Internet of Things: A survey on Protocols and Architecture based on Cloud Computing

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Abstract- Internet of things involves a lot of technologies and standardization organizations, its industrial chain is huge and wide, its development needs the government's policy support, mutual cooperation and exchange between enterprises, the joint efforts of the organization.This review at first describe conventional architecture of IoT, then talk about the New Security Architecture for IoT Network and at the end deliver some description about Architecture Design of the Internet of Things based on Cloud Computing.

Index Terms- Internet of Things, IoT, Protocols, Architecture, Cloud Computing

I. INTRODUCTION

We need the potential of the Internet of Things to exploit a set of technologies. Without a vision-based on architecture and protocols, understanding of technology and its role in the Internet eco-system objects will be very difficult, So this article will focus on IoT architecture and protocols.

The architecture of the Internet of Things

There is a four-tier architecture for the Internet of Things, including the network layer and connecting sensors, switches, and network layer gateway, service management layer and application layer. The lowest level in a sensor network consisting of sensors, actuators and tags (eg barcode or RFID). face at the network layer and gateway, with a network WAN, a mobile communication network, a WiFi, Ethernet and other items such as control gateway. in the service layer and finally the layer flow management and security control program that can be witnessed the presence of a large number of applications in different domains. These are examined with more details.

A. Sensors layer

This layer provides network connectivity, and sensor and includes many technologies and features. At the lowest level that includes RFID tags and bar codes, and on it, sensors and actuators are located. On top of the sensor network requirements that can be predicted for local networks or private networks with small dimensions.

B. Network layer and Getaway

This layer provides the requiring of network resources to serve the numerous technology. Features embedded in this layer Should support a high volume of Internet data objects Generated by wireless sensors and smart devices. The function of this layer is reliable and robust. Regardless of the nature of the network (private, public or hybrid).

Modules to meet the needs of network Quality of Service (QoS) for delay, error probability, scalability, bandwidth and security Have been designed taking into consideration the efficient use of energy. It is important that different type of network can be integrated into a platform for the Internet of Things. Sensors by supporting of different kinds of technology are capable of supporting multiple protocols and networks. A variety of protocols, including heterogeneous networks using different technologies, are aggregated. Internet of Things should be scalable networks to support the extensive set of services and applications on very large networks takes an active part. Some of these networks have their own security protocols and requirements.

C. Service Management layer

In this layer several possibilities to manage the service is provided. According to the possibilities of this layer is very important, especially in terms of service-centric architecture Because many applications on the application layer are directly affected by this architecture. This layer is responsible for analyzing information, control, process modeling, security, and device management. Data transmitted from the sensor can be periodically or not. Internet of Things sensor data that is

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transmitted periodically needs the filtering. Because the volume of data transmitted is very high and is necessary due to the requested type, filtering process is applied on them. Nonperiodic data may also be required to deliver immediate and appropriate response because this type of data may be associated with a specific event.

Management of information flow, data access, integration and mechanisms of access to information are the other important tasks of architecture layer in IoT. Due to the large volume of data, it's necessary to process information extraction to have a good vision from the processing. Internet service objects must guarantee security, privacy, confidentiality and integrity.

D. Application layer

In this layer are a large family of applications that possibly are designed and implemented for a Vertical market or Horizontal market. Different industries can take advantage of a variety of Internet of Things applications to improve their own services. Programs can be grouped by available network, integration, size, business model, real-time requirements, etc.

The dimensions of this type of program are small and only able to meet the increased demand and a limited number of users are small, But some Internet applications designed and implemented large-scale objects And they can be deployed at corporate level. Network size, bandwidth requirements and the type of Internet connection to program different objects and each have their own unique requirements. Understanding the needs of any application to create the necessary infrastructure and the use of appropriate technology in each layer is essential.

