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The analysis of application of cloud computing in wisdom city

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ABSTRACT

Wisdom city is based on the digital city, the Internet of things and cloud computing to establish the fusion of the real world and digital world. This article explains the relationship between cloud computing and wisdom city, probes into the advantages of cloud computing is applied to wisdom city, analyzes the cloud computing in the application of intelligent city, and get the enlightenment.

KEYWORDS

Cloud computing; Wisdom city; Application analysis.
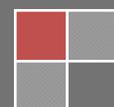
INTRODUCTION

With the scale and further development of urbanization, many problems are also presented. For example, population expansion, traffic congestion, environmental pollution, etc. These problems not only affect the quality of the construction of the modern city, also affects the daily life of urban residents. How to solve this problem? So people put forward the "wisdom city" a practical proposition[1]. The wisdom of the people are looking forward to the future city will be a road more clear, communication more convenient, the environment more beautiful and happier life.

What is wisdom city? Wisdom city in many applications, many industry, and complex composed of complex system. Multiple application system of information sharing and interaction between the demand. Each different application systems need to extract data integrated computation and rendering comprehensive results together. So many complicated systems requires more powerful information processing center for a variety of information processing. Simply formulization, that is: wisdom city = + Internet, digital city cloud computing. Digital city is the city of geographic information and other information about the combination and stored on the computer network. It makes the city and the virtual space of urban outer space together. Wisdom city was completed through the sensor network virtual space and realistic space.

Wisdom city construction cannot leave the cloud computing and cloud services support. What is cloud computing? Cloud computing is a network based on heterogeneous service supply model of facilities and resources circulation. It can autonomous services it provides to the customer. Cloud computing support heterogeneous resources and the basis of the heterogeneous system of multitasking. It can realize resources on-demand, volume pricing, and achieve the objectives of the demand for. The outstanding characteristic of computing data center is the basis of a large number of software and hardware resources. It ultimately promote resource scale, prompting the division of labor and specialization of network business innovation.

According to incomplete statistics, at present more than 300 cities in China through the cloud data processing. For the social and economic development, urban management, and the people living with intelligent service. But China's cloud computing services market scale is rising at an annual rate of 50% in recent years. By the end of 2015, China's cloud computing service market will be worth $13.669 billion[2].

Now with some successful cases, discusses the application of cloud computing in intelligent advantages and significance of the city. And get enlightenment.

THE ADVANTAGES OF CLOUD COMPUTING IS APPLIED TO WISDOM CITY

The unity of the platform layer and highly efficient

Cloud computing architecture by service build mode of the traditional data center architecture, different brands, different models of server consolidation. It through the cloud of the operating system scheduling system to the application to provide a unified operation support platform. At the same time, the system with the help of the cloud computing platform virtualization infrastructure, resources can be effective for cutting, resource allocation and resource integration. And according to the application needs to allocate computing and storage resources. Its maximum optimization efficiency ratio.

Mass based hardware and software management

Based on hardware and software management is mainly responsible for large-scale infrastructure software, hardware resources monitoring and management. It is cloud computing center operating system resource scheduling and other advanced application provides decision-making information. It is cloud computing center operating system of the basis of resource management. Basic software resources include stand-alone operating system, middleware, database, etc. Basic hardware resources include three main equipment under the network environment, namely: computing (server), storage (storage device) and network (switches, routers and other devices). Based on hardware and software management center can to asset management based software, hardware resources. It can realize the state of the underlying hardware monitoring and performance monitoring. It can trigger the alarm for abnormal situation, to alert users to timely maintenance equipment. It can carry on the long-term statistical analysis of basic software and hardware resources, provides the decision-making basis for the high level of resource scheduling.

Business and resource scheduling management

The prominent characteristics of cloud computing data center are the basis of a large number of software and hardware resources, realize the scale of basic resources. It can improve the utilization rate of resources, reduce the cost of resources. Business and resource dispatch center can realize multiple users to share resources, effectively improve the utilization of resources. And can automatically according to the load of business to resource scheduling to where it is needed. Business resource and control center is cloud computing data center advanced application mode of the operating system, and cloud computing data center the inevitable requirement of low carbon and green business.

