

# Internet of Things

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## Abstract :

Internet Of thing , these changing much about the world we live in from the way we drive , how ,how to make purchase ?even how we get energy at home ? Sophisticated sensors on chip embedded in physical things surrounded us. Each transmitting valuable data .Data better understand .how things work and work together .but how exactly do all these devices share such large quantities of data and how do we put that information to work whether we are improving the production of a factory ,giving city residents real-time updates on where to park or monitoring our personal health its common Internet Of Things platform that bring us diverse information together and provide common language for the devices and apps to communicate each other .

## Keywords

IoT, RFID, IPv6, Wi-Fi, Bluetooth, ZigBee, Sensors, Actuators, IKV, IKEV2, 802.15.4, 802.15.6, 802.16

## Introduction :

It has been anticipated that very soon all the different things that are going that we are seeing around us and that we have around us are all going to be internet worked. They are all going to be interconnected. it is going to be expanded beyond computing and computer devices being connected. It is going to interconnect different things that physical objects that we see around us, the different objects such as the lighting system in a room, the lights, the fans, the air conditioners and anything and everything including things such as the toothbrush, the microwave oven, the refrigerator and so on so forth and not only in our homes, but also in our businesses such as internet working different machines, internetworking different equipments and so on. each and everything that we see around us that we use at our home in businesses, in workplaces, everything being internet worked. this is the whole vision of internet work of things, internet of things. things are going to be all equipped with embedded systems and these embedded systems along with embedded electronics, embedded processor, embedded communication systems.

we are going to connect or internet work different machines, different tools typically, but not necessarily using wireless technologies, such as Wi-Fi cellular technologies, Bluetooth Zigbee and different other wireless technologies that are available to us.

2020, almost we are going to have 1.9 trillion devices that are connected that are going to be internetworked.( Figure 5) IoT is one of the building blocks that is considered to be of use for developing smart homes and smart cities. The unification of different technologies that becomes very much mandatory. So, internetwork of things is not a single technology. Physical devices can be of different types of physical devices having different configurations, different specifications . Each of these supported through different other systems such as cloud technology, big data machine, learning networking computer vision, you name it and all these different technologies from electrical sciences and some from even mechanical sciences are required in order to build IoT.

The term "Internet of things" was likely coined by Kevin Ashton of Procter & Gamble, later MIT's Auto-ID Center, in 1999.[1]The Internet of Things (IoT), also sometimes referred to as the Internet of Everything (IoE), consists of all the web-enabled devices that collect, send and act on data they acquire from their surrounding environments using embedded sensors, processors and communication hardware. These devices, often called "connected" or "smart" devices, can sometimes talk to other related devices, a process called **machine-to-machine** (M2M) communication, and act on the information they get from one another. Humans can interact with the gadgets to set them up, give them instructions or access the data, but the devices do most of the work on their own without human intervention.[2]

“The Internet of Things (IoT) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.” [3]

## Characteristics of IOT

ubiquity: anytime, anyplace, anything, connectivity is what is going to be observed in this new era of ubiquity.

Scalability: if the number of sensors and the sensing devices IoT devices are going to increase, the overall network performance should not be compromised.

There has to be unambiguous meaning and addressing architecture. we need a new mechanism for naming and addressing of the different nodes, these physical nodes, the physical objects that are fitted with embedded systems.

## Components of IOT's:

### 1.Sensors/Devices

Sensors or devices collect data from their environment. They sense different parameters depending on the sensor being used. For example, temperature, pressure, humidity conditions, lighting conditions and so on. A sensor it detects or senses the changes in the ambient conditions or it can also sense the state of another device. (Figure 1)

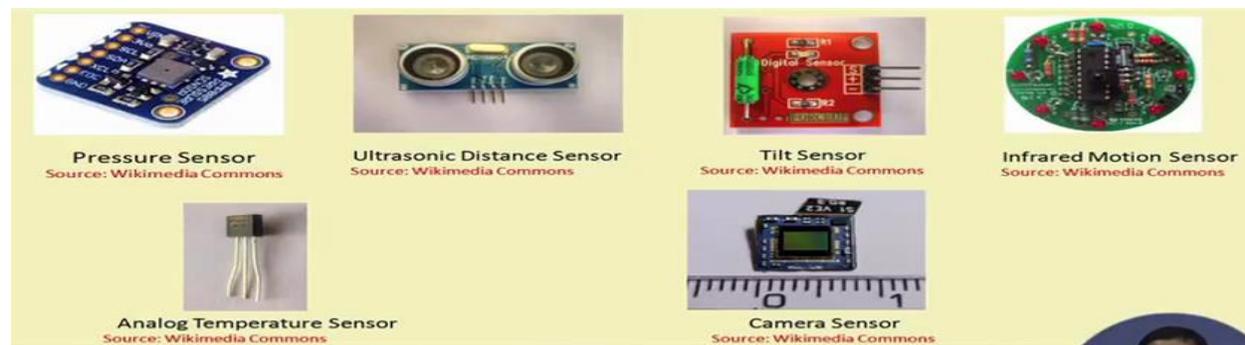


Figure 1

## 2. Connectivity

The sensors/devices can be connected to the cloud through a variety of methods including: At present there are different various sources, different various ways of offering connectivity. Cellular is one Wi-Fi Ethernet, then Bluetooth Low Energy, Dash 7, Insteon, IEEE 802.15.4, 802.15.6, 802.16 so and so forth. So, many different connectivity mechanisms, connectivity standards are available. some kind of handshaking between each of this different isolated standards Unique Building Blocks, such as the LAN IoT, WAN IoT, Node IoT, Gateway IoT, Proxy and so on. (Figure 2) multi-homing, where a particular Node or an IoT device or the sub network, IoT sub network can be connected multiple networks for improving the reliability. IOT use IPV6 addressing scheme .

