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A SECURE AND REUSABLE ARTIFICIAL INTELLIGENCE PLATFORM FOR EDGE COMPUTING IN BEYOND 5G NETWORKS

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101015922

5G PPP The 5G Infrastructure Public Private Partnership

AI@EDGE Network Architecture and Automation of Future Telecom networks

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AI@Edge WP2 leader on Architecture

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A **Secure and Reusable** **AI** Platform for **Edge Computing** in **Beyond 5G Networks**

Key project figures

- H2020-ICT-52-2020 Project
  5G PPP – Smart Connectivity beyond 5G
- **Research and Innovation Action**
- Duration: 36 Months
  (1.1.2021-31.12.2023)
- 20 partners
  (10 Academia, 4 SMEs, 6 Industries)

New applications place higher demands on networks and create new opportunities

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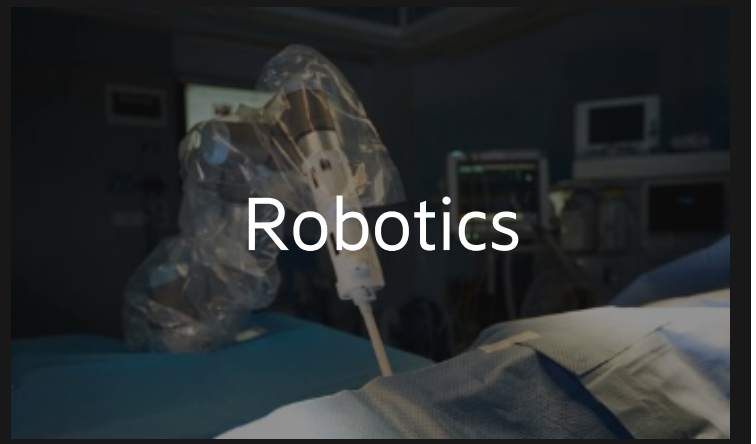
2G
A network for voice services

