

Dynamo: Amazon's Highly Available Key-value Store

Aman Shankar(as5171)

1. Motivation

Due to the large usage and working on a massive scale hence it is of utmost importance to create a highly reliable system. Any failure either big or large can cause a significant business and financial losses.

2. Goal

Developing a storage system that handles failures as a normal use case. Hence, designing a storage system which can manage high number of structure data and giving high availability.

3. Idea

Doing away with the traditional Data Base Modelling. Storing data with only primary key and hence doing away with more complex queries and management models.

4. Design

The papers used two major design aspects, one being that conflict management happens in the read cycle rather than the write cycle this gives a highly available system. Secondly, the conflict resolution will be done by the application rather than the server. It's based on the assumption that by eventually we will start getting the correct and reliable data. Node store different key ranges in a ring arrangement. Additionally, other design aspects are symmetry, decentralization, heterogeneity and incremental scalability.

5. Results

There is a 99.9 latencies during the peak operation using Amazon Dynamo. The concern with the design is its consistency over the read operation because Amazon Dynamo key design aspect was to provide a more available system.

6. Conclusion

Dynamo has been deployed in Amazon and several versions are being used based on the use case. Some them being replicating data across various nodes and reconciliation is done by the application time stamp based reconciliation where the last logic wins. The last one being providing incremental stability to high performance read engines

7. Comments

It's a highly scalable system since it is based on a fully distributed system. The disadvantage being it has a hard-lined data storage since it is based on primary key value storage. Though the paper proves to provide good latency rate.