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Computation Caching: a new frontier for Mobile Edge Cloud

Mise en cache calculée : une nouvelle frontière pour le Mobile Edge Cloud

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5G will face severe backhaul, fronthaul and complexity bottlenecks in its real operational functioning due to extensive network densification, the growing uplink capacity demand and the explosion in number of connected devices. Therefore, it will be mandatory to bring connectivity, computation and storage support at the edge of the network to limit service delay and both devices and network energy consumption. This is why 5G proposed architectures add Mobile Edge Computing (MEC) intelligence and elastic ad hoc distribute (multi)cloud support closer to the users.

On the other hand, most of operations needed for services provisioning and network optimization are recurrent, context-dependent and too often re-executed. In this talk, we propose a novel paradigm, the computation caching for MEC, aimed at further reducing both power consumption and service delay of mobile edge cloud computing by caching popular computations, in order to prevent re-executing the same instruction blocks.

Our proposal is based on merging computation caching with mobile cloud computing. To this end, we propose to use full storage potential of edge cloud clustering for computation caching. Exploiting the popularity of computational requests, some are cached at the edge of the network, preventing their recurrent computation. Simulation results show that our proposal permits to substantially reduce both energy and delay without degrading performance.