Exploration of Cloud Computing Resource Pool Virtualization Technology and Implementation Methods

Yang Wenyan
Dalian Vocational & Technical College, 116035
2003512256@dlvtc.edu.cn

Abstract: With the advancement of technology, people's lifestyles have undergone essential changes. Especially the cloud computing technology that has appeared in recent years, has gradually become a hot Internet technology after several years of development. This article summarizes the virtualization technology used in cloud computing resource pools from the perspective of cloud computing applications. The author not only unifies the division and functions of the resource pool, but also unifies the resource pool combination deployment and its related software. This paper not only adds some applications that are conducive to the unification of resource pools, but also discusses the implementation of cloud computing resource pools.

1. Introduction
Cloud computing mainly relies on the combination of virtualization technology and the network to build a supercomputing system. In the early days when cloud computing was proposed, it was questioned by many scientific researchers, who said that the technology is impossible to achieve. However, with the improvement of hardware performance and the improvement of software system functions, cloud computing technology has gradually matured and has become a major hot spot in the Internet field. Cloud computing design can provide more convenience to people's lives and bring more benefits to business development. Therefore, its development is with good prospects.

2. Concept of Cloud Computing
Cloud computing is an advanced computing mode with the help of network and virtualization technology. This type of operation is actually an abstract configuration established to meet the actual computing needs of users. Besides, the technology can also achieve a comprehensive expansion of computer computing through multiple software and platform designs. The content involved is the integration of computing and data storage, and finally forms a form of service that provides users with supercomputing. In general, the construction of cloud computing requires a platform that works well with virtualization technology. From the perspective of cloud computing applications, virtualization is of great significance. Moreover, cloud computing can be regarded as a great achievement in the field of virtualization applications. In addition, cloud computing can be regarded as a virtual high-level business computing model. In the actual application process, we can use two kinds of calculation to complete the work. One of them is grid computing, and the other is distributed computing. With the help of cloud computing, users can quickly find the resources they need on the Internet. Therefore, cloud computing is a commercialized network service that develops service models and usage methods based on actual access types through the Internet. After the emergence of this type of
technology, users can realize effective sharing of specific resources. Cloud computing also helps users find the resources they want on the Internet and obtain more storage space. At the same time, improve the corresponding information services.

3. Virtualization Technology Adopted by Cloud Computing Resource Pool

3.1. Resource Pool
In general, cloud computing belongs to the field of supercomputing, which can allocate computing tasks to resource pools. The resource pool mentioned here mainly refers to a virtual space that can be dynamically upgraded. Users can determine the resources they want in the virtual space according to their own needs, or obtain corresponding storage space to improve information services. Cloud computing can rely on virtualization and distributed processing to transform data into an independent operating state after implementing abstract processing through related facilities in the data center and its development platform. This is also the basic process of implementing IT resource management. Then, cloud computing provides more convenient conditions for users through similar network channels. The application of this type of technology is not free, but a specific charging system is established based on the amount of virtual space resource usage. Therefore, cloud computing represents a business computing service model.

3.2. Virtualization Technology
Virtualization technology is an emerging technology related to physical machine simulation. It can build multiple virtual machines with the help of one physical machine. With the help of these virtual machines, software can get more opportunities to run independently, and resources will appear more independent. After several years of development, virtual machine technology has become more and more mature. Technicians often decentralize service systems and assign different services to different computers. Although this can improve the safety factor of the service system, the corresponding maintenance cost is also relatively high. With the help of virtualization technology, we can achieve multiple simulated machines running on one physical machine at the same time. More importantly, the virtual machines under the same physical machine will be in a mutually independent state, and the failure of any one virtual machine will not affect other virtual machines in the same environment. But if a physical machine fails, many virtual machines under that physical machine will be in a faulty state. This will cause related services to fail to operate normally. The popular application of virtualization technology can provide great convenience for the deployment of computer systems, which can also improve system operability and management. Moreover, compared with the previous system, its operating costs are correspondingly reduced and work efficiency is greatly improved.

