

TeraFlow  
SDN  
*by ETSI*



**Across**

Automated zero-touch cross-layer provisioning  
framework for 5G and beyond vertical services

# OpenSlice - TeraFlowSDN integration in ACROSS

Lluis Gifre (CTTC)

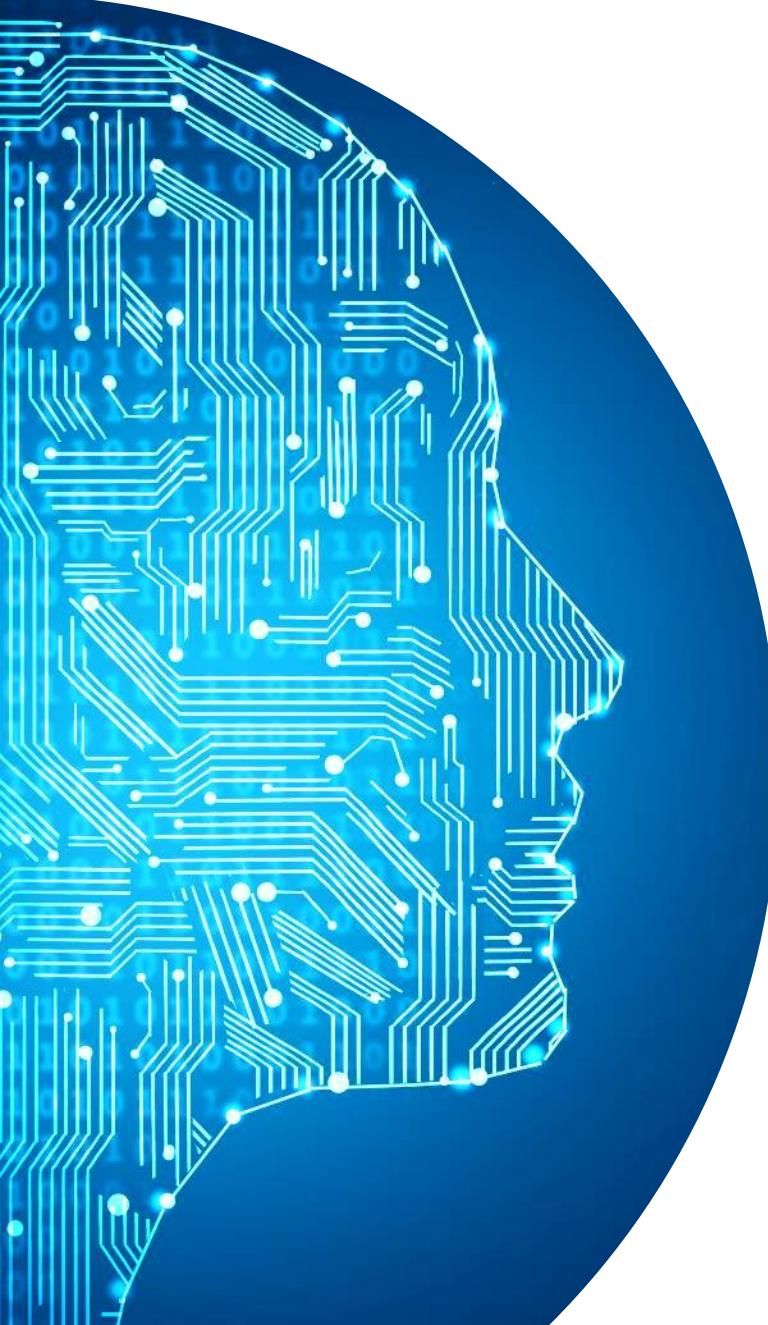
TFS#3 Ecosystem Day, 18/October/2023

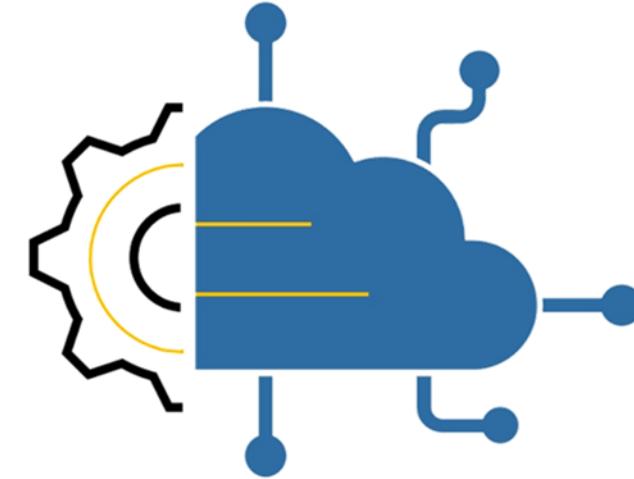


# Agenda

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- Overview of the ACROSS project
- Integration between OpenSlice and TeraFlowSDN
- New TeraFlowSDN features





