FutuRe cOmmunication NeTworks
FRONT Research Group

Dr. Harilaos Koumaras

Head of FRONT Research Group

Koumaras Harilaos
koumaras [at] iit.demokritos.gr
210 650 3107

Head of FRONT

Verticals and Experimentation

- 5G Network Openness and Programmability for verticals
- 5G Core Exposure
- 3GPP NEF Emulator
- 5G-driven UAVs
- Automated 5G Experimentation for verticals
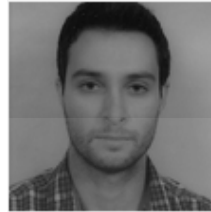
Makropoulos George

Fragkos Dimitrios

Georgoulas Spyros

Pitsilis Vassilis

Sakellaropoulos Andreas

Vicky Rentoula

Ilias Alexandropoulos

Maria Karapsiadi

Manolopoulos John

Xenia Gialia

Evaggelia Alexopoulou
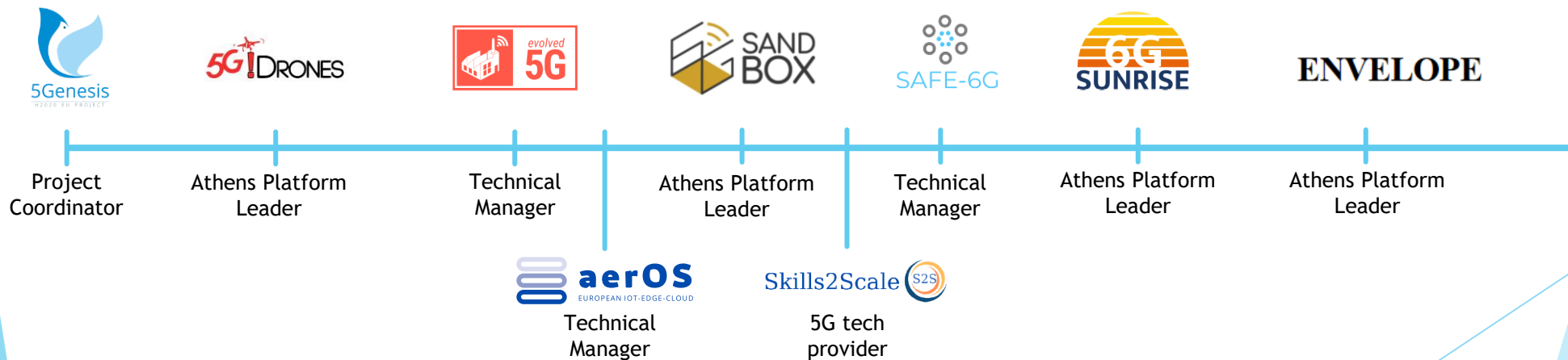
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FRONT Objectives and Research Projects

FRONT research group activities revolve around 5 pillars:

