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MODERN IOT ARCHITECTURES, THEIR CHARACTERISTICS AND APPLICATIONS ANALYSIS

This paper is devoted to give an insight about Internet of Things (IoT) which is a type of technology used to connect humans to machines and machines to machines using the Internet as its underlying technology to ensure that this connection is possible coupled with the aid of sensing devices, microprocessors, microcontrollers etc. to conduct proper and accurate information exchange, communication and processing. It aims to give an overview about the characteristics of IoT, architecture, enabling technologies, future technological developments and challenges that may likely arise.

With the rapid growth in technology and the importance of data we are heading into a world where everything and everyone will be connected and IoT will be the underlying technology that makes this possible. Its main idea is to have independent and self-sufficient connections that allows exchange of data among real world physical devices and real applications.

The fundamental characteristics of IoT include but are not limited to the following:
1. Interconnectivity: where anyone or anything can be connected.
2. Heterogeneity: that is has to be platform and hardware independent.
3. Dynamic state: where it can be operating in an active or a passive state.
4. Enormous scale: that it can accommodate lots of devices and data.

It is worth mentioning that IoT is not a single technology but a combination of different software and hardware devices and together these two categories ensure the effective operational and functional capability of IoT. Some examples of these devices that makes IoT what it is include sensors, microprocessors, microcontrollers, GPS, WI FI, GSM, RFID, GPRS, 2G/3G/4G, etc.

An IoT architecture consist of different layers of technologies and this different layers work hand in hand to ensure efficient and effective communication and data processing. These layers are classified into smart device/sensor layer, gateway/network layer, management service layer and application layer.

Future technological developmets for IoT are mainly concerned with improvements in the field of science in areas such as semiconductor, smart phones/devices, cloud computing and networking, network virtualization and sensors etc. It is safe to state that IoT will be tremendously affected by any or all of the aforementioned improvements and these improvements will likely result in better sensing, data transfer, data processing and runtime, as well as connectivity.

While to the future of a functional human will depend on IoT it is also important to acknowledge its drawbacks and some of these concern and have to deal with issues regarding privacy and security, interoperability, data management and different device energy levels.

IoT technology has become increasingly popular in the last 5 years and with advances in computing communication and routing it will be what will shape the future of humans and interaction with technological environment that will be found in all facets of human life ranging from agriculture, healthcare, manufacturing, transportation and even insurance.

References

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