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</thead>
<tbody>
<tr>
<td>Average latency *</td>
<td>1 ms</td>
<td>2-5 ms</td>
<td>10-20 ms</td>
<td>&gt; 20 ms</td>
</tr>
</tbody>
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**SCOPE OF THE EDGE & CLOUD ROADMAP**

- **EDGE**
  - In-country Data Center
  - Central Data Center
  - Near Premise
  - Aggregation Node
  - Cell Site

- **CLOUD**
  - Central Office
  - Mini DCs
  - 10s

- **ON-DEVICE**
  - ON-PREMISES
  - ON-PREMISES
  - FAR EDGE
  - NEAR EDGE
  - <10s
Cloud to Edge WG Task Forces

Chair: [Open Nebula]
Co-chairs: [Capgemini, SAP]

1. EU CLOUD / EDGE COMPUTING LANDSCAPE
2. DEFINITION OF TECHNICAL SOVEREIGNTY FOR EDGE/CLOUD
3. CLIMATE NEUTRALITY AND RESOURCE EFFICIENCY
4. CYBERSECURITY
5. INTEROPERABILITY AND MULTI-PROVIDER SERVICES
6. EDGE AND DATA CENTRE INFRASTRUCTURE
7. NETWORK INTEGRATION AND CONNECTIVITY
8. CLOUD / EDGE FOUNDATION INFRASTRUCTURE
9. INFRASTRUCTURE SERVICES
10. PLATFORM SERVICES

Working Group lead by 3 companies, with Task Forces of 5-10 members coordinated by 2-3 co-leaders
Cloud to Edge WG Members

45 industrial members representing cloud providers, telco operators, technology providers and services providers

[Image of logos]
Cloud to Edge WG New Roadmap

Working on an updated roadmap that will provide recommendations to EC Programmes

Source: European Commission
Cloud to Edge WG New Roadmap

Working on an updated roadmap that will provide recommendations to EC Programmes

- **Use Cases** that will be strategic for future edge-cloud in the EU.

- **Technology Priorities** with activities for the specification, research, development, and innovation of the next-generation cloud-edge continuum capabilities.

- **Deployment Priorities** with activities for the coordination and deployment of cloud-to-edge infrastructure and services to enable the initial roll-out of next-generation use cases on a European-wide scale.

- **Deployment Challenges** of the cloud-edge continuum in the European market.
EU Cloud Alliance Join Us!


MAIN INTERESTS?
- Interoperability & multi-cloud approaches.
- Climate-neutral & sustainable cloud.
- Edge deployment.
- Sovereign cloud stack, encompassing the edge.
- Defence cloud.
- Governance rules and standards for data processing services.
- Cloud for European common data spaces, including coordination with the Support Centre for data sharing and the European Data Innovation Board.
- Telco edge cloud.

Source: European Commission
“It may be too late to replicate hyperscalers, but it is not too late to achieve technological sovereignty in some critical technology areas”

President Ursula Von der Leyen

My Agenda For Europe: Political Guidelines For The Next Commission (2019-2024)

“When it comes to digital, Europe's resilience will depend on our ability to develop the next generation of cloud and edge capacities and invest massively in developing European alternatives to reduce our current dependencies”

Commissioner Thierry Breton

A European Sovereignty Fund for an industry “Made in Europe” (September 15, 2022)
Thanks!

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