# ACROSS project overview

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# ACROSS PROJECT CONSORTIUM

**Work Programme** HORIZON-JU-SNS-2022  
**Programme Topic** STREAM-A-01-07  
**Type of Action** HORIZON-JU-RIA

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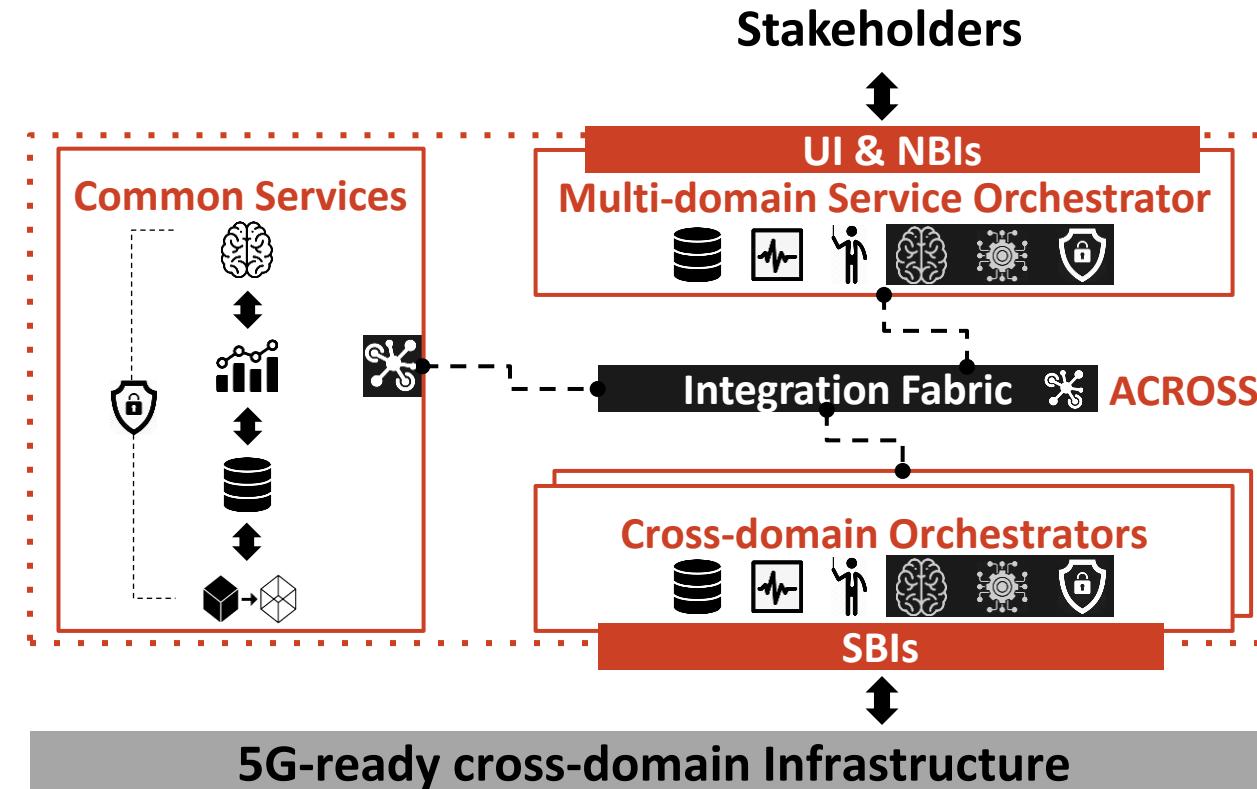
#	Partner	Name	Country
1	NOVA	NOVA TELECOMMUNICATIONS & MEDIA SINGLE MEMBER SA	Greece
2	TID	TELEFONICA INVESTIGACION Y DESARROLLO SA	Spain
3	ERI-LMI	L.M. ERICSSON LIMITED	Ireland
4	NEC	NEC LABORATORIES EUROPE GMBH	Germany
5	UOP	PANEPISTIMIO PATRON	Greece
6	UPM	UNIVERSIDAD POLITECNICA DE MADRID	Spain
7	CTTC	CENTRE TECNOLOGIC DE TELECOMUNICACIONES DE CATALUNYA	Spain
8	UBI	UBITECH LIMITED	Cyprus
9	ICP	INLECOM COMMERCIAL PATHWAYS	Ireland
10	K3Y	K3Y	Bulgaria
11	WINGS	WINGS ICT SOLUTIONS	Greece
12	π-NET	PI NET	Greece

