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**Multi-user Multi-task Computation Offloading in Green Mobile Edge Cloud Computing**

**Abstract**

Mobile Edge Cloud Computing (MECC) has becoming an attractive solution for augmenting the computing and storage capacity of Mobile Devices (MDs) by exploiting the available resources at the network edge. In this work, we consider computation offloading at the mobile edge cloud that is composed of a set of Wireless Devices (WDs), and each WD has an energy harvesting equipment to collect renewable energy from the environment. Moreover, multiple MDs intend to offload their tasks to the mobile edge cloud simultaneously. We first formulate the multi-user multi-task computation offloading problem for green MECC, and use Lyaponuv Optimization Approach to determine the energy harvesting policy: how much energy to be harvested at each WD; and the task offloading schedule: the set of computation offloading requests to be admitted into the mobile edge cloud, the set of WDs assigned to each admitted offloading request, and how much workload to be processed at the assigned WDs. We then prove that the task offloading scheduling problem is NP hard, and introduce centralized and distributed Greedy Maximal Scheduling algorithms to resolve the problem efficiently. Performance bounds of the proposed schemes are also discussed. Extensive evaluations are conducted to test the performance of the proposed algorithms.