

## Brief Talk on Cloud Computing Technology

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### Abstract

Since the rapid rise of Internet empire, the rapid expansion of data volume, and the increasing complexity of massive data processing, the traditional single computer computing mode is difficult to deal with such problems. So the concept of cloud computing came into being. This paper mainly introduces the concept, characteristics, service model and deployment model of cloud computing. These are the building blocks of cloud computing.

### Keywords

Big data, cloud computing, service model, deployment model.

### 1. Introduction

Before introducing cloud computing, we have to talk about the big data that is closely related to cloud computing. What is big data? Big data refers to a lot of data, usually in Pb. Because of its huge scale, it is very difficult for the mainstream single machine to be calculated at the time acceptable to users or simply unable to be calculated. It is precisely because of the processing of big data, cloud computing is very necessary. Before the emergence of cloud computing technology, IDC hosting, IDC renting, virtual host and VPS were widely used. The cloud computing model solves the problem that these traditional models use resources irrationally. China's cloud computing infrastructure industry has formed an industrial structure pattern with the Bohai Rim region, the Yangtze River Delta region and the Pearl River Delta region as the core and Chengdu Chongqing, northeast and other key regions developing rapidly. Although cloud computing technology and equipment have a certain scale, and large-scale data center construction has been carried out, the cloud computing service market in China is still in its infancy.

### 2. Definition of Cloud Computing

At this stage, NIST, the most recognized National Institute of standards and technology in the United States, defines cloud computing as a pay per use model, which provides available, convenient and on-demand network access, Access to the configurable computing resource sharing pool, these resources can be provided quickly, with little management work or interaction with service providers . This mode greatly meets the needs of users and reduces unnecessary energy and resource waste. According to statistics, the resource utilization rate of this new model is about 79%, about six times that of the traditional model.

### 3. Characteristics of Cloud Computing

From different perspectives, cloud computing has different characteristics. Here I focus more on the classification of the five characteristics. The characteristics of cloud computing are as follows:

- (1). Resource pooling. The pooling of resources makes users no longer care about the physical location and existence form of computing resources, and departments can more flexibly allocate resources.
- (2). Ubiquitous network access. As long as it's cloud computing mode, it can't be separated from the network. Network access is the basic precondition of cloud computing.
- (3). On demand self-service. Users can choose according to the actual needs of the software or project. There is no need to worry about the shortage or surplus of computer related resources.
- (4). Measurable service. To put it simply, it's about billing. Users can charge according to different time or traffic. Of course, this service will also provide users with system monitoring and optimization services.
- (5). Fast scaling. In the cloud computing mode, users can dynamically adjust computer resources, which has strong flexibility.

## **4. Service Model of Cloud Computing**

### **4.1. IAAs Infrastructure As A Service**

Consumers can use the Internet to get services from a systematic computer infrastructure. for instance. For example, a company wants to deploy its own company website to a server. The IAAs model is the equivalent of the company renting a server with almost no relevant software. Basically the same as the new computer operating system. If you want to deploy the project, you need the person in charge of the project to download and install the running environment required by the software. Different from the traditional mode, the company does not need to configure a separate dedicated computer room to place the server.

### **4.2. PAAS Platform As A Service**

A service platform as a service mode provided by cloud companies. In the above example, only project managers or responsible personnel do not need to configure the running environment of the software or website by themselves. They can directly select the appropriate platform from the cloud computing service provider, and then rent and deploy the project. The time-consuming and laborious environment installation process is saved.

### **4.3. SaaS Software As A Service**

This mode is equivalent to that the cloud computing provider has done the project by the way, and even the website does not need the company to find a way to do it. Instead, it tells the provider the company's specific needs and tasks to be completed at what time. Then the provider provides a full range of services from hardware facilities to software environment to software projects. Of course, this mode of complete trusteeship also has some limitations. If the company project needs to be modified or moved, the company will pay more expenses. The benefits are straightforward and easy to use, but this is generally suitable for situations where the project requirements are basically unchanged or difficult to change.

These three service models have their own characteristics. Users should choose the right service according to the actual situation.

## **5. Cloud Computing Deployment Model**

### **5.1. Public Cloud**

Public cloud, as the name suggests. It refers to the cloud service that everyone can use, and the shared resource service is its feature. Public cloud is usually a cloud service provided by large companies for small and medium-sized companies or individuals. Users access and log in the cloud devices through remote access to realize the operations they want to perform. At present,

there are a large number of public clouds with a good development. Amazon's AWS, Microsoft's azure and Google's GFS are more famous.

### 5.2. Private Clouds

Private cloud usually refers to a service specially designed for a user. Its most important attribute is proprietary resources, which prevents the disadvantages brought by resource sharing. It can provide reliable protection for its data, programs, data and other resources, effectively prevent the problem of data leakage, and greatly improve the security performance. Users can configure their own programs according to their own needs.

### 5.3. Hybrid Cloud

Hybrid cloud is the main trend in cloud computing deployment model. It is an organic and clever combination of the above two. It has the advantages of private cloud and public cloud. It can not only enable customers to enjoy the powerful computing resources of public cloud, but also ensure customers' needs for data security. Although this way is good, it is difficult to maintain. How to allocate and coordinate resources properly is an inevitable problem.

### 5.4. Community Cloud

I think community cloud is a kind of public cloud, a new form of public cloud. Similar to the separation of B / S architecture from C / S architecture. A community cloud is a collection of public clouds with specified scope or specified resources. With this feature, users with similar needs can be combined to provide targeted cloud computing services. In this way, the utilization of cloud computing is more thorough and efficient.

## 6. Computing Virtualization Technology

Through the cloud computing virtualization technology, the geographically dispersed computing, storage and network resources of various weapons and equipment can be managed in a unified way to form a tactical resource pool. As the infrastructure of cloud computing, data center has received great attention from academia and industry in recent years. It abstracts the underlying physical resources through virtualization technology to form a unified virtual resource pool, which can be used by users. When the end user makes an application request, the resource management mechanism in the management middleware will allocate virtual resources to the user. Therefore, an important problem for cloud providers is how to allocate and manage data center resources effectively. Generally speaking, it is a NP problem to determine the optimal resource allocation scheme for a group of tasks. The heterogeneity and dynamics of cloud data center environment further complicate the problem. Efficient resource allocation strategy is not only conducive to improving the utilization of underlying physical resources, reducing the energy consumption of physical devices, but also to improving the revenue of cloud providers. Therefore, the research on how to allocate resources more efficiently in the cloud data center has become a hot issue in academia and industry, which has important theoretical value and practical significance.

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