

Mongodb 在互联网金融的应用



@考拉理财 Wade

About

Wade -- Kaolalikai (考拉理财) Team Lead

从0~1 折腾过几款百万级别用户盈利的产品

Github: [no7dw](#)



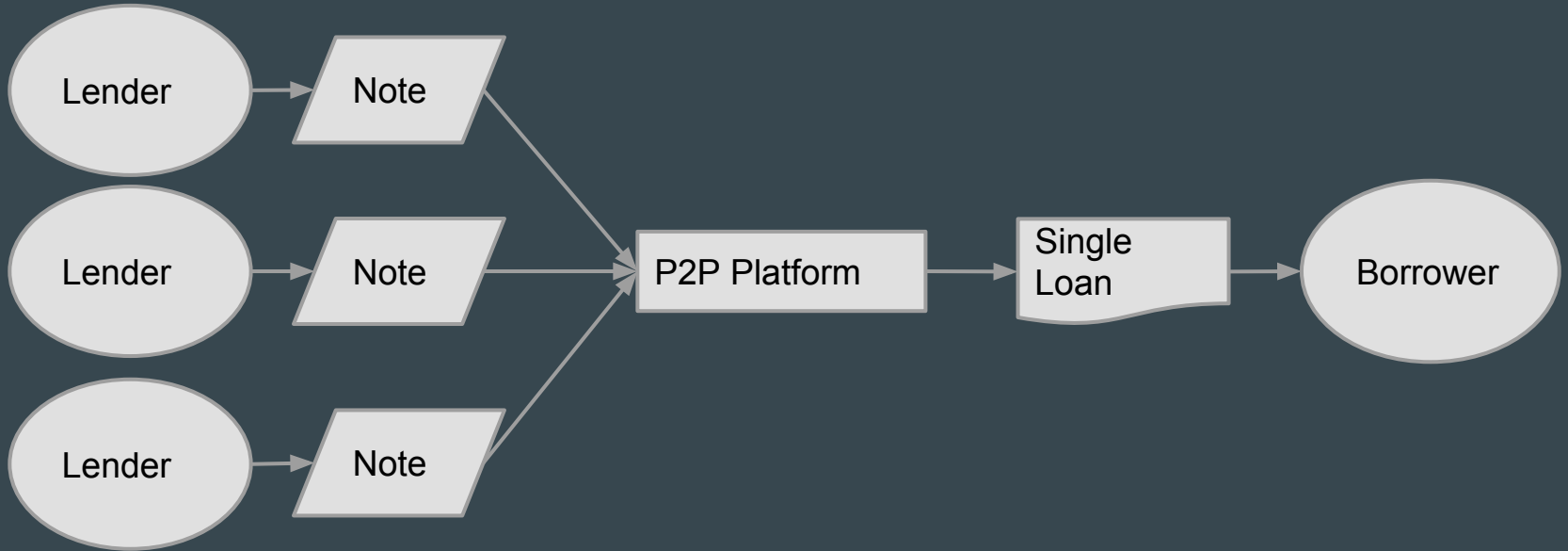
Agenda

- What
- Why ? Requirements
