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/
• 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

Activities
Results

- **STSM**
  - MRaaS\textsubscript{2}: 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”