



GopherChina2018



# 逻辑思维Go语言微服务改造实践

方圆





# 自我介绍

- Cisco
- Weibo
- 创业阶段
- 逻辑思维

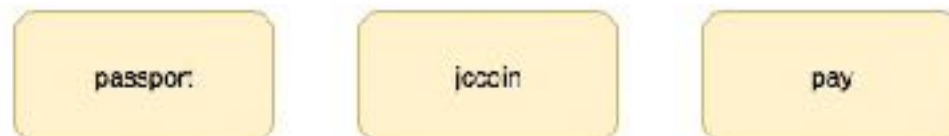
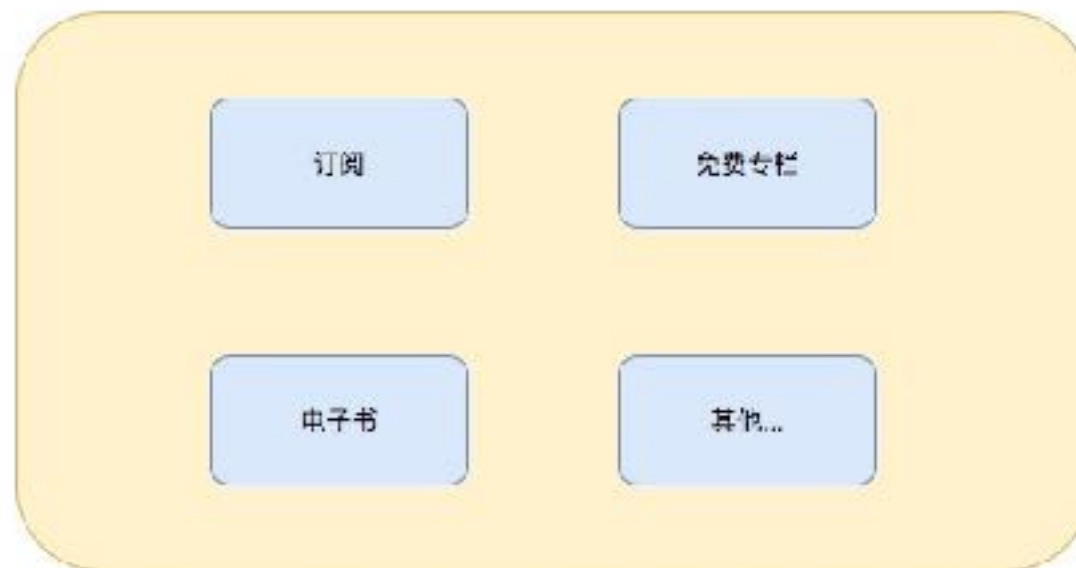




- 背景
- 改造过程
- 未来做什么



# 最早的版本

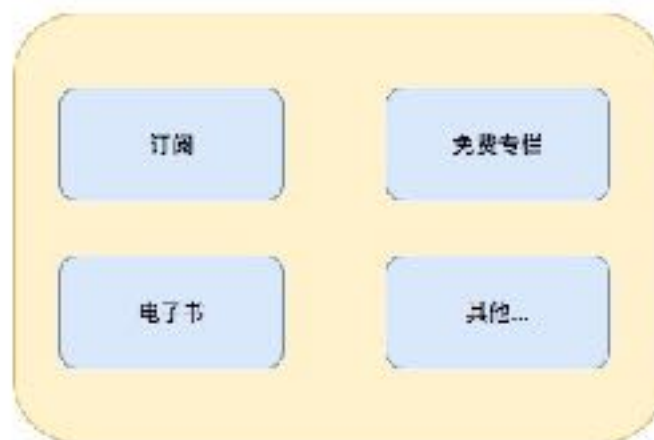


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# 第二版

v2



passport

jqcoin

pay



# 屋漏偏逢连夜雨

- 8/31大故障
- 罗老师要跨年
- 产品迭代不能停



# 改造目标

- 高性能
- 服务化
- 资源拆分隔离
- 高可用



# 为什么选择Go

- 简单易用
- 高性能
- 原生支持并发
- 部署运维方便





# 改造过程

- 架构图
- 框架和基础设施完善
- 系统重构



gateway

XX课

XX专栏

留言

官网

商城

int

gcenter

DRM

注册中心  
配置中心

APM/tracing

PP

JC

ord

日志

监控

存储/缓存/消息总线



# 框架和基础设施

- API GATEWAY
- 服务框架
- 多级缓存
- 熔断降级

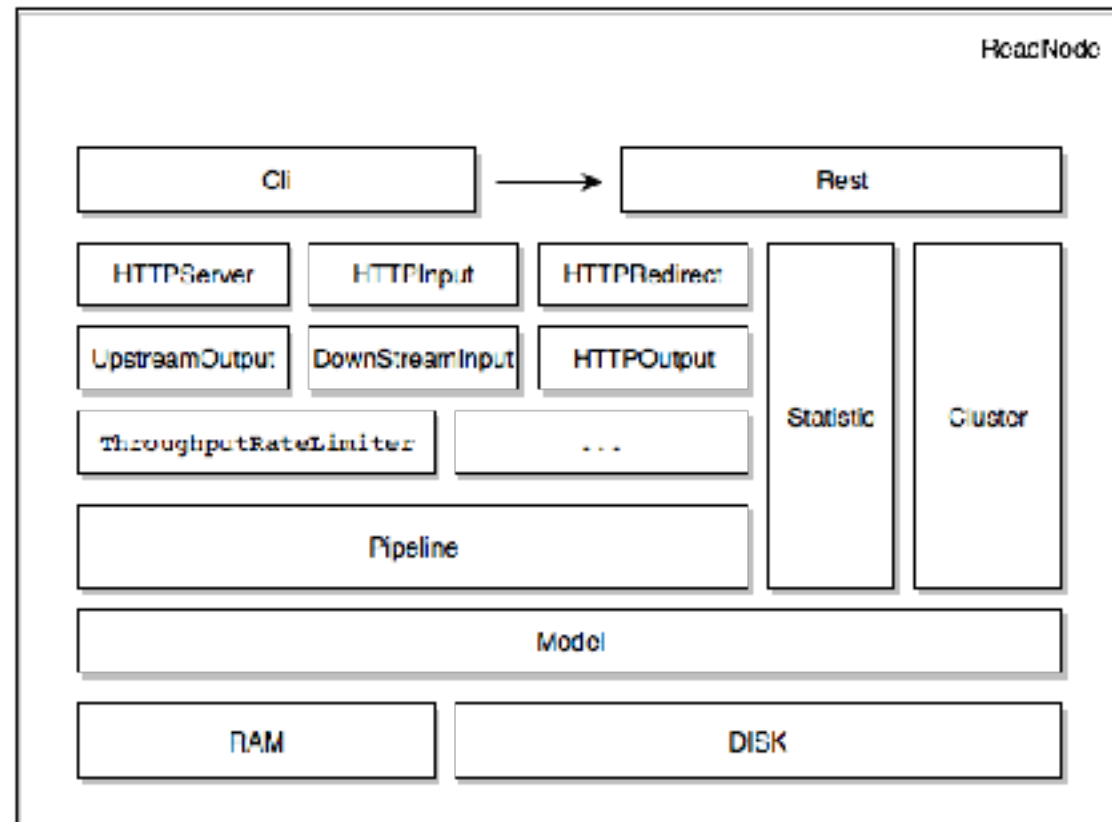
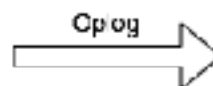
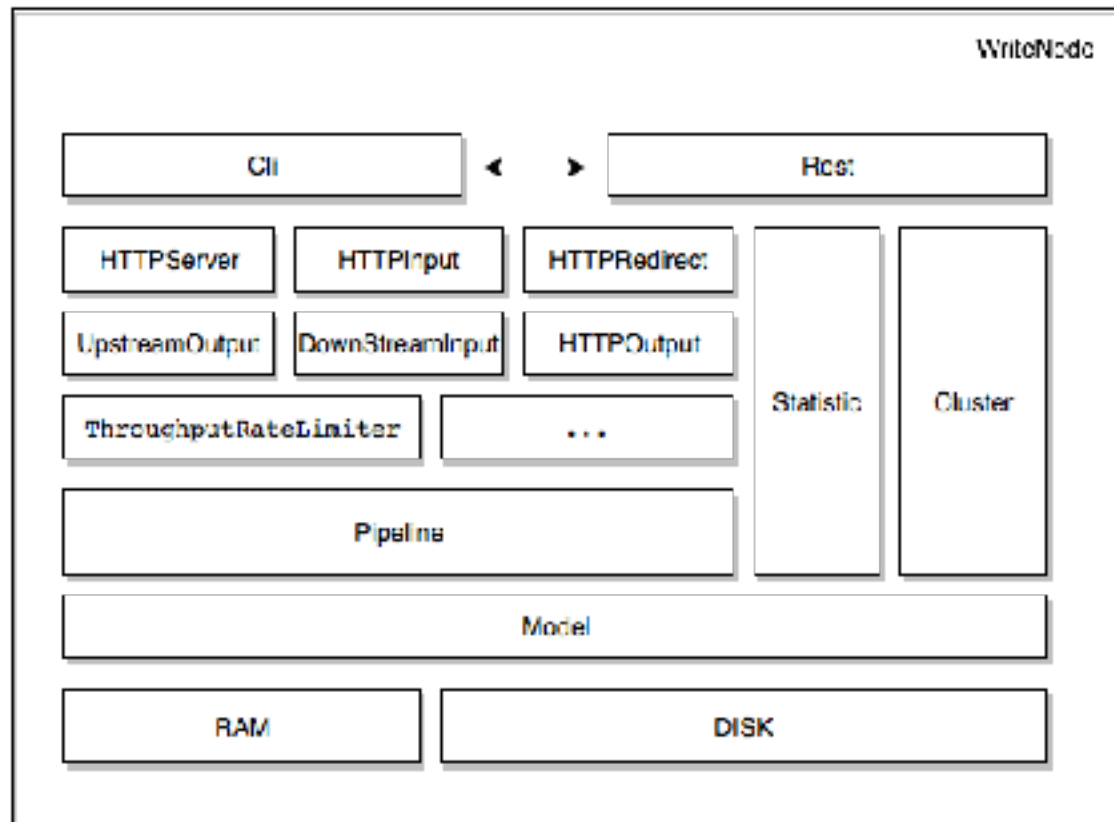