# ACROSS Scope

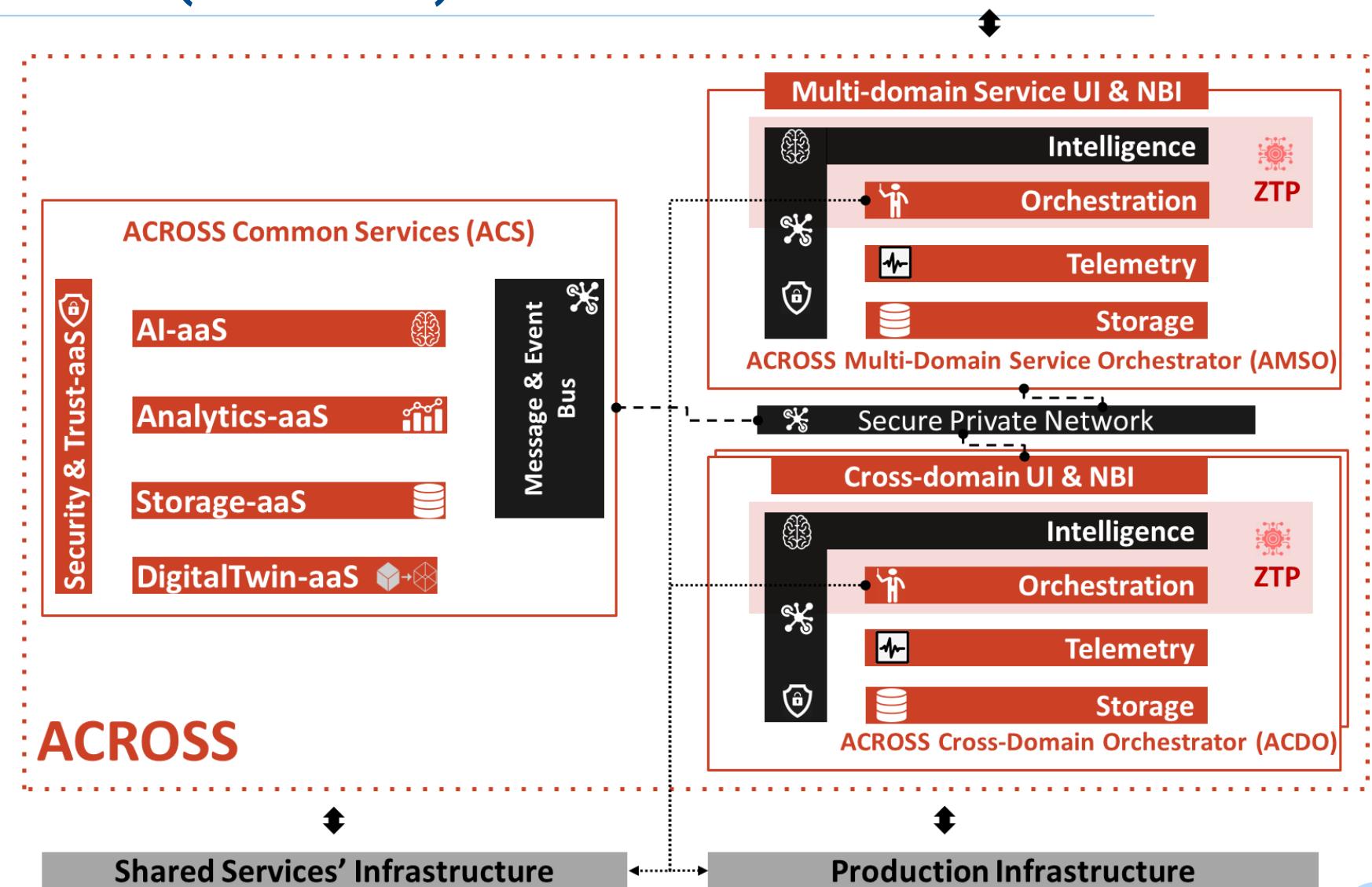
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- Beyond 5G and 6G infrastructures...
  - Have led to the automation of many industries worldwide.
  - Growing need for advanced management methods and services for these expanding systems.
- The ACROSS project aims to develop an **end-to-end service and management platform** for next generation networks.
  - Improved performance, adaptability, growth, energy efficiency and automation.
  - Implement an **ETSI ZSM-aligned system** composed of **highly distributed domain-level orchestrators** managed by a **cloud-managed multi-domain orchestrator**.

