SQL

OR

NoSQL

@majidfn
MajiD Fatemian
Ubisoft Montreal

BIG DATA

NoSQL

NoSQL

① ② ③

No SQL Cluster Schemaless

YOURSHAPE
Fitness Evolved

YOURSHAPE
Fitness Evolved

XBOX 360

Wii U

YOURSHAPE
Fitness Evolved

XBOX 360™

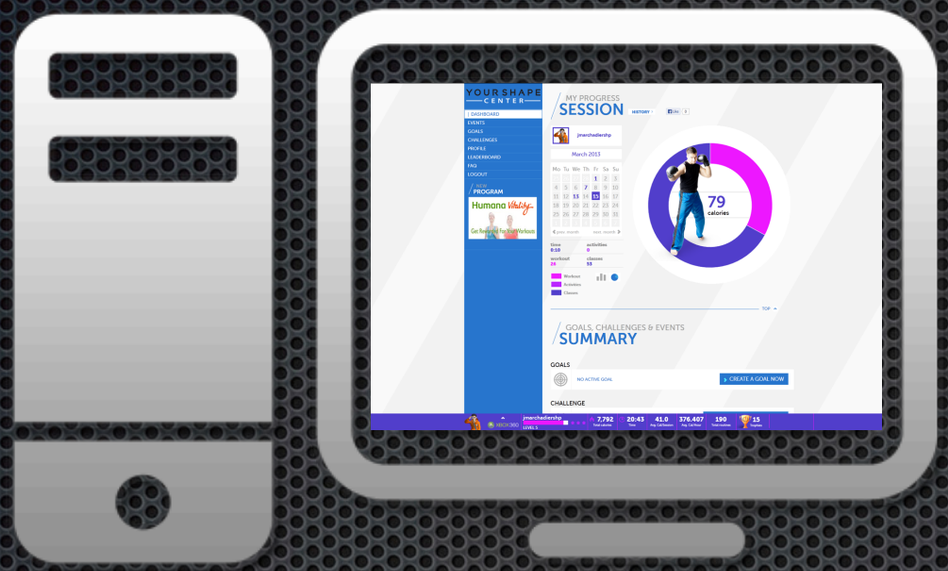
Wii U™

YOURSHAPE

Fitness Evolved

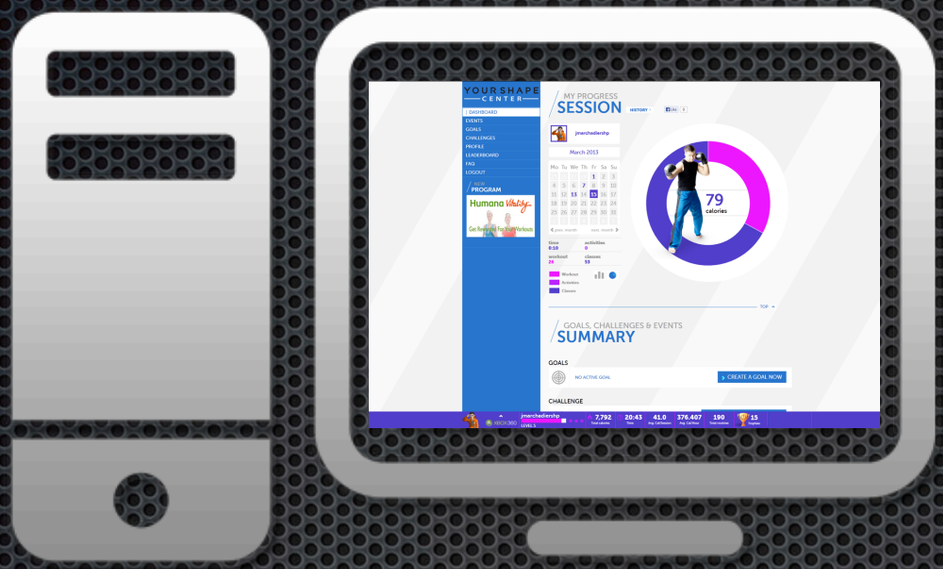
YOURSHAPE

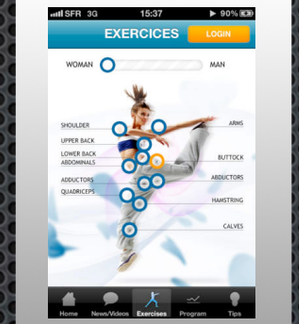
Fitness Evolved



YOURSHAPE

Fitness Evolved

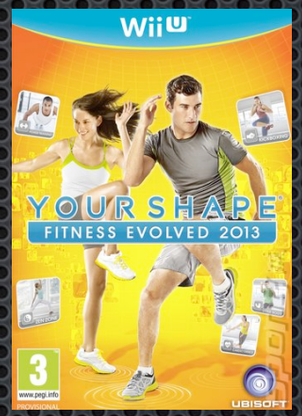




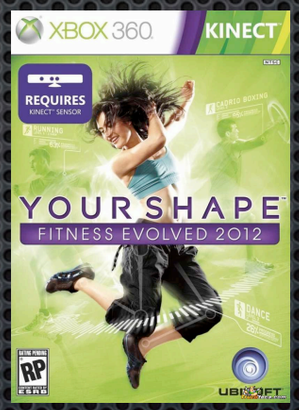
STATS

Users	Concurrent	Daily Activities
2.2M	10K	160K(Max) 40K (Avg)

