ISG ZSM PoC Proposal

1 PoC Project Details

1.1 PoC Project

PoC Number: (assigned by ETSI)	
PoC Project Name:	Automated platform expansion, service provisioning, and proactive service-level agreement (SLA) preservation across multi-site and multi-stakeholder environments.
PoC Project Hosts:	UoP, Telefonica S.A.
Short Description:	This PoC assumes that an open orchestration platform already manages a certain domain in the city of Athens. Upon request, the PoC begins with the demonstration of (i) the expansion of the orchestration platform towards a new private domain in a zero-trust fashion and with high-degree of automation, (ii) the automated provisioning of compute, network, and end user services across the new and the existing domains, and (iii) policy-based access control towards service component coupled with a proactive preservation of a multi-domain SLA in a truly zero-touch manner. This PoC addresses the following ZSM PoC topics: (i) the Automation in Multi-Stakeholder Ecosystems (Topic 2 here, WIs ZSM-001 and ZSM-003) (ii) the Cross-domain user-driven E2E services (Topic 4 here, WI ZSM-008).

1.2 PoC Team Members

	Organisation name	ISG ZSM participant (yes/no)	Contact (Email)	PoC Point of Contact (*)	Role (**)	PoC Components
1	UBITECH Ltd.	No	Georgios P. Katsikas gkatsikas@ubitech.eu		Network/service provider	- Use case definitions - Testbed provider
2	p-NET	No	Christos Tranoris ctranoris@p-net.gr		Network/service provider	- Use case definitions - Testbed provider
3	Telefónica Innovación Digital	Yes	Diego R. López diego.r.lopez@telefonica.com		Network/service provider	- Testbed provider - NDT environment provider
4	UPM	No	Alberto Mozo a.mozo@upm.es		University/ supplier	- AI Model repository provider
5	NOVA	No	Ioannis Markopoulos Ioannis.Markopoulos@novaict.gr		Network/service provider	- Secure integration fabric service provider - Integrator
6	University of Patras	Yes	Kostis Trantzas ktrantzas@ece.upatras.gr	X	University/ supplier	- End-user service provider - Integrator
7	CTTC	Yes	Lluis Gifre lluis.gifre@cttc.es		Research center/supplier	- Transport network controller provider - Network security controller provider
8	LMI	No	Joseph McNamara joseph.mcnamara@ericsson.com		Integrator	- Automation service for SLA adaptation
9	WINGS	Yes	Dimitrios Triantafyllou dtriantafillou@wings-ict-solutions.eu		Integrator	- Automation service for SLA adaptation
10	K3Y	No	Evangelos Syrmos esyrmos@k3y.bg		Integrator	- Automation service for SLA monitoring and forecasting
(*) Identify the PoC Point of Contact with an X. (**) The Role will be network/service provider, supplier, or other (universities, research centers, test labs, Open Source projects, integrators, etc…).						

All the PoC Team members listed above declare that the information in this proposal is conformant to their plans at this date and commit to inform ETSI timely in case of changes in the PoC Team, scope or timeline.

1.3 PoC Project Scope

1.3.1 PoC Topics

PoC Topics identified in this clause need to be taken for the PoC Topic List identified by ISG ZSM and publicly available in the ZSM WIKI. PoC Teams addressing these topics commit to submit the expected contributions in a timely manner.

PoC Topic Code	PoC Topic Description	Related WI	Expected Contribution	Target Date
ACROSS Automation PoC - Scenario #1 (see Section 2.2)	East-west platform expansion to a new private edge domain	ZSM-001, ZSM-003, ZSM-008	Propose a solution to automate the east-west expansion of an orchestration platform to a new private domain in a secure and trusted manner. The solution includes the provisioning of a dedicated domain orchestrator instance in the new domain that will be interconnected with a multi-domain orchestrator via a secure integration fabric.	By 30/11/2025
ACROSS Automation PoC - Scenario #2 (see Section 2.2)	Zero-touch multi-domain end-to-end service provisioning	ZSM-001, ZSM-003, ZSM-008	Propose a solution to automate the provisioning of an end-to-end 5G-based service across the central management domain and the new private edge domain. This solution will entail the automated provisioning of (i) compute (Kubernetes-as-a-Service) and mobile network (5G-as-a-Service) resources, (ii) the end-user service on top of the allocated resources, and (iii) end-to-end telemetry for compute, 5G, and end user services.	By 30/11/2025
ACROSS Automation PoC - Scenario #3 (see Section 2.2)	Zero-touch service access control and proactive SLA preservation	ZSM-001, ZSM-003, ZSM-008	Propose a solution for creating an SLA for the deployed service and ensuring that this SLA is proactively preserved using Analytics forecasting for potential SLA violations and a closed loop Automation that proactively adapts the end user service to preserve the SLA.	By 30/11/2025

1.3.2 Other topics in scope

List here any additional topic for which the PoC plans to provide input/feedback to the ISG ZSM.

