

Optimal Caching in 5G Networks with Opportunistic Spectrum Access

ABSTRACT

Cache-enabled small base station (SBS) densification is foreseen as a key component of 5G cellular networks. This architecture enables storing popular files at the network edge (i.e., SBS caches), which empowers local communication and alleviates traffic congestions at the core/backhaul network. An optimization framework for file caching is then developed to maximize this hit probability. To this end, a simple concave approximation for the hit probability is proposed, which highly reduces the optimization complexity and leads to a closed-form solution. The sub-optimal solution is benchmarked against two widely employed caching distribution schemes, namely uniform and Zipf caching, through numerical results and extensive simulations. It is shown that the caching strategy should be adapted to the network parameters and capabilities. For instance, diversifying file caching according to the Zipf distribution is better in multicast systems with large number of channels.

EXISTING SYSTEM

- In existing system, the optimal file placement in SBSs is proposed to maximize the hit probability.
- However, It consider a single channel system in a fully loaded SBS scenario, which contradicts with the intrinsic multi-channel nature of cellular networks and thus leads to pessimistic performance assessments.
- The unicast scheme serves each user request on a unique frequency channel irrespective of the requested content.

PROPOSED SYSTEM

- The OSA success probability is used to compute the weighted average of the coverage probabilities in the considered caching systems.
- Hence, the proposed caching is highly desirable to maximize the probability of finding the desired file in the closest possible SBSs.
- The number of users requesting each file is independent from the transmission scheme. Hence, is to compute the OSA success probability in both the unicast and multicast schemes.

SYSTEM REQUIREMENTS

HARDWARE REQUIREMENTS

- Processor - Intel core i3
- RAM - 2B
- Hard Disk - 20 GB

SOFTWARE REQUIREMENTS

- Operating System : LINUX
- Tool : Network Simulator-2
- Front End : OTCL (Object Oriented Tool Command Language)

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