2012



2011



2013

2011

2012

2013

Architecture

2011

Architecture

2011

MySQL

MySQL

MySQL

SQL / JOIN
ACID
Transaction
Partitioning
Replication
Tools
OPs
Data Modeling

2012

2011

2013

DATA

Global

Profile Info.

Aggregated stats

Community Events

Specific

Details

Activities

Leaderboards

SQL / JOIN
ACID
Transaction
Partitioning
Replication
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Data Modeling

SQL / JOIN
ACID
Transaction
Partitioning
Replication
Tools
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Data Modeling

SQL / JOIN
ACID
Transaction
Partitioning
Replication
Tools
OPs
Data Modeling

Volume
No Details
Variant Schema
Partitioning
Scale out
Sharding

SQL / JOIN

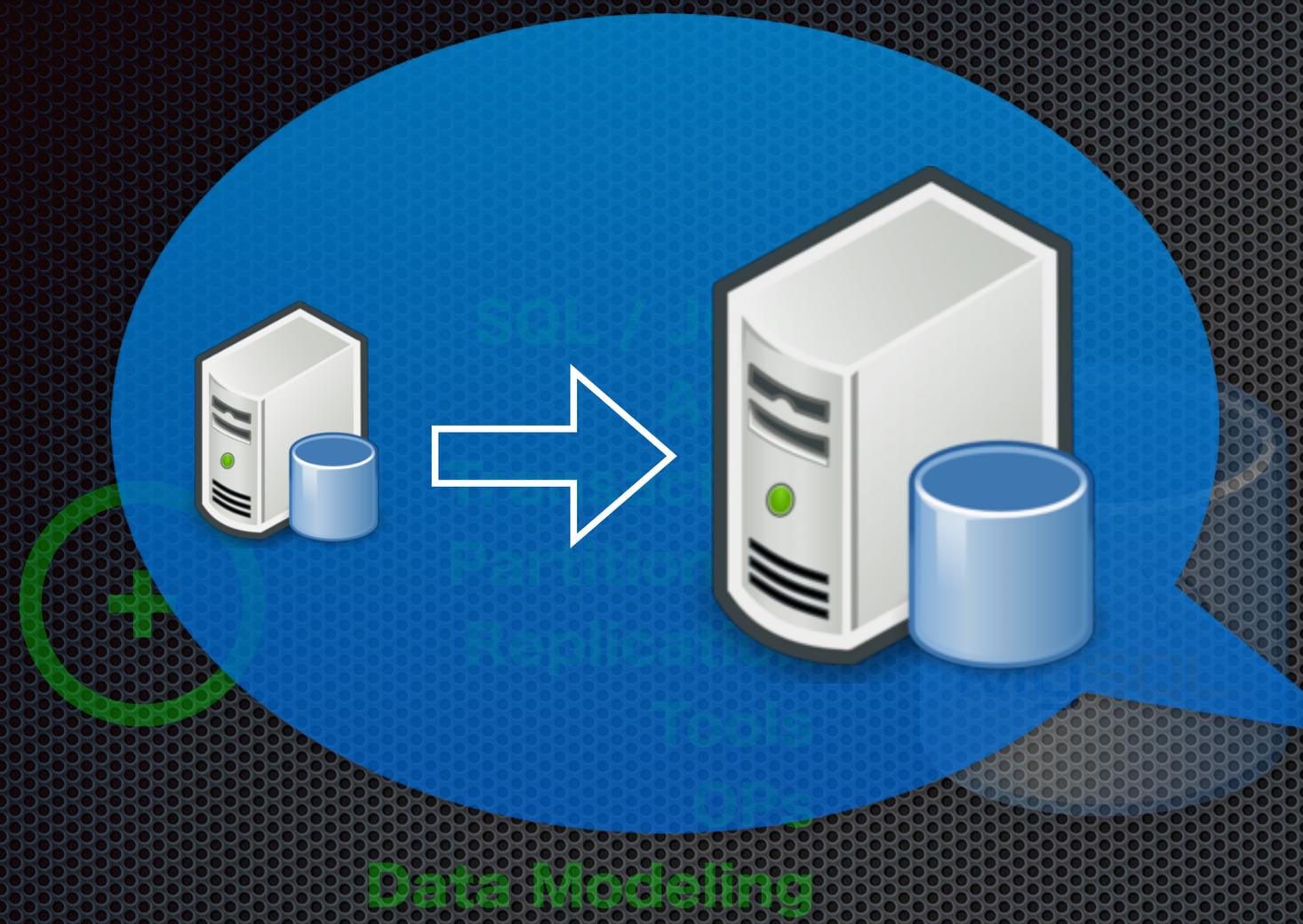
Volume
No Details
Variant Schema
Partitioning
Scale out
Sharding

xbox v.1

```
{
    player_id: 1234,
    game_id: 1002,
    platform: wiiu,
*   calories: 75,
*   duration: 120
}
```

