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**基于ceph的云存储运维系统的设计和实现**

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**Design and implementation of cloud storage operation and maintenace system based on ceph**

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书脊

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摘要

此次主要讨论基于ceph的云存储运维系统的设计和实现。基于ceph的云存储运维系统，是为了实现将网络中相互独立，型号各异，价格低廉的存储设备统一组织起来，并对外提供统一接口。从而实现具有备份、容灾、易于维护特性的存储系统。基于ceph的云存储系统充分利用每一个磁盘，能提供高稳定性和高并发的特性。同时具备易于扩展的特点。

基于ceph的云存储运维系统是基于ceph基础之上对磁盘进行监控的系统，在ceph层可以实现的功能如下：

1. 容灾备份：

当出现突发情况时，造成局部磁盘数据损坏而造成的数据丢失，可以通过ceph的容备特性，等排出故障磁盘后通过存储在其他地方的数据来恢复原先坏掉磁盘的数据。对于一些重要的信息，以实现将原来的两地三中心，变成三地三中心，值要不同时破坏掉对应数据的所有存储场所，对应的数据都是安全可靠的

1. 高效存取：

现在存储数据TB级数据已经很常见了，PB级数据也时有出现，这就面临着一个问题，如何更好的存储这些数据。对于大数据，如何有效存储至关重要，这不仅仅关系到数据存储的安全，还包括读取数据的效率。基于ceph的云储存运维系统，提供了很好的存储方案。其设计充分发挥了每台对应服务器的计算能力，摆脱了传统单一中心节点的瓶颈，实现了真正无中心的特性。其中有八个字概括这一特性：无需查表，算算就好。这充分体现了整过数据存取的过程中不会因单点故障，而造成系统故障，同时保证了存取的高效

1. 负载均衡

在数据存储的过程中，难免会出现磁盘损坏，磁盘扩容，以及不同磁盘集聚的磁盘使用率的失衡，这样将会影响到数据存取效率。如果能做到将同一个大文件合理的存储在不同磁盘上，将会使数据存储效率有明显的提升，充分利用系统提供的高并发特性，实现数据的并发存取。避免单个磁盘因频繁被操作而缩短使用寿命。

在用户界面层将实现和用户交互的监控界面，隐藏底层操作细节，通过用户的点击实现对应的操作

关键字：容灾备份，均衡，并发ABSTRACT

The design and implementation of cloud storage operation and maintenance system based on CEPH is mainly discussed. In order to achieve the network in each other independent, different models, inexpensive storage devices unified organization, and to provide a unified interface to the outside world, in order to achieve an easy storage, backup and disaster tolerance system maintenance characteristics, the cloud storage system based on CEPH was appearance. The cloud storage system based on CEPH makes full use of every disk, which can provide high stability and high concurrency. At the same time, the cloud storage system has the characteristics of easy to expand.

CEPH, which based cloud storage operation and maintenance system, is the monitor system, based on the disk. In the CEPH layer, we achieved the function as follows:

1. back and up:

It is possible which in the emergency situation, the disk in someplace was damage and resulting in the disk data was loss. Using the CEPH which has the characteristic of content preparation, the disk data can be recover when replacing the broken disk by other place disk data. For some important information, it has three places storage data and it have three center point of primary, rather than two places for storage data and three center point of primary. Using the system, if not make the same data was destroy at the same time, the corresponding data are safe and reliable

1. efficient access:

Now the data which stored disk has TB level is very common. And the data which has PB level was also appearance. That will make a problem, how to efficient store these data. For big data, effectively store is essential. It is not only related to the safety of data storage, but also includes the efficiency of reading data. The cloud storage system based on CEPH provides a good method for storing data. The design gives full play to the computing power of each corresponding server, gets rid of the bottleneck of the traditional single center node, and realizes the real non center characteristic. There are eight words summed up the characteristics: no look-up table , it is of for calculating. This fully reflects that the whole process of data access will not cause the system failure as a single point breakdown, while ensuring access to efficient

1. load balance

In the process of data storage, it is inevitable that there will be a disk damage, disk expansion, as well as the disk of different disk use rate of imbalance, which will affect the efficiency of data access. If you can store a big file in a good method, the data storage efficiency will be significantly improved. These will full use of the system to realize the character of the high concurrency, the realization of data access. To avoid a single disk has shorten the service life due to frequent operation.

In the user interface layer, I will be implemented the function that used monitor the state of disk, hide the underlying operating details, through the user's click to achieve the corresponding operation.

Key Words: Backup, balanced, concurrent