

A Contemplate on Internet of Things - Architecture, Applications

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Abstract- Internet of things has become a actuality. It can be defined as things which are affinity to the internet. IOT is actually a combination of internet with RFID's, various sensors (like ambient, wearable)and smart objects (things) around us. The IoT is a bridge of various individual devices called things and wireless sensor networks are also playing an important role in it. For IoT devices on the basis of their architecture, scheduling methods, networking technologies, programming models, power and memory management methods, together with other features they required for an IoT applications. IoT now a days has become a invocation but still it is lacking due to many challenges. This paper presents an introduction on internet of things and discusses on the architecture, various application for extent of it.

Keywords- Internet of things, IoT architecture, IoT applications

I. INTRODUCTION

The Internet has rectification almost every aspect of our lives: how we work, think, educate, and entertain ourselves, and now the time has arrived for the Internet of Things (IoTs).The internet of things has enlarge the currently available internet services to accommodate each and every real world object which is present in this world.

This will connect more devices and connect us to the devices This will impact our lives more than any other aspect of the digital age has done before. which have the capability to interact with each other. The idea behind this IoT is the usage of various different objects such as RFID, Sensors, Actuators, mobile phones,NFC etc.

These objects can hear, see, think, and can actually perform various tasks by talking to each other (sharing information with each other). Many of the routine works we do in our daily life will be affected greatly by IoT for These objects are termed as a ' Smart Object' because of their functionality and improved technology. IoT is contributing to improve the quality of life and to increase the economy of world to a great extent. example, in case of smart homes we want to enter home door will be opened automatically when

residents reach their home, climate will be controlled automatically on their entrance to room, lights will be turned on , TV's and other appliances will be controlled automatically. things we use daily in our routine like furniture , food packaging stuff, fridge's, paper documents and many more . Many such approximations are made regarding emergence of new devices as CISCO approximated. For such a highly interconnected environment, new protocols are necessary to be developed to provide a greater compatibility for communication between 'things'. Along with that there is a need to improve the conventional architecture of internet so as to meet the requirements and challenges of IoT. Moreover, adoption of larger address space as IPv6 is necessary so that the demands of customer are met. There are also some issues that IoT is agonize from, such as security and privacy.

II. ARCHITECTURE OF IOT

The architecture of IoT should be a pliable in nature, because it has to interconnect heterogeneous objects in billions and trillions ways. There are many propound architectures for IoT but all of them are not yet converged to form a unique reference model yet. Many projects are available that have helped to create a common architecture of IoT based on technological changes and researches.

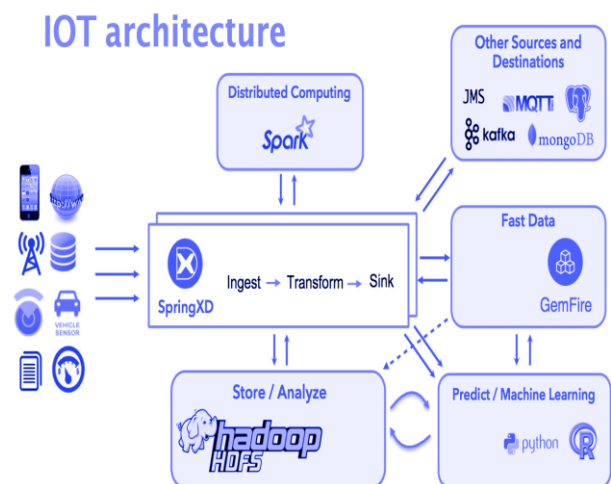


Fig :IoT Architecture

The most basic architecture is a three-layer architecture as show in fig It was introduced in the early stages of research in this area. It has three layers, namely, the perception, network, and application layers. 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. 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. 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.

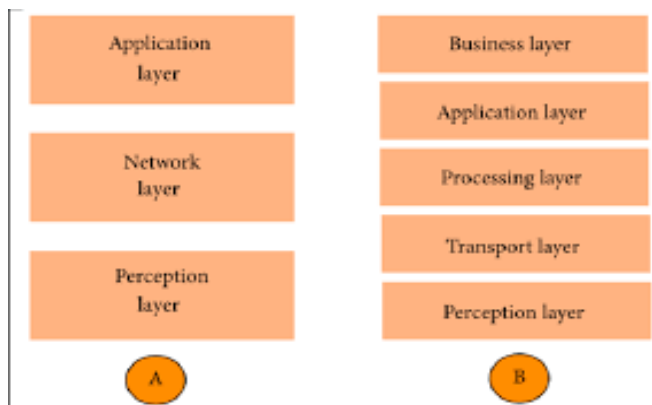


Fig: IoT A(3) layers & B(5) layers

The three-layer architecture defines the main idea of the Internet of Things, but it is not sufficient for research on IoT because research often focuses on finer aspects of the Internet of Things. That is why, we have many more layered architectures proposed in the literature. One is the five-layer architecture, which additionally includes the processing and business layers [3–6]. 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. (i) 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. (ii) 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. (iii) The business layer manages the whole IoT system, including applications, business and profit models, and users' privacy. The business layer is out of the scope of this paper. Hence, we do not discuss it further.

Another architecture proposed by Ning and Wang [7] is inspired by the layers of processing in the human brain. It is inspired by the intelligence and ability of human beings to think, feel, remember, make decisions, and react to the physical environment. It is constituted of three parts. First is the human brain, which is analogous to the processing and data management unit or the data center. Second is the spinal cord, which is analogous to the distributed network of data processing nodes and smart gateways. Third is the network of nerves, which corresponds to the networking components and sensors.

III. APPLICATIONS OF IoT:

security is highly censorious in almost all iot applications that have already been deployed or are in the process of deployment. the applications of iot are increasing very rapidly and penetrating most of the existing industries.

1. Smart Cities:

The main features of a **smart city** include a high degree of **information** technology integration and a comprehensive application of **information** resources. ... With the technical support from **IoT**, **smart city** need to have three features of being instrumented, interconnected and intelligent.

2. Smart Environment:

Internet of Things (**IoT**) is a concept and a paradigm that considers pervasive presence in the **environment** of a variety of things/objects that through wireless and wired connections and unique addressing schemes are able to interact with each other and cooperate with other things/objects to create new applications.

3. Smart Grids:

The **Smart Grid** is part of an **IoT** framework, which can be used to remotely monitor and manage everything from lighting, traffic signs, traffic congestion, parking spaces, road warnings, and early detection of things like power influxes as the result of earthquakes and extreme weather.

4. Smart Security :

IoT based **smart security** and home automation system. Internet of Things (**IoT**) conceptualizes the idea of remotely connecting **and** monitoring real world objects (things) **through** the Internet [1]. ... Besides, the same can also be utilized for home automation by making **use** of the same set of sensors.

5. Smart Retail:

IOT(Internet Of Things). ... **IOT** aims at integrating networked **information** systems to real worlds entities. It connects objects such as Smarts Phones, Sensors with cloud where the data is store. With the help of this system owner can maintain inventory **information** also place the order of inventory.

IV. CONCLUSION

In this contemplate, we have explained an architecture and applications of IoT that where they are used in various security threats at different layers of an IoT application. The idea of IoT is to connect every single thing around us and at any time that we can use . But still there are many challenges that cannot be overlooked. The applications of IoT are very smart as they are having automatic perception.

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