

Abstract

Wireless sensor networks are networks of compact micro sensors with wireless communication capability. These small devices are relatively cheap with the potential to be distributed in large quantities. Emerging applications of data gathering range from the environmental to the military. As autonomous devices they can provide pervasive, distributed and collaborative network of computer nodes. Architectural challenges are posed for designers such as computational power, energy consumption, energy sources, communication channels and sensing capabilities. Embedded Systems provide the computational platform for hardware and software components to interact with the environment and other nodes. The IEEE 802.15.4 MAC layer protocol forms an integral part of sensor networks. Recently, the IEEE 802.15.4e MAC layer protocol has been standardized for factory automation. The new standard is mostly implemented in the star topology and is at a ground level in terms of hierarchy. In this work the focus is to extend the IEEE 802.15.4e MAC layer protocol in a cluster tree topology for an industrial automation environment with multi level hierarchy. The associated problems are identified and some modifications along with slot allocation rules are suggested.