

Everyday



Open-source, high-performance,
schema-free, document-oriented
database.

Basic Terms

Document

BSON

Collection

GridFS

Document

```
{ “definition”: “Basic unit of storage in  
MongoDB.”,  
“relational analog” : “record”,  
“sample types” : [ “utf-8 string”,  
                    “integer”,  
                    “object”],  
“special types”: [“utc date”,  
                    “binary”,  
                    /regular expression/],  
“storage format”: “BSON”}
```

BSON

Binary JSON

- Efficient, fast, rich in types
- Client serializes to BSON
- Data stored at BSON in MongoDB
- MongoDB fluent in BSON

General-purpose

- RPC / Custom protocols

Collection

Group of Documents

- Analogous to Relational Tables.
- Supports up to 40 indexes.
- Informal namespacing:
 - `blog.posts`, `blog.authors`
- Schema-free.

GridFS

Storing large files in MongoDB

- GridFS: specification for chunking files.
- Chunked for performing range operations.
- File metadata stored in a files

Technical Bits

Administration / Drivers

Javascript Shell

Replication

Sharding

Administration

Socket / Wire Protocol

- Drivers for
 - Java
 - Perl
 - PHP
 - Python
 - Ruby

Technical

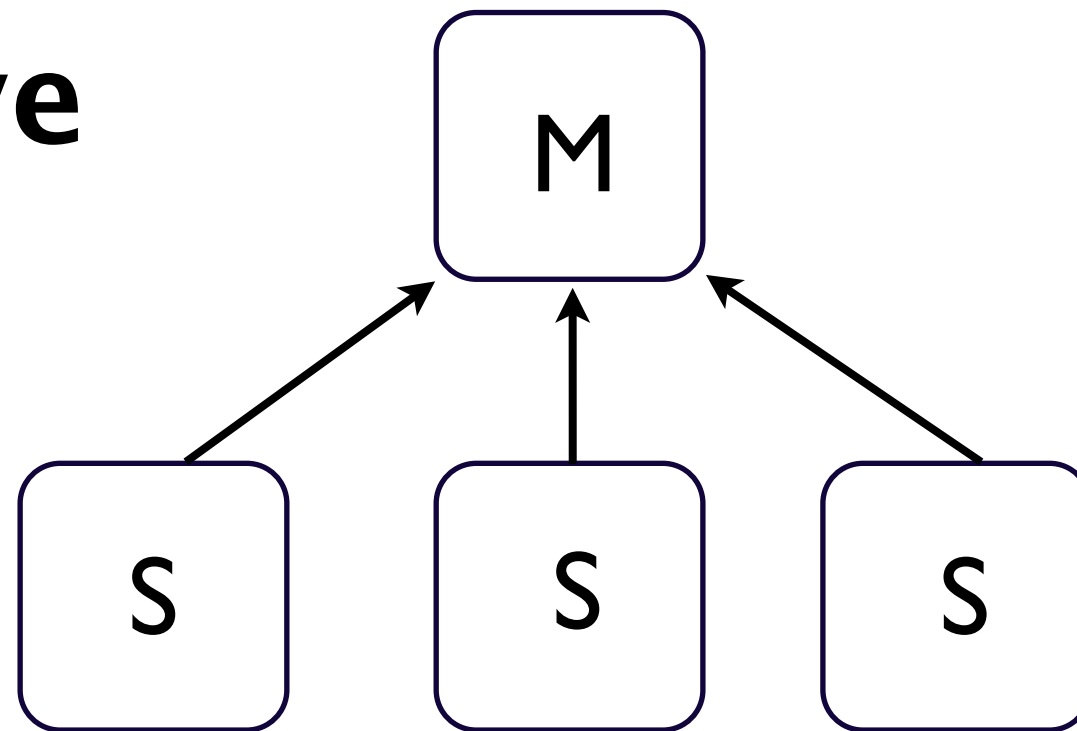
Javascript Shell

```
MongoDB shell version: 1.1.2
url: test
connecting to: test
type "help" for help
> db.addresses.find({}, {"street": 1, "location": 1})
{ "_id" : ObjectId("4ae75756090ef60873460185"), "street" : "17 W. 18th St." }
{ "_id" : ObjectId("4ae7576f090ef60873460186"), "street" : "149 Fifth Ave" }
{ "_id" : ObjectId("4ae75943090ef60873460187"), "street" : "25 W. 34 St.", "location" : 0 }
