

Présentation de MongoDB

20 novembre 2018

Sponsorisé par

sopra  steria





Bonjour !

```
{  
  "fullname": "Bertrand THOMAS",  
  "shortResume": "Ingénieur génie logiciel, 15 ans d'expérience",  
  "profile": "Développeur avec forte contagion test & système",  
  "topFiveTechno": [".NET Core/C#", "MongoDB", "Angular", "Symfony", "VSTS"],  
  "knownRelationalDb": ["Oracle", "MySQL", "PostgreSQL", "SQL Server"],  
  "currentPosition": "Directeur des Développements Logiciels @Sogetrel",  
  "hobbies": "Montagne, lecture, films, séries, voyages"  
}
```

Agenda



- ◆ Qu'est-ce que MongoDB ?
- ◆ Fonctionnalités de base
- ◆ Ecosystème
- ◆ Démo
- ◆ Premiers pas

1.

Qu'est-ce que MongoDB ?

La technologie, la société

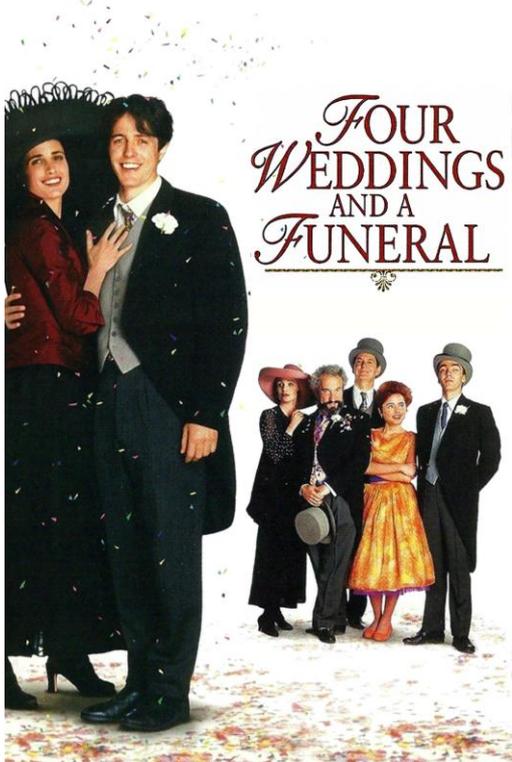


Flexibilité & scalabilité

Le stockage avec un modèle relationnel est-il vraiment le meilleur choix ?

