

Construction of computing balancing model in the Internet of Things devices system

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At this work, we have started to research development and construction of a math model for load balancing in the Internet of Things devices system. Suggested model is useful to perform experiments of modeling the parameters and behavior of the IoT devices system with different scripts of data loading. The main goals of current work are to reduce delays in the performance of tasks, to increase battery life and energy efficiency. The objectives are to describe tasks performed in IoT systems, to summarize definitions of tasks balancing methods, to develop a math model in the IoT devices system and to design various balancing methods for this model.

At first, we perform analysis and classification of tasks for the IoT devices system. Based on this classification, we assume that not each kind of tasks (and associated computations) could be reassigned to another node in system. In the end of this part we describe moveable class of tasks for IoT devices system.

At second part, we compare existing methods of computing balancing for IoT systems. We classify methods by its centralization, scaling and flexibility. Here we introduce our balancing method based on the computation offloading at heterogeneous systems with different levels of performance. This method allows moving computation to any performance level node. Similar methods already have described in the works of other authors [1][2], but they are concentrated on transfer tasks to higher performance level (e.g. cloud center).

In the end, we develop the mathematical model of the Internet of Things devices system. It is particularly based on the model proposed in work by Elizarov M. [3]. Model extended for balancing processes and node health check.

In advance, results of this work will be used for modeling and comparative analysis of balancing methods. Further, we will compare obtained results with other results, based on experiments on the virtual and physical system of devices to determine the quality of the constructed model.

References

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