

Formulaire - MAC

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Impedance Mismatch Objet-Relationnel Disconnect between data layer and application layer

- Solutions: *ORM, NoSQL*

NoSQL

- Horizontal scaling
- No schema, fields can be added later
- Easy replication
- Simple API
- Not ACID

Column oriented

- Écriture à grande échelle
- Accès aux données co-localisé (pour la lecture et l'écriture)

Key-value

- Caches
- Domaine simple avec accès en lecture rapide
- Systèmes massivement concurrents
- Opaque value

Document oriented

- Suited for agile dev.
- When data modeling follows the structures of natural documents
- No need for migration schema
- No need for ORM layer
- Replicated, each document is independent
- Separation approach: normalized data
 - + Data consistency through a single canonical source
 - + Simpler queries (closer to relational databases)
 - + Better cache efficiency and hardware utilization
 - Requires multiple lookups and joins
 - Forced consistency may be undesirable in some contexts
- Imbrication approach: unnormalized data
 - + Faster access (no joins, single document retrieval)
 - + Fewer failure points in distributed systems
 - + Simpler application logic
 - Risk of data inconsistency due to redundancy
 - More complex queries on nested data
 - Larger, heavier documents

Models

- Represent n-to-m relations
 - document model: *difficult*
 - relation model: *easy*
- Optional fields
 - document model: *possible*
 - relations model: *not possible*

Couchbase

TODO Couchbase indexes

Graph

- Interconnected data

- When the domain can be represented by nodes and relations
- Social media, recommendation engines
- Relational DBs compute the relations during the query, graph DBs store them.
- Native: custom underlying storage
- Non-Native: underlying relational DB
- Index-free adjacency:** the relations are stored

CAP Theorem

Partition Re-equilibration

Réplication maître-esclave

Réplication peer-to-peer

Index Free Adjacency