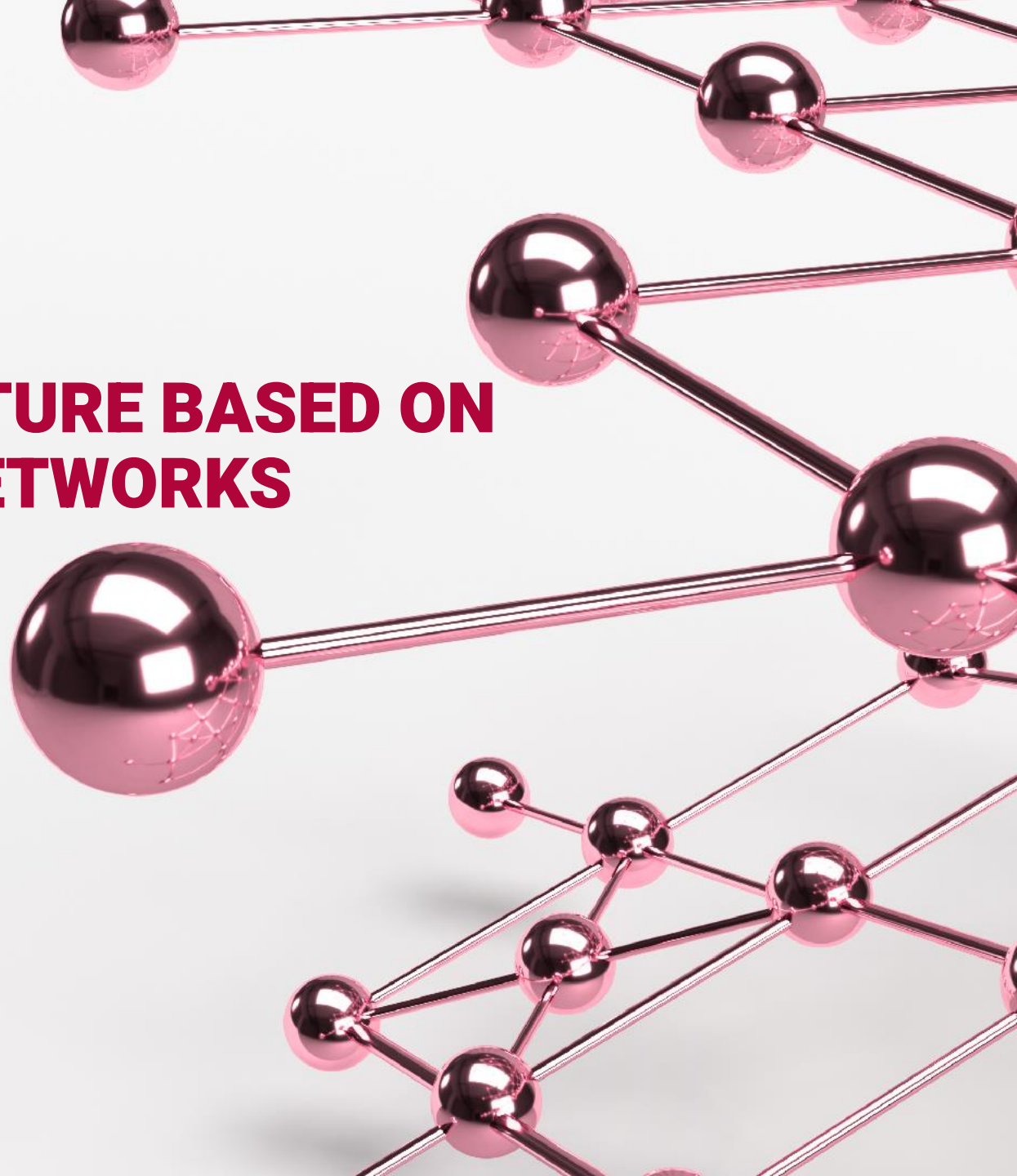
DESIRE6G

DESIRE6G – A 6G ARCHITECTURE BASED ON DEEPLY PROGRAMMABLE NETWORKS



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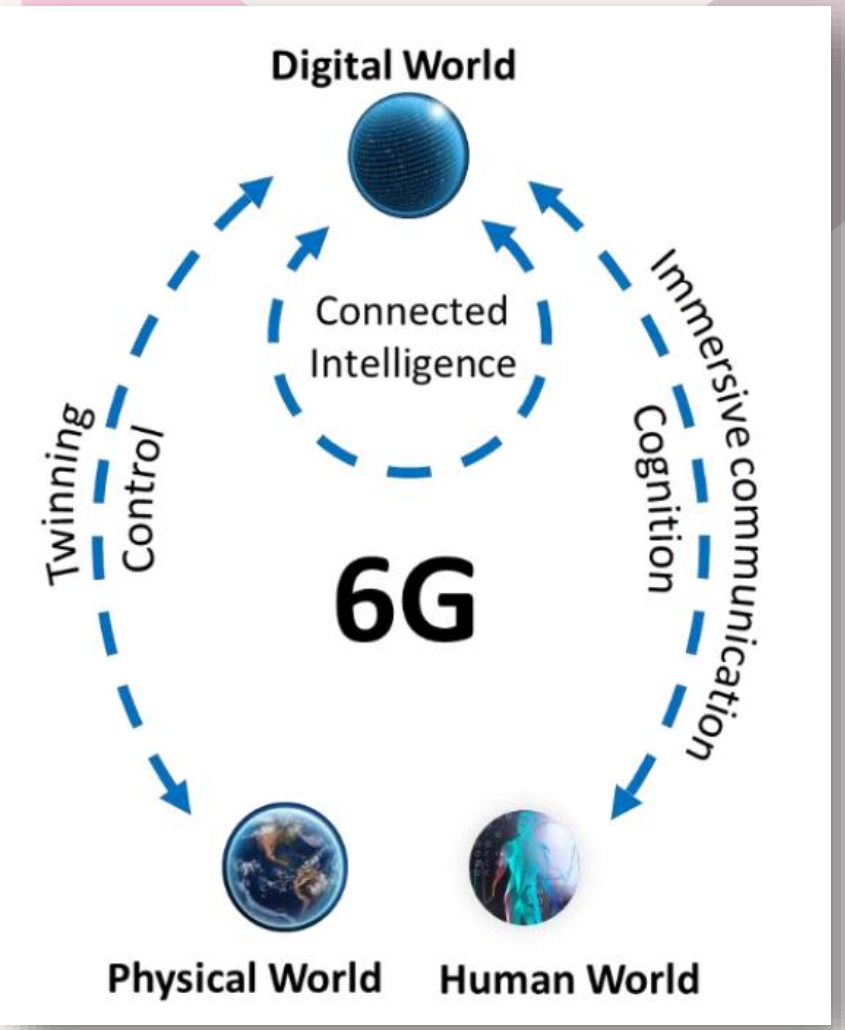
Co-funded by the European Union

6GSNS

06/12/2023

WHAT IS 6G?

- No general globally-accepted vision on 6G
- European vision (6G-SNS)
  - Massive digitalization – Phy representation
  - Connected intelligence – Awareness, real-timeness
  - Network as Compute Fabric - Decisions, actions
