

# MONGO FOR JPA DEVELOPERS

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# WHO AM I?

- Java Developer since 1996
- Currently Sr. Software Engineer at Squarespace.com
- Former member of the GlassFish/Grizzly team
  - Implemented the WebSocket support for GlassFish 3.1.x and 3.2
  - JSR 356 (WebSocket) Expert Group Member
- Worked with EE since 2000
  - We built our own ORM

# WHAT IS MONGO?

- Name derives from "humongous" which mean big (for you non-idiomatic English speakers)
- It is a scalable, high-performance, open source NoSQL database
- Written in C++
- Document oriented
- Fully indexable
- Replication and HA
- Map Reduce
- GridFS

# DOCUMENT ORIENTED

- In JPA, one object is typically mapped across multiple cells in one row of a table
  - sometimes multiple objects with embedded entities
- Documents stored in json-style documents
  - <http://bsonspec.org>)
  - BSON adds some "extra" information to documents, like length prefixes, that traversal efficient.

# WHAT DOES A DOCUMENT LOOK LIKE?

db.users.find().pretty()

```
{
  "_id" : ObjectId("50fdb55a18c650918ee414be"),
  "className" : "com.antwerkz.jfokus.mongo.model.User",
  "firstName" : "Jules",
  "lastName" : "Winnfield",
  "email" : "jules@hotmail.com",
  "addresses" : [
    {
      "street" : "1858 N Vermont Ave",
      "city" : "Los Angeles",
      "state" : "CA",
      "zip" : "90027"
    }
  ]
}
```