# API GATEWAY

- 目的
  - 限流
  - 升级API
  - 鉴权
- 架构

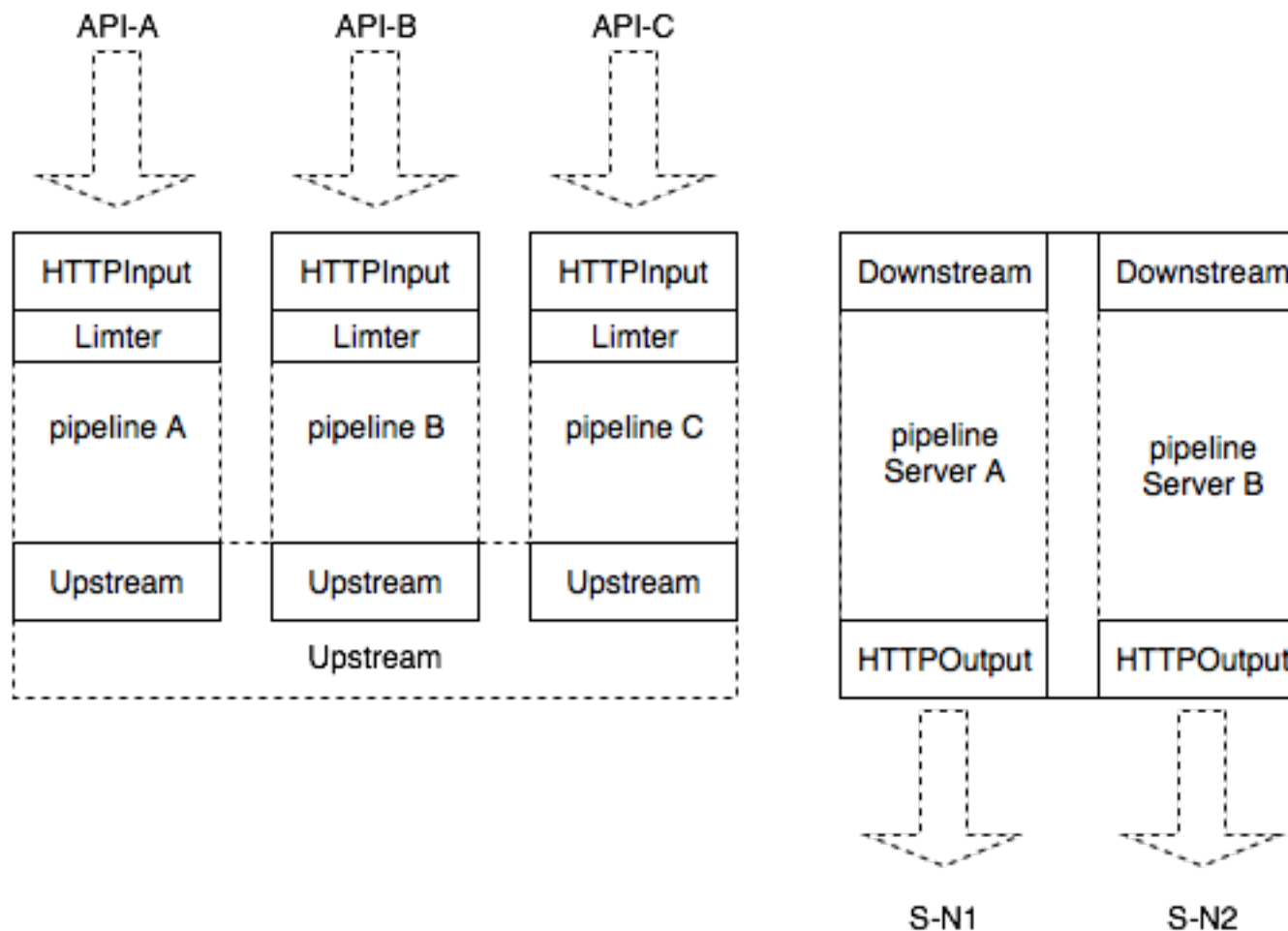


# API GATEWAY



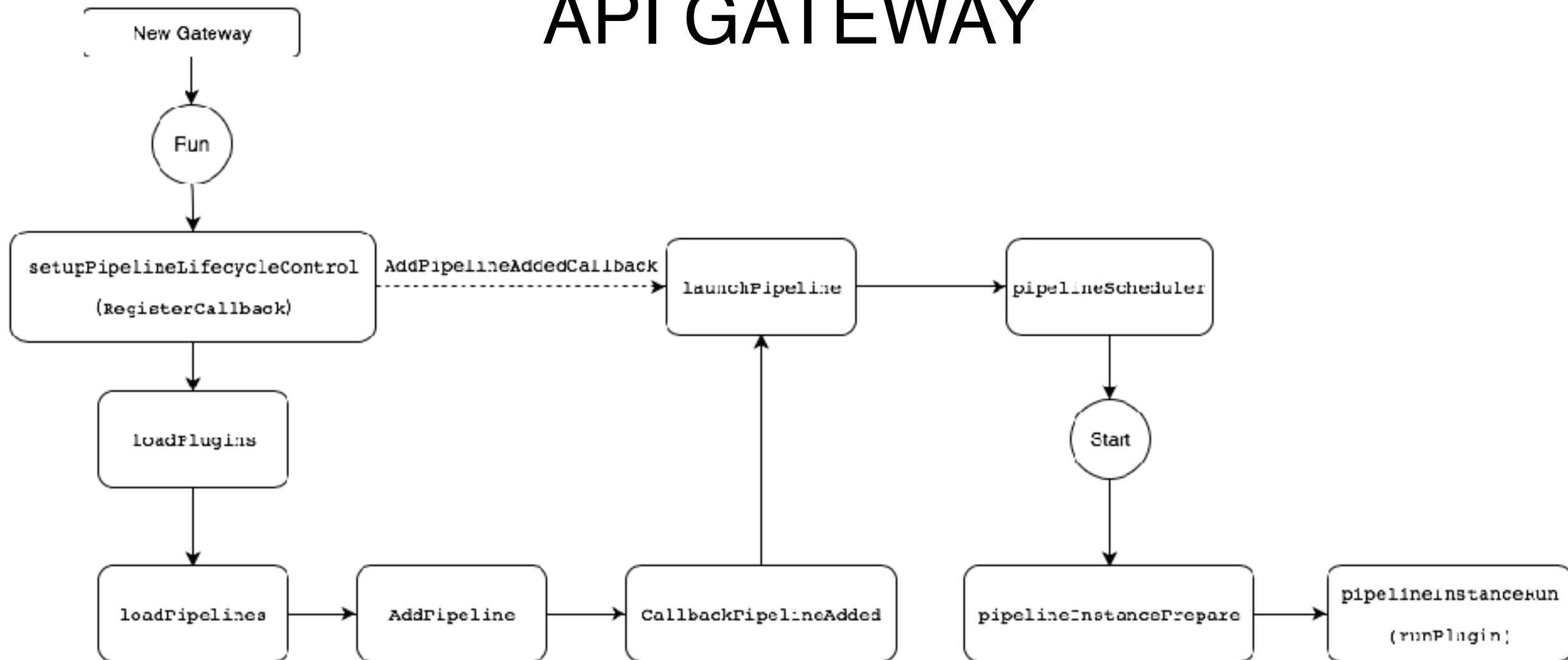


# API GATEWAY



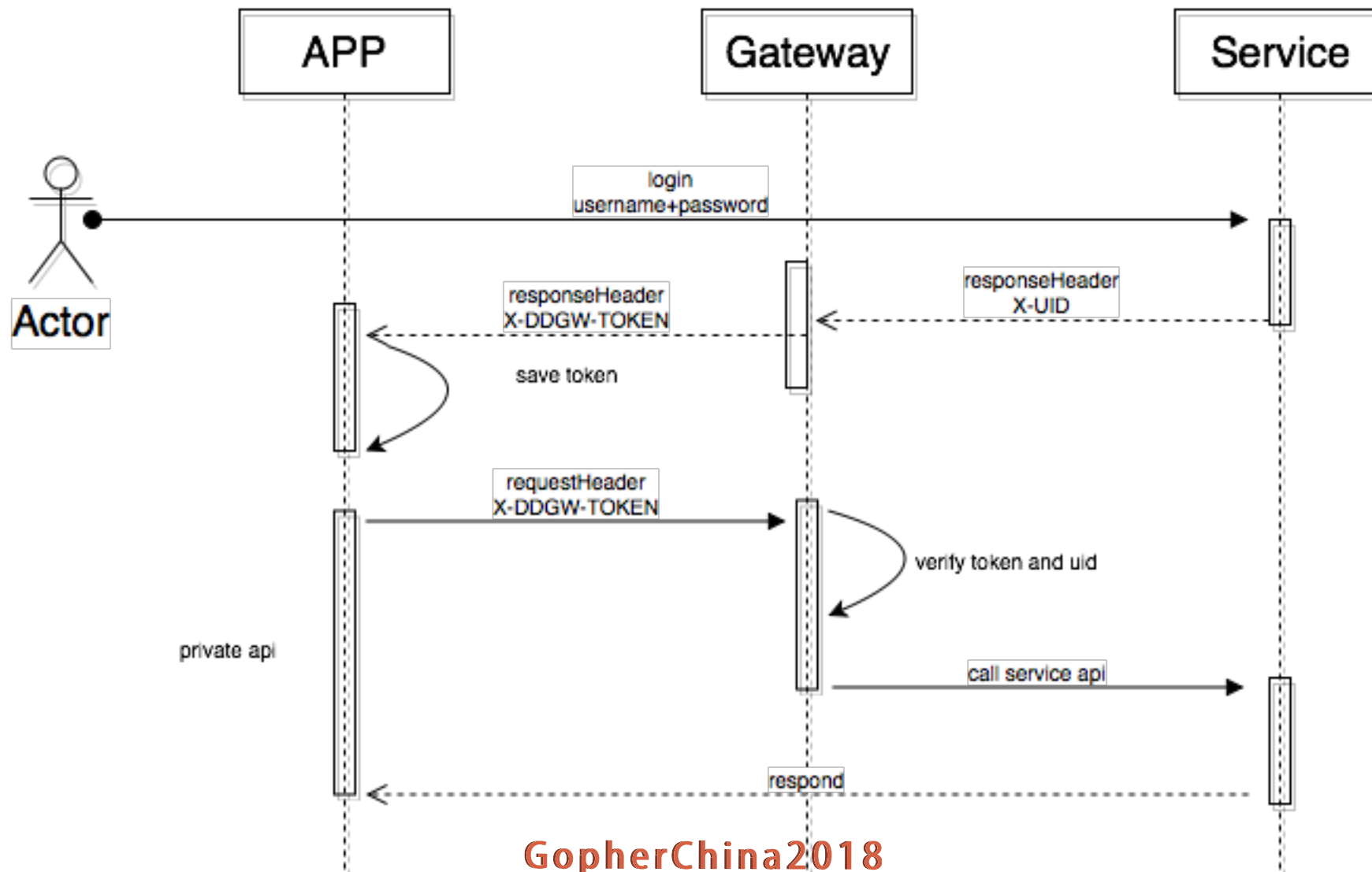


