Smart Service System of the Internet of Things

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***Abstract*-- The rapid development of the Internet of things makes the interconnection of all things possible. The platform is a key part of the IoT, which is designed to satisfy a flexible and efficient operation. We put forward a kind of resource sharing and user centered smart service platform of IoT: the 3S platform. Finally, a specific application of the 3S platform is introduced: the smart service store.**

I. INTRODUCTION

The Internet of things (IoT) is increasingly complex because it is connected with a large number of heterogeneous devices and services. Therefore, in order to meet the flexible and efficient operation of the IoT, the concept of the IoT platform comes true. As a key part of the IoT, the IoT platform is to provide interoperability between end-users and smart devices, as well as smart devices and applications. In fact, the functional requirements of the IoT platform are closely related to the needs of the IoT. The existing platform architecture of the IoT can be divided into three types: service-oriented, object-oriented, and cloud-based. At present, the cloud-based IoT platform has become the mainstream. The cloud-based platform architecture of the IoT is shown in Figure 1.

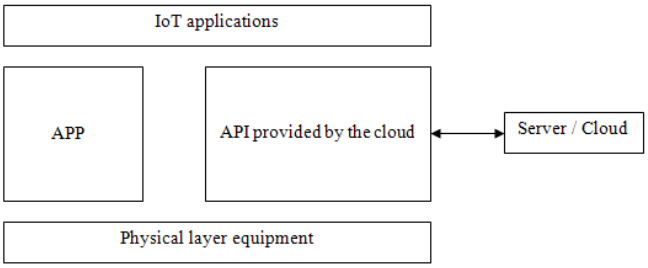

Figure 1 The architecture of the cloud-based IoT platform

II. A COMPARATIVE SUMMARY OF THE IOT PLATFORM

On the one hand, technological development has brought diversified choices to users. On the other hand, it also brings problems such as inconvenient access, incompatibility of various network partitions, and so on.

In general, an excellent IoT platform should achieve the following aspects: (1) User centered: It is essential that the user receives the most convenient service. (2) Support for integrated development. This includes solving problems of connection, storage of data, distributed cluster deployment, elastic expansion and security, etc., and adopting a virtual device system that is convenient to debug. (3) Support heterogeneous network: the system can choose a suitable network to serve users according to their environment by reusing existing networks. Meanwhile, the member network should be equipped with a moderate interface for the use of a cooperative control platform and service platform. (4) Integration of business environment: regardless of the type of network and terminal, the business logic is the same. That is, network and terminal are transparent to the platform. The system is integrated at the business level, and its heterogeneity is reflected in the differences of business data.

Professor Zhu Hongbo of Nanjing University of Posts and Telecommunications and others introduced the concept of cooperative network to the relevant situation in the existing technology. A software definition based smart service system and its architecture are designed through the collaboration of heterogeneous terminals and heterogeneous networks to provide ubiquitous services: 3S (Smart Service System, 3S) platform.

III. 3S PLATFORM

The 3S platform is a user centric, business driven, software-defined smart service system, which is oriented to the application. It includes a service-oriented wireless network architecture and three software definition control platforms: software definition service control platform, software defined network control platform, and software defined terminal control platform. It has opened up the resource barriers of heterogeneous network, different industries and departments, realized resource sharing, and established a user-centered network, ultimately meeting the development needs of the IoT. The collaborative network concept of the platform can be expressed as a "one center, tri-environment, polymorphic reconfiguration." A "center" refers to the construction and design of the entire network centered on the user, who can receive the most convenient service. The tri-environment refers to the virtual terminal environment, the heterogeneous network environment, and the integrated business environment. "Polymorphic refactoring" designates that these three environments can be reconfigured according to the environment in which the user is located.

It includes isomeric terminal platform, broadband ubiquitous network platform, information fusion platform, integrated service platform, and management support system, as shown in Figure 2.

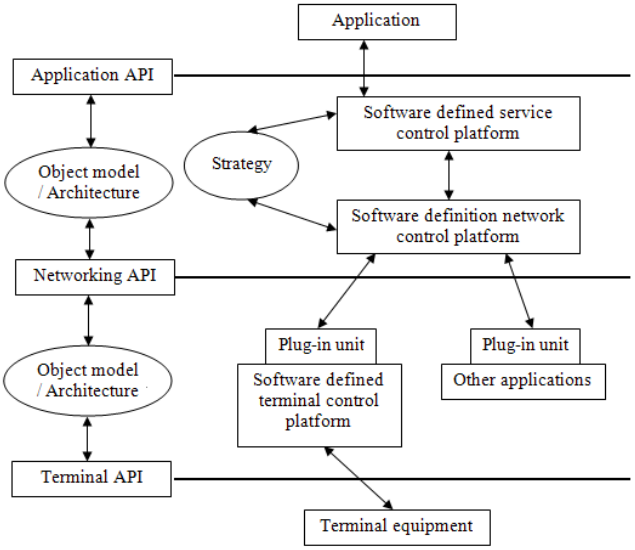

Figure 2 The architecture of the 3S platform

IV. AN APPLICATION OF THE 3S PLATFORM—SMART SERVICE STORE

The architecture of the smart service store is exhibited in Figure 3.

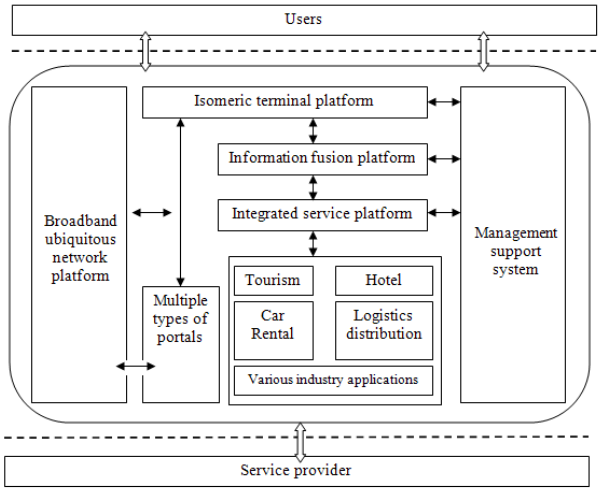

Figure 3 The architecture of smart service store

Users can break through the limitation of the single operation mode of the previous system and obtain services anytime and anywhere by using mobile phones, smart cards, sensing facilities, transceivers, game machines, remote controls, audio/video players, electronic wallets, GPS navigators, and a variety of other information terminals. They can access the system through a multitude of ways, such as browsers, remote procedure calls, etc. In the environment of ubiquitous network and virtual terminal, the interconnection and interoperation of equipment of different technical means can be realized through several adaption and mediating means. It provides an open and integrated service environment for providers, operators, and users, overcoming the limitation of service functions of previous systems. Providers, operators, and users can configure their devices and environment according to their needs with the support of the fusion environment, fusion technology, and information fusion, obtaining an assortment of smart services. Smart service stores enable users to combine or reorganize their services, constituting a large, smart application that fits their personal needs.

V. CONCLUSION

The IoT platform as a key part of the IoT, its role is to provide interoperability between end-users and smart devices, as well as smart devices and applications. Besides the functions of equipment resource management, data storage, and processing, the IoT platform also supports high-quality ubiquitous services to provide genuinely smart services.

The 3S platform proposes a user centric, business driven idea by means of software definition, building a smart service for the IoT application. The system has opened up the resource barriers of heterogeneous network, different industries and departments, realized resource sharing, and established a user centered network, ultimately meeting the development needs of the future IoT.

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