

Research on the Architecture and Key Technologies of Cloud Computing

Qiang Liu

Hefei University of Technology School of Computer and Information, Xuancheng 242000, China.

lqwxml@163.com

Abstract. In the process of our current technological development, computers still play an important role, if the computer breaks down, a lot of data will be lost, we use e-mail or U disk to transmit data information. When we come to the era of cloud computing, "cloud" can store the data we need and carry out related calculations, the advantage of the cloud is that it can be used anytime, anywhere, to ensure the safety and reliability of data. This paper systematically analyzes and summarizes the research status of cloud computing, divides the cloud computing architecture into three levels: core services, service management, user access interface and so on, and makes a close study on the aspects of low cost and reliability, and studies the key technical content and development direction of cloud computing.

Key words: cloud computing, architecture, Key Technologies.

1. Preface

The emergence of cloud computing began in the 1960s. In 2007, IBM launched a cloud computing program. They understand cloud computing as a platform that can be deployed dynamically according to actual needs. This paper focuses on the basic concepts, architecture and key technologies of cloud computing, hoping to study cloud computing. Make some contribution to development.

2. The Concept of Cloud Computing

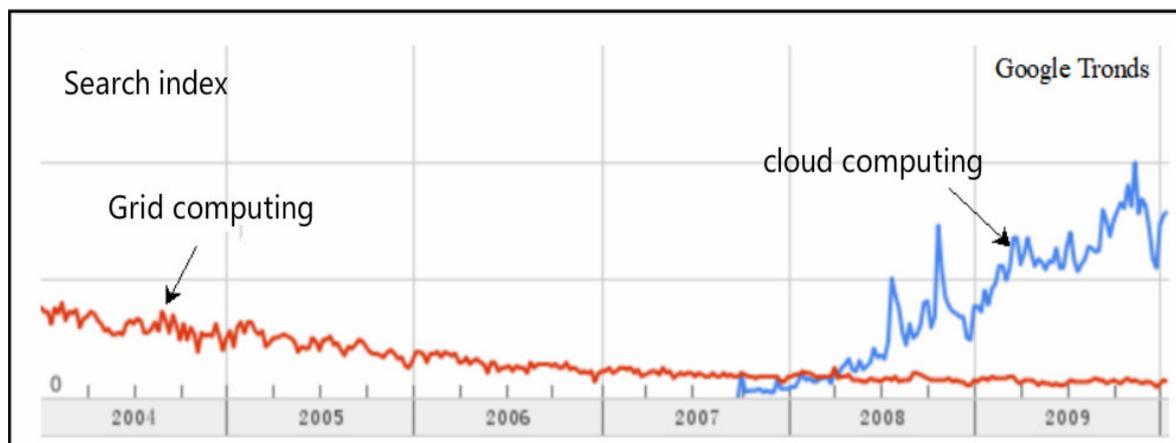


Figure 1. Search trends in cloud computing and grid computing in Google

At present, there is no clear definition of cloud computing. The authoritative technical departments in the United States believe that cloud computing is a model, users can easily access the relevant resources inside, these resources can be quickly used and open up, we generally say that the cloud computing "cloud", generally speaking, the Internet server-related resources, these resource bundles It includes two aspects: hardware resources and software resources. When users use the software locally, they can use the corresponding resources by sending the corresponding request information.

3. Architecture of Cloud Computing

Cloud computing can provide corresponding resources according to actual needs, which is actually the integration of many services. According to the current research direction of cloud computing, we

can divide its architecture into three aspects, which include core services, service management, user access interface. Generally speaking, the core services refer to hardware, software equipment, applications and other services, which can meet the actual needs of a variety of aspects. The service management layer provides guarantee for the core service in the system. The user access interface is mainly achieved between the communication between the cloud and the cloud.

