Towards Serverless NFV for 5G Media Applications

David Breitgand
IBM Research – Haifa, Israel
davidbr@il.ibm.com

Avi Weit
IBM Research – Haifa, Israel
weit@il.ibm.com

Stamatia Rizou
Singular Logic, Greece
srizou@singularlogic.eu

David Griffin
University College London, UK
d.griffin@ucl.ac.uk

Ugur Acar
Netas, Turkey
uacar@netas.com.tr

Gino Carrozzo
Nextworks, Italy
g.carrozzo@nextworks.it

Nikolaos Zioulis
Centre for Research and Technology Hellas, Greece
nzioulis@iti.gr

Pasquale Andriani
Engineering Ingegneria Informatica, Italy
pasquale.andriani@eng.it

Francesco Iadanza
Engineering Ingegneria Informatica, Italy
francesco.iadanza@eng.it

ABSTRACT
The advent of virtualization and IaaS have revolutionized the telecom industry via SDN/NFV. A new wave of cloud-native PaaS promises to further improve SDN/NFV performance, portability, and cost-efficiency. In this poster, we highlight a work in progress being done in the 5G-MEDIA project [2], which pioneers the application of the serverless paradigm to NFV in the context of media intensive applications in 5G networks. Motivational use cases include tele-immersive gaming, mobile journalism and UHD content distribution. For example, consider a next-gen e-sport, in which bouts between gamers last only a few minutes. FaaS offers a clear cost-efficiency benefit for hosting such applications. An architecture is shown in Fig. 1. It includes i) an Application/Service Development Kit (SDK) to enable access to media applications development tools; ii) a Service Virtualization Platform (SVP) to run the ETSI MANO framework, the Media Service MAPE optimization component and the VIM and WIM plugins to enable NFVIs integration; iii) different NFVIs to execute media-specific VNFs. FaaS VIM is implemented for integration of FaaS with the rest of the MANO stack. It allows mixing FaaS and “regular” VNFs within the same media forwarding graph. For reference implementation, Apache OpenWhisk [1] and Kubernetes are used. The main challenge is extending the programming model to support groups of actions communicating over a network, while retaining the simplicity of FaaS. The project is supported by EU H2020 R&I program (Grant Agreement No 761699).

REFERENCES