- How ? Architecture
- Problems
- Solutions
- Future

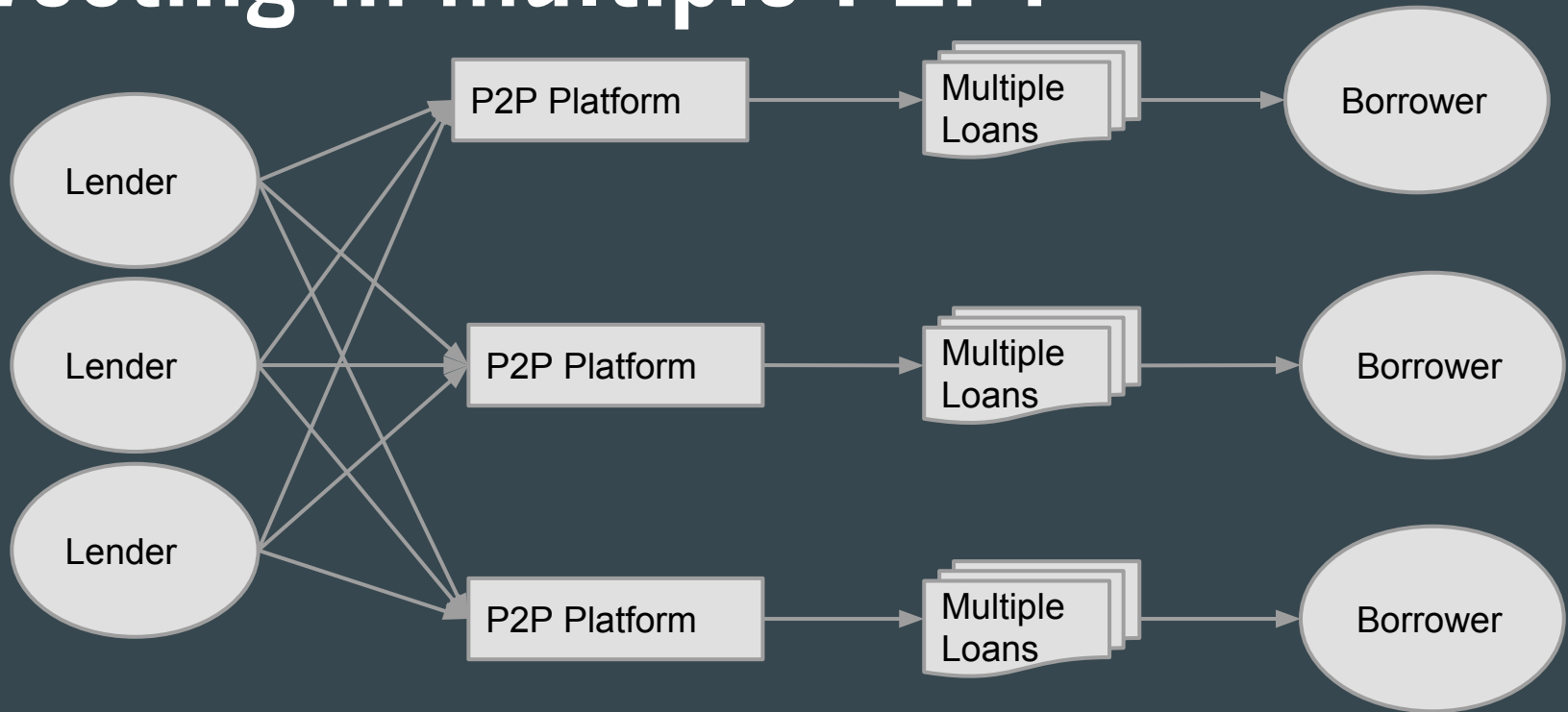
What is P2P

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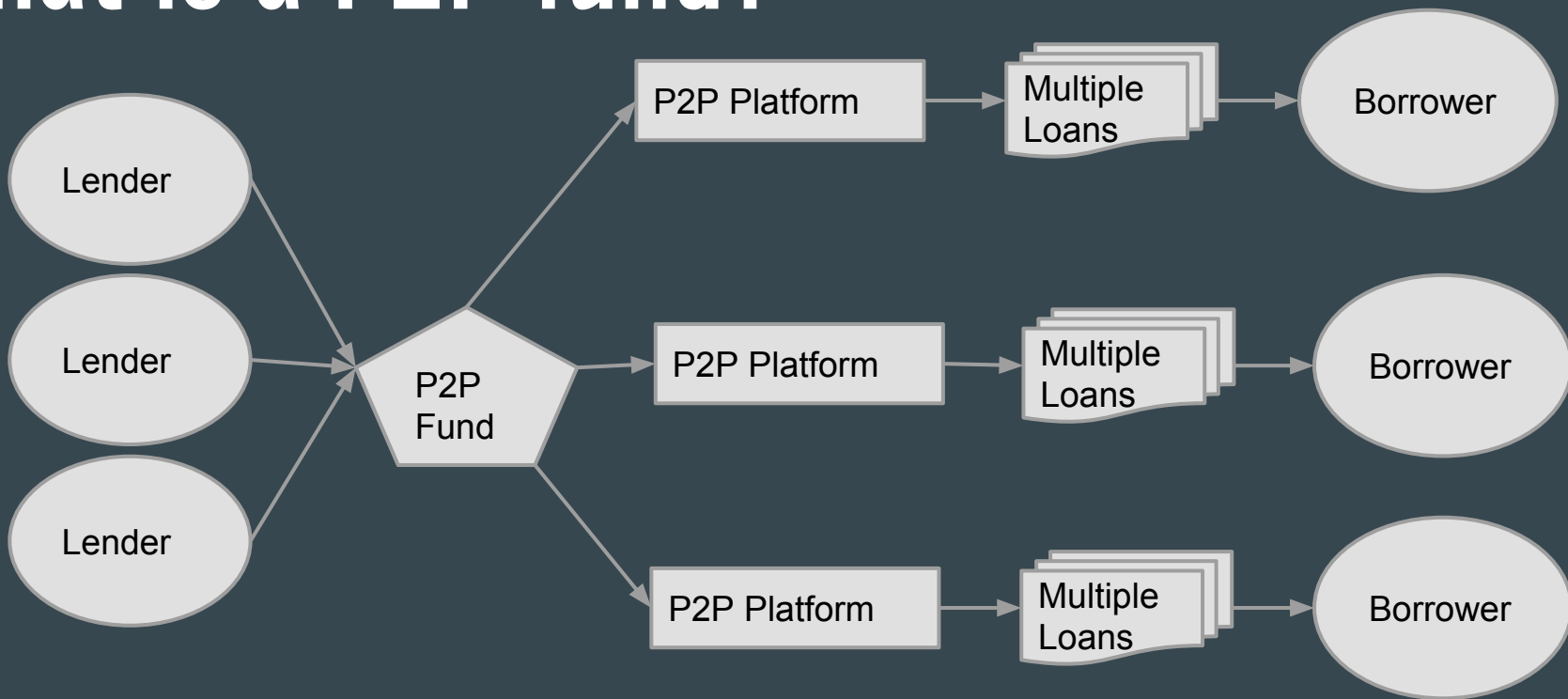
What is a P2P?