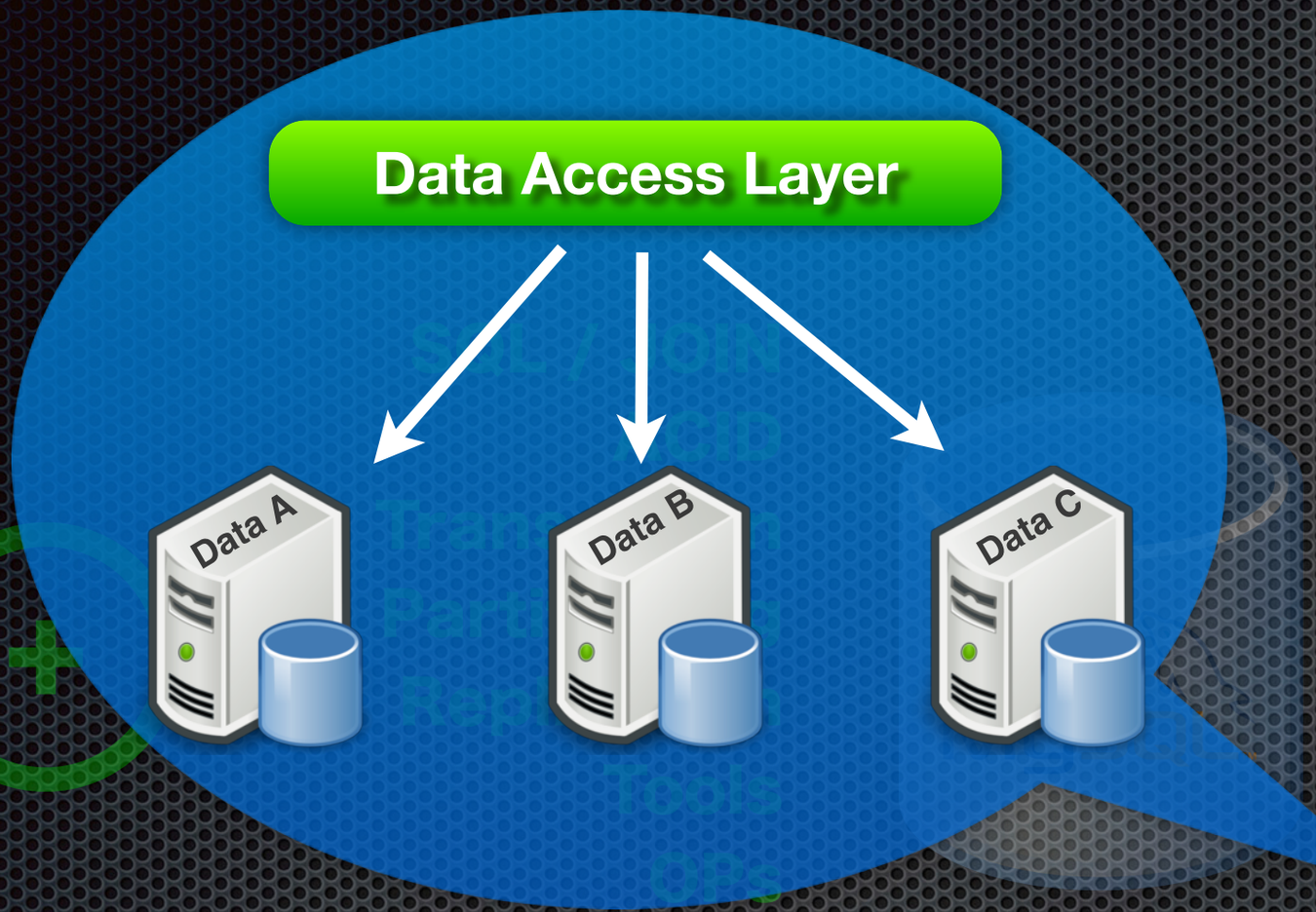
xbox v.2

```
{
    player_id: 1234,
    game_id: 4001,
    platform: xbox360,
*   calories: 40,
*   duration: 75,
    difficulty_level: medium,
    jumping_ropes: 178,
    score: 450,
    endurance:3,
    category: 4
}
```



