

GopherChina2018



逻辑思维Go语言微服务改造实践

方圆



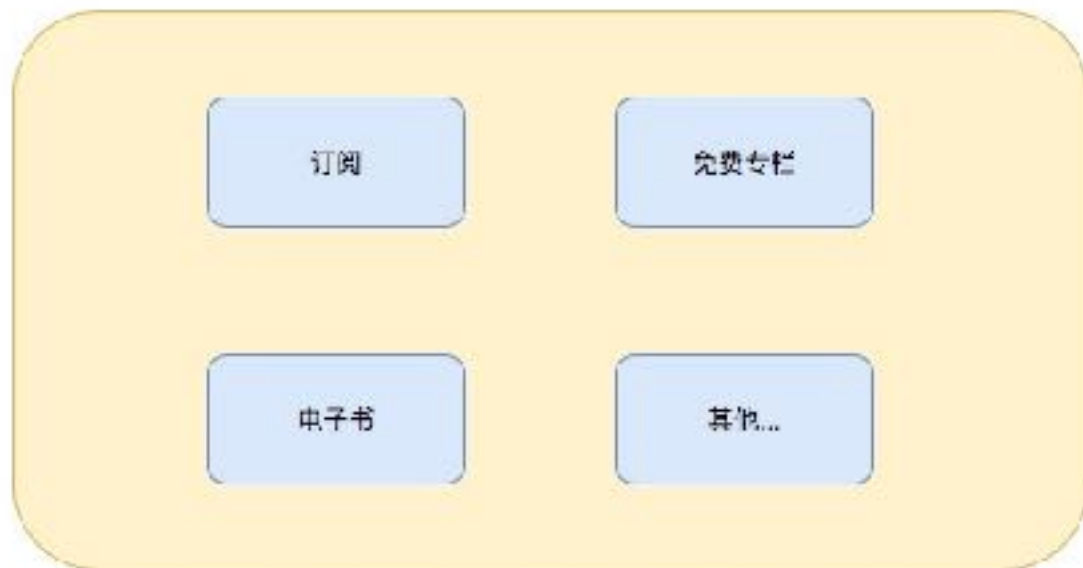
自我介绍

- 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



passpor.

jocoin

pay

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第二版

v2

订阅

免费试用

电子书

其他...

passport

jccoin

pay

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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

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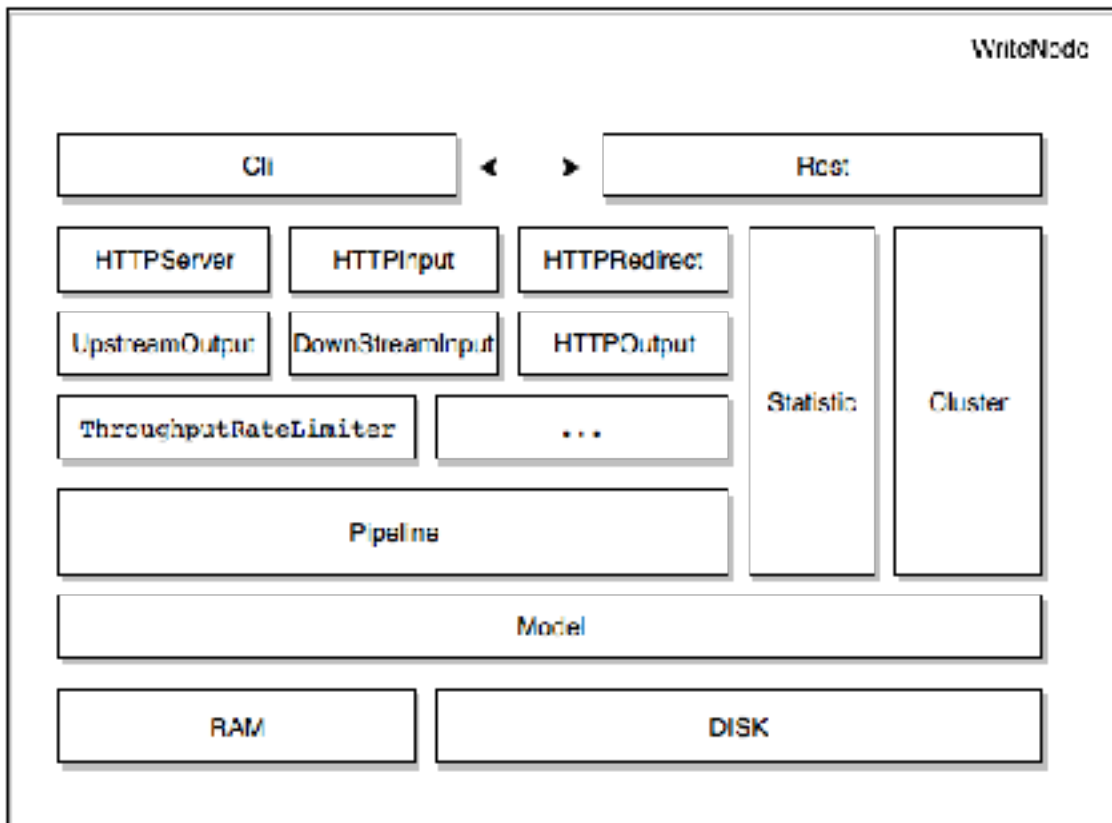
框架和基础设施

