RELIANCE

Resilient and Scalable Slicing over Multiple Domains

Project ID: C2017/3-8

Start Date: 1 June 2018

Closure date: 31 March 2021

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The main goal of RELIANCE is to extend the 5G network architecture with new functionalities needed for multi-service and multi-domain management, with the related abstractions, interfaces, while respecting the need for resilience, security & scalability.

Main focus

RELIANCE aims to conduct research activities on the concept of federated network slicing to compose end-to-end services that span across different technical and administrative domains. A key innovation of the project is the highly scalable and robust slice choreography plane that enables the offering of vertical-tailored slices "as-a-Service", ensuring the required scalability, security, and resilience features. It facilitates the mapping of service requirements from the verticals with their predicted traffic demands into dedicated networking and cloud resources through automated multiparty negotiation. Scalable slice federation is complemented with protocols for deployment and runtime adaptation of resilience and security mechanisms over heterogeneous infrastructures, so to enable a unified reliability framework.

Approach

The architectural work of RELIANCE is driven by the diverse needs and requirements stemming from vertical industries (industry 4.0, Smart Cities, Enhanced multimedia broadband & train control & management system). The RELIANCE framework will be implemented and validated on selected use-cases through proof-of-concepts, aiming at demonstrating the envisioned benefits of the RELIANCE framework.

Achieved results

RELIANCE provided a better understanding of the opportunities and current constraints of Network slicing from the vertical point of view. This point brings a great impact since it means a new perspective to generate new opportunities based on RELIANCE capabilities. Added to this, the enhanced vertical-specific services and components generated have resulted in key actual products and pilots, with a high expected return of investment:

♦ Enhanced Augmented Reality-based support system for IIoT.
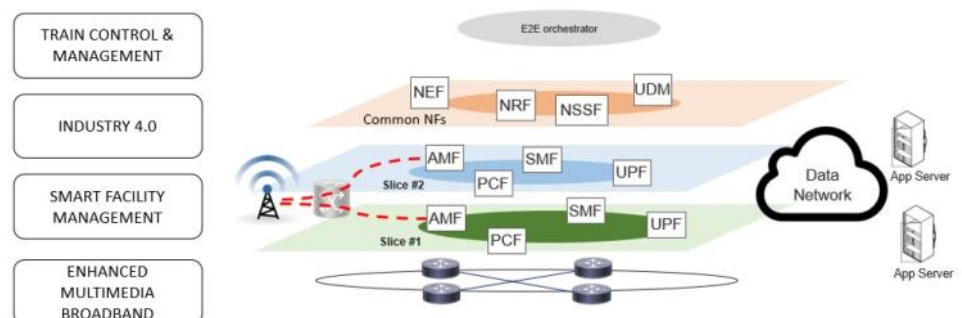
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- Augmented, Volumetric Streaming in real-time for Smart Facility Maintenance Operations.
- Enhanced diagnostic and maintenance system for Train Control and Management System (TCMS).
- New technical specifications of 5G router prototype for train application, evolving the existing train to the wayside communication system.
- Improved video conferencing platform with an intent-based routing engine to improve video quality.

From the telco point of view, the opportunity to test different services helped to define a criterion to comply with for new services in the future, improving the 5G SA Core testbed. Also, the Network slicing capabilities have been improved based on project outputs verifying that the assurance of QoS metrics when application services are assigned to different network slices with specific dedicated resources. RELIANCE has set the foundations for a wider adoption of network slicing. It opened new research opportunities to manage resources with a predictable structure and to generate an autonomous slice-based resource management.

Impact

The flexibility and agility offered by RELIANCE in the provisioning and management of slices will encourage vertical industry actors to access this new network slice marketplace, thus bridging the gap between verticals and telco industries. In addition, the creation of these novel business interactions and models will enable verticals to either deploy new customized services or improve existing ones, thus strengthening their positions in their respective markets. This is also reflected on the telco industry side, whereby operators will have opportunities to engage new customers from the vertical sectors with more appealing service offerings. Moreover, the extremely flexible and agile RELIANCE approach, based on recursive abstraction and virtualisation of resources, will enable network operators to improve their products portfolio beyond network connectivity services.

About Celtic–Plus

Celtic-Plus is an industry-driven European research initiative to define, perform and finance through public and private funding common research projects in the area of telecommunications, new media, future Internet, and applications & services focusing on a new „Smart Connected World" paradigm. Celtic-Plus is a EUREKA ICT cluster and belongs to the intergovernmental EUREKA network. Celtic-Plus is open to any type of company covering the Celtic-Plus research areas, large industry as well as small companies

or universities and research organisations. Even companies outside the EUREKA countries may get some possibilities to join a Celtic-Plus project under certain conditions.

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