- Key values
  - Sustainability
  - Inclusion
  - Trustworhiness



Source: https://5g-ppp.eu/wp-content/uploads/2021/06/WhitePaper-6G-Europe.pdf

DEEP PROGRAMMABILITY & SECURE DISTRIBUTED INTELLIGENCE FOR REAL-TIME END-TO-END 6G NETWORKS

Project coordination:
University of Amsterdam

Technical coordination:
Ericsson Hungary

Duration:
01/01/2023 - 31/12/2025

Total Cost:
6.227.919€

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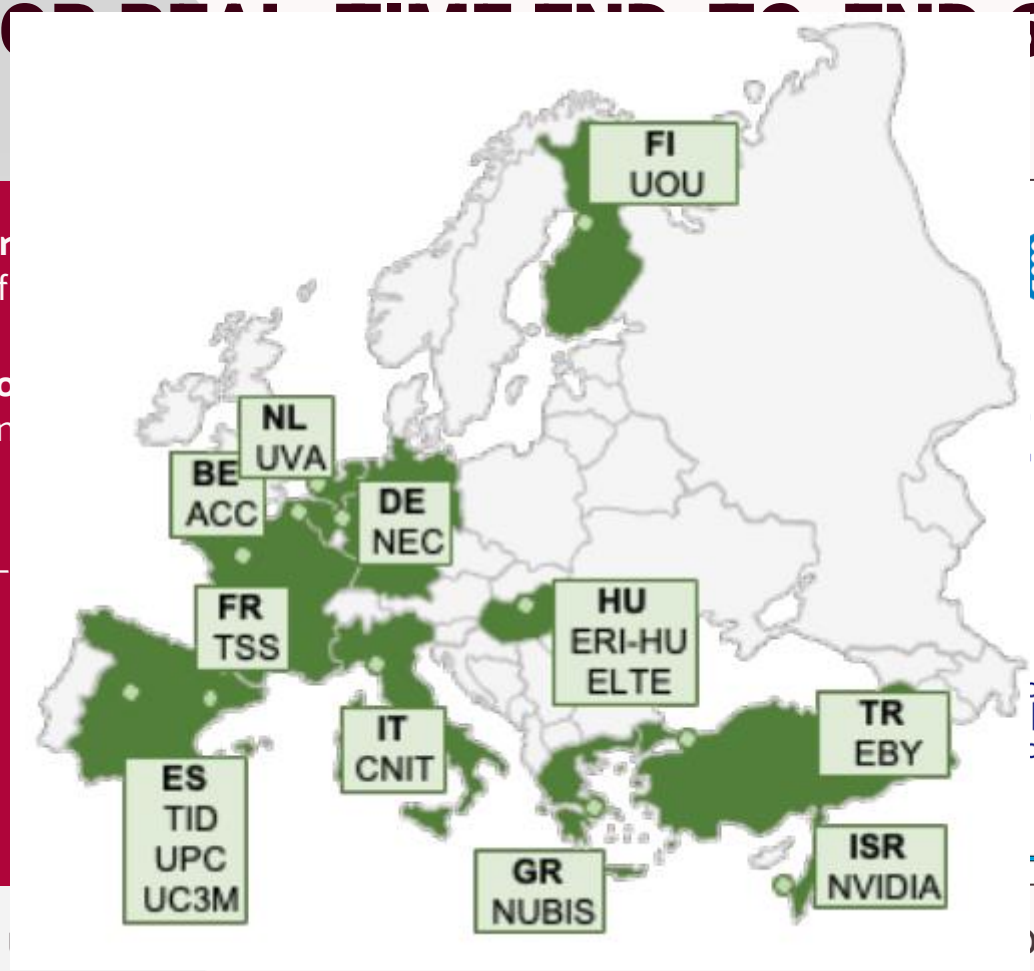