▶ Automated **6G/5G experimentation** methodologies for KPI/KVI assessment

▶ 6G/5G **Network Openness** and **Programmability** for Vertical industries

▶ **Cognitive AI** for future communication networks,

▶ IoT-Edge-Cloud **Continuum** and **Service Mesh**,

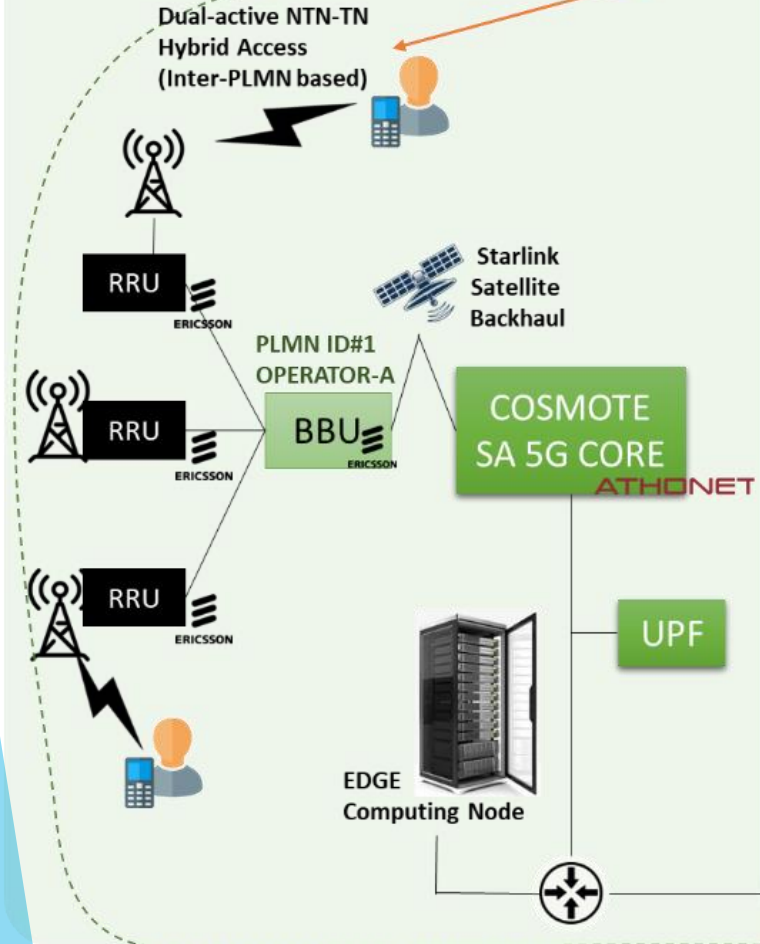▶ **Trustworthiness** for user-centric 6G services

