GETTING STARTED WITH MONGODB FOR CFML DEVELOPERS

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Why you're here

- Hear about what MongoDB is

- See how easy it is to install for development

- Learn how to start putting data in and getting data out with Adobe ColdFusion and Railo CFML engines

- Hopefully **not** expecting to know everything there is to know about MongoDB when you leave here today

  - Session is designed to "whet your appetite"

Obligatory "About Me" slide

- Began experimenting with HTML in 1997 after the birth of our twins while on active duty with the U.S. Air Force

- Staff developer for a company headquartered in San Jose, CA for 8 1/2 years

- Began with Allaire ColdFusion 4.5 in 2000 as part of a Spectra 1.0 project

- Have developed on every Allaire/Macromedia/Adobe ColdFusion version since then *

- Have done several projects of varying sizes with Railo

- Independent consultant since 1999 working with clients of all sizes across the U.S. building applications on multiple CFML engines and versions

- Contributing partner and build master for the Model-Glue MVC framework for CFML

- Also enjoy shooting, coaching basketball, amateur (HAM) radio and video games

What is MongoDB?

Long, boring definition

[1]MongoDB is an open-source document database, and the leading NoSQL database. Written in C++, MongoDB features document-oriented storage, full index support, replication and high availability...
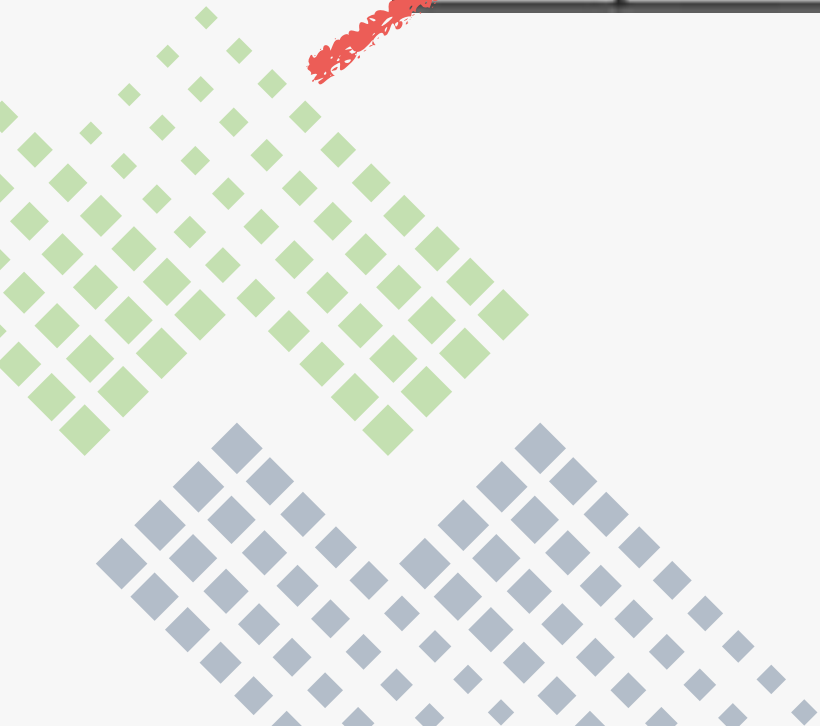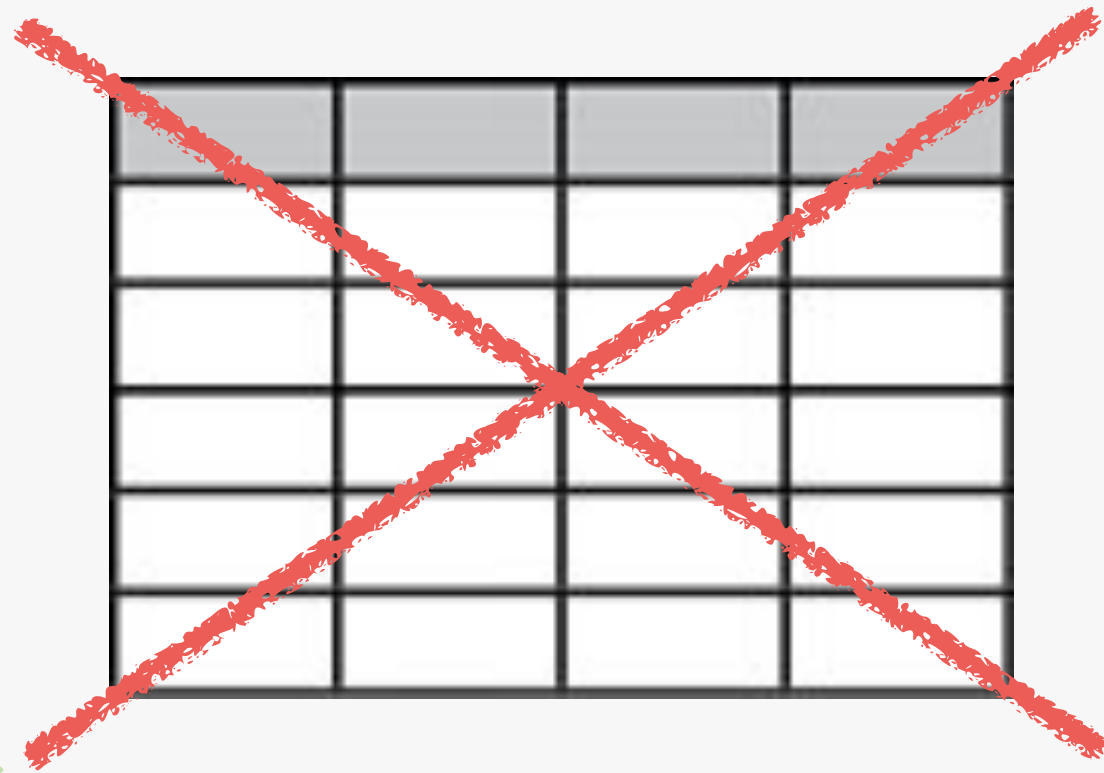
ZZZZZZZZZZZ...

