IOT Architecture And Applications

Research Paper Summary
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Vaishnavi Bhuvanagiri

21011101033

AI-DS A

Computer Science and Engineering
Shiv Nadar University, Chennai

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0.1 Summary

The above paper talks about basic definition of IOT and the growth of IOT in the present world. It discusses about three layer and five layer architecture along with its component layers. Two kinds of system architectures cloud and fog computing and their differences is explained. Social IOT which gives social relationship between humans and objects and basic components of social IOT is discussed. Taxonomy of research in IOT technologies which includes

1. • Perception
2. . Pre-processing
3. **C**ommunication
4. **N**etworking
5. **M**iddleware
6. **A**pplications

Key contribution/ideas from the author

Architecture of IoT Three- and Five-Layer Architectures. The most basic architecture is a three-layer architecture [3–5] It was introduced in the early stages of research in this area. It has three layers, namely, the perception, network, and application layers.

1. The perception layer is the physical layer, which has sensors for sensing and gathering information about the environment. It senses some physical parameters or identifies other smart objects in the environment.

2. The network layer is responsible for connecting to other smart things, network devices, and servers. Its features are also used for transmitting and processing sensor data.

3. The application layer is responsible for delivering application specific services to the user. It defines various applications in which the Internet of Things can be deployed, for example, smart homes, smart cities, and smart health.

The five layers are perception, transport, processing, application, and business layers (see Figure 1). The role of the perception and application layers is the same as the architecture with three layers. We outline the function of the remaining three layers.

1. The transport layer transfers the sensor data from the perception layer to the processing layer and vice versa through networks such as wireless, 3G, LAN, Bluetooth, RFID, and NFC.

2. The processing layer is also known as the middleware layer. It stores, analyzes, and processes huge amounts of data that comes from the transport layer. It can manage and provide a diverse set of services to the lower layers. It employs many technologies such as databases, cloud computing, and big data processing modules

Taxonomy

The first architectural component of IoT is the perception layer. It collects data using sensors, which are the most important drivers of the Internet of Things.There are various types of sensors used in diverse IoT applications. The most generic sensor available today is the smartphone. The smartphone itself has many types of sensors embedded in it [16] such as the location sensor (GPS), movement sensors (accelerometer, gyroscope), camera, light sensor, microphone, proximity sensor, and magnetometer. These are being heavily used in differ-

ent IoT applications. Many other types of sensors are beginning to be used such as sensors for measuring temperature, pressure, humidity, medical parameters of the body, chemical and biochemical substances, and neural signals.

Applications of iot

There are a diverse set of areas in which intelligent applications have been developed. All of these applications are not yet readily available; however, preliminary research indicates the potential of IoT in improving the quality of life in our society. Some uses of IoT applications are in home automation, fitness tracking, health monitoring, environment protection, smart cities, and industrial settings

1. Home Automation. Smart homes are becoming more popular today because of two reasons. First, the sensor and actuation technologies along with wireless sensor networks have significantly matured. Second, people today trust.technology to address their concerns about their quality of life and security of their homes (see Figure 8). In smart homes, various sensors are deployed, which provide intelligent and automated services to the user. They help in automating daily tasks and help in maintaining a routine for individuals who tend to be forgetful. They help in energy conservation by turning off lights and electronic gadgets automatically. We typically use motion sensors for this purpose. Motion sensors can be additionally used for security also.

2. Smart Transport. Smart transport applications can manage daily traffic in cities using sensors and intelligent information processing systems. The main aim of intelligent transport systems is to minimize traffic congestion, ensure easy and hassle-free parking, and avoid accidents by properly routing traffic and spotting drunk drivers. The sensor technologies governing these types of applications are GPS sensors for location, accelerometers for speed, gyroscopes for direction, RFIDs for vehicle identification, infrared sensors for counting passengers and vehicles, and cameras for recording vehicle movement and traffic.

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Conclusion

In this survey paper we presented a survey of the current technologies used in the IoT domain as of 2016. Currently, this field is in a very nascent stage. The technologies in the core infrastructure layers are showing signs of maturity. However, a lot more needs to happen in the areas of IoT applications and communication technologies. These fields will definitely mature and impact human life in inconceivable way