

Internet of things platforms in support of smart cities infrastructures

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Abstract

The internet of things (IoT) is a term where everyday physical objects are connected to the internet via fixed or wireless networks, thereby creating a ubiquitous network. These physical objects are augmented with sensing, processing and networking capabilities. With such capabilities, these physical objects are referred to as “smart objects”. The challenge has been in reducing the complexities involved in connecting the billions of devices, people, services and sensors, in order to bridge the gap between the real and virtual worlds. This has been made possible through the development of IoT platforms. A city is referred to as ‘smart’ if it integrates smart objects into its products and services. The challenge is to integrate IoT platforms into the smart cities architectures in an effort to provide automated solutions to the various use cases for smart cities. Each IoT platform has a unique functionality to solve a particular use case, for example. Therefore in such a situation there should be criteria in place to select the most appropriate platform to solve a particular use case. The solution presented in this paper is the design of an architecture for a system that matches the problem domain (use case) to the appropriate IoT platform/s. This research identified a number of current IoT platforms and this research also conducted a literature review on smart cities that led to the identification of areas of applications of smart objects in smart cities through related use cases. The smart city environments identified in this research fall under the categories of smart transport, smart energy, waste disposal, water management and environmental management. The selection criteria for a platform vary from commercial uses of the platform, standards and interoperability, security features, services provided, cost models and applications supported. The information obtained therefore led to the design of an architecture that captures a use case and suggests the most appropriate platform to solve the use case.