OPTIMIZED TASK SCHEDULING ON FOG COMPUTING ENVIRONMENT USING META HEURISTIC ALGORITHMS

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Fog computing is an extended version of cloud computing which was developed by implementing fog devices at the edge of the network. The basic concept is kind of similar to cloud computing and supports virtualizations as well. This technology is very helpful when it comes to applications such as healthcare, intelligent transportation systems and smart cities. Since fog computing supports real time data transferring, it consumes large amount of energy. Therefore, energy should be managed by scheduling resources in fog environment. Optimal resource scheduling is a key subject in the virtualization of fog computing. The resource scheduling procedure is an NP-complete issue where the time required to find the solution differs depending on the problem size. There are various computation-based performance metrics which are used in scheduling procedure such as energy consumption and execution cost. This resource scheduling process of tasks can be classified as a heuristic, metaheuristics and hybrid task scheduling approach. The heuristic task scheduling algorithms deliver ease to schedule the task and deliver the best possible solutions, but since it skips some steps while processing, it doesn't guarantee the optimal result. The approaches to metaheuristics can manage huge search space in a reasonable time to find a better optimal solution to the task scheduling problem. The smart healthcare application model is implemented and simulated in iFogSim simulator tool, which is used to test and select the technique to introduce a Whale Optimization Algorithm (WOA). The Whale Optimization Algorithm (WOA) is a metaheuristic optimization algorithm which is developed according to bubble-net attacking process and compared with several heuristic algorithms (RR, SJF) and PSO algorithm. The results show that proposed algorithm improved the average energy consumption of 4.47% and cost 62.07% relative to the RR, SJF algorithms and energy consumption of 4.50% and cost 60.91% relative to the PSO algorithm.

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