

TF13. Prediction and modelling of service composition performance, quality and reliability

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Participants

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Research goals

- Explore empirical behaviour by measuring service composition properties in order to improve the modelling of service compositions
- Develop policies and mechanisms for deployment and runtime self-adaptation of composite services, with focus on stream analytics applications
- Analyse and model the impact of service differentiation on quality of next generation network services
- Develop new modelling tools and frameworks for programmable network environments

Activities

- SIP message differentiation
 - Develop and integrate a module for SIP message differentiation
 - Measure and analyse critical QoS performance metrics for unified communication service under different load conditions
- IoT in 5G performance requirements
 - Propose activity-based classification of IoT applications
 - Specify and prioritize performance requirements of such IoT application classes

Activities

- Network-aware optimal service selection and data stream processing (DSP) applications deployment and run-time adaptation
 - Network latency aware optimal formulation for service selection
 - Generalized for optimal DSP placement problem with QoS guarantees in Fog environments
 - Joint formulation to optimize the placement and replication of the operators of a DSP application
 - Distributed architecture for QoS-aware deployment and runtime adaptation of DSP applications
 - Mechanisms for the elasticity of stateful DSP operators
- Platforms
 - MOSES <https://github.com/uniroma2moses>
 - Distributed Storm <http://matnar.github.io/uniroma2-storm/>
 - Elastic Storm <http://matnar.github.io/elastic-storm/>

Activities

- ElaClo framework for optimizing cloud information systems
- Mayan framework based on FIRM approach to Software Defined Service Composition
- Modelling of reliability distributions based on topological analysis
- Reliable platform for run time service composition based on OpenStack Mirantis in SEIPLab@RITEH

Results

- STSM
 - MRaaS₂: MapReduce-as-a-Service for QoS-Aware Software-Defined Service Composition
- Project
 - Evolving Software Systems: Analysis and Innovative Approaches for Smart Management (EVOSOFT), Croatian Science Foundation

Results

- 2 journal papers
- 16 conference papers
- 2 chapters in ACROSS book
 - “QoS-based Elasticity for Service Chains in Distributed Edge Cloud Environments”
 - “Integrating SDN and NFV with QoS-aware Service Composition”