Abstract

The increasing deployment of smart devices has proved that Internet of Things (IoT) is a new trend for the next era. IEEE 802.11ah, a specification belonging to 802.11 wireless local area network (WLAN) protocol family, has been recently released to support the long-range, low-power and low-rate wireless communication among smart devices used in IoT systems. However, security requirements of the energy-constrained devices have plenty of features different from the traditional line-powered devices. Due to the high overhead and latency, link setup protocol, such as IEEE 802.11i, does not meet the requirements of IoT networks. It requires that the lightweight protocol has to support low-power and low-latency as well as the long-lasting features of IoT devices. To meet these demands, an upcoming solution proposed by IEEE 802.11 group, which was specified in IEEE 802.11ai. It is called Fast Initial Link Setup (FILS), a brand-new method aiming at establishing fast and secure links among devices to be applied to 802.11ah networks. Based on the premise that FILS is applied to 802.11ah network, this thesis has proposed two enhancement proposals for the authentication process in the link setup procedures to improve security and efficiency.