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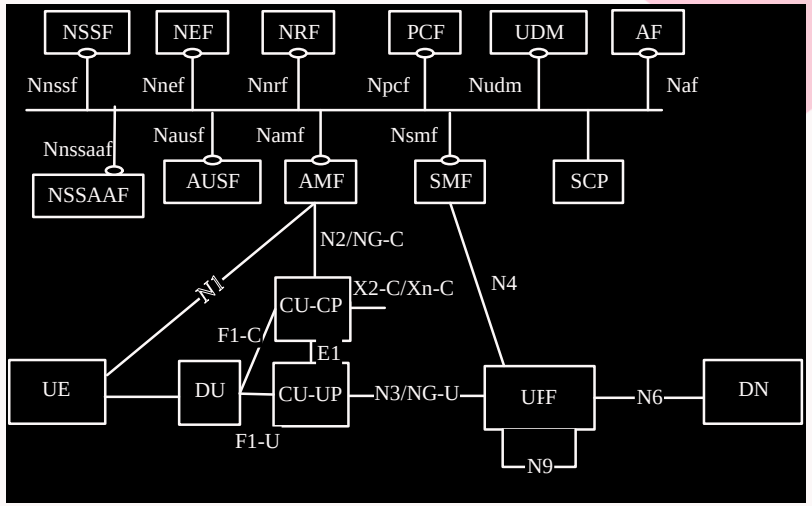
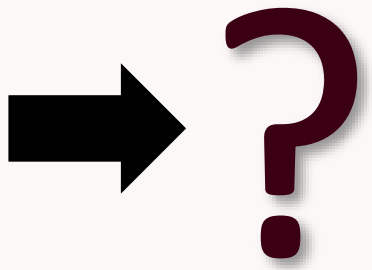
ARCHITECTURAL CHALLENGES FOR 6G