Safety control management

In the era of information, data has become the industry core competitiveness of the country. Cloud computing is not only realized the separation of computing and storage, and share resources of the number of users on the same basis. But at the same time, many users share the same resources are also put forward higher challenge to data security. Based resources in cloud computing environment, the concentration of scale management more transferred to the security problem of the client's

data center. From the specialized Angle, end users can use the cloud data center security mechanism to realize the business of security, rather than to waste too much resource and energy. But at the same time, the need for cloud computing center directly responsible for the safety of more users. To be specific, the cloud computing security involves the following several main aspects: data access, data is kept risk, information risk management, risk data isolation, legal investigation support, sustainable development and transfer risk and so on. Cloud computing data center security control, can from the underlying hardware and software security design, cloud computing center operating system architecture, comprehensive prevention and control strategy, authentication, encryption, etc. So as to ensure the information security of cloud computing data center.

Energy saving management

Cloud computing data center to realize the resource of multi-tenant application. It through business history statistics, cooperate with business and resource scheduling management, can effectively improve the utilization of resources. In a typical application, the energy saving technology of cloud computing data center resources can be increased to 80% of the load. Despite the loss of resources scheduling process, it can be the payload is 2 times of resources. The current Chinese server ownership in 200 more than ten thousand units. If it can be common use cloud computing energy saving technology can reduce the loss of around 65% of the energy. With average energy consumption of the server 200 watt/hour, the year can save 16 billion kilowatt hours of electricity[3]. And data center overall lower load cases, at night, can be idle resources into sleep mode). So as to achieve the maximum data center green and low carbon energy saving operation.

CLOUD COMPUTING IN THE APPLICATION OF INTELLIGENT CITY

Cloud computing strategy widely implemented in China

According to the white paper on China's cloud computing industry development is expected, the 12th five-year period, China's cloud computing industry chain scale up to 750 billion to 1 trillion yuan. Tempting prospects not only attracted many companies into the market, even in many cities of cloud computing. Across a variety of "cloud computing center" in bloom. Since 2011, China's many cities have announced the launch of a cloud computing strategy[4].

Beijing "xiangyun plan". The plan is divided into two steps. The first phase of 2010-2010, through the it support and create a number of industry leading enterprise cloud computing, completed preliminary Beijing overall layout of the cloud computing industry chain. The second phase of 2013-2013, on the basis of preliminary layout of the cloud computing industry chain aspirant cloud computing industrialization grope, form 50 billion yuan of industrial scale. It to drive the industry chain is worth 200 billion yuan. This will make Beijing a world-class cloud computing industry base.

"Sea of clouds plan" of Shanghai. Shanghai is committed to create "Asia Pacific cloud computing center". It plans to cultivate ten years over RMB one hundred million yuan of business revenue cloud computing company, drive the information service of new business income is one hundred billion yuan. Action plan mentioned in the five key development. Mainly includes: the breakthrough core technology, research and development management of cloud computing platform virtualization, cloud computing infrastructure construction, encourage the cloud computing industry application, building a cloud computing security environment, etc. Goal of the programme of action is after three years of efforts to achieve the development of Shanghai in the field of cloud computing "1000" goal. Also is 10 in domestic influential over RMB one hundred million yuan of business revenue of cloud computing technology and services company. Built 10 oriented urban management in areas such as cloud computing demonstration platform. This will drive hundreds of software and information service companies to cloud computing service transformation.

Guangzhou "vitreous plan". Plan by the end of the 12th five-year, guangzhou cloud computing application level to reach the domestic leading level. "A vitreous plan" is the key project of guangzhou push. The important goal is to build a group of the world's leading cloud computing platform, to build international cloud computing center. And on this basis, thus forming the integration of technology, products and services for the development of industry structure. This will promote the "wisdom of guangzhou" rapid, coordinated and sustainable development. "Vitreous plan" will be implemented a number of cloud application demonstration pilot project, the electronic government affairs, health, culture, education, city management, and other key areas, will demonstrate drive, to the point with surface to build cloud computing platform of public service. It, for example, by integrating existing resources information center and data center, promote e-government comprehensive transition to the cloud era, the construction of "government cloud" and "cloud" security, decrease the cost of electronic government affairs. Again, for example, it plans to choose the financial, education, medical treatment, traffic information application level of high industry as pilot, such as use of cloud computing service patterns of innovation, provide citizens with convenient cloud computing services.