# ACROSS Architecture (basic)

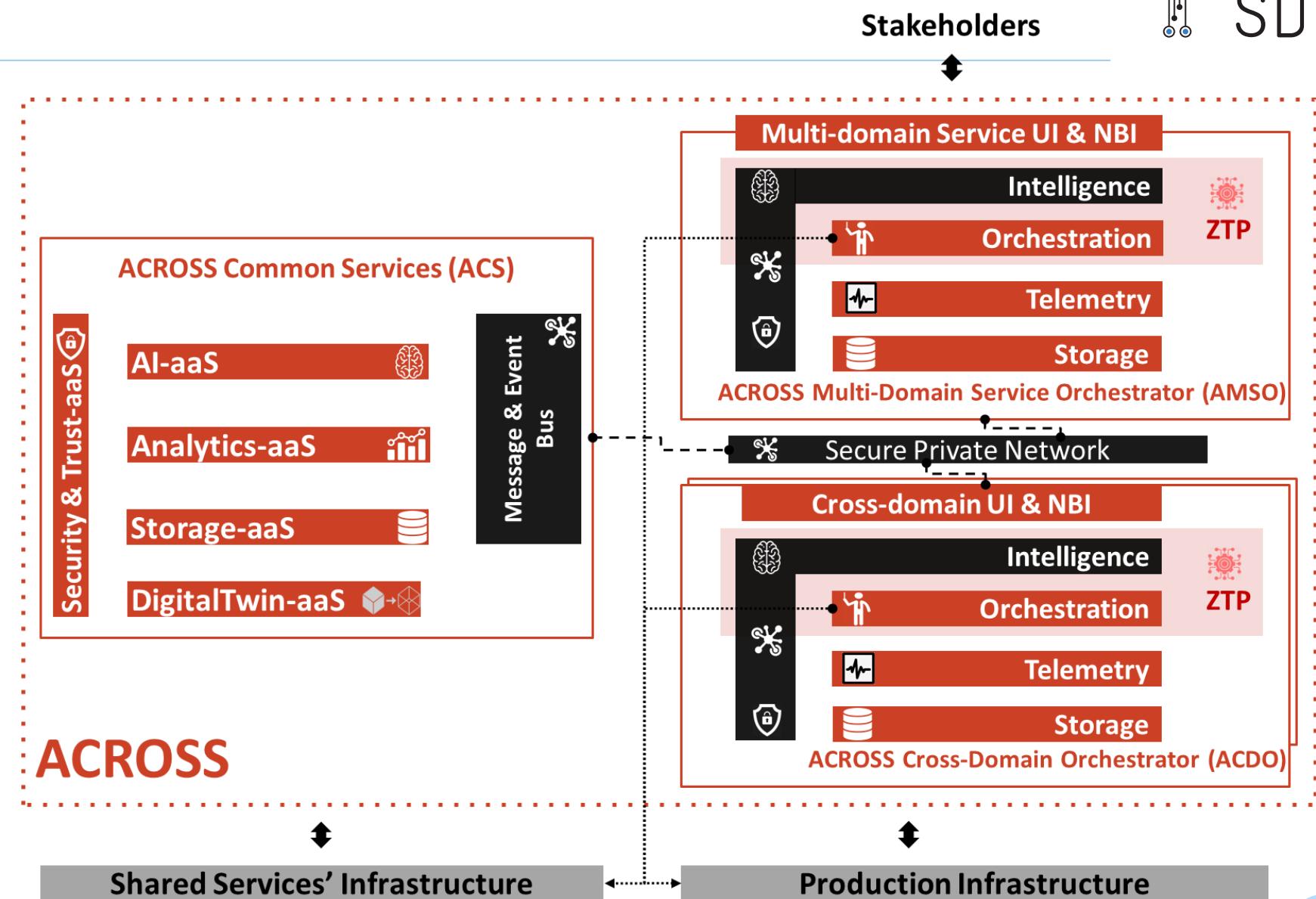


# ACROSS Architecture (detailed)

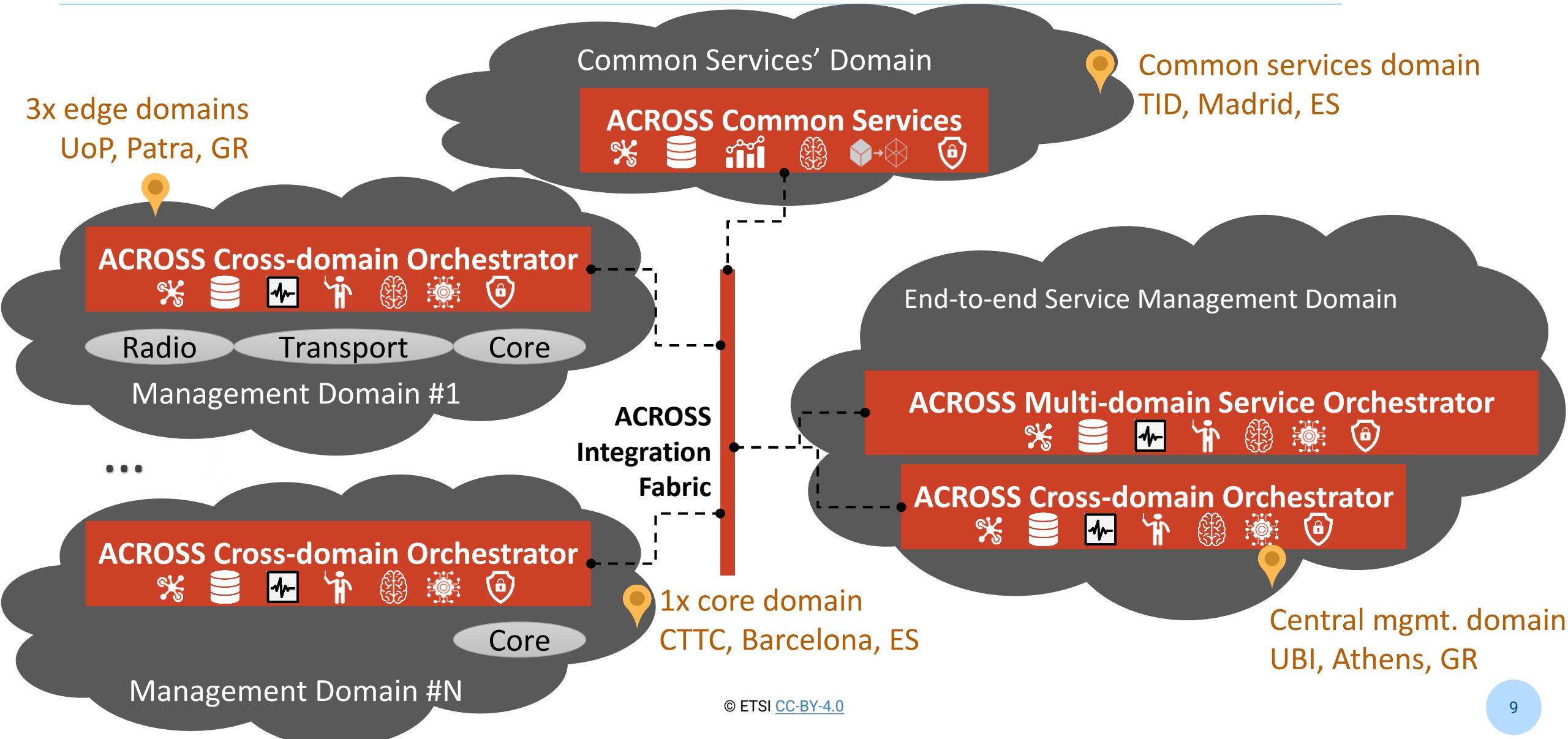


# Motivation

