ServiceComb

开源微服务框架技术演进之路

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软件工程师，华为

大纲

- 服务形态演进
- 基于SDK的传统微服务框架
- 何为Service Mesh
- 演进：从SDK到Service Mesh
- 拥抱Service Mesh开源生态
- 相关资源

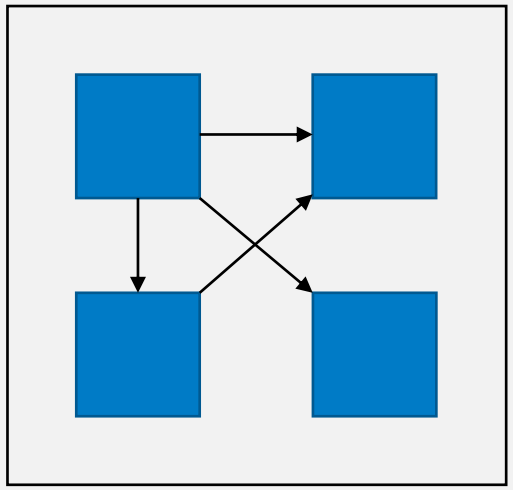
#微服务 #SDK

#云原生 #Service Mesh

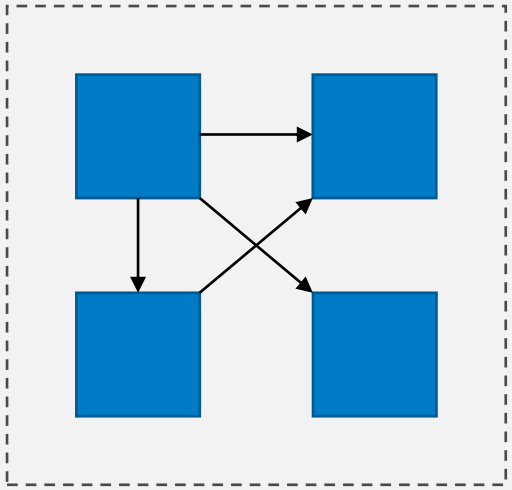
#数据面，控制面

#Sidecar

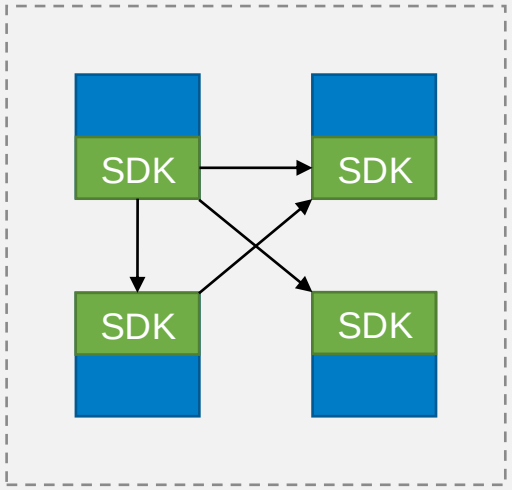
服务形态的演进



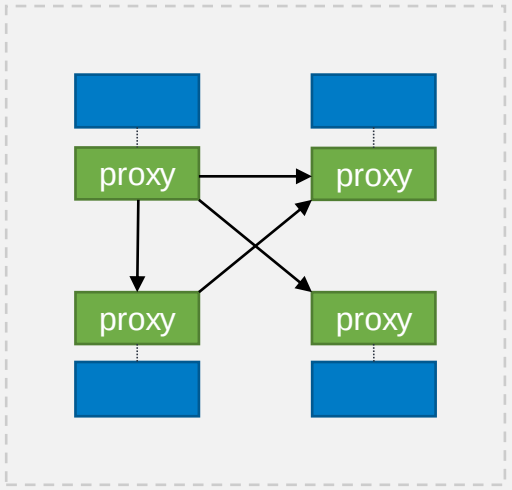
- 单体应用
- 业务模块划分
- 程序模块间调用



- 独立应用模块
- 通信：协议、队列



- SDK引用
- 通信：http、RPC…
- 服务治理



- 透明代理
- 通信：通用协议
- 服务治理
- Cloud Native部署

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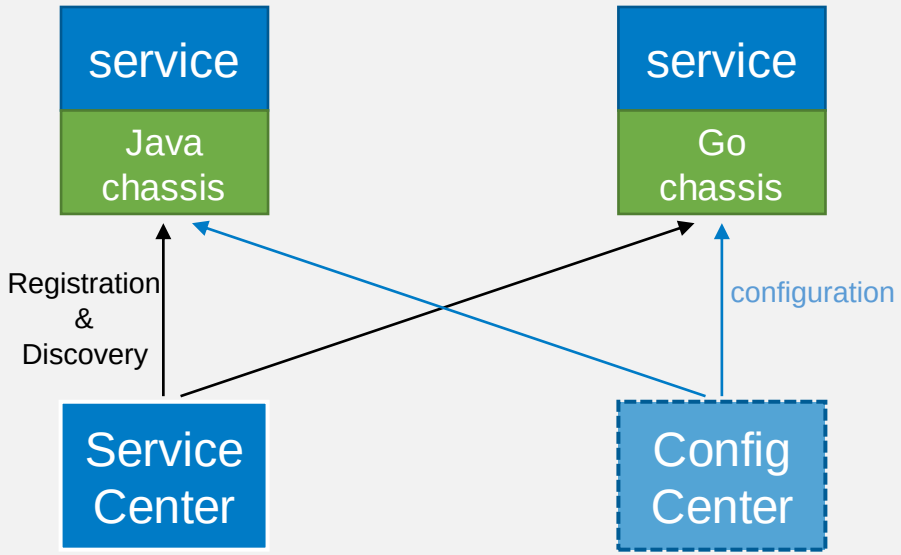