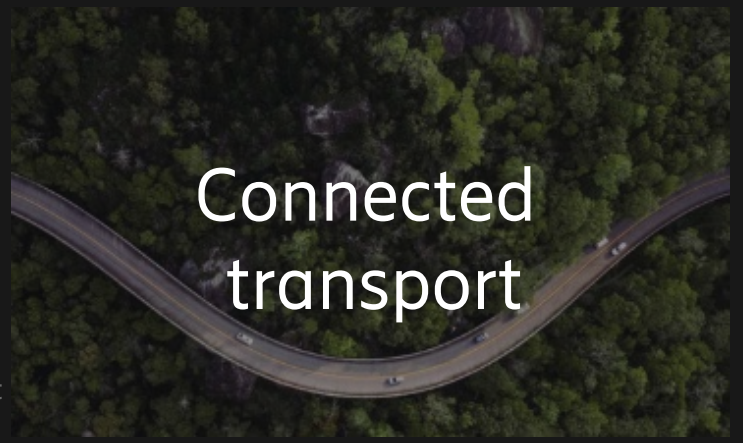
3G
A network for voice & data services

4G
A network for video & data services

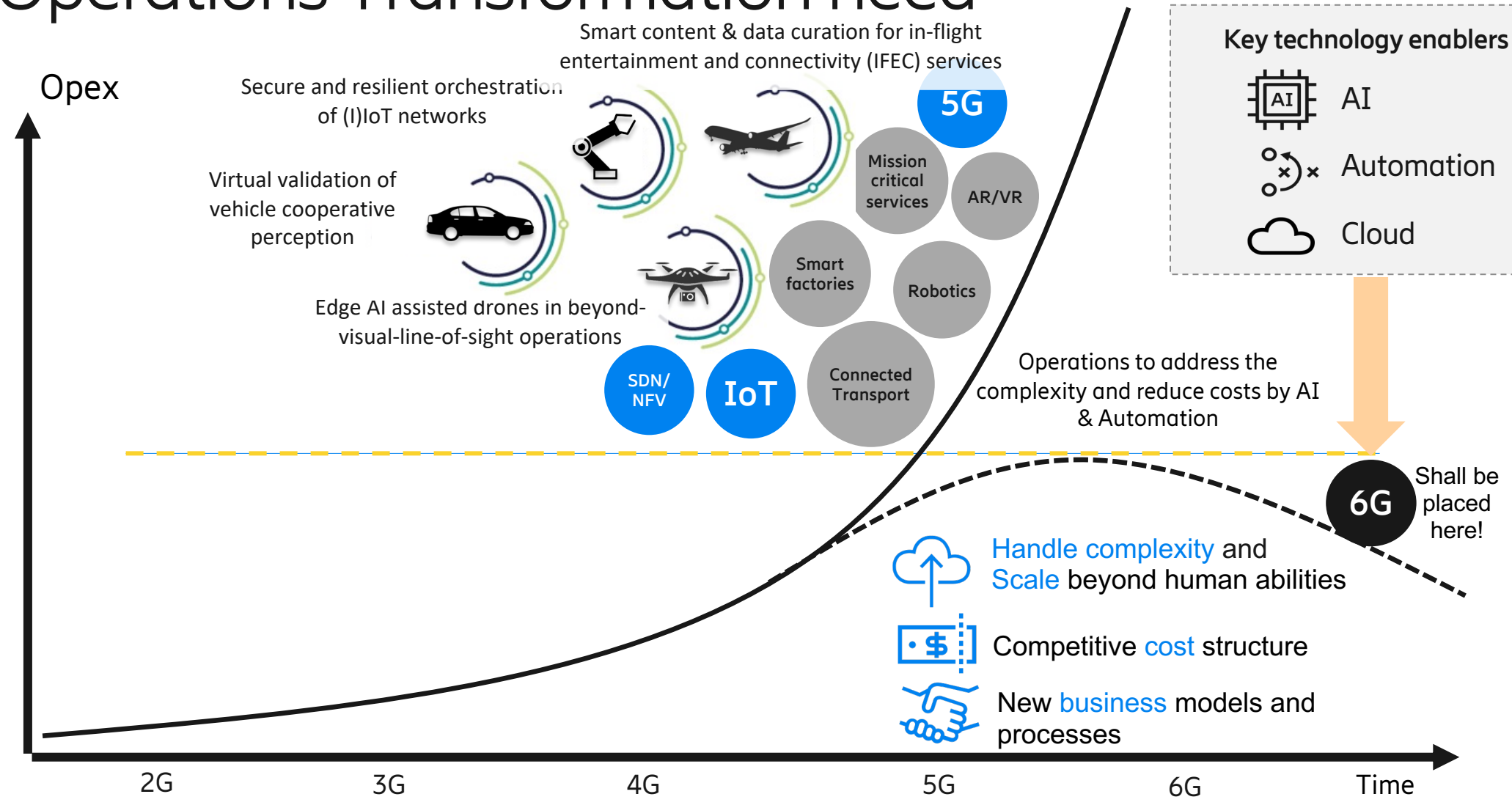
5G
A network for a million different needs

6G
Ever-present intelligent communication





Technology complexity curve - Operations Transformation need



Testbeds at a glance

+ integration, validation, test plans, new KPIs validation, techno economical analysis, etc.

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Virtual validation of vehicle cooperative perception