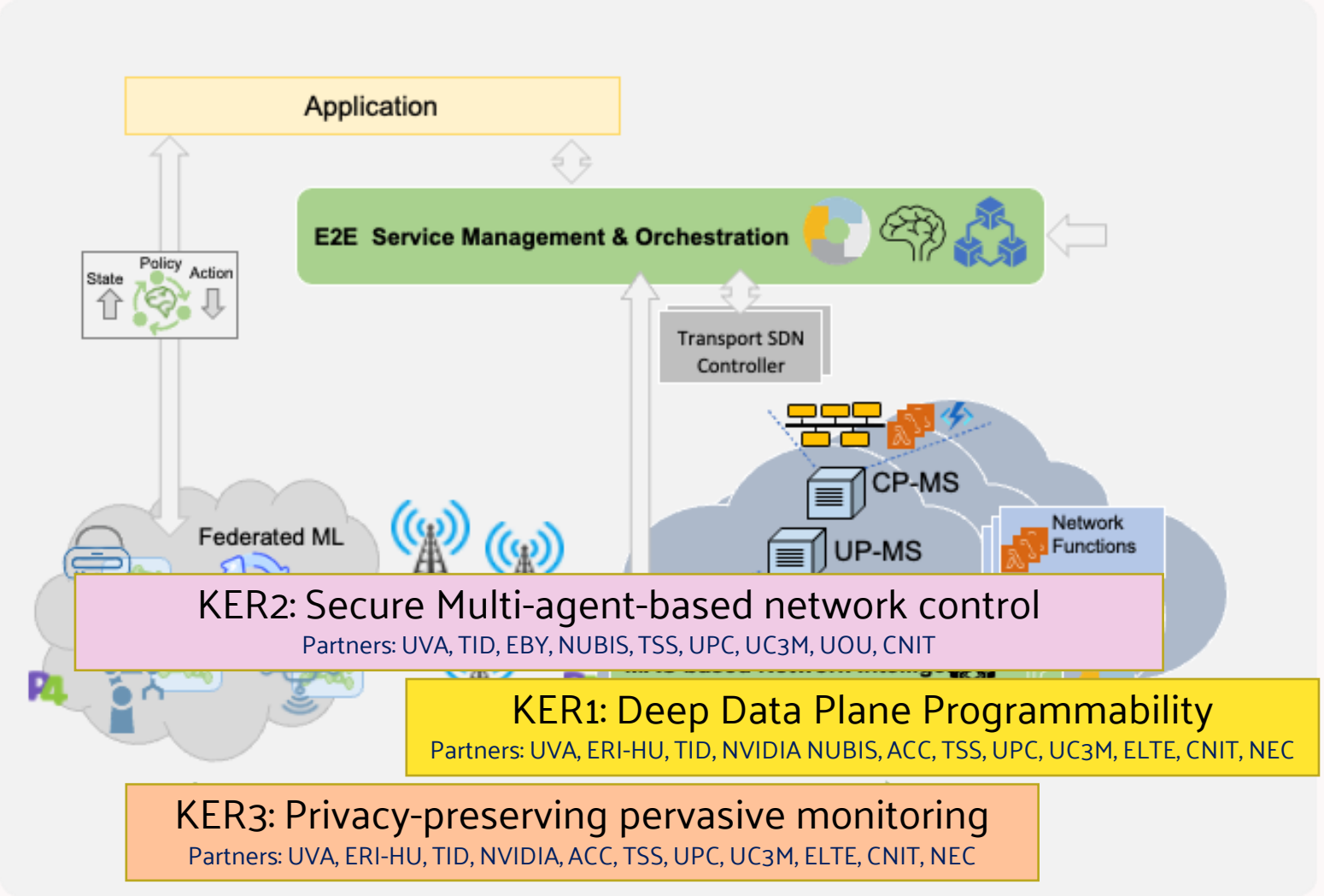
- Main questions of all architecture discussions:
  - How should the functions be grouped / split?
  - How should the interfaces and procedures look like?

- 5G was addressing complexity issues, but only with partial success:
  - “Service Based Architecture” (SBA) became heavier and less cloud-native than expected
  - User plane remained mainly node-based, no “cloud-native” evolution happened there
  - Too detailed standards, less room for vendor innovation
  - The standard does not really count on using IT frameworks/tools to simplify the architecture





