A Brief Analysis of Development Situations and Trend of Cloud Computing

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Abstract: in recent years, the rapid development of Internet technology has radically changed people's work, learning and lifestyles. More and more activities are completed by virtue of computers and networks. The amount of information and data generated is bigger day by day, and people rely more on computer, which makes computing power of computer fail to meet demands of accuracy and rapidity from people. The cloud computing technology has experienced fast development, which is widely applied in the computer industry as a result of advantages of high precision, fast computing and easy usage. Moreover, it has become a focus in information research at present. In this paper, the development situations and trend of cloud computing shall be analyzed and researched.

1. A Brief Introduction of Cloud Computing

1.1 Definition of Cloud Computing
The cloud computing aims to provide virtualized storage data comprehensive, dynamic and easy-to-spread by virtue of computer technology on the basis of increased relevant internet patterns. In a narrow sense, the cloud computing refers to IT-based delivery and utilization model, which means to obtain resources through demands and easily expanded ways on the basis of internet technology [1]; broadly, it refers to the industrial service utilization and delivery model, which is not only related to network and the internet, but also is able to be applied into other industries. Moreover, the cloud computing technology can also be in circulation on the internet as a product.

The working principle of cloud computing technology aims to establish an information storage server being separated from mobile phone, computer and hardware. In this storage model, there is no need for users storing application program and relevant data directly into their own personal computers, which can be stored in an information storage server; users can obtain their own accounts after registration, thus ensuring safety of the stored information through account passwords. When needing the information, users can read and use it in relevant software of cloud storage. Enterprises are able to store their various data produced during the production into internet data center by virtue of cloud computing so as to switch resources to application required, and access computers and storage systems according to needs, which promotes the development of enterprises.

1.2 Advantages Analysis of Cloud Computing Operation
With the rapid development of cloud computing technology in China, following advantages are shown in its operation process:

① Powerful Computing Ability
The computing ability of cloud computing is hundreds or even thousands of times as powerful as that of an ordinary computer, and it is able to effectively save computing time and improve work
efficiency. Moreover, when the cloud computing is applied, the accurate result is a demonstration of its powerful computing ability. The application of cloud computing technology is able to check and test the entire calculation procedure strictly as well as minimize errors so as to significantly enhance accuracy of computed data.

② High Security
Cloud computing technology is generally protected by a professional R & D enterprise, and users are able to protect stored data by setting their own passwords, which grants it a high security.

③ Resource Sharing
Data sharing between different devices is available through cloud computing technology, which further enhances utilization of data.

④ Rapid and Accurate Reaction
The cloud computing is able to provide users with faster settings and resources required according to need; for example, if you want to terminate a contract, the cloud can complete it for you; besides, it is fast and accurate.

⑤ Easiness for Maintenance
Cloud computing is able to deploy shared infrastructures rapidly during the process of program repair and upgrading and carry out maintenance by virtue of data backed up in advance.

2. Development Situations of Cloud Computing

2.1 Deployment Forms of Cloud Computing
① Public cloud: it adopts distributed computing and utilizes idle computers to divide problems into multiple small fragments, which will process various small pieces by idle computer resources, and realize cross-regional computing model. The core of the public cloud is concentrated distribution in operation, which means that problems are decomposed firstly and then they will be solved. Lenovo public cloud becomes the world's third cloud service provider because of its high stability and high security advantages.

② Private cloud: its deployment is generally private service pool within enterprises and it is established for serving individual users [2]. Unlike the remote data center in public cloud, the private cloud is behind the firewall. Therefore, it is of high security and reliability. Enterprises are able to establish large-scale private cloud platforms under the assistance of private cloud technology so as to provide information sharing services for all employees in enterprises.

③ Hybrid cloud: it is usually a combination of private cloud and public cloud, which aims to establish private network by virtue of VPC. Users compose hybrid cloud through the VPN and their own machine rooms, and exchange visits between the public cloud and private cloud on this basis. In the hybrid cloud model, enterprises are able to store a portion of private data in a private cloud service for processing, and store some non-sensitive and public data in a public cloud for processing. This hybrid approach can not only maximize utilization of data resources, but also ensure the security management of information. For example, Alibaba Cloud Computing Co. Ltd establishes apsara stack on the public cloud for Sinopec, and connects proprietary network with enterprise's proprietary room by virtue of special lines so that Sinopec realizes its hybrid cloud program. The implementation of this hybrid cloud program is able to promote information security management and cost control effect of enterprises effectively [3].

2.2 A Brief Analysis of Cloud Computing Service Models
① Iaas: it generally provides calculation resources rental service, which is also the information service demand during operation for the majority of central enterprises, and it has been developed by leaps and bound at home in recent years. The accurate and scientific concept, as well as its realization, makes Alibaba resist a lot of concurrent access during Double 11 Shopping Carnival. Alibaba is equipped with powerful hardware devices, which is able to provide solutions for lots of concurrent
delivery services by integrating computing resources. However, these computing resources are idle usually which are not utilized fully. Besides, money needs to be spent in maintaining and updating hardware. In this case, Alibaba can rent these idle computing resources in spare time, which can not only solve the difficulties in SMEs in China effectively, but also save maintenance costs in daily operation of cloud service providers.

