Across

ACROSS is a HORIZON-JU-SNS-2022 funded research project that designs and implements an end-to-end service deployment and management platform for next generation networks and services, aiming at unprecedented levels of automation, performance, scalability, and energy efficiency.

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TC1: Stakeholder-driven zero-touch orchestration

Summary of the TC1 Approach

TC1 shows how the ACROSS platform makes network service setup faster, simpler, and smarter with less manual effort. Imagine being able to click a button and have complex services set up and running across networks, all while staying secure and efficient. This test case brings that vision to life by letting stakeholders define what they want, and letting the platform do the rest automatically. It is a big step forward for telecom providers and industries that need reliable, agile networks to support their digital services and future growth.

Key Innovations & Business Value

- TC1 introduces intelligent automation mechanisms for popular system operations that transform how operators perform daily maintenance to their infrastructures and services—cutting costs, reducing errors, and enabling faster service delivery.
- TC1 automates device onboarding and telemetry, service onboarding and provisioning, as well as service security add-ons with minimal manual effort and maximum business agility.

Architecture & Core Technologies

TC1 spans two geo-distributed domains: a central domain in Athens hosting the ACROSS multi-domain orchestrator and the Zero-Trust Connectivity (ZTC) Fabric, and a local domain in Patras supporting 5G applications. A domain orchestrator, telemetry stack, and security services are deployed automatically in Patras. The setup enables secure orchestration of compute, transport, and 5G network resources. Integration with Prometheus, Kubernetes, and ETSI-aligned orchestration frameworks ensures scalable, secure, and policy-compliant service delivery across domains.

Key Innovations

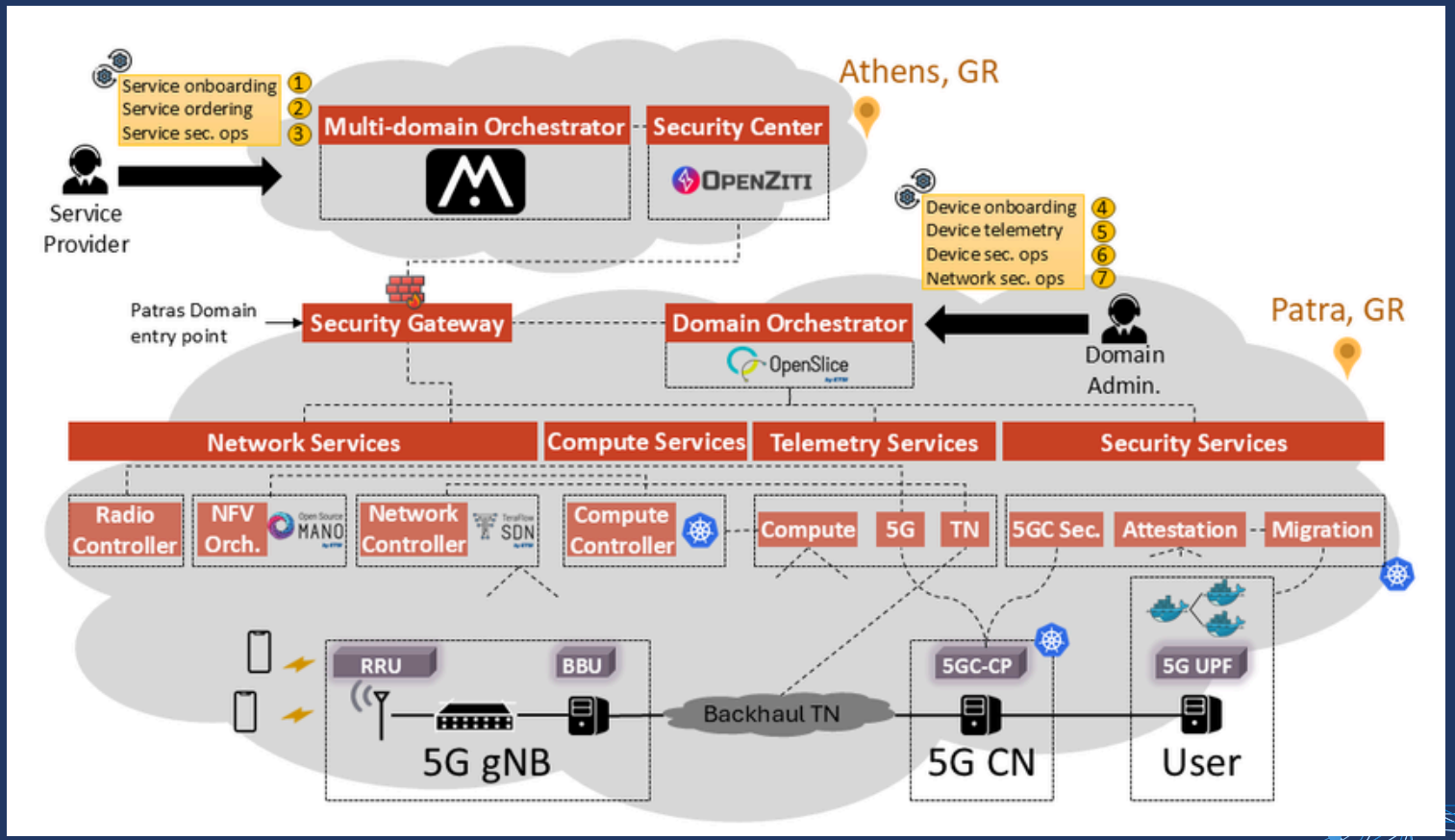
- On-demand attestation of heterogeneous compute and network devices in a zero-touch fashion.
- Fully automated telemetry provisioning for heterogeneous compute and network devices.
- Zero-Touch onboarding and provisioning of 5G-ready end-user applications.
- Zero-Touch update of end user and core network (5GC) services.
- On-the-fly zero-touch chaining of security add-ons on running service instances.
- Stateful container migration in a zero-touch manner.

