# QoS AND MOBILE TECHNOLOGIES

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# CHAPTER 25

# ZIGBEE APPLICATIONS

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## 25.1 INTRODUCTION

Apparently, the traditional power grid has shown signs of inefficient operation and has been experiencing difficulties in meeting the requirements of the 21st century. As a result, the Energy Independence and Security Act of 2007 gave a start for the smart grid implementation in the United States [1]. The smart grid is a modern electric power grid infrastructure using intelligent transmission and distribution networks to deliver electricity. The smart grid aims to improve the efficiency, reliability and safety of the electric system through modern communication technologies, automated control, and dynamic optimization of electric system operations, maintenance, and planning [2]. The cornerstone of a Smart Grid is the ability for multiple entities to interact via bidirectional communication networks.

Hence, the development of a reliable and pervasive communication infrastructure represents a crucial issue in operating smart networks. To address this problem, the deployment of Wireless Sensor Network (WSN) appears to be particularly suitable since it could make possible the realization of advanced and highly valuable communication services (sophisticated metering, remote control and supervision) without requiring the construction of complex and expensive infrastructure, and by assuring at the same time, a set of intrinsic advantages such as wide area coverage, easy access to remote sites, no leasing cost and adaptability to changing network patterns. Moreover, the collaborative nature of WSNs brings several advantages over traditional wired industrial monitoring and control systems, including self-organization, rapid deployment, flexibility, and inherent intelligent-processing capability.

Some of the typical Zigbee applications that can be provide redundant, self-configuring and self-healing capabilities of wireless mesh and ad-hoc networks. These applications include:

**1.** Smart grid technology, which is mainly to provide greater information and control of energy usage, provide customers with better service and more choice, better manage resources, and help to reduce environmental impact.

**2.** Smart home, which provides more flexible management of home appliances i.e. lighting, heating and cooling, security, and home entertainment systems from anywhere in the home.

**3.** Building control, to integrates and centralize management of lighting, heating, cooling and security in medium distance and range.