

# Secure Framework for Internet of Things Based e-Health System

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## ABSTRACT

Internet of Things (IoT) is the emerging technology finding applications in a wide range of fields that include smart homes, intelligent transportation, e-health, supply chain management. Among IoT applications, e-health is one of the most promising application in which smart devices capable of monitoring physiological parameters of patients are implanted in or around their bodies which automatically sense and transmit collected data to medical consultants. However, security issues for electronic patient records (EPR) in-transit hinder the usage of IoT in e-health systems. Among these issues, EPR confidentiality and entity authentication are major concerns. In this article, confidentiality of EPR and its secure transmission over network is focused mainly. A security framework is proposed where-in smart devices encrypt sensed physiological data with Light-Weight Encryption Algorithm and Advanced Encryption Standard cryptographic algorithms. The security framework and the designed protocol provides better security and are energy efficient as presented in the evaluation section.

## KEYWORDS

AES, Constrained Application Protocol (CoAP), Electronic Patient Records (EPR), Internet of Things (IoT), Message Queue Telemetry Transport (MQTT)

## 1. INTRODUCTION

Internet of Things (IoT) is a novel technology rapidly gaining popularity in the current era that emerges from embedded system, sensor technology and wireless communication. IoT is the interconnection of physical things that are equipped with sensing, actuating and communication technologies that enable objects to sense environmental or physiological phenomenon, collect data and share it with other objects and take actions of their own or prompt humans to take actions. The rapid growth of IoT (Andreev et al., 2012; Atzori et al., 2010) and its capability to provide enormous services in diverse areas such as industry, education, e-health, defense and social life, have made it the burgeoning technology. It is projected that trillions of objects will be connected to internet during next five years (Adiga et al., 2012). IoT will result in \$1.7 trillion in value added to the global economy in 2019 (Greenough, 2014). Scientific communities like IETF (Internet Engineering Task Force) and

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