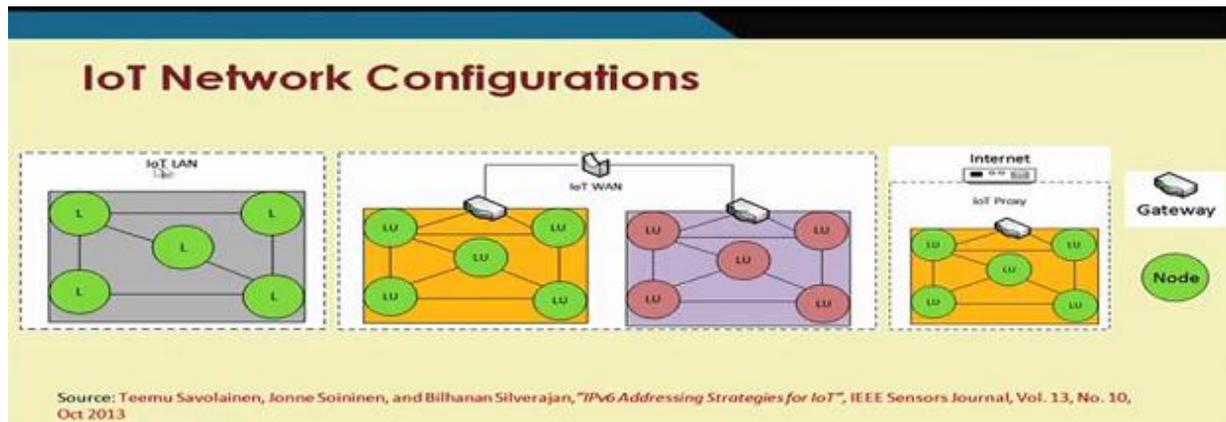


Figure 2

## 3.Data Processing

Once the data gets to the cloud, software performs some kind of processing on it.

## 4.User Interface

Next, the information is made useful to the end-user in some way. This could be via an alert to the user (email, text, notification, etc). For example, a text alert when the temperature is too high in the company's cold storage. [5]

## How does work?

Devices and objects with built in sensors are connected to an Internet of Things platform, which integrates data from the different devices and applies analytics to share the most valuable information with applications built to address specific needs.( Figure 3) [6]

Nodes to communicate directly to the internet as well and this can be done with the help of concept of tunneling where the Nodes can communicate to a remote anchor point instead of channeling their packets through the router. This can be done with the help of tunneling protocol, such as IKV, IKEV2.

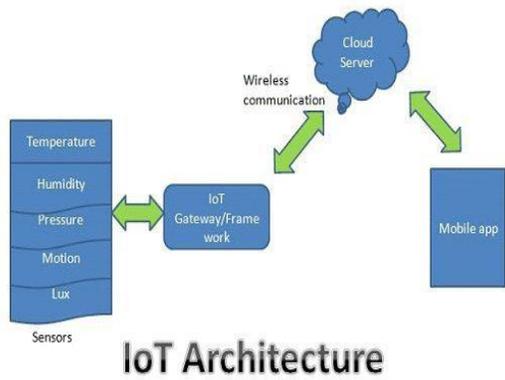


Figure 3



Figure 4

Google Flu Trend was first launched in 2008 by Google.org to help predict outbreaks of flu. Figure 4 [7] Large corporations value its market in tens of trillions of dollars for the upcoming years, investing billions into research and development. The Google has purchased 3.2-billion-dollar company which produced IOT device like thermostat and smoke detector sensor.[2] 2020, almost we are going to have 1.9 trillion devices that are connected that are going to be internetworked.( Figure 5) [8]

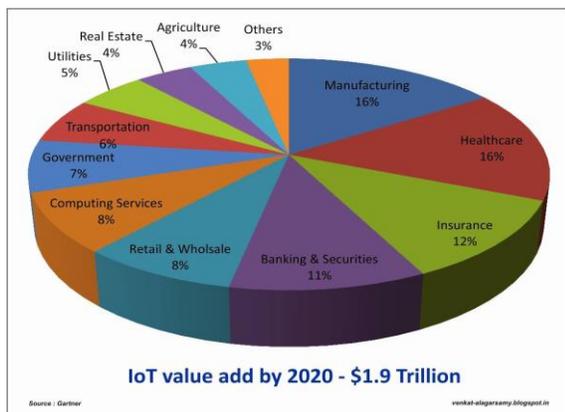


Figure 5

**Challenges :**

There is collision issues between devices . There are security and privacy issues. There may be chances to steal your data and breach your privacy . Observing the traces of this digital war, it is highly likely that the next potential threats to IoT would be cloud networks. Rapid growth in technology has resulted in a limited understanding of the IoT.

**Conclusion :**

The Internet Of Things uses a variety of information sensing identification device and information processing equipment , such as RFID, WSN, GPRS etc combining with the internet to form an extensive network in order to information and intelligence s the entities or objects.

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