24ο Συνέδριο infocom world 2022 | infocom media

AFFORDABLE 5G

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

Affordable5G

29/11/2022

George Kontopoulos

EIGHT BELLS

EIGHTBELLS
Independent Research & Consultancy

Agenda

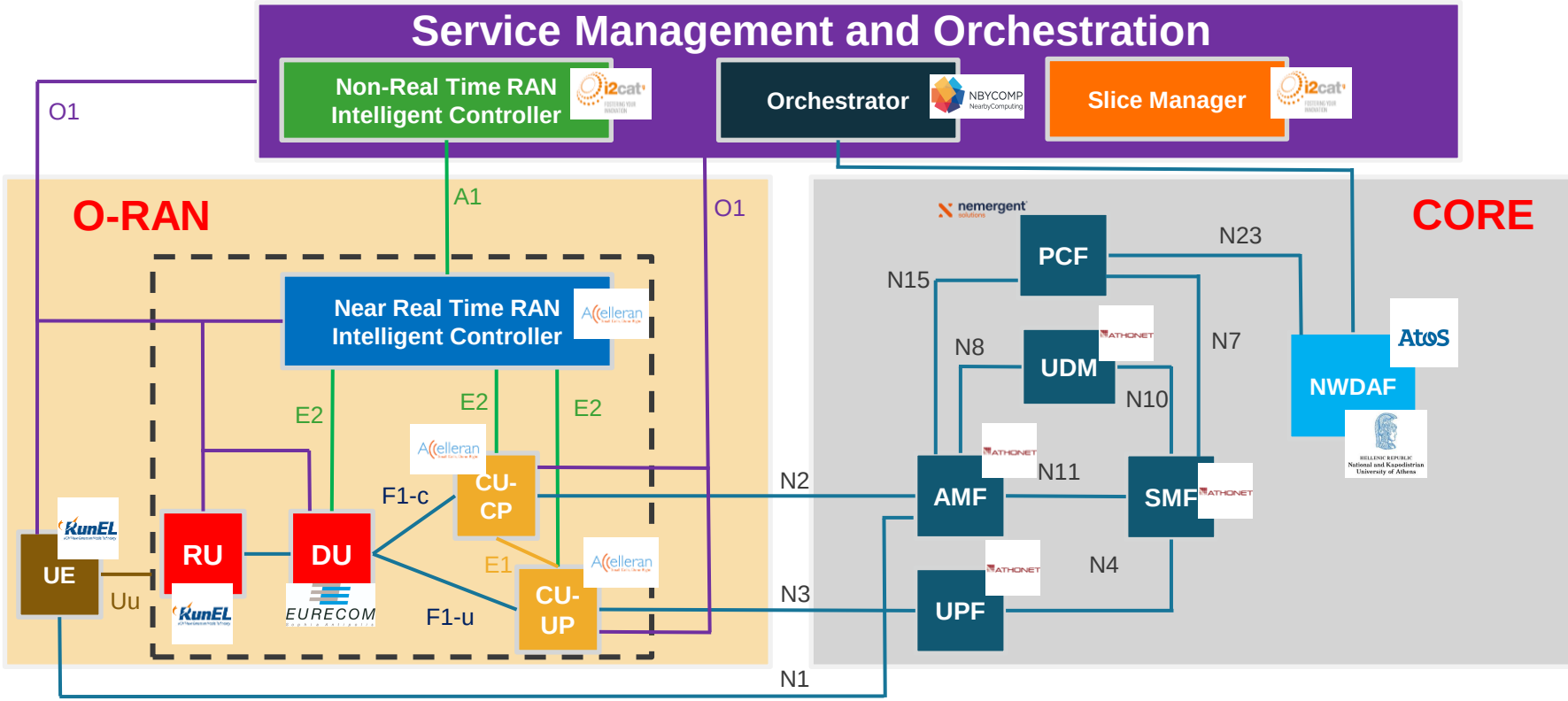
1. Project Scope
2. Produced Innovations
3. New Open RAN ecosystem