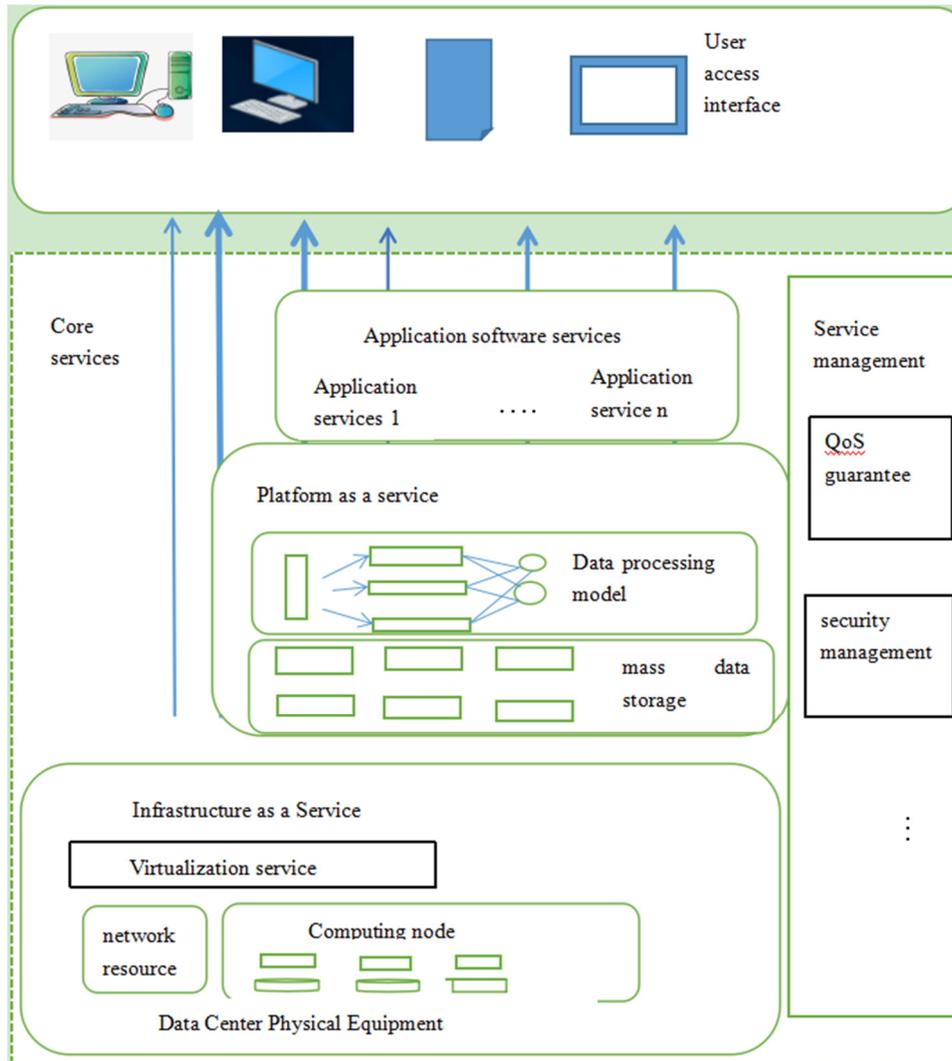


Figure 2. Cloud computing architecture

3.1 Core Service Layer

Cloud computing core services generally have three levels, including infrastructure, platform, software three service levels, in the following table for a detailed analysis and comparison of the three levels.

Table 1. Core service layer of cloud computing

service content	service object	Mode of use	key technology	System example
IaaS provides infrastructure Deployment Services	Users who need hardware resources	User upload data, program code, environment configuration	Data center management technology, virtualization technology, etc.	Amazon EC2, Eucalyplus etc.
PaaS provides application deployment and management services.	Program developer	Users upload data, program code	Massive data processing technology, resource management and scheduling technology.	Google App Engine, Microsoft Azure, Hadoop etc.
SaaS provides Internet based application services	Enterprises and users who need software applications	User upload data	Web service technology, Internet application development technology, etc.	Google Apps etc.

3.2 Service Management Layer

The main responsibility of service management is to provide a strong guarantee for the core service level, mainly reflected in two aspects, service quality and service security.

Cloud computing can provide very reliable, practical, low-cost related services, but in the actual situation, the cloud service platform in general a large number of devices and systems, sometimes it is difficult to fully meet the personalized needs of customers. At this time, service providers and users negotiate and draw up a service level agreement, so that both sides can complete their work on the basis of the agreement. If the service provider fails to meet the requirements of the agreement, then the corresponding compensation can be obtained.

3.3 User Access Interface Layer

The user's access to the interface, in fact, is the formation of an access process to cloud computing services, which generally includes such as command line, network services, network portal and other different ways, network services and command line in this form can give a variety of terminals an application development interface, which It enables multiple services to be integrated into it. Network portal is an important form of accessing interfaces.

Through the network portal, cloud computing can connect the application on the user's computer to the Internet, at this time users can use the browser to access the content of the data program smoothly, thus further improving efficiency. Of course, users can use cloud services very easily through the access interface. However, because the standards of relevant service providers are not uniform at present, this causes a lot of users' data, it is impossible to spread among different service providers.

4. Key Technologies of Cloud Computing

4.1 Virtualization Technology

Virtualization is one of the typical characteristics of cloud computing, and it is the key to the development of cloud computing. This Technology Abstracts and unifies the related physical resources. In fact, it operates the components of the computer in the simulated environment, not in the real environment. It deploys the resources according to the actual needs, and arranges the load synthetically. Its operation has no direct relationship with the hardware. Connection ensures the stability and reliability of the system. This technology has been applied to many aspects, including servers, storage, platforms, applications and so on.

4.2 Distributed Technology

This technology was originally proposed by GOOGLE and is being promoted and used worldwide. Under this architecture, millions of computers can work at the same time. The file system of this technology can complete a large number of distributed storage. Distributed computing programming can easily carry on a huge task. Row partitioning, and then through the simultaneous calculation of many computers, distributed database can complete a large number of structured data content preservation work.

4.3 Parallel Computing

This method refers to the full use of a large number of computing resources to deal with computing problems, this method can improve the speed of computing and the ability to enhance. Its main logical idea is to use enough processors to deal with a problem, in fact, is to deal with the problem, divided into many small parts, each part has a separate processor to deal with.

This method of calculation is essentially different from that of a single computer. Each problem it deals with is operated on a separate processor. Processors do not interact with each other. If they need to exchange information between them, it is transmitted through information.

4.4 SaaS / PaaS / IaaS Service Mode

The important innovation of cloud computing lies in the change of service mode. The core idea of cloud computing is that all computer hardware and software are actually a kind of service. In the future, the user's demand is actually a kind of service, such as computing, network, software, platform, storage and so on. There are three types, SaaS (Software as a Service), PaaS (Platform as a Service) and IaaS (Infrastructure as a Service).

5. Summary

Cloud Computing is a new computing model that utilizes a variety of technologies. In the current era of rapid development of information technology, cloud computing has a lot of room for development. Behind a large number of successful cases of cloud computing, cloud computing has been widely promoted. It has also given the Internet industry a new change and promoted the science. Technological progress.

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