HIGH-TECH AND AFFORDABLE 5G NETWORK ROLL-OUT TO EVERY CORNER

Affordable5G

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George Kontopoulos

EIGHT BELLS

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Agenda

1. Project Scope

2. Produced Innovations

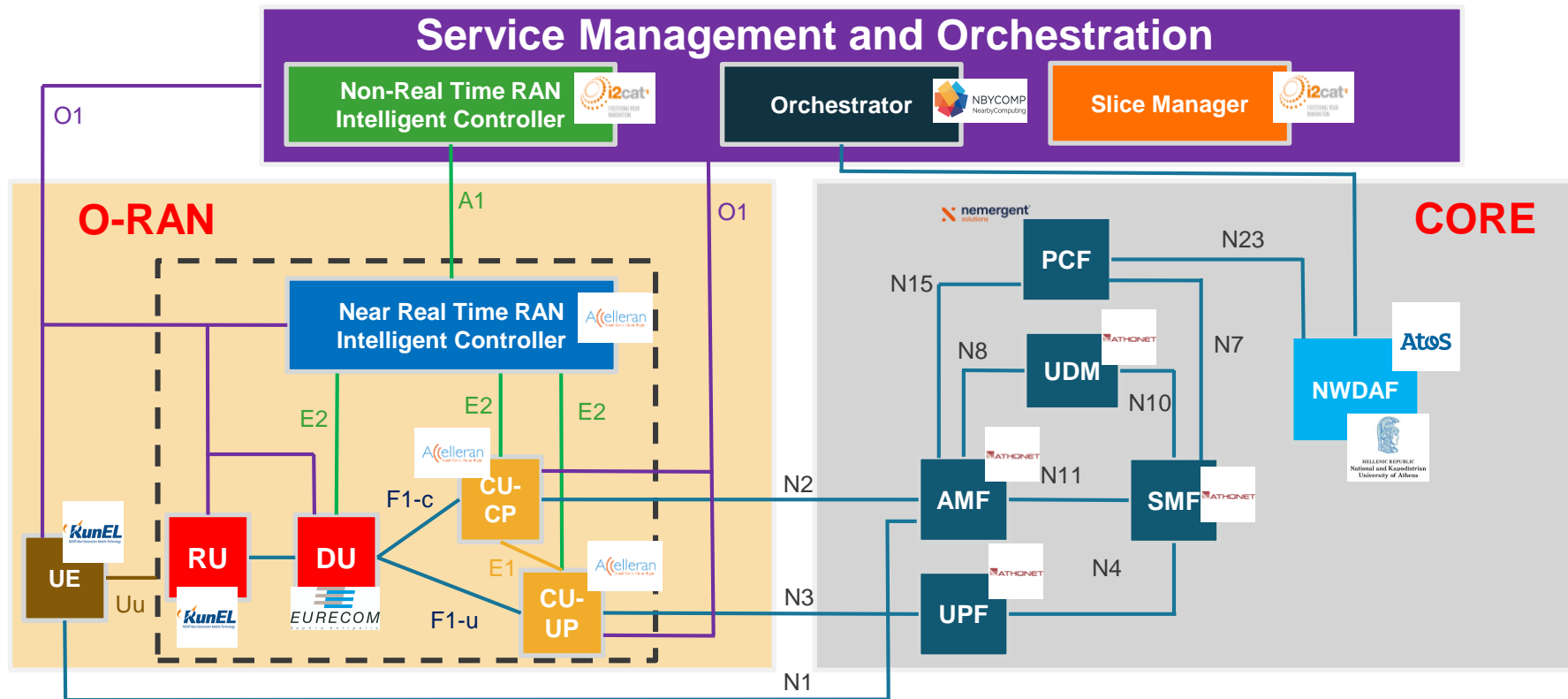3. New Open RAN ecosystem

