

# NoSQL - MongoDB

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DIS Exercise Course



Persistent Data

Application Integration

Mostly Standard

Concurrency Control

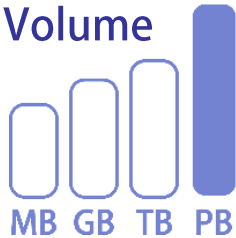
# Big Data

2000

2010

2020

Volume



20 hours of video  
uploaded on **You Tube**  
every min

Global Online  
Population

2000  
360 Million

2012  
2.1 Billion

Velocity



400 Million  
a Day in 2012



Variety



**f** reached 1  
billion users in 2012



Global Data Storage  
in Exabytes

2005  
130

2010  
1,227

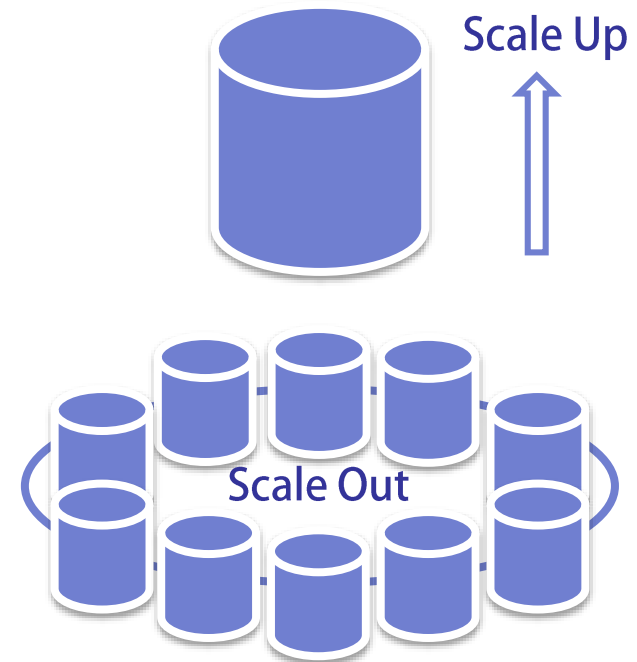
2012  
2,837

# 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

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Non-Relational

Cluster-Friendly

Schema-Less

Open-Source

21st Century Web

# NoSQL Data Models

## Key-Value

Amazon DynamoDB



Project Voldemort



redis



## Column-Family



Cassandra



HYPERTABLE™

## Document



CouchDB  
relax



Couchbase



MarkLogic™



mongoDB

## Graph



Neo4j  
the world's leading  
graph database



sones

But ...

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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 ...

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Master Project: NoSQL  
WiSe 2014/2015 & SoSe 2015



Seminar (Freier Wahlbereich):  
Skalierbare Datenbanken (SDB)  
SoSe 2015

