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Research on the Application of Computer Network Storage Technology

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Abstract. With the continuous increase of network data, the application of computer network storage technology is more and more important. For the traditional computer network storage technology, it has been unable to adapt to the needs of society, it is necessary to study the new technology. The article will analyze the computer network storage technology and explore its application in the practice.

Introduction

With the continuous development of society, computer technology has been rapid development and the computer has been applied to people in various fields of life, to provide people with fast and convenient technology. Computer network storage technology plays a very important role in the storage of data. Network data becomes an indispensable component of people's life. Therefore, data storage has become the core of the development of computer network in China. In fact, the rational application of network storage can bring good benefits and results which requires technical staff based on the corresponding storage data on the technology to choose, find the right way to bring the greatest benefits.

The Main Computer Network Storage Technology

In fact, Chinese computer network storage technology has been widely attention to the community, which also greatly promoted the development of computer network storage technology. The existing computer network storage technology includes several different methods and these methods are based on the characteristics of different data design, which requires the staff to make a reasonable choice, which includes the following:

SAN Technology. SAN technology is when the server's operating system is arranged in a high-performance safe and reliable external storage device, the server can start in the SAN environment, to avoid the built-in disk on the data capacity constraints, but also to avoid the built-in disk itself of the limitations of the performance, so as to effectively achieve the system migration and data centralized management, more conducive to the deployment of the work carried out, with a strong server system integration capabilities, SAN technology in the server out of the built-in disk of the limitations and impact, effectively saving space, followed by DSAN technology can be unified management and scheduling of multiple servers to strengthen the management of the integrity and convergence. Of course, SAN technology also has some shortcomings, first SAN technology needs to be recommended in a safe, reliable and stable storage system on the process, the process needs to be the storage system and the server can be compatible with each other to avoid reading failure. Second, because of the SAN technology, all servers need to access from the storage device work, at the same time, the computer operating system in the virtual memory also need to access through the SAN, so you can say SAN technology storage device performance requirements Higher. Finally, the most important issue, that is, once the system failure or crash and other issues, the whole system will cause paralysis.

Storage Virtualization Technology. Storage virtualization technology is mainly to store hardware resources, is a collection of virtualization methods, in fact, storage virtualization technology not only covers the storage virtual pool, logical partition, thin provisioning and cluster network storage, etc. This kind of virtual storage method effectively analyzes the different actual storage requirements, brings the high level service to the user, and ensures the maximization of the

resource utilization of the whole system which mainly includes symmetrical and asymmetric two ways. Storage virtualization technology can make the network storage system in the network to achieve decentralized, independent. Enhance the overall reliability of the entire system also increased the expansion of resources. This approach helps to improve the competitiveness of core business, mainly due to storage virtualization technology in the storage process to ensure its high stability and high security features, storage virtualization technology performance is high, can effectively ensure the normal work to carry out to the enterprise to bring more competitive. Virtual storage technology breaks the traditional storage model, the effective combination of memory and external memory. That is, using the advantages of physical equipment, but also broke the limitations of traditional physical equipment, and truly achieves efficient, high performance.

NAS Gateway Technology. In NAS gateways, storage devices typically connect to each other through Fiber Channel, which enables multiple storage resources connected to the SAN to be accessed and managed through the gateway. NAS gateway technology can manage the way the client uses the document and can deal with the client's request promptly and this kind of processing needs to be established on the basis of the shared agreement. The request of the client is transferred to the gateway, and the gateway translates the request into a block data request to the storage array. When the storage array processes the block data and then passes the result to the gateway, the gateway converts the data into file data to the client. This process ensures transparency, and the whole system becomes flexible and more scalable.

The Network Storage Related Technology

Redundancy Technology. Storage network If hardware and software failures occur, the availability of the system can be ensured by redundant hardware and software. If the data information is wrong, it can be restored by redundant information to ensure its availability.

Logical Technology. The state recovery after system failure mainly includes log-based state recovery and state recovery based on checkpoint. The log-based approach not only saves checkpoints, but also records events that are not pre-determined; these logs can be used to fully reproduce the execution state of the process upon recovery. A checkpoint is a technique that allows a process to save its state at regular intervals to reduce the amount of failover effort during normal operation.

Replication Technology. Replication technology is mainly through the network data replication, so that different nodes in the network data to maintain a high degree of consistency, thereby reducing the probability of error in the network storage. The security technology is mainly to protect the data stored in the network to avoid the illegal modification or destruction of data information, which has a key role in the normal application of the storage network. According to the current situation of network storage, identity authentication technology and firewall technology is the most important security technology.

Security Technology. How to ensure that the data in the storage network is not being illegally modified and destroyed is one of the key issues facing storage network high availability. At present, the security technology used in network storage mainly includes: (1) firewall technology; (2) identity authentication technology.

