The Cloud Computing and Internet of Things (IoT)

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Abstract - Cloud computing is a huge network of connected powerful servers that Provide services to both businesses and individuals. Internet of Things (IoT) interconnects Computer devices, machines, objects, animals, and humans to provide unique identities and data transfer over a network without requiring direct human-to-human or human-to-computer communication. Cloud Services facilitate excessive communication for the IoT sensors, ensure greater connectivity. Soon, humans will be able to connect with billions of machines and devices. The Internet of Things generates a large amount of data, while cloud computing enables it to travel seamlessly. The purpose of this paper is to examine how cloud providers can take advantage of this to use pay-per-use models, using the specific resources the customers need to pay. IoT startups can also benefit from cloud hosting as a service by reducing their overall cost structure due to economies of scale.

Key Words: Cloud computing, IoT, Future.

1.INTRODUCTION

As IoT generates a great deal of inconsistent data due to which Internet Infrastructure comes under pressure. To solve this problem companies are continuously trying to find an effective way. Cloud computing will play a major role in finding the solution to this problem by making all the connected devices work together, aggregating the generated data, and extracting meaningful knowledge out of it. Cloud computing allows for high scalability that makes the complicated process of comparing data across wider areas quite easy. In IoT, millions of sensors are used to generate and transfer the data for which each sensor consumes an excessive amount of computational power. As a result, the process would be highly energy-intensive and expensive. When using the cloud, however, all this data can be aggregated and passed to the cloud to be processed, which is cheaper and more efficient. In daily life, the Internet of Things plays a significant role. As an example, you can start your cooling device remotely through your smartphone using smart homing. Furthermore, IoT as a tool has also been used in various industries across various business environments. However, the amount of big data being collected by IoT is putting a lot of pressure on the Internet Infrastructure. It has led businesses and organizations to look for a solution that will reduce this load, such as cloud computing, which provides computing power, database storage, applications, and IT resources on demand. Today, cloud computing is a major component of mainstream IT and its infrastructure. Many big tech companies such as Amazon, Alibaba, Google, and Oracle are building software based on machine learning to offer a variety of solutions to businesses worldwide with the help of cloud computing. Cloud computing is key to IoT and this article explains why they are inseparable.

2. IMPACT OF CLOUD COMPUTING IN IoT

The goal of cloud computing and the Internet of Things is to make everyday tasks more efficient, and both are complementary. Taking the advantage of this, many cloud providers provide a Pay-as-you-use model that allows a customer to pay for specific resources used. Also, cloud hosting as a service is a great way to reduce the overall costs for IoT startups. In addition to facilitating better collaboration among developers, cloud computing also allows them to store and access data remotely, allowing them to implement projects more quickly. A business that uses thousands of sensors to collect data uses a lot of computational power on each sensor. In this situation, it is better to send these sensor data to the cloud so that they are processed as a whole. As most collected data is processed and analyzed in the cloud, one might say that the cloud is the brain of the IoT.

Fig -1: Figure

3. NEED OF CLOUD IN IoT

Sensor networks:
Although cloud technology provides new opportunities for gathering sensor data, it also creates challenges due to security and privacy concerns. IoT has been amplified by sensor networks. Users have been able to measure, infer, and understand delicate environmental indicators with the help of these networks. However, the problem of timely processing data collected from so many sensors has proven extremely challenging.

Remote processing power Provider:
The IoT has become more than just air conditioners, refrigerators, etc. Thanks to cloud computing technology. Cloud storage is so vast that you no longer need on-premise infrastructure. Due to miniaturization and the shift from 4G to high-speed internet, Cloud computing will offer developers faster computing speeds processes.

Networking and communication protocols:
With the cloud and IoT, many types of devices can communicate with each other using a variety of protocols. Since most applications don't involve mobility, managing this variation could be challenging. Wireless and Bluetooth instruments are used right now mainly as a stop-gap measure to facilitate travel to some extent.

Enables inter-device communication:
Dropstr and Cloud Cache rely on cloud computing to enable smartphone connectivity. It facilitates the sharing of information between devices, which is fundamental to the IoT cloud. Cloud computing can be said to accelerate the IoT market. There are, however, certain challenges to deploying cloud technology. It's not that cloud technology is flawed, but when combined with the IoT cloud can cause users some challenges.

4. FUTURE OF CLOUD AND IoT

IoT, when combined with Cloud Computing, will lead to a boost in the growth of IoT systems and cloud-based services soon. It is generally accepted among a majority of industries that cloud computing is a necessary component for many IoT projects. IoT generates a large amount of data. Cloud providers allow this data to transfer over the internet, which facilitates data navigation. In a cloud infrastructure, you can run applications, analyze data, and make decisions quickly. Cloud computing and IoT combine to form a vital component of user security and privacy. IoT on the cloud provides third-party access to the infrastructure, thus helping the IoT area. Therefore, the integration can support the use of IoT data and computational components.

Increased Scalability: IoT devices need lots of storage to share vital data. In the cloud, such as the Cloud Connect to Azure, customers can receive more storage that can increase if the user's needs change. Providing storage solutions to our customers.

Increased Performance: To interact and connect, IoT devices produce large amounts of data. In the cloud, IoT allows devices to share information so it can be interpreted quickly.

Pay-as-you-go: The Internet Cloud Computing infrastructure enables IoT to make sense of the increasingly large quantity of data. There is no worry about buying too much or too little storage. They can pay for only the amount of storage they use and can scale up the storage as they generate more data.

5. CONCLUSION

Internet of Things encompasses a broad field of applications with a great deal of variety. IoT is a good fit for cloud infrastructure. Cloud computing can provide the IoT with unlimited capabilities and resources Since it has scalable capacities. Also, cloud infrastructure is accessible anytime and anywhere, with lower capital expenditures and operating expenditures. To conclude, we show how IoT, cloud computing, and big data generate a new horizon for decision support systems. As well, combining big data, IoT, and cloud computing may open new opportunities for all sectors.

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