Data Modeling

Volume
No Details
Variant Schema
Partitioning
Scale out
Sharding



Data Modeling

Volume
No Details
Variant Schema
Partitioning
Scale out
Sharding

SQL / JOIN
ACID
Transaction
Partitioning
Replication
Tools
OPs
Data Modeling

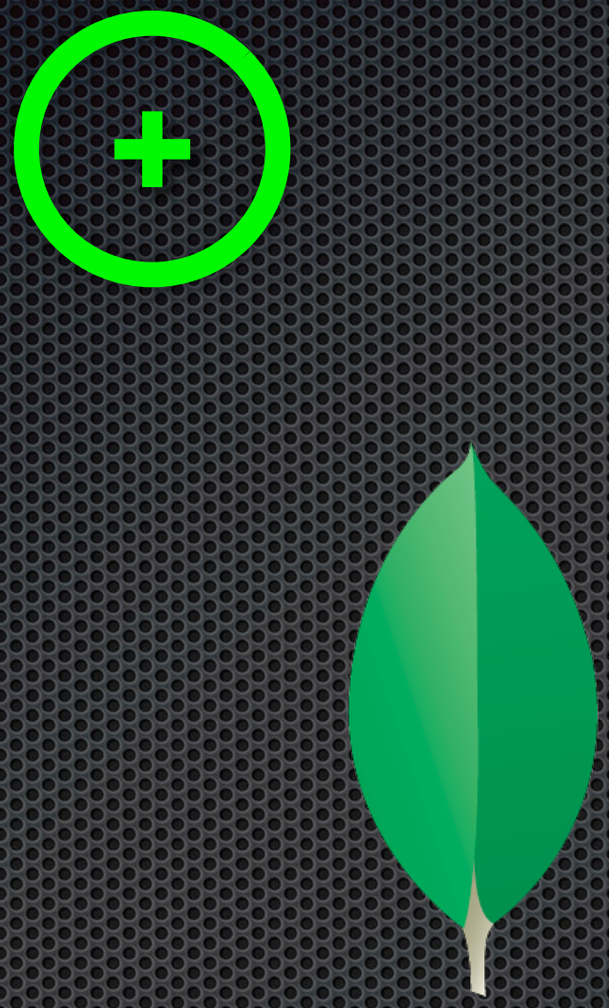
Volume
No Details
Variant Schema
Partitioning
Scale out
Sharding

No SQL

No SQL

mongoDB

1. OPs
2. Support
3. Community



Schema-Less
Aggregated Data
Object Mapping
Large Scale Data
Sharding
Map/Reduce
Eventual Consistency
Memory Storage
Journaling

Schema-Less

Aggregated Data

Object Mapping

Large Scale Data

Sharding

Map/Reduce

Eventual Consistency

Memory Storage

Journaling

xbox v.1

```
{
  player_id: 1234,
  game_id: 1002,
  platform: wiu,
* calories: 75,
* duration: 120
}
```

WiiU

```
{
  player_id: 1234,
  game_id: 4001,
  platform: xbox360,
* calories: 40,
* duration: 75,
  difficulty_level: medium,
  jumping_ropes: 178,
  score: 450,
  endurance:3,
  category: 4
}
```

