5G-EXCHANGE (5GEX)

Multi-domain Orchestration for Software Defined Infrastructures

TECHNICAL AND RESEARCH CHALLENGES

The current market fragmentation results from having a multitude of telecommunications network and cloud operators each with a footprint focused on a specific region, while lacking inter-operator collaboration business models, services and supporting tools. This makes it infeasible to deploy and offer cost-effective infrastructure services spanning multiple countries. Existing services and inter-operator collaboration tools are very limited and cumbersome. Our challenges are to invent technical and business solutions to autonomous orchestration of services across multi-domain and multi-technology environments.

MAIN OBJECTIVES

5G Exchange (5GEx) will enable efficient business and technical cross-domain orchestration of services over multiple administrations as well as multi-domain orchestration over single administrations. Such orchestration shall allow instantiating end-to-end networks and services into multi-vendor and heterogeneous technology resource environments. In order to overcome the traditional separation of network resources from compute and storage, 5GEx will realize composite services by seamlessly combining networking with computing and storage across domains. Service deployment, activation and further management can be viewed as the efficient mapping of service elements onto an abstracted model based on a virtualised substrate belonging to multiple operators. The goal of the 5GEx project is the automated assignment and mapping of virtualised service elements, which represent service and network functions and components, to the underlying (physical hardware) resources across domains. 5GEx cross-domain business models and orchestration shall optimise 5G business and operational policies and KPIs including substrate utilisation, OPEX reduction and revenue maximisation. Business-wise, 5GEx will create opportunities for operators to buy, sell, and integrate infrastructure services in an automated and cost-effective manner. 5GEx will build a working end-to-end system and deploy a proof-of-concept prototype, which includes the concept of a "Sandbox Exchange". Sandbox Exchange will enable new ways of experimentation and use case validation close to an operating environment facilitating the transition from experimentation, to piloting and further to real-world operation. 5GEx will contribute to the relevant standard forums and Open Source communities.

APPLICATIONS

5GEx will focus on a number of use cases for demonstrating the set of functionalities required for multi-domain and multi-technology perspectives, reflecting future realistic scenarios enabled by 5GEx. The use cases have been categorised according to the target service scope to be provided: (i) the Connectivity problem, (ii) the Network as a Service demand, and (iii) the Network - Storage - Computing as a Service request.

IMPACT

5GEx will go beyond the state of the art by (i) achieving a 90-minute service setup; (ii) integrating monitoring instances in the multi-operator architecture; (iii) optimally embedding -in terms of resource utilisation and revenue- service requests into the set of virtualised resources mapped into multiple operators domains while matching each service SLA requirements; and (iv) defining novel business, coordination and information models, trading mechanisms and pricing schemes.

5GEx also aims to experiment and validate the devised mechanisms and architecture of the multi-domain orchestrator into a Sandbox Exchange which will integrate of 5GEx testbeds.

PROJECT COORDINATOR

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MORE INFORMATION

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