Literature Survey for the Performance of the ZigBee and Z-Wave Standards
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Introduction:
As the world becomes ever more interconnected, wireless networks are increasingly used to control remote video or sensor systems, monitor equipment status, and otherwise communicate between smart devices. The vision of the Internet of Things (IoT), in particular, has relatively recently gained traction as a way for billions of devices to be interconnected and to collect and exchange data. However, this vision also presents a new set of challenges. For instance, communication across IoT channels requires both sufficient power and throughput. Two promising wireless standards that have arisen in an effort to resolve these issues are the ZigBee and Z-Wave standards. Both of these specifications use mesh networks to transmit data, and both are designed for low data rate, low power applications.

Project Description:
In this project, I will analyze and compare the performance of the ZigBee and Z-Wave standards with an emphasis on ZigBee, since Z-Wave is proprietary and has less literature – more specifically, I will concentrate on throughput and energy efficiency. The papers that will be discussed are listed below in the References section.

In [1], Latré et al. describe the maximum throughput and minimum delay of the then-new ZigBee standard and study the impact of various address schemes. In [2], Huang et al. propose a novel ZigBee control protocol that allows links to achieve relatively good performance even with heavy WiFi interference. In [3], Ferrari et al. consider the delay and throughput of both ZigBee and Z-Wave protocols in indoor settings. In [4], Francesco et al. describe a new algorithm under the ZigBee standard for near-optimal energy consumption while still achieving an application’s reliability requirements. In [5], Peng et al. propose a power control strategy in the ZigBee specification for low energy consumption that also balances the nodes’ energy.

I will discuss the throughput achieved under the schemes proposed in [1]-[3], and the energy efficiency achieved in [4]-[5]. I will also consider questions such as “What metrics do the authors use to quantify their system performance, and how did they compare to the state-of-the-art?” and “Where would each system best be used?”
References:


