

NOSQL: Defined in contrast to RDBMS

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 - There is no consensus definition of NOSQL. NOSQL is a misnomer. No SQL has less to do with SQL or an alternative to query language. NOSQL has more to do with new database strategies and data structures.

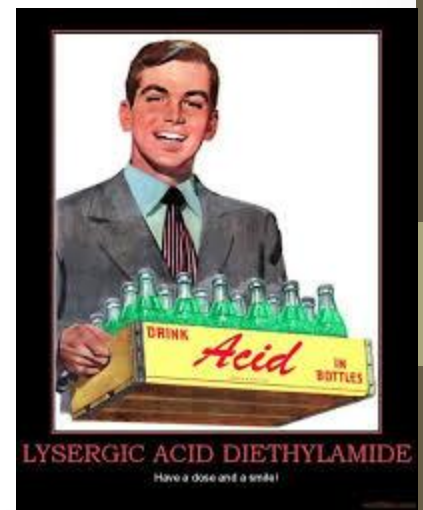


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- RDBMS vs. NOSQL
 - NOSQL has to do with databases that do not follow the pattern of a relational database management system (RDBMS)
 - Therefore we need to define NOSQL in contrast to RDBMS. The hallmark of RDBMS is the relational model and **ACID**.
- Quick and Simple Overview of NOSQL (watch at home):
http://www.youtube.com/watch?v=sh1YACOK_bo

ACID: RDBMS

- ACID and the relational model are the hallmarks of RDBMS. ACID stands for:
 - Atomic
 - Consistent
 - Isolation
 - Durability



ACID: Atomic

- Atomic is Greek for unsplittable
- All or nothing
- All the changes of a transaction will happen or none of them will happen.
- Aborted transactions are rolled back.

ACID: Consistent

- Database is consistent before transaction. Database is consistent after transaction.
- Database will adhere to all the consistency rules before and after every transaction.
- Database constraints and column relations to other data are maintained. In other words, data written to the database must abide by integrity constraints. For Example:
 - A column which requires a unique identifier will not tolerate a duplicate value.
 - A column that requires no NULL values will not accept a NULL value.
 - The database will verify that each value is a valid foreign key in a column that demands that each value is a valid foreign key.

Beware! The word consistency is overloaded. The C in ACID is for a different consistency than the well-known consistency problem in a NOSQL distributed system. When we talk about consistency in NOSQL we mean that replicated data are the same after updates.

ACID: Isolation

- Transactions are isolated from one another.
- During a transaction, other processes cannot see the affected parts of the database until the transaction has completed. The other processes have to wait. The result is as if the transactions occurred in sequentially
- Isolation is achieved by concurrency control. When two transactions execute at the same time, each attempting to modify the same data, one of the two must wait until the other completes.

ACID: Durability

- What is written is readable until explicitly deleted
- Data doesn't evaporate

Durability is the hallmark of databases in general. NOSQL and RDBMS both succeed equally well in durability.

RDBMS vs. NOSQL

- The atomic, consistent, and isolated aspects of an RDBMS are the basis of what is called a transaction shell or bubble.
- Durability is just as important in NOSQL as it is in an RDBMS
- Base
 - Basic Availability: Basic Availability means that the system is available most of the time. (Availability means that a database request receives a response about success or failure.)
 - Soft-state
 - Eventual consistency

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NOSQL

- NOSQL databases are distributed databases that split up data into manageable blocks and replicate data to prevent data loss
- NOSQL databases allow scale-out using many cheap servers and, typically, do not fully use scaled-up servers
- NOSQL databases may have a relaxed schema and can dynamically add new attributes to records
- NOSQL databases have a relaxed transaction shell and do not abide by ACID
- NOSQL databases do not need to be immediately consistent after every transaction. They can be eventually Consistent.

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