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**Energy Efficient Cooperative Computing in Mobile Wireless Sensor Networks**

**Abstract:**

Advances in future computing to support emerging sensor applications are becoming more important as the need to better utilize computation and communication resources and make them energy efficient. As a result, it is predicted that intelligent devices and networks, including mobile wireless sensor networks (MWSN), will become the new interfaces to support future applications. In this paper, we propose a novel approach to minimize energy consumption of processing an application in MWSN while satisfying a certain completion time requirement. Specifically, by introducing the concept of cooperation, the logics and related computation tasks can be optimally partitioned, offloaded and executed with the help of peer sensor nodes, thus the proposed solution can be treated as a joint optimization of computing and networking resources. Moreover, for a network with multiple mobile wireless sensor nodes, we propose energy efficient cooperation node selection strategies to offer a tradeoff between fairness and energy consumption. Our performance analysis is supplemented by simulation results to show the significant energy saving of the proposed solution.

**Existing System:**

Existing cloud computing models are designed for traditional web applications, rather than future Internet applications running on various mobile and sensor nodes. Particularly as we go to the era of Internet of Things (IoT) with one trillion endpoints worldwide, that creates not only a real scalability problem but the challenge of dealing with complex clusters of endpoints, rather than dealing with individual endpoints. Moreover, public clouds, as they exist in practice today, are far from the idealized utility computing model, since it makes their network distance too far from many users to support highly latency-sensitive applications. This is particularly true for applications that are developed for a particular provider’s platform and running in data centers that exist at singular points in space.

**Proposed System:**

We propose an optimal partition to minimize the total energy consumption required by local and remote sensor nodes in cooperative computing under static channel model to satisfy a given deadline requirement. Furthermore, an offloading decision rule is defined to indicate the best computing strategy. Moreover, under the optimal partition, our analysis shows that the required energy consumption of a remote node (helper) is always smaller than that of a local node, a result which lays a foundation to encourage the cooperative behaviors which means that the helping part only needs to spend relatively small amount of energy than the one seeking help from others.

By utilizing the optimal results, we propose energy efficient cooperation node selection strategies to achieve fairness and maximal energy saving in a multi-node environment, and analyze node’s “willingness” to cooperate when selfish and unselfish natures are imposed to individuals. Simulation results are supplemented to illustrate the significant energy savings of the proposed strategies in providing reliable services.