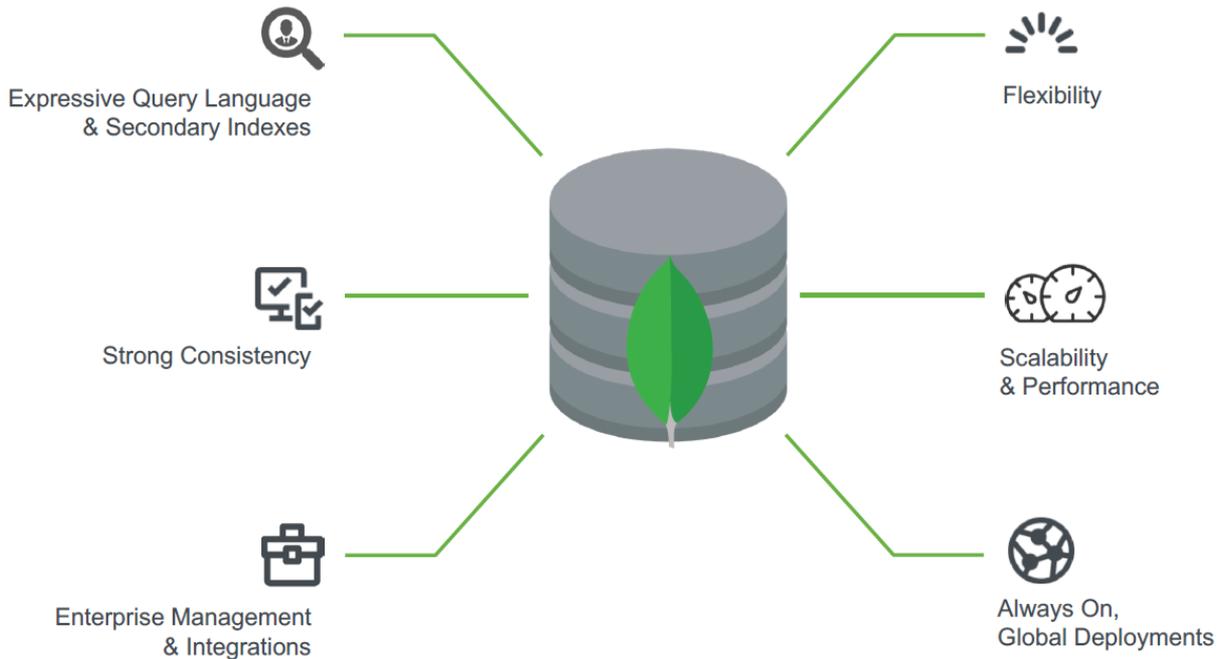


Document Model



```
{
  "imdbId": "tt0109831",
  "originalTitle": "Four Weddings and a Funeral",
  "movieDirector": "Mike Newell",
  "titles": [
    {
      "lang": "fr-FR",
      "title": "4 mariages et 1 enterrement"
    }
  ],
  "mainActors": [
    {
      "imdbId": "nm0000510",
      "fullName": "Andie MacDowell"
    },
    {
      "imdbId": "nm0000424",
      "fullName": "Hugh Grant"
    }
  ],
  "imdbRate": 7.1,
  "imdbVotes": 122395
}
```

Le meilleur du relationnel et du NoSQL



La société MongoDB



La société en quelques dates :

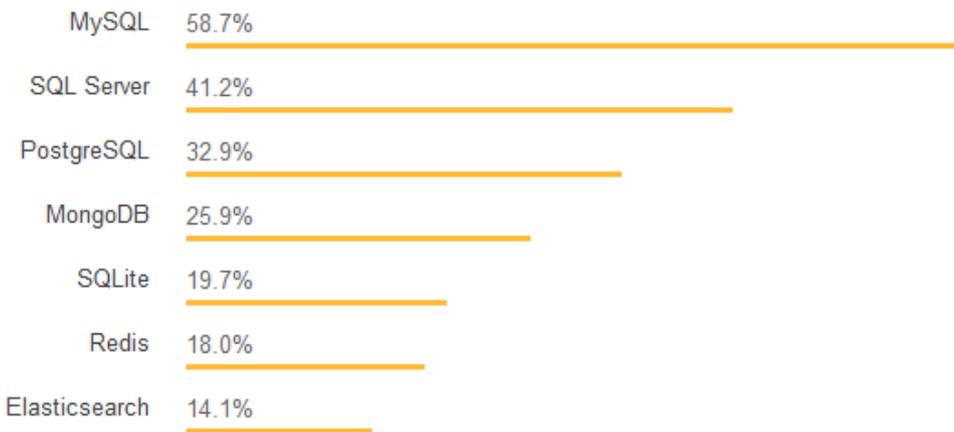
- ◆ **2007** : Création de la société (appelée 10gen) par l'équipe derrière DoubleClick
- ◆ **2010** : Passage en open source avec une offre commerciale (Enterprise)
- ◆ **2016** : Service dans le Cloud Atlas
- ◆ **2017** : Version 3.6 avec les Change Streams
- ◆ **2017** : Introduction en bourse
- ◆ **2018** : Version 4.0 avec les transactions (ACID)
- ◆ **2018** : Plateforme serverless Stitch

Leader sur le marché



Etude stackoverflow 2018 :

