

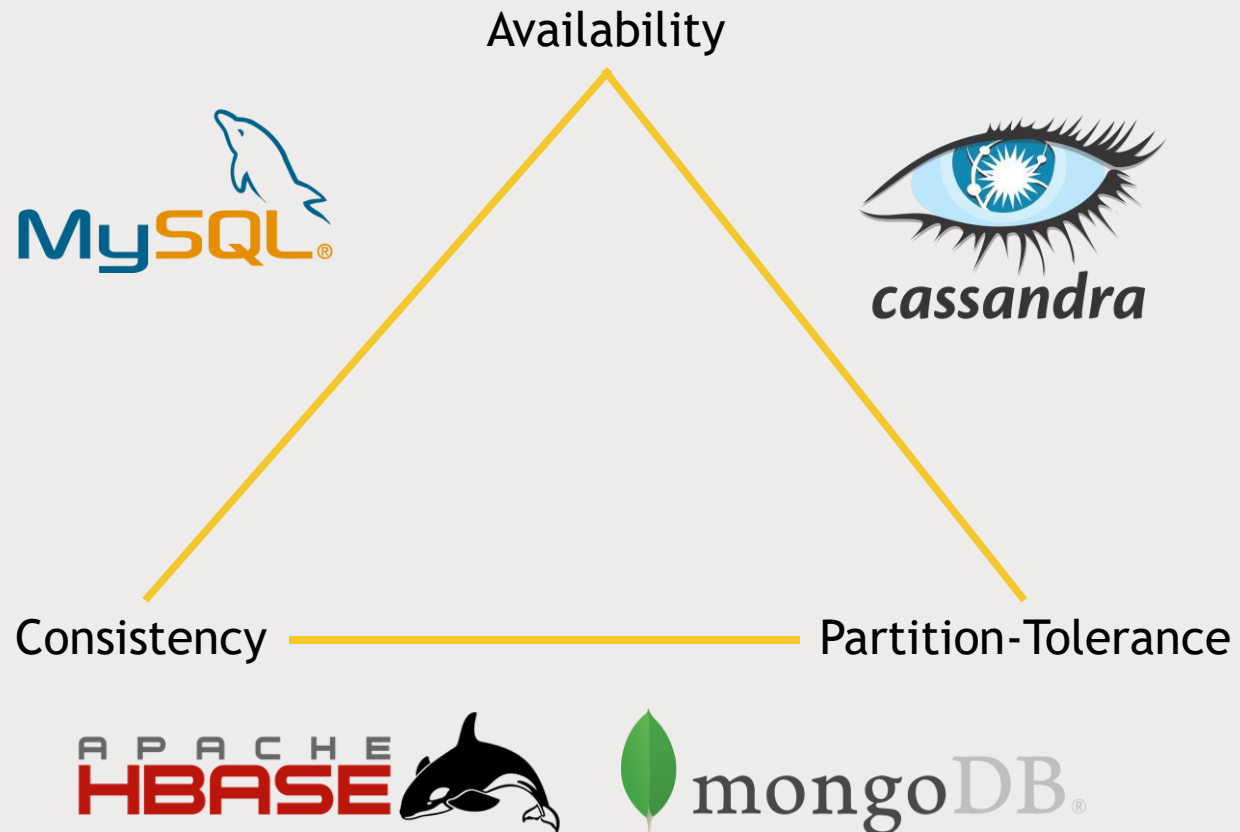


# MONGODB

Managing HuMONGOus data



# Where are we?



# Document-based data model

Looks like JSON. Example:

```
{
  "_id" : ObjectId("7b33e366ae32223aee34fd3"),
  "title" : "A blog post about MongoDB",
  "content" : "This is a blog post about MongoDB",
  "comments": [
    {
      "name" : "Frank",
      "email" : fkane@sundog-soft.com,
      "content" : "This is the best article ever written!"
      "rating" : 1
    }
  ]
}
```