Investing in multiple P2P?



What is a P2P fund?



About Koala

Tags: Finance , P2P mashup, 懒人 --通过极致的分散理财, 达到风险&收益的平衡

正式上线: 2015/5

交易额: 30亿 ¥

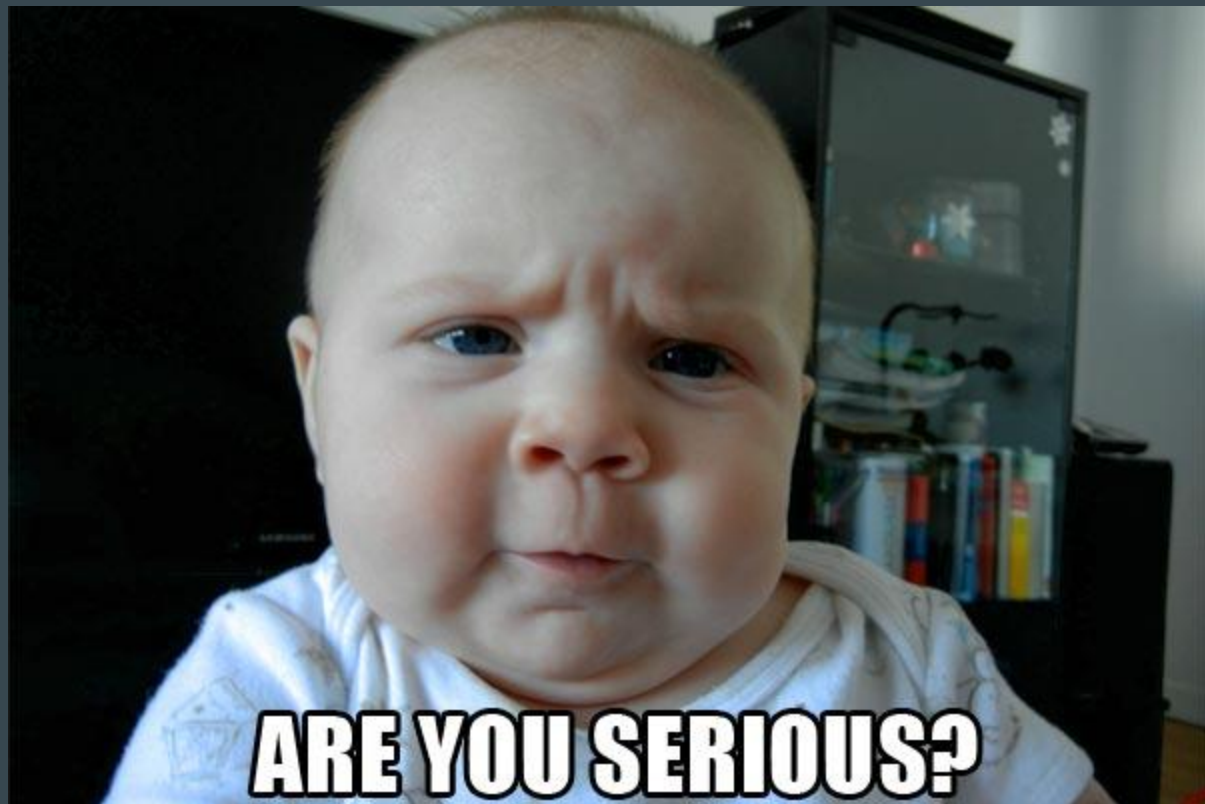
AUM: 7亿 ¥

documents count: 千万 → 亿

用户量: 70万, 同时在线: 100~2,000

**Mongodb supports most of our
core systems**

...



ARE YOU SERIOUS?

Requirements for change

- Loans info are variable
- P2P platform are variable
- Mkt requirement changes often