- API GATEWAY
- 服务框架
- 多级缓存
- 熔断降级

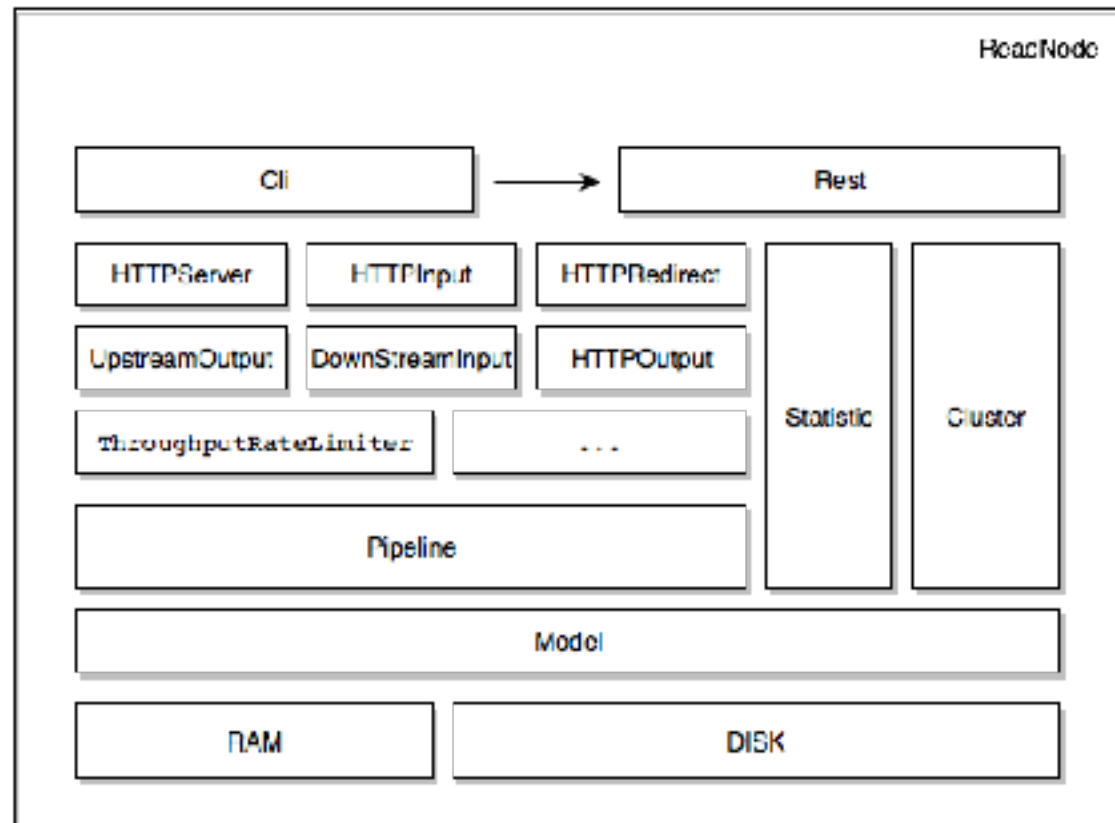
API GATEWAY

- 目的
 - 限流
 - 升级API
 - 鉴权
- 架构

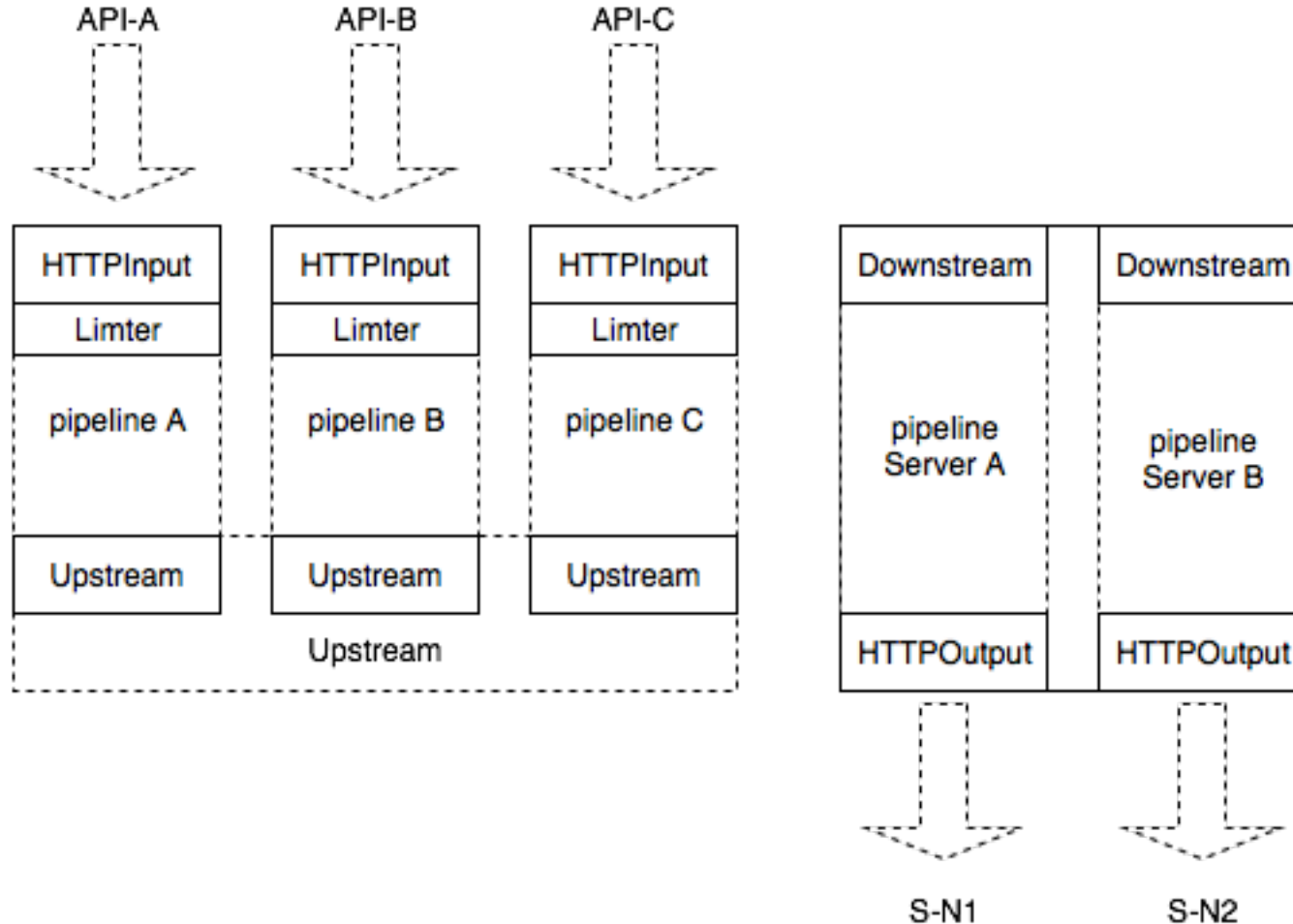