[1] www.mongodb.org

Usable definition

MongoDB is a different way of storing data than what we've been used to with relational databases.

DIFFERENT HOW!?!?

TABLE/ROW vs DOCUMENT

Document-Oriented Storage

```
{
    "city" : "MINNEAPOLIS",
    "latitude": 44.967345,
    "longitude": -93.282841,
    "pop" : 14098,
    "state" : "MN",
    "_id" : "55403"

}
```
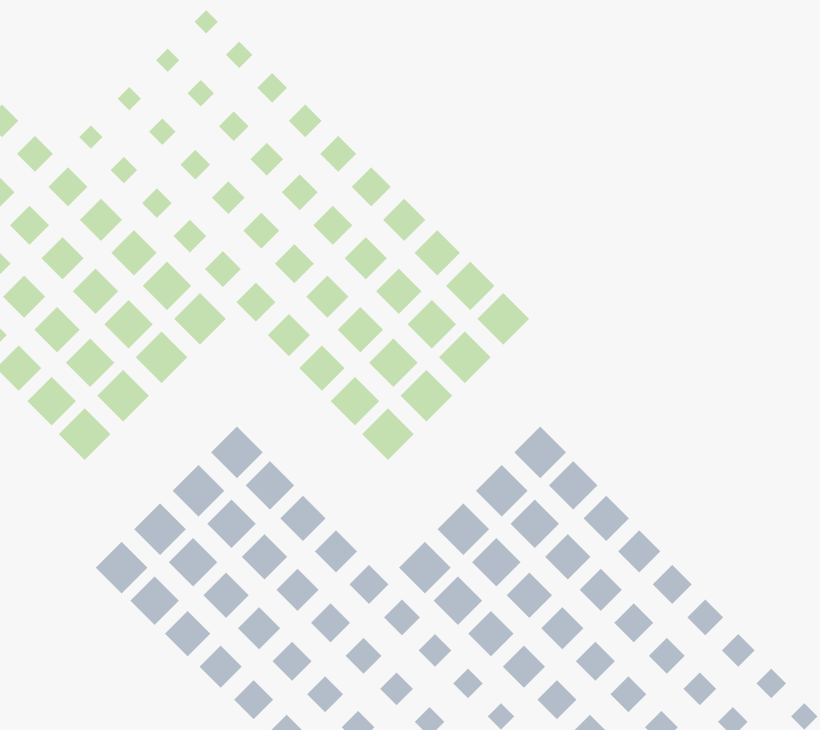
OTHER DIFFERENCES

