The Research on Wisdom City's Informatization System Design Based on Cloud Computing

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Abstract. The information system construction has become the focus of the wisdom of urban construction. Multiple applications of information technology has formed the traditional property management, e-government. But between these systems independent of each other to form a plurality of data silos, resulting in mutual degree of integration between the various systems is very low, highlighting the phenomenon of repeated construction, related resources cannot integrate applications. In addition, with the increase in business and applications system to face the massive data storage and improve system scalability requirements. The emergence of cloud computing provides an opportunity to address the issues. Cloud computing technology as a computing model, the important feature is the integration of resources, it is easy to maintain, highly scalable technology capability makes cloud computing more and more attention and application.

Introduction

The rapid development of the socio-economic and urban development, information has become a driving force and a key element of economic and urban development. The use of the information element transformation of urban development, enhance the management level of the city, it has become an important way to improve the world the city's comprehensive competitiveness. Building efficient and sustainable smart city information service system, for enhancing the level of city management, promote urban management information and wisdom of the rapid development of a very important practical significance. Big cities and medium cities have put forward the concept of building a smart city, offered to make a new generation of information technology to promote industrial upgrading and economic restructuring, so that the city be more innovative, to make public administration level again on the floor, Let the future development blueprint for urban change. If you want to complete China's new round of urban development and transformation of gorgeous, and want to improve the level of urban modernization and people's lives, a new generation of information technology must be the only option. But in our country, whether it is the practical application of theoretical research smart city, or the wisdom of the city are still in its infancy. Therefore, the wisdom of the city information service system to study in both theoretical and practical aspects of great significance [1-2].

This paper studies the open source cloud computing framework Hadoop, and related technologies HDFS, Map Reduce and HBase. On the basis of the specific needs of the combined wisdom of the city on a given architecture solution based on cloud computing technology, smart city information platform. The use of cloud computing technology can effectively integrate multiple isolated systems. In response to massive data storage and improve system scalability issues, analyzing the various foundation based HDFS storage scheme, according to the characteristics of the wisdom of the city's proposed storage solutions adapted to the wisdom of the city.

Related key technology in cloud computing

The concept of cloud computing, there is no uniform standard, which is defined as in the United States, the cloud is a convenient payment trial mode, in this mode, you need to access the structured computing resource pools to quickly access the desired resource, only a small amount of management [3]. This paper argues that cloud computing is a model for large-scale distributed

computing services market ,, it is an Internet-based delivery model and increase the use of related services. In this mode, the distributed computer application pool consisting of all applications deployed in the shared pool, users can extend their resources according to compensation for the use of [4--5]. At present, the type of cloud computing is divided into: public, private cloud, community cloud, hybrid cloud. Public cloud computing platform for public service, cloud computing, cloud storage services. A private cloud is a cloud service for internal use, mainly for individual agencies, private network by providing cloud services to the public, the public cannot use these services [6]. Applications community cloud services, cloud services provide affiliates. Hybrid Cloud is a combination of two or three or more clouds. Figure 1 shows the classification of cloud computing.
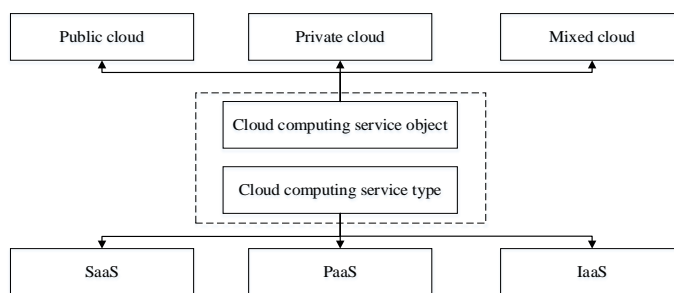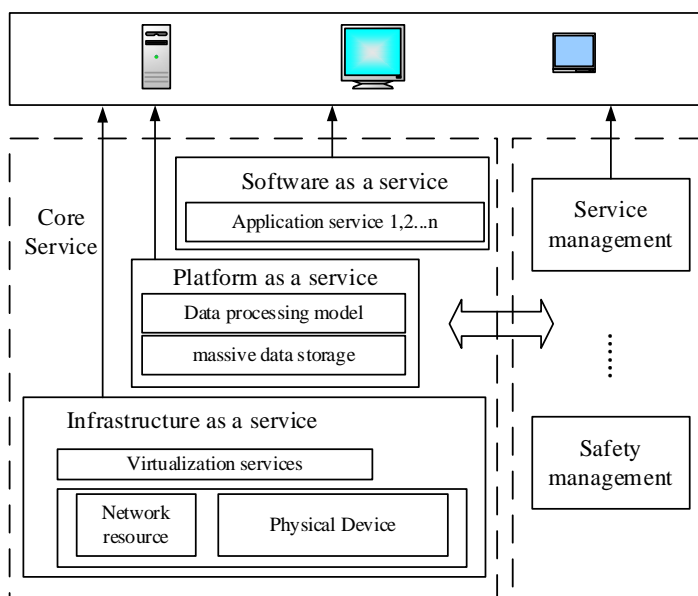

