

NoSQL - MongoDB

DIS Exercise Course



Persistent Data

Concurrency Control
(Transactions)

ACID

Mostly Standard (SQL)

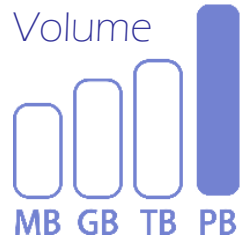
Application Integration

Big Data

2000

2010

2020



20 hours of video
uploaded on
every min

YouTube

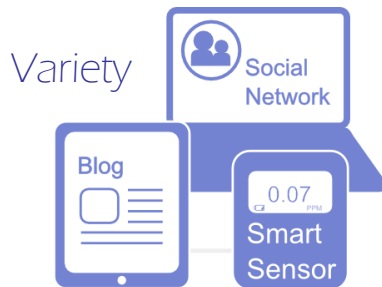
Global Online
Population

2000
360 Million

2012
2.1 Billion



400 Million
a Day in 2012



 reached 1
billion users in 2012

Global Data Storage
in Exabytes

2005
130

2010
1,227

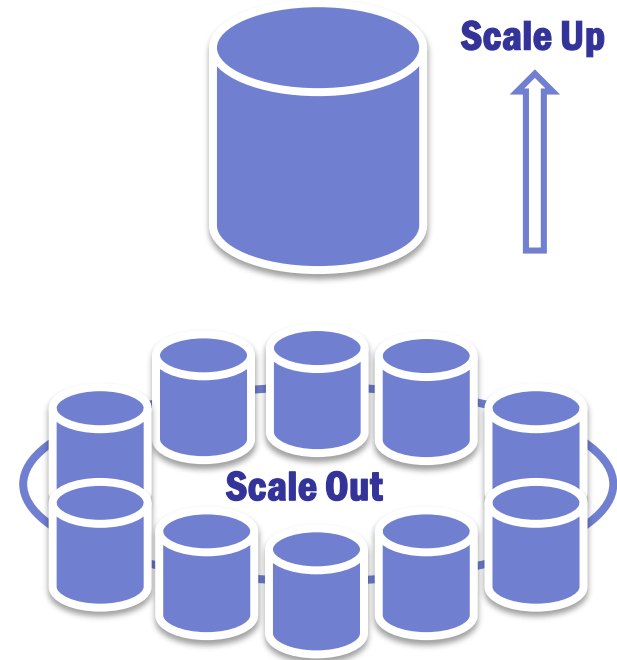
2012
2,837

What's the problem with RDBs?

RDBs designed to run on a single machine.
You need to buy a bigger machine to scale vertically.

But it's cheaper and more effective
to scale horizontally by buying lots of
machines.

**Google and Amazon were both early
adopters of large clusters, and both
eschewed RDBs.**



Amazon DynamoDB

Google Bigtable

So Now We Have NoSQL Databases

Non-Relational

Cluster-Friendly

Schema-Less

BASE

Open-Source

21st Century Web

NoSQL Data Models

Key-Value

Amazon DynamoDB



Project Voldemort



redis



Tokyo Cabinet
8192MB



Column-Family

Google Bigtable



HYPERTABLE™

Document



CouchDB
relax



Couchbase

MarkLogic™



mongoDB

Graph

*dex



Neo4j
the world's leading
graph database

sones

But ...

The relational model is still relevant !

ACID Transactions

Tools

Familiarity



A scalable, high-performance, schema-free, open-source document-oriented database.

- JSON-Style Documents
- Auto-Sharding
- Replication & High Availability
- Full Index Support
- Fast In-Place Updates
- Rich, Document-Based Queries
- Map/Reduce

What's a JSON-Document Anyway ?

```
{
  _id : "2016711",
  title : "Star Trek: Nemesis",
  year : "2002",
  ...
  genre : [
    "Action",
    "Sci-Fi",
    "Thriller"
  ],
  releases : [
    {
      country : "USA",
      date : ISODate("2002-12-08T23:00:00Z")
    },
    {
      country : "Germany",
      date : ISODate("2003-01-15T23:00:00Z")
    }
  ]
}
```

Learn More ...

Master Project: NoSQL
WiSe 2015/2016 & SoSe 2016



Seminar (Freier Wahlbereich):
Skalierbare Datenbanken (SDB)
SoSe 2016