"Schema-less"*

MongoDB doesn't care if not all documents in a collection have the same fields

Embed Data vs Foreign Key Linkage

MongoDB preference is to embed related data as a nested document

Document-Oriented Storage

```
{
    "city" : "MINNEAPOLIS",
    "loc" : [
        -93.282841,
        44.967345
    ],
    "postoffice": {
        "address1": "100 S 1ST ST",
        "phone": "612-349-4713",
        "tty": "877-889-2457"
    },
    "pop" : 14098,
    "state" : "MN",
    "_id" : "55403"
}
```

OTHER DIFFERENCES

"Schema-less"*

MongoDB doesn't care if not all documents in a collection have the same fields

Embed Data vs Foreign Key Linkage

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Easily Replicated

Easily replicate data across 3+ MongoDB instances for fault tolerance and performance improvements

WHY MONGODB?

THE GOOD, THE BAD, THE…

- It's FAST

- It's FLEXIBLE

- It's FORGIVING

- No transactions

- No JOINs

- No data write guarantee *

- No documents over 16MB

- No direct cross-over from SQL language most of us are used to

Installation

MAC / *NIX INSTALLATIONS

Using A Package Manager

```
brew install mongodb

yum install mongo-10gen mongo-10gen-server

apt-get install mongodb-10gen
```

Download & Unzip

http://www.mongodb.org/downloads

WINDOWS INSTALLATIONS

Download & Unzip

http://www.mongodb.org/downloads

Using Chocolatey Package Manager

```
cinst mongodb
```

Install as a Windows Service

```
C:\mongodb\bin\mongod.exe
    --config C:\mongodb\mongod.cfg --install
```

OK, NOW WHAT?

Hint: Run It!

Mac / *nix

```
mongod
```

Windows

```
c:\mongodb\bin\mongod.exe
```

SUCCESS! Or, wait a minute….