- 1^{er} NoSQL
- 4^{ème} Général



Une Roadmap qui tient toutes ses promesses



MongoDB 3.0	MongoDB 3.2	MongoDB 3.4	MongoDB 3.6	MongoDB 4.0	MongoDB 4.2
NEW STORAGE ENGINE (WIREDTIGER)	ENHANCED REPLICATION PROTOCOL, STRICTER CONSISTENCY & DURABILITY	SHARD MEMBERSHIP AWARENESS	CONSISTENT SECONDARY READS IN SHARDED CLUSTERS	REPLICA-SET TRANSACTIONS	SHARDED TRANSACTIONS
	WiredTiger default storage engine		Logical sessions	Storage support for prepared transactions	Transaction - compatible chunk migration
	Config server manageability improvements		Retryable writes	Make catalog timestamp-aware	More extensive WiredTiger repair
	Read concern majority		Causal Consistency	Replica set point-in-time reads	Transaction manager
			Cluster-wide logical clock	Recoverable rollback via WT checkpoints	Global point-in-time reads
			Storage API changes to use timestamps	Recover to a timestamp	Oplog applier prepare support for transactions
			Read concern majority feature always available	Sharded catalog improvements	...
			Collection catalog versioning		
			Make collection drops two phase		
			UUIDs in sharding		
			Fast in-place updates to large documents in WT		

Legend

DONE

IN PROGRESS

PLANNED

TRANSACTION EPIC

2.

Fonctionnalités de base

Les capacités « by-design »



BSON (Binary JSON)



MongoDB stocke les données au format [BSON](#).

BSON étend le modèle JSON :

- ◆ Ajout de types de données (par exemple Date)
- ◆ Champs ordonnés
- ◆ Meilleure performance

Replica set

Client Application
Driver

Writes Reads

Primary

Replication

Replication

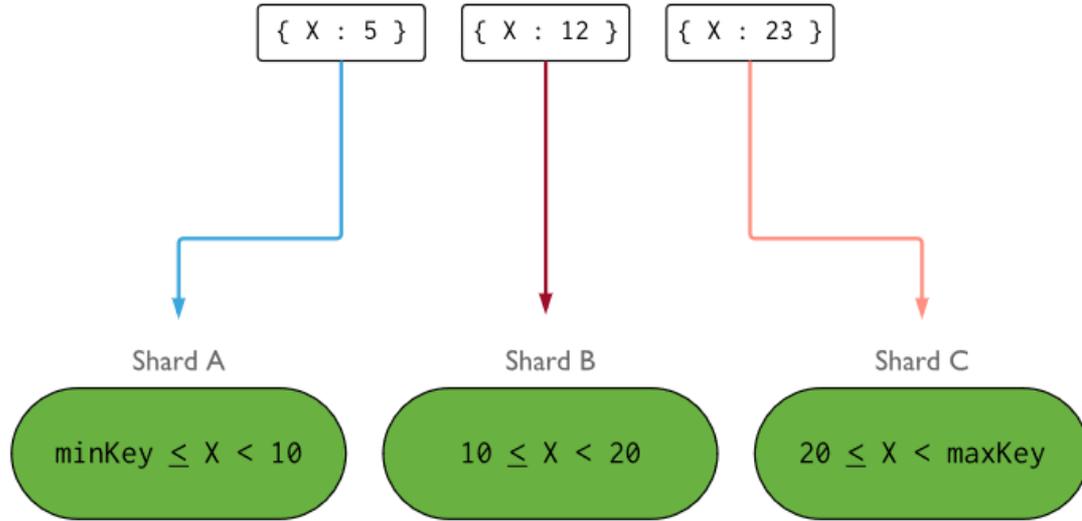
Secondary

Secondary



“A replica set in MongoDB is a group of mongod processes that provide redundancy and high availability.”

Sharding



“Sharding is a method for distributing data across multiple machines. MongoDB uses sharding to support deployments with very large data sets and high throughput operations.”

