

Towards Data and Computation Offloading in Mobile Cloud Computing: Taxonomy, Overview, and Future Directions

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Abstract

The rapid developments in the mobile application context illuminate the demand for more resources and processing power at Smart Mobile Devices (SMDs). Mobile Cloud Computing (MCC) enables the SMDs to offload their workloads on the remote cloud servers and benefit from the MCC's extensive resources to deal with this issue. To this end, numerous offloading schemes are provided in the literature to enhance the SMD's efficiency by offloading their workloads on the nearby cloudlets or remote cloud computing resources. This article puts forward a comprehensive survey and taxonomy of the offloading approaches designed and proposed for MCCs. It first classifies them based on the algorithms which have been used for making the offloading decisions. Then, in each category, it illuminates how the offloading decisions are made to improve application performance and mobile devices' energy efficiency, regarding offloading factors such as deadlines, costs, etc. The evaluation metrics, simulator, offloading type, and architecture of the studied schemes are compared and illuminated in each category. Furthermore, regarding the various properties of the studied offloading methods, the offloading domain's leading issues and challenges are discussed. Lastly, the concluding points are provided, and directions for the subsequent studies in the offloading context are specified.

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