Whoops

DATA DIRECTORIES

MongoDB does not auto create your data directories

Mac / *nix
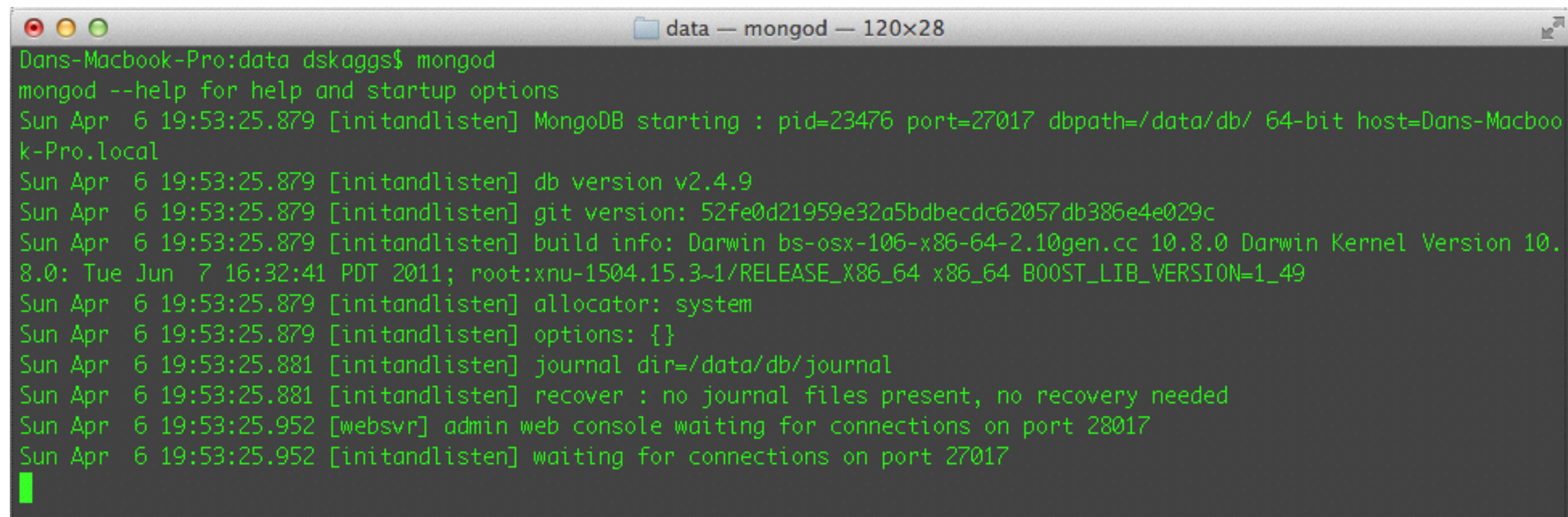
```
/data/db
```

Windows

```
c:\data\db
```

Use a Custom Data Directory

```
mongod --dbpath /path/to/my/folder
mongod.exe --dbpath "d:\path\to\my\folder"
```

Maybe this time…..

SUCCESS!

GETTING CONNECTED

MongoDB Clients

- Mongo Shell

- RoboMongo

- MongoVue

- Railo Extension

- CFMongoDB

Mongo Shell

Railo MongoDB Extension

CFMongoDB Installation

- Download CFMongoDB from GitHub (https://github.com/marcesher/cfmongodb)

- Extract to your web root or to an external location and set up a mapping

- Copy the following files from the /lib folder to a folder that's in the class path for your CFML server (location varies by engine / version)

  - mongodb[version].jar

  - cfmongodb.jar

- Restart your CFML server
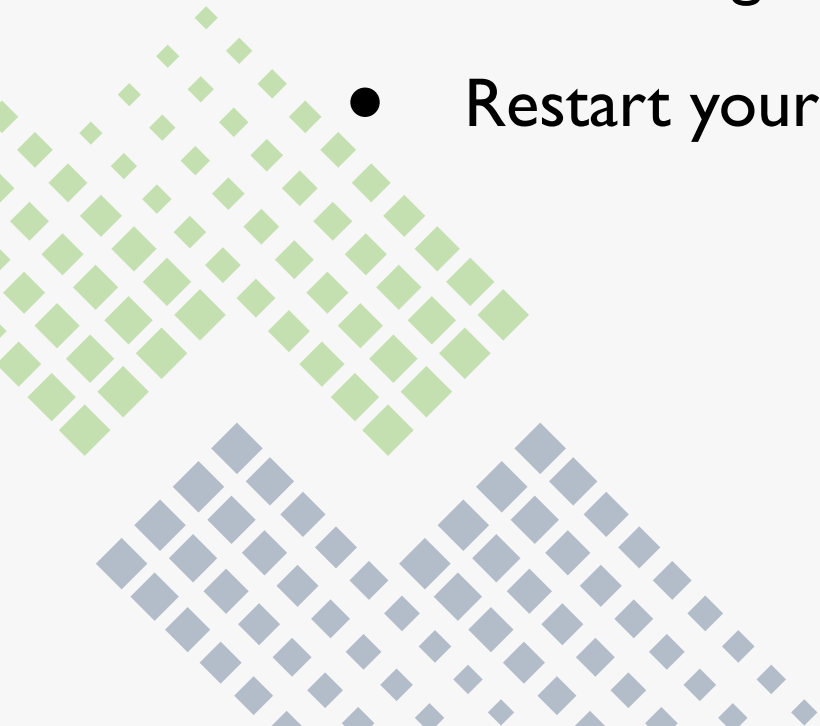
ABOUT THE DATA

MongoDB version of Northwind database

customers
orders
orderdetails
products
suppliers
….more….

