Mobility management for IoT: a survey

ABSTRACT

Internet of Thing (IoT) or also referred to as IP-enabled wireless sensor network (IP-WSN) has become a rich area of research. This is due to the rapid growth in a wide spectrum of critical application domains. However, the properties within these systems such as memory size, processing capacity, and power supply have led to imposing constraints on IP-WSN applications and its deployment in the real world. Consequently, IP-WSN is constantly faced with issues as the complexity further rises due to IP mobility. IP mobility management is utilized as a mechanism to resolve these issues. The management protocols introduced to support mobility has evolved from host-based to network-based mobility management protocols. The presence of both types of solutions is dominant but depended on the nature of systems being deployed. The mobile node (MN) is involved with the mobility-related signaling in host-based protocols, while network-based protocols shield the host by transferring the mobility-related signaling to the network entities. The features of the IoT are inclined towards the network-based solutions. The wide spectrum of strategies derived to achieve enhanced performance evidently displays superiority in performance and simultaneous issues such as long handover latency, intense signaling, and packet loss which affects the QoS for the real-time applications. This paper extensively reviews and discusses the algorithms developed to address the challenges and the techniques of integrating IP over WSNs, the attributes of mobility management within the IPv4 and IPv6, respectively, and special focus is given on a comprehensive review encompassing mechanisms, advantages, and disadvantages on related work within the IPv6 mobility management. The paper is concluded with the proposition of several pertinent open issues which are of high research value.

Keyword: Wireless sensor network; Mobility wireless sensor network; IPv6 protocol; IP-enabled wireless sensor network; Mobility management; Ubiquitous computing