Aggregation pipeline



Collection
↓
db.orders.aggregate([
 \$match stage → { \$match: { status: "A" } },
 \$group stage → { \$group: { _id: "\$cust_id", total: { \$sum: "\$amount" } } }
])

{ cust_id: "A123", amount: 500, status: "A" }
{ cust_id: "A123", amount: 250, status: "A" }
{ cust_id: "B212", amount: 200, status: "A" }
{ cust_id: "A123", amount: 300, status: "D" }

orders

→ \$match

{ cust_id: "A123", amount: 500, status: "A" }
{ cust_id: "A123", amount: 250, status: "A" }
{ cust_id: "B212", amount: 200, status: "A" }

→ \$group

Results
{ _id: "A123", total: 750 }
{ _id: "B212", total: 200 }

Change streams (3.6)



```
{  
  _id: <resumeToken>,  
  operationType: 'update'  
  ...  
}
```

collection.watch()

MONGODB
WORLD'18

#MDBW18

Transactions (4.0)



```
try (ClientSession clientSession = client.startSession()) {  
    clientSession.startTransaction();  
    collection.insertOne(clientSession, docOne);  
    collection.insertOne(clientSession, docTwo);  
    clientSession.commitTransaction();  
}
```

Multi-document ACID transactions!

3.

Ecosystème

L'hébergement, les outils, les extensions



Compass



MongoDB Compass - localhost:27017/demoZip.zips

localhost:27017 STANDALONE MongoDB 4.0.4 Community

demoZip.zips

DOCUMENTS 29.4k TOTAL SIZE 2.6MB AVG. SIZE 95B INDEXES 1 TOTAL SIZE 308.0KB AVG. SIZE 308.0KB

Documents Aggregations **Schema** Explain Plan Indexes Validation

FILTER { field: 'value' } OPTIONS ANALYZE RESET

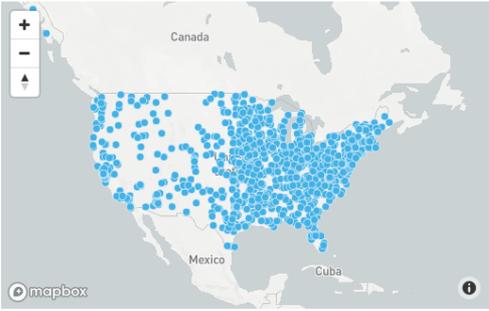
Query returned 29353 documents. This report is based on a sample of 1000 documents (3.41%).

string

HERNDON BEULAH TALBOTTON CEDARBURG BLAIRS DE WITT HOUSTON HEDRICK
KEND LAKESIDE DALLAS SHONTO BIRMINGHAM

loc

coordinates



mapbox

pop 62%

The screenshot shows the MongoDB Compass interface for a database named 'demoZip.zips'. The left sidebar shows a tree view with 'localhost' selected, containing 4 databases and 2 collections. The 'demoZip' database is expanded to show a 'zip' collection. The main area displays the 'Schema' tab for the 'zip' collection, showing a 'string' field with a list of city names. Below this, the 'loc' field is shown with a 'coordinates' field, which is visualized as a map of the United States with numerous blue dots representing data points. A 'pop' field is partially visible at the bottom with a 62% value.

Atlas



CLUSTERS > CREATE NEW CLUSTER

Create New Cluster

Global Cluster Configuration

Cloud Provider & Region Azure, Paris (francecentral) ▾



Create a **free tier cluster** by selecting a region with **FREE TIER AVAILABLE** and choosing the **M0** cluster tier below.

★ recommended region ⓘ

NORTH AMERICA	EUROPE	ASIA
 Iowa (centralus) ★	 Ireland (northeurope) ★	 Pune (centralindia)
 Virginia (eastus) ★	 Netherlands (westeurope) ★ FREE TIER AVAILABLE	 Mumbai (westindia)
 Virginia (eastus2) ★ FREE TIER AVAILABLE	 London (uksouth)	 Chennai (southindia)
 Illinois (northcentralus) ★	 Cardiff (ukwest)	 Hong Kong (eastasia) FREE TIER AVAILABLE
 California (westus) ★	 Paris (francecentral)	 Tokyo (japaneast)

