

ABSTRACT

Wireless surveillance systems using internet of things (IoT) architecture have been developed to conserve more bandwidth and storage by using several methods, such as limiting frames per second on the camera nodes when there are no active movements in observation. However, a more appropriate surveillance IoT platform is needed to accommodate the camera nodes with bandwidth-efficient algorithms.

This thesis proposes an IoT platform for image storage system using software as a service (SaaS) model. A wireless surveillance system with IoT architecture is more efficient in using storage and uses less bandwidth than a conventional surveillance system. This thesis aims to accommodate the specifications for such IoT platform by using the SaaS model. The IoT platform, in the form of a Flask web application framework and MongoDB database server, uses a virtual machine (VM) in a public cloud service to connect to the camera nodes and to store the transmitted images. To fulfill the SaaS model, customized web services and lightweight web-based client applications are developed to manage the camera nodes and display the stored images.

This thesis proposes an experiment using real-time transmission of sample images sent from a simulated camera node to the IoT platform through a public network. During the experiment, the quality of service of the IoT platform is measured and analyzed using TShark and Free Monitoring by MongoDB to determine whether the IoT platform meets the requirements for an image storage system with SaaS model that can be used for a wireless surveillance system.

The proposed IoT platform is able to provide an average delay of 435.3 milliseconds with no packet loss and an average rate of insert and read operations performed of 2.83 operations per second and 2.26 operations per second respectively. Furthermore, the CPU usage of the VM is below 2.5% and the memory usage is below 39% during the experiment.

Keywords: Wireless Surveillance System, IoT Platform, SaaS, Flask, MongoDB.