Connecting Your Code

Railo Extension

```
application.mongo=MongoDBConnect("northwind","localhost", 27017);
```

CFMongoDB

```
mongoConfig = createObject(
                          'component',
                          'cfmongodb.core.MongoConfig'
                ).init(dbName="northwind");


application.mongo = createObject(
                          'component',
                          'cfmongodb.core.MongoClient'
                ).init(mongoConfig);
```

TO THE DATA!

findOne()

```
db.customers.findOne()
{

    "_id" : ObjectId("51ba0970ae4ad8cc43bb95e3"),
    "CustomerID" : "ALFKI",
    "CompanyName" : "Alfreds Futterkiste",
    "ContactName" : "Maria Anders",
    "ContactTitle" : "Sales Representative",
    "Address" : "Obere Str. 57",
    "City" : "Berlin",
    "Region" : "NULL",
    "PostalCode" : 12209,
    "Country" : "Germany",
    "Phone" : "030-0074321",
    "Fax" : "030-0076545"

}
```

CFMongoDB   Railo Extension

find()

```
> db.customers.find({'Country':'Germany'}).pretty()
{
    "_id" : ObjectId("51ba0970ae4ad8cc43bb9638"),
    "CustomerID" : "WANDK",
    "CompanyName" : "Die Wandernde Kuh",
    "ContactName" : "Rita Müller",
    "ContactTitle" : "Sales Representative",
    "Address" : "Adenauerallee 900",
    "City" : "Stuttgart",
    "Region" : "NULL",
    "PostalCode" : 70563,
    "Country" : "Germany",
    "Phone" : "0711-020361",
    "Fax" : "0711-035428"
}

+ 10 more records
```

CFMongoDB   Railo Extension

find() - Nested Data

```
> db.people.find( {'KIDS.DESCRIPTION': 'fun'} ).pretty()

{

    "_id" : ObjectId("5373f52003643329a12b70dc"),
    "COUNTER" : 1,
    "NAME" : "Cool Person 1",
    "BIKE" : "Specialized",
    "SPOUSE" : "Cool Spouse 1",
    "KIDS" : [{              {
                "NAME" : "kid 1",
                "AGE" : 47,
                "DESCRIPTION" : "fun",
                "HAIR" : "strawberry"
        }],
    "TS" : ISODate("2014-05-14T22:58:40.790Z")
}
```

CFMongoDB Search DSL

$eq   startsWith

$gt   endsWith

$gte   exists

$lte   regex

$in   before

                    after

Limiting Returned Data

```
> db.customers.find(
                    {'Country':'Germany'},
                    {'ContactName': 1, 'Phone': 1, 'Fax': 1}
                    ).pretty();


{
     "_id" : ObjectId("51ba0970ae4ad8cc43bb95e3"),
     "ContactName" : "Maria Anders",
     "Phone" : "030-0074321",
     "Fax" : "030-0076545"
}

+ 10 more records
```

CFMongoDB   Railo Extension

Adding A Record

```
> newCustomer = {
                "CustomerID" : "TEST123",
                "CompanyName" : "Kevin's Klown Kostumes",
                "ContactName" : "Kevin Kennedy",
                "ContactTitle" : "Owner",
                "Address" : "Jagdhaus 77",
                "City" : "Kaiserslautern",
                "Region" : "NULL",
                "PostalCode" : 67661,
                "Country" : "Germany",
                "Phone" : "0251-037483",
                "Fax" : "0251-035112"
        };
> db.customers.save( newCustomer );
```

CFMongoDB   Railo Extension

Deleting A Record

MongoDB Shell

```
> db.customers.remove({"CustomerID" : "TEST123"});
```

CFMongoDB

```
collection = application.mongo.getDBCollection( "customers" );
collection.remove({'CustomerID': 'TEST123'});
```

Railo Extension

```
application.mongo.customers.remove({'CustomerID': 'TEST123'});
```

Distinct Records

MongoDB Shell

```
> db.employees.distinct('LastName')
```

CFMongoDB

```
collection = application.mongo.getDBCollection( "employees" );
names = collection.distinct('LastName');
```

Railo Extension

```
names = application.mongo.employees.distinct('LastName');
```

Counting Records

MongoDB Shell

```
> db.employees.count();
12

> db.employees.count( {'LastName': 'London'} )
2
```

CFMongoDB

```
collection = application.mongo.getDBCollection( "employees" );
names = collection.count();

names = collection.count({'LastName': 'London'});
```

Railo Extension

```
application.mongo.employees.find().count();
application.mongo.employees.find({'LastName': 'London'}).count();
```

REPORTING!?!?!