API GATEWAY



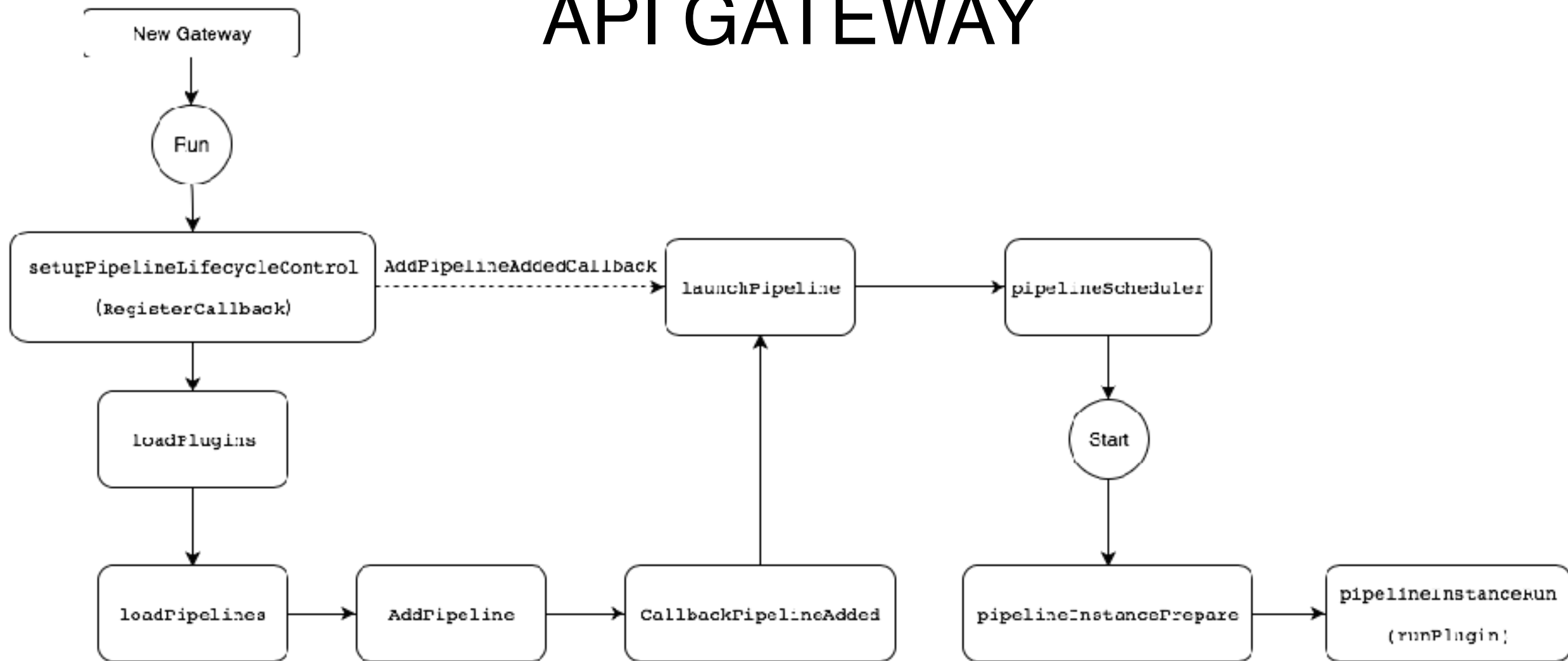
Cplog →



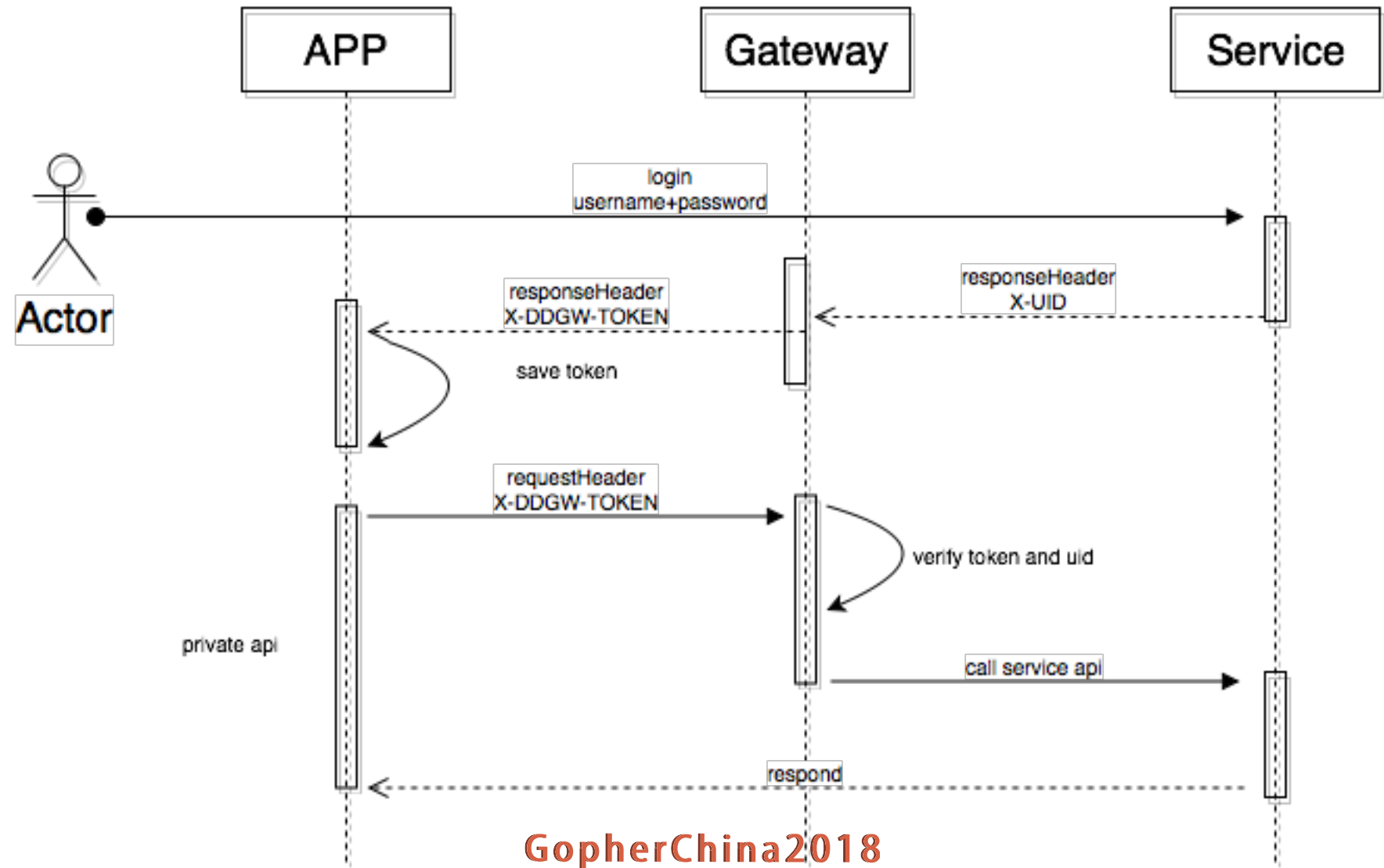
API GATEWAY



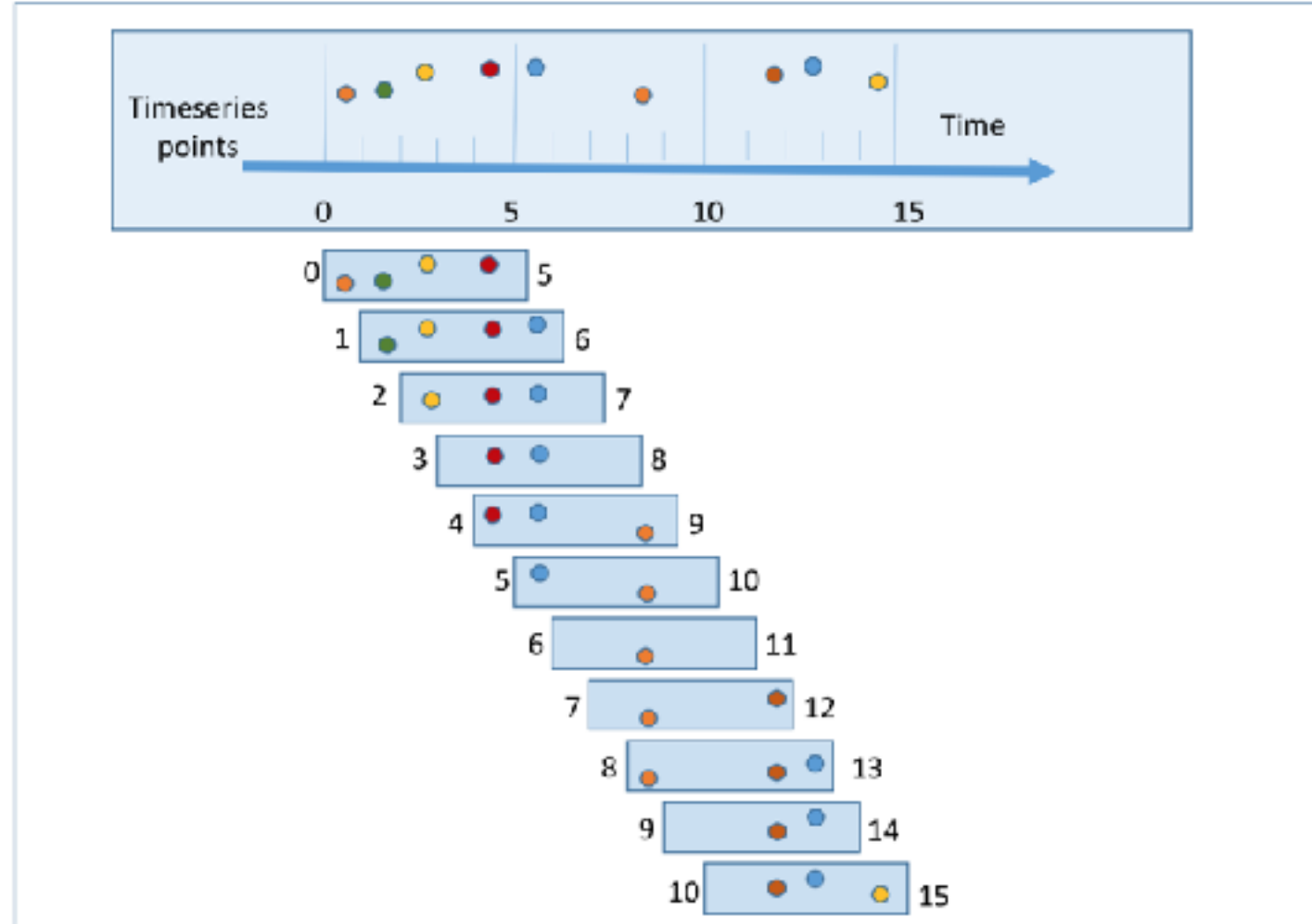