System Failure Detection and Failure Processing Technology. In the distributed storage network environment, to maintain the high availability of the whole system, there must be effective failure detection means and failure recovery processing technology. The failure detection and failure processing mainly includes failure monitoring, failure diagnosis and positioning, failure elimination and restoration of three stages. Failure detection can be passive detection and active detection in two ways.

In the distributed storage network environment, in order to make the whole system has a high degree of availability, we must have a perfect system failure detection technology and failure processing technology as a basis. In the process of failure detection and failover, the three steps of failure monitoring, failure diagnosis and location, failure elimination and recovery are mainly carried out. The failure detection is divided into active detection and passive detection.

Network Storage Hot Issue

Virtualization Storage Technology. Storage virtualization is based on virtual volume mapping, streaming data location, data snapshots, virtual machines and other technologies to achieve the unified management of heterogeneous storage devices and storage location independence, the purpose of shielding storage management in a series of complex issues users provide a simple and transparent unified storage access mode. The goal is to address the ever-expanding growth in storage requirements to accommodate the growing and complex network storage systems, how heterogeneous storage devices are effectively managed and efficiently used to shield different storage devices differences and provide a simple and unified way to visit. Such as unified virtual storage, virtual network storage space division and abstraction technology, virtual network storage system data distribution strategy research is the contents of virtualization storage.

Wireless Network Storage Technology. Wireless network storage technology is a storage technology based on wireless networks that can provide better performance when using mobile devices to store and manage data and enable mobile devices to have better mobility to meet the needs of users.

Dynamic Adaptive Network Storage System. That is, in order to achieve the stability and efficient operation of the network and the continuous availability of data access services, the introduction of network monitoring and adjustment mechanism, by observing samples, according to pre-defined constraints and strategies to make adaptive adjustment of the storage system itself Storage node load balancing, and improve network stability of an adaptive storage system. Dynamic adaptive network storage system is in the process of using the adjustment mechanism and network monitoring into the system, so that the system has data access services, the continued availability of the network and maintain a stable and efficient operation. Through the observation of the sample, according to the pre-prepared strategy and constraints, adjust the storage system's own adaptability, so that the network stability is improved and to achieve the role of balanced storage node load of an adaptive storage system.

Data Layout Algorithm Research of Network Storage System. The need for a networked storage system to build a large-scale network storage system that can adapt to storage scale changes, fair, redundant and highly available data layout algorithms is scalable and reliable for data management. For large-scale network storage systems, to have a high degree of reliable data management and scalability, it is necessary in the network storage system to establish a suitable data layout algorithm, and this data layout algorithm must be able to adapt to storage size change, fairness and redundancy, and to have a high degree of availability, which is one of the key technologies of large-scale network storage systems.

Network Storage Protocol Research. In order to get better storage performance, the current network storage protocol research is also a hot spot in this field. Such as Wilson Yong Hong Wang, Tow Chong, a data storage research institute at the National University of Singapore and a new SAN-based open source network storage protocol, Hyper-SCSI. According to the current research, network storage protocol research is also a hot topic in the industry, because it allows the storage system has better storage performance. At present, Singapore researchers based on actual needs to design an open source network storage protocol, and this agreement based on the SAN.

The Development Direction of Network Storage Technology

A Variety of Network Storage Technology Integration. Network storage technology is toward the function enhancement, system and performance improvement direction. Fiber storage network is mainly a high transmission rate, the development potential and other advantages and the future is still the mainstream of SAN. By the DAA-NAS, SAN island-wide area SAN-future global broadband storage network is certainly the network storage development model of the technical line. With the development of information processing and information transmission technology, network storage technology will be toward the integration of technology, functional improvement, intelligent and more efficient development trend.

The Virtualization and Intelligence of Storage. Storage virtualization consolidates the physical storage devices of different interface protocols into a virtual storage pool, creating and providing virtual storage volumes equivalent to local logical devices for the host as needed. By dynamically managing storage space, virtual storage technology avoids storage space being inaccessible, improving storage utilization. Virtual storage reality is not a new storage management technology, but the rapid development of virtual storage technology, the potential is huge, is gradually becoming the mainstream of shared storage management technology. At the same time, next-generation storage devices will provide a smarter, more flexible architecture that seamlessly integrates new transport protocols for maximum flexibility.

Conclusion

With the continuous development and application of Chinese network storage technology, the advantages of various technologies are revealed, only the correct analysis and use of these technologies can really effectively ensure the efficient implementation of storage technology. This requires the relevant staff to conduct a more professional analysis and research, strengthen the cloud storage technology and SSD technology applications and promote the development of Chinese computer network storage technology.

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