Products Document

```
> db.products.find({'ProductID': 77}).pretty()
{
    "_id" : ObjectId("51ba0971ae4ad8cc43bba270"),
    "ProductID" : 77,
    "ProductName" : "Original Frankfurter grüne Soße",
    "SupplierID" : 12,
    "CategoryID" : 2,
    "QuantityPerUnit" : "12 boxes",
    "UnitPrice" : 13,
    "UnitsInStock" : 12,
    "UnitsOnOrder" : 0,
    "ReorderLevel" : 25,
    "Discontinued" : 0
}
```

Products On Order

```
> db.products.aggregate([
    { "$match": { Discontinued: 0, UnitsOnOrder: {'$gt': 0} } }
]);

> {"result" : [
        {    "_id" : ObjectId("51ba0971ae4ad8cc43bba225"),
            "ProductID" : 2,
            "ProductName" : "Chang",
            "SupplierID" : 1,
            "CategoryID" : 1,
            "QuantityPerUnit" : "24 - 12 oz bottles",
            "UnitPrice" : 19,
            "UnitsInStock" : 17,
            "UnitsOnOrder" : 40,
            "ReorderLevel" : 25,
            "Discontinued" : 0
        },
      … 16 other products ….
]}
```

<u>CFMongoDB</u>   <u>Railo Extension</u>

Products On Order v2

```
> db.products.aggregate([
    { "$match": { Discontinued: 0, UnitsOnOrder: {'$gt': 0} } }
    , { "$project": { _id: 0, SupplierID: 1, ProductID: 1
                , TotalOrder: { $multiply:["$UnitPrice", "$UnitsOnOrder"] } } }
]);

> {"result" : [
        {
            "ProductID" : 2,
            "SupplierID" : 1,
            "TotalOrder" : 760
        },
        {

            "ProductID" : 3,
            "SupplierID" : 1,
            "TotalOrder" : 700
        }
    … 15 other products ….
]}
```

CFMongoDB   Railo Extension

Products On Order v3

```
> db.products.aggregate([
    { $match: {Discontinued: 0, UnitsOnOrder: {'$gt': 0} } }
  , { $project: { _id: 0, SupplierID: 1, ProductID: 1
                , TotalOrder: { $multiply:['$UnitPrice', '$UnitsOnOrder'] } } }
  , { $group : {_id : "$SupplierID", SupplierTotal : { $sum : '$TotalOrder'} } }
  , { $sort : {_id: 1} }
]);
> {"result" : [
        {
            "_id" : 1,
            "SupplierTotal" : 1460
        },
        {
            "_id" : 2,
            "SupplierTotal" : 1700
        },
    … 12 other suppliers ….
]}
```

CFMongoDB   ~~Railo Extension~~

Product Reorders Needed

```
> db.products.aggregate([
    { "$project": {
            _id: 0,
            SupplierID: 1,
            ProductID: 1,
            Discontinued: 1,
            UnitsOnOrder: 1,
            StockRatio: { $subtract:["$UnitsInStock", "$ReorderLevel"] }
        }
    }
    , { "$match": { Discontinued: 0
                , UnitsOnOrder: 0
                , StockRatio: {'$lte': 0}
                }
        }
])
```

CFMongoDB   Railo Extension

WHAT'S NEXT?

Offerings

M101J: MongoDB for Java Developers

M101JS: MongoDB for Node.js Developers

M101P: MongoDB for Developers

M102: MongoDB for DBAs

M202: MongoDB Advanced Deployment and Operations

Shard 0   Shard 1   Shard 2   Shard M - 1

Resources

- MongoDB University

- CFMongoDB GitHub Repo Wiki

- Railo Google Group

- Stack Overflow
  http://stackoverflow.com/questions/tagged/mongodb

- Free Support Forum
  http://groups.google.com/group/mongodb-user

- IRC Chat and Support
  irc://irc.freenode.net/#mongodb

- Commercial Support

Questions?

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