Diploma/Master Thesis Topics in the Field of Cloud Data Management

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1. Overview of transaction management and concurrency control approaches for Distributed Databases and Cloud Data storage.

Currently, existing data management solutions for the cloud do not provide transactions as used in conventional DBMS. Nevertheless, ongoing research addresses this issue. The goal of the thesis would be to provide an overview of transaction management and concurrency control approaches that are used in distributed databases and current results from academic and industrial research on providing transactional facilities for cloud systems.

2. Supporting Transaction Contexts for Cloud Data Management

Currently, existing data management solutions for the cloud do not provide transactions as used in conventional DBMS. The goal of this thesis is to extend an existing cloud data management solution (e.g. HBase, Cassandra, Riak) by implementing a simple transaction manager that includes creating a transaction log, execute single operations (across several rows or tables), and supporting the ability to commit or roll back a transaction (properties A and D of ACID properties).

3. Using Time Stamps for the Synchronisation in Cloud Data Management:

Currently, existing data management solutions for the cloud do not provide transactions as used in conventional DBMS. The goal of this thesis is to develop concepts for and a prototypical implementation of a scheduler that provides synchronization for concurrent accesses to data items while keeping higher level of consistency (properties C and I of ACID properties) based on time stamps.

4. Using Locks for the Synchronisation in Cloud Data Management:

Currently, existing data management solutions for the cloud do not provide transactions as used in conventional DBMS. The goal of this thesis is to develop concepts for and a prototypical implementation of a scheduler that provides synchronization for concurrent accesses to data items while keeping higher level of consistency (properties C and I of ACID properties) based on locking mechanisms.

Other topics: we want to encourage students to propose their own topics in the field of cloud data management!