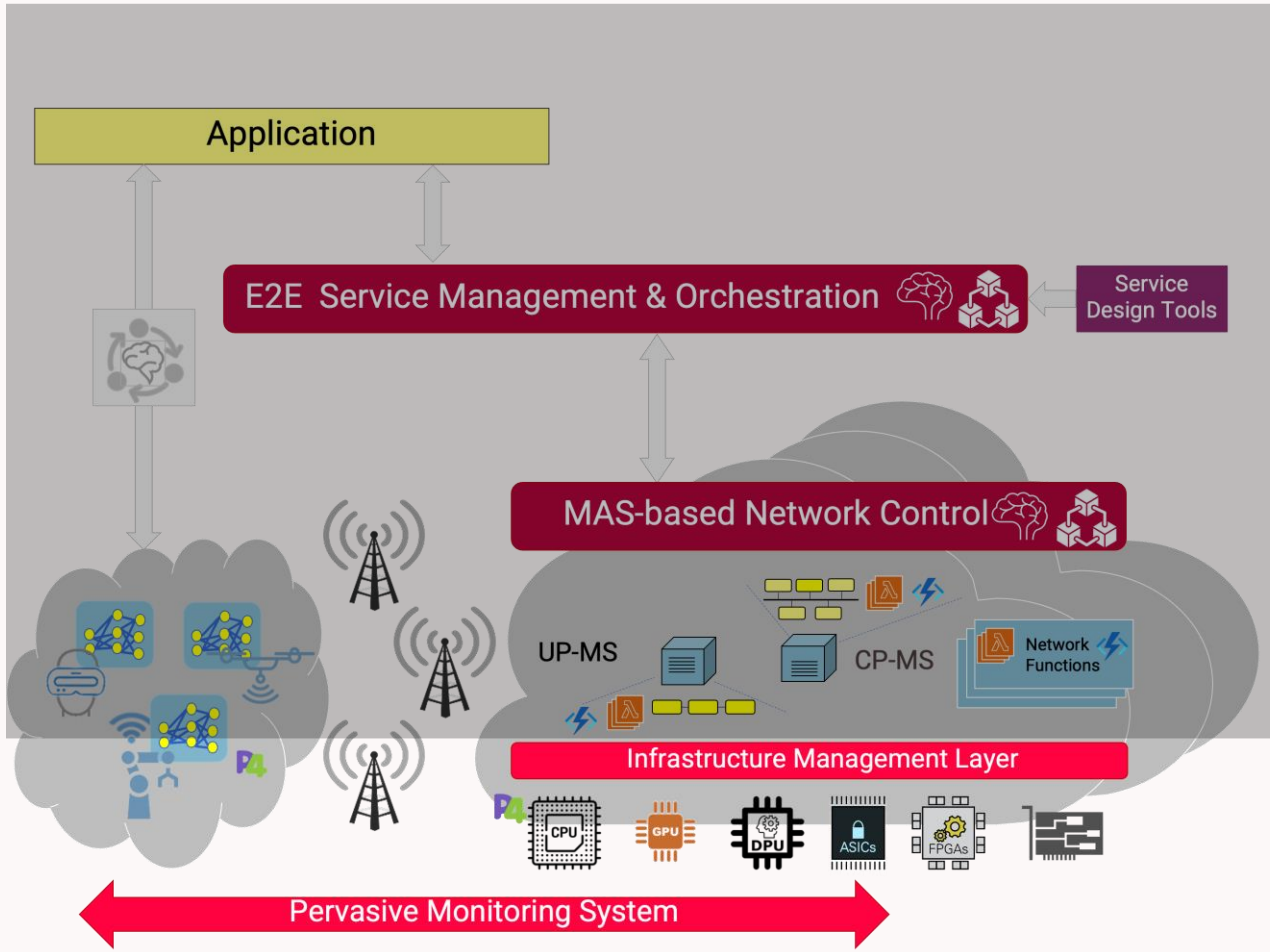
D6G ARCHITECTURE



Innovation

- Intelligent Applications
- End-to-end and per-domain intent-based orchestration
- Lightweight blockchain-based federation
- xURLLC services
- Serverless Architecture
- RAN-Core Convergence
- Cloud-to-edge continuum
- Secure Distributed Intelligence
- E2E Data Plane Programmability
- Multi HW acceleration
- E2E Telemetry