Project Coordinator	Athens Platform Leader	Technical Manager	Athens Platform Leader	Technical Manager	Athens Platform Leader	Athens Platform Leader
5Genesis	5G!Drones	evolved 5G	SAND BOX	SAFE-6G	6G SUNRISE	ENVELOPE

	aerOS	Skills2Scale	
	Technical Manager	5G tech provider	

5G/6G Athens Experimentation Platform
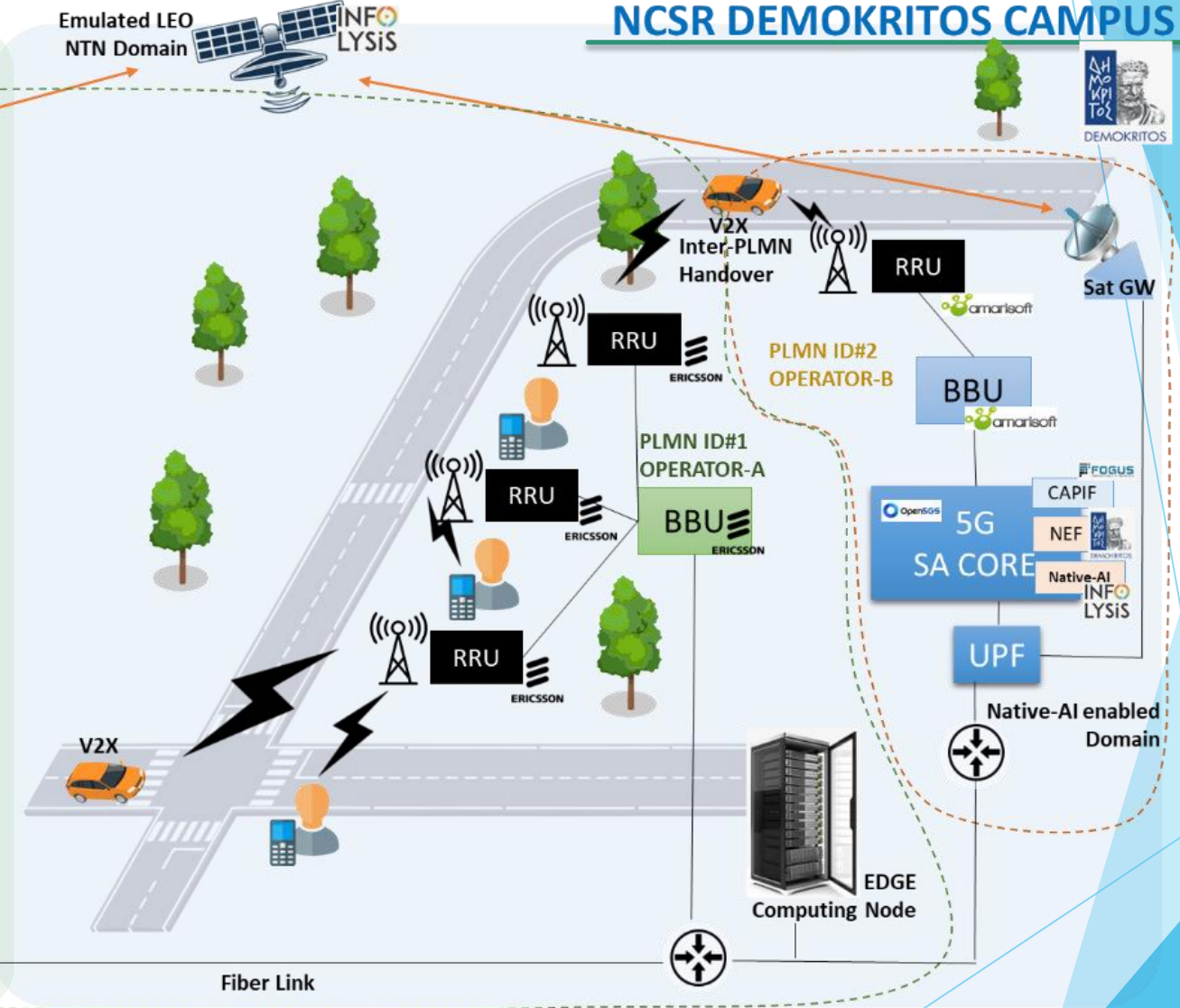
Open5GS