Cloud Manager / Ops Manager



mongoDB Atlas All Clusters Paris Usage This Month: \$0.00 [details](#) Bertrand

CONTEXT **Project 0**

ITG > PROJECT 0 > CLUSTERS

DemoMeetup201811 VERSION 4.0.4 REGION Netherlands (westeurope)

Overview Real Time **Metrics** Collections Command Line Tools

GRANULARITY **Auto** ZOOM **1 hour** CURRENT DISPLAY **11/19/2018 03:00pm** to **11/19/2018 04:00pm** AT 1 MINUTE GRANULARITY

TOGGLE MEMBERS **ADD CHART** DISPLAY OPCOUNTERS ON SEPARATE CHARTS DISPLAY TIMELINE ANNOTATIONS

demomeetup201811-shard-00-00-9ivsvr...:27017 **demomeetup201811-shard-00-01-9ivsvr...:27017** **demomeetup201811-shard-00-02-9ivsvr...:27017**

Opcounters

Network

Stitch



MongoDB QueryAnywhere

Use the MongoDB query language directly from your front-end code.



Serverless Functions

Run server-side code with access to app context and external services.



MongoDB Mobile

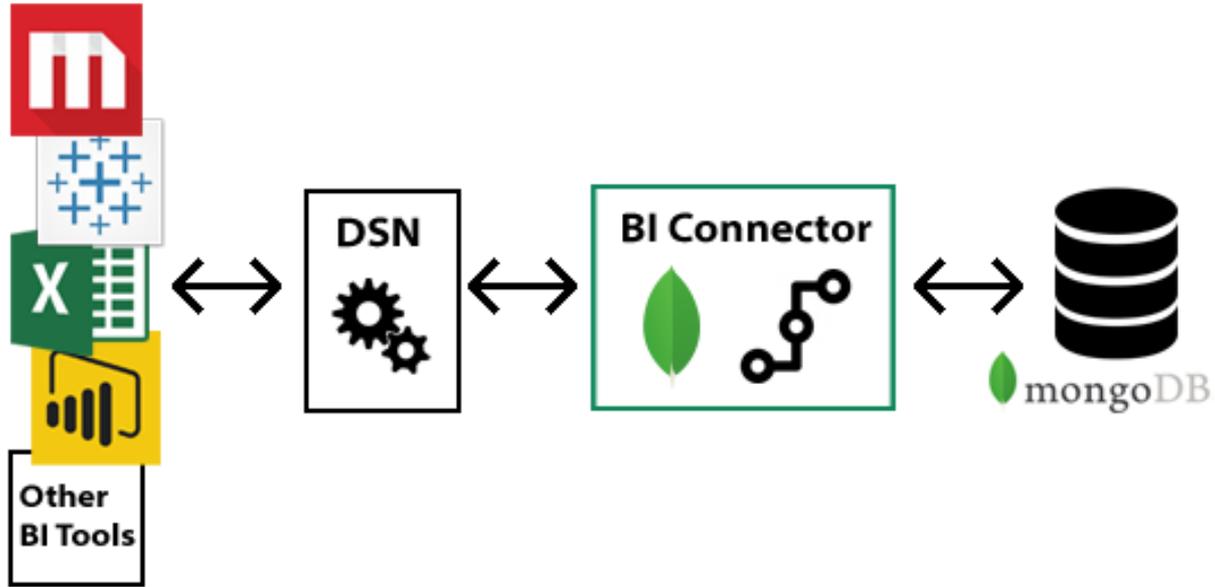
Leverage the full power of MongoDB embedded natively on mobile devices.



Event Triggers

Execute functions automatically in response to events in your application.

