2018–00514 - [CORDIS2018-NEO] Content-aware caching in Multi-access Edge Computing (MEC) architectures

Level of qualifications required: Graduate degree or equivalent
Function: PhD Position

About the research centre or Inria department

The Inria Sophia Antipolis - Méditerranée center counts 37 research teams and 9 support departments. The center's staff (about 600 people including 400 Inria employees) is composed of scientists of different nationalities (250 foreigners of 50 nationalities), engineers, technicians and administrators. 1/3 of the staff are civil servants, the others are contractual. The majority of the research teams at the center are located in Sophia Antipolis and Nice in the Alpes-Maritimes. Six teams are based in Montpellier and a team is hosted by the computer science department of the University of Bologna in Italy. The Center is a member of the University and Institution Community (ComUE) “Université Côte d’Azur (UCA)”.

Context

GLOBAL CONTEXT

Global mobile data traffic is expected to increase by seven times in the next 5 years [Cis]. The growth is due to the development of the internet of Things (IoT) with 30 billion of connected objects by 2020 [Nor], and to the shift from connection-centric communications, such as phone calls, to content-centric communications, such as video streaming, fueled by the surge of users' generated contents spread through social networks. In the near future Augmented Reality (AR) services can put further strain on the wireless infrastructure: it has been estimated that, at high human density places, wireless networks should be able to deliver up to 100 Gb/s/m² to support such services, a rate that is far from achievable with current technologies [Kni]. Virtual reality applications are even more demanding in terms of rates and latencies [Che]. Wireless network densification, with the introduction of small cells ranging from micro- to pico- and femto-cells, increases transmission capacity per area unit by enhancing frequency reuse, but it risks to move the bottleneck from the radio access to the Mobile Operator (MO) backhaul and core network.

At the same time the Multi-access Edge Computing (MEC) industry initiative (MECI4) is pushing a new network infrastructure where IT and cloud-computing capabilities are located within the Radio Access Network (RAN) in close proximity to mobile subscribers. The initiative envisions a MEC server closely managing a set of small cells. MEC will enable the development of low-latency context-aware and context-optimized applications, which can tap into real-time information about local-access network conditions exposed by the base stations. Moreover, by opening the radio network edge to third-party partners (e.g. Mobile Virtual Network Operators, MVNOs, or Content Providers, CPs) MEC platforms will enable new value-added services and then potential new revenues for operators, vendors and third-parties.

The goal of this project is to investigate how to allocate and exploit edge storage and computation resources in a multi-tenant, MEC-enabled cellular network in order to reduce backhaul traffic and address the challenges of new application services (in particular IoT ones).

REFERENCES

Benefits package

- Subsidised catering service
- Partially-reimbursed public transport
- Social security
- Paid leave
- Flexible working hours
- Sports facilities

**Remuneration**

Duration: 36 months  
Location: Sophia Antipolis, France  
Gross Salary per month: 1982€ brut per month (year 1 & 2) and 2085€ brut/month (year 3)