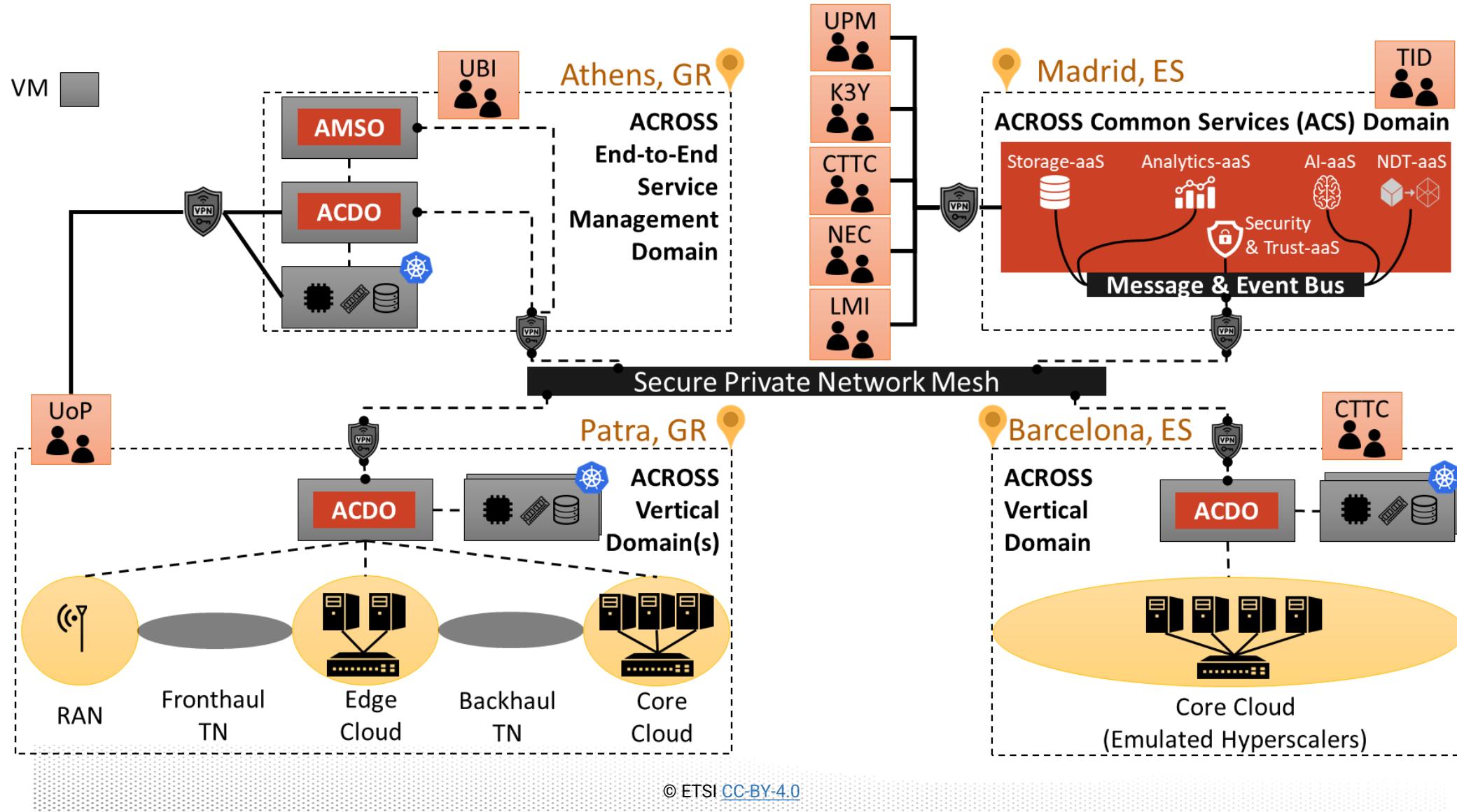
- ✓ Decoupled orchestration
- ✓ Proactive actuation
- ✓ AI + Analytics
- ✓ Zero-touch operations
- ✓ Resource + Service level
- ✓ Security and Trust