- Documents count: 10 to 100 Millions
- Lots of statistics dimension

Requirements for finance

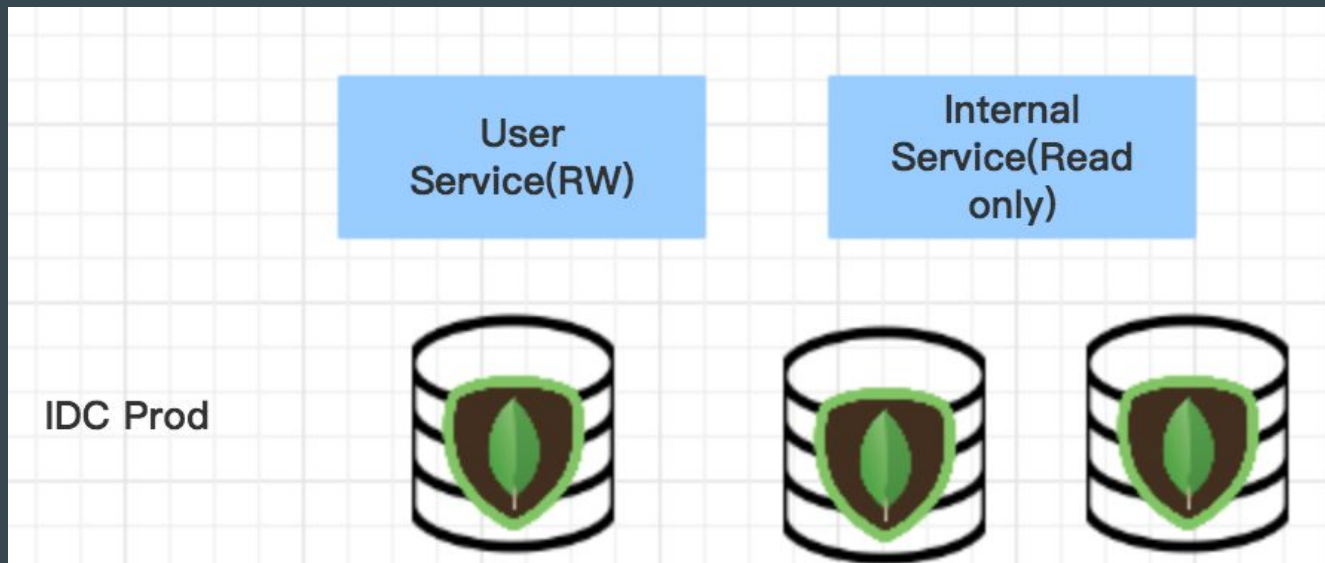
- Change History should be preserved -- NOT ALLOW to delete
- Backup
- Security
- Drills
- Operation should have reverse operation

Security Summary

- Role Design: Administrator/Monitor/Read Write/Read Only
- Don't use default port
- Use Password
- Different Password for prod & dev env