Service in Castelloli Infrastructure

Scenario

- Use case: 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



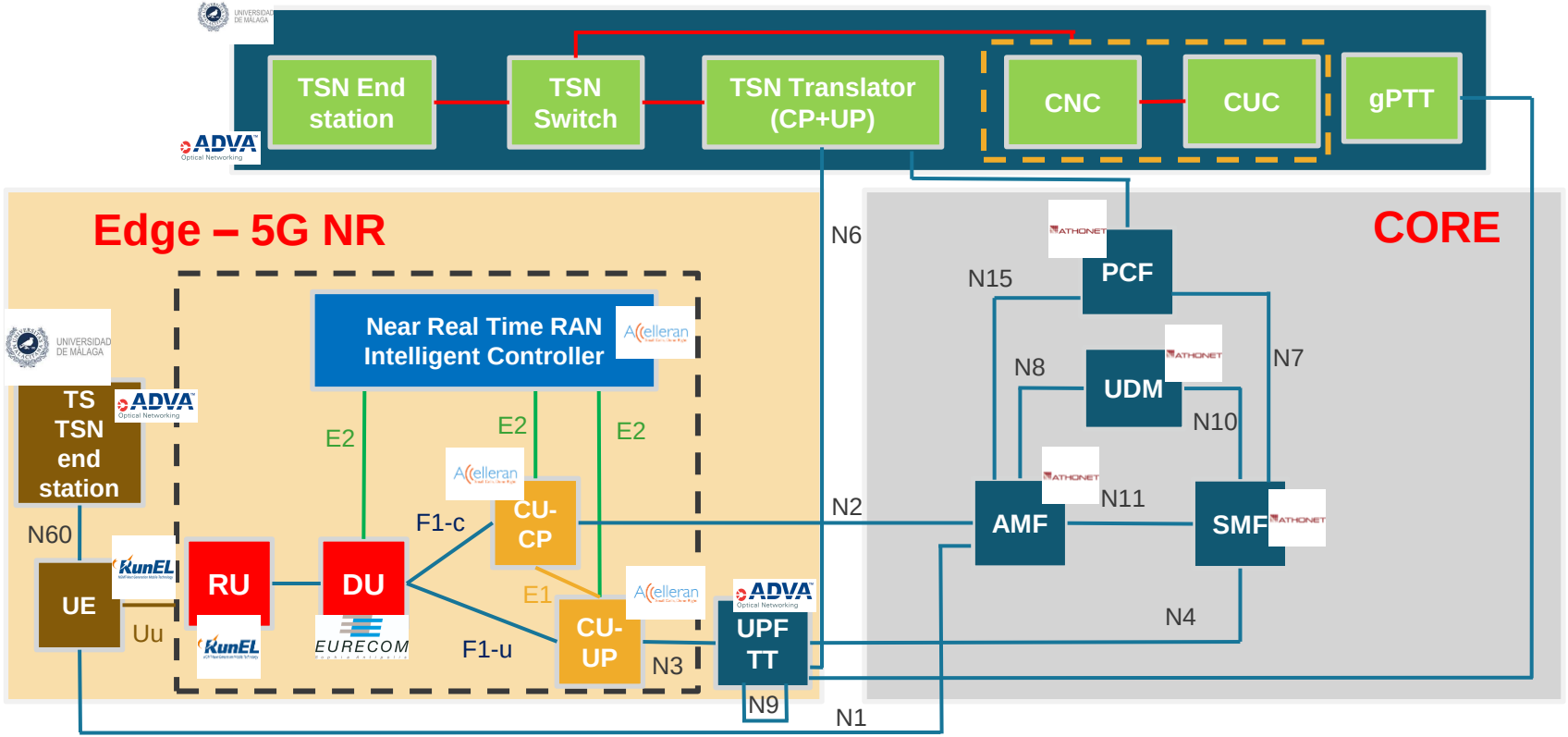
Services in Malaga Infrastructure

Scenario

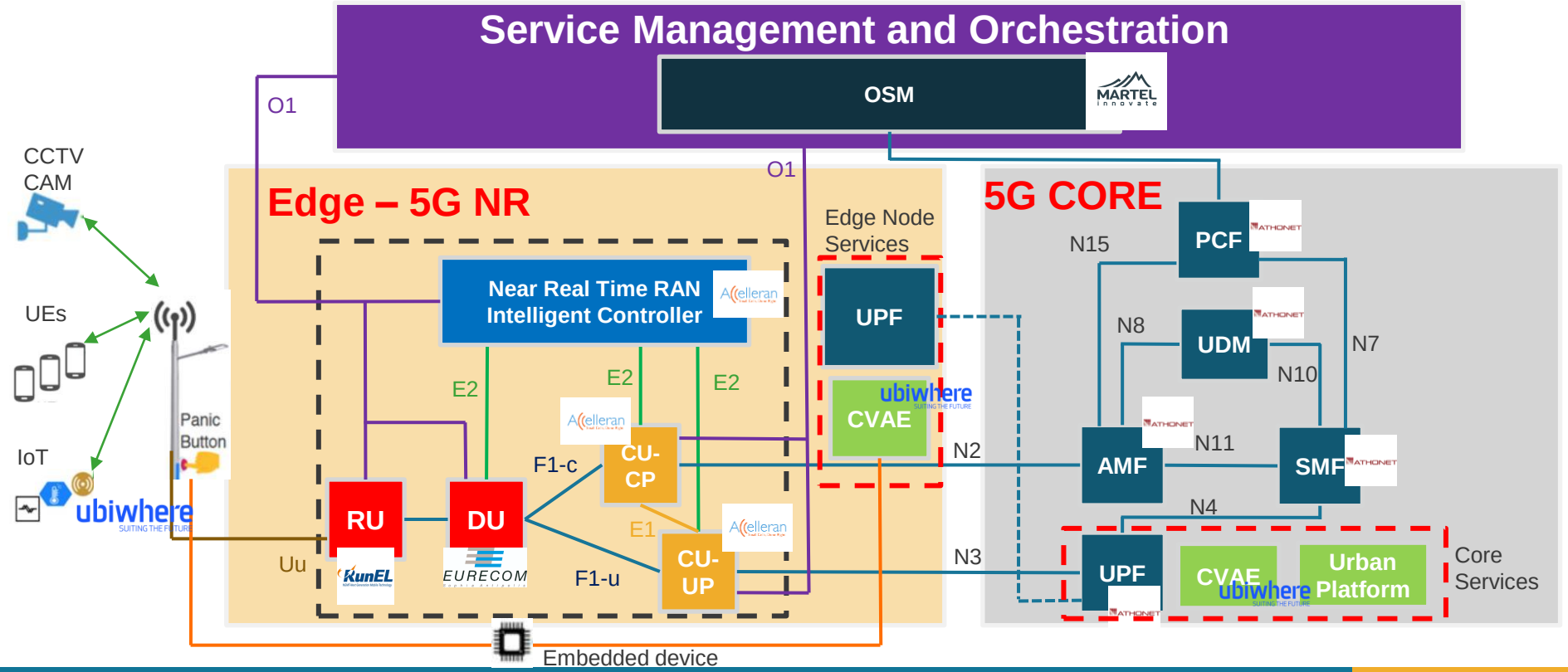
- Use case: Industrial network with TSN support
- Demonstration of TSN network over 5G

- Use case: 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

- RU with Open RAN 7.2 split i/f
- 5G dRAX (CU-CP, CU-UP, RIC)
- xAPP for controlling RAN power in RT-RIC, optimize throughput/interference control
- TSN enhancements & exposure of KPI metrics in 5GC
- End to end intelligent orchestration and slice management