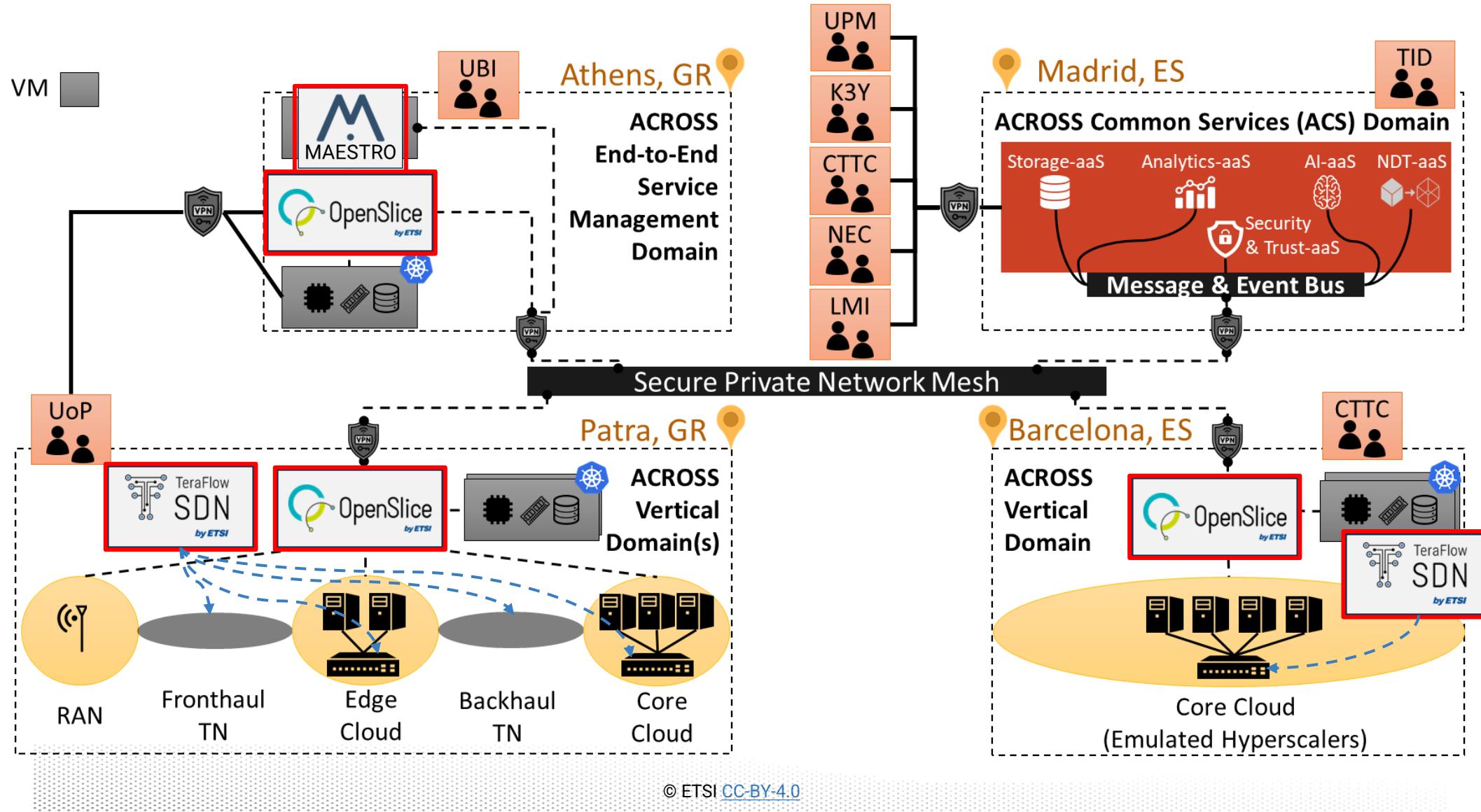
# ACROSS Domains – Mapping with Testbeds