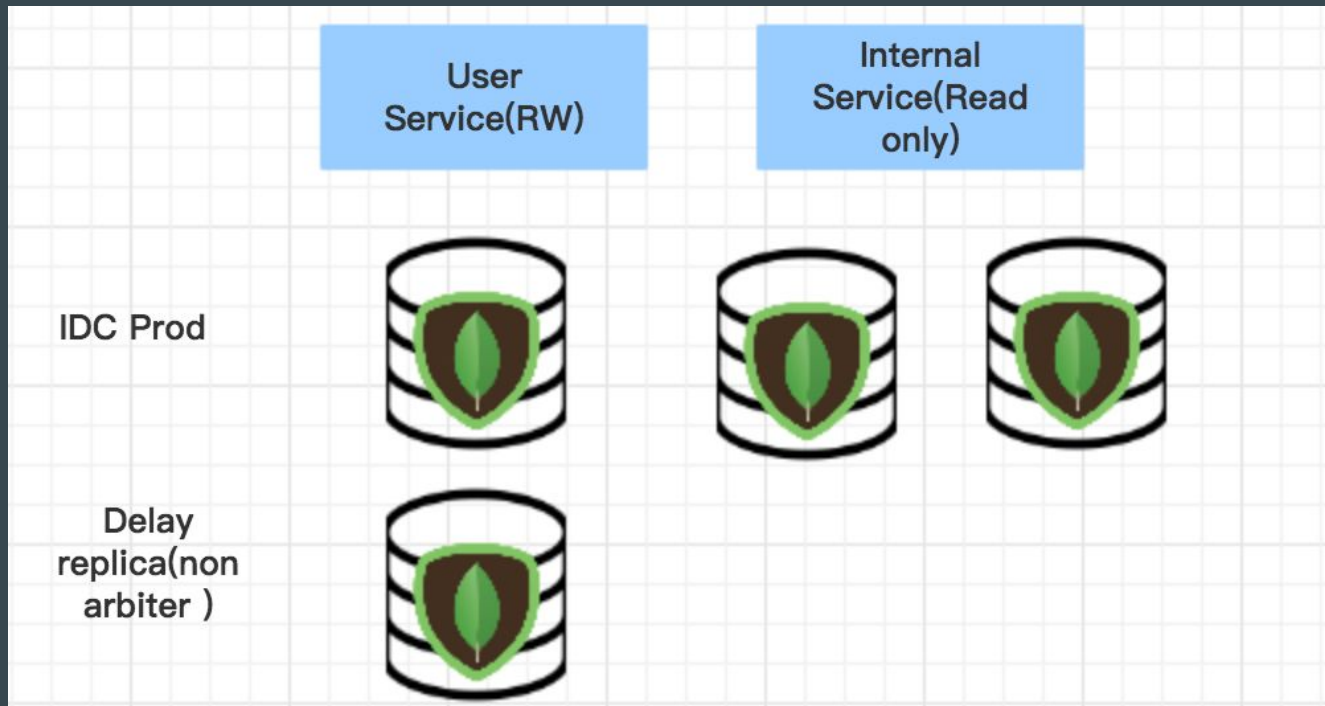
Mongodb deploy architecture

V1



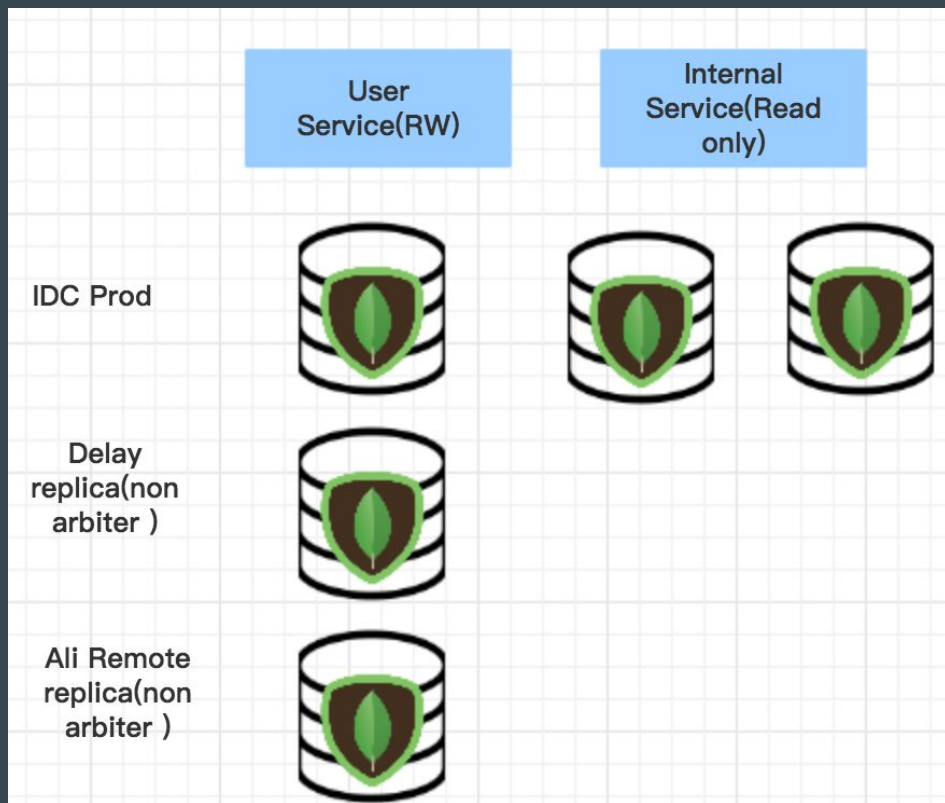
Mongodb deploy architecture

V2



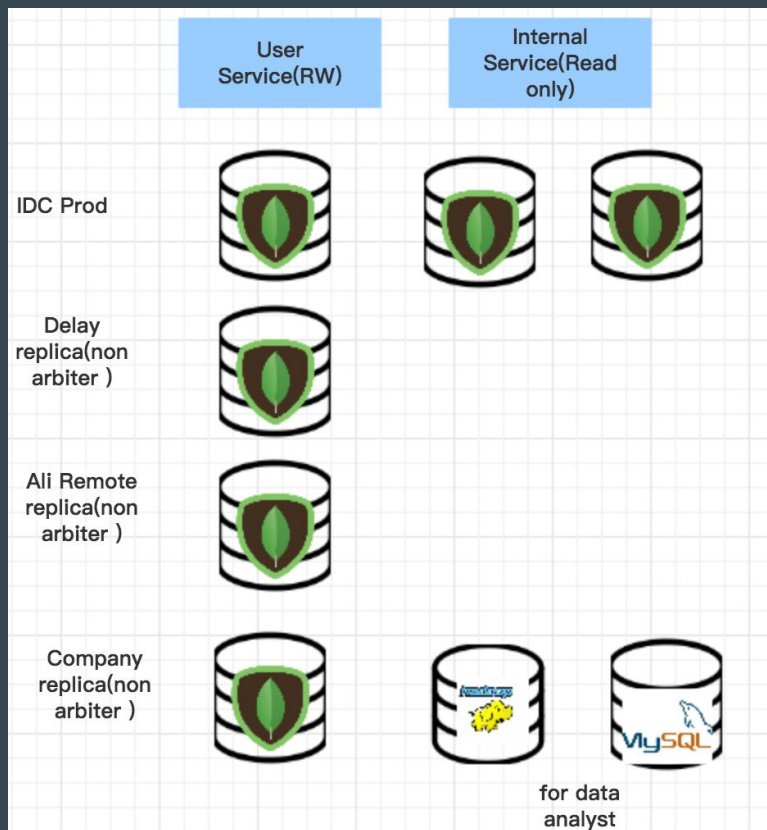
Mongodb deploy architecture

V3



Mongodb deploy architecture

V4



Backup Summary

- Oplog Recovery Drills to Certain Time Point
- Full backup Every 6 hours
- Daily Backup within Recently 30 Days
- Delay instance (1 hour) -- prevent replica set data realtime pollution
- Remote DataCenter instance

Tech Stack

- MongoDB(core) Hadoop
- Nodejs Python R Sql Java(non core)

Problems about Trading

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Crash while processing

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Need Transaction?

- We need “transaction”
- not necessary for strict mode(强一致性) -- data of each account are usually individual

Mongodb Solutions

- Embed documents
 - Pros: Sometimes works & make query faster
 - Cons: Sometimes it just don't work
- Two phase commit
 - Make code looks complicated