# API GATEWAY





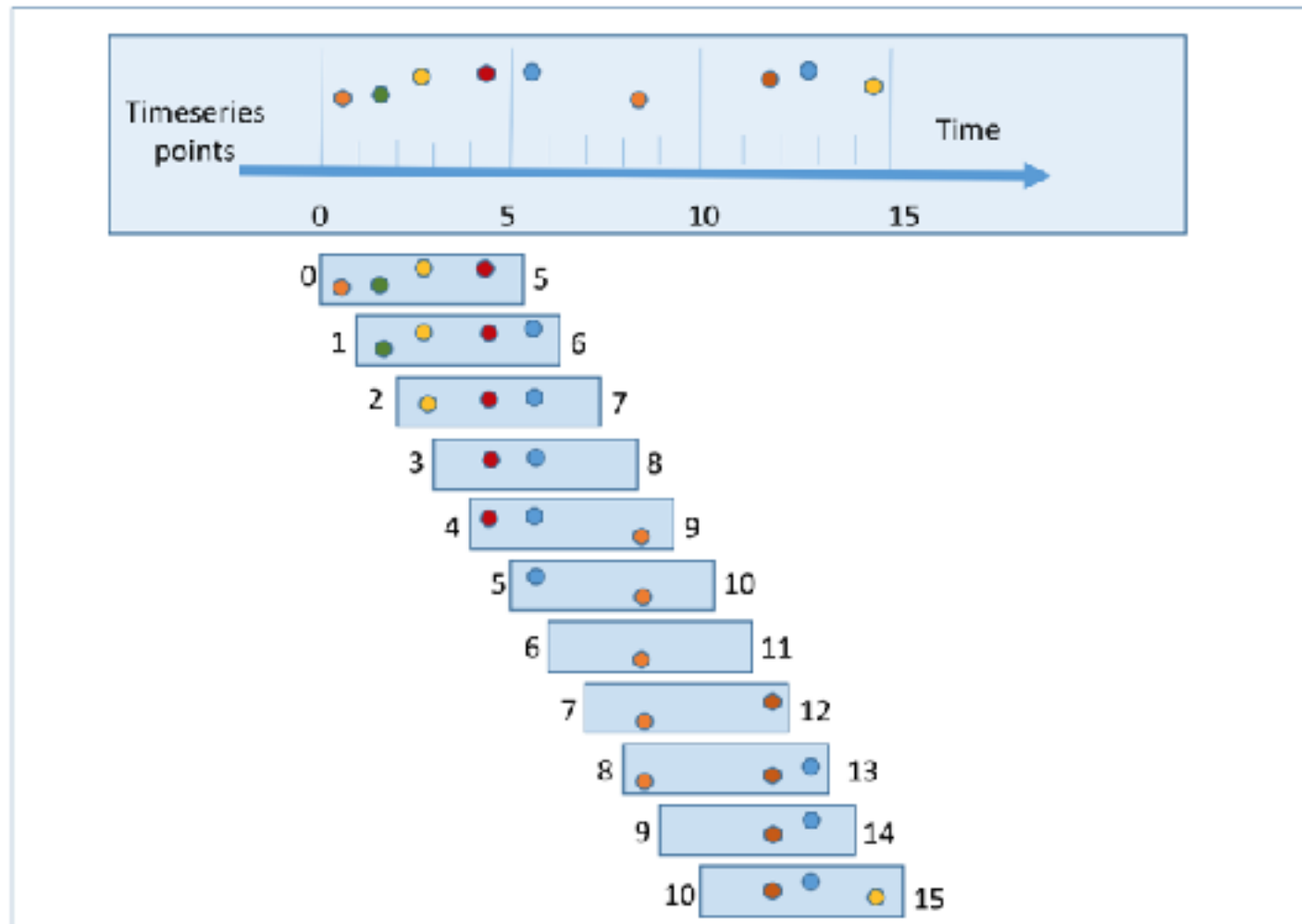
# API GATEWAY







# API GATEWAY



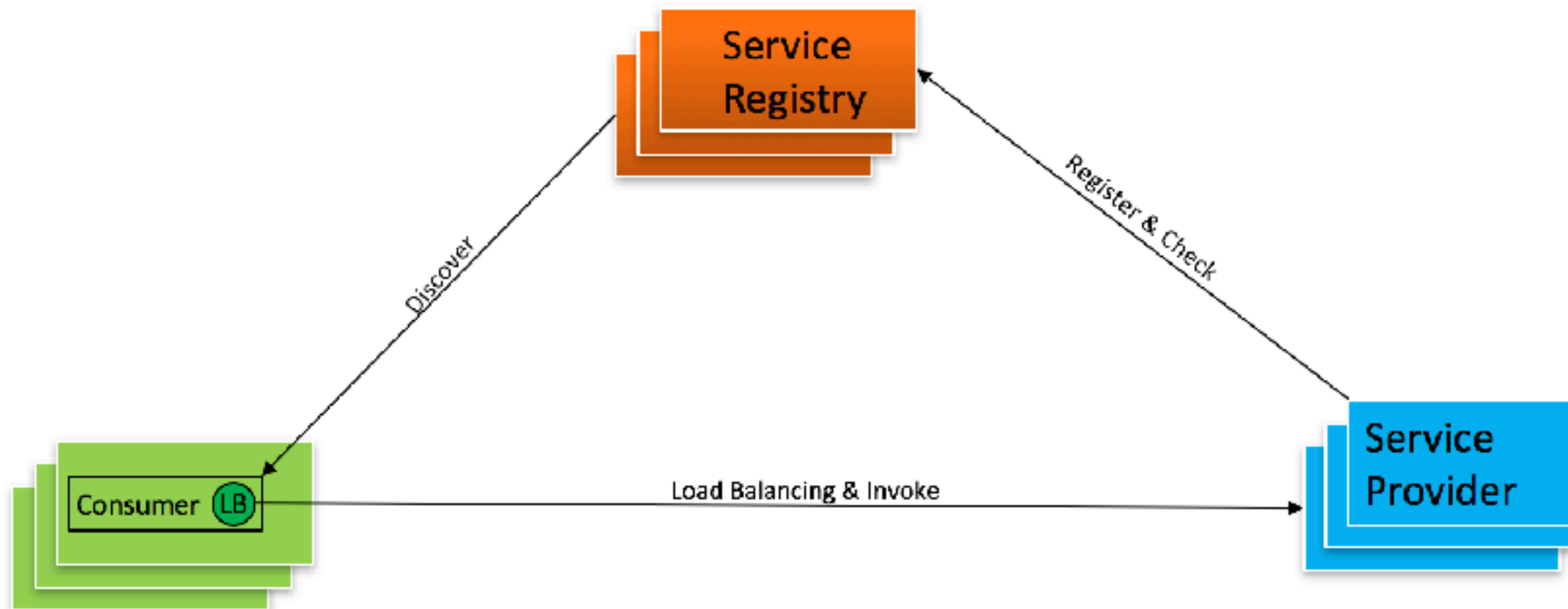


# 服务框架

- 目的
  - 简化应用开发
  - 服务注册发现
