

Mobile Edge Computing in the 5G Era – Bridging Applications and Networking Environments

Telecommunication networks are undergoing a profound evolution, which is bringing their structure ever closer to computing systems. With the advent of Software Defined Networking (SDN) and Network Functions Virtualization (NFV), Network Service Providers (NSPs) have started considering an increasing level of “softwarization” of the functionalities to be performed, especially as regards the access segment. This trend has been further strengthened by Mobile Edge Computing (MEC), and by the consolidation of the fifth generation of mobile networks (5G), providing a much stronger integration between the wireless mobile access and the fixed transport network and enhancing configuration flexibility through the concept of network slicing.

In this scenario, more and more often resource allocation and network control problems are encountered that present analogies with similar settings in computing systems and datacenters. Typically, given a set of general-purpose computing machinery, deployed by an Infrastructure Provider (InP), they will host multiple tenants that act as NSPs for their (fixed or mobile) customers; through their User Equipment (UE), the latter consume and feed application-related data that may need custom computing resources/processes that are partly local (at the mobile edge – to cope with possible latency constraints that may require resource reallocations to follow users on the move) and partly residing in a remote datacentre. Bridging the world of Cloud Computing and 5G to transform cloud-native applications to 5G-ready ones is becoming of crucial relevance.

This talk will highlight the architectural and optimization problems behind this effort, touching in particular topics related to the interaction between the 5G Vertical Applications Orchestrator (VAO), Mobile Edge Orchestrator (MEO) and NFV Orchestrator (NFVO) and to the ensuing network management and resource allocation tasks to be performed in order to meet Key Performance Indicators covering a vast range of aspects, including users’ Quality of Experience (QoE), network performance and energy efficiency.

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