# ACROSS Domains – Testbeds' Setup

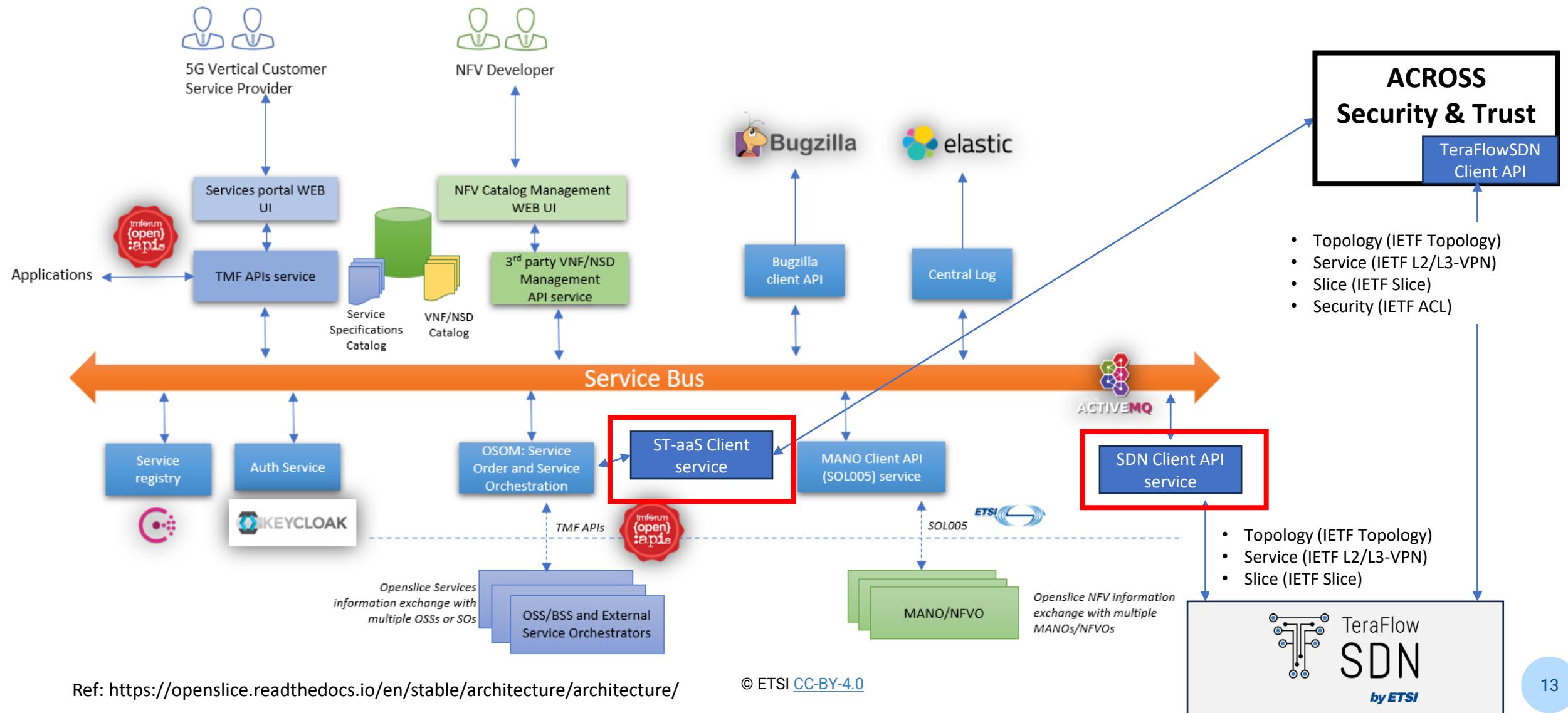


# ACROSS Domains – Testbeds' Setup

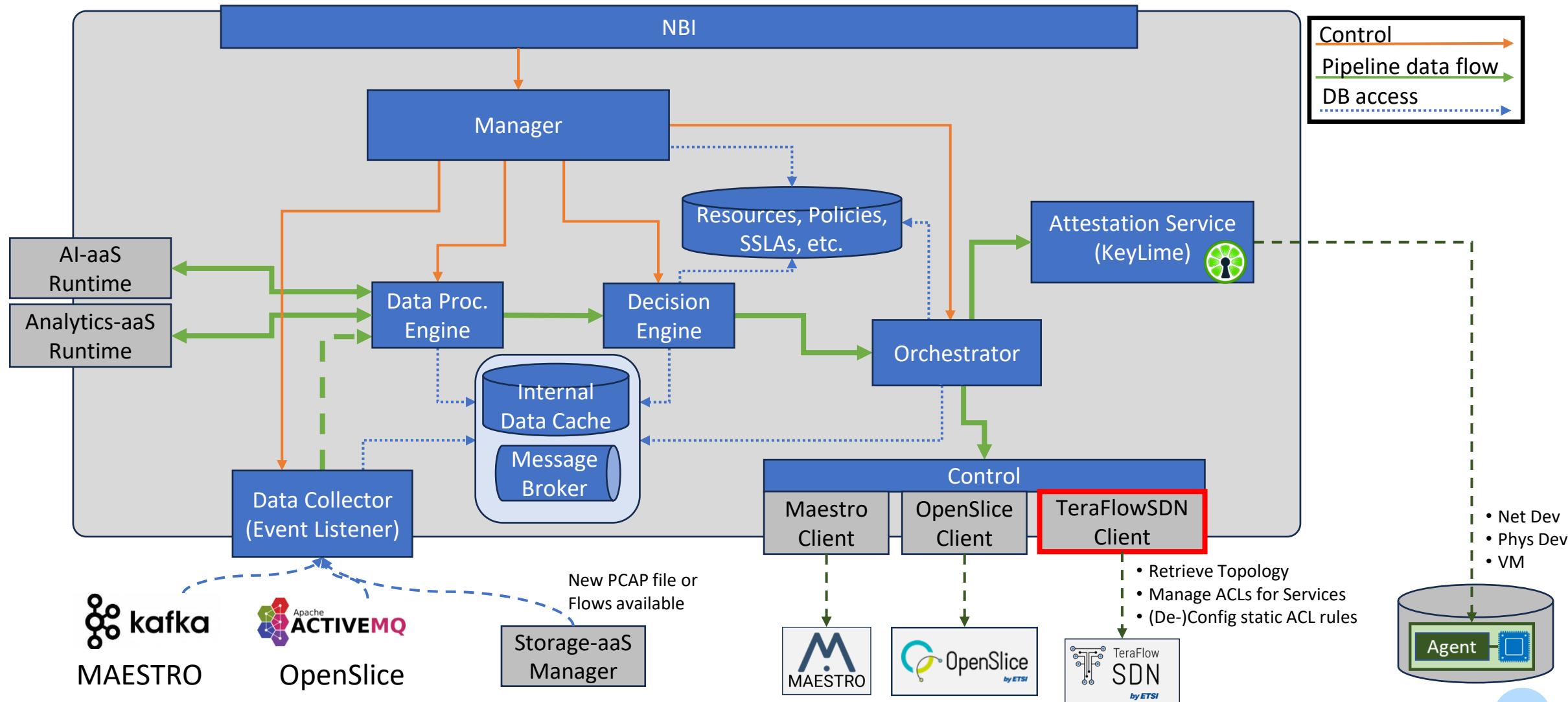


# Integration between OpenSlice and TeraFlowSDN

# OpenSlice + TeraFlowSDN Architecture



# ACROSS Security & Trust as a Service



# IETF Data Models (I)

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- IETF RFC8345 – YANG Data Model for Network Topologies
  - Abstract (generic, or base) YANG data model for network/service topologies and inventories.
- IETF RFC8466 – YANG Data Model for L2VPN Service Delivery
  - YANG data model that can be used to configure a Layer 2 provider-provisioned VPN service.
- IETF RFC8299 – YANG Data Model for L3VPN Service Delivery
  - YANG data model that can be used to configure a Layer 3 provider-provisioned VPN service.

# IETF Data Models (II)

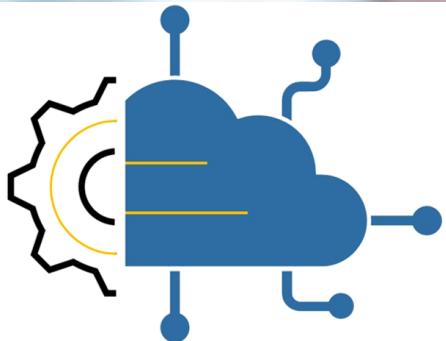
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- IETF draft-ietf-teas-ietf-network-slices-25 – A Framework for Network Slices in Networks Built from IETF Technologies
  - General framework for requesting and operating IETF Network Slices. Defines characteristics, necessary system components and interfaces, mapping of requests to specific technologies, etc.
- IETF RFC8519 – YANG Data Model for Network Access Control Lists (ACLs)