  - 方便配置管理
- 架构

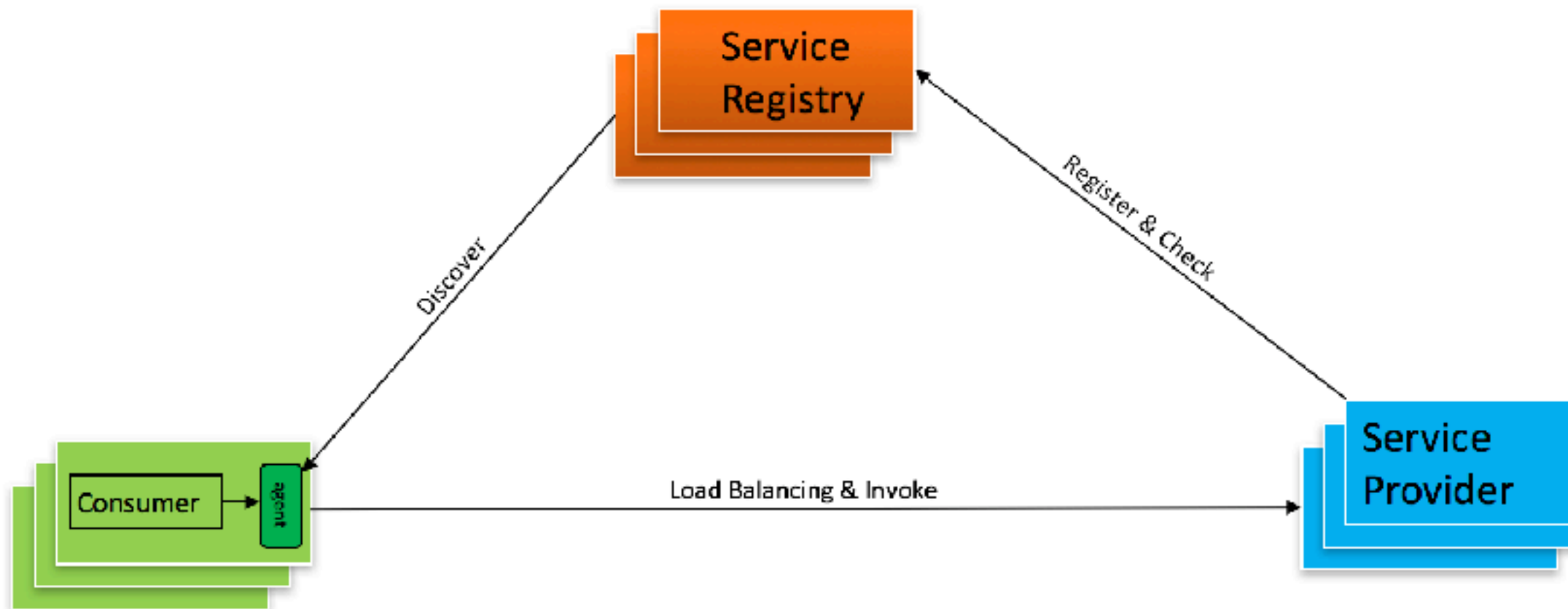


# 服务框架



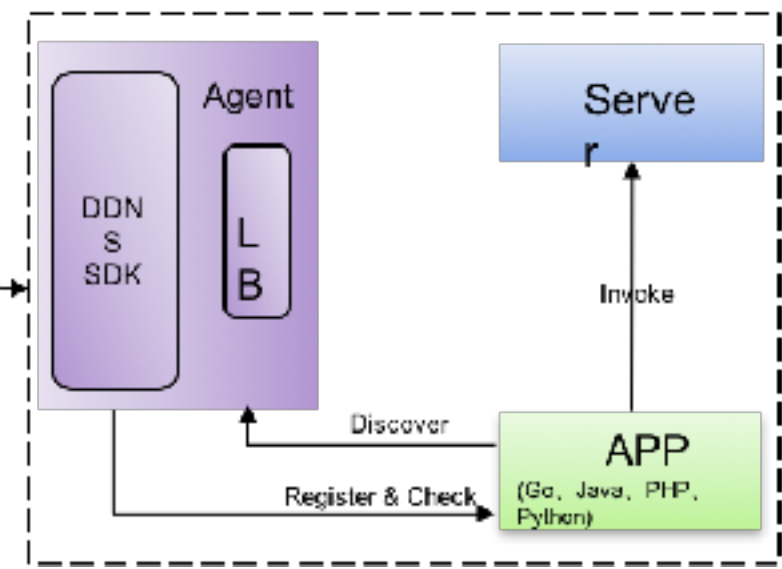
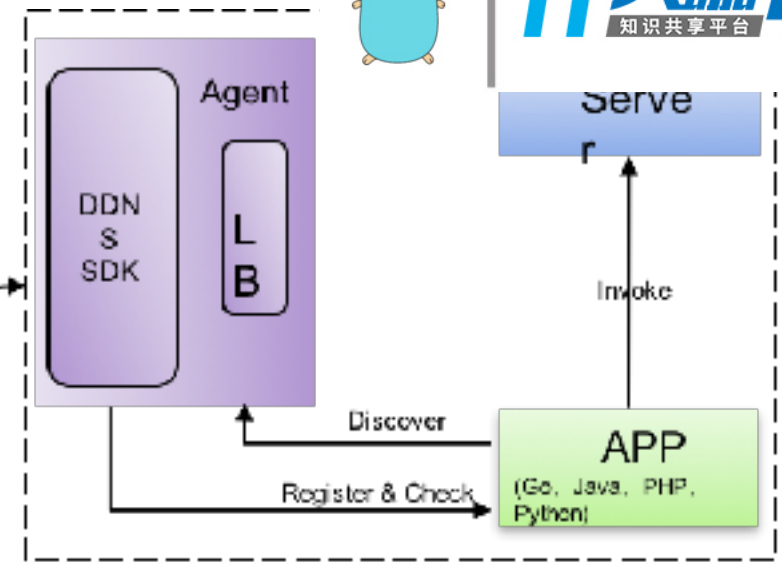
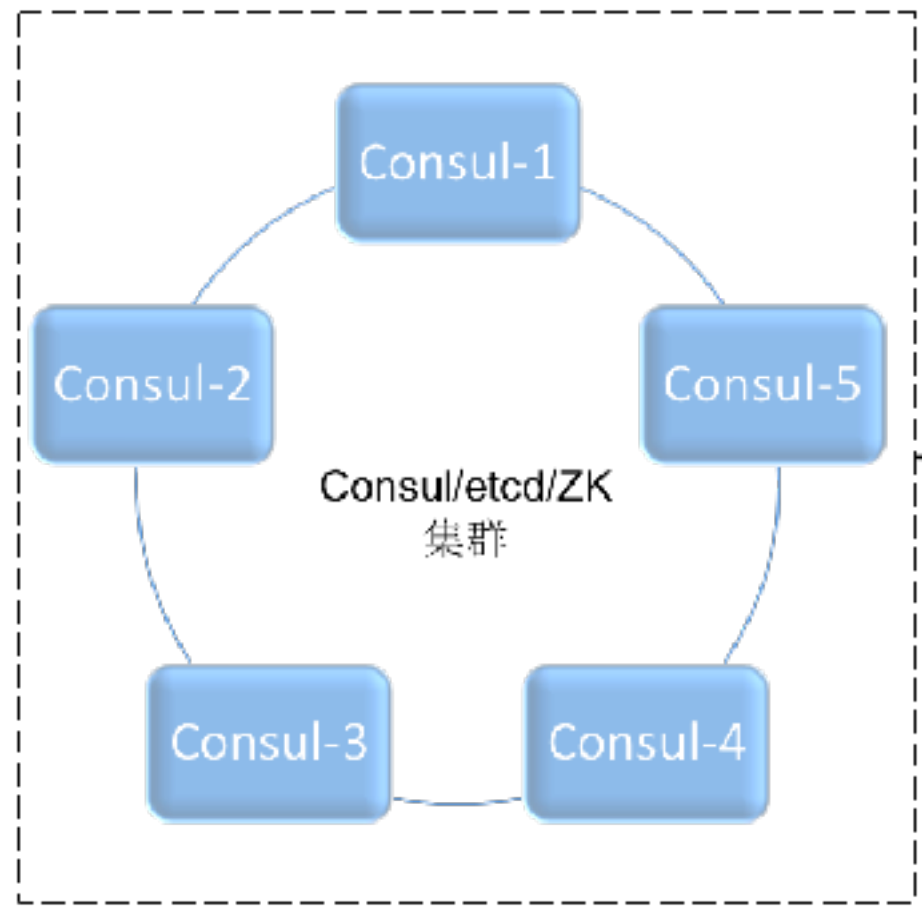


