

# Security Issues and Challenges in IoT

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**ABSTRACT:** *Internet of things is a very challenging part of the technological environment in present scenario. Major issues to deal with it are security and reliability of the applications. So to subdue with this matter of contention we will try to have some related solutions in this paper. On studying in brief we find that the algorithms which are relatable to diminish the security challenges in many applications is being tested over a period of time. In this research paper we will test the working of various technologies ensuring latest security points and key methods to face the challenges.*

**KEYWORDS:** *internet of things, security, machine to machine (M2M).*

## I. INTRODUCTION:

Many of the things that are known while getting access whenever connected to internet and their virtual representation was early known in 1998 known as the term internet of things. As in the recent time the, IoT is emerging at its full boom with some of the applications like smart home controller, intelligent sanitation, smart education and in medical fields. IoT is mostly based on three major parts which includes sensors, connectivity and people and processes, along with two important features privacy and security.

As the growth of IoT is increasing day by day, most the industries are also investing in this technology making smart cities all over the world.

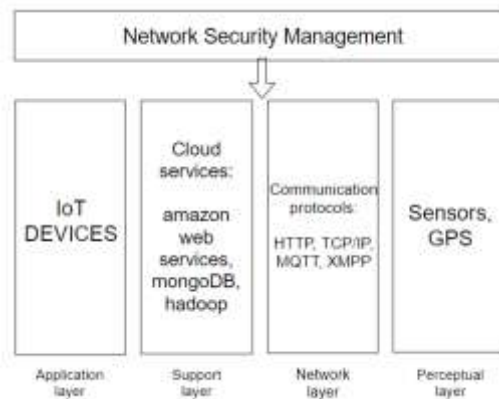
Now talking about the security, IoT will come across many of the challenges. Many of the reasons include: 1) IoT increases its range of connectivity in many of the areas and fields. 2) everything will be connected to "internet". 3) the unknown sources will communicate with each other. Hence leading to many security issues, which makes us think about the CIA(confidentiality, integrity and authenticity) traid.

For this not only the intelligent and automatic control is sufficient, we need to look for more technologies and methods to meet the reliability, security and privacy in IoT.

## II. IoT SECURITY ARCHITECTURE:

IoT is dissected into four key stages as shown in the figure below:

- Application layer
- Support layer
- Network layer
- Perceptual layer



**Fig 1: Security Architecture of IoT**

Among all the four layers the most basic one is perceptual layer which collects information from various fields through sensors and other equipments and represent the physical world in the digital world.

Previous to it is the network layer which is responsible for the secure and reliable sharing of information from perceptual layer. It transmits the information through internet, satellite etc. in many devices.

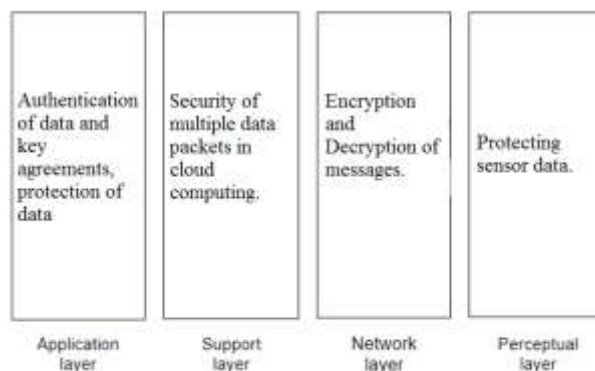
Next layer is the support layer, in this layer the various internet connection are made through cloud services. It behaves as an middle layer between application layer and network layer.

Application layer is top layer which behaves as an interface between the user and internet. This layer makes the user make access to the internet through various modes like television, automatic gadgets etc.

Above all the layers security and management of each layer plays an important role in keeping the technology safe.

**III. NECESSITY OF SECURITY:**

As the security architecture is build to make the IOT much more smarter and easier to access, so its security is also a high priority to maintain. Diagram below shows the various layers and their security necessity.



**Fig 2: Necessity of security at each layer.**

- a) Perceptual layer: At this layer the security of the data is much more required in order to protect data from the suspicious node disturbing the CIA traid, and encryption of data is also necessary.

- b) Network layer: At this layer the various communication security methods are difficult to apply. The main form of attack is DENIAL OF SERVICE attack which is found at a large amount in network layer.
- c) Support layer: At this layer the various cloud computing services are not much helpful and also the multiparty data storage platform makes it more to keep a high security though from various antivirus.
- d) Application layer: In order to keep the data secure at application layer we need to look after two things: one is authentication and the other is the key agreement for encrypted form of data.

Summarizing the whole necessity of IoT environment we came to the conclusion about the various challenges coming in the way, which we will discuss below.

#### **IV. CHALLENGES IN IOT SECURITY:**

There are various challenges for iot security. Some of them are mentioned below:

- a) Secure limited space gadgets: Most of the iot devices have restricted amount of storage to store their data may be because of mostly working devices on batteries. These devices are mostly effected through the side party attacks which is a very big challenge to the iot device developers.
- b) Secure encryption and decryption of data: If the devices are secured we need to look the security between the cloud services and the devices or apps. There should be no infected encrypted data received by the receiver.
- c) Availability of data: The data should be available to the user at any instant of time so that no urgent or important work gets on hold. As the unavailability of data may lead to severe disasters like loss of human creature, loss of revenues etc.
- d) Laws and rules need to be made: As the whole world is growing through the internet of things and its features, the government needs to look after the rules and laws to secure the data.

#### **V. CONCLUSION:**

As the emerging of this advance technology and autonomous field, we have come across through various issues and challenges. In this paper we have discussed about various points like security architecture which included four stages application, support, network, perceptual. And then we discussed about different challenges that make iot devices a less welcomed to all in case of privacy and that needs to be discussed and find a solution.

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