Project Innovations

- **RU with Open RAN 7.2 split i/f**
- 5G dRAX (O-DU SP, CU UP, RIC)
- xAPP for controlling RAN power in Near-RIC, optimize throughput/interference control
- TSN enhancements & exposure of KPI metrics in 5GC
- 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

- RU with Open RAN 7.2 split i/f
- **5G dRAX (CU-CP, CU-UP, RIC)**
- xAPP for controlling RAN power in RT-RIC, optimize throughput/interference control
- TSN enhancements & exposure of KPI metrics in 5GC
- 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

- RU with Open RAN 7.2 split i/f
- 5G dRAX (CU-CP, CU-UP, RIC)
- **xAPP for controlling RAN power in RT-RIC, optimize throughput/interference control**
- TSN enhancements & exposure of KPI metrics in 5GC
- End to end intelligent orchestration and slice management

- Development environment for xAPPs

Project Innovations

- RU with Open FAST C-plane
- 5G dRAX (CU-CP, CU-UP, RIC)
- xAPP for controlling RAN power in RT-RIC, optimize throughput/interference control
- **TSN enhancements & exposure of KPI metrics in 5GC**
- End to end intelligent orchestration and slice management

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

Project Innovations

- RU with Open RAN 7.2 split i/f
- 5G dRAX (CU-CP, CU-UP, RIC)
- xAPP for controlling RAN power in RT-RIC, optimize throughput/interference/energy
- TSN enhancements & exposure of KPI metrics in 5GC
- **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

- 3GPP-compliant mission critical systems over neutral host and hybrid deployments
- Time Sensitive Networking over 5G
- NEOX RISC-V ultra-low power hardware accelerator
- OSM (Open Source MANO) enhancement for flexible cloud native service deployments
- Smart City platform

Project Innovations

- 3GPP-compliant mission critical systems over neutral host and hybrid deployments
- Time Sensitive Networking over 5G
- NEOX RISC-V based open hardware accelerator
- OSM (Open Source MANO) enhancement for flexible cloud native service deployments
- 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

- 3GPP-compliant mission critical systems over neutral host and hybrid deployments
- Time Sensitive Networking over 5G
- NEOX RISC-V ultra-low power hardware accelerator
- OSM (Open Source MANO) based flexible cloud native service deployments
- Smart City platform

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

Project Innovations

- 3GPP-compliant mission critical systems over neutral host and hybrid deployments
- Time Sensitive Networking over 5G
- NEOX RISC-V ultra-low power hardware accelerator
- OSM (Open Source MANO) enhancement for flexible cloud native service deployments
- 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

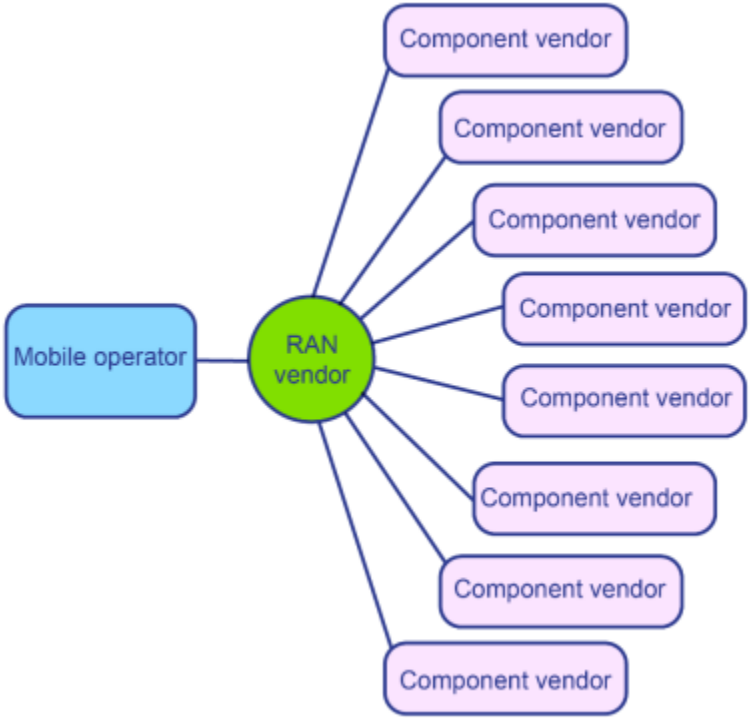
- 3GPP-compliant mission critical systems over neutral host and hybrid deployments
- Time Sensitive Networking over 5G
- NEOX RISC-V ultra-low power hardware accelerator
- OSM (Open Source MANO) enhancement for flexible cloud native service deployments
- Smart City platform