# 服务框架



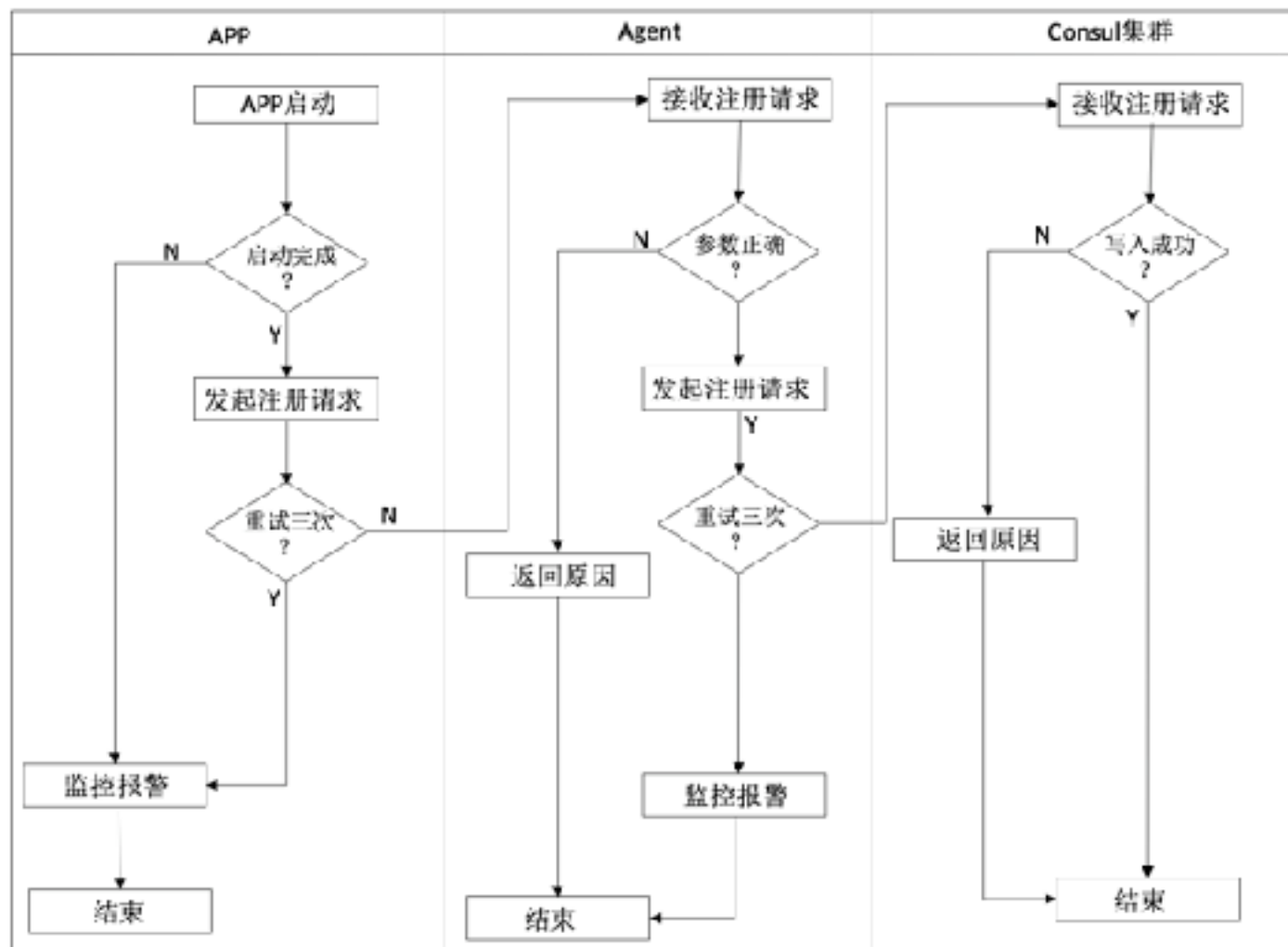


# 服务框架



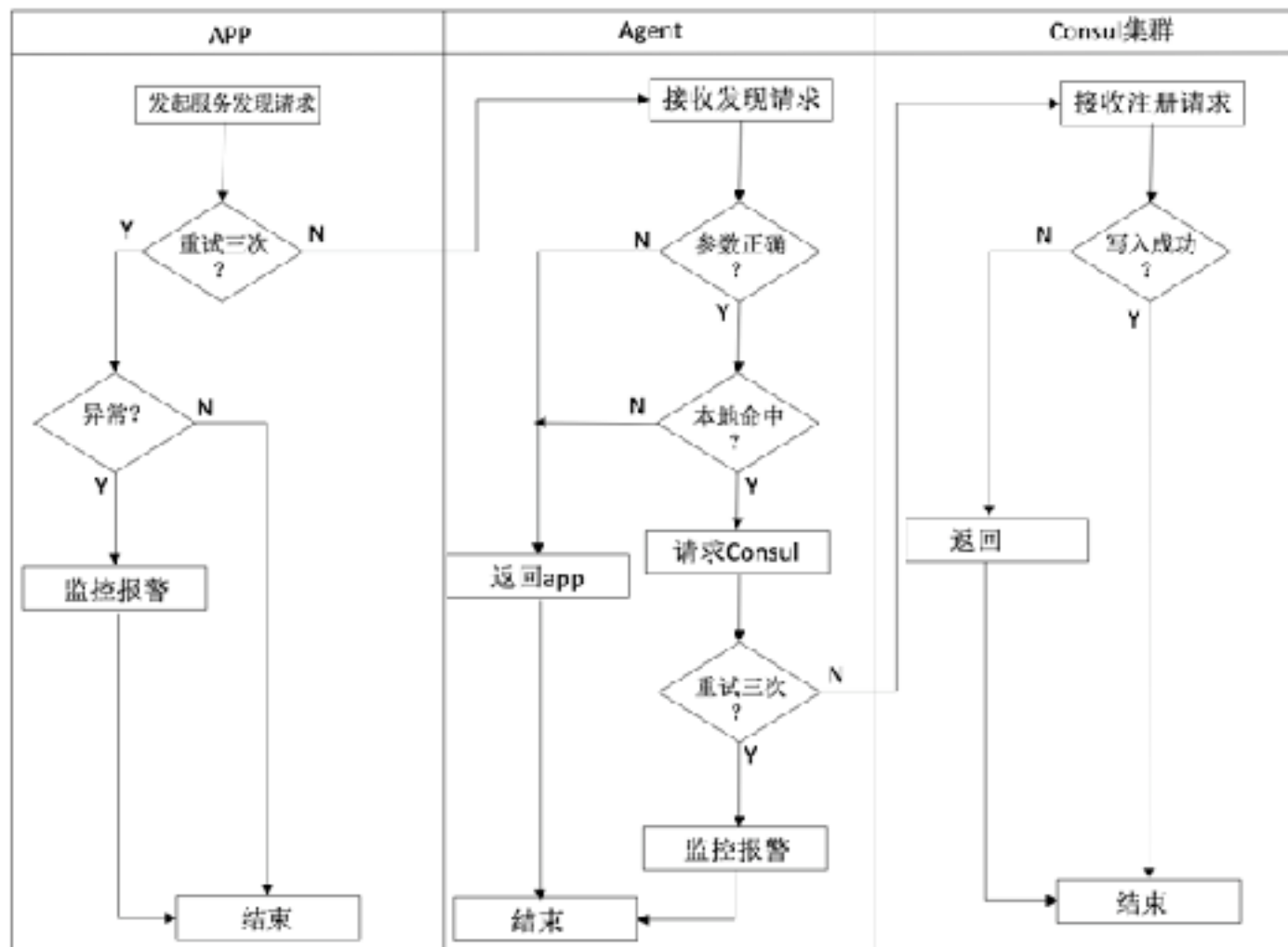


# 服务框架





# 服务框架





# 服务框架

```
type Registry interface {  
    Register(*Service, ...RegisterOption) error  
    Deregister(*Service) error  
    GetService(string) ([]*Service, error)  
    ListServices() ([]*Service, error)  
    Watch() (Watcher, error)  
    String() string  
}
```

```
func DDNS(ctx context.Context, serviceName, method string, body map[string]interface{},  
balance string, header map[string]string, ret interface{}) error {
```