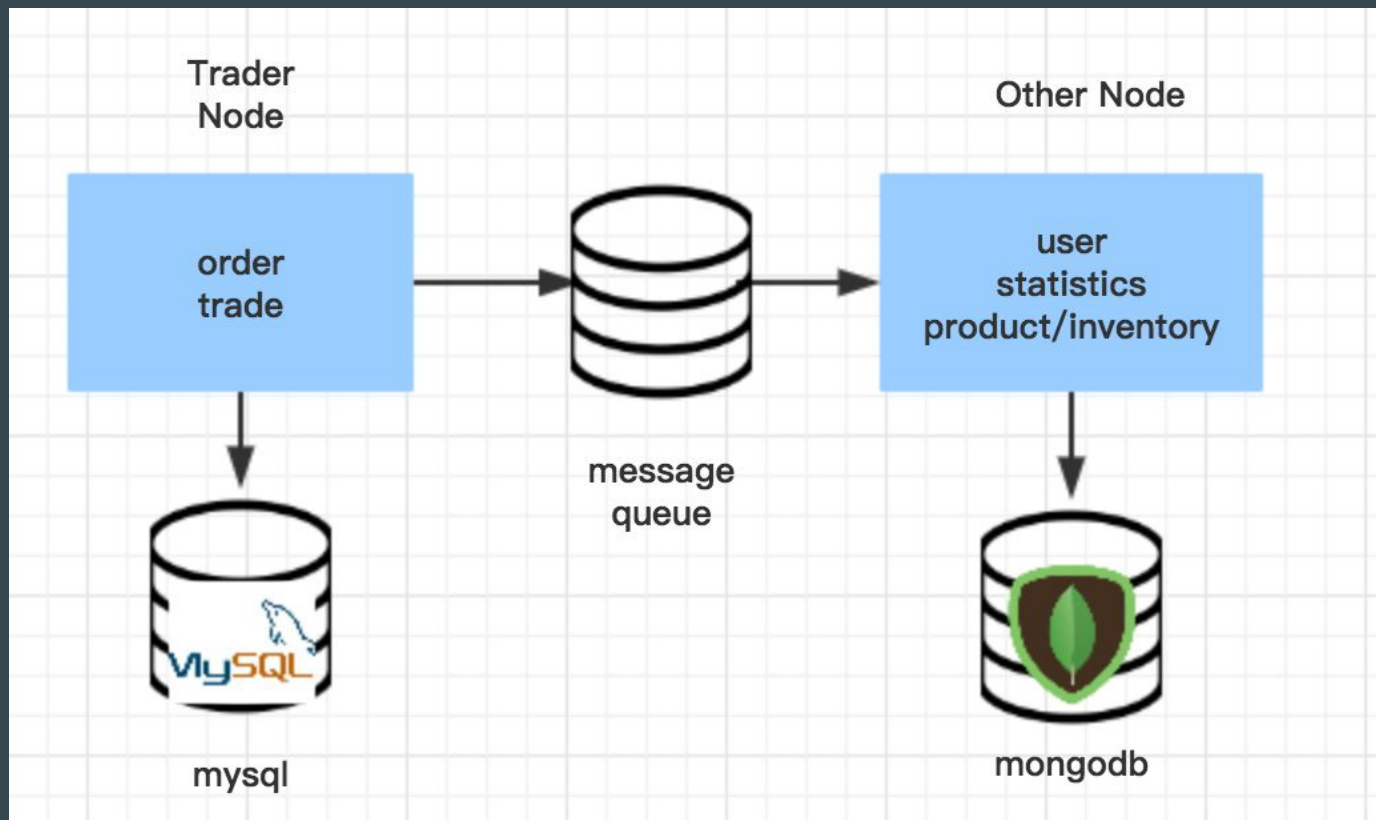
Other Solutions

- Mysql
- **Mysql (trade + account service) + mongodb (other)**
- SequoiaDB
- Cassandra
- PostgreSQL

Hybrid already

- Redis + MongoDB
- Redis + MySQL

Hybrid Solution for Mysql & Mongodb



Hybrid Solution Problems

- Maintainability: More Complex
- Foreign Key
- Join Tables
- Sync

Other's Mongodb Only Solution: Events Sourcing

Events Sourcing :