Service in Castelloli Infrastructure

Scenario
- <u>Use case</u>: Mission-Critical services (MC-PTx)
- Demonstration of AI/ML using metrics from NEM MCS through NWDAF in the Core Network, and Orchestrator implementation
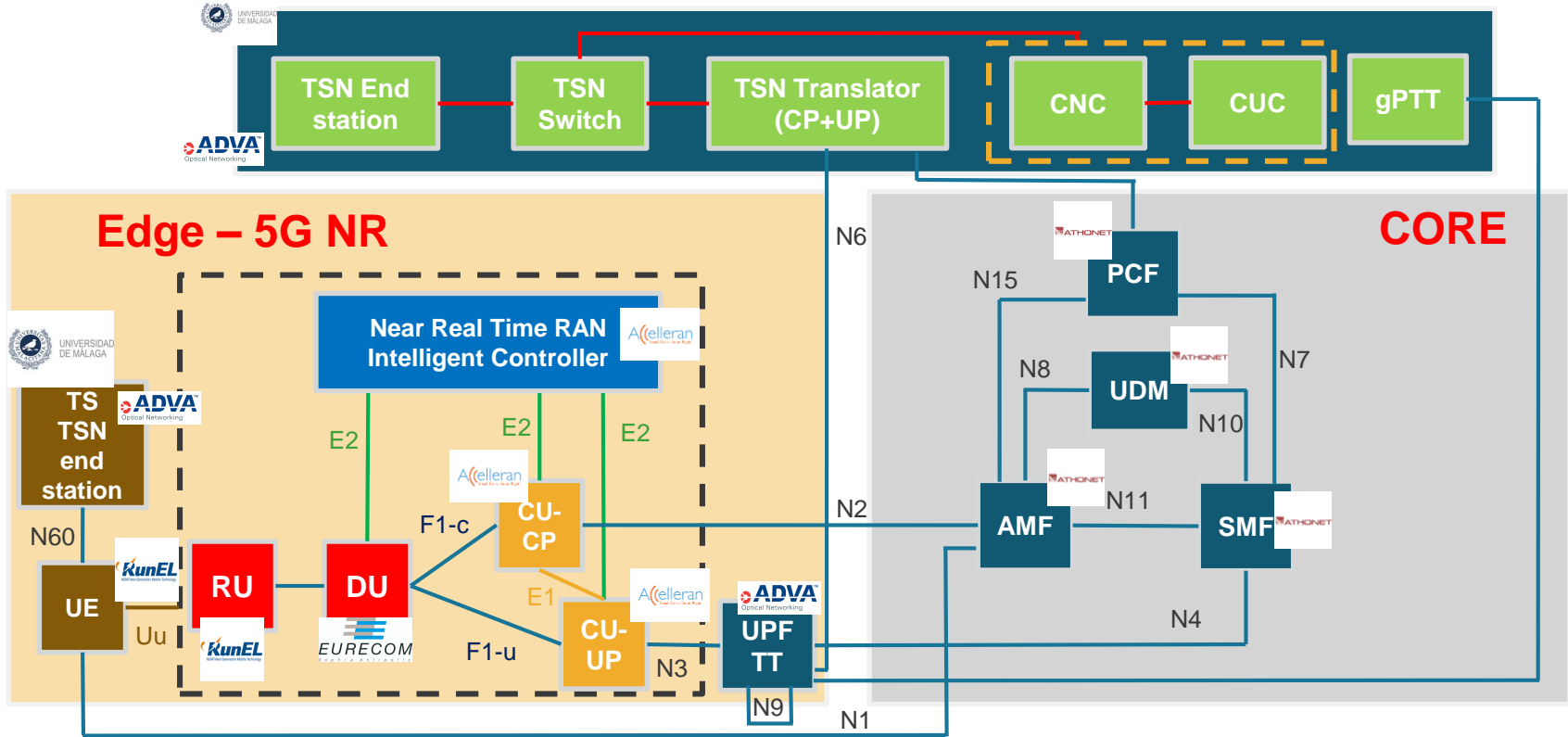
Testbed 1 – Castelloli