{ "_id" : ObjectId("4ae75943090ef60873460188"), "street" : "25 W. 34 St.", "location" : 1 }
{ "_id" : ObjectId("4ae75943090ef60873460189"), "street" : "25 W. 34 St.", "location" : 2 }
{ "_id" : ObjectId("4ae75943090ef6087346018a"), "street" : "25 W. 34 St.", "location" : 3 }
{ "_id" : ObjectId("4ae75943090ef6087346018b"), "street" : "25 W. 34 St.", "location" : 4 }
{ "_id" : ObjectId("4ae75943090ef6087346018c"), "street" : "25 W. 34 St.", "location" : 5 }
{ "_id" : ObjectId("4ae75943090ef6087346018d"), "street" : "25 W. 34 St.", "location" : 6 }
{ "_id" : ObjectId("4ae75943090ef6087346018e"), "street" : "25 W. 34 St.", "location" : 7 }
{ "_id" : ObjectId("4ae75943090ef6087346018f"), "street" : "25 W. 34 St.", "location" : 8 }
{ "_id" : ObjectId("4ae75943090ef60873460190"), "street" : "25 W. 34 St.", "location" : 9 }
{ "_id" : ObjectId("4ae75943090ef60873460191"), "street" : "25 W. 34 St.", "location" : 10 }
{ "_id" : ObjectId("4ae75943090ef60873460192"), "street" : "25 W. 34 St.", "location" : 11 }
{ "_id" : ObjectId("4ae75943090ef60873460193"), "street" : "25 W. 34 St.", "location" : 12 }
{ "_id" : ObjectId("4ae75943090ef60873460194"), "street" : "25 W. 34 St.", "location" : 13 }
{ "_id" : ObjectId("4ae75943090ef60873460195"), "street" : "25 W. 34 St.", "location" : 14 }
{ "_id" : ObjectId("4ae75943090ef60873460196"), "street" : "25 W. 34 St.", "location" : 15 }
{ "_id" : ObjectId("4ae75943090ef60873460197"), "street" : "25 W. 34 St.", "location" : 16 }
{ "_id" : ObjectId("4ae75943090ef60873460198"), "street" : "25 W. 34 St.", "location" : 17 }
has more
> db.addresses.count()
202
>
```