"Cloud" west lake in hangzhou. In April 2011, "west lake cloud computing public service platform", marks the hangzhou has the nation's first use of cloud computing technology in the service of the public service platform of e-commerce industry. According to understand, "cloud" west lake will provide covered by the company include financial software, business intelligence software, public cloud services such as bandwidth resources, as well as the data center, financing, innovation platform and the integration of the industrial park private cloud services. It will be through the four years building to form a total of nearly 300000 square meters, building can hold 100-200 home cloud computing cloud computing related enterprises of hangzhou industrial park. The park will build an advanced, can radiation cloud city and even the whole IDC center. It will create "e-government cloud" and "cloud" business, for the hangzhou electronic information enterprises with a high level of cloud computing industry research, technology development, business consulting, employee

training and other services. At the same time, on the basis of the cloud platform product launches, gradually increase the measuring and monitoring ability and the establishment of cloud services supermarket.

Shenzhen "Kun cloud plan". Shenzhen cloud computing industry alliance was established in August 2011, and start the "Kun cloud plan". Predicts 2015, shenzhen will produce 10 years sales revenue exceeds 1 billion yuan of enterprise, drive the related industrial output value of more than one hundred billion yuan. "Kun cloud plan" an important task of includes five aspects: one is the innovation in cloud computing solution pilot; Second is to promote the development of major public technology; 3 it is to promote intellectual property management and standardization; Four is to strengthen the certification testing and integration each testing service; Five is to strengthen the cultivation of professional talents. Shenzhen cloud computing center with a total investment of 1.23 billion yuan. It is the national 863 program and guangdong province and shenzhen major projects. These government clouds constitutes the "cloud" with Chinese characteristics.

Cloud computing in the application of intelligent city

Intelligent security integration platform construction of kaifeng

Security information integration platform in wisdom play a crucial role in the construction of city. But the traditional monitoring system can store video images, although can guarantee "evidence", but not early warning and forecast. Based on video image intelligent analysis of intelligent security technology to monitor real-time analysis. It for detecting abnormal behavior anticipation. It can realize video monitoring and policing linkage between applications, improve the intelligent security monitoring[5].

Kaifeng intelligent security integration system adopted the enterprise service bus (ESB) ESB, service-oriented architecture SOA, video cloud storage, video cloud computing, multiple application integration technology and software integration technologies such as video image information database. It makes the ability to get a boost in information security information integration platform and information processing. Its architecture as shown in Figure 1.
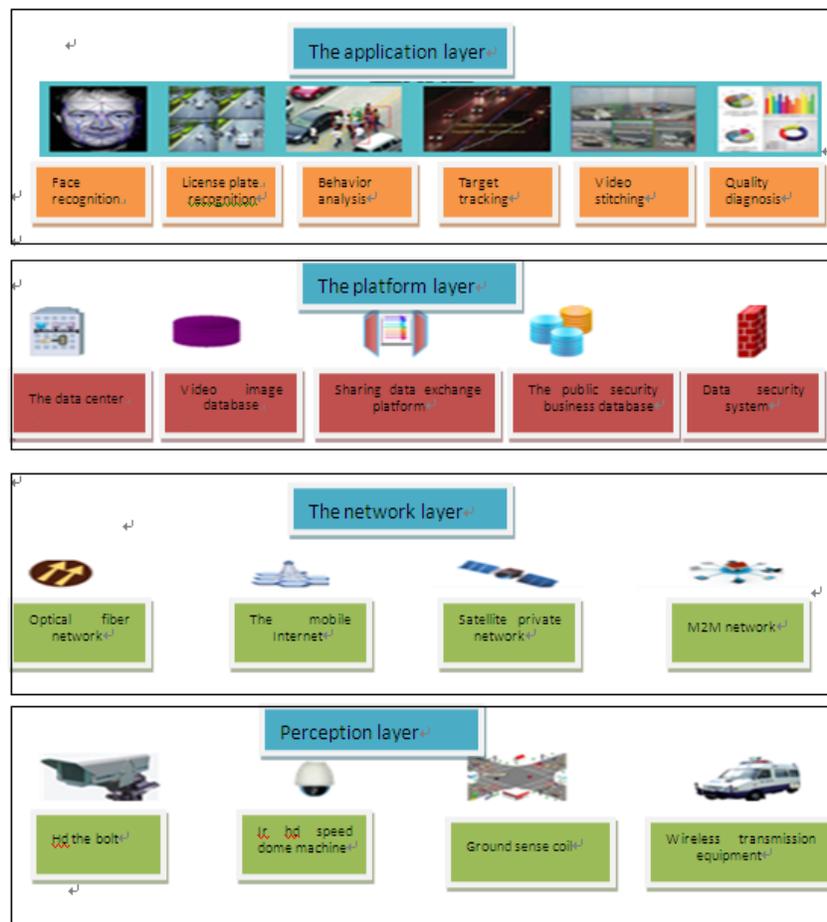