Services in Malaga Infrastructure
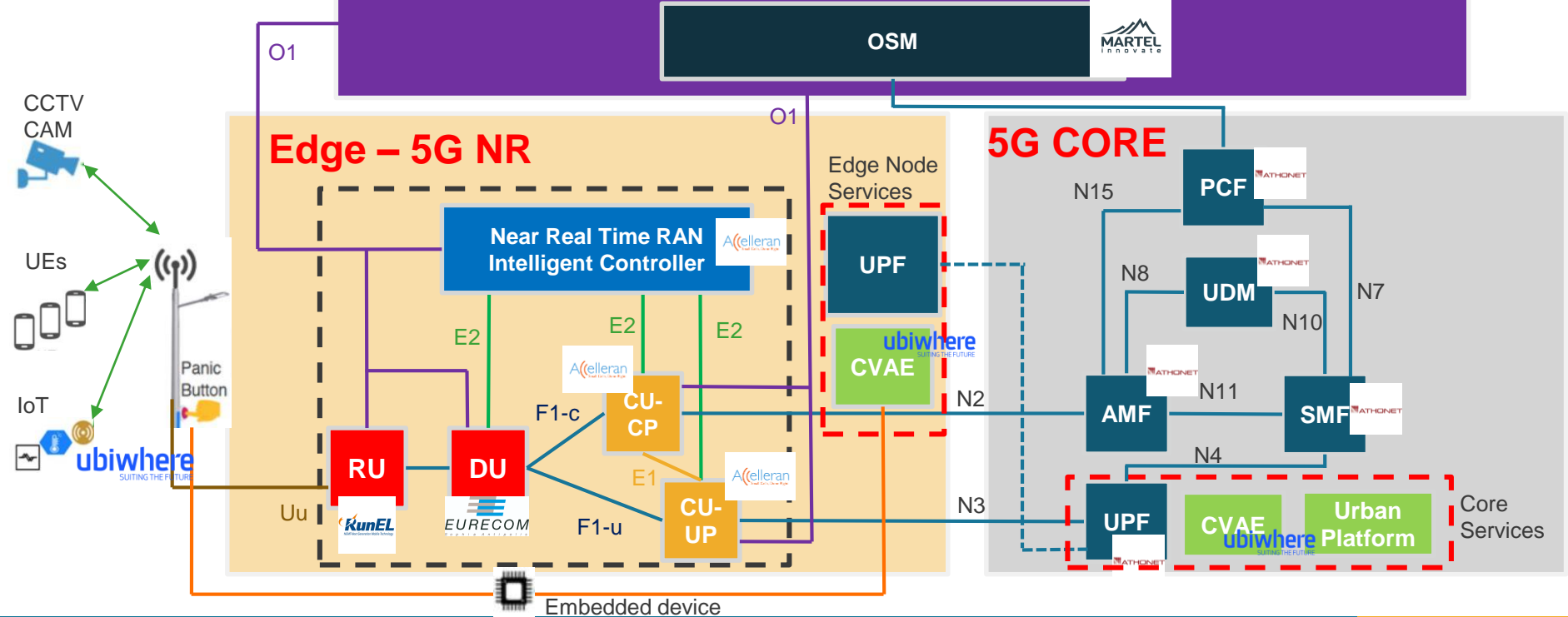
Scenario

- <u>Use case</u>: Industrial network with TSN support
- Demonstration of TSN network over 5G

- <u>Use case</u>: Smart City deploymemt
- Video processing employing computer vision at the network edge
- Demonstration of 5G video streaming in dense scenarios with automatic/manual triggering of emergencies

Testbed 2 – Malaga

Testbed 3 – Malaga

Project Innovations

o RU with Open RAN 7.2 split i/f

o 5G dRAX (CU-CP, CU-UP, RIC)

o xAPP for controlling RAN power in RT-RIC, optimize throughput/interference control

o TSN enhancements & exposure of KPI metrics in 5GC

o End to end intelligent orchestration and slice management

Project Innovations

o **RU with Open RAN 7.2 split i/f**

o 5G dRAN (CU-CP, CU-UP, RIC)

o xAPP for controlling RAN power in R&RIC, optimize throughput/interference control

o TSN enhancements & exposure of KPI metrics in 5GC

o End to end intelligent orchestration and slice management

- PHY layer & Beamforming functionality
- 64 element Beamforming Antenna
- Sub 6 GHz bands
- Scalable to 64 Gbps per 100MHz ch. BW