# No real schema is enforced.

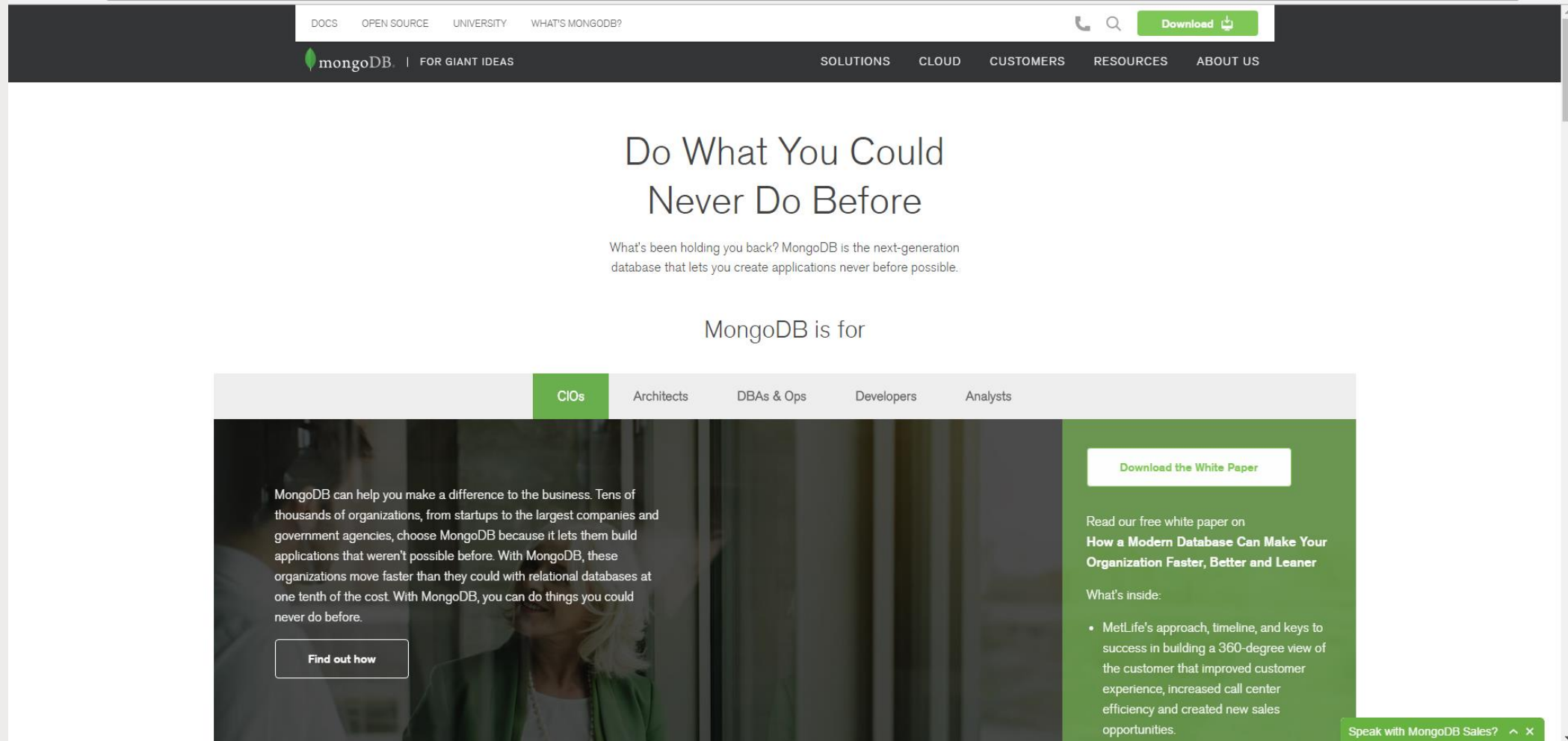
- You can have different fields in every document if you want to
- No single “key” as in other databases
  - *But you can create indices on any fields you want, or even combinations of fields.*
  - *If you want to “shard”, then you must do so on some index.*
- Results in a lot of flexibility
  - *But with great power comes great responsibility*