Schema-Less

Aggregated Data Object Mapping

Large Scale Data

Sharding

Map/Reduce

Eventual Consistency

Memory Storage

Journaling

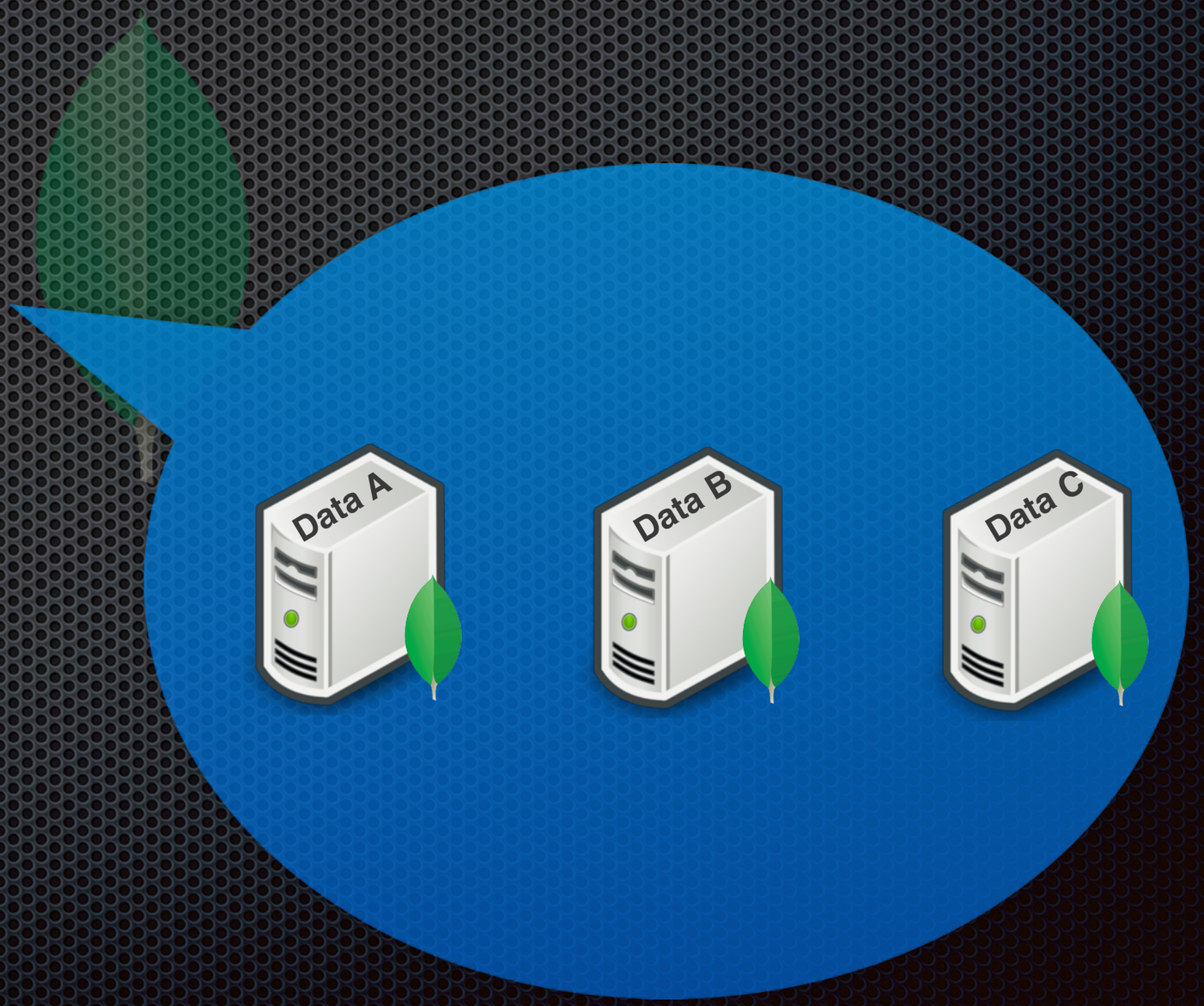
```
{
    player:
    {
        name: example, gender: M, country:CA
    }
    game_id: 4001,
    date: “2013-11-08”,
    calories: 40,
    duration: 75,
}
```

