

Hybrid MQTT-COAP Protocol for Data Communication in Internet of Things

Wireless Sensor Networks (WSNs) consist mainly of resource constrained sensor nodes and gateways. Therefore, various lightweight communication protocols are emerging for Machine to Machine (M2M) communications. Among the various application layer protocols for data communication in WSNs, the two most popular protocols for constrained devices are the Message Queue Telemetry Transport Protocol (MQTT) with a variant for sensor nodes (MQTT-SN) and the Constrained Application Protocol (CoAP). Studies have shown that the performance of these different protocols are dependent on different network conditions. CoAP is more efficient in terms of message overhead and MQTT-SN is more efficient in terms of client complexity. Studies have further emphasized the levels of difficulties to implementing any of these protocols with regard to application requirements. In this paper we propose a hybrid MQTT-CoAP protocol technique using an abstraction layer that enables both MQTT-SN and CoAP protocol to be used in the sensor node. Performance evaluation of these protocols under the hybrid technique shows that the hybrid is feasible and while CoAP performs better in terms of energy consumption, the two protocols perform almost equally in latency. The observed values of latency and energy consumption in the developed hybrid technique was comparable to other studies.

Published in: 2020 5th International Conference on Computing, Communication and Security (ICCCS)

<https://ieeexplore.ieee.org/abstract/document/9277179>