

Survey of Communication Technologies for IoT Deployments in Developing Regions

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Abstract : The Internet of Things (IoT) is a network of connected data processing devices, mechanical and digital machinery, items, animals, or people that may send data across a network without requiring human-to-human or human-to-computer interaction. Each component has sensors that can pick up on specific phenomena, as well as processing software and other technologies that can link to and communicate with other systems and/or devices over the Internet or other communication networks and exchange data with them. IoT is increasingly being used in fields other than consumer electronics, such as public safety, emergency response, industrial automation, autonomous vehicles, the Internet of Medical Things (IoMT), and general environmental monitoring. Consumer-based IoT applications, like smart home gadgets and wearables, are also becoming more prevalent. This paper presents the main IoT deployment areas for environmental monitoring in developing regions and the backhaul options suitable for them. A detailed review of each of the list of papers selected for the study is included in section III of this document. The study includes an overview of existing IoT deployments, the underlying communication architectures, protocols, and technologies that support them. This overview shows that Low Power Wireless Area Networks (LPWANs), as summarized in Table 1, are very well suited for monitoring environment architectures designed for remote locations. LoRa technology, particularly the LoRaWAN protocol, has an advantage over other technologies due to its low power consumption, adaptability, and suitable communication range. The prevailing challenges of the different architectures are discussed and summarized in Table 3 of the IV section, where the main problem is the obstruction of communication paths by buildings, trees, hills, etc.

Keywords : communication technologies, environmental monitoring, Internet of Things, IoT deployment challenges

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