Figure 1.Classification of cloud computing

Figure 2.Architecture cloud computing

Cloud computing can provide flexible resources according to need, it is a form of service collection, its architecture is shown in figure 2. Combined with the current cloud computing applications and research infrastructure can be divided into core services, service management, and user access interface layer , the core service layer, the hardware infrastructure, software operating environment and application abstraction services that have strong reliability, high availability, scalability, to meet the needs of different applications. Service management is the core business of providing support to further ensure reliability, availability, and security of core services. User access interface layer to achieve access to the cloud.

Hadoop cloud platform architecture structure

Development and maintenance of the Apache Hadoop is a distributed computing framework that can run applications on a cluster consisting of a large number of low-cost hardware, and provides a stable and reliable interface for the application, aims to build a high reliability and good

scalability of distributed systems. The earliest Apache Hadoop as a platform for open source search engine project basis and the development of Nutch, and later as the project progresses, Hadoop is an open source project as a separate development, the latest version is already 1.2.10Hadoop the world's most popular One cloud computing framework, both in size and in performance are excellent. Currently many well-known companies to build their own applications on Hadoop. The main advantage of Hadoop are: high efficiency, strong expansion capability, high reliability, high portability, low cost and free open source Hadoop is mainly composed of two main parts consisting of HDFS and Map Reduce. HDFS is a distributed file system. Map Reduce is a programming model for parallel computation to calculate the large amount of data [7].

HDFS (Hadoop Distributed File System) is a project development Hadoop distributed file system, which uses a master / slave architecture. HDFS's Narne node (document indexing server) and a large number of data nodes (data nodes). HDFS to provide users with the appropriate file name stored in the user data file space. HDFS general will file these documents cut into pieces, sliced files are stored in a data block server. Then open node provides the name, closed, and renaming files and directories basic functions, is also responsible for the block map file to the data nodes. Then responsible for reading and writing the data node in response to client-specific files, create the initiating node name in the process, delete, and requested backup data block.

Reduce parallel computing architecture. Map reduce computer designed as multiple parallel processing large amounts of data parallel computing framework. Input data map reduce work is usually divided into separate data blocks, data parallel processing tasks normally divided a majority of the map. Mapper on the local hard drive, reducer further calculation process will result in storing the output data from HDFS by a local hard disk or network mapper output to HDFS. Map reduce framework focused task arrangements to monitor the status of task execution, if it fails, it will re-execute the task. Compute nodes and storage nodes are usually together, which means that the same node and maps to reduce the use of Hadoop HDFS use. This allows the map to reduce the frame can display data distributed storage. Case scheduled tasks. Map reduce framework includes a separate master track work (work distribution server) and group together data nodes task tracker installation from the server (task execution server). Primary server is responsible for scheduling from the server, and monitoring tasks, re-execute the failed task.

