

An investigation addressing issues with the performance and throughput of cloud-based IoT applications

Ashok Kumar Panda
College of Engineering Bhubaneswar, Biju Pattnaik University of
Technology, Odisha, India

Abstract:- Every human life has given rise to the cloud and IOT. In order to connect seamless networks and networked things, the Internet of Things (IoT) is the most essential concept in the field of Internet technology. In order to process massive data streams and computations while overcoming the difficulties of linking everything with a seamless network, cloud computing offers backend solutions. But cloud computing and IOT integration cannot occur without problems or hindrance. This paper presents an overview of the various cloud computing domains that are dominant in the Internet of Things (IoT) and discusses the difficulties and potential solutions for the Future Internet (IF) under cloud computing.

Keywords—Cloud Computing, Internet of Things, Information Technology, Future Internet.

INTRODUCTION

The Internet of Things (IoT) refers to any gadget that has sensors integrated into it that can gather and send data over a network without any interruptions. They are able to interact with the exterior and internal environments thanks to the object's emerging technology. With the use of IOT technology, we may now attach a device to an inside object that is capable of measuring environmental conditions, producing related data, and sending it over a communications network. The Internet of Things (IoT) is the most important concept of Future Internet for providing a common global IT Platform to combine seamless networks and networked things. People will be connected to anything, anyone, anywhere, at any time, and appropriately through any network or service in the future [2]. In addition, the Internet of Things addresses the connection, computing, convergence, collections, communication, and convergence between people and things [3][4]. While facing the challenges of everything that is connected with seamless networks in the future, the Cloud Computing is regarded as the backend solution for processing huge data streams and computations [5]. Cloud technologies can provide a flexible, efficient, scalable, and virtual data centre for context-aware computing and online service for enabling Internet of Things [6][7]. The IoT and Cloud computing are both rapidly developing services, and have their own unique characteristics.

Advantages of integrating IOT with Cloud Computing

The Internet of Things has limited processing power and storage capabilities, so it must also deal with problems like performance, security, privacy, reliability. The integration of the IoT into the Cloud is certainly the best way to overcome most of these issues. The Cloud can even benefit from the IoT by expanding its limits with real world objects in a more dynamic and distributed way, and providing new services for billions of devices in different real-life scenarios [8],[10]. In addition, the Cloud provides simplicity of use and reduces the cost of the usage of applications and services for end-users. The Cloud also simplifies the flow of the IoT data gathering and processing, and provides quick, low-cost installation and integration for complex data processing [11].

CLOUD-BASED IOT

Architecture diagram

The IoT is defined by the variety of its protocols, devices, and technologies. As a result, achieving reliability may be difficult. Scalability, interoperability, security, availability, and efficiency. Most of these problems can be solved by integrating IoT with the cloud. Other characteristics offered by it are usability and accessibility.

As stated by the previous studies, the defined IoT architecture is technically classified into three different layers: application, perception and network layer. Most assume that the network layer is the Cloud layer, which realises the Cloud-based IoT architecture, as illustrated in Figure-1

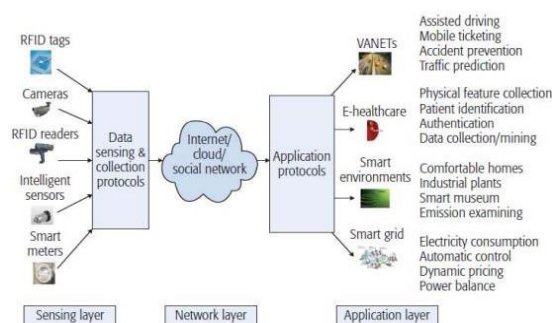


Figure-1: Cloudbased IOT Architecture [1]

Cloud Based IOT Applications

- Numerous apps and smart services have been launched using the cloud-based IoT strategy, impacting end users' daily life. Cloud-based IOT is being widely used in a number of industries, including healthcare, smart cities, automotive and smart mobility, smart logistics, environment monitoring, and video surveillance. For many security-related applications, such as wireless CCTV cameras and movement detection systems, it has emerged as one of the best technologies available. The primary function of Ethernet as a Service (EaaS) is to offer ubiquitous connectivity for controlling remote devices.
- Sensing and Actuation as a Service (SAaaS); this provides control logics automatically; Identity and Policy Management as a Service (IPMaaS); this provides access to political identity management; Database as a Service (DBaaS); this provides ubiquitous database management; Sensor Event as a Service (SEaaS): this provides messaging services that are generated by sensor events; SenaaS: this provides management for remote sensors; and DaaS: this provides ubiquitous access to any type of data.

Challenges in Cloud Based IOT

Internet of Things uses cloud computing to analyse, verify and store data, which greatly reduces the computation, storage and communication overhead of IoT and improves efficiency.

- particularly when data integrity must be guaranteed
- A perfect data management solution which will allow the cloud to manage massive amounts of data is still a big issue
- Obtaining adequate network performance in order to transfer data to Cloud environments is a huge issue and it required uninterrupted high network bandwidth for real-time applications
- Service providers must adapt to various international regulations considering the security of the data.
- Encryption of vast amount of data from IOT various applications lead to more computational processing power.

CONCLUSION

All forms of data are encrypted using the same standard by current cloud service providers. Since different applications may not require the same level of data sensitivity, we can select different encryption standards for different applications to prevent needless strain on computing resources and performance. Better performance for real-time IOT applications will result from this. Authorization is increasingly crucial for non-realtime applications, and attribute-based encryption using different encryption protocols will improve throughput and performance.

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