BI Connector



Charts



mongoDB Charts

Dashboards

Data Sources

User Management

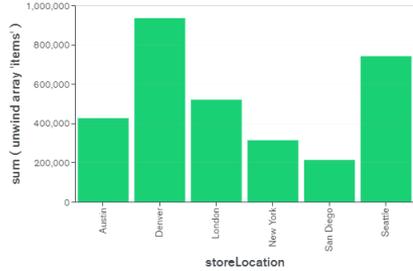
Tom ▾

Super Store Supply Sales
Sales, Customer Analytics and More

Updated 29 minutes ago

Add Chart

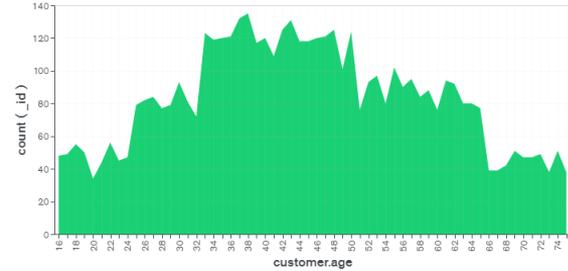
Total Sales (\$) by Store Location



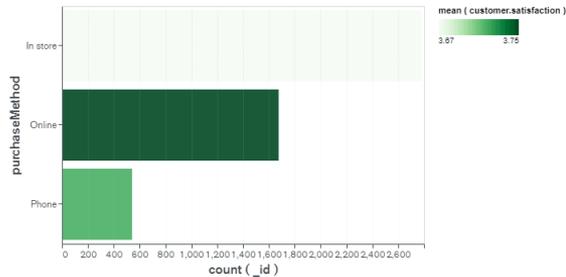
Frequency of Item Tags from sales in Denver



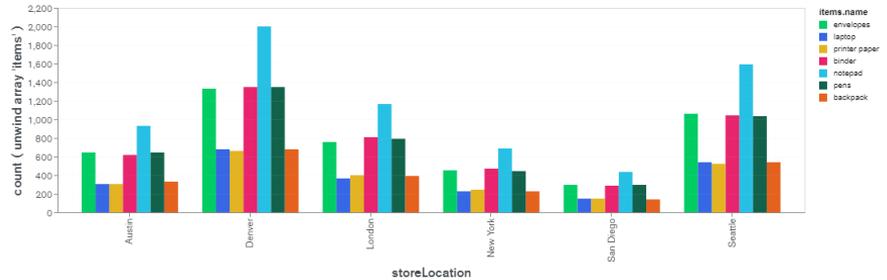
Distribution of Customer Ages



Sales by purchase method, colored by Satisfaction



Most common items sold by store location



4.

Démo

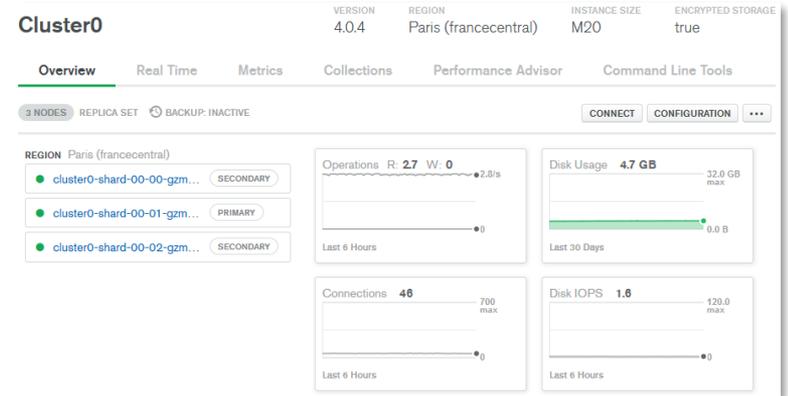
MongoDB en action !



Démo de la mise en place d'une base données



Objectif : créer rapidement une application avec un stockage de donnée flexible, performant et sécurisé.



5.

Premiers pas

Astuces pour démarrer sur les bons rails



Comment démarrer ?



Une expérience simple à réaliser :

- ◆ S'inscrire à un cours gratuit de la [MongoDB University](#)
- ◆ Expérimenter en local avec un serveur et Compass
- ◆ Créer une première application
- ◆ Initier un cluster « free tiers » sur [Atlas](#)
- ◆ Lire la [documentation](#), explorer les [webinars](#)



Merci !

Des questions ?

Vous pouvez me contacter sur [@devprofr](https://twitter.com/devprofr) & bertrand@devpro.fr