② Pass: Pass platform is a third party management platform, in which tenants can establish application programs freely by using tools offered by third parties, and they have administration authority for these programs. In general, Pass services mainly include three aspects such as speeding up video trans-coding, introduction of third-party to share and attract traffic and development platform [4].

Pass speeding up video trans-coding aims to provide high quality and efficient computing services for various computing services through cloud computing platform of distributed processing clusters of cloud computing, so as to meet the actual needs of various video terminals. The Pass can provide developers with many management platforms including SDK, open API and others, and allow APP to become convenient and reliable when the APP being involved in audio and video.

The Yonyou Software is a representative for Pass to introduce a third-party sharing to attract traffic, and the software allows tenants to perform SDK integrated software download and open source code like third-party sharing and establishment of integral sharing; moreover, it supports users’ sharing behaviors and other data of multidimensional data statistics background for various developers, and allows developers to deeply trace traffic effects. In this case, significant increase will be made in sharing clicks of application programs and the amount of sharing.

Pass providing development platforms will provide relevant APP developers with platforms stable, fast, transparent and controllable, which can effectively reduce costs for development and maintenance of developers

③ Saas: as a result of complicated service model, it develops slowly in China at present; the Kingdee captures the lion’s share in domestic market and CRM service based on the fact that Saas is able to establish software, hardware and data center on the cloud, which allows enterprises to operate without purchasing any software through customer relationship management software on cloud computing. Tenants are able to timely receive feedbacks from customers, analyze and transmit them through the cloud platform; information among employees in one way and departments in another way will be transmitted rapidly to reduce conflicts and realize collaborative working and only by this way can innovation of management mechanisms be fully achieved and can the further improvement of service level of enterprises be achieved.

2.3 A Brief Analysis of Domestic Service Models and Market Scales of Cloud Computing

Figure 1 refers to domestic service models and market scales of cloud computing at present. An analysis of Figure 1 shows that the service models provided by cloud service providers are quite different currently, and their services in various sub-categories of service modes are also distinctive. Among three cloud computing services applied in China nowadays, Sass captures the lion's share and Laas grows rapidly. The reason for this situation is mainly that tenants are willing to independently manage their own systems in order to prevent the loss of their own business information; while the reason for Saas' growth is that it is capable of solving time-consuming and laborious difficulties for SMEs in establishing application programs so that these SMEs are able to enter the market quickly and retain customers.
Moreover, many provinces and cities in China have formulated development plans of cloud computing, and there is no significant difference in the number of cloud plan for coastal cities and that for inland cities, let alone polarization. The coordinated deployment of cloud computing in many places will increase data transmission node and further enhance speed of data transmission on the one hand; it shall facilitate economic development of local places and propel our national economy on the other hand. For example, with the establishment of cloud computing data center in Xinjiang in recent years, it is possible to attract some enterprises in Beijing to rent cloud servers in Xinjiang as long as cloud computing cable trunk is established between Beijing and Xinjiang; besides, regional economic development shall be further facilitated.

3. Analysis of Cloud Computing Development Trend

Currently, the cloud computing is usually applied in SMEs, and large enterprises are cautious in applying public cloud computing out of data backup and data privacy. In recent years, IBM has developed a new encryption algorithm that can operate all data in encrypted data, which leads to the situation that even service providers fail to see the clear text data directly, and it further enhances the privacy of data. Therefore, the application of public cloud becomes feasible in large enterprises.

At present, most cloud computing services are independent and various service models are bound to produce more interaction during the development of cloud computing, which shall connect various independent cloud computing services together, forming a more powerful cloud computing and providing users with effective and rich services.

Besides, cloud computing brings intense competition into the browser market; although the IE browser captures the lion's share in market currently, it still cannot rest easily with the increase of a strong and growing market atmosphere of Firefox browser and challenges from 360 browser. In order to further enhance online experience of users, it is necessary to accelerate information collection by virtue of cloud computing-based technology so as to provide users with abundant information resources; only by this way can further development of browser enterprises be ensured.

Finally, the network in current stage fails to fully meet the actual needs of cloud computing, which brings troubles for some application software in operation without the desktop. In recent years, Google is testing and inspecting the world's maximum speed optical fiber network, whose bandwidth can even reach 1Gb. The extensive application of 4G network technologies also provides technical support for high-speed access of mobile internet, which will further stimulate the development of cloud computing technology.

Issues in laws must be taken into consideration in addition to challenges technically. For instance, one has to be clear about issues like ownership of the data, loss of liability and their compensation in...
the process where cloud computing provides services, and only by this way can security of data be further improved.

4. Conclusions:
Serving as a new computing model, the cloud computing supports the development of internet technically and brings significant changes to our life and work styles. Therefore, it is necessary for national relevant technical personnel to have a clear understanding of the development situations and trend of cloud computing, and constantly optimize and improve cloud computing service models at present on this basis, so as to propel the further development of internet technology in China.

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