Figure 1 : Kaifeng intelligent security system architecture diagram

The system mainly includes five aspects of cloud computing architecture. First, claaS layer mainly achieve virtualization of resources management. It provides a unified storage network, services, and computation. Second, vPaaS layer mainly by way of middleware to realize the video storage, playback, video streaming media video retrieval and video services, as well as intelligent video classification, analysis, retrieval, archiving and other service functions. It also includes a distributed database, task scheduling and distributed file system management. Third, vSaaS layer mainly visualization of

urban management. It implements video control and other business systems, such as police command, emergency linkage and other business applications. Fourth, the security services are mainly in the cloud computing environment of application security, system security, network vulnerability detection, data security, virtual environment security and comprehensive security measures such as intrusion detection protection. Its real-time monitoring in the network security risk and aggression And actively respond to security threats. Adjust security equipment when it strategy, promote the overall system security. Fifth, cloud management platform is mainly allocated, registration, change, department, monitoring, collection, statistics and other management functions of all kinds of resources of the internal resource pool. It and provide related interfaces with other systems, for users provide platforms, queries, and application of all kinds of resources.

Number of video image information gathering emergency, social management and the prevention and control of the core library video image library is video image information database. It is also a city alarm and video data center. Establish video image classification information database in public security information network to classify and organize storage wake-up call attention to each section of the video image information. It with video image information concerned by GongAnSuo case effectively, the correlation, is designed to help and to the public security intelligence analysis. It adopt the mode of dynamic management, video image information data can ensure the accuracy and timeliness of library information.

Video on the cloud storage is the cloud computing concept and extension of the development of a new concept. Storage refers to through the grid technique, cluster or distributed file systems, and other functions, to a large number of various types of storage devices in the network set up to work together. It is through the application software, common external provide business data access and storage capability of a system. Cloud storage to achieve the following functions: storage space of the unified management, unified management of a large number of storage devices, based on the dynamic planning, resource allocation of storage location of dynamic planning, unified storage server access interface, etc.

The introduction of intelligent security technology for the public security video detective work to provide a "intelligent, network, platform" analysis of the application support platform. It greatly shortened the cycle; reduce the waste of police video analysis. For the case investigation and provides a quick and effective way and method. In the prevention, detection, control and the fight against illegal and criminal provide clues to solve crimes; illegal and criminal evidence plays an irreplaceable role. It strong shock current illegal and criminal behavior, improve the city visualization management level.

