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"
}
]
}
```

REPLICATION AND HA

- eventually consistent
- replica sets
- sharding

TO THE SHELL!

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

```
                "price" : 8693,
                "_id" : ObjectId("511222d218c66ceb01802c5c")
        },
        {

                "name" : "Computer Repair for Rocket Scientists (Hardcover)",
                "price" : 23.45,
                "_id" : ObjectId("511222d218c66ceb01802c5e")
        }
],
"fulfilled" : true,
"total" : 8716.45,
"size" : 2
}
{

        "_id" : ObjectId("511222d218c66ceb01802c78"),
        "className" : "com.antwerkz.jfokus.mongo.model.ProductOrder",
        "orderDate" : ISODate("2012-01-31T23:00:00Z"),
        "userId" : ObjectId("511222d218c66ceb01802c59"),
        "products" : [
                {
                        "name" : "Quadtech",
                        "price" : 1711.26,
                        "_id" : ObjectId("511222d218c66ceb01802c6c")
                },
                {

                        "name" : "Biolux",
                        "price" : 605.08,
                        "_id" : ObjectId("511222d218c66ceb01802c68")
                },
                {

                        "name" : "Bigzamnix",
                        "price" : 22677.33,
                        "_id" : ObjectId("511222d218c66ceb01802c72")
                }
        ],
        "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("511222d218c66ceb01802c78"),
        "className" : "com.antwerkz.jfokus.mongo.model.ProductOrder",
        "orderDate" : ISODate("2012-01-31T23:00:00Z"),
        "userId" : ObjectId("511222d218c66ceb01802c59"),
        "products" : [
                {
                        "name" : "Quadtech",
                        "price" : 1711.26,
                        "_id" : ObjectId("511222d218c66ceb01802c6c")
                },
                {
                        "name" : "Biolux",
                        "price" : 605.08,
                        "_id" : ObjectId("511222d218c66ceb01802c68")
                },
                {
                        "name" : "Bigzamnix",
                        "price" : 22677.33,
                        "_id" : ObjectId("511222d218c66ceb01802c72")
                }
        ],
        "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("511222d218c66ceb01802c78"),
        "className" : "com.antwerkz.jfokus.mongo.model.ProductOrder",
        "orderDate" : ISODate("2012-01-31T23:00:00Z"),
        "userId" : ObjectId("511222d218c66ceb01802c59"),
        "products" : [
                {
                        "name" : "Quadtech",
                        "price" : 1711.26,
                        "_id" : ObjectId("511222d218c66ceb01802c6c")
                },
                {
                        "name" : "Biolux",
                        "price" : 605.08,
                        "_id" : ObjectId("511222d218c66ceb01802c68")
                },
                {
                        "name" : "Bigzamnix",
                        "price" : 22677.33,
                        "_id" : ObjectId("511222d218c66ceb01802c72")
                }
        ],
        "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("511222d218c66ceb01802c78"),
        "className" : "com.antwerkz.jfokus.mongo.model.ProductOrder",
        "orderDate" : ISODate("2012-01-31T23:00:00Z"),
        "userId" : ObjectId("511222d218c66ceb01802c59"),
        "products" : [
                {
                        "name" : "Quadtech",
                        "price" : 1711.26,
                        "_id" : ObjectId("511222d218c66ceb01802c6c")
                },
                {
                        "name" : "Biolux",
                        "price" : 605.08,
                        "_id" : ObjectId("511222d218c66ceb01802c68")
                },
                {
                        "name" : "Bigzamnix",
                        "price" : 22677.33,
                        "_id" : ObjectId("511222d218c66ceb01802c72")
                }
        ],
        "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("511222d218c66ceb01802c78"),
        "className" : "com.antwerkz.jfokus.mongo.model.ProductOrder",
        "orderDate" : ISODate("2012-01-31T23:00:00Z"),
        "userId" : ObjectId("511222d218c66ceb01802c59"),
        "products" : [
                {
                        "name" : "Quadtech",
                        "price" : 1711.26,
                        "_id" : ObjectId("511222d218c66ceb01802c6c")
                },
                {
                        "name" : "Biolux",
                        "price" : 605.08,
                        "_id" : ObjectId("511222d218c66ceb01802c68")
                },
                {
                        "name" : "Bigzamnix",
                        "price" : 22677.33,
                        "_id" : ObjectId("511222d218c66ceb01802c72")
                }
        ],
        "fulfilled" : true,
        "total" : 24993.670000000002,
        "size" : 3
}
```

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

```
db.product_orders.find({ size : 3 }).pretty()
{
        "_id" : ObjectId("511222d218c66ceb01802c78"),
        "className" : "com.antwerkz.jfokus.mongo.model.ProductOrder",
        "orderDate" : ISODate("2012-01-31T23:00:00Z"),
        "userId" : ObjectId("511222d218c66ceb01802c59"),
        "products" : [
                {
                        "name" : "Quadtech",
                        "price" : 1711.26,
                        "_id" : ObjectId("511222d218c66ceb01802c6c")
                },
                {
                        "name" : "Biolux",
                        "price" : 605.08,
                        "_id" : ObjectId("511222d218c66ceb01802c68")
                },
                {
                        "name" : "Bigzamnix",
                        "price" : 22677.33,
                        "_id" : ObjectId("511222d218c66ceb01802c72")
                }
        ],
        "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("511222d218c66ceb01802c78"),
        "className" : "com.antwerkz.jfokus.mongo.model.ProductOrder",
        "orderDate" : ISODate("2012-01-31T23:00:00Z"),
        "userId" : ObjectId("511222d218c66ceb01802c59"),
        "products" : [
                {
                        "name" : "Quadtech",
                        "price" : 1711.26,
                        "_id" : ObjectId("511222d218c66ceb01802c6c")
                },
                {
                        "name" : "Biolux",
                        "price" : 605.08,
                        "_id" : ObjectId("511222d218c66ceb01802c68")
                },
                {
                        "name" : "Bigzamnix",
                        "price" : 22677.33,
                        "_id" : ObjectId("511222d218c66ceb01802c72")
                }
        ],
        "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("511222d218c66ceb01802c78"),
        "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("511222d218c66ceb01802c6c")
                },
                {
                        "name" : "Biolux",
                        "price" : 605.08,
                        "_id" : ObjectId("511222d218c66ceb01802c68")
                },
                {
                        "name" : "Bigzamnix",
                        "price" : 22677.33,
                        "_id" : ObjectId("511222d218c66ceb01802c72")
                }
        ],
        "size" : 3,
        "total" : 400,
        "userId" : ObjectId("511222d218c66ceb01802c59")
}
```

TO THE CODE!

LINKS

- **https://github.com/evanchooly/mongo4jpadevs**
- **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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