design db based on queries that support requirement

# MongoDB terminology

- Databases databases
- Collections tables
- Documents rows

# It's kinda corporate-y



The screenshot shows the MongoDB website homepage. The top navigation bar is dark with links for DOCS, OPEN SOURCE, UNIVERSITY, and WHAT'S MONGODB? on the left, and a search icon, a green 'Download' button, and a social media icon on the right. Below this is a secondary dark bar with the MongoDB logo and 'FOR GIANT IDEAS' on the left, and links for SOLUTIONS, CLOUD, CUSTOMERS, RESOURCES, and ABOUT US on the right. The main content area has a large heading 'Do What You Could Never Do Before' and a subtext 'What's been holding you back? MongoDB is the next-generation database that lets you create applications never before possible.' Below this is a section titled 'MongoDB is for' with a horizontal menu for CIOs, Architects, DBAs & Ops, Developers, and Analysts. The 'CIOs' tab is active. The main content area features a large image of a woman in a green jacket. On the left, text describes how MongoDB can help businesses. On the right, there is a green box with a 'Download the White Paper' button and a list of bullet points. At the bottom right, there is a green button that says 'Speak with MongoDB Sales?'.

DOCS OPEN SOURCE UNIVERSITY WHAT'S MONGODB?

Download

mongoDB. | FOR GIANT IDEAS

SOLUTIONS CLOUD CUSTOMERS RESOURCES ABOUT US

## Do What You Could Never Do Before

What's been holding you back? MongoDB is the next-generation database that lets you create applications never before possible.

### MongoDB is for

CIOs Architects DBAs & Ops Developers Analysts

MongoDB can help you make a difference to the business. Tens of thousands of organizations, from startups to the largest companies and government agencies, choose MongoDB because it lets them build applications that weren't possible before. With MongoDB, these organizations move faster than they could with relational databases at one tenth of the cost. With MongoDB, you can do things you could never do before.

Find out how

Download the White Paper

Read our free white paper on  
**How a Modern Database Can Make Your Organization Faster, Better and Leaner**

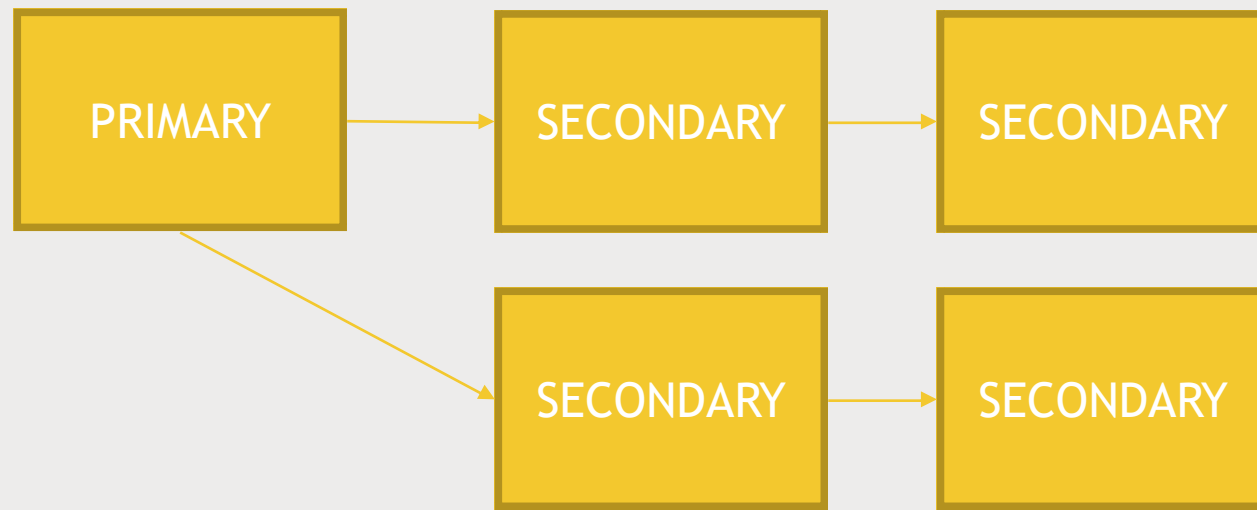
What's inside:

- MetLife's approach, timeline, and keys to success in building a 360-degree view of the customer that improved customer experience, increased call center efficiency and created new sales opportunities.

Speak with MongoDB Sales?