+

Schema-Less
Aggregated Data
Object Mapping

Large Scale Data
Sharding
Map/Reduce

Eventual Consistency
Memory Storage
Journaling



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Schema-Less
Aggregated Data
Object Mapping
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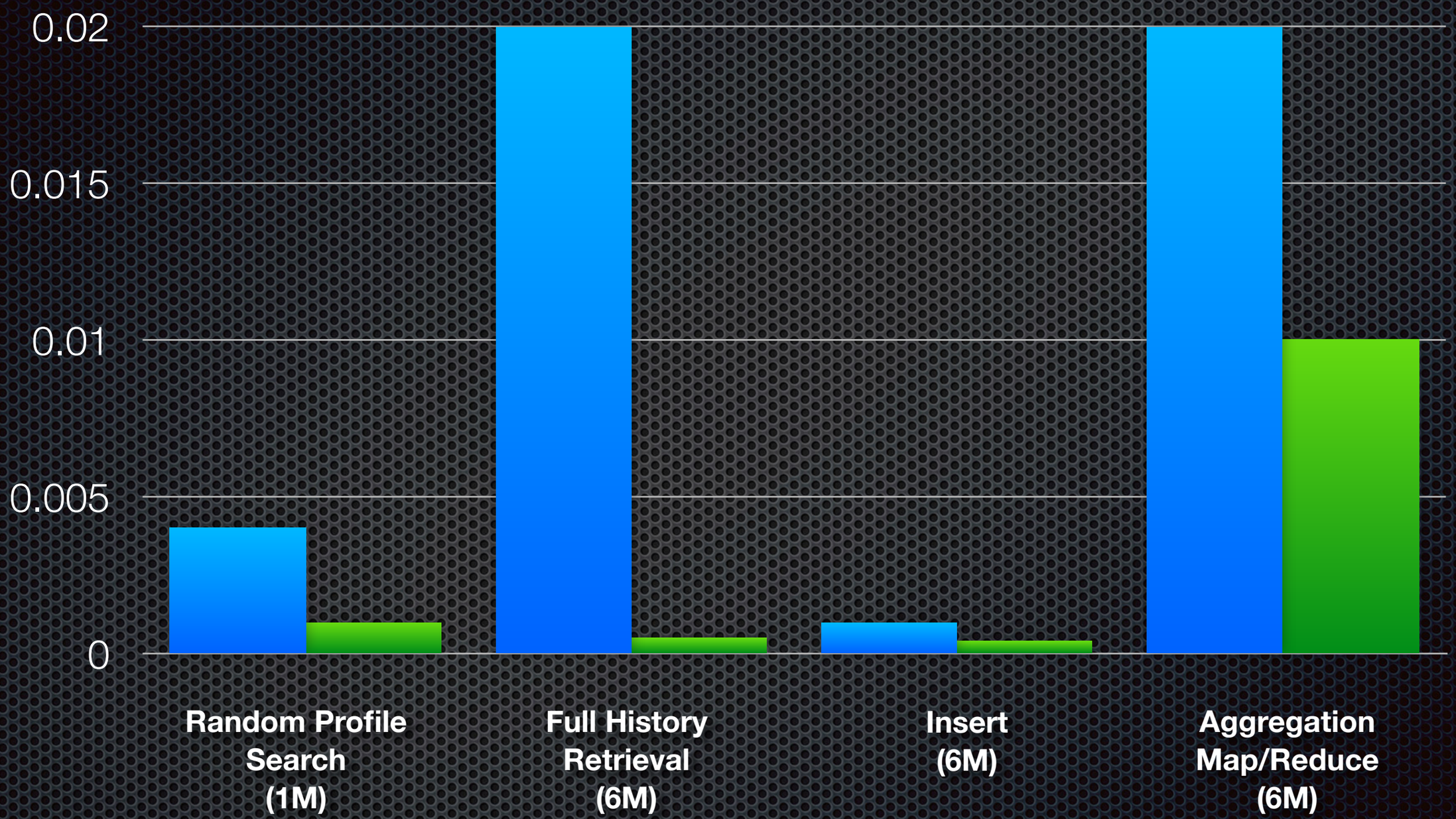
Eventual Consistency
Memory Storage
Journaling

Denormalized data
Disk Space
Expertise
Complex Querying
Resource Usage
DB-Level Locking

BENCH
MARK


0.02
0.015
0.01
0.005
0
Random Profile Search (1M)
Full History Retrieval (6M)
Insert (6M)
Aggregation Map/Reduce (6M)
MySQL
MongoDB