Nanjing wisdom traffic cloud platform

Nanjing traffic cloud platform system function and performance characteristics of six[6]. First, in terms of massive historical traffic monitoring data summary, to the pull of the billions of level on the massive historical traffic monitoring data processing. Second, in terms of mass original transportation monitoring data report, report to the pull of the billions of level mass transportation monitoring data report processing. Third, in the huge amounts of raw data real-time warehousing and generate index, to be able to flow in more than 10000 / m full amount of the original real-time traffic monitoring data stream processing. Fourth, in terms of mass data storage and computing, able to store billions of level data, calculation and finish all kinds of complex business applications. Fifth, at levels billions of data a second query ability, can effective index algorithm and intelligent scheduling system, meet the second grade query speed. Sixth, in the second level real-time response, can be efficient real-time data channels, provide a second level response time.
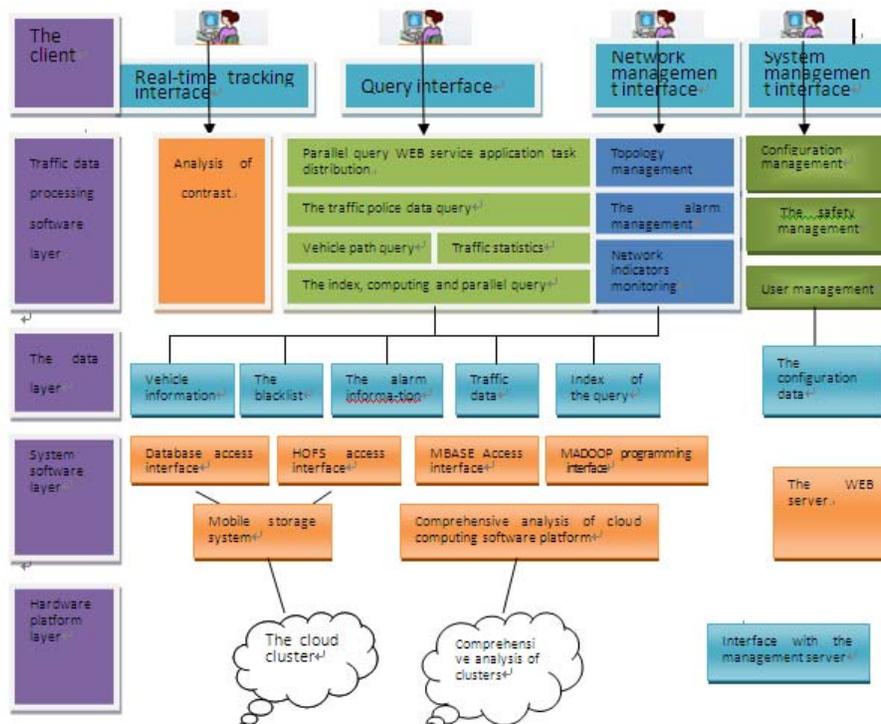

Figure 2 : Nanjing wisdom traffic cloud platform overall architecture and function module chart

On the scheme design, cProc huge amounts of data decomposition to composed of a large number of X86 architecture computer low-cost cloud computing platform for real-time processing. It relies on distributed cloud processing software fault tolerance, thereby improving intelligence traffic cloud platform the real-time and ratio of huge amounts of data analysis.

Figure 2 from the bottom up is divided into five levels. The bottom layer is the hardware platform. It will use cloud computing center city public security bureau provided by computing, storage, and network resources. Processing system from the system point of view, this layer mainly includes the cloud computing cluster, moreover also includes interface and the management server, including used to implement the client to access the Web server. The second layer is the system software layer. It includes mobile cloud storage system software, integrated analysis of cloud computing software platform, and the Web service software, etc. Cloud storage system will provide based on JDBC/SQL database access interface and HDFS access interface. Comprehensive analysis of cloud computing software platform can provide access to the HDFS, Hbase data, and provides graphs programming model and interface, and the programming interface of graphs model. The third layer is the intelligent traffic data in a cloud layer. It includes raw traffic data, the middle of the index data, used to analyze data, and system configuration data, etc. Among them, the original traffic data, indexes, such as huge amounts of data will be stored in the public security bureau in the hadoop distributed file system of cloud storage system. HDFS interfaces with storage and access. And the other is applied to the analysis of the intermediate data such as data volume is not big but processing performance requirements of high response data will be stored in the cloud storage system in a relational database system, using the JDBC/SQL storage and access. The fourth layer is traffic data processing software. It is mainly to complete intelligent traffic cloud platform need to provide many functions. The top is the client user interface software. It is mainly for the user query and monitoring data related information. All the other parts need to implement the corresponding user interface.

The intelligent traffic cloud platform for public security provides a big traffic data warehousing, mass data storage, real-time data analysis, fast data query traffic control platform. In this project, cProc with its superior performance and reliability is highly evaluated by the client. This is mainly embodied in the following: first, the system to provide 7 * 24 uninterrupted services, to ensure the reliability. Second, specific vehicle driving trajectory automatically generated road traffic information and an important node of the remote again. Third, it implements automatic matching and the dynamic control for the main vehicle and the whereabouts of abnormal vehicle to the automatic alarm.

