

Chapter 13

IoT Architecture

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ABSTRACT

Internet of Things (IoT) is an emerging area for the researchers. IoT with the combination of thing, gateway, and Internet perform any operation in a smart way. This chapter discusses the importance of Internet of Things in various application areas. It has been elucidated that how IoT can be used effectively in the smart wireless networks. Most of the devices used in the IoT system are of sensor and actuator devices. The architectural model and communication layout of IoT is explicated through appropriate diagrams. A 16 bit and 32 bit microcontroller based processors are used in the IoT devices to send and receive instructions from the machine to machine, people to people and people to machine. As and when changes or any variations occur in the smart environment suitable instructions are forwarded through gateway to execute corrective task.

INTRODUCTION

Internet of Thing (IoT) is a common term used to specify that how networked devices are helpful in communication. In most of the researches it has been shown that IoT has made the daily lives of human easier. The devices involved in the IoT structure are linked with the Internet to sense and generate data or information to interact with the whole world for disseminating it. On receipt of this information various actions are performed in different applications and tasks are executed effectively. Moreover IoT is not limited to any industrial application or any specific application area. In the recent tears it is noticed that IoT is a part of information security, transmission of data and an important communication channel in electronic devices. So IoT is a collection of smart objects as the price and size of electronic devices involved in it such as sensors and actuators are low and small. And also these devices consume less energy to perform any transmission as these devices are considered as smart devices.

These smart devices are capable to handle the situations or perform the actions with the help of interlinked functionalities which are already defined. These smart devices apply Internet services in a specified situation, so that human-machine interaction to be carried out in any digitized objects. This is a significant advantage for the smart devices of IoT to have enhanced interaction. IoT is more helpful in maintaining the tasks of smart devices in remote regions where human cannot intervene. This ensures

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that the real world situations can be perceived in unexpected levels by a manageable cost. Most of the critical scenarios or situations are handled automatically with the help of IoT to provide faster service and to improve the services of commercial applications. Actually in the year 1999, the caption “Internet of Things” became popular based on the work carried out in Auto-ID Centre at the Massachusetts Institute of Technology (MIT). This institute is famous for designing Radio Frequency IDentification (RFID) infrastructure. From the year 2005 it has been shown that how computers can operate from networked structure to network of interlinked smart objects. Most of the researchers proved that how real world had change the life style from RFID to IoTs in the conferences held in the year 2006 and 2007.

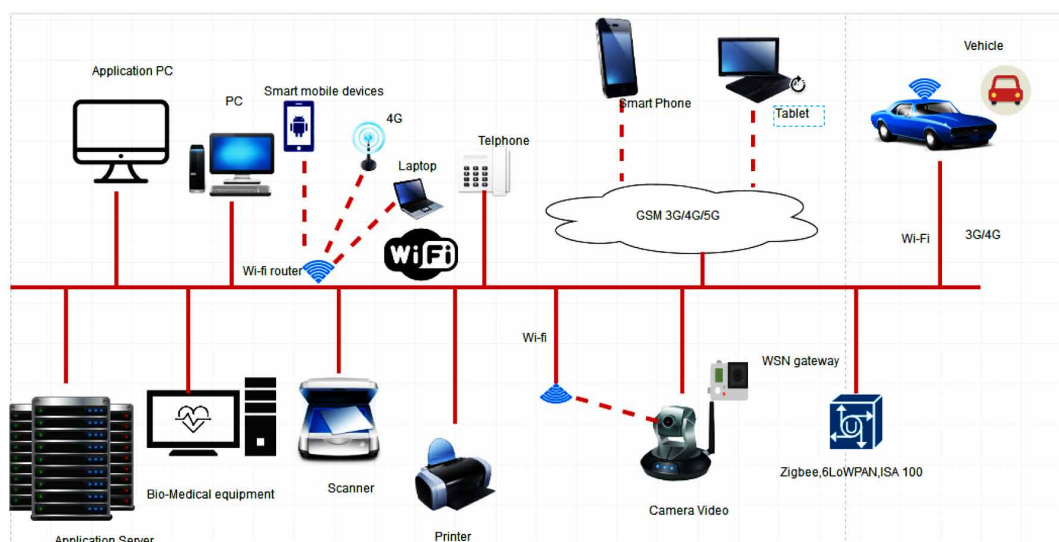
The question arises that in what way the IoT can be more useful to people. The following are the some of the technologies or equipments in which IoT can be applied.

- When IoT is linked with the wearable sensor devices, it sends cautionary messages on detection of critical situations.
- Helpful in parking vehicles with the sensors
- Assisting elderly people in home with sensor equipped devices
- Manage the home purchase orders
- Ensuing the daily activity schedules
- Providing safety mechanisms for the people who work in precarious environments
- Using intelligent mechanisms in the engines IoT saves fuel

All the devices such as motion sensors, lighting equipments and different kinds of home appliances connected with the Internet are customized to function in an IoT structure. In addition smart watches and smart glasses also a part of IoT networked system. All the above mentioned devices are operable with wireless standards such as Zigbee, WiFi and Bluetooth.

The Figure 1 shows how Internet of things is involved in various applications like biomedical applications, vehicular networking, healthcare systems and remotely operated systems in channel accessing.

Figure 1. Layout of IoT communication



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