Introduction to Fog Architecture: Beyond the Cloud System

Eun-Kyu Lee

Dept. of Information and Telecommunication Engineering
Incheon National University, Incheon, Korea
eklee@inu.ac.kr

Abstract. Rapid development in the IoT (Internet of Thing) to meet the traffic needs of users growing exponentially growing amount of end devices currently on the market yen of cloud computing model seems a limitation. Cloud computing has many problems such as limitation of intensive, real-time connection load, security issues, the need for complex design DB. Computing the fogging (fog computing) model for overcoming these problems has been proposed. Fog computing model is undergoing a soft mountain course, etc. physically closest gateway or PC, Smartphone, set top box) gave me a real-time rapid response provides an easy-to-use interface , and give to spread the load of cloud server security Saints to give improved . To describe the technology trends and development directions for the fog computing model.

Keywords: fog computing, Internet of things, cloud computing, wireless network, mobility

1   Introduction

IoT technologies are developed and fused with all sectors, and has grown drastically. Also increasing in number faster and width redness, so be expected to be abnormal 5 billion in 2020 for the endpoint (end point) the development and cheaper cost of sensor technology. [1] This exponential increase words or the current endpoint hagieneun treated as cloud computing system (cloud computing system) seem much point limit. First, while focusing on a number of traffic (traffic) a server, you may experience a delay in response time load occurs. In addition complicate the design database (data base), and it has many problems such as process efficiency, and security. In addition, real-time communication must be the nature of the IoT product point but many current network structure, material constraints. New technologies model that overcomes these limitations is the fog computing system (fog computing system). Fog computing system allows to disperse the traffic is concentrated on the server cloud to the user and provides a fast and effective reaction interface, and improved security.
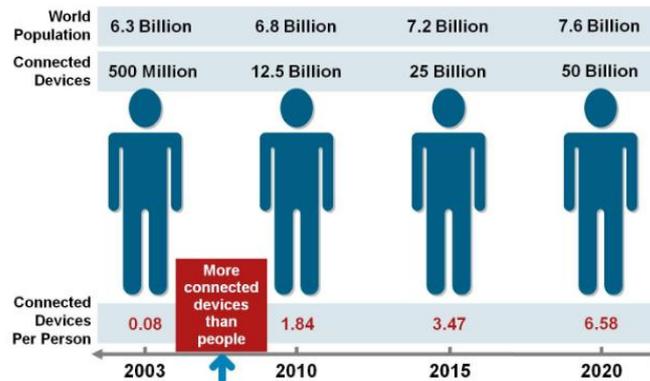
Fig. 1. The number of end points grows exponentially (Source: Cisco IBSG, April 2011[1]).

2 What is a Fog Computing?

Fog computing is cloud computing, extended the concept to the network edge only (edge of the network) from operations, save that Lorca terminal device (end device) and existing cloud data center (cloud computing data center) between the network services provided by the platform a. [2] the calculation process two names (cloud) under the fog (fog) of a computing named after the fog at that point made invisible in the rain.

Near Gateway does not send data to servers (routers, smartphones, set-top box, PC, micro server, etc.) collection and processing by lowering the delayed (low latency) to enable automatic response and control of the terminal device, and four in user-friendly interface for providing real-time.

Unlike cloud computing is concentrated in one place fog computing has the geographically dispersed nature. That reotgi because cars such as moving the model (active model) to proxy (proxy) and network connection relay point (access point) to use services provided to be there. [2] The distributed computing (distributed computing) the nature of having it may distribute traffic to be concentrated in the cloud server.

3 Beyond the Cloud

3.1 Challenges

In the near future, it said the IoT market costs anywhere in the sensor's life. The exponentially increasing number of terminal devices increases and the amount of data traffic accordingly. This is the collecting big data (big data) across multiple sectors can be very effective and overcome the numerous discomfort or overcome problems. But Big collect data, or control terminal device and hagien provides a convenient user

interface to existing cloud server system is difficult to accommodate all the explosive increase in traffic. Numerous traffic is concentrated to efficient server design also is complicated database will drop depending on the incoming data of various types causes the load. Because of the large amount of data is large, but also greatly increases the number of concurrent users that require response (react), each unit is not good efficiency.

3.2 Fog Architecture

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Architecture (architecture) fog computing system is a computer in the middle equipped with all the hardware features such as network connection, the local communication such as Wifi, Xbee, Bluetooth and an application above it is driven [3]. Fog computing is literally a cloud server the process of dividing up the work in the middle Fog Layer. Save the information on the number of end devices in the Fog Layer, analysis , and processing and fast response Tues speed control of the terminal devices switch to , or automatic response to disperse the load is concentrated on a cloud server to transmit only the essential information simplification is necessary to the cloud server . Computing the strength of the fog model is divided into two branches.

First, by balancing processing the traffic is concentrated in the cloud server provide load balancing (load balancing) function, and the endpoint may form a platform that provides a fast response and an effective response. This is very effective in IoT technology that requires an immediate and accurate response.

Second, if must be connected to the real-time nature of IoT product is the majority. Fog node (fog node) is varieties of devices are connected to the WiFi, ZigBee, short-distance communication such as Bluetooth and shall immediately process the data in [3]. The low-power of the presence of fog nodes, maintain the connection without the broken efficient local area communication to provide a high cost and robust communication systems than did the power 3G / 4G (LTE) communication.

It third, geographically distributed is effective for distributed computing and large range of the sensor which require a storage network (large-scale sensor network). Also provides a service model in which the movement (mobility), such as a car with a proxy and network relay point [2].

4 Conclusion

Effective management and the role of the platform for analyzing and controlling the number of traffic coming from the IoT market is becoming increasingly important. As a result, cloud computing systems are coming through the traditional limitations shall be changed to suit the characteristics of the IoT market. Configuring a real-time

connected, quick response and the platform to provide a convenience feature effectively distribute the large amount of traffic in the fog and computing the model can be implemented to cope with various situations.

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