API GATEWAY



API GATEWAY



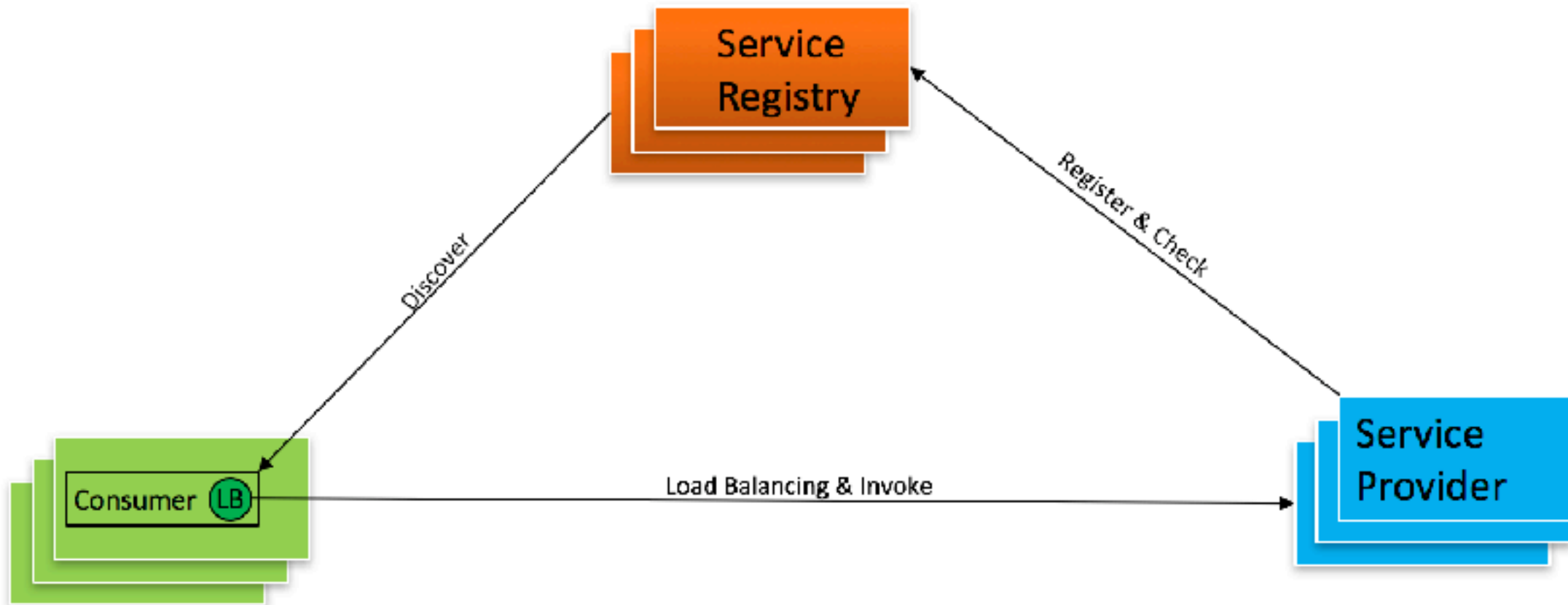
API GATEWAY



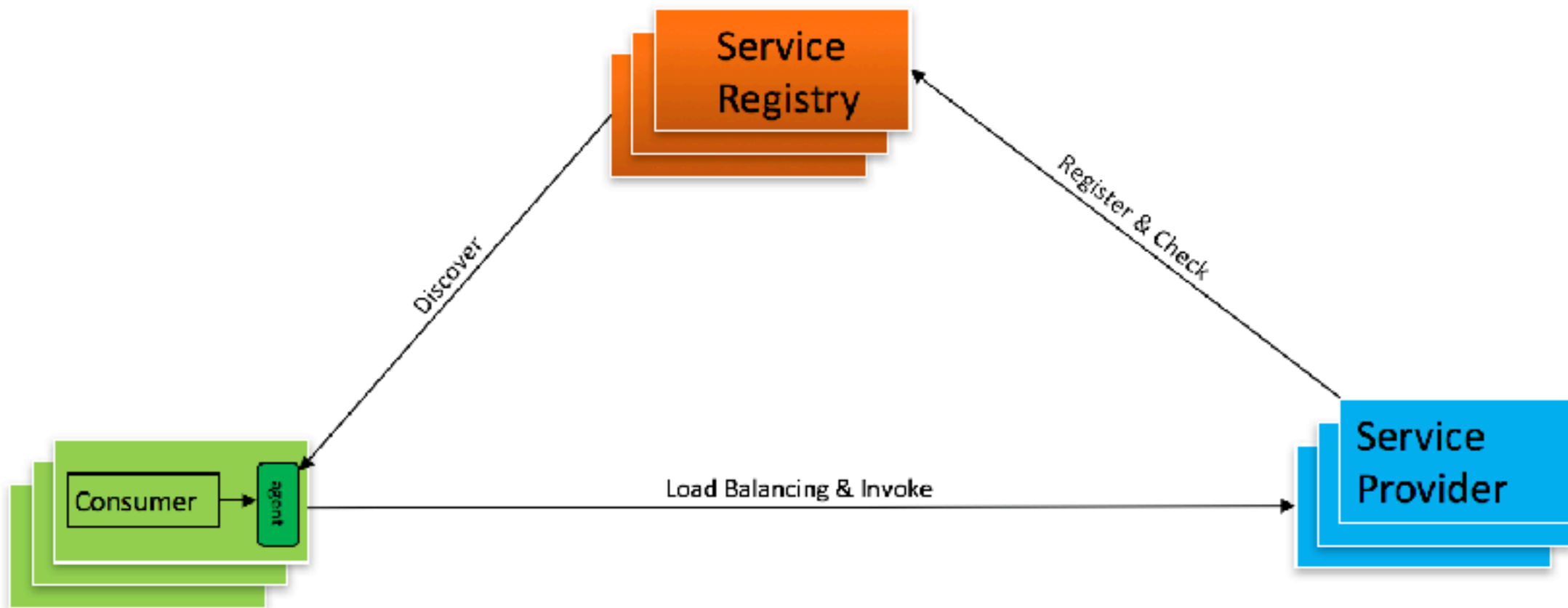
服务框架

