

Cloud Computing

Why we need cloud computing?

As the traditional applications are becoming increasingly complex, the requirement of technical support has been pushed into a higher level: support for more users, more computing power, more stability and security. In order to support these growing demands, companies have to buy various hardware devices(server, storage, bandwidth, etc.) and software(database, middleware, etc). There are also a complete operation and maintenance team needed to support the normal operation of these devices or software, including maintenance, installation, configuration, testing, running, upgrading, and ensuring system security. You'll find that the overhead of supporting these applications is huge, and their cost increases as your application grows in size. That's why even in those big companies with great IT department, those customers are still complaining that the systems they use are sometimes difficult to satisfy their needs. For small and mid-size companies, the cost of operating software products is even more unbearable.

Therefore, cloud computing came into being: A bigger, faster, and stronger solution to the above problem.

What is cloud computing?

Cloud computing is an add-on, usage and delivery model of Internet based related services that typically involves providing dynamically scalable and often virtualized resources over the Internet. Cloud is a metaphor for the Internet and the Internet. In the past, the cloud was often used to represent the telecommunications network, and later used to represent the abstraction of the Internet and the underlying infrastructure. As a result, cloud computing can even make you experience 10 trillion operations per second, with such powerful computing power to simulate nuclear explosions, predict climate change, and market trends. Users access the data center through computers, laptops, mobile phones, etc., and perform calculations according to their own needs.

There are many ways to define cloud computing. The official definition of cloud computing is provided by the National Institute of Standards and Technology's (NIST) in their Special Publication 800-145 "The NIST Definition of Cloud Computing". This publication has defined cloud computing as;

*"..... a model for enabling ubiquitous, convenient, on-demand network
access to a shared pool of configurable computing resources
(e.g., networks, servers, storage, applications and services) that can
be rapidly provisioned and released with minimal management
effort or service provider interaction."*

Cloud computing features

Cloud computing is done by distributing computing across a large number of distributed computers, rather than local or remote servers, and the enterprise data center will behave more like the Internet. This allows companies to switch resources to the applications they need and access computers and storage systems as needed. It is like a shift from the old single generator mode to the centralized power supply mode of the power plant. It means that computing power can also be circulated as a commodity, just like gas and water, it is easy to access and low cost. The biggest difference is that it is transmitted over the Internet.

The generally accepted characteristics of cloud computing are as follows:

1. Large Scale
'Cloud' has a considerable scale. Google Cloud Computing has more than one million servers. So are the clouds of Amazon, IBM, Microsoft and Yahoo.
2. Virtualization
Cloud computing allows users to access application services from any location using a variety of terminals. The requested resource comes from the 'cloud' rather than a fixed tangible entity. The app runs somewhere in the 'cloud', but in reality the user doesn't need to know or worry about where the app is running.
3. High Reliability
'Cloud' uses measures such as data multi-copy fault tolerance and computational node isomorphism to ensure high reliability of services. Cloud computing is more reliable than using local computers.
4. Universality
Cloud computing is not targeted at specific applications. Under the support of 'cloud', it can construct ever-changing applications. The same "cloud" can support different application operations at the same time.
5. High Scalability
The scale of the 'cloud' can be dynamically scaled to meet the needs of application and user scale growth.
6. On-demand Service
'Cloud' is a huge resource pool that you buy on demand; the cloud can be billed like tap water, electricity, and gas.
7. Extremely Cheap
Because the "cloud" special fault-tolerant measures can use extremely cheap nodes to form a cloud, the cloud's automated centralized management eliminates the need for large enterprises to afford increasingly high data center management costs, and the versatility of "cloud" enables resource utilization. Compared with traditional systems, users can fully enjoy the low-cost advantage of "cloud".
8. Potential Danger
For government agencies, commercial organizations (especially those with sensitive data such as banks) should be vigilant in choosing cloud computing services. Once commercial users use cloud computing services provided by private organizations on a large scale, no matter how strong their technological advantages are, it is inevitable for these private organizations to use the "data (information)" importance to curb the entire society.

Cloud computing model service

1. Software as a Service(SaaS)
The capability provided to the consumer is to use the cloud provider's applications running on its cloud infrastructure.
2. Platform as a Service(PaaS)
The capability provided to the consumer is a pre-installed cloud infrastructure platform such as relational database environment, Hadoop big data, Java development, etc.
3. Infrastructure as a Service(IaaS)
The capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications.

Cloud computing application

1. Internet of Things on cloud
"The Internet of Things is the Internet connected by things." This has two meanings: First, the core and foundation of the Internet of Things is still the Internet, which is an extended and extended network based on the Internet. Second, its client extends and extends between any item and item to conduct information. Exchange and communication. As the volume of IoT traffic increases, the demand for data storage and computing will bring the demands of "cloud computing" capabilities.
2. Cloud security
Cloud Security is a new term that evolved from "cloud computing." The strategic concept of cloud security is: the more users, the more secure each user is, because such a large user base is enough to cover every corner of the Internet, as long as a website is hanged or a new Trojan virus appears. It will be intercepted immediately.
3. Cloud storage
Cloud storage is a new concept extended and developed in the concept of cloud computing. It refers to a large number of different types of storage devices in the network through functions such as cluster application, grid technology or distributed file system. A system that combines application software to work together to provide data storage and service access functions.