★★★★★

Relational Data Model

Ease of Use

★★★★★

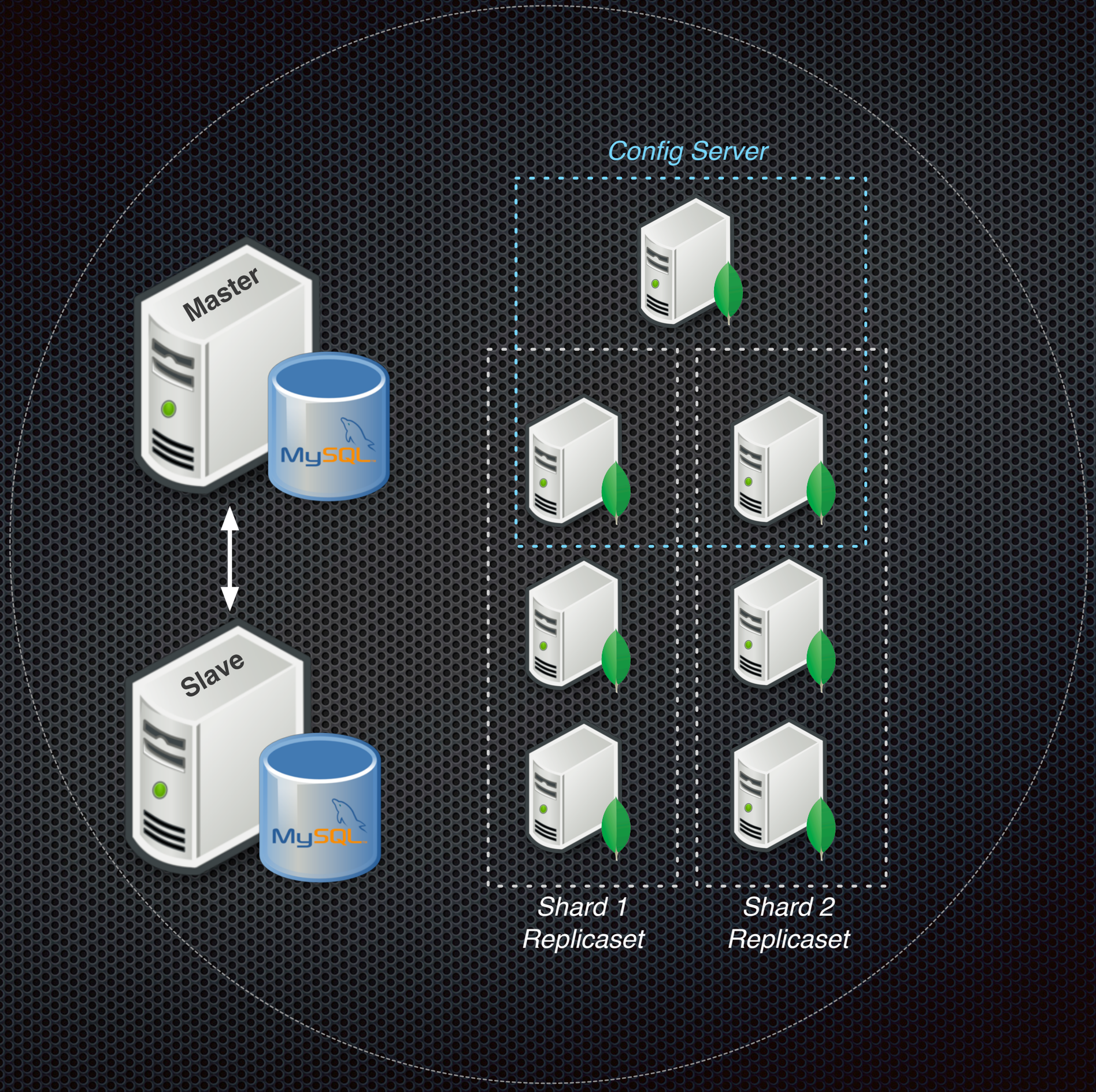
Schema Less

Performance

Sharding

GO!

Hybrid


Config Server
Master
MySQL
Slave
MySQL
Shard 1
Replicaset
Shard 2
Replicaset

Concerns

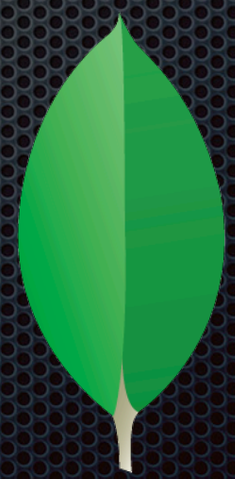
1. Inconsistency
2. Consistency vs. Latency
3. Data Duplication
4. Complexity