PoC Topic Code	PoC Topic Description	Related WG/WI	Expected Contribution	Target Date
-	-	-	-	-

1.4 PoC Project Milestones

PoC Milestone	Milestone description	Target Date	Additional Info
P.ST	PoC project start	July 01, 2025	-
P.SM	PoC proposal submission	July 18, 2025	-
P.PR	PoC presentation	September 09-10, 2025	ETSI ZSM #32 plenary meeting (online presentation)
P.P.A	PoC public announcement	At a convenient date set by ETSI ZSM	-
P.U.S	PoC user story detailed	In October 2025	-
P.T.P	PoC test plan	In October 2025	-
P.D	PoC demo	In November 2025	Webinar
P.R	PoC report	By Dec. 15, 2025	-

NOTE: Milestones need to be entered in chronological order.

1.5 Additional Details

Horizon Europe ACROSS project [1] web portal details information about project's scope and multiple references to design, implementation, validation, and open-source contributions.

2 PoC Technical Details

2.1 PoC Overview

This PoC aims at demonstrating the automated expansion of an orchestration platform to a new private domain, where the domain stakeholder is offered means to (i) provision end-to-end 5G-based services in a fully automated manner and (ii) proactively preserve the service's SLA using smart SLA forecasting and service reconfiguration actions. This PoC will utilize parts of the infrastructure of the ACROSS Horizon Europe project [1].

2.1.1 Infrastructure

This PoC leverages infrastructure from the ACROSS project; ACROSS is a Horizon Europe RIA project that envisions ambitious – yet tangible – breakthroughs in zero-touch service and network management. To realize this vision, ACROSS establishes a hierarchical orchestration platform based on 4 main pillars:

1. A logically centralized (cloud managed) Multi-domain Orchestration (MDO) platform that resides in an end-to-end service management domain.
2. A dedicated domain orchestration (DO) platform instance in every managed domain (DO is distributed)
3. A Network Planning domain where Digital Twins and realistic Data Generation mechanisms are employed to facilitate the training of smart AI/Analytics-based models for network management.
4. An open and programmable Zero-Trust Connectivity (ZTC) Fabric which ensures secure integration of all the managed domains with the end-to-end service management and the network planning domains.

ACROSS provides the above capabilities through a testbed that is currently active in the south part of Europe across Greece and Spain as shown in Figure 1. The domains of this testbed and their main components are explained in the rest of this section.

