5G-CORAL: A 5G Convergent Virtualised Radio Access Network Living at the Edge

PROJECT COORDINATOR

Antonio de la Oliva
UNIVERSIDAD CARLOS III DE MADRID
(UC3M)

TECHNICAL MANAGER

Dr. Alain Mourad – European TM
INTERDIGITAL EUROPE LTD

Dr. Tony Do – Taiwanese TM
INDUSTRIAL TECHNOLOGY RESEARCH INSTITUTE
INCORPORATED (ITRI)

PARTNERS

Universidad Carlos III de Madrid /
Ericsson AB / InterDigital Europe /
Telecom Italia / Telcaria Ideas / RISE
SICS AB / Azcom Technology /
Industrial Technology Research
Institute Incorporated / ADLINK /
National Chiao Tung University

START DATE: 01/09/2017

END DATE: 31/08/2019

COST: 3,856,973.75€ including 2,497,223.75€ from EU H2020

MORE INFORMATION

www.5g-coral.eu

CONTACT

5G-CORAL-Contact@5g-ppp.eu

MAIN OBJECTIVES

5G-CORAL aims at delivering a converged 5G multi-RAT access through an integrated virtualised edge and fog solution that is flexible, scalable, and interoperable with other domains including transport (fronthaul, backhaul), core and clouds.

Main objectives:

o   Develop a system model including use cases, requirements, architecture, deployment scenarios, and business models to design and validate the 5G-CORAL solution.

o   Design virtualised Radio Access Network (RAN) functions for multiple RATs including Cellular, WiFi and IoT, data services, and users and third party low latency applications for hosting in the 5G-CORAL integrated Edge and Fog computing System (EFS).

o   Design an Orchestration and Control system (OCS) for dynamic integration and federation, and optimised allocation of 5G-CORAL EFS computing resources, including the interworking with other (non-EFS) domains such as the distant Cloud.

o   Integrate and demonstrate 5G-CORAL technologies in large-scale testbeds making use of facilities offered by Taiwan, and measure their Key Performance Indicators.

o   Disseminate and contribute 5G-CORAL results into international research and innovation venues to pave the way for their successful exploitation.
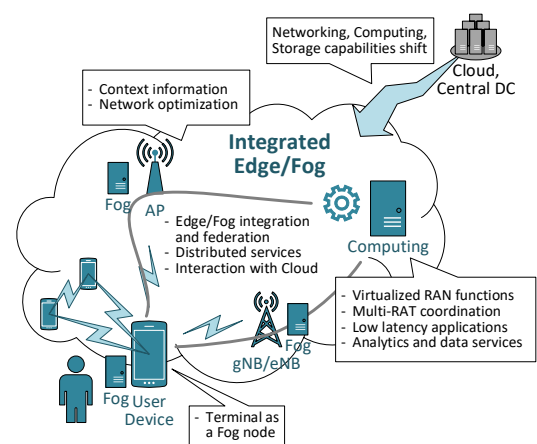
USE CASES

5G-CORAL project will be validated in three testbeds:

1.   Shopping Mall with mixed reality (AR/VR) and robotic applications (Taiwan)

2.   High-speed train (Taiwan)

3.   Connected cars (Taiwan and Italy)

TECHNICAL AND RESEARCH CHALLENGES

5G-CORAL project leverages on the pervasiveness of edge and fog computing in the RAN to create a unique opportunity for access convergence. This is envisioned by means of an integrated and virtualised networking and computing solution where virtualised functions, context-aware services, and user and third-party applications are blended together to offer enhanced connectivity and better quality of experience.

The proposed solution contemplates two major building blocks, namely EFS and OCS. The EFS is a logical unified platform for hosting applications and functions in a distributed manner across the underlying edge and fog infrastructure. The EFS also offers a platform for distribution of the data services mainly from the multiple RATs in the RAN through publish/subscribe protocols (e.g. DDS, MQTT, etc.) to the functions and applications. The OCS is the entity in charge of creating the EFS and managing and controlling its operations. The OCS extends on the current NFV, SDN, and MEC frameworks to support automated and secure integration and federation of the distributed EFS resources which may be mobile, volatile, and owned by multiple owners including end users.