**Software Defined QoS for Multilevel Data in IoT Sensing Applications**

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1. INTRODUCTION and ABSTRACT

IoT Sensing Application consist of two parts, functional requirement and non-functional requirement. For the past few years, researcher had been focusing on non-functional requirement, Quality of Services (QoS) [1, 2]. QoS is being applied global on computer network today. However, it is not being applied widely to Internet of Things (IoT) sensing application since the bandwidth demand by the application is negotiable comparing to the global network traffic.

As sensors improved, and cloud computing arise, future IoT involved more sensors and each with metadata, bandwidth demand by IoT sensing application became more and more significant [2, 3]. Congestion control with priority strategies such as Integrated Services and Differentiated Services [cite] is a must. In this paper we will focus primarily on priority congestion control for IoT sensing application by introducing N to one system, where N is the number of end-point sensors with one centralized server equipped with queuing system that handles different level priority data and senders.

1. Goals

Modern QoS network must allow network supervisor to actively monitor packages traffic and perform dynamically fine adjustment accordingly [2]. Our goal is to deploy an API for manufactures to build on top for any large scale IoT sensing applications. The API consist of two parts, server and client (sensors).

Server will be able to handle large amount of data and connections, ensuring time sensitive events handle promptly while maintain energy efficiency by keeping all heavy workload on server over IoT device [4].

Client will be able to perform minimal processing power with dynamically policy updating instructed by the server.

The API provide flexibility by allowing consumer selecting the optimal number of sensors along with their favorite brand that best fit for their application while preserving cost efficiency.

* + 1. **Milestones**

Elaborate on previous points. Create API, java server, python client simulating traffic within network. Due to budget issues, we will use TCP and simulate across VMs on our devices. If time permitted, we will create a physical prototype by using actual sensor and microcontrollers.

1. BACKGROUND AND LITERATURE

Recent research on IoT sensing shows cloud computing is a very popular technique for IoT application, where engineer wanted to preserve the minimal power usage on the sensor [2, 5].

1. REFERENCE

[1] L. Lu, R. Mei, and Z. Guangquan, "An Internet of things QoS estimate approach based on multi-dimension QoS," in *Computer Science & Education (ICCSE), 2014 9th International Conference on*, 2014, pp. 998-1002.

[2] S. Radovanovic, N. Nemet, M. Cetkovic, M. Z. Bjelica, and N. Teslic, "Cloud-based framework for QoS monitoring and provisioning in consumer devices," in *Consumer Electronics ?? Berlin (ICCE-Berlin), 2013. ICCEBerlin 2013. IEEE Third International Conference on*, 2013, pp. 1-3.

[3] Y. Shih-Yuan, S. Chi-Sheng, J. Y. J. Hsu, H. Zhenqiu, and L. Kwei-Jay, "QoS Oriented Sensor Selection in IoT System," in *Internet of Things (iThings), 2014 IEEE International Conference on, and Green Computing and Communications (GreenCom), IEEE and Cyber, Physical and Social Computing(CPSCom), IEEE*, 2014, pp. 201-206.

[4] M. Taneja, "A framework for power saving in IoT networks," in *Advances in Computing, Communications and Informatics (ICACCI, 2014 International Conference on*, 2014, pp. 369-375.

[5] G. Tanganelli, C. Vallati, and E. Mingozzi, "Energy-Efficient QoS-aware Service Allocation for the Cloud of Things," in *Cloud Computing Technology and Science (CloudCom), 2014 IEEE 6th International Conference on*, 2014, pp. 787-792.