Note that additional services may be part of each testbed, depending on the needs of a certain use case; Section 2.2 showcases a more detailed view of this testbed will all the components that participate in the proposed PoC.
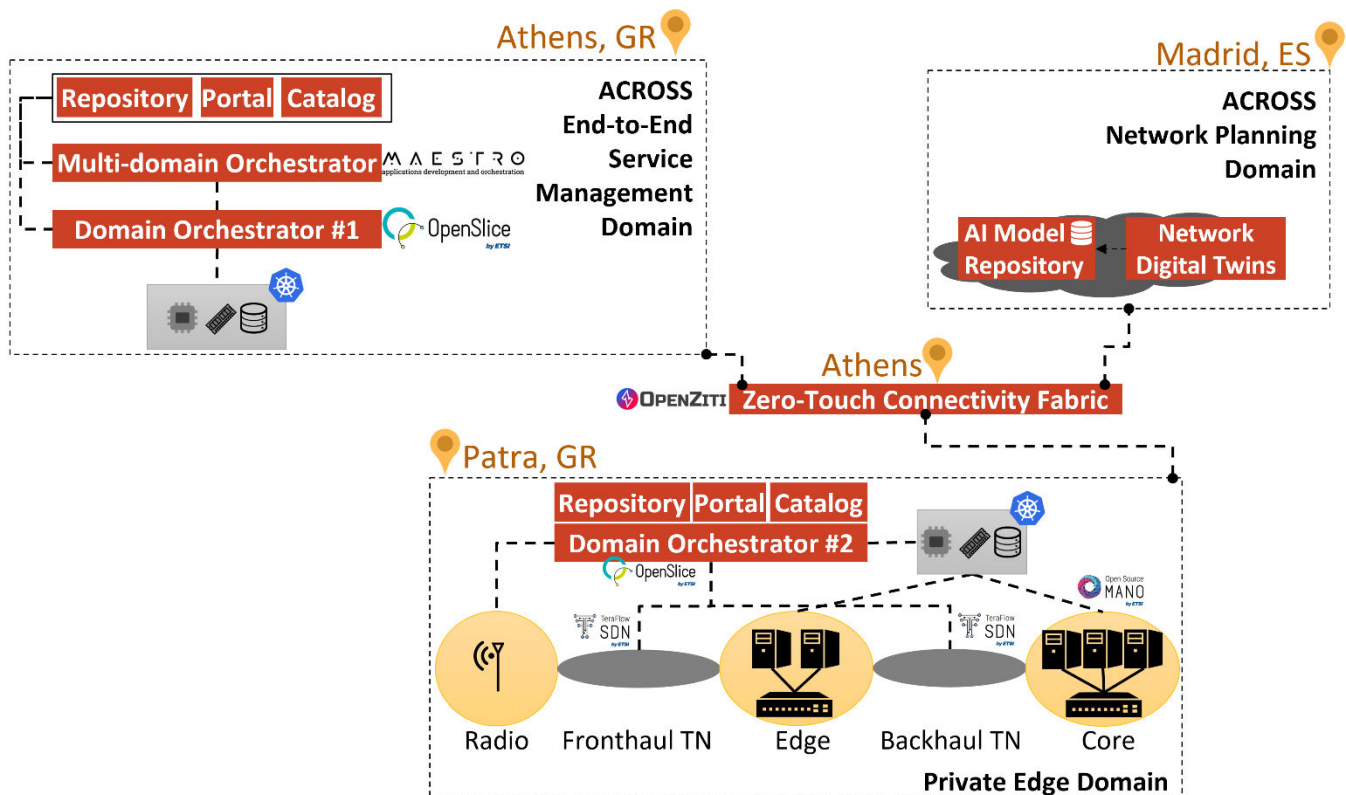
Figure 1: ACROSS infrastructure sites leveraged by this PoC.

End-to-end Service Management Domain (Athens, Greece)

This domain serves as a central point of management, where ACROSS employs an instance of the MDO as well as an instance of the DO (i.e., Domain Orchestrator #1 in Figure 1) for managing local compute resources as shown in the top left part in Figure 1. UBITECH's Maestro [4] service orchestration platform acts as the MDO and ETSI OpenSlice [5] acts as the Domain Orchestrator #1.

Network Planning Domain (Madrid, Spain)

This domain offers Telefonica's Network Digital Twin (NDT) environment for serving as a pre-production facility where telco operators can test their services under realistic conditions and traffic patterns. Part of the NDT's capabilities is (i) the training of AI/Analytics-based models using either artificial or real network data, (ii) the validation of these models, and (iii) the exposure of these models into a model repository that is exposed to other domains via a secure integration fabric (i.e., the Zero-Touch Connectivity Fabric). This domain is in line with the concept of the Network Digital Twins as defined in the ETSI GS ZSM 018 document [3].

Private Edge Domain (Patra, Greece)

This domain serves as a realistic environment for employing vertical applications from different sectors, such as smart cities, energy management, Industry 4.0, etc. These services leverage the large-scale Patras 5G testbed that spans across the UoP campus, the Patras city centre, and other locations in the region of Patra. This testbed offers distributed points-of-presence of compute and mobile network resources that can be dynamically interconnected and orchestrated by a local DO (i.e., OpenSlice acting as Domain Orchestrator #2) instance. Underneath OpenSlice, additional ETSI SGD platforms are employed to manage 5G cNFs (ETSI OSM [6]) and transport network services (ETSI TFS [7]).