Challenges

1. **Availability**
2. Time
3. Expertese

Data Access Layer

OR



Plans

Backup

Failure

Plans

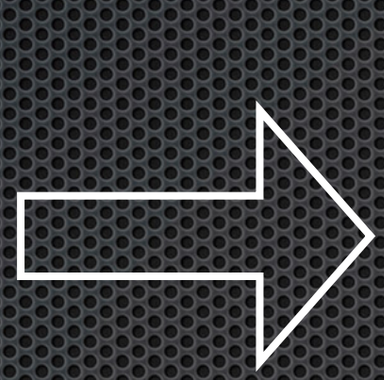
Backup

Failure

DATA

Migration

MySQL



MySQL

1. One Shot Migration

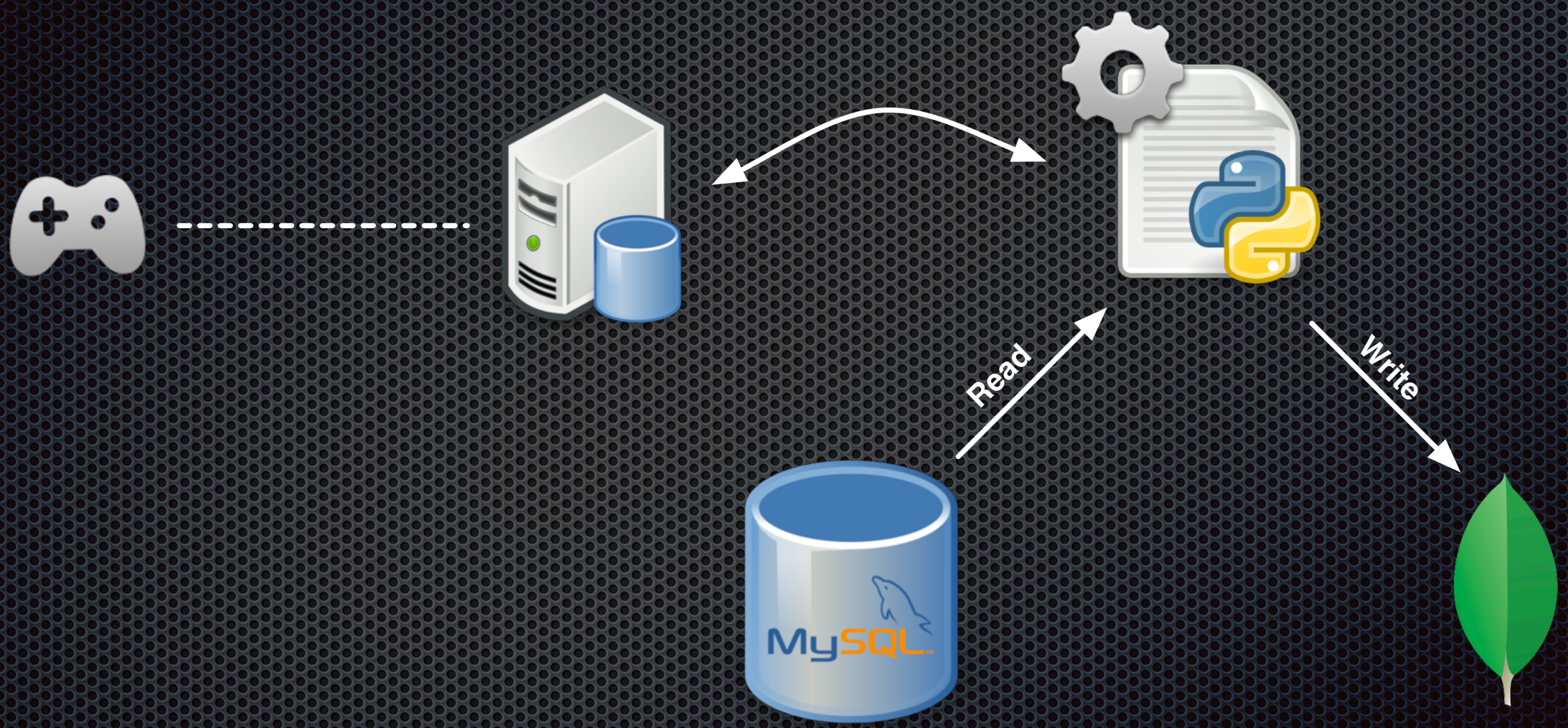
2. Profile Versioning

① One Shot Migration 4 hrs !!

② Profile Versioning

① One Shot Migration 4 hrs !!

② Profile Versioning Live!


Read
Write
MySQL

TEST!

1

Unit

2

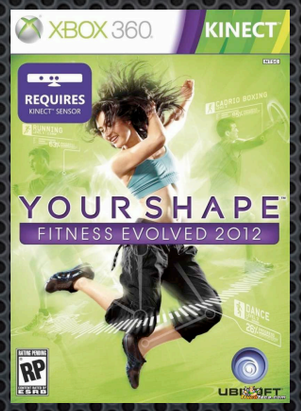
Functional

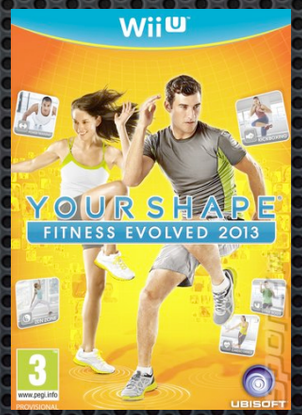
3

Integration

Final Results

Scalability





&...

Details

Response Time

0.02″ ⇨ 0.0002″

Architecture

2013

Architecture
2013

REST

> 1 year uptime

1. Based on Requirements

2. Benchmark!

3. Choose Wisely!

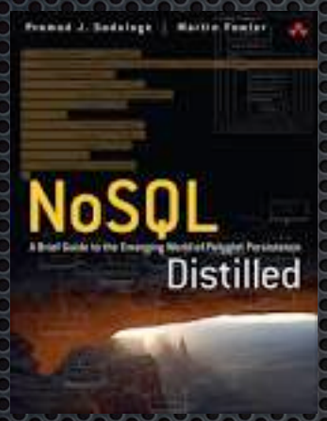
Thank YOU!

@majidfn

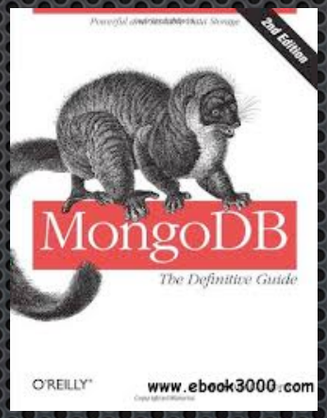
https://joind.in/9977

References

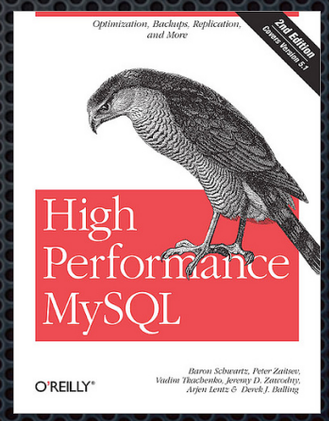
NoSQL
Distilled



MongoDB
The definitive guide



MySQL
High Performance



we need YOU!

http://montreal.ubisoft.com/en/video-games-jobs-my-career

Got Q?

@majidfn