  - Data model for ACLs; sets of rules used to configure the forwarding behavior in a device. Each rule is used to find a match on a packet and define actions that will be performed on the packet.

# New TeraFlowSDN Features

## Preliminary list of Features

- 
- IETF Topology Data Model
    - Add plugin in NBI
  - IETF L2/L3-VPN Service Model
    - Add plugin in NBI
    - Review support for L2/L3-VPNs in Service component
  - IETF ACLs
    - Add plugin in NBI
    - Review Service component's support for managing ACLs
    - Review SBI component to configure ACLs in devices
  - In-band Network Telemetry (INT) in P4
    - Switch roles (Source, Transit, Sink)
    - Telemetry collector as a TeraFlowSDN microservice



# ACROSS

Automated zero-touch cross-layer provisioning  
framework for 5G and beyond vertical services

**NOVA**

**Telefónica**

**NEC**

**ERICSSON**

UNIVERSITY OF  
PATRAS  
ΠΑΝΕΠΙΣΤΗΜΙΟ ΠΑΤΡΩΝ

**KY**

**cttc<sup>R</sup>**

Centre Tecnològic de  
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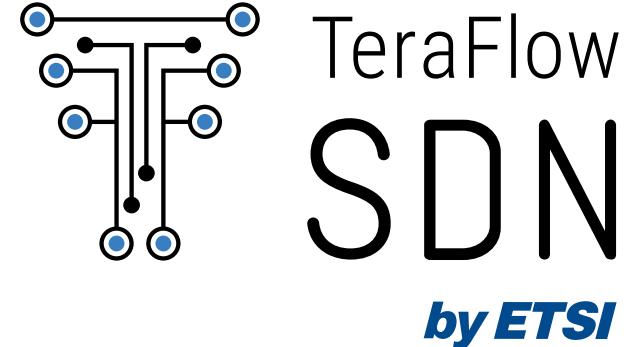
**VWINGS**  
ICT SOLUTIONS

**πNET**  
EMERGING NETWORKS & APPLICATIONS



POLITÉCNICA

This project has received funding from the European Union's Horizon Europe  
research and innovation programme under the Grant Agreement No 101097122



# Thank You! Questions?



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