@POLIMI

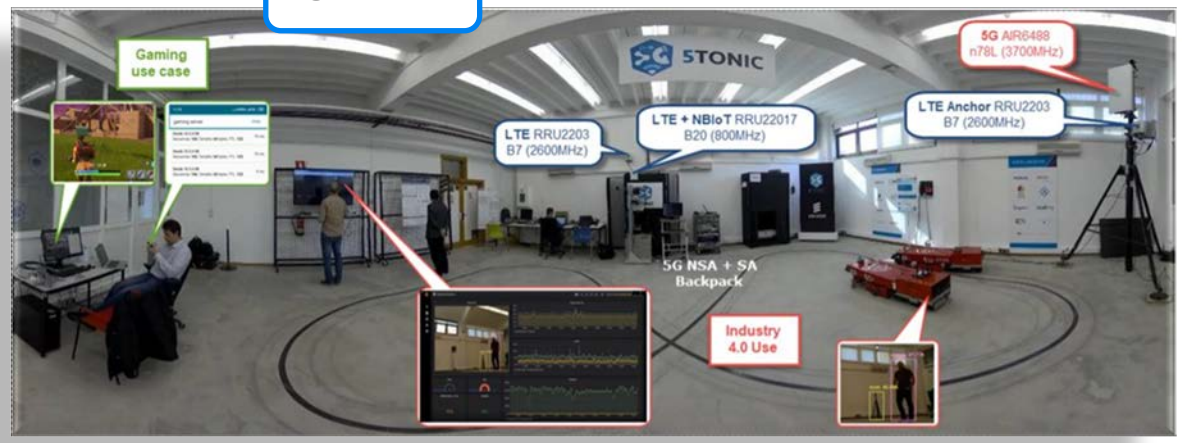
@CRF

Secure and resilient orchestration of (I)IoT networks

@DFKI

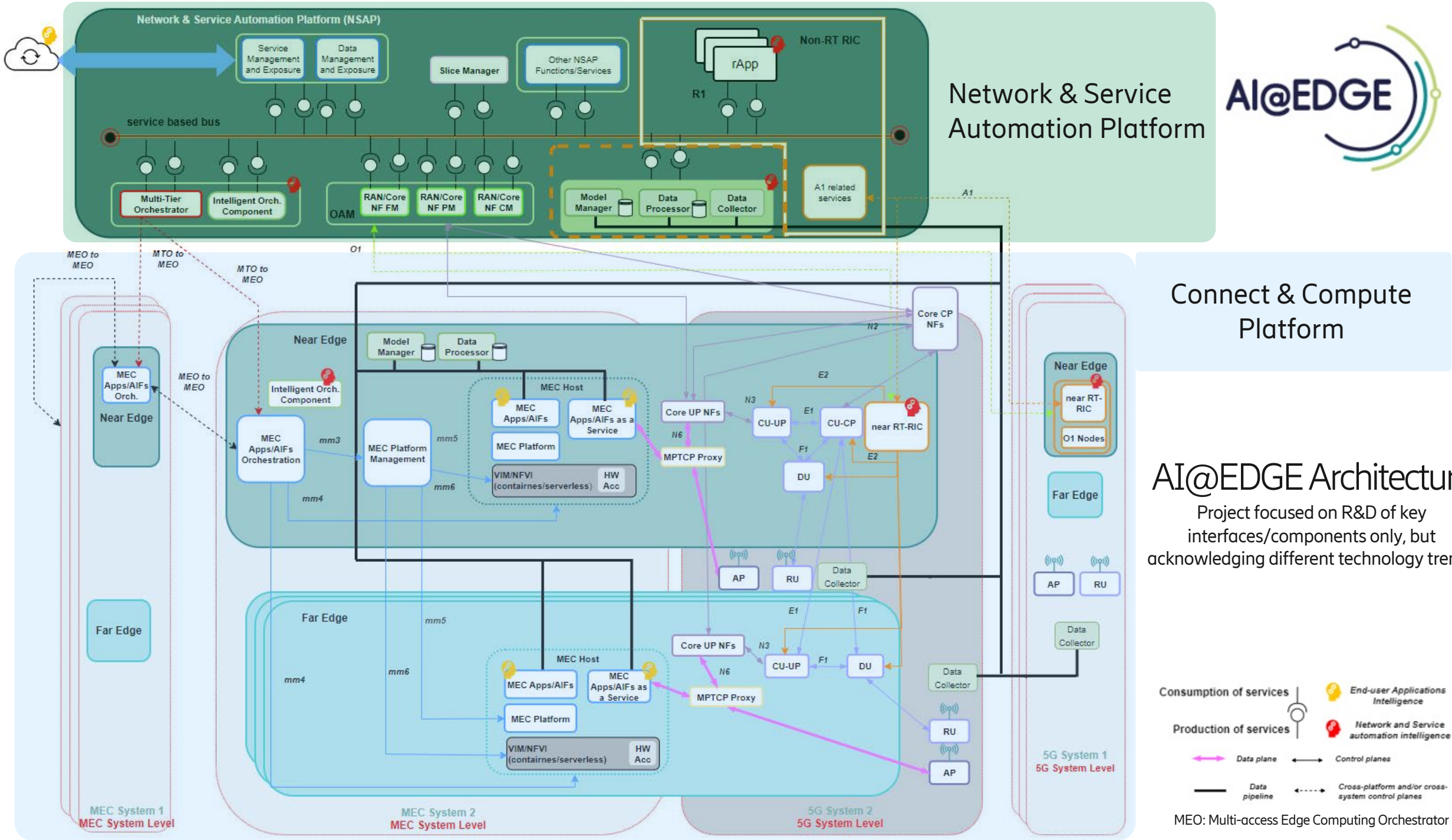
@5TONIC

Edge AI assisted drones in beyond-visual-line-of-sight operations



Smart content & data curation for in-flight entertainment and connectivity (IFEC) services