Implementation & Validation

TC1 uses an integrated, hierarchical orchestration stack combining Maestro (AMSO), OpenSlice (ACDO), and OpenZiti for secure, zero-trust connectivity. This platform integrates with various underlying services: (i) ETSI Open-Source MANO (OSM) for the orchestration of 5G network functions, (ii) ETSI TeraFlowSDN controller for the management of programmable transport network services, (iii) Kubernetes for the management of compute resources and services, (iv) compute, 5G and end user service telemetry using Prometheus, and (v) security services for protecting key functions of the 5GC, a device attestation service, as well as a secure container migration service. Important KPIs for TC1 include:

- Automated compute, 5G, and transport network device attestation in less than 1 second, against a target of under 1 minute.
- 5G core network service update achieved in approximately 5 seconds (estimated), against a target of ≤5 minutes.
- 5G core network service expansion with security functions achieved in approximately 32 seconds, against a target of under 1 minute.
- End-user service provisioning over an existing compute cluster achieved in 11 seconds for a single-component application and 13 seconds for a three-component application, against a target of ≤1 minute.

Overview of the ACROSS Test Case 1



Expected Impact & Market Potential

TC1 positions the ACROSS platform as a key enabler for next-generation telecom services by radically simplifying service deployment through zero-touch orchestration. Its ability to translate stakeholder needs into automated, policy-driven workflows unlocks faster time-to-market, lower operational costs, and higher service quality.
This innovation supports a broad range of use cases—from private 5G for enterprises to dynamic multi-tenant service delivery—making it attractive for telecom operators, vertical industries, and digital infrastructure providers seeking scalable, secure, and intelligent automation at the network edge and core.

Technical Benefits

TC1 removes the need for manual configuration and reduces human error.
It introduces an intelligent, zero-touch orchestration engine that automates the deployment and lifecycle management of complex services. This results in faster provisioning, seamless integration across domains, and scalable network operations—key capabilities for telecom providers looking to optimize performance, reduce costs, and accelerate service innovation.

Business & Industry Value

TC1 offers a transformative shift for telecom operators by combining zero-touch orchestration with a standards-based, open architecture.
Built on frameworks like ETSI NFV and Open RAN, it empowers providers to move beyond rigid, vendor-locked systems. This openness enables faster service rollout, lower operational costs, and more responsive business models in an increasingly dynamic, multi-tenant digital services landscape.