ABSTRACT

Title: Task Offloading Schemes for Vehicular Cloud

A significant issue in *vehicular cloud computing* (VCC) is the design of effective task offloading schemes which can facilitate efficient resource utilization in a vehicular cloud. Use cases of vehicular networks include self-sufficient transportation nodes, vehicular platooning, strategic removal of vehicles during road accidents or other natural or manmade disasters, non-physical traffic light deployment at cross-roads, etc. Henceforth, seeing monetary benefit in local data storage, increased demand for data access, and the problem of energy saving with base station access, the cloudlet formed by the research work proposed use of vehicular nodes as an option in place of usual remote servers for these said functions. An added benefit an automobile can provide is context-dependent information through participation in carrying out geographically isolated processing of data generated by sensor devices. Owing to many potential features from these resource affluent, inherently non-stationary nodes, these are now called as *vehicular cloud* similar to a collection of resource affluent data centers. In-vehicular cloud computing, the most often taken up and an important dispute can be the picking of a proxy node to carry computation to facilitate fulfilling of client requirements for data store, task offloaded/ processing or offering aggregated sensor generated data. The research work is towards addressing the challenges faced in implementing such a vehicular cloud. The study identified the foremost challenges faced when implementing efficient task offloading schemes in a vehicular cloud. To this end the research work tried to achieve the objectives like implementing a unicast protocol for reliable task offloading schemes, formulating the relationship between task completion time and link lifetime for effective task offloading schemes, modeling asset accessing, reservation and task queuing and reducing network wide power consumption by exploiting characteristics of wireless medium in vehicular clouds.

The research work proposed algorithms to address the above said challenges in realistic mobility conditions with accurate network protocol designs. The methods put into practice *VEINS* framework which pairs *OMNET++* with Simulation of Urban Mobility tool for practical mobility representation. We assessed the performance trade-offs by varying the *vehicular node density, node mobility* and *the amount of jobs offloaded*. The metrics discussed for comparison with previous studies were *average job execution time, successful job completion rate, throughput* and *overhead.*

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