@SPI


Network & Service Automation Platform (NSAP)
Service Management and Exposure
Data Management and Exposure
Slice Manager
Other NSAP Functions/Services
Non-RT RIC
rApp
R1
service based bus
Multi-Tier Orchestrator
Intelligent Orch. Component
OAM
RAN/Core NF FM
RAN/Core NF PM
RAN/Core NF CM
Model Manager
Data Processor
Data Collector
A1 related services
A1
O1
Network & Service Automation Platform
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MEO to MEO
MTO to MEO
MTO to MEO
MEO to MEO
Connect & Compute Platform
Core CP NFs
N2
Near Edge
Model Manager
Data Processor
MEC Apps/AIFs Orch.
Near Edge
Intelligent Orch. Component
MEC Host
MEC Apps/AIFs
MEC Apps/AIFs as a Service
MEC Apps/AIFs Orchestration
mm3
MEC Platform Management
mm5
MEC Platform
VIM/NFVI (containes/serverless)
HW Acc
mm6
mm4
Core UP NFs
N3
CU-UP
E1
CU-CP
near RT-RIC
E2
N6
MPTCP Proxy
F1
DU
Near Edge
near RT-RIC
O1 Nodes
Far Edge
AP
RU
Data Collector
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AP
Data Collector
RU
AP
MEC System 1
MEC System Level
MEC System 2
MEC System Level
5G System 2
5G System Level
5G System 1
5G System Level
AI@EDGE Architecture
Project focused on R&D of key interfaces/components only, but acknowledging different technology trends
Consumption of services
Production of services
End-user Applications Intelligence
Network and Service automation intelligence
Data plane
Control planes
Data pipeline
Cross-platform and/or cross-system control planes
MEO: Multi-access Edge Computing Orchestrator