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

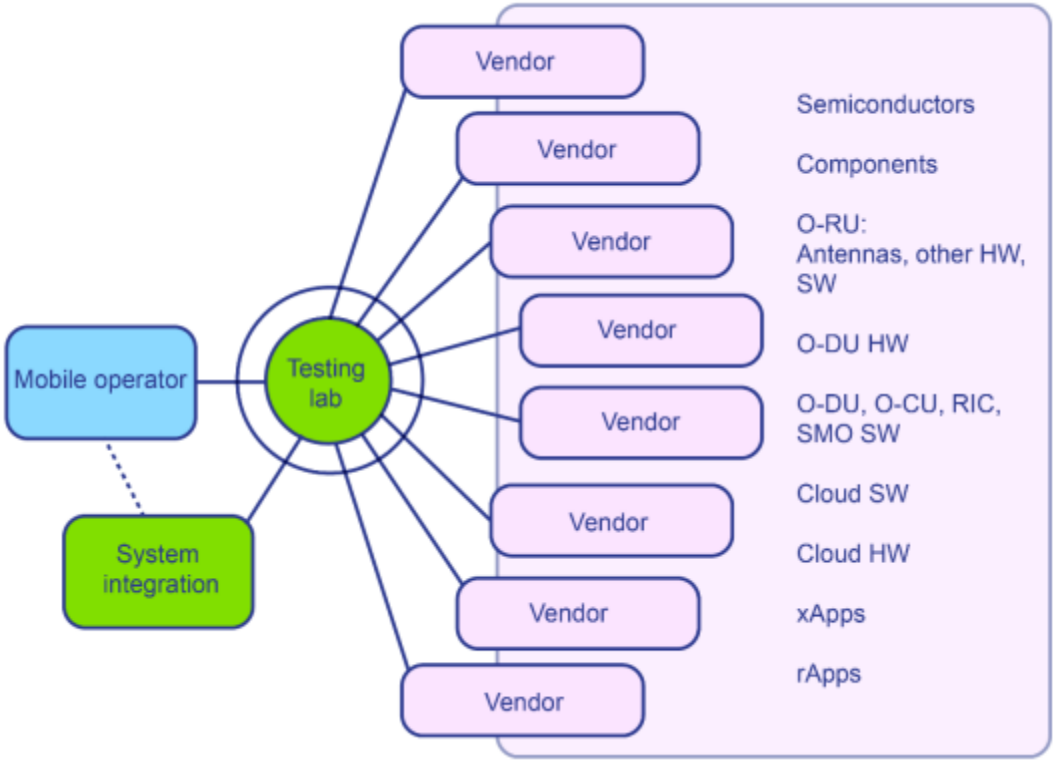
Project Innovations

- 3GPP-compliant mission critical systems over neutral host and hybrid deployments
- Time Sensitive Networking over 5G
- NEOX RISC-V ultra-low power hardware accelerator
- OSM (Open Source MANO) enhancements for flexible cloud native service deployments
- 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

GET IN TOUCH

www.affordable5g.eu

info@affordable5g.eu

@affordable5g

THIS PROJECT IS PART OF THE 5G PUBLIC AND PRIVATE PARTNERSHIP

5G PPP WWW.5G-PPP.EU

Affordable5G project is funded by the EU's Horizon2020 programme under Grant Agreement number 957317.

AFFORDABLE 5G

...