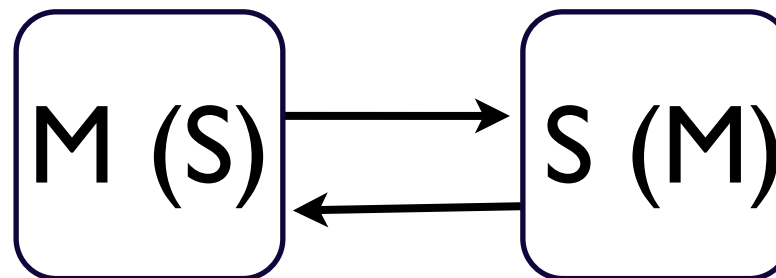
Technical

Replication

Master – Slave

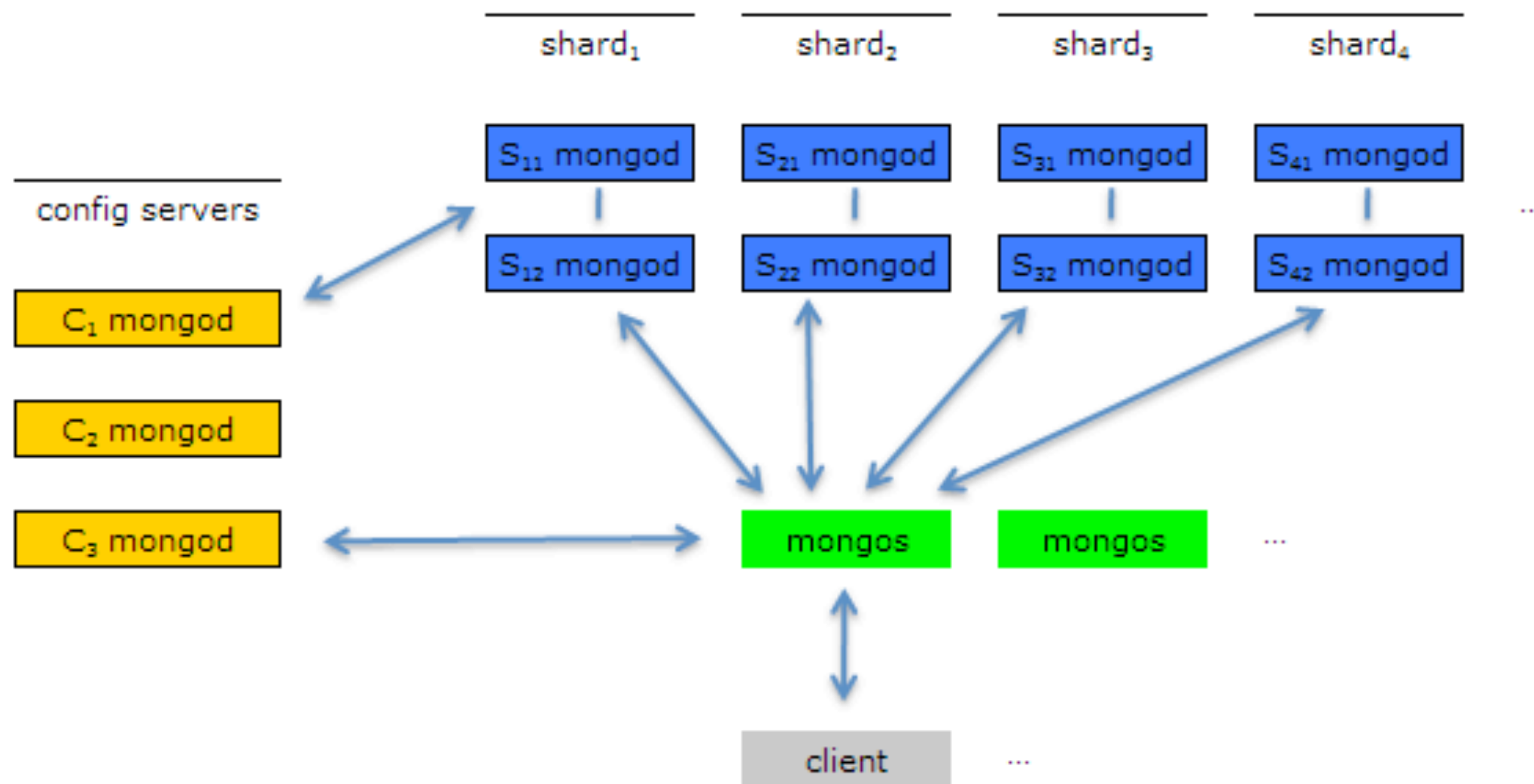


Replica Pairs



Technical

Auto Sharding



Features

Sophisticated, Dynamic Queries

Map/Reduce

Upserts

Capped Collections

Sample Document

```
{"title": "NoSQL Database Internals",  
"date": "Tue Oct 27 2009 17:24:18  
GMT-0400 (EDT)",  
"tags": ["nosql", "databases", "c++"],  
"comments": [{"author: "Fred",  
                  text: "Quite
```


Dynamic Queries

```
db.posts.find({"author":  
"Kyle"})
```

```
db.posts.find("tags": "nosql")
```

```
db.posts.find(  
  {"date": {"$lte": Date.now})
```

Features |

Queries / Indexes on Nested Documents

```
db.posts.ensureIndex("comments.author": 1)
```

```
db.posts.find("comments.author":  
"fred")
```

```
db.posts
```

```
.find({}, {"comments":1})
```

Query Operators

- \$gt, \$lt, \$gte, \$lte, \$ne, \$all, \$in, \$nin
- where()
- `db.posts.find({"$where": this.author == "kyle" || this.author === nil})`

Features |

And...

- Map/Reduce
- Count
- Group
- Distinct
- Regex queries
- Upserts
- Capped Collections

MongoDB in Production

BusinessInsider.com
TweetCongress.org / Squeejee
SourceForge.net

BusinessInsider.co

October 24, 2009

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"I tried to use my card about 3 weeks ago at the grocery store and it was denied. Needless to say, I walked out without the food. We don't waste anything, not money,

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Overview

- MongoDB since Jan, 2008
- 12M page views / month
- 2.2M uniques / month

Data Modeling

- 10 Collections
- Posts with embedded comments
- Settings
- Real-time analytics (heat maps)
- Users with Facebook connect.