record event and replay after crash

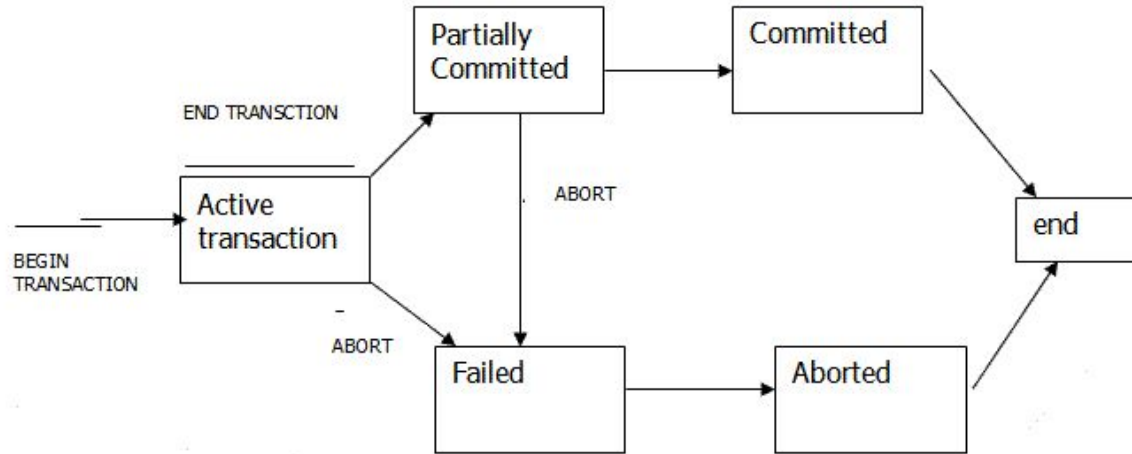
Trade off

...

Our Solutions

- Base on Embed docs design
- Do it in ORM level:
 - Our wheel : Npm package: Mongoose-transact/waterline-transact

How Transaction Is Implement



How Transaction Is Implement

```
1 //简化的逻辑
2 var opId = opRecord(operations)
3 var result = doPatchWork()
4 if(!result)
5     return Rollback(operations)
6 Done(opId)
```


Usage Sample Code

```
Transact.transactionManager('trans', function (transactionId, taskCallback) {
  Thenjs(function (cont) {
    // 生成订单
    Transact.txCreate(Order, transactionId, order, function (err, cOrderT) {
      cOrder = cOrderT;
      cont(err);
    });
  }).then(function (cont) {
    // 插入现金流
    Transact.txCreate(User_account_cashflow, transactionId, cashflowMin, function (err, cCashflowT) {
      cont(err);
    });
  }).then(function (cont, result) {
    taskCallback(null, result);
  }).fail(function (cont, err) {
    taskCallback(err.stack || err);
  });
}, function (err) {
  callback(err, cOrder, cCashflowMin, cCashflowAdd, cEarningCashflow);
});
```

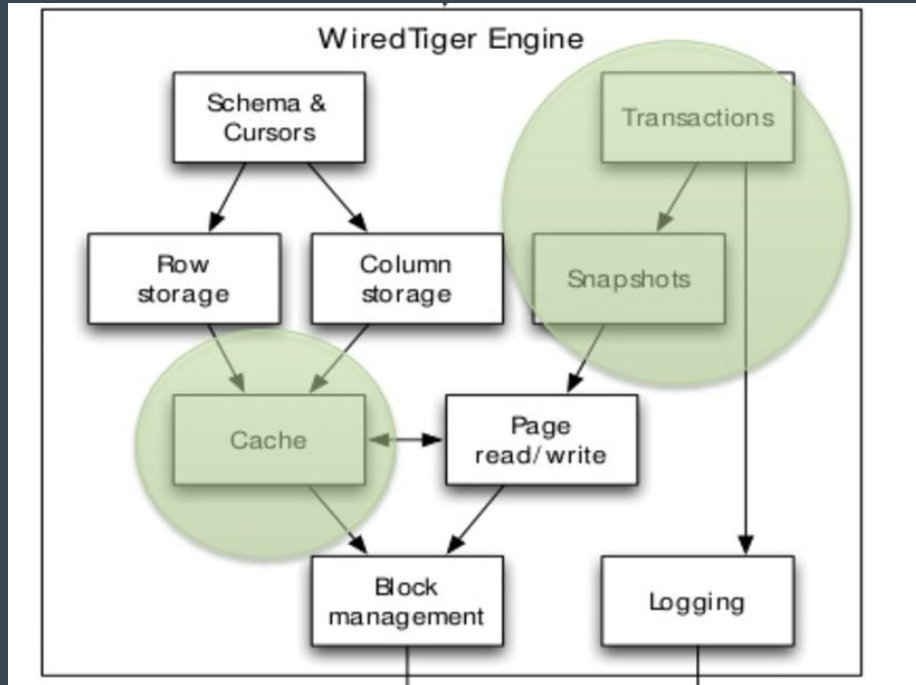
Best Practise for Account Trading

- Reentrant function (可重入函数)
- Check and retry (掉单检测:补救)
- Strict Schema validator (npm package: joi)
- Operation Lock(User Op Level)
- Irrelevant with mongodb:
 - Pre Save check
 - Unit test to help improving quality

注:支付异步回调会发生多次直到处理成功(限定时间内or限定次数内)。

Future

Transaction may not far



Thx and Q&A



@考拉理财 累计为用户赚取4400万¥

WX: no7dwdavid

2017-4