Zero-Trust Connectivity (ZTC) Fabric (Athens, Greece)

This domain is the glue among all the other domains as it provides a secure and programmable fabric for establishing on-demand tunnels between services that reside in geo-distributed private domains. This is done via OpenZiti [8], an open-source platform that acts as the foundation for the ACROSS ZTC fabric. This platform is in line with the concept of the Integration Fabric as defined in the ETSI GS ZSM 002 architecture document [2].

2.1.2 Objective

This PoC will leverage the ACROSS infrastructure to showcase a comprehensive zero-touch orchestration use case deployed across multiple administrative domains with minimal manual configuration. The demonstration will capture the entire service lifecycle—from the initial expansion of the infrastructure, through automated onboarding of required services, to dynamic provisioning over on-demand compute and network resources—coupled with end-to-end SLA-driven service management. Specifically, the use case assumes:

- A Multi-domain Orchestrator, a Domain Orchestrator (i.e., Domain Orchestrator #1 in Figure 1), and the Zero-Touch Connectivity Fabric initially operate within Domain A. The MDO triggers the establishment of a secure, orchestrated link towards a newly introduced Domain B via the ZTC Fabric, enabling inter-domain connectivity.
- Following the successful establishment of secure connectivity towards Domain B, DO#1 instructs the instantiation of a second Domain Orchestrator (DO#2) instance within Domain B. This new orchestration instance assumes control over local infrastructure and resource controllers, managing them autonomously and exposing them in an "as-a-Service" manner.
- Once Domain B is fully onboarded, the user service is prepared, and its deployment is requested via the orchestration platform. The MDO initiates the service order by instructing DO#2 to provision the necessary compute, network, and telemetry resources tailored to the service requirements. Upon successful provisioning, the MDO proceeds to deploy the user application atop the newly instantiated infrastructure and launches the telemetry collection and visualization workflow.
- During the service runtime, the PoC supports dynamic enforcement of security policies governing access to service components. Simultaneously, it enables the definition of an SLA, followed by continuous SLA monitoring and predictive analytics to detect deviations in advance. The latter forms the basis for a self-sustaining, closed-loop control mechanism that preserves SLA compliance autonomously, without human intervention.

2.2 PoC Architecture

This section introduces the PoC architecture, which gets fully defined after the following distinct scenarios will be conducted during the PoC demonstration:

(i)   **Scenario #0:** the initial state of the testbed before the launch of the PoC.
(ii) **Scenario #1 (PoC begins):** Launch of the PoC with the expansion of the orchestration platform to a new domain.
(iii) **Scenario #2:** Multi-domain and telemetry-enabled end-to-end service provisioning in Domain B (see Figure 2).
(iv) **Scenario #3 (PoC ends):** Real-time service security and proactive SLA preservation across Domains A and B (see Figure 2).

