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Process migration-based computational offloading framework for IOT-supported mobile edge/cloud computing

ABSTRACT

Mobile devices have become an indispensable com-ponent of Internet of Things (IoT). However, these devices have resource constraints in processing capabilities, battery power, and storage space, thus hindering the execution of computation-intensive applications that often require broad bandwidth, strin-gent response time, long battery life, and heavy computing power. Mobile cloud computing and mobile edge computing (MEC) are emerging technologies that can meet the aforementioned require-ments using offloading algorithms. In this paper, we analyze the effect of platform-dependent native applications on computa-tional offloading in edge networks and propose a lightweight process migration-based computational offloading framework. The proposed framework does not require application binaries at edge servers and thus seamlessly migrates native applications. The proposed framework is evaluated using an experimental testbed. Numerical results reveal that the proposed framework saves almost 44% of the execution time and 84% of the energy consumption. Hence, the proposed framework shows profound potential for resource-intensive IoT application processing in MEC.