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# REPLICATION AND HA

- eventually consistent
- replica sets
- sharding

TO THE SHELL!

```
db.product_orders.find({ fulfilled :  
                        true })
```



```
db.product_orders.find({ fulfilled : true }).limit(2).pretty()
{
  "_id" : ObjectId("511205c918c646bccbccd1ad"),
  "className" : "com.antwerkz.jfokus.mongo.model.ProductOrder",
  "orderDate" : ISODate("2012-07-14T22:00:00Z"),
  "userId" : ObjectId("511205c818c646bccbccd18e"),
  "products" : [
    {
      "name" : "Spacesuit",
      "price" : 8693,
      "_id" : ObjectId("511205c918c646bccbccd193")
    },
    {
      "name" : "Computer Repair for Rocket Scientists (Hardcover)",
      "price" : 23.45,
      "_id" : ObjectId("511205c918c646bccbccd195")
    }
  ],
  "fulfilled" : true,
  "total" : 8716.45,
  "size" : 2
}
{
  "_id" : ObjectId("511205c918c646bccbccd1af"),
  "className" : "com.antwerkz.jfokus.mongo.model.ProductOrder",
  "orderDate" : ISODate("2012-01-31T23:00:00Z"),
  "userId" : ObjectId("511205c918c646bccbccd190"),
  "products" : [
    {
      "name" : "Quadtech",
      "price" : 1711.26,
      "_id" : ObjectId("511205c918c646bccbccd1a3")
    },
    {
      "name" : "Biolux",
      "price" : 605.08,
      "_id" : ObjectId("511205c918c646bccbccd19f")
    },
    {
      "name" : "Bigzamnix",
      "price" : 22677.33,
      "_id" : ObjectId("511205c918c646bccbccd1a9")
    }
  ],
  "fulfilled" : true,
  "total" : 24993.670000000002,
  "size" : 3
}
```

```
db.product_orders.find({ fulfilled :  
    true, size : 3 })
```

```
db.product_orders.find({ fulfilled : true, size : 3 }).limit(2).pretty()
{
  "_id" : ObjectId("511205c918c646bccbccd1af"),
  "className" : "com.antwerkz.jfokus.mongo.model.ProductOrder",
  "orderDate" : ISODate("2012-01-31T23:00:00Z"),
  "userId" : ObjectId("511205c918c646bccbccd190"),
  "products" : [
    {
      "name" : "Quadtech",
      "price" : 1711.26,
      "_id" : ObjectId("511205c918c646bccbccd1a3")
    },
    {
      "name" : "Biolux",
      "price" : 605.08,
      "_id" : ObjectId("511205c918c646bccbccd19f")
    },
    {
      "name" : "Bigzamnix",
      "price" : 22677.33,
      "_id" : ObjectId("511205c918c646bccbccd1a9")
    }
  ],
  "fulfilled" : true,
  "total" : 24993.670000000002,
  "size" : 3
}
```

```
db.product_orders.find({ "products.name"  
  : { $in : [ "Quadtech", "Biolux" ] } })
```

```
db.product_orders.find({ "products.name" : { $in : [ "Quadtech", "Biolux" ] } }).limit(2).pretty()
{
  "_id" : ObjectId("511205c918c646bccbccd1af"),
  "className" : "com.antwerkz.jfokus.mongo.model.ProductOrder",
  "orderDate" : ISODate("2012-01-31T23:00:00Z"),
  "userId" : ObjectId("511205c918c646bccbccd190"),
  "products" : [
    {
      "name" : "Quadtech",
      "price" : 1711.26,
      "_id" : ObjectId("511205c918c646bccbccd1a3")
    },
    {
      "name" : "Biolux",
      "price" : 605.08,
      "_id" : ObjectId("511205c918c646bccbccd19f")
    },
    {
      "name" : "Bigzamnix",
      "price" : 22677.33,
      "_id" : ObjectId("511205c918c646bccbccd1a9")
    }
  ],
  "fulfilled" : true,
  "total" : 24993.670000000002,
  "size" : 3
}
```

```
db.product_orders.find( { "products.name"  
                          : "Quadtech" } )
```

```
db.product_orders.find({ "products.name" : "Quadtech" }).limit(2).pretty()
{
  "_id" : ObjectId("511205c918c646bccbccd1af"),
  "className" : "com.antwerkz.jfokus.mongo.model.ProductOrder",
  "orderDate" : ISODate("2012-01-31T23:00:00Z"),
  "userId" : ObjectId("511205c918c646bccbccd190"),
  "products" : [
    {
      "name" : "Quadtech",
      "price" : 1711.26,
      "_id" : ObjectId("511205c918c646bccbccd1a3")
    },
    {
      "name" : "Biolux",
      "price" : 605.08,
      "_id" : ObjectId("511205c918c646bccbccd19f")
    },
    {
      "name" : "Bigzamnix",
      "price" : 22677.33,
      "_id" : ObjectId("511205c918c646bccbccd1a9")
    }
  ],
  "fulfilled" : true,
  "total" : 24993.670000000002,
  "size" : 3
}
```

```
db.product_orders.find({ $or : [ { size  
    : 3 }, {fulfilled : false } ] })
```



```
db.product_orders.find({ $or : [ { size : 3 }, {fulfilled : false } ] }).limit(2).pretty()
{
  "_id" : ObjectId("511205c918c646bccbccd1af"),
  "className" : "com.antwerkz.jfokus.mongo.model.ProductOrder",
  "orderDate" : ISODate("2012-01-31T23:00:00Z"),
  "userId" : ObjectId("511205c918c646bccbccd190"),
  "products" : [
    {
      "name" : "Quadtech",
      "price" : 1711.26,
      "_id" : ObjectId("511205c918c646bccbccd1a3")
    },
    {
      "name" : "Biolux",
      "price" : 605.08,
      "_id" : ObjectId("511205c918c646bccbccd19f")
    },
    {
      "name" : "Bigzamnix",
      "price" : 22677.33,
      "_id" : ObjectId("511205c918c646bccbccd1a9")
    }
  ],
  "fulfilled" : true,
  "total" : 24993.670000000002,
  "size" : 3
}
```

```
db.product_orders.find({ size : 3 })
```

```
db.product_orders.find({ size : 3 }).pretty()
{
  "_id" : ObjectId("511205c918c646bccbccd1af"),
  "className" : "com.antwerkz.jfokus.mongo.model.ProductOrder",
  "orderDate" : ISODate("2012-01-31T23:00:00Z"),
  "userId" : ObjectId("511205c918c646bccbccd190"),
  "products" : [
    {
      "name" : "Quadtech",
      "price" : 1711.26,
      "_id" : ObjectId("511205c918c646bccbccd1a3")
    },
    {
      "name" : "Biolux",
      "price" : 605.08,
      "_id" : ObjectId("511205c918c646bccbccd19f")
    },
    {
      "name" : "Bigzamnix",
      "price" : 22677.33,
      "_id" : ObjectId("511205c918c646bccbccd1a9")
    }
  ],
  "fulfilled" : true,
  "total" : 24993.670000000002,
  "size" : 3
}
```

```
db.product_orders.update({ size : 3 }, {  
    $set : { "total" : 400 } } ) ;  
db.product_orders.find({ size : 3 })
```

```
db.product_orders.update({ size : 3 }, { $set : { "total" : 400 } } ) ; db.product_orders.find({ size : 3 }).pretty()
{
  "_id" : ObjectId("511203bf18c6570e861aa49d"),
  "className" : "com.antwerkz.jfokus.mongo.model.ProductOrder",
  "orderDate" : ISODate("2012-01-31T23:00:00Z"),
  "userId" : ObjectId("511203bf18c6570e861aa47e"),
  "products" : [
    {
      "name" : "Quadtech",
      "price" : 1711.26,
      "_id" : ObjectId("511203bf18c6570e861aa491")
    },
    {
      "name" : "Biolux",
      "price" : 605.08,
      "_id" : ObjectId("511203bf18c6570e861aa48d")
    },
    {
      "name" : "Bigzamnix",
      "price" : 22677.33,
      "_id" : ObjectId("511203bf18c6570e861aa497")
    }
  ],
  "fulfilled" : true,
  "total" : 400,
  "size" : 3
}
```

```
db.product_orders.update({ size : 3 }, {  
  $push : { "baubles" : { color : "red" }  
            } } )
```

```
db.product_orders.update({ size : 3 }, { $push : { "baubles" : { color : "red" } } } )
```

```
db.product_orders.find({ size : 3 })
```

```
db.product_orders.find({ size : 3 }).pretty()
{
  "_id" : ObjectId("511203bf18c6570e861aa49d"),
  "baubles" : [
    {
      "color" : "red"
    }
  ],
  "className" : "com.antwerkz.jfokus.mongo.model.ProductOrder",
  "fulfilled" : true,
  "orderDate" : ISODate("2012-01-31T23:00:00Z"),
  "products" : [
    {
      "name" : "Quadtech",
      "price" : 1711.26,
      "_id" : ObjectId("511203bf18c6570e861aa491")
    },
    {
      "name" : "Biolux",
      "price" : 605.08,
      "_id" : ObjectId("511203bf18c6570e861aa48d")
    },
    {
      "name" : "Bigzamnix",
      "price" : 22677.33,
      "_id" : ObjectId("511203bf18c6570e861aa497")
    }
  ],
  "size" : 3,
  "total" : 400,
  "userId" : ObjectId("511203bf18c6570e861aa47e")
}
```

TO THE CODE!



# LINKS

- <http://www.mongodb.org/> Mongo Homepage
- <http://code.google.com/p/morphia/> Morphia homepage
- <https://github.com/jmkgreen/morphia> Morphia fork
- <http://jongo.org> Jongo
- Disclaimer: My Stuff
  - <https://github.com/evanchooly/critter> critter
  - <https://github.com/evanchooly/ophelia> Ophelia

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