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

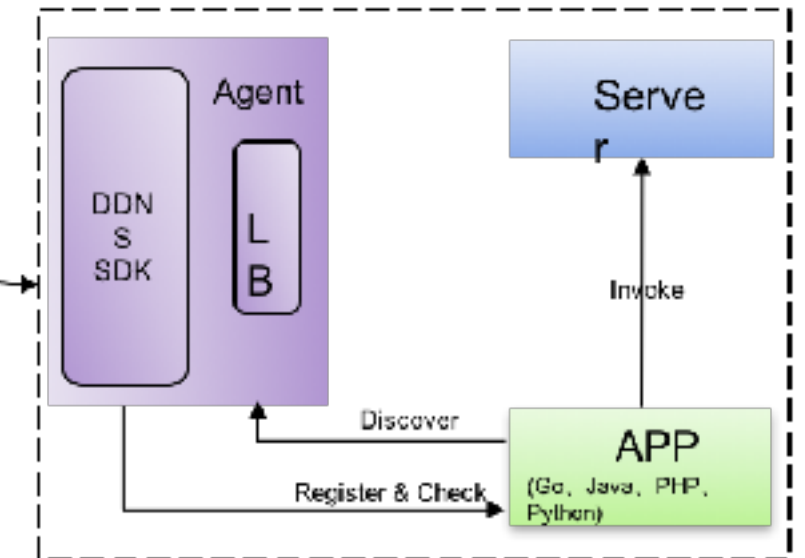
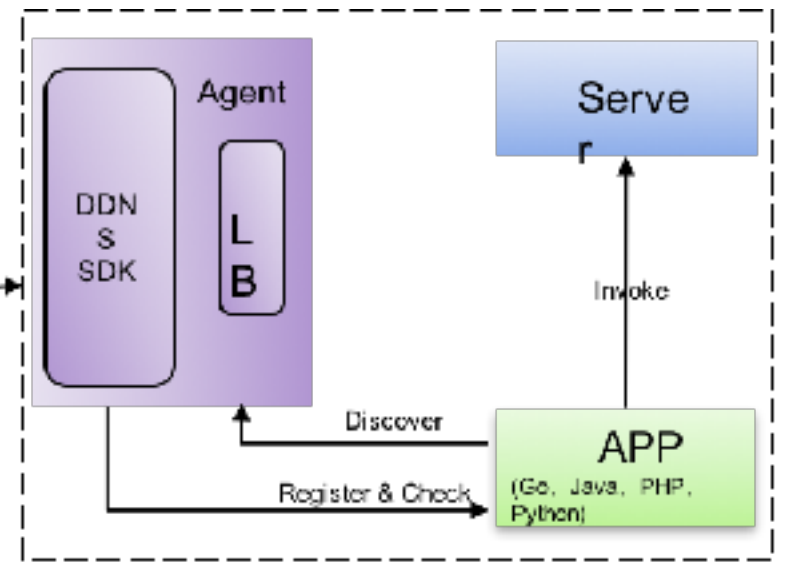
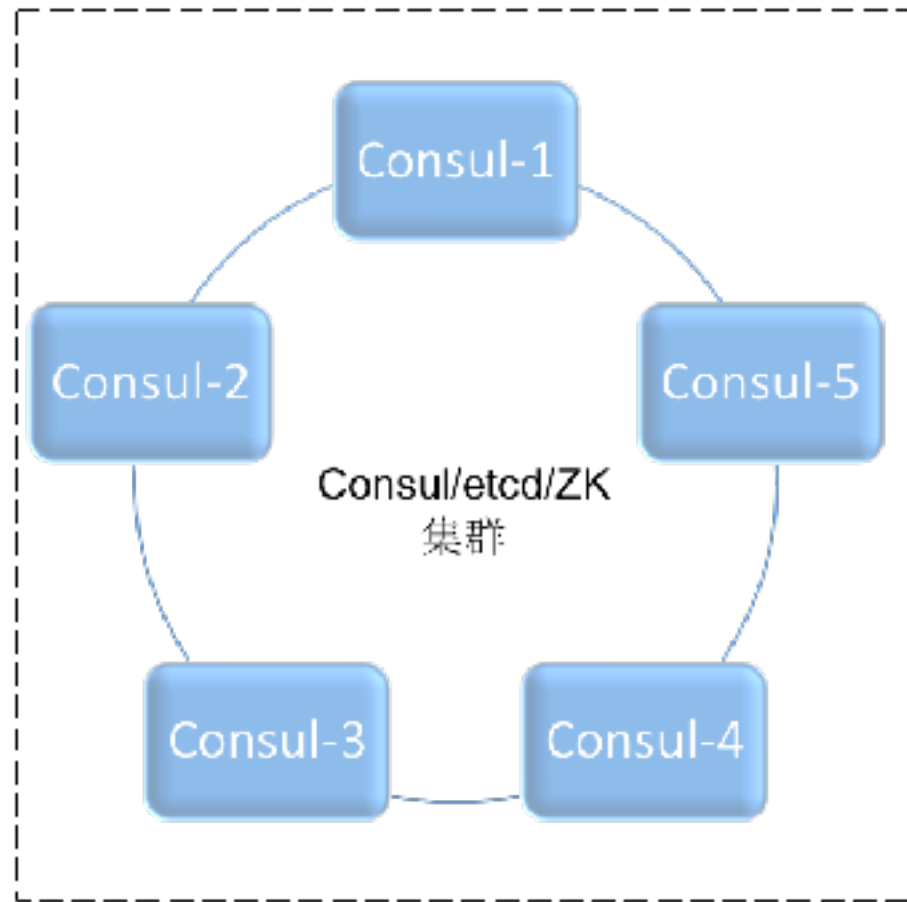
服务框架



