Assignment #6

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The survey paper titled "Performance, Reliability and Scalability for IoT" authored by Andriy Luntovskyy and Larysa Globa discsses iportat issue of QoS optimization iIoT systems which is crucial for performance, reliability and scalability. Scalability issues being a novice research problem for such systems.

The paper states that, there are a lot of apps and software platforms to IoT support. However, a most important problem of QoS optimization, which lays in Performance, Reliability and Scalability for IoT, is not yet solved. The extended Internet of the future needs these solutions based on the cooperation between fog and clouds with delegating of the analytics blocks via agents, adaptive interfaces and protocols. Apart from QoS, the survey paper also mentions how IoT can generate large arrays of unmanaged, weakly-structured, and non-configured data of various types, known as "Big Data".

The paper introduces its survey research work on related technologies like basic platforms clouds, fog, and data mining. Also, relatively modern technologies like Blockchain, Machine Learning, IoT, Robotics, 5G are surveyed for its increasing requirements of higher QoS, advanced Performance, Reliability and Scalability.

In Section 2, modern networking techniques of QoS parameters aimed to Performance, Reliability and Scalability optimization are discussed. IoT is based nowadays on IPv6. Apparently, this brings more freedom in addressing of immense quantity of available devices. Researchers state that, huge amount of heterogeneous data volumes (approx. 100PB to 100EByte) are acquired additionally causing Big Data shortcomings.

To counter this, considered approaches are able to increase the performance, reliability and scalability in desktop applications, these include:

(1) Multi-threading.
(2) Replication.
(3) Caching on Client.
(4) n-tier and use of proxies and gateways (GW).
(5) highly-distributed Peer-2-Peer (P2P) as well as
(6) further empiric rules (refer Table I).

Also, methods to further performance optimization, are discussed. Somme of the interesting ones include migration into the clouds, as cloud-centric systems can discharge the energy-critical mobile nodes.

Scalability and logical placement of devices is surveyed in the next section. The researchers bring out an important consideration in IoT paradigm. Scalability in IoT is extremely crucial for growing networks and its implementability. One OPC UA specification is surveyed along with other solutions, attempting to solve reliability and scalability problems. ROS, an

advantageous OS is discussed for fault-tolerance, reduced development, and complexity. A couple other QoS optimizations are discussed but are not satisfactory enough to be mentioned here.

In Section 4, Big data shortcomings are discussed from the surface to get the user to understand the issues that can arise from it, as the data is hugely unstructured and unmanaged. Section 5 introduces machine learning and how it can be utilized for artificial creation of knowledge from the obtained voluminous experimental data in background mode. Use of machine learning is also surveyed.

The researchers conclude the survey in section 7. The researchers feel that IoT-scenarios need nowadays the efficient access and management models under considering of the QoS parameters and low-energy-criteria. The best practices and case studies on Big Data and ML were discussed. Due to the nature of their research, the authors rightly claim that, this work can be qualified as a work-in-progress.

In this survey paper, some classical as well as the advanced approaches to the optimization of Performance, Reliability and Scalability for IoT solutions were analysed. All in all, a good survey of the field, provided its novelty of view point of scalability for QoS optimization. Clearly, some advanced approaches for optimization of Performance, Reliability and Scalability for IoT-solutions are surveyed within the paper.

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