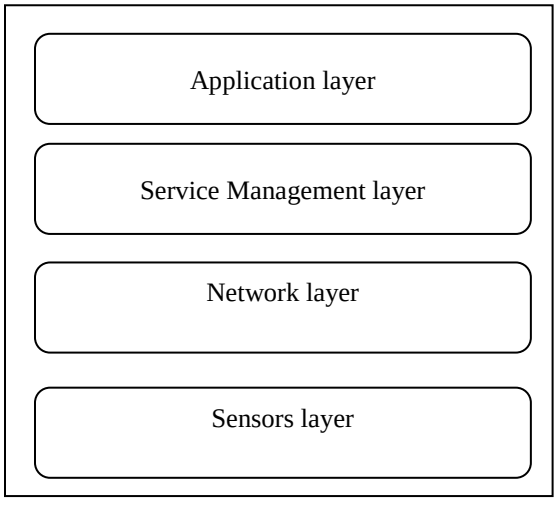

Figure 1. Four-layer architecture in IoT

II. RELATED WORKS

In this section, we examine Architecture Design based on Cloud Computing in IoT which is one of the most important object in IoT Technologies.

Internet of Things and cloud computing technology can be divided into the following pattern.First Multiple final state. The distribution of this small state and the final state of the Internet of Things cloud as a data processing center assumes. Final information and data is stored and analyzed by the cloud. Cloud Center a unified interface for user operation and display provides. This type of cloud can be the center of mass storage, unified interface and hierarchical management and provide other functions, which facilitate everyday life provides. This model is mainly used in the monitoring of community and family, some aspects such as public infrastructure is used.

The second mode of multiple centers and multiple modes is final. This mode is mainly for companies and units suitable areas with great length. For high security requirements of information and data, finding safety requirements without affecting other data and information transfer could be better.

Processing of hierarchical information and programs, collective terminal. for a lot of data, but not require high security, such as video, games and so on, we can have a local center to deal with storage. To calculate the demand is high, the amount of data is not large, it can be in a particular Supercomputer Center which is responsible for high-speed operation be saved. Demand for data requires high security, can be stored in the cloud with the security center.

With cloud computing, our integrated operations management system framework put forward IOT and the middle layer platform technology uses cloud computing. This greatly improves the operational efficiency of the Internet of Things. Based on the framework, we plan construction of commercial operation of the system we propose IOT platform, it can be used as reference for building the Internet of Things platform design to be used. Here, a unified management system architecture based on cloud computing offered IOT operations, including perception, sustained access layer, platform middleware layer and application layer.

1. Awareness layer can be divided into two sub-layers, collect information and communication shared subnet. Information layers including sensor technology and detection technology, including M2M, barcode, RFID, sensors and cameras. Subnet mainly in the form of short distance communication technology network environments, such as ZigBee, WiFi, UWB, Bluetooth, expansion of the broadband network and unified communications modules, and other uses.

2. access layer to the substrate tolerance of the access network and the core network is divided. Access incurred layer can be roughly divided into cable access and wireless access. Mobile wireless access, wireless, microwave and satellite, etc., access to cable can be via the Internet and PSTN. The following core network transmission and core network layer with respect to

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the operator, such as technology transfer mainstream PTN, OTN and SDH, 2G, 3G, LTE and NGN network is.

3. Layer Management Center platform, including the Internet cloud, data center, infrastructure and control center. The basic features are calculating mass data processing and high reliability, which embodies the advantages of cloud computing services. So, making the Internet of Things layer firmware platform based on cloud computing will be huge amounts of data generated by the application of Internet of Things face, which is a very good solution.

4. Application layer is a kind of support layer. Performance application support layer is that developers authentication and certification logo analyze and manage end-user equipment are doing. If software development and business operations come from the same company, the function of this layer can be placed on a platform of business operations.

III. CONCLUSION

The main goal of this familiarity with the general architecture of the Internet of Things, a four-layer architecture for the Internet of Things was introduced. In the first layer using a set of sensors and networking capabilities required, data collection and aggregation is to continue to help embedded features. In the second layer that functions as a network, the data collected in the third layer for managing and processing required to be placed. As a result of services provided by the three layers, the fourth layer is a powerful software that a variety of programs required by industry and may exploit the benefits of the Internet of Things to be achieved in practice. All organizations that intend to use the potential of the Internet of Things, in the first step should be to develop a systematic strategy for action in this area. The strategy formulation with a focus on reference architecture can be successful in implementing strategies to increase significantly. With detailed knowledge and understanding of the capacity of the existing architecture of the Internet of Things can define identify opportunities and threats, as a logical business model. The Internet of Things and cloud computing technologies are introduced, the concept and definition, characteristics, system architecture and key technologies in detail, focusing on Internet of things industry chain and business models for operators, and some suggestions is logical. With cloud computing, the Internet of Things integrated operations management system, is forward.

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