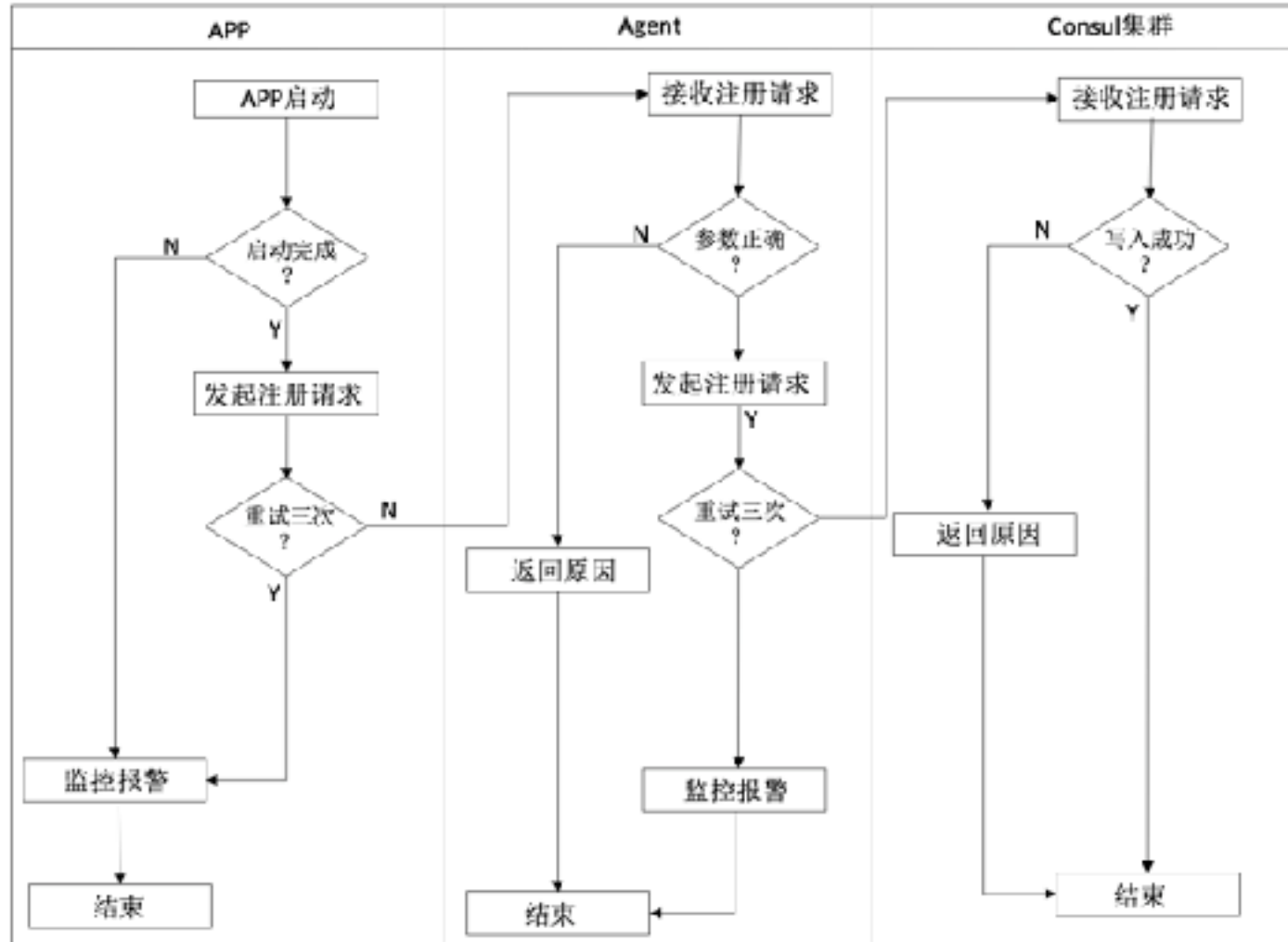
服务框架



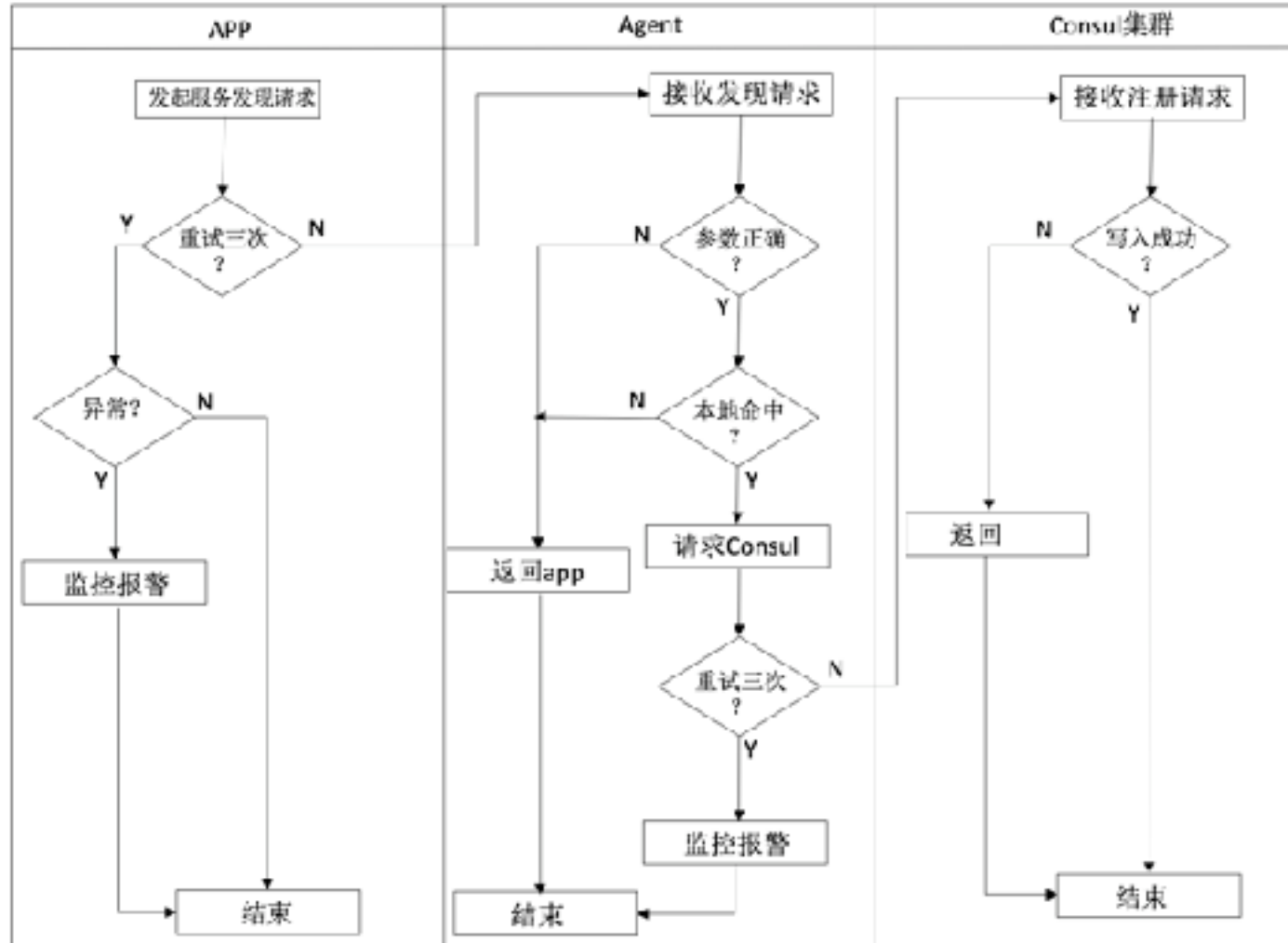
服务框架



服务框架



服务框架



服务框架

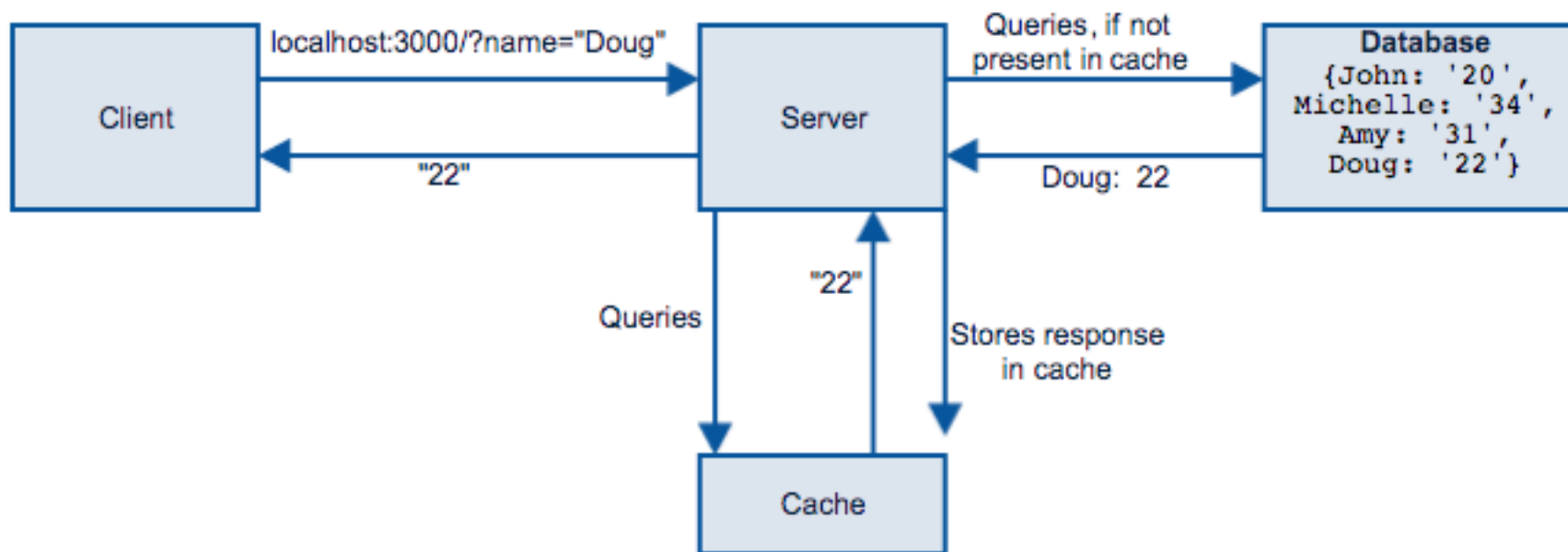
```
type Registry interface {
    Register(*Service, ...RegisterOption) error
    Deregister(*Service) error
    GetService(string) ([]*Service, error)