Project Innovations

o RU with Open RAN 7.2 split i/f

o **5G dRAX (CU-CP, CU-UP, RIC)**

o xAPP for controlling RAN power in RT-RIC, optimize throughput/interference control

o TSN enhancements & exposure of KPI metrics in 5GC

o End to end intelligent orchestration and slice management

- Multi-RAN (4G & 5G)
- O-RAN Alliance compliant
- RIC supports AI-based xApps from 3rd party developers to enhance RAN intelligence & automation

Project Innovations

o RU with Open RAN 7.2 split i/f

o 5G dRAX (CU-CP, CU-UP, RIC)

o **xAPP for controlling RAN power in RT-RIC, optimize throughput/interference control**

o TSN enhancements & exposure of KPI metrics in 5GC

o End to end intelligent orchestration and slice management

- Development environment for xAPPs

Project Innovations

o RU with Open Fronthaul split

o 5G dRAX (CU-CP, CU-UP, RIC)

o xAPP for controlling RAN power in RT-RIC, optimize throughput/interference control

o **TSN enhancements & exposure of KPI metrics in 5GC**

- MCX and TSN-oriented dynamic QoS adaptation mechanisms
- KPI exposure mechanisms to support analytics functionalities

o End to end intelligent orchestration and slice management

Project Innovations

o RU with Open RAN 7.2 split i/f

o 5G dRAX (CU-CP, CU-UP, RIC)

o xAPP for controlling RAN power in RT-RIC, optimize throughput/interference in scheduler

o TSN enhancements & exposure of KPI metrics in 5GC

o **End to end intelligent orchestration and slice management**

- Utilization of AI and ML powered control loops for the reconfiguration of the computational resources
- End to end orchestration of the 5G resources including slice provisioning

Project Innovations

o 3GPP-compliant mission critical systems over neutral host and hybrid deployments

o Time Sensitive Networking over 5G

o NEOX RISC-V ultra-low power hardware accelerator

o OSM (Open Source MANO) enhancement for flexible cloud native service deployments

o Smart City platform

Project Innovations

o 3GPP-compliant mission critical systems over neutral host and hybrid deployments

o Time Sensitive Networking over 5G

o NEOX RISC-V infrastructure power and low-cost vector

o OSM (Open Source MANO) enhancement for flexible cloud native service deployments

o Smart City platform

- Deploy MCX services over neutral host infrastructures (Voice, Video, Data)
- Flexible deployment and scaling (EDGE)
- 5G specific and dedicated QoS Mission Critical flows

Project Innovations

o 3GPP-compliant mission critical systems over neutral host and hybrid deployments

o Time Sensitive Networking over 5G

o NEOX RISC-V ultra-low power hardware accelerator

o OSM (Open Source MANO) enhanced portable cloud native service deployments

o Smart City platform

- Transport of latency-sensitive traffic with bounded latency, low packet delay variation, and low packet loss

Project Innovations

o 3GPP-compliant mission critical systems over neutral host and hybrid deployments

o Time Sensitive Networking over 5G

o NEOX RISC-V ultra-low power hardware accelerator

o OSM (Open Source MANO) enhancement for flexible cloud native service deployments

o Smart City platform

- Low power consumption, for executing the AI/ML applications at the edge level where the power consumption is a limiting factor
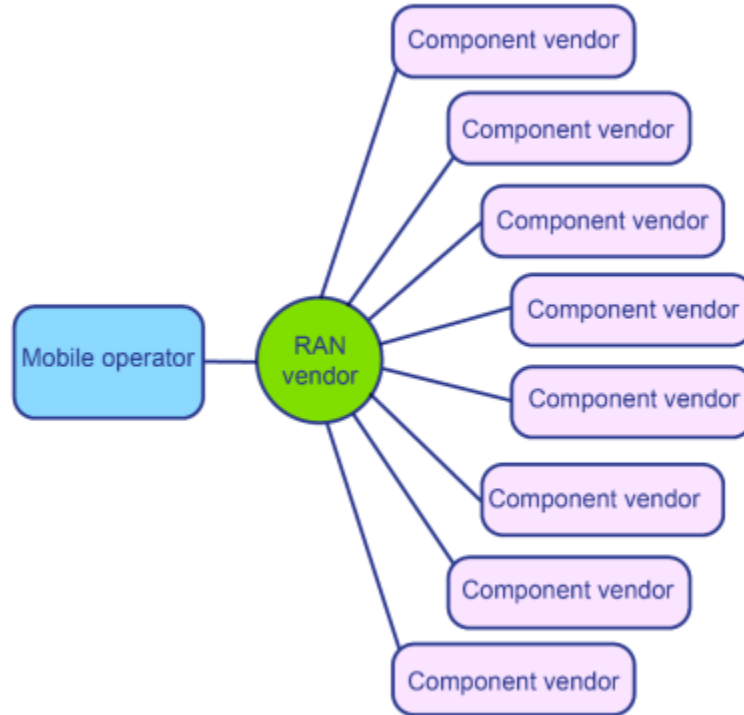
Project Innovations

