


Internet of Things (IoT): The Standard Protocol Suite for Communication Networks

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EXECUTIVE SUMMARY

Naturally, IoT network consists of constrained devices with limited power, storage, and processing capabilities. However, IoT has some challenges to face internal and external issues, for instance, security issues, connectivity complex, data management, etc. In such a case, IoT is not supported by a heavyweight protocol suite. So, developing the lightweight protocol suite is the challenge for IoT environment. This chapter also describes such protocols that fulfill the requirements of IoT. In fact, IoT environment consists of a huge amount of devices. The controlling of all the devices is another issue, as well as data analytics among different devices, also considered a major issue. As a constraint, this chapter focuses to design a standard protocol suite for IoT environment.

1. INTRODUCTION

Internet of Things (IoT) is an innovative paradigm which comprises billions of things communicating intelligently. In recent years, IoT has become an emerging technology in different application domains. The term IoT is defined as the future of internet or next generation of the internet in which billions of things or objects are communicating together. The connected things in IoT environment are called as “Smart things”. The devices in the IoT network are wirelessly connected through the communication technologies such as WiFi, Bluetooth, etc. Generally, IoT has five layers, each layer consists of appropriate protocol suite (Raheem Ali et al.,2014). The constrained devices are connected by a set of IoT protocols that allow devices to communicate together. The IoT protocols like 6LoWPAN, RPL, COAP, IPv6, MQTT, TCP/IP used as standard protocols in IoT environment. These protocols making the network as an intelligent communication.

Naturally, IoT network consists of constrained devices with the limited power, storage and processing capabilities. However, IoT has some challenges to face internal and external issues. For instance, security issues, connectivity complex, data management etc. In such case, IoT is not supported for heavy-weight protocol suite. So, developing the light-weight protocol suite is the challenge for IoT environment. This chapter also describes such protocols which are fulfill the requirements of IoT. In fact, IoT environment consists of huge amount of devices, the controlling of all the devices is another issue as well as data analytics among different devices also considered as major issue. As a constrained, this chapter focuses to design of standard protocol suite for IoT environment.

The following are the key features of this chapter:

- Describes the various standard protocols based on IoT layers
- Provides the IoT protocols and their appropriate applications
- List the issues and challenges of IoT protocol suite
- Designing the real time scenarios (Case Study)

1.1 Various Standard Protocols Based on IoT Layers

There is no single consent on architecture for IoT, which is agreed universally. Different architectures have been proposed by different researchers. Generally, the basic architecture has three layers such as perception layer, network layer and application layer as shown in figure 1 (a).

(Pongle Pavan et al.,2015), This three-layer architecture was introduced in early stage of IoT research area. The three-layered architecture defines the basic idea of the IoT. But, it is not sufficient for IoT research, because it focuses on magnificent

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