Operating Systems Design: Critique

2019712600

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● Ceph: A Scalable, High-Performance Distributed File System

CEPH is a paper that solves the scalability problem of the existing file system in a new way. The management of metadata and data is made using a distributed function called CRUSH so that it can operate in a heterogeneous environment. This resulted in the good performance and scalability of CEPH.

The advantage of this paper is that the problem is solved by separating metadata and data blocks. As far as I know, I know that there are many follow-up papers and comparative papers.

● TxFS: Leveraging File-System Crash Consistency to Provide ACID Transactions

TxFS suggests that the sync option normally used for application consistency is lacking in terms of efficiency and convenience and suggests using the transaction concept to solve it. And this paper talks about how to use the journal of existing file system for implementation convenience and performance advantage.

The advantage of this paper is that it presents a new view of using transactions. Existing papers have been aimed at improving the transaction file system itself. However, this paper presents a file system that breaks the existing framework and maintains consistency using transactions rather than fsync. And when using multiple transactions, the problem of keeping dependencies and isolation is complicated. On the other hand, the downside is that the performance advantage in the reaworld bench is not significant and the size of multiple journals is small. The new journal concept is introduced to maintain the consistency of the application rather than simply upgrading the journal file system. Therefore, the available journal size is small per transaction. Secondly, it says that operation in multiple processes is not yet possible.

I hope that the following paper will show how transactions are executed by different processes, or when thread migrations occur in places such as load balancing if they are not possible. In addition, the results of the experiment and analysis are also described in more detail in the following paper.