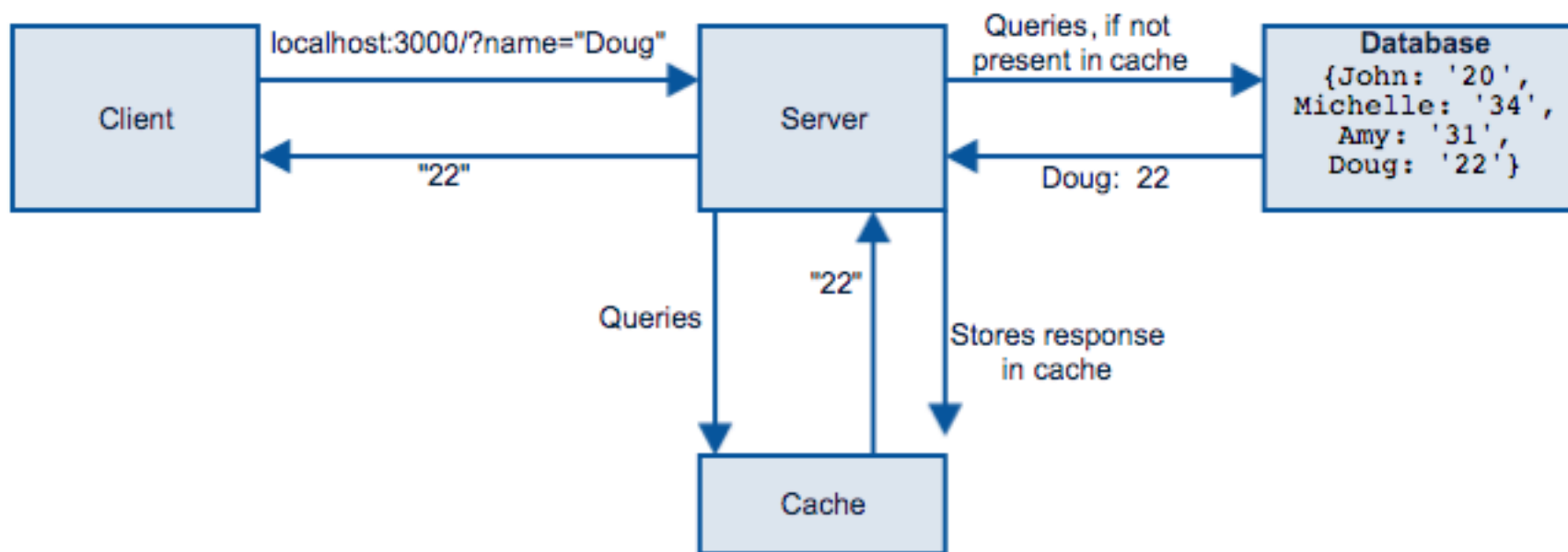


# 多级缓存

- 缓存是万金油，怎么抹是个问题

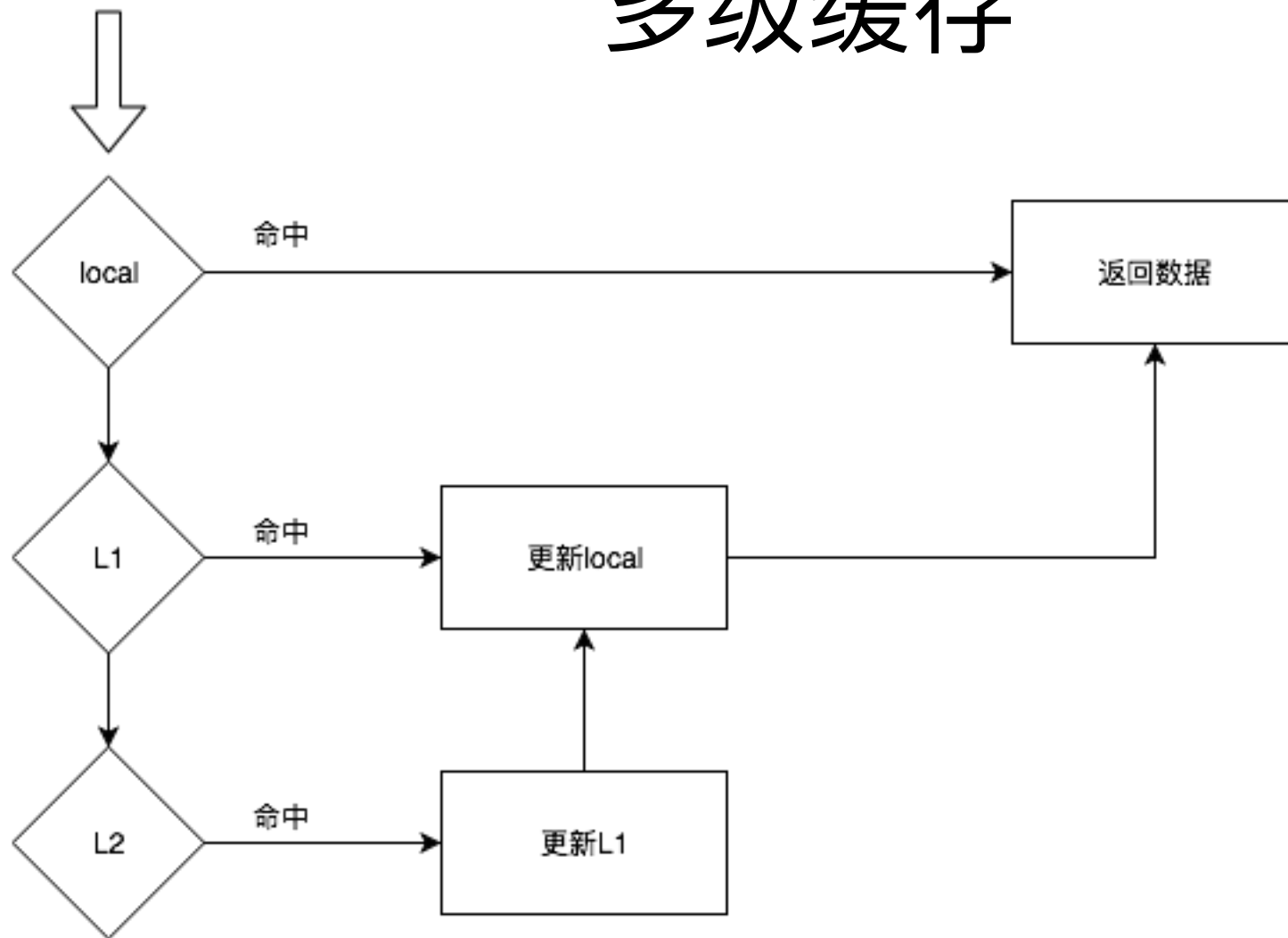


# 多级缓存



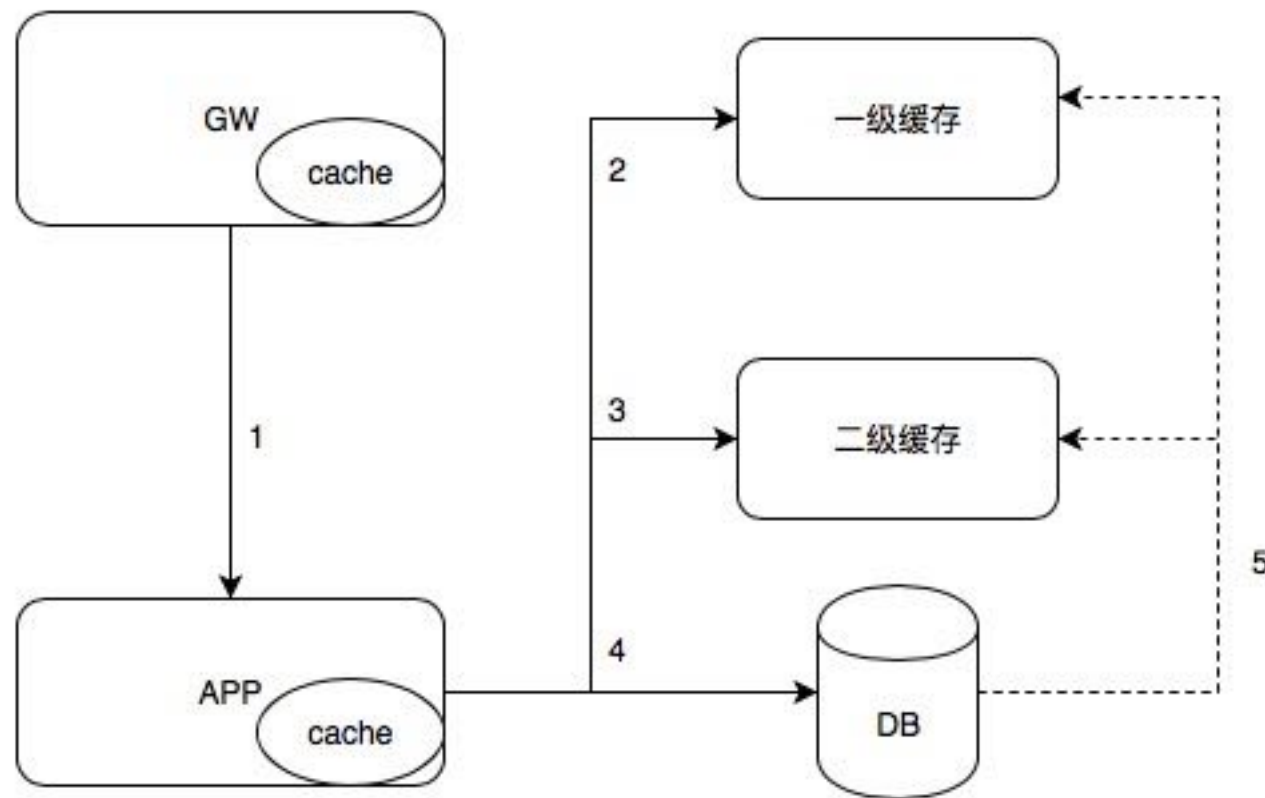


# 多级缓存





# 多级缓存





# 多级缓存

```
type Storage interface {
    Get(ctx *context.Context, key Key, value interface{}) error
    Set(ctx *context.Context, key Key, object interface{}) error
    Add(ctx *context.Context, key Key, object interface{}) error
    MultiGet(ctx *context.Context, keys []Key, valuesMap interface{}) error
    MultiSet(ctx *context.Context, values map[Key]interface{}) error
    Delete(ctx *context.Context, key ...Key) error
}

// 添加一个deleteable接口, 给模版使用, 判断某对象有没有实现DoDelete
