Chapter 6
QoS-Enabled Improved Cuckoo Search-Inspired Protocol (ICSIP) for IoT-Based Healthcare Applications

R. Vadivel
Bharathiar University, India

J. Ramkumar
VLB Janakiammal College of Arts and Science, India

ABSTRACT

Internet of Things (IoT) is a technology which accommodates the hardware, software, and physical objects that collaborate with each other. IoT-based healthcare applications are increasing day by day and are never going to be decreased. Healthcare applications work in an ad-hoc manner to collect patient data and send it to corresponding persons so they can take just-in-time action. The routing protocols designed for general ad-hoc networks and applications are not supported by IoT-based, ad-hoc networks. Hence, there exists a need to develop a routing protocol to support IoT-based, ad-hoc networks. This chapter focuses to develop a routing protocol for an IoT-based, cognitive radio ad-hoc network by utilizing bio-inspired concept with the objective of reducing the delay and energy consumption. NS2 simulation results reflect the proposed routing protocol's performance in terms of benchmark performance metrics.

INTRODUCTION

Internet of Things

In the computing world, the term Internet of Things (IoT) indicates all the things that are connected to the World Wide Web, where IoT term is more utilized to describe the object that makes communication with each other. Commonly, IoT is made (or formed) from interconnecting the basic elementary sensors

DOI: 10.4018/978-1-7998-1090-2.ch006

to modern smartphones. By making integration with these kinds of devices, the autonomous systems can gather the information, make analysis and step into an action. For the year 2020, it has been predicted to have more than 26 billion of connected devices over the Globe. It is because; IoT has started stepping in each and every domain, where users didn't find any reason to exclude IoT from their use due to the virtual endless support. Currently, IoT have stepped into healthcare industry which includes digitalizing the medical related information, its process, its progress, tracking the patient health details, etc. In healthcare industry, IoT is used to (i) monitor the patient details, (ii) manage the information of medical waste, (iii) mange the patient information, (iv) manage the medical emergency, (v) maintain the storage of drugs, (vi) control the pharmaceutical error, (vii) anti-kidnap system for born baby

Health Care Application

Health Care Applications (HCA) in IoT frameworks have begun to grow and get attention slowly. In general, IoT systems have the capability to give multiple positive features that assist the doctors by monitoring the patients from the remote place. Devices of Personal Health Care (DPHC) have become an important component of HCA in IoT. DPHCs are electronic device with mobile facility which can measure the biomedical signals by sensing. The people can check their own health condition and take care by themselves in an advanced manner. DPHCs are expected to become more popular because of its ability to connect to centralized servers of healthcare. Generally, hardware may get malfunctioned at any time which will give the result in failure of system. Bugs in software, shortage of power, hazards in environment may also leads to failure of system. Multiple comprehensives studies are being conducted in IoT by making an assumption of having minor error disrupting the operations. In IoT, devices are distributed geographically and have rare maintenance. These kinds of devices are progressively susceptible to bugs, shortage of power, and hazards in environment. The count of nodes in IoT may tend to get gradually increases with faults leading to fail the IoT based network. Furthermore, the data that are sent by DPHC are more valuable and it should be taken care in failure of system. Only a very few proposals have focused this thrust research area. HCA in IoT frameworks have started to gather the researchers' attention towards itself due to the features which it provides for monitoring the patients from remote location, where it has the feature of scalable, flexible and interoperable. While considering the HCA in IoT frameworks, the gateway plays a major role. The result of IoT system is getting success or failure depends on the management of gateways.

Cognitive Radio Ad-hoc Network

Cognitive radio network is made up of number of nodes which have the mobile facility. Cognitive radio network is building cognitive radio technology giving a distinctive ability to sense the spectrum, frequent configuring of radio signals, developing the spectrum accessibility by analyzing the spectrum environment. This kind of nodes can be denoted the secondary users (SUs). Sometimes SUs are also called as cognitive users (CUs). In cognitive radio networks, few users have the license and they are denoted by primary users (PUs). By default, PUs has higher priority level to utilize the cognitive radio network, where SUs has lower priority level. If SUs are in the need to utilize the network to transmit the data, then it necessary to use the licensed frequency band in a opportunistic manner, which is presently not used by the PUs. Hence, the important duty of SUs become to make sure that the spectrum is available for accessing, because it should affect the PUs usage.

Behavioral Analysis Approach for Likelihood Determination in Cloud IDS: Implementation Architecture
Youssef Ben Charhi, Nada Mannane, Elmahdi Bendrissand Regragui Boubker (2018). *International Journal of Mobile Devices, Wearable Technology, and Flexible Electronics (pp. 36-57).*
www.irma-international.org/article/behavioral-analysis-approach-for-likelihood-determination-in-cloud-ids-implementation-architecture/227064