After the end of Scenario #3, the testbed is expected to reach its final state. Figure 2 highlights this state, also defined as the PoC architecture. The PoC report will provide detailed descriptions of the 4 scenarios above, as well as additional drawings that will highlight how the PoC infrastructure and services will be formed during each scenario.
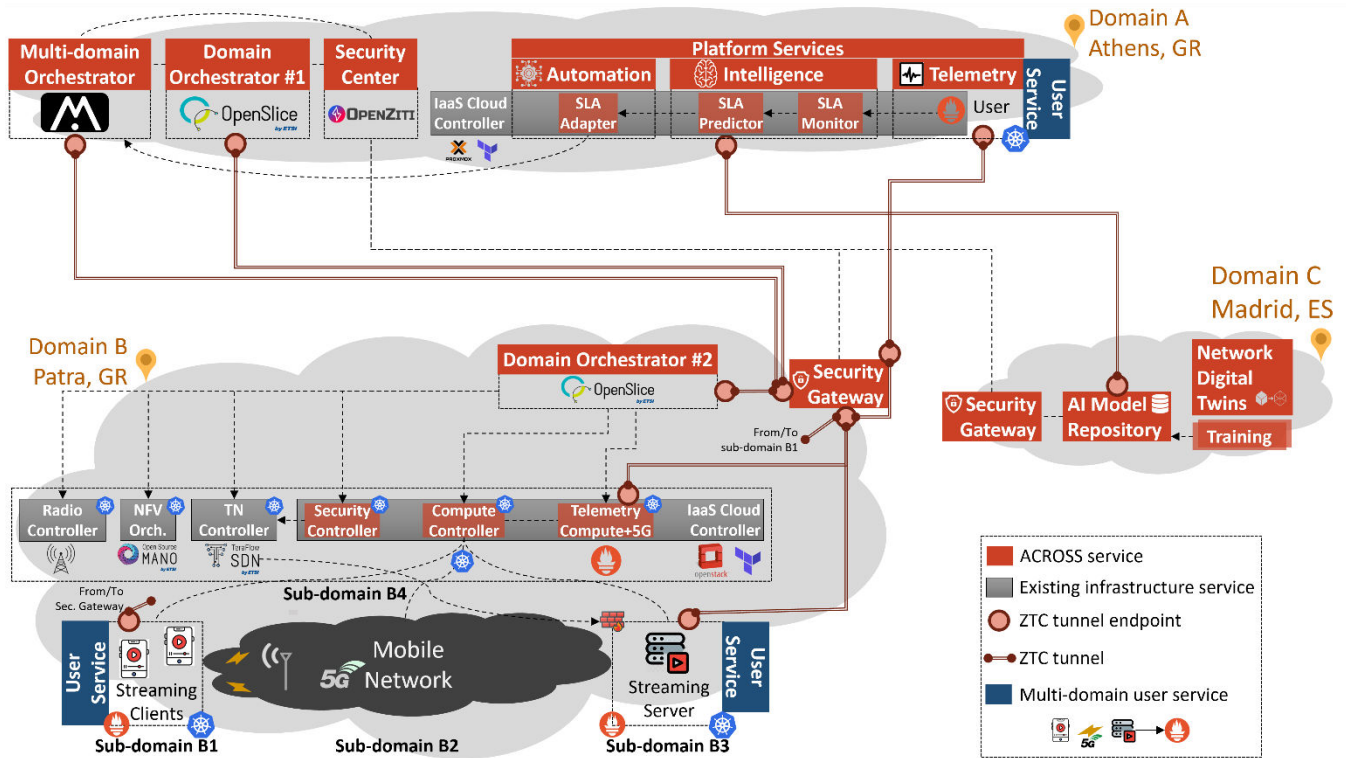
Figure 2: PoC architecture after the end of Scenario #3 (final state).

2.3   Additional information

This section concludes the PoC proposal with some acknowledgements to the funding sources of this work and the involved open-source communities behind these projects (see Section 2.3.1) and some useful references that are relevant to support the claims in this document (see Section 2.3.2).

2.3.1 Acknowledgements

Specifically, this entire PoC comprises Test Case 4 of the ACROSS project, which had originally (since the proposal time) planned to contribute this test case as a PoC to ETSI ZSM. COP-PILOT is a new CL4 Innovation Action project that leverages the ACROSS platform as a baseline to accommodate large scale trials across 4 clusters of testbeds across Europe, thus attempt to elevate the ACROSS platform's TRL to close-to-market levels. The fact that this PoC is entirely based on open-source community projects, some of which are Software Development Groups under ETSI, makes the proposed platform a suitable framework for building up a growing ecosystem, where software development communities (from EU consortia, SMEs, industries, and/or universities) contribute towards a preliminary 6G-ready orchestration platform.

2.3.2 References

The references used throughout this document are listed below:

[1]. ACROSS HEU project, Available: https://across-he.eu/

[2]. ETSI GS ZSM 002 v1.1.1 (2019-08): "Zero-touch network and Service Management (ZSM); Reference Architecture", Available: https://www.etsi.org/deliver/etsi_gs/ZSM/001_099/002/01.01.01_60/gs_ZSM002v010101p.pdf

[3]. ETSI GS ZSM 018 v1.1.1 (2024-12): "Zero-touch network and Service Management (ZSM); Network Digital Twin for enhanced zero-touch network and service management", Available: https://www.etsi.org/deliver/etsi_gs/ZSM/001_099/018/01.01.01_60/gs_ZSM018v010101p.pdf

[4]. Maestro end-to-end service orchestration platform, Available: https://maestro-mkdocs.readthedocs.io/

[5]. ETSI OpenSlice (OSL), Available: https://osl.etsi.org

[6]. ETSI Open-Source MANO (OSM), Available: https://osm.etsi.org

[7]. ETSI TeraFlowSDN (TFS), Available: https://tfs.etsi.org

[8]. OpenZiti, "Cloak Your Network. Secure Services not IPs", Available: https://openziti.io/

[9]. COP-PILOT EU project, Available: https://cop-pilot.eu/