- 5G SA
- 3GPP NEF exposure
- Containerized/Service Mesh
- Amarisoft RAN / SRSRan (O-RAN) / UERANSIM

amarisoft

- 5G SA (Callbox Classic)
- Amarisoft RAN

athonet

- 5G SA
- Ericsson RAN
  [1 outdoor unit, 2 indoor units]

free5GC

- 5G SA
- NWDAF exposure for 6G-NTN/TN selection
- SDN Controller

amarisoft

ERICSSON

gNBs (5G SA)

Baseband 6630 & IRU 8848
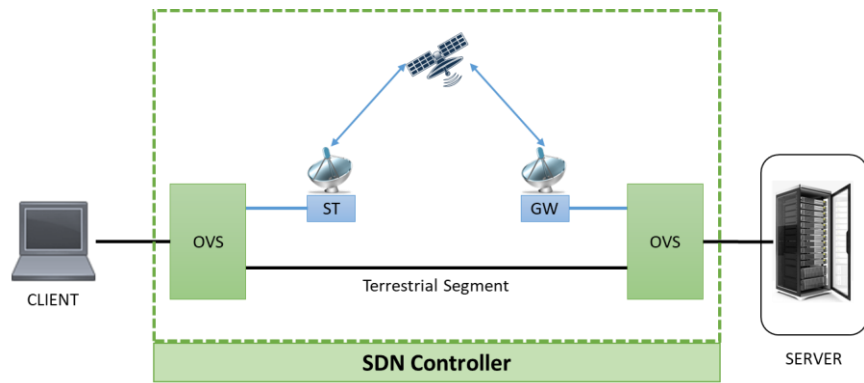
Radio 4408

Dot 4479

+mmwave

Emulated 6G NTN/TN Integration

SDN Controlled

Use-cases
- **Maritime coverage**
- **Urban air mobility**
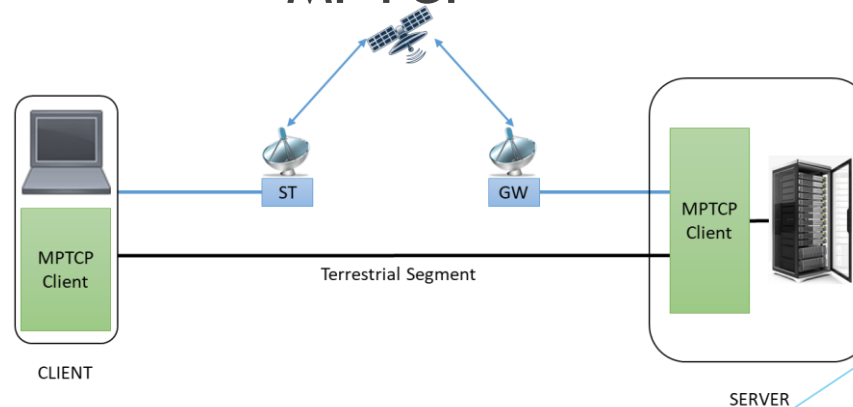- **Service Continuation/High Mobility**

Features
- **Physical device integration**
- **Real-traffic provision**

MPTCP

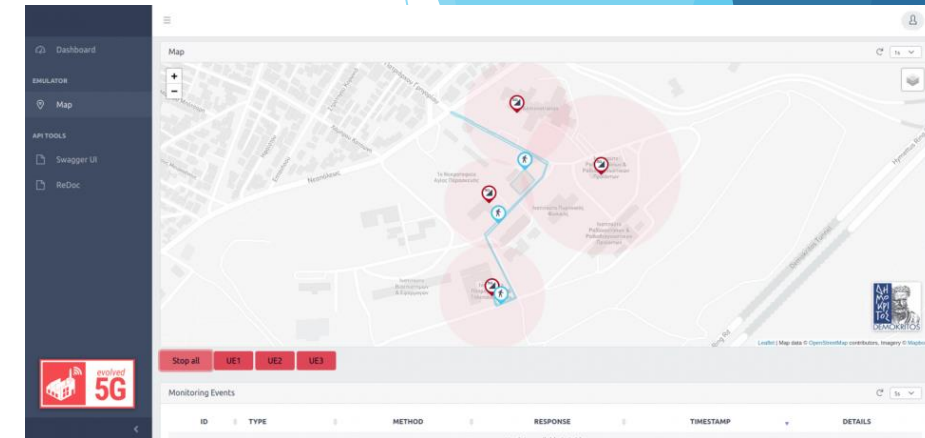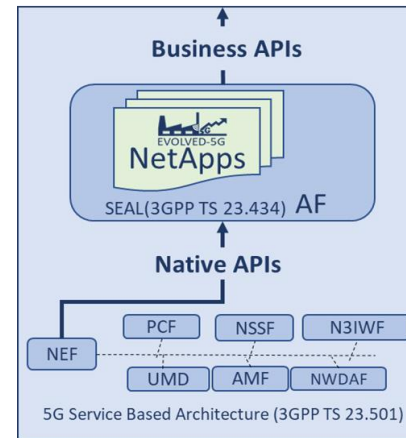**Virtualization Platforms**
- **Openstack**
- **Proxmox**
- **OpenNebula**

3GPP NEF and ETSI OpenCAPIF

- NetApp is a microservice that "consumes" 3GPP core network APIs (e.g., native APIs NEF/SEAL/CAPIF) or other telco APIs (e.g. MEC APIs, resource management APIs).

- It responds to the same request that triggered the development of Vertical Application Enablers (VAE) by 3GPP SA6