AI@EDGE System Architecture

Key proposals - Avoiding AI-Silos: reusable data and ML pipelines

AI "In-platform" Inclusion

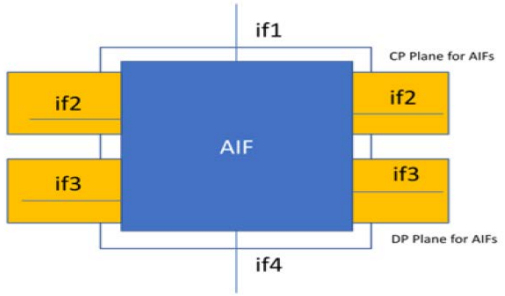
AI "On-platform" Inclusion

Data and ML Pipelines and Governance

E2E System Orchestration and Management

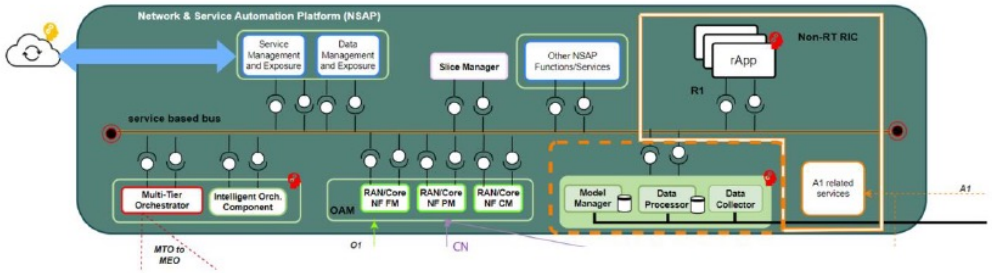
Distributed Connect Compute Platform

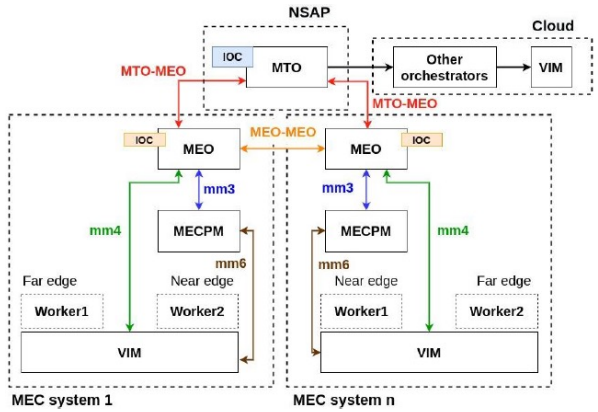
AI Functions – AIFs



AI model encapsulated in CNF

Network & Service Automation Platform

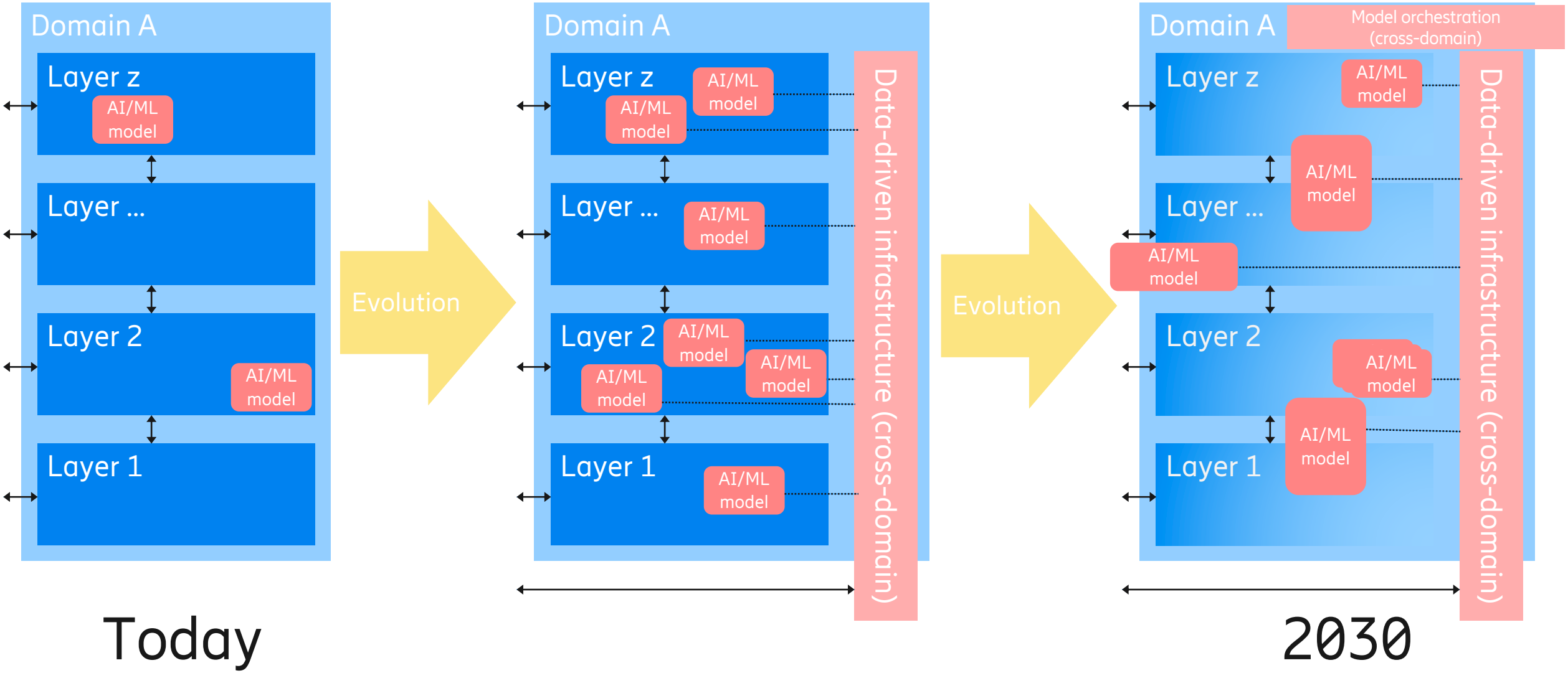




Going beyond specific vertical Use Cases

From using AI to AI-Native

6G



Today

2030

AI-Native Architecture = intelligence everywhere + distributed data infrastructure + zero-touch + (optionally) AIaaS

Challenges and Open Questions

Looking ahead

Handle complexity and Scale beyond human abilities

Competitive cost structure

New business models and processes

Near real time Data Analytics processing

AI “in-platform” challenges

Business dimension - Pricing and sharing mechanism

Software development for intelligent edge

AI “on-platform” challenges

Thank you.

Any question?

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