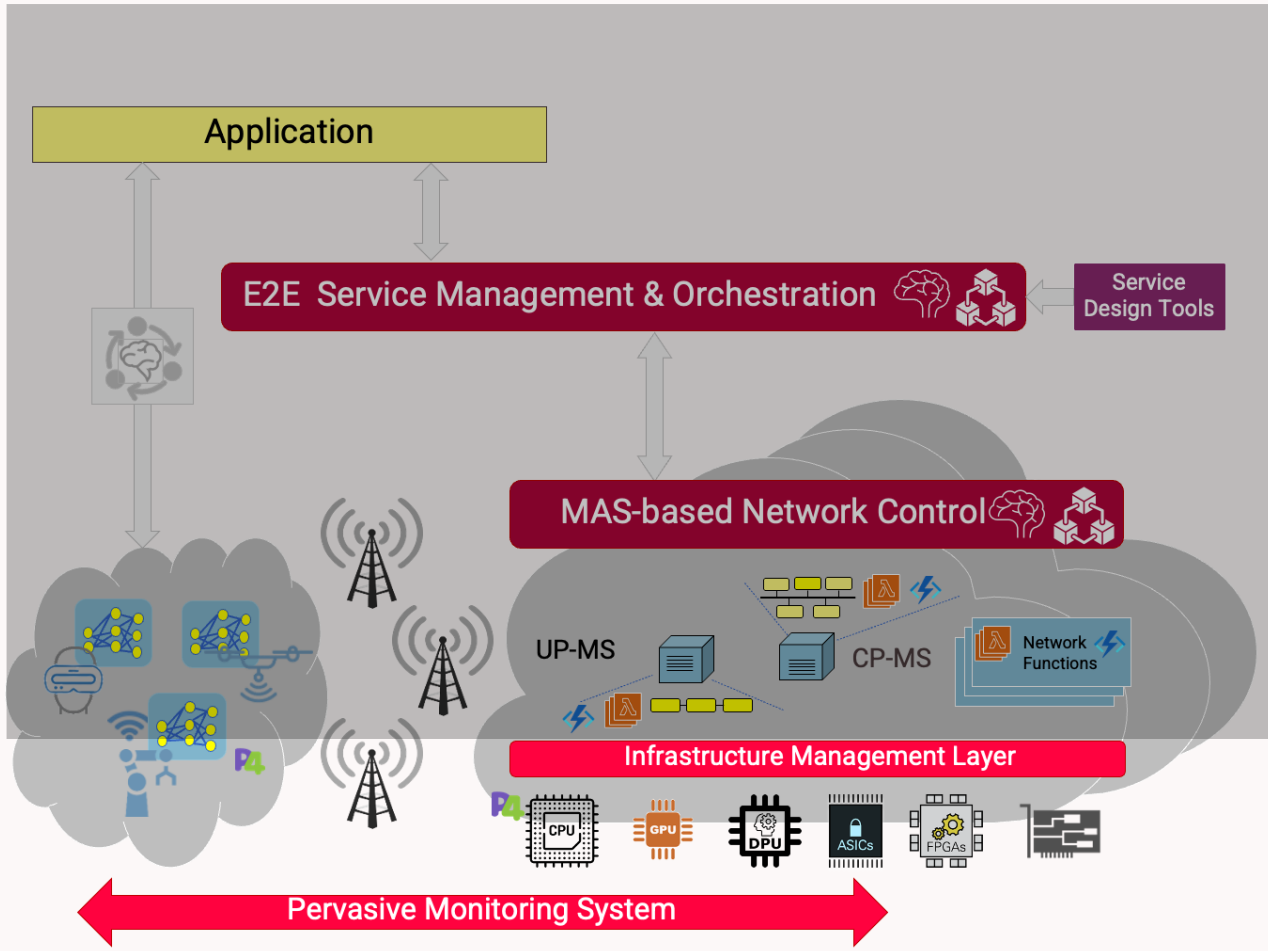
DEEP PROGRAMMABILITY



Innovation

- xURLLC services
- Edge Intelligence
- Intent-based orchestration
- Blockchain-based federation
- Secure distributed intelligence
- RAN-core convergence
- Edge-to-Cloud continuum
- Serverless architecture
- **E2E programmable data plane**
- **Multi HW acceleration**
- E2E network telemetry