    ListServices() ([]*Service, error)
    Watch() (Watcher, error)
    String() string
}

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

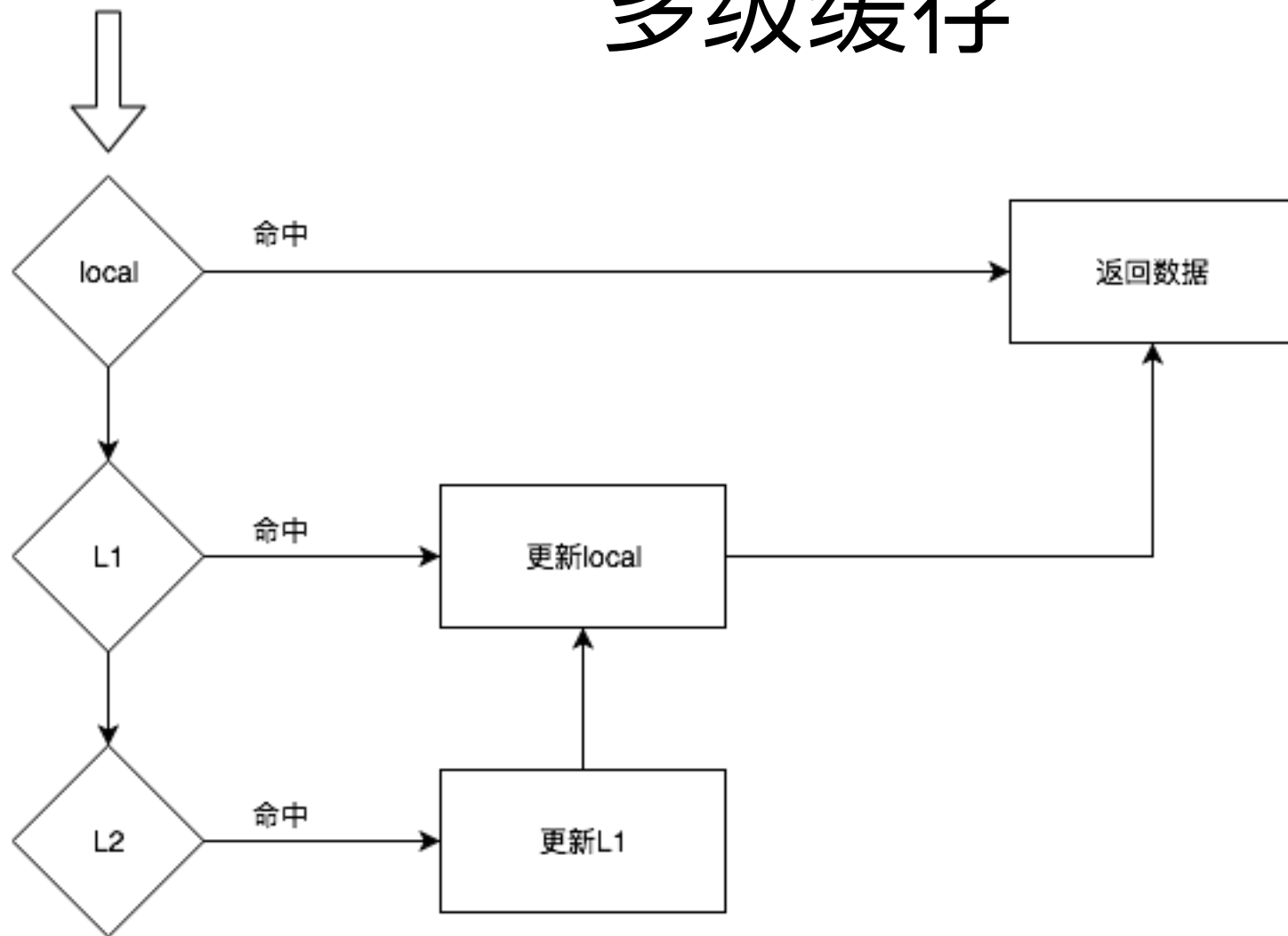

多级缓存

- 缓存是万金油，怎么抹是个问题

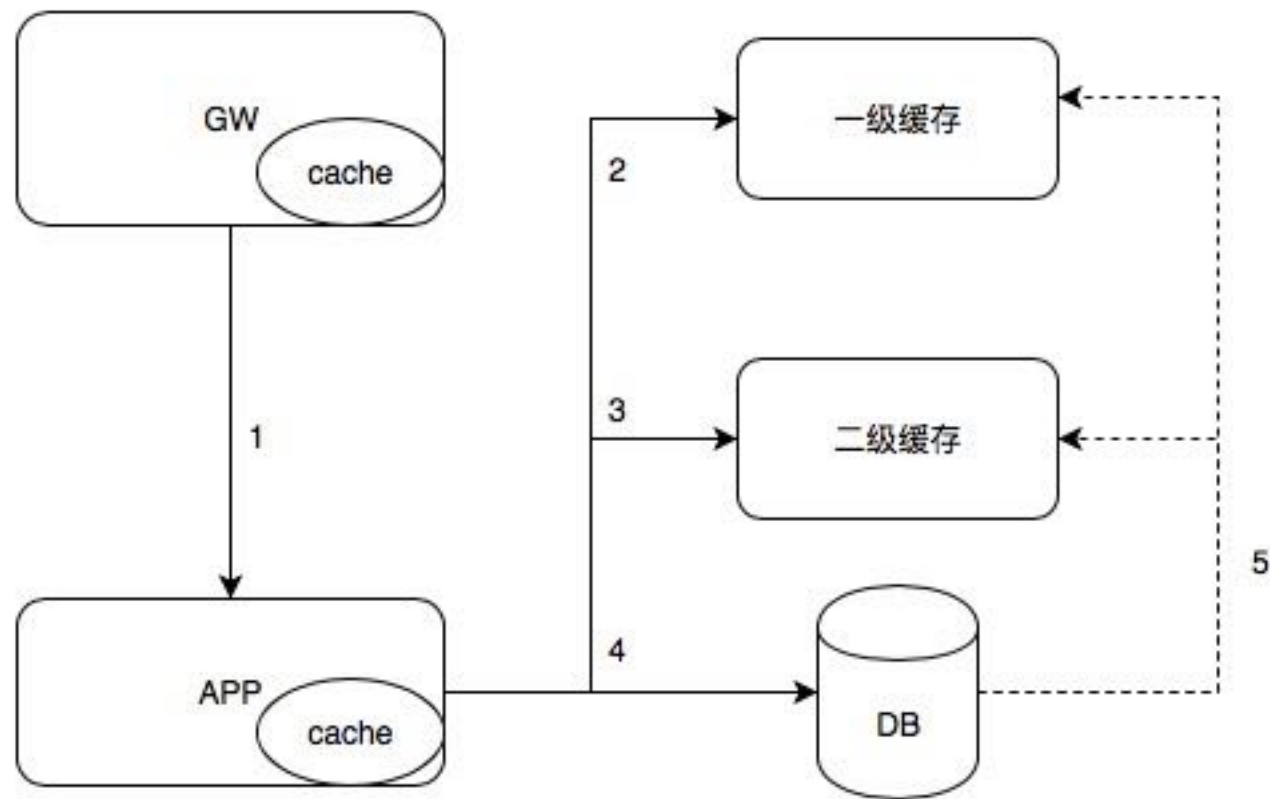
多级缓存



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
}
```

