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Abstract

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Telemedicine is an important practice that removes the necessity for physical encounters between patients and physicians. Combined with the capabilities of remote monitoring systems, a patient can be monitored using physiological sensors which seamlessly gather data. Using an Internet of Things (IoT) model, non-invasive physiological sensors that capture a patient's current health status can be exposed through a Telemedicine platform. By closely monitoring patient's vital signs, physicians can capture a snapshot of a patient's well being. This is an important factor in the lives of palliative care patients, where focus is placed on quality of life.

This dissertation outlines a secure, cloud-enabled Telemedicine solution aimed at the field of palliative medicine. This dissertation plans to expose the Bluetooth 4.0 protocol in order to provide a multi-stream data transmission protocol of low and high bit-rate data. Use of an adaptive data stream enables efficient sensor traffic with capabilities of complex sensor data transmission in emergency situations and low bandwidth data that can provide episodic updates. Each patient sensor makes use of a gateway to transmit information to a cloud based service, which publishes current and historic data for individual patients. Secure storage, access and transmission of patient data is also an important concern. This dissertation outlines two security mechanisms using a combination of symmetric and asymmetric cryptography.