E2E NETWORK VISIBILITY



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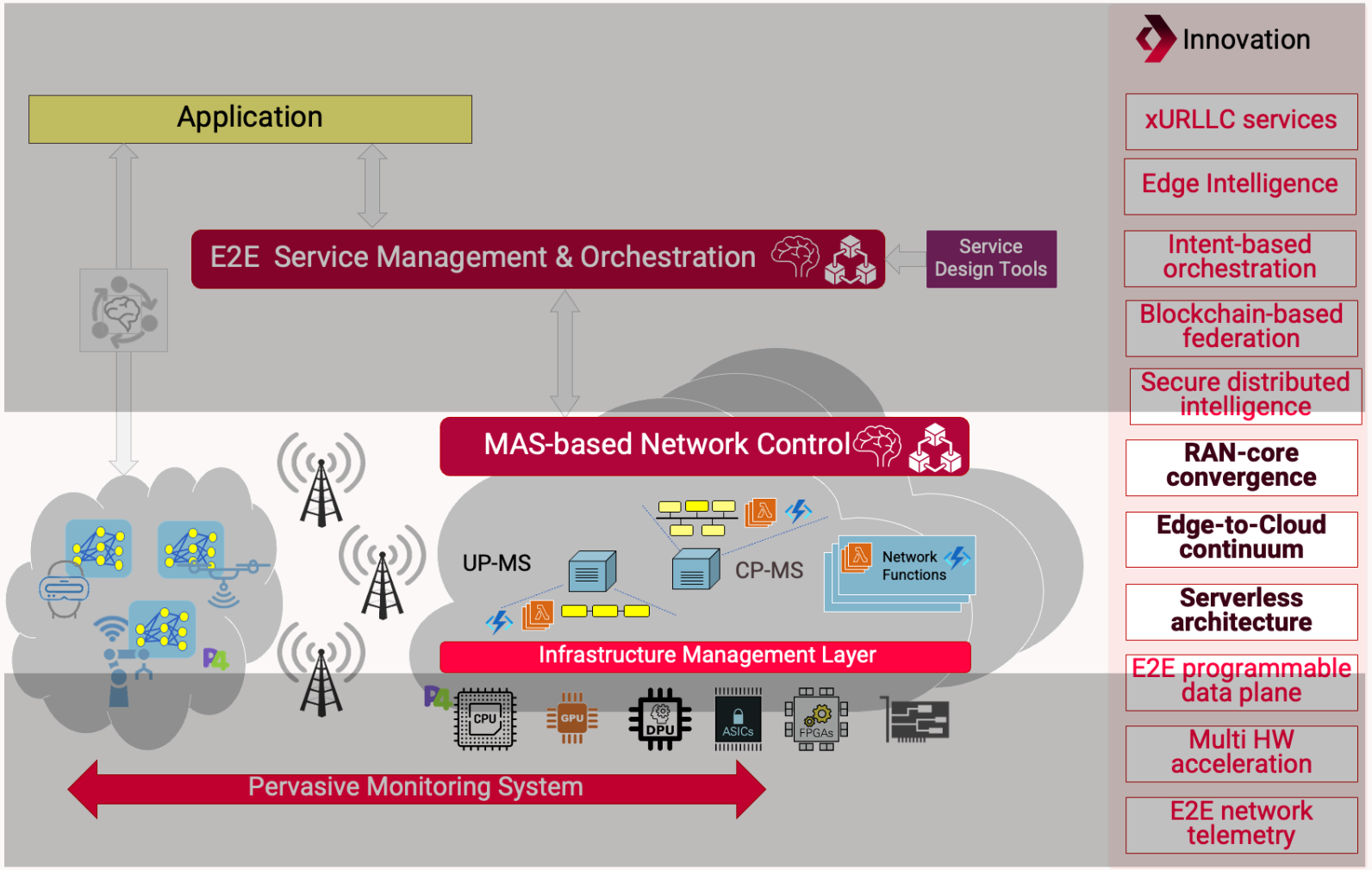
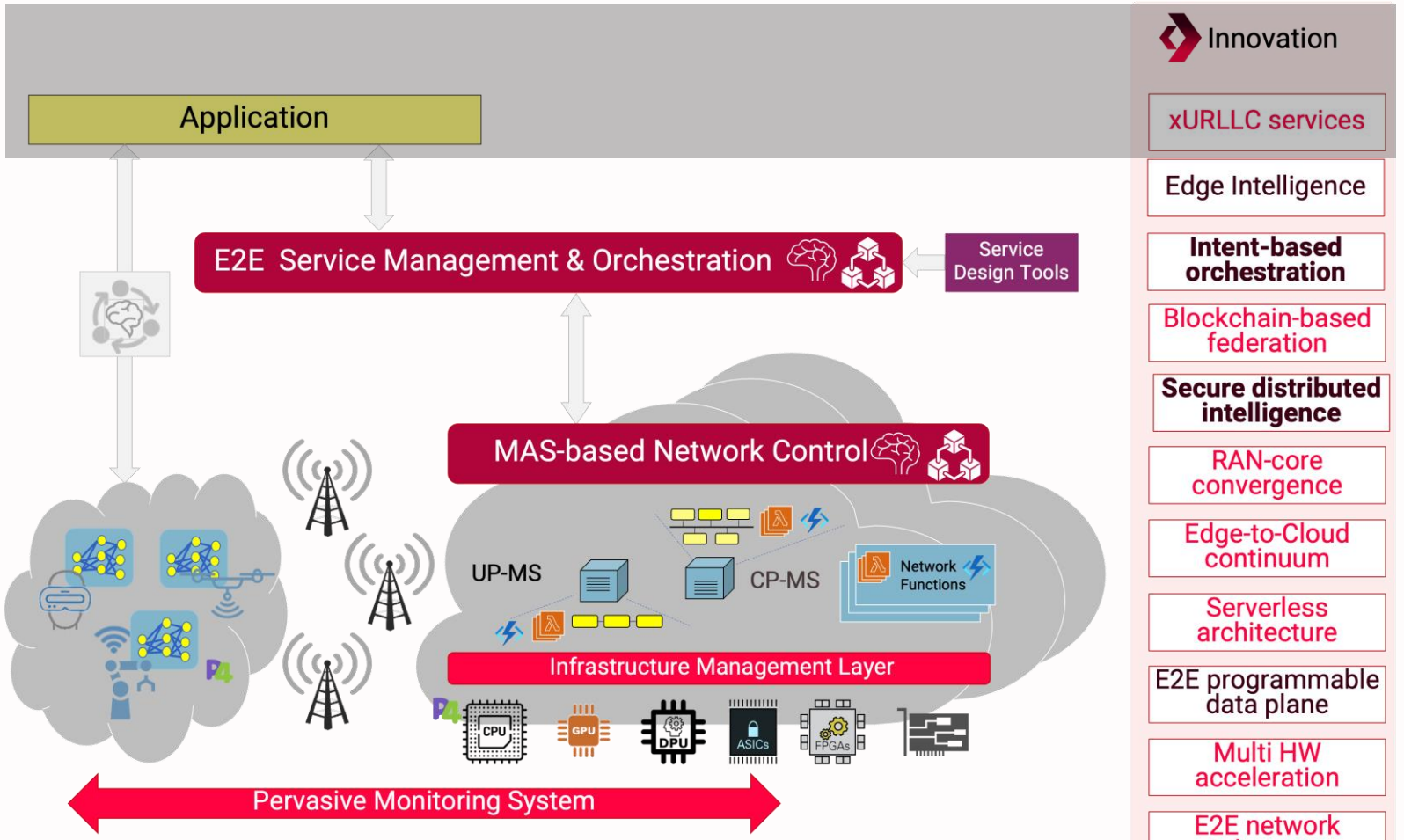
CLOUD NATIVE