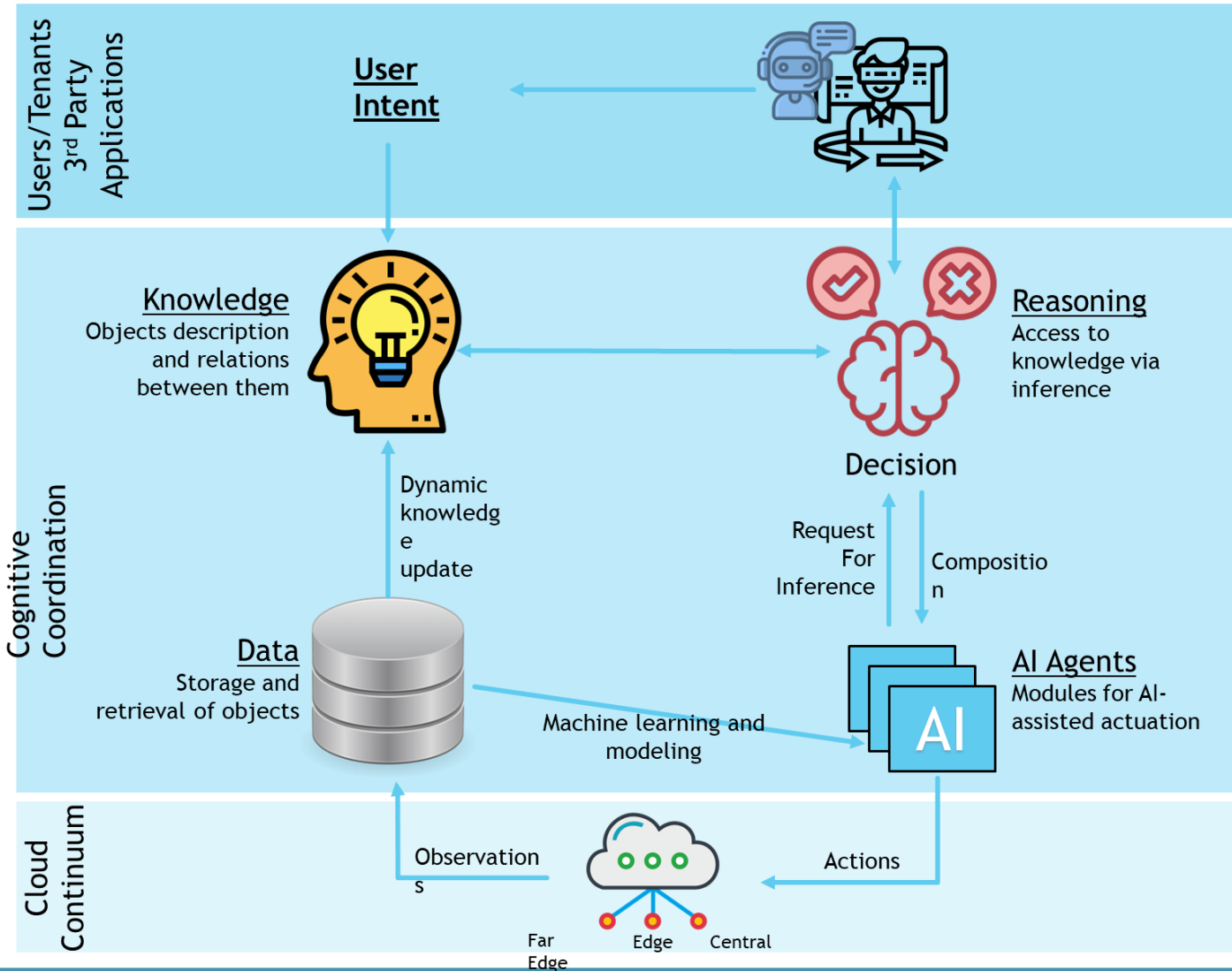https://github.com/medianetlab/NEF_emulator