CLOUD COMPUTING IN THE APPLICATION OF INTELLIGENT CITY

Clouds computing on the basis of intelligent city play an important supporting role

"Wisdom city" all kinds of application of the bearing and the implementation of wisdom, it needs the cloud computing and data processing integrated platform of strong support. This will greatly improve resource deployment and application development model, implement unified service delivery, so as to improve resource utilization, reduce the cost of wisdom, and deepen the city level of wisdom[7].

First, the cloud computing service mode is to promote urban wisdom level of propellant. Wisdom city of people, goods, content, and information from the function is similar to the gardener irrigation, photosynthesis, nutrient transfer, circulation. This several functional unit's operation flow, the realization of material exchange and energy flow within the scope of the whole society. Wisdom applications mainly include government health care, business intelligence, wisdom, wisdom, energy, wisdom, such as traffic, bank of wisdom. It is like blooming flowers and fruits, flowers, fruits branch. Cloud computing is tending wisdom application a fertile soil. Each layer soil provides different functions for the intelligent application support. The wisdom of SaaS layer application platform for application of wisdom blossom of cloud ecosystem provides "chemistry". PaaS layer foundation ability platform for the wisdom of cloud ecosystem development provide strong application ability. IaaS layer of cloud computing data center for intelligent application operation provides resource carrying cloud ecosystem. The future cloud computing platform with powerful data analysis ability will be wisdom the decisive factor of urban development. Cloud computing platform can become a "brain" in the city of wisdom, realize the mass data storage and computing, and save operating costs and improve resource utilization.

Second, cloud computing is helpful to integrate the information resources of the city. Is a kind of network relations between urban areas? They are interdependent. Wisdom city construction put forward new task to the mayor. Its vision is in a high level of global relationship and high dimension. It focus on the network in various flow and to analyze the information flow, cash flow, cash-flow, energy flow, personnel. To grasp the global urban development. Cloud computing platform can realize data exchange consolidation, for the wisdom of the forecast and decision-making to provide strong reference. The essence of wisdom city lies in the integration. It is the depth of the informationization, industrialization and urbanization. When the traditional industry and the integration of information technology, it can directly drive the emerging industries, indirectly promote the development of city traditional pillar industries. In the process of the construction of a cloud computing platform, you need to fully mix, the functions of the government and information technology to solve the medical treatment, traffic, education, finance, energy supply, and a series of social management, social security, public safety services. Cloud computing for the continuous prosperity of wisdom city creates more space for development.

Third, wisdom will support the urban development in a variety of form. Wisdom city construction and development is a very large project, involved in urban management, transportation, community life, health care, finance, business and other fields. Cloud support wisdom city construction of wisdom in these areas shows a variety of forms. For example, the

municipal government cloud is one of the important forces dominate the wisdom urban construction. Based on cloud computing, accelerate the government information is the foundation of wisdom urban construction. Traffic cloud based on the requirement of the public travel information, integration of all kinds of location and traffic information resources and services, the formation of uniform traffic sources. It provides various kinds of travel information for the public service. Community cloud mass storage and concentration were obtained through the cloud computing ability, realize the safe community video surveillance, intelligent home appliances intelligent management, building the fire lift management and so on the many kinds of intelligent security and intelligent family function. It can make people travel more comfortable, more worry at home. Medical and health cloud is public health information network was established through cloud computing. It let people have health records. The medical institutions share the use of health information. Financial business through the combination of wireless broadband and cloud computing, the cloud can realize mobile payment, business circle personalized information push and remind, and convenient shopping and customer transactions.

Cloud wisdom cities are faced with the problems and challenges

First, the safety problems: Cloud computing is an important driver of wisdom urban construction. At the same time, cloud computing platform may cause various security hidden dangers. Such as privacy threats, identity, pretend to be, information abuse, eavesdropping, etc. The core of the cloud computing model is the service, the service is the premise of users to establish trust and service delivery. As a result, cloud computing platform construction should pay attention to the information system security and controllable as well as the information itself credible. Cloud computing magnifies the part of the traditional security problems, at the same time also brought a series of new problems. Traditional security detection means is difficult to meet the demand of current wisdom city information security.