The overall design of smart city information platform

Construction wisdom information platform first need reasonable framework. For the city's information resources can be integrated depth between different systems can mutually utilize resources, reduce maintenance costs and improve the efficiency of urban management, and information technology with the wisdom of the city so that the city can become a part of the wisdom of wisdom of the city. This topic issues facing the wisdom of urban construction, based on cloud computing technology, the proposed architecture of smart city information platform, the platform architecture from bottom to top by the underlying network layer, layer of basic capabilities, management support layer, application layer. The overall architecture of the system is shown in Figure 3.
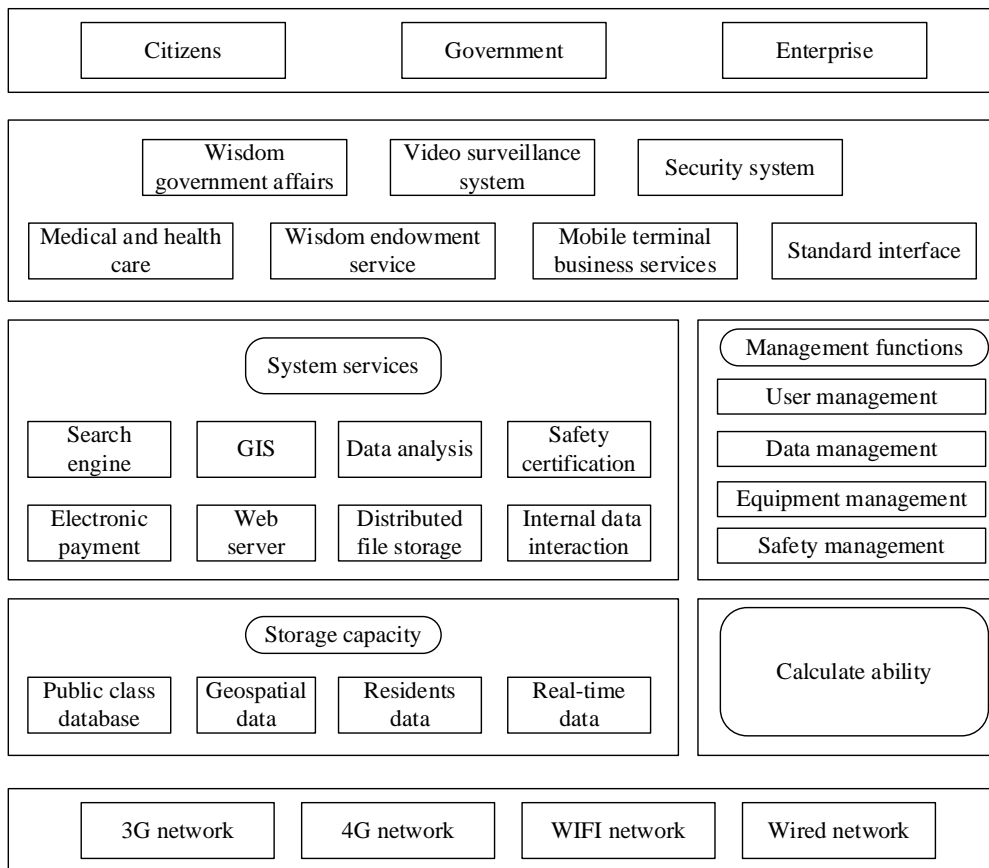
Figure 3. Architecture of wisdom city information platform based on the cloud computing

Underlying network layer. The main function of the network layer is within the city video surveillance systems, sensors and other equipment and facilities, access to urban communication networks, data transmission of each system in the network exchange. It is the realization of the city's various systems interoperable physical protection. Network layer is composed of a network, network, network, cable networks.

Basic capabilities layers. Basic capabilities for the upper layer service provides storage capacity and computing power. Storage capacity is reflected in the standardization of interfaces for data exchange standard for data in different applications subsystem for efficient storage and integration, the establishment of a unified data center, to provide data for various applications within management support layer.

Management support layer. Management support layer is the core of the entire architecture. This layer not only provides support for applications wisdom of the city, but also the perpetrators of system administration. This layer is mainly composed of various system services and management functions. Smart City information systems and services for the upper platform to support the application, the smart city management information platform to provide a means for managers to manage in smart city information platform equipment, data, etc., the specific management features include: user management, data management, device management, security management.

Application layer. Application layer performance intelligent city performance functional requirements. For direct participants in the wisdom of the city, including urban, urban property, government and enterprises. Through different terminals, such as mobile phones, flat pull computers, electronic displays and other applications provide access to the city, to provide personalized services to different users. The layer specific implementation strategies include: the completion of the relevant information to view, enter, store, and use a variety of smart devices. Specific applications include are: the wisdom of government, the city video surveillance management, urban security management, urban health, wisdom pension services, urban convenience services, property information management, mobile multimedia terminal business

services. In order to achieve the wisdom of the city, the government, enterprises, other cities and other third-party interaction, provide a standard interface specification.

Conclusion

In this paper, according to the needs of the wisdom of the city's analysis, conducted research on cloud computing technology, this paper presents the architecture of the smart city cloud architecture based information platform. The city in all application integration in the cloud architecture, avoids the formation of each application data silos, reduce data redundancy, improving resource utilization. This paper analyzes the cloud computing framework and his components. Build a cloud-based computing clusters, and will be deployed thereon. With the development of cloud computing, more and more enterprises will deploy their own applications and cloud computing over the internet.

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