# Replication Sets

- Single-master!
- Maintains backup copies of your database instance
  - *Secondaries can elect a new primary within seconds if your primary goes down*
  - *But make sure your operation log is long enough to give you time to recover the primary when it comes back...*



# Replica Set Quirks

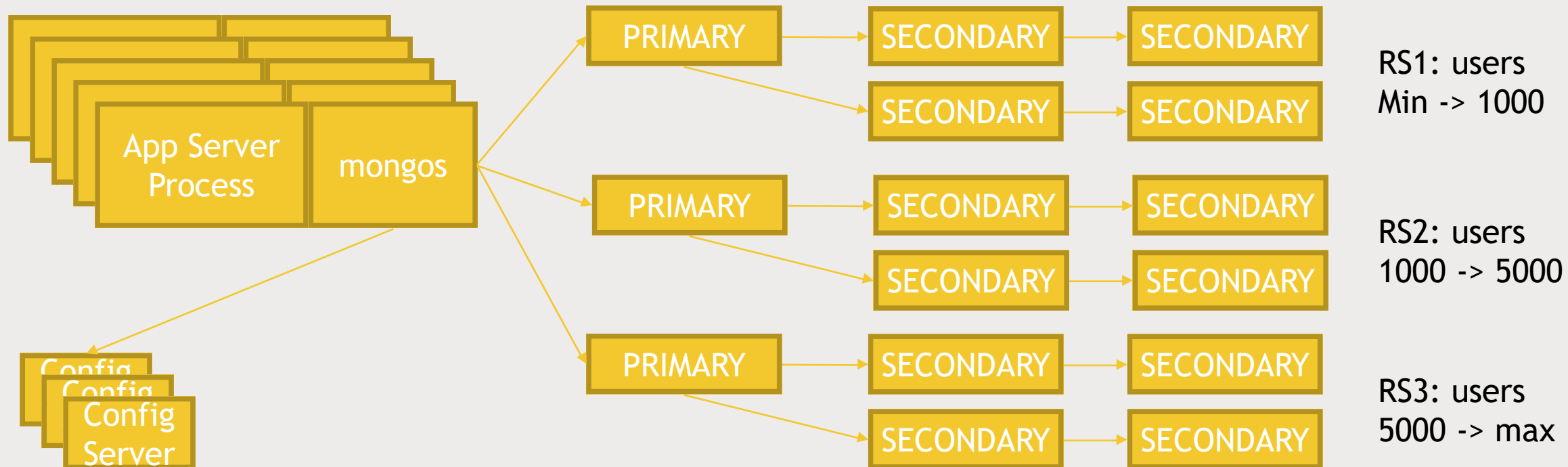
- A majority of the servers in your set must agree on the primary
  - *Even numbers of servers (like 2) don't work well*
- Don't want to spend money on 3 servers? You can set up an 'arbiter' node
  - *But only one*
- Apps must know about enough servers in the replica set to be able to reach one to learn who's primary
- Replicas only address durability, not your ability to scale
  - *Well, unless you can take advantage of reading from secondaries - which generally isn't recommended*
  - *And your DB will still go into read-only mode for a bit while a new primary is elected*
- Delayed secondaries can be set up as insurance against people doing dumb things



# Sharding



- Finally - “big data”
- Ranges of some indexed value you specify are assigned to different replica sets



# Sharding Quirks

limitation

- Auto-sharding sometimes doesn't work
  - *Split storms, mongos processes restarted too often*
- You must have 3 config servers
  - *And if any one goes down, your DB is down*
  - *This is on top of the single-master design of replica sets*
- MongoDB's loose document model can be at odds with effective sharding

# Neat Things About MongoDB

- It's not just a NoSQL database - very flexible document model
- Shell is a full JavaScript interpreter
- Supports many indices
  - *But only one can be used for sharding*
  - *More than 2-3 are still discouraged*
  - *Full-text indices for text searches*
  - *Spatial indices*
- Built-in aggregation capabilities, MapReduce, GridFS
  - *For some applications you might not need Hadoop at all*
  - *But MongoDB still integrates with Hadoop, Spark, and most languages*
- A SQL connector is available
  - *But MongoDB still isn't designed for joins and normalized data really.*

# Let's Mess Around

- We'll integrate MongoDB with Spark
- Then play around with the resulting database in the mongo shell