Second, cloud computing data center energy efficiency problem. In 2011, China's total data center power consumption up to 70 billion KWH, accounting for 1.5% of electricity in the whole society. China telecom data center power consumed 11.2 billion KWH, total need to consume 1.0295 million tons of standard coal. China's twelfth five-year plan for national economic and social development program for the unit GDP energy consumption reduced by 16%, per unit of GDP carbon dioxide emissions by 17%. From 2008 began to promote energy conservation and emissions reduction work of the state council, the state has staged a series of measures to attract and promote the development of energy conservation and emissions reduction work. "Green" and "carbon reduction" has become a term of the enterprise can not be ignored[8]. For cloud computing data center, the realization of basic resources of green and energy saving operations management is the inevitable demand of business resource suppliers, is also one of the purpose of the development of cloud computing. How to effectively evaluating cloud computing data center energy efficiency level, reasonable optimization of energy efficiency, will deeply affect the data center industry application market and technology trends.

Third, as the cloud computing application, the key point. Cloud computing industry's healthy development is inseparable from the policy to promote, is also inseparable from the enterprise of all kinds of innovative applications. The personage inside course of study points out, cloud computing will succeed in the Chinese market, the key is to change the application to the ground, allows users to truly experience the advantages of cloud computing. Acid consulting issued 2011 white paper points out that the cloud computing industry development in China, large sums of capital construction of local government cloud computing center, found that the lack of valuable practical application, resulting in the cloud computing industry is now developing "castles in the air". Therefore, the government should seize the strategic opportunity of cloud computing, to promote practical cloud services fall to the ground.

The thinking to solve the problem of cloud city facing wisdom and advice

First, the practical solution of cloud wisdom city safety and energy efficiency problems. On the one hand, should be oriented to security issues, to provide cloud computing inspection testing services, research and development independently controllable cloud testing tools. On the other hand, in view of the cloud computing data center energy efficiency index evaluation, research and development of energy efficiency testing and diagnostic tools, reflect data center energy efficiency level, is the only way to raise the urban energy conservation level of wisdom. Wisdom city will breed and catalytic cloud computing is a typical application of the ground and promotion. Cloud computing technology in industrial, transportation, energy, medical, and treatment, municipal economic and social fields such as supporting the wisdom of city development[9]. It will be through technical innovation to improve the city's comprehensive management efficiency and level of public service, make the city business development more wisdom.

Second, the government is an important application of main body and cloud computing industry development. For government users, cloud computing can not only improve office efficiency, saving the cost of information technology, can help realize the management innovation and transformation of a service-oriented government. The government is not only an important application of cloud computing subject, but also a significant market rules, the industrial operation regulators and industry development. The government promote can promote cloud computing industry development by leaps and bounds. In cloud computing industry development, the core of government users' attention focused on data security, cloud computing standards of construction and industrial ecosystem building, etc. The government can play an important role in the following three aspects: one is the relatively loose policies and standards, granular, cloud security reliability and the market access mechanism. 2 it is to support local cloud computing center, and actively cooperate with industry leading enterprises, encourage the promotion of new cloud service providers. Three is the government organ shall take the lead in application of cloud services, support, such as "government cloud", the construction of the "cloud" of public service, industry leading and

leading role. Local governments should fully evaluate the effects of cloud computing, selecting key areas for demonstration pilot project. At the same time, local governments should be combed local key industry development needs, and evaluate cloud computing industry value and economic driving force, to clear the direction of cloud computing application field and development orientation.

CONCLUSION AND PROSPECT

Cloud computing is accelerating information technology and service innovation. It will be to enhance the level of national informatization, improve the public service ability, transformation of the mode of development play an important role. Wisdom city is based on the digital city, the Internet of things and cloud computing to establish the fusion of the real world and digital world, thus to achieve the perception of people and objects, control and intelligent service. We can see, with the widespread application of cloud computing, intelligent city will better promote the development of information industry and service industry, people's life will be more wisdom and convenient.

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