type Deleteable interface {
    DoDelete(ctx *context.Context, key ...Key) error
}

type StorageProxy struct {
    PreferredStorage Storage
    BackupStorage    Storage
}
```



# 多级缓存

	php with redis cache	go with redis cache	big cache	object cache
免费专栏首页	100+	600+	2000+	12000+
付费专栏首页	200+	900+	2400+	14000+

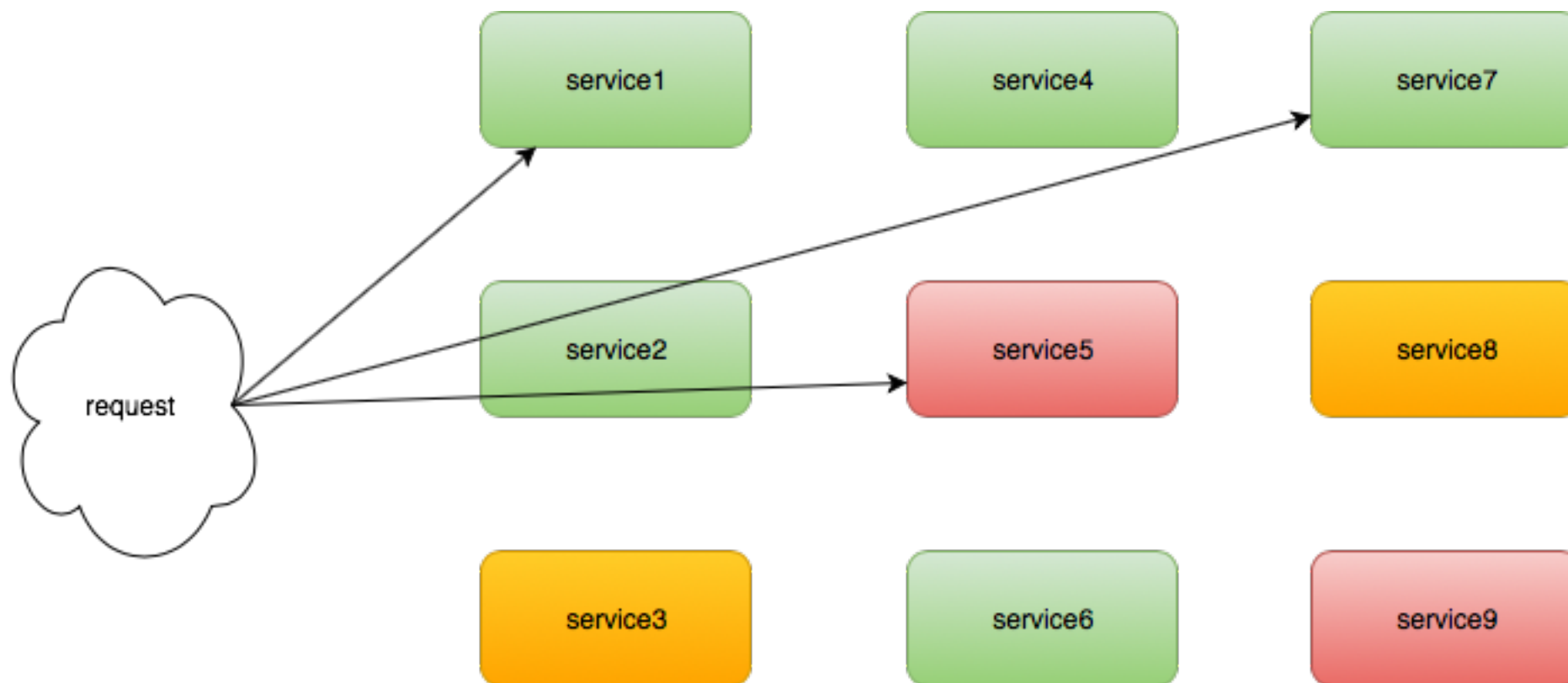


# 熔断降级

- 熔断
- 降级



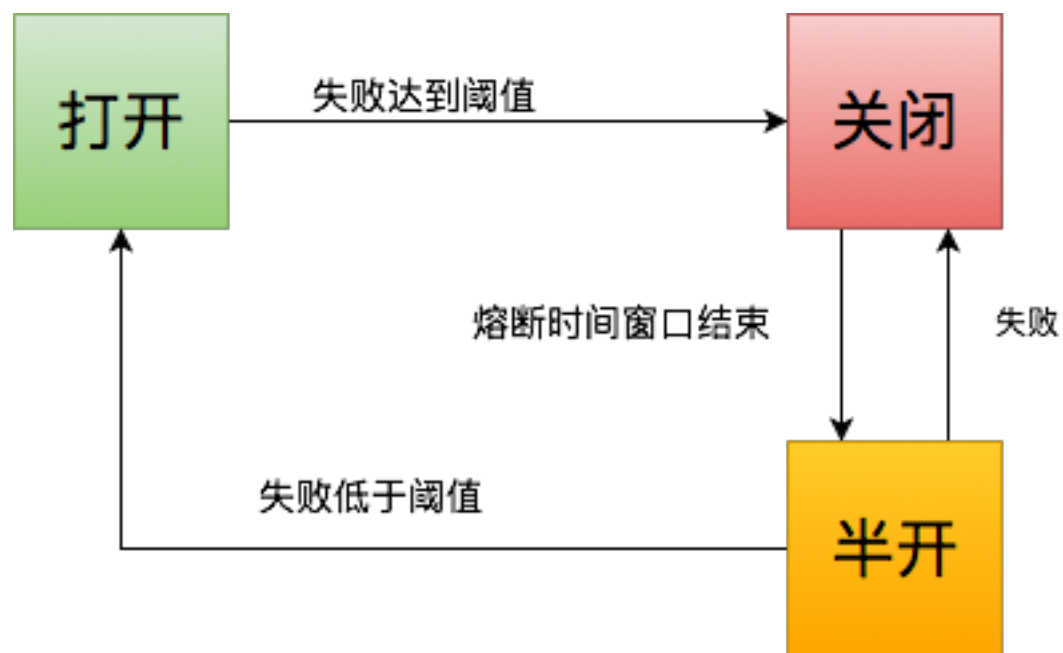
# 熔断







# 熔断





# 熔断

```
hystrix.Go("my_command", func() error {  
    // talk to other services  
    return nil  
}, func(err error) error {  
    // do this when services are down  
    return nil  
})
```