o 3GPP-compliant mission critical systems over neutral host and hybrid deployments

o Time Sensitive Networking over 5G

o NEOX RISC-V ultra-low power hardware accelerator

- Enhance Kubernetes Network Functions (KNF) deployment to support placement of KNFs on specific K8s node within cluster

o OSM (Open Source MANO) enhancement for flexible cloud native service deployments
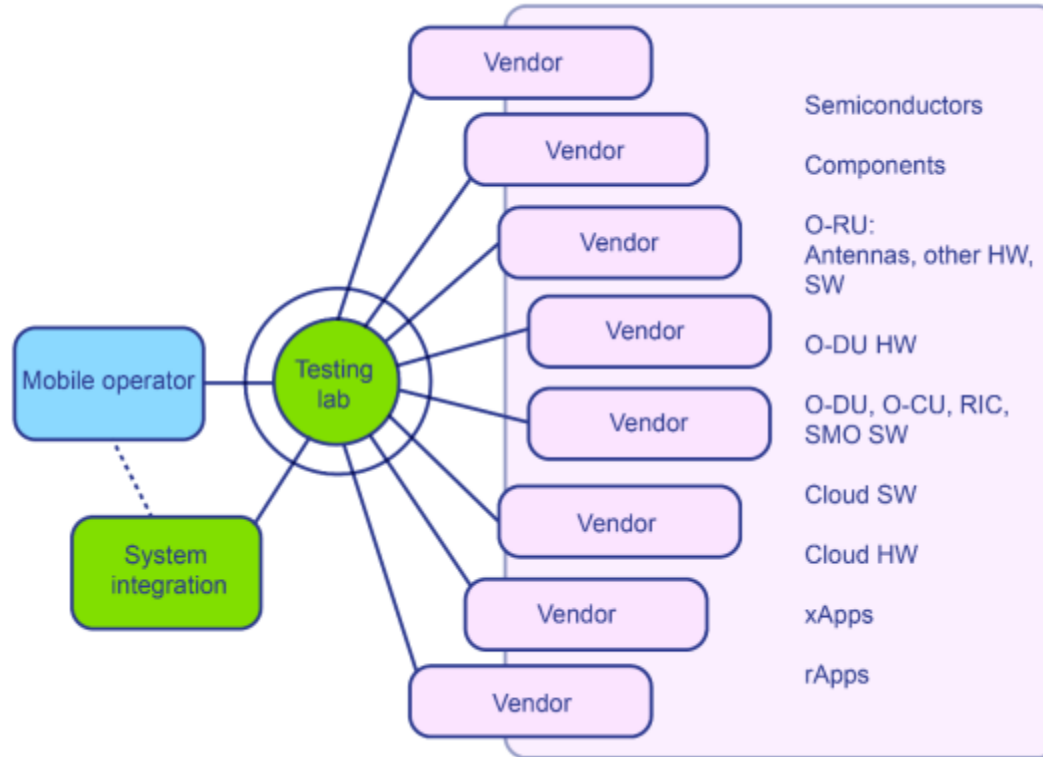
o Smart City platform

Project Innovations

o 3GPP-compliant mission critical systems over neutral host and hybrid deployments

o Time Sensitive Networking over 5G

o NEOX RISC-V ultra-low power hardware accelerator

o OSM (Open Source MANO) towards more flexible cloud native service deployments

o Smart City platform

- Automatic management & detection of danger situations, exploring the possibility of Edge video processing and automatic sending of both image and alerts

The traditional RAN ecosystem

The Open RAN ecosystem

Project Partners

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