AI-NATIVE



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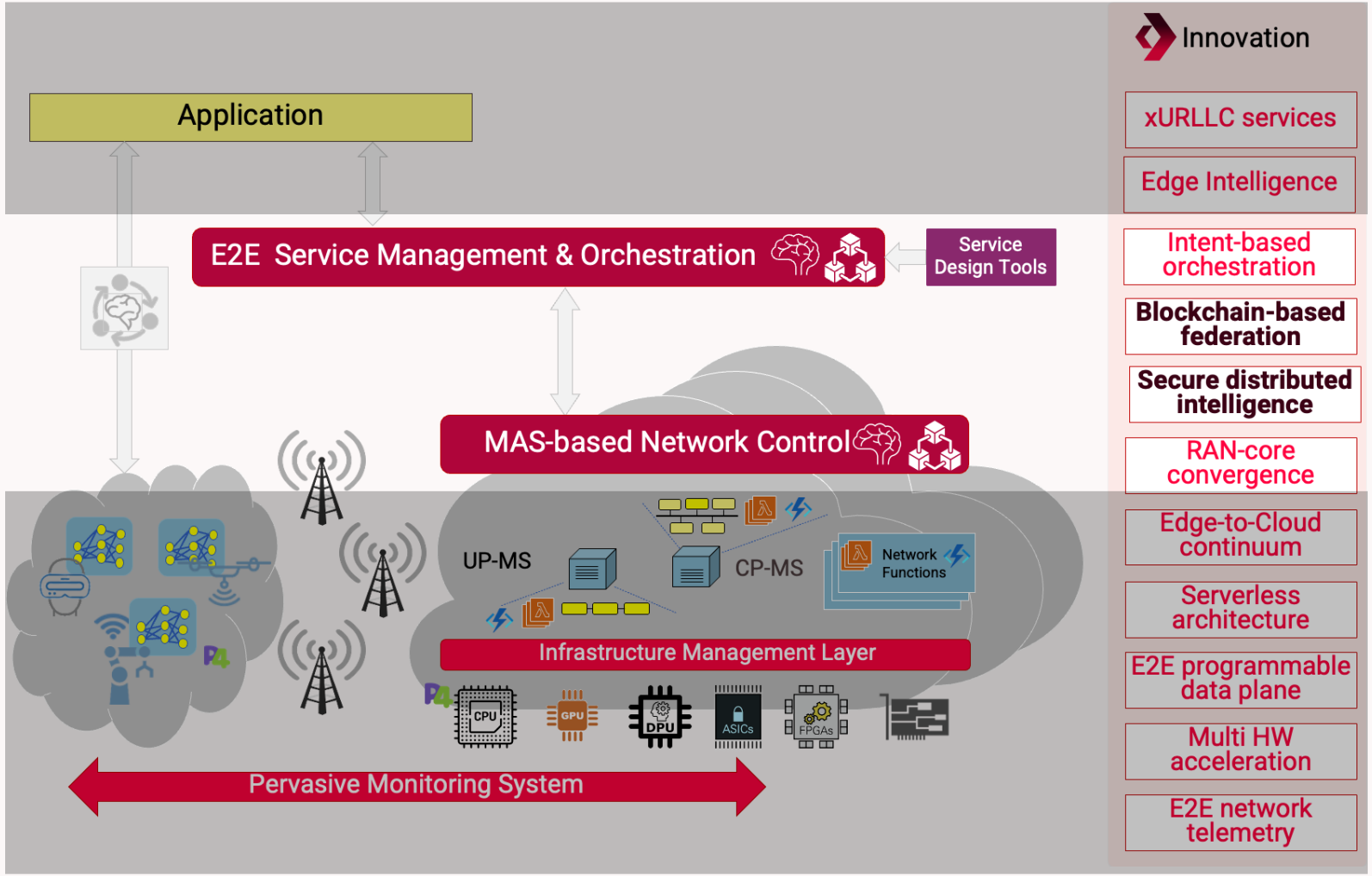
DLT FOR ZERO-TRUST ARCHITECTURE



TAKE-AWAY

Simplicity and high-performance: they are not necessarily enemies!
In 6G we'll need both.

We answer the following questions:

- How to have cloud-native-like behavior also for user plane (PDP, IML)
  - Transparent acceleration
  - Automatic load balancing and heavy-hitter handling
  - These mechanisms are independent from the business logic / NF-CP
- How to maintain performance KPIs dynamically (MAS)
  - On-demand in-network telemetry
  - Multi-agent-based service optimizers
- How to offer simplicity towards users (SMO)
  - Intent-based, simple external APIs
  - Translation logic to create internal, more complex structures

[2] D6G: "Pervasive monitoring and distributed intelligence for 6G near real time operation". EUCNC Post
[3] D6G: "Securing Multi-Agent Systems for Near Real-Time Control of 6G Services". EUCNC Post

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THANKS!

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