# 经验总结

- 通用基础库非常重要
- 善用工具
  - generate + framework提升开发效率
  - pprof+trace+go-torch确定性能问题



```
>jixiuf@bogon igetserver/ledgers (master) % ../storage_template/generate_storage.sh diary notes_comment notes_comment_dao
```

这个工具的意义是生成针对table的storage,只适用于根据主键或单一系列进行GET/MultiGet/...等场景

请一定要在你项目的根目录下运行此脚本

```
using:../storage_template/../../storage_template/generate_storage.sh dbname tablename packagename [keycolumnname]
```

```
demo ../storage_template/generate_storage.sh coupon coupon_relation coupon_relation sender_uid
```

```
/Users/jixiuf/go/src/gitlab.luojilab.com/igetserver/storage_template
```

```
/Users/jixiuf/go/src/gitlab.luojilab.com/igetserver/storage_template
```

```
/Users/jixiuf/go/src/gitlab.luojilab.com/igetserver/storage_template
```

新生成的models文件:

```
total 840
```

```
-rw-r--r-- 1 jixiuf staff 2.6K 4 4 16:23 notes_comment.go
```

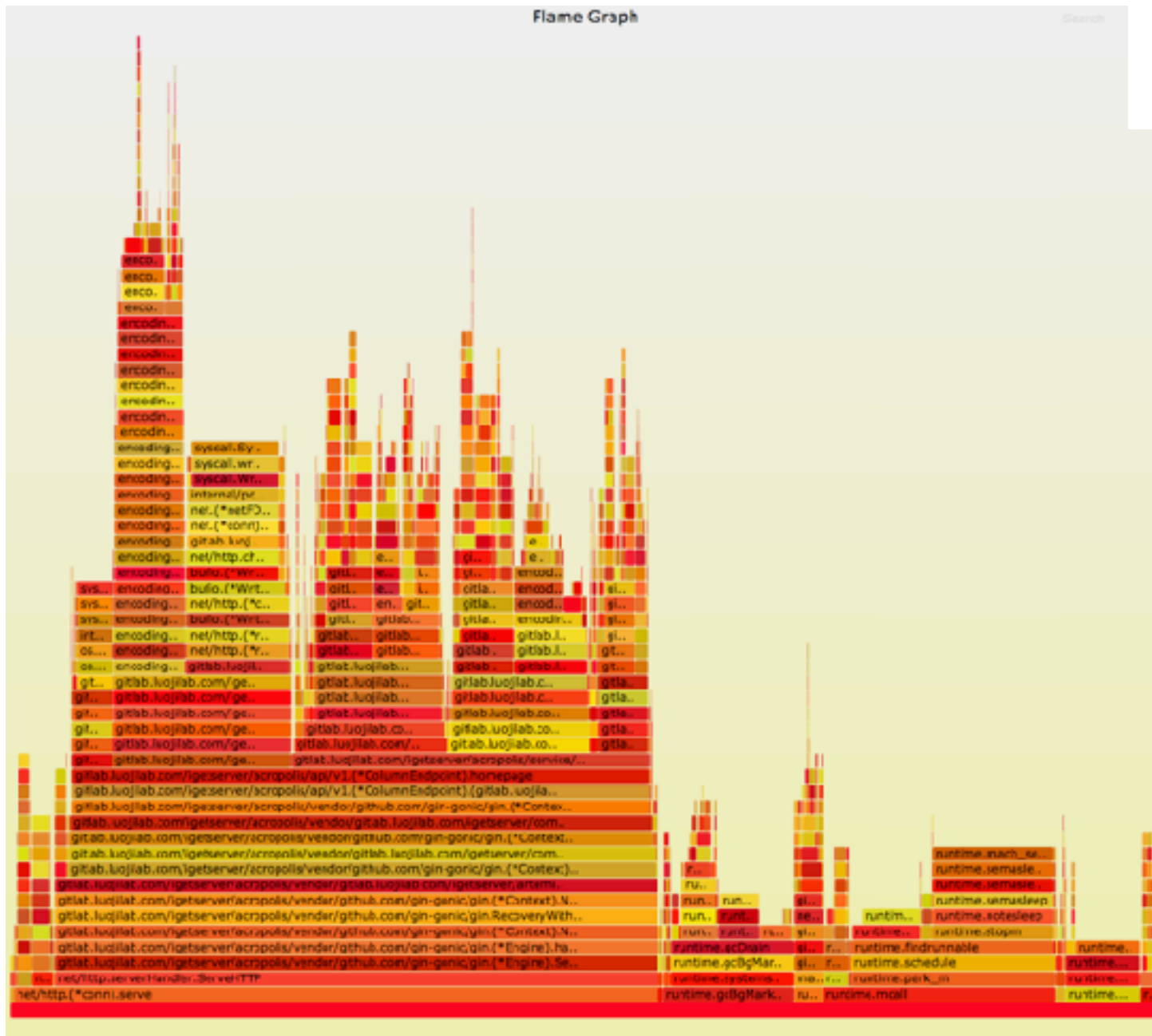
新生成的storage文件:

```
/Users/jixiuf/go/src/gitlab.luojilab.com/igetserver/ledgers/dao/notes_comment_dao
```

```
/Users/jixiuf/go/src/gitlab.luojilab.com/igetserver/ledgers/dao/notes_comment_dao/notes_comment_dao_gen.go
```

```
/Users/jixiuf/go/src/gitlab.luojilab.com/igetserver/ledgers/dao/notes_comment_dao/notes_comment_storage_gen.go
```

```
/Users/jixiuf/go/src/gitlab.luojilab.com/igetserver/ledgers
```





### Flame Graph



```
(pprof) top
Showing nodes accounting for 4943.10kB, 100% of 4943.10kB total
Showing top 10 nodes out of 37
  flat flat% sum%   cum  cum%
1542.01kB 31.20% 31.20% 1542.01kB 31.20% gitlab.luojilab.com/igetserver/
1321.24kB 26.32% 57.52% 1321.24kB 26.32% gitlab.luojilab.com/igetserver/
1071.64kB 21.68% 79.20% 1071.64kB 21.68% runtime.makemap
 516.01kB 10.44% 89.64%  516.01kB 10.44% runtime.allgadd
 512.20kB 10.36% 100%   512.20kB 10.36% runtime.malg
    0     0% 100%    514kB 10.40% gitlab.luojilab.com/igetserver/
    0     0% 100%   1228kB 20.80% gitlab.luojilab.com/igetserver/
    0     0% 100%   1228kB 20.80% gitlab.luojilab.com/igetserver/
    0     0% 100%    514kB 10.40% gitlab.luojilab.com/igetserver/
    0     0% 100%   557.26kB 11.27% gitlab.luojilab.com/igetserver/
(pprof)
```

/debug/pprof/

profiles:

0 [block](#)

58 [goroutine](#)

3000 [heap](#)

0 [mutex](#)

22 [threadcreate](#)

[full goroutine stack dump](#)

```
(pool.NewConn
syncBuffer).rotateFile
Func12
Func13
pprof.init
```





# 经验总结

- 针对热点代码做优化
- 合理复用对象
- 尽量避免反射
- 选择合适的序列化/反序列化方式
- GC开销



# 经验总结

- 压力测试
  - ab
  - siege
  - pts





# 经验总结

- consul的坑
  - consul集群不同node可以存在相同的serviceId
  - consul提供的API不能有效删除service



# 正在做什么

- 分库分表和分布式事务
- API GATEWAY
- APM
- 容器化
- 缓存服务化



# Q&A

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