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**Economic and Energy Considerations for Resource Augmentation in Mobile Cloud Computing**

**Abstract:**

In earlier works we proposed to utilize a centralized broker-node to perform task scheduling for the resource augmentation of a large number of mobile devices. The task scheduler model focused on energy optimization was proposed for the centralized task scheduling problem. In this paper, the model extends the optimization process by including an economic element to it. Thus, we propose an energy and monetary cost-aware mathematical task scheduler model. Compared to the previous model, this model, can allow mobile devices to offload multiple tasks to cloud resources. The results in this paper are more thorough and more aspects of task offloading have been analysed. For instance, the model is evaluated under two different resource augmentation environments for mobile cloud computing: a local private cloud and public clouds. More precisely, the task scheduling problem is optimally solved to minimize: (i) the total energy consumption when applied to a local private cloud, and (ii) the total energy consumption and monetary cost when applied to public clouds. Our proposed model at the centralized broker-node finds optimal solutions for task assignment problem, and provides a significant reduction in the total costs compared with the task assignment by the centralized scheduler without optimization.

**Existing System:**

The resource augmentation of mobile devices through task offloading poses some challenges. Task offloading involves additional data communication, which may increase the task’s remote completion time and/or energy consumption, and may incur a monetary cost for using resources at a remote location. Thus, to determine whether task offloading is beneficial or not, a task scheduling process checks if the cost of executing the task at a remote location is less than the cost of executing it locally on the mobile device. Therefore, prior to offloading, a resource monitoring process would repeatedly contact the remote computation nodes to obtain an up-to-date status of currently available resources such that an appropriate offloading decision can be made. However, employing such a scheme has limitations, in a scenario, in which a large number of mobile devices and multiple remote computing nodes are expected.

**Proposed System:**

The proposed centralized broker node was utilized to manage task scheduling on behalf of a large number of mobile devices. In these works, a mathematical model, subject to various constraints was proposed for the centralized task scheduling problem. The model was evaluated in a large Cyber Foraging System (CFS) and in Mobile Cloud Computing (MCC) environments. The model provides optimal solutions for the task scheduling problem by minimizing the total energy consumption across all mobile devices in the system.