OpenCAPIF by ETSI

ETSI Software Development Group OpenCAPIF
The ETSI Software Development Group OpenCAPIF (SDG OCF) is developing an open source Common API Frameworks, as described by 3GPP, allowing to expose and consume APIs in a secure and consistent way.
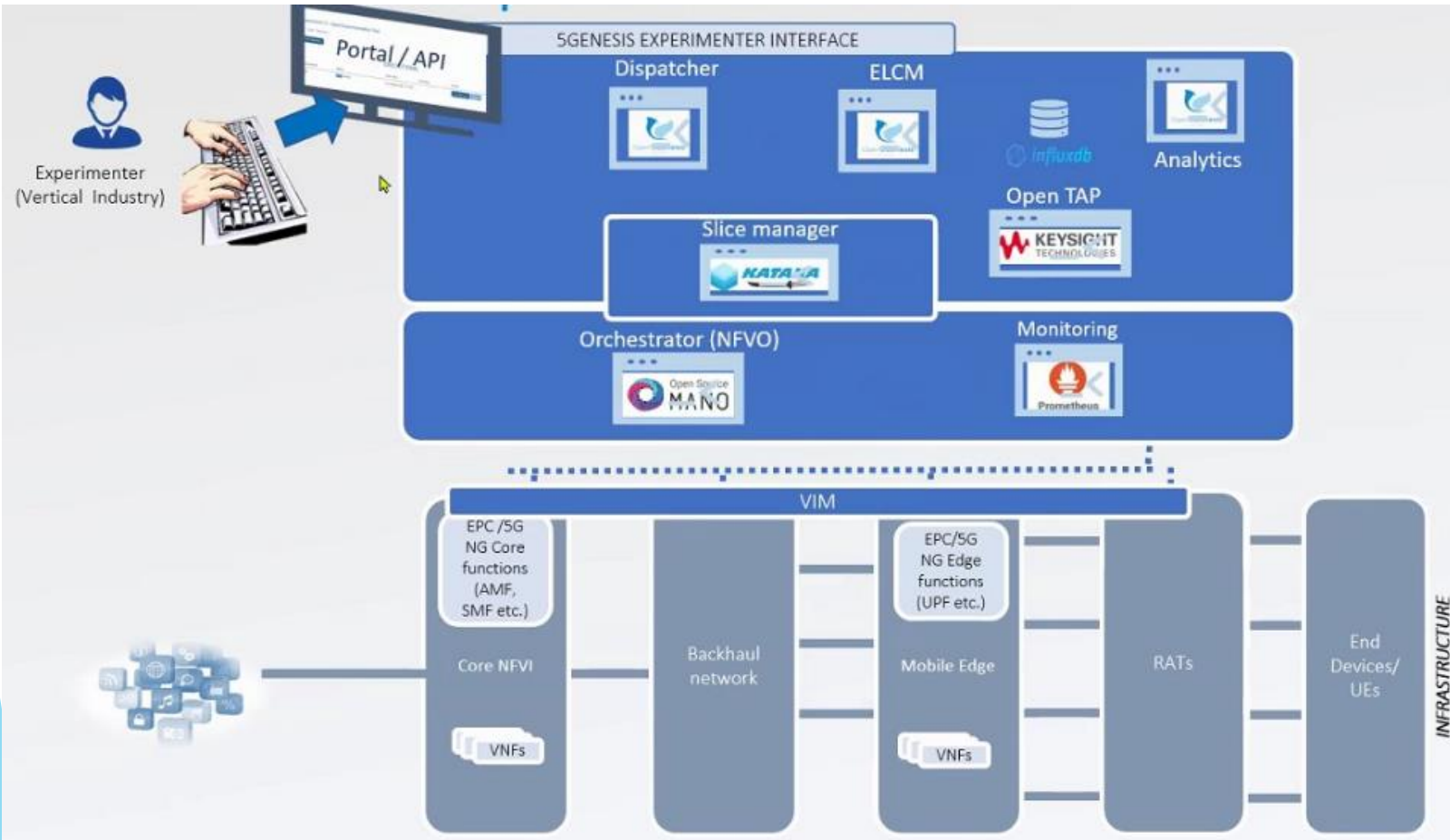
Cognitive AI for 6G Networks

AI
- AI-model benchmarking
- AI Reliability

Use-cases
- User-centric configurations
- Edge/Continuum Selection
- UPF placement
- Level of trust
- Inter-PLMN hand-overs
- Smart-buildings

5GENESIS has built the Open5GENESIS Suite that provides a common API for testing and experimentation of new services by vertical industries.

https://github.com/5genesis

Further improvements took place in EVOLVED-5G and 6G-SANDBOX

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FRONT Research Group Expertise in 6G Networks

Contact for Collaboration
Dr. Harilaos Koumaras
Head of FRONT Research Group
koumaras@iit.demokritos.gr

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