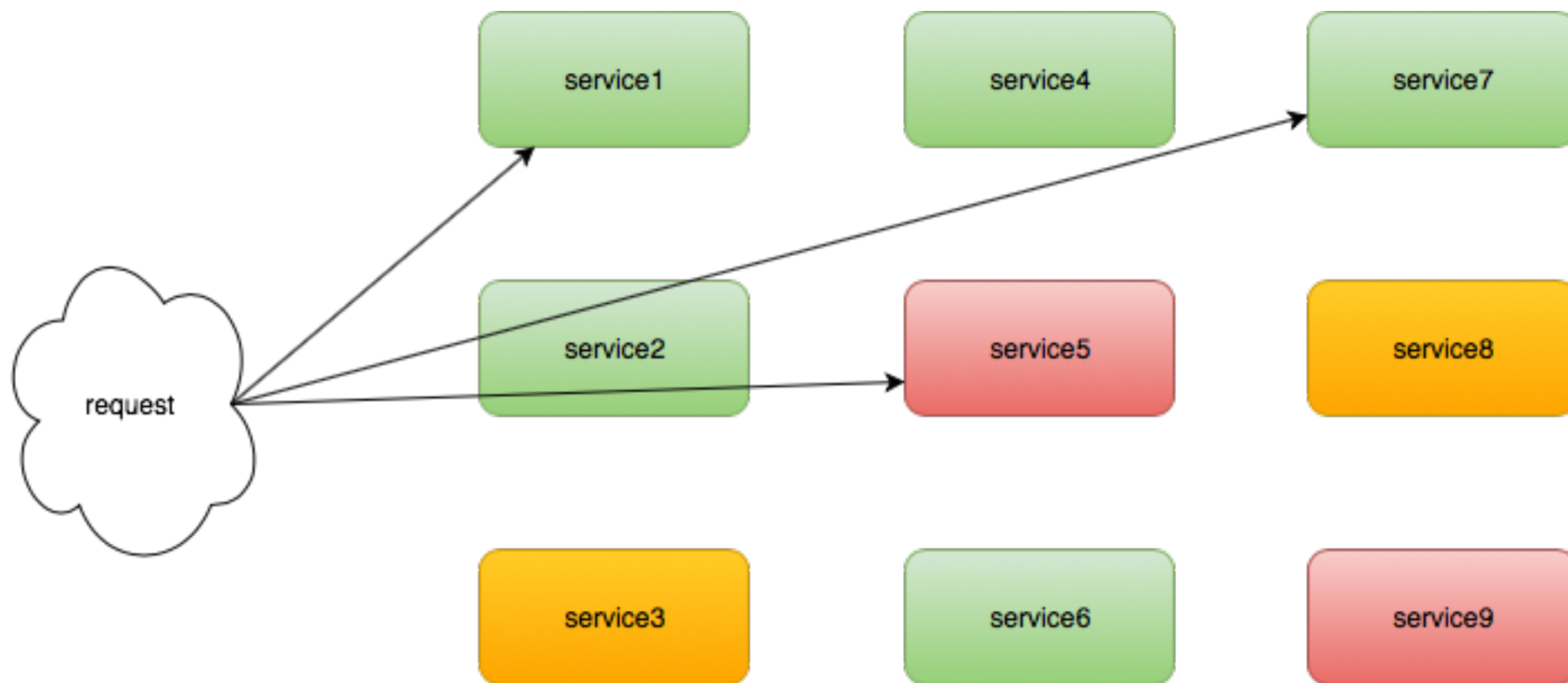
多级缓存

	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+

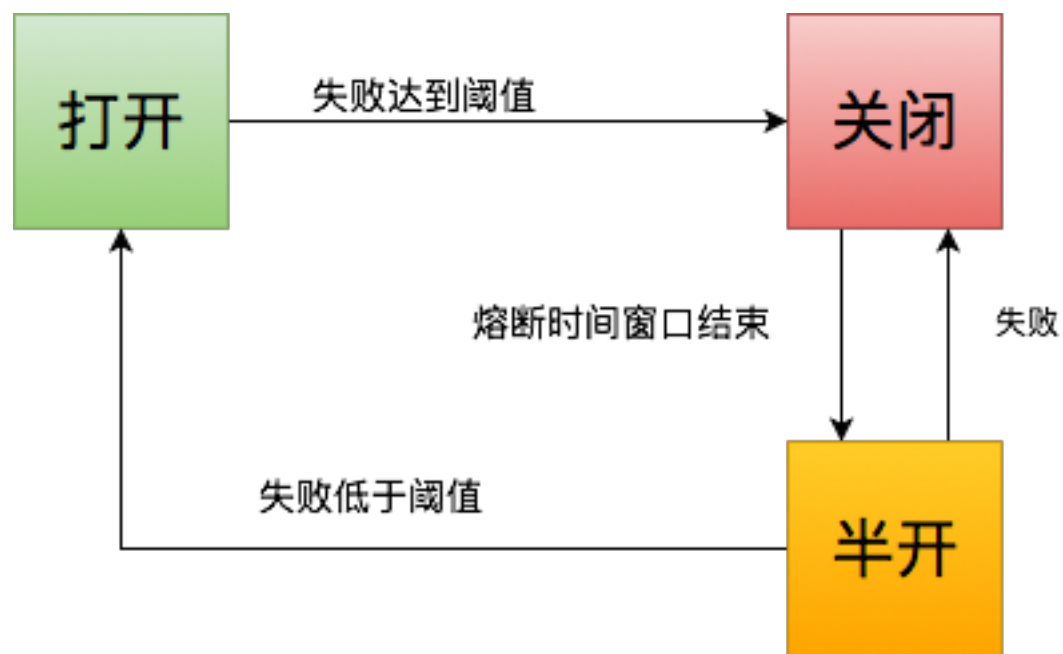
熔断降级

- 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
```

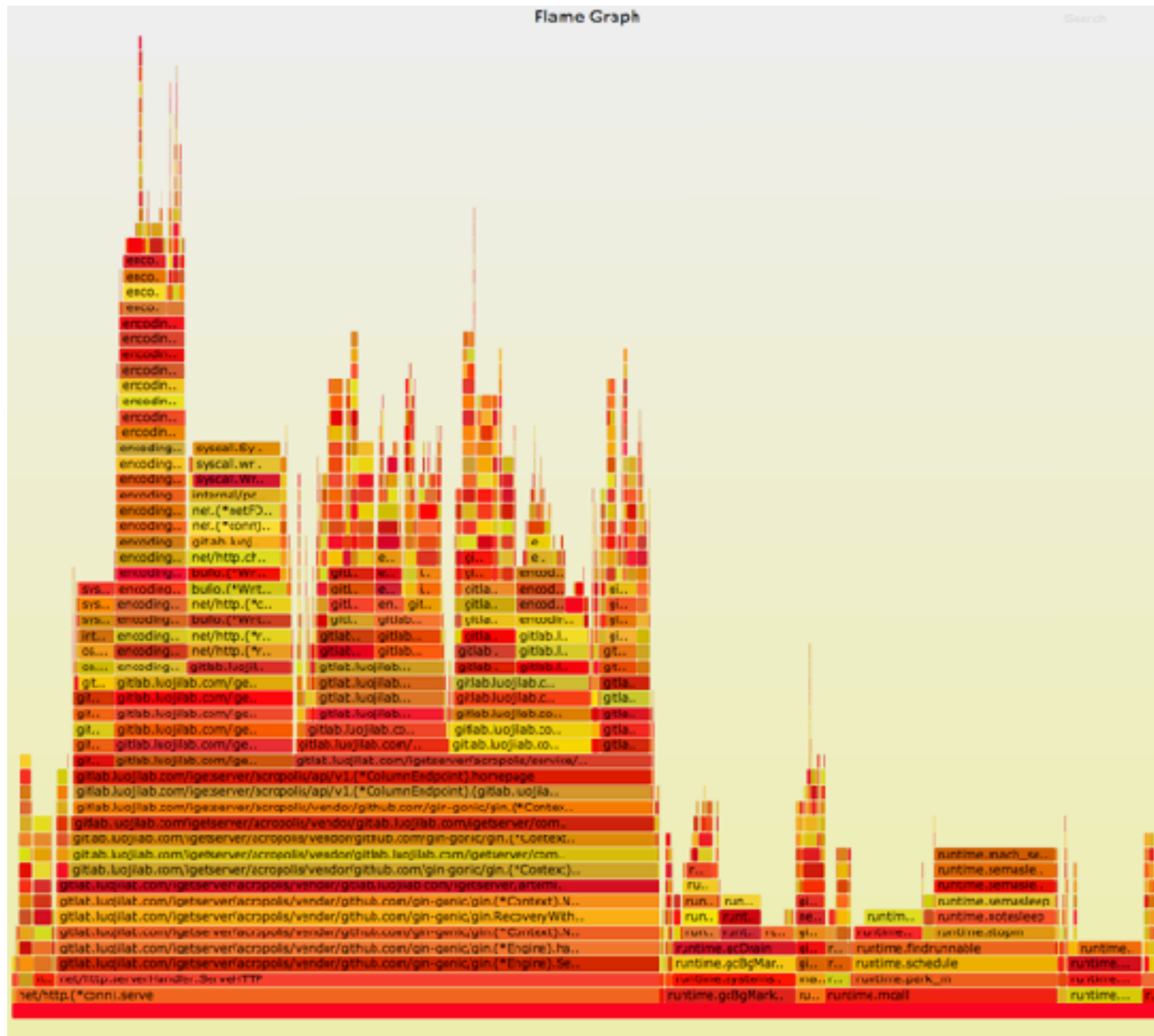
新生成的storage文件:

```
/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

Search

```
(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)
```

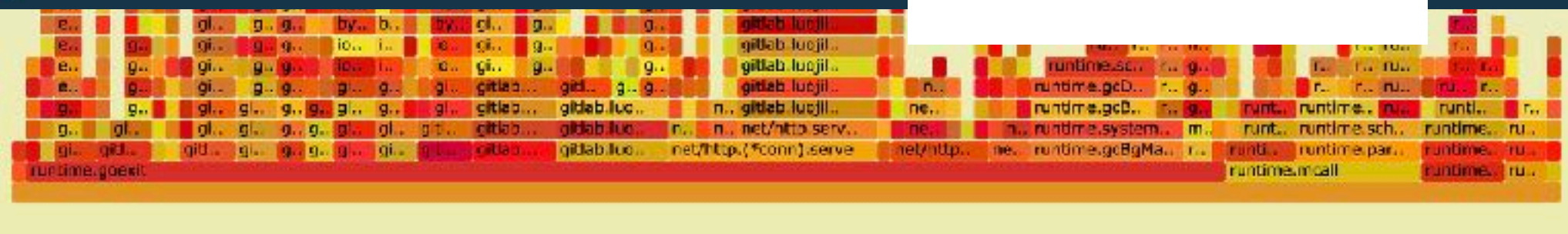
/debug/pprof/

profiles:

- 0 [block](#)
- 58 [goroutine](#)
- 3000 [heap](#)
- 0 [mutex](#)
- 22 [threadcreate](#)

[full goroutine stack dump](#)

```
(pool.NewConn
yncBuffer).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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