The Viability of Ceph Abstract

High capacity systems require data redundancy via RAID or erasure coding to protect against hardware failure. RAID does not offer high redundancy in larger systems. High availability via data striping and fault tolerance across many nodes is not supported in RAID. Ceph is an open source object store and filesystem. In order to test the performance and reliability of Ceph, a Ceph object store was built on a ten node cluster. Three different profiles were tested using built in RADOS benchmarking tools. These profiles included one replicated and two erasure coded profiles, which were benchmarked using varying object sizes and erasure coding parameters. During benchmarking, hard drive failure occurred and the object store could not recover automatically or with manual intervention. Given more time and experience, Ceph may be tuned and configured to be more robust.

Ceph did not prove to be resilient to hardware failure. Although the performance of Ceph is promising, it is difficult to set up and the stability of the Ceph software still needs to be improved.

Raid only goes to 4 + 2, so it does not scale well. During rebuilding of a hard drive, the probability of data loss increases. Also, erasure coding allows for higher availability because there are more places to get data from. Redundancy is higher in object store erasure coding.

RAID does not offer high redundancy in larger systems, and high availability via data striping across many nodes, along with fault tolerance, is not supported in RAID.

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