Analytics

- Page views, real-time statistics panel
- Dynamic queries ease data analysis
- Fast updates: non-locking inserts
- Sailthru for click tracking

Images with GridFS

- All data, images included, in db.
- Meta-data alongside images.
- On-the-fly sizing.
- Possible con: database large.

Migrations

Mitigated

- Simplifies schema changes.
 - No “alter” statements.
- Easily create new fields, collections.
- Certain data migration still necessary.


```
{ "_id" :  
  ObjectId( "f4b9b9146c65f647af..." ),  
  "name" : "2008/4/flixster-can-t-sell-  
to-i..." ,  
  "title" : "Flixster Can't Sell To IAC, Raises  
$5 M..." ,  
  "commentsEnabled" : true ,  
  "ts" : "Fri Apr 04 2008 13:43:00 GMT-0400  
(EDT)" , "cls" : "entry" ,  
  "content" : "<p>Movie rating site/social  
network..."  
  "author" : "Dan Frommer" ,  
  "excerpt" : "Who wants to pay $150  
million..." ,  
  "channel" : "Hollywood"
```

```
"comments" :  
[{"author" : "Alphanaliste" ,  
"email" :  
"harderwisdom@aol.com" , "url" :  
""  
 ,  
"ts" : "Fri Apr 04 2008 15:18:31 GMT-0400  
(EDT)" ,  
"text" : "This junk won't  
survive..." ,  
"cid" :  
ObjectId( "f4b9b91407..." ) },  
{"author" : "jenkins" ,
```

Deployment

- Single database server, 16GB, 15–30%.
- 3 Apache/PHP servers.
- MongoDB for caching.
- Exception: memcached for homepage.

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Floxee.com (Squeejee)



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36 minutes ago



R-UT Jason Chaffetz: <http://bit.ly/Ci4TN> Utah soldier killed in Afghanistan. A hero!
about 11 hours ago



R-SC Robert Inglis: Kemet proves that the road to recovery and the road to energy independence are one and the same. And that road runs through SC!
about 11 hours ago



R-TX Michael Burgess: And another read on Healthcaucus.org forum. <http://bit.ly/23XBWR>
about 11 hours ago

Community



Dudeman1962: I am a victim of UK NHS, socialized #hcr is a stupid mess. Do not go there. #hcr09 #tweetcongress #ocra
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sarabialb: @BarackObama - 2,521,000, continue to tell your Congress Reps you want HCR Public Option @OpenCongress @tweetcongress - IMPORTANT
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sarabialb: @BarackObama - 2,520,616, continue to tell your Congress Reps you want HCR Public Option @OpenCongress @tweetcongress - IMPORTANT
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great	maine	saturday
rep	#ifyc09	leaders

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We the Tweeples...
do hereby find, follow, and tweet the Congress of the United States of America.

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Overview

- MongoDB since May, 2009
- Mash-up millions of tweets
- Ruby Driver, MongoMapper

Data Modeling

- Version-controlled schema
- Code defines the schema
- Migrations simplified

Advantages of MongoDB

- Good for API Integration
- Upserts, fast writes
- API data to documents

Advantages of MongoDB

- Modeling associations
 - Embedded document vs Separate Collection
 - Embedded arrays for tagging, simple associations.

Deployment

- 64-bit EC2, Rackspace Cloud
- Single master, snapshots
- Heroku with MongoHQ for smaller, internal

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posted by [calmman](#) 42 days ago
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 Great tool. I use it in combination with KeePass PPC and they both use the same database.


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KeePass for J2ME is a J2ME

Overview

- Goal: Front pages, project pages, download pages stored in single MongoDB document.
- Master / 5–6 Read-only slaves
 - Scaling for reads, reliability.
 - 10x current traffic, with 100x linearly.
- Python Driver with Turbogears

Why Use

Document Model

Powerful, Dynamic Queries

Binary Storage

Scalability

Pre-compiled binaries

Great documentation

Multi-language support



- <http://www.mongodb.org>
- [#mongodb](irc.freenode.net)
- [mongodb-user](#) on google groups
- kyle@10gen.com