3.3. The Role and Division of Unified Resource Pools
In the traditional architecture, each platform and system must deploy a set of hardware resources, but this cannot achieve sharing and resource shifting operations. Moreover, this requires a lot of equipment, and the utilization rate is also very limited. At the same time, new businesses and products have a long launch cycle and slow response to market demand. Therefore, the effective construction of actual resource pools represents the first step in cloud computing applications. From the perspective of the traditional architecture, in order to control the peak load, the system will over-allocate computing resources, which will lead to low resource utilization. In addition, the construction of resource pools is mainly to combine resources such as servers and storage by means of virtualization to build a huge resource pool. After that, use cloud computing to reallocate resources and help people make better use of resources. From the standpoint of specific service types, actual telecommunications networks mainly include basic networks, service platforms, and support systems. With the help of network services, establish a rental service for accessing various users and basic resources for internal applications, and build a good support system. In general, in the deployment process of a unified resource pool combination, the most common forms are as follows. First, the computing resource pool
model is mainly used for portal websites and large-scale data processing. Second, the storage resource pool model is applied to disaster recovery centers and large database centers. Third, the combination of computing resource pools and storage resource pools creates more favorable conditions for subsequent business development. Many new business platforms are involved in the unified resource pool, including specific support systems. As a consequence, the selection of this type of resource pool is recommended to use a combination of computing resource pool and storage resource pool.

4. Implementation of Cloud Computing Resource Pool

4.1. Division and Role of Unified Resource Pool
It can be seen from traditional system management that almost all systems or platforms are in a mutually independent state, and each system and platform corresponds to a kind of hardware resource. This kind of management model cannot share resources at all. More importantly, this management method will waste a lot of resources. This affects the user's utilization of resources, making it unable to adapt to the current development of the network society. At this stage, to ensure that cloud computing can make breakthroughs, relevant staff need to establish a reasonable resource pool. In order to achieve this goal, relevant staff need to completely avoid the problem of excessive computing resources in the previous structure. Throughout the construction process of the entire resource pool, it is mainly the entire process of a network's storage and services, and then these resources are effectively allocated. It is precisely because of this situation that resources can be truly shared, and resource utilization can be greatly improved.

There are three main types of services for telecommunications network construction, namely, service platforms, basic network services, and support systems. Among them, business platforms mainly refer to some common external applications, basic network services mainly refer to providing users with basic storage space and Internet resources, and supporting systems belong to the category of internal applications. In other words, if it is divided according to specific service objects, the telecommunications network mainly involves external and internal applications. Thereinto, business platforms and basic network services represent external applications, while supporting systems belong to the category of internal applications. In order to meet the above division operation, the staff can apply the following forms. First, divide operations according to business cloud platforms, IT cloud systems, and resource rental platforms. Second, it is divided according to the actual application of the cloud inside and outside. Third, carry out division work according to the type of resource pool. Fourth, to achieve effective unification of resource pools. It can be seen from the actual security application process that people not only need to fully consider the degree of resource sharing, but also present the degree of network security, which is also the basic point of the division of resource pool types.

4.2. Unified Deployment of Resource Pools
There are three common forms of cloud computing resource pool deployment process, namely, computing resource pool mode, storage resource pool mode and the combination of the two. First of all, the computing resource pool model mainly uses the user search function and network management system to create favorable conditions for the execution of subsequent data processing tasks. Second, the storage resource pool model is mainly applied to big data and disaster recovery centers. Finally, the combination of the two can satisfy all the above-mentioned needs, and create favorable conditions for the subsequent development of new businesses. It can also be seen from the actual application process that the combined application of the computing resource pool and the storage resource pool can also establish good conditions for the unification of subsequent resource pools. For example, China Mobile deployed the first phase of resource pool nodes in Baotou and Harbin, which involved a total of 6,000 servers. In addition, the second phase is also in the state of expansion. The total number of servers is 40,000. The overall structure of the actual data center is shown in Figure 1.
Figure 1 The Overall Architecture of the Data Center

4.3. Unify Resource Pool Related Software
Different system application processes correspond to different solutions, and the software systems used are also quite different. At this stage, there are two most common software, namely commercial virtualization software and open source virtualization software. Commercial virtualization software consumes a lot of costs in the application process, and its functions are more abundant. Commercial virtualization software is mainly used for commercial development. When this type of software is used, the most common ones are Microsoft and VMware. Related research shows that VMware has obvious performance advantages compared with other software. VMware itself will also configure CPUs and virtual machines, so it will stand out among similar software in terms of actual memory allocation. Therefore, VMware is a good choice when it comes to specific commercial software choices. But when choosing, we should also pay attention to its price, because VMware is slightly higher than the price of general software.

4.4. Add Applications Conducive to Unify Resource Pools
Whether the system needs to be clouded or not, we should mainly consider from two aspects, that is, whether the system needs to be clouded and whether it is feasible for the system to be clouded. First of all, after the system is clouded, some system resources can be saved, making actual business deployment more convenient. At the same time, the security and efficiency of the service system will be improved accordingly, and the maintenance of the system by technicians will become easier. But these advantages are not what the system wants, or system cloudification is not simply to obtain the advantages in this respect. At this time, the advantages of cloudification will also be affected. If the system needs improvement, we need to discuss whether the system cloudification is feasible in the next step. Then, consider whether the cost of system cloudification is lower than the benefits generated after cloudification. For example, when resource utilization is not stable, enterprises should conduct cloud operations. However, if resource utilization is maintained at around 50%, cloudification operations should not be performed. If the real-time requirements of the system are high, because cloudification is more responsive and consumes system resources, we should not be cloudification
either.

4.5. Applications Suitable for Moving Into Unified Resource pools

Under the effect of cloudification, systems with large changes in resource utilization will have limited access to cloud computing resource pools. In the actual physical environment, we can also use advanced configuration servers to ensure that resource utilization is maintained between 40% and 50%. Moreover, in order to avoid affecting the operating efficiency of the system, we may not migrate to a virtualized environment. In contrast, the real-time requirements of this type of system are relatively high, and relevant staff need to increase the speed of being included in the cloud computing resource pool. In addition, for critical and interconnected services, staff should use specialized software and hardware systems. From the perspective of a unified resource pool, it involves corresponding business platforms and many support systems, and there are also many requirements for capacity. Therefore, when using a unified resource pool, the staff can apply the mode of combining storage resource pool and computing resource pool.

5. Conclusion

In summary, the improvement of the level of science and technology makes people put forward higher requirements for Internet services, which also creates favorable conditions for the development and application of cloud computing. Through the combination of network and virtualization technology, cloud computing provides people with a simpler resource query space. Although cloud computing was deeply questioned when it was first proposed, as the technology continues to improve, cloud computing is combined with more new elements, and its application frequency is getting higher and higher.

Acknowledgement

Achievements of scientific research projects of Dalian Vocational & Technical College (DaLian Radio and Television University) in 2020

References

[1] Li Xuqing. Cloud computing resource load forecasting relying on the bat algorithm SVM[J]. Journal of Anyang Normal University, 2020(02): 24-29.
[2] Tian Ye. A cloud computing resource IoT monitoring and service platform[J]. Electronic World, 2020(06): 43-44.
[3] Guo Peng. Cloud computing resource reservation strategy based on online learning [J]. Journal of Xinyang Agriculture and Forestry College, 2020, 30(01): 113-116.
[4] Chen Donglin, Lin Wenjian, Huang Lili. Cloud computing resource load forecast based on BPNN-LSTM combined model[J]. Journal of Beijing University of Posts and Telecommunications (Social Science Edition), 2020, 22(01): 53-60.
[5] Li Bo. Research on cloud computing resource load distribution based on cuckoo search algorithm [J]. Microcomputer Applications, 2020, 36(02): 141-144.
[6] Liu Yanyan. Application and simulation research of an improved bat algorithm in cloud computing resource scheduling[J]. Journal of Ningxia Normal University, 2020, 41(01): 66-71.