

NOSQL

Not Only SQL
-> niet relationeel

Enkele Voorbeelden

- Wide Column Store
 - Bv Cassandra, HBase, ScyllaDB
- Document Store
 - Bv MongoDB, Couchbase, Realm
- Graph based
 - Bv Neo4J, Memgraph, NebulaGraph
- Key Value
 - Bv Redis, Berkeley DB, MemcacheDB
- Multivalue
 - Bv SciDB, Rasdaman, OpenQM
- Search Engines
 - Bv Elasticsearch, Solr, OpenSearch

Enkele Voorbeelden

- Time Series DBMS
 - Bv InfluxDB, Prometheus, TimescaleDB
- RDF Stores
 - Bv Apache Jena – TDB, RDF4J, 4store
- Vector DBMS
 - Bv Chroma, Weaviate, Milvus
- Spatial DBMS
 - Bv PostGIS, spatialite, GeoMesa
- Native XML DBMS
 - Bv BaseX, Sedna, eXist-db
- Object oriented DBMS
 - Bv ObjectBox, Perst, WakandaDB

Enkele Voorbeelden

- Event stores
 - Bv EventStoreDB, NeventStore
- Content stores
 - Bv Jackrabbit, ModeShape
- Multi-model DBMS
 - Verschillende RDBMS ondersteunen vaak verschillende paradigma
 - Bv PostgreSQL, MariaDB, ClickHouse

Mongo db

- Binaire JSON
- JSON voorbeeld:
- CRUD
- Index
- Aggregation
- Replication
- Sharding

```
{
  "firstName": "John",
  "lastName" : "Smith",
  "age"       : 25,
  "address"   :
  {
    "streetAddress": "21 2nd
                      Street",
    "city"         : "New York",
    "state"        : "NY",
    "postalCode"   : "10021"
  },
  "phoneNumber":
  [
    {
      "type" : "home",
      "number": "212 555-1234"
    },
    {
      "type" : "fax",
      "number": "646 555-4567"
    }
  ]
}
```

KV

- Look up Value using Key
- Structuur?
- Cf Dictionary (ODMS)
- RDBMS oplossingen..
 - Postgresql : hstore of gewoon..

```
CREATE TABLE kvp
(id    SERIAL NOT NULL,
key   text    NOT NULL,
value text    ,
CONSTRAINT kvp_pk PRIMARY KEY id );
```

```
-- KeyValuePair
```

```
-- index op key maken
```

KV

- Look up Value using Key..
- Cf Dictionary (ODMS)
- RDBMS oplossingen..
 - Postgresql : hstore of gewoon..

BASE

- vs ACID
- Basically Available: zo beschikbaar mogelijk
- Soft-state: geen garantie op consistentie, inhoud kan veranderen zonder invoer van de gebruiker
- Eventually consistent: doel is consistentie, gegeven genoeg tijd