Dynamo

Introduction

Link to paper

Dynamo is Amazon's K/V store! Between BigTable and Dynamo, you've got most of Cassandra laid out.

> Dynamo uses a synthesis of well known techniques to achieve scalability and availability: Data is partitioned and replicated using consistent hashing [10], and consistency is facilitated by object versioning [12]. The consistency among replicas during updates is maintained by a quorum-like technique and a decentralized replica synchronization protocol. Dynamo employs a gossip based distributed failure detection and membership protocol. Dynamo is a completely decentralized system with minimal need for manual administration. Storage nodes can be added and removed from Dynamo without requiring any manual partitioning or redistribution.

Dynamo synthesizes a lot of different techniques to achieve reliability and scalability in a distributed, eventually-consistent world. Let's see how!!!

Background

Traditional RDBMSes offer more power than needed for most Amazon services; these services just require primary key data access, along with solid availability.

Dynamo at a glance:

- **Query**: simple query model based on primary key
- **ACID**: weaker consistency instead of ACID, for performance and availability. No isolation guarantees.
- **Efficiency**: commodity hardware with tight SLAs

Hinted Handoff

When trying to validate a quorum write, we only need to confirm writes to `N`