Understanding Eventual Consistency

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Modern large-scale, geo-replicated Web Applications depend on databases that are highly available and can be scaled largerly. Following the CAP theorem, this can not be achieved without constraints in consistency. Geo-replicated databases like Amazon DynamoDB, MongoDB, CouchDB, and many others offer consistency models that are commonly described with the term *eventual consistency*. While some of these databases offer similar features, it is not possible to compare features of different systems semantically, as different formalisms are used, weak guarantees are being made and handling of conflict resolution varies greatly.

Based on [BGY13], this presentation is going to suggest a rigorous way to specifiy the semantics of geo-replicated databases. After presenting a function that is general enough to specify the semantics of any replicated data type, different conflict resolution strategies from real-world applications are identified. To show the validity of the replicated data type specification, examples are given to show how those strategies can be specified using the presented formalism. In a next step, the semantics of individual objects are extended to the whole database by defining sessions and a database history that provide a context allowing us to formalize features and guarantees of the whole database, considering interactions in different sessions and on different replicas.

Und hier kommt dann dein teil und ein satz zu konklusion...

Literatur

[BGY13] Sebastian Burckhardt, Alexey Gotsman, and Hongseok Yang. Understanding eventual consistency. Technical Report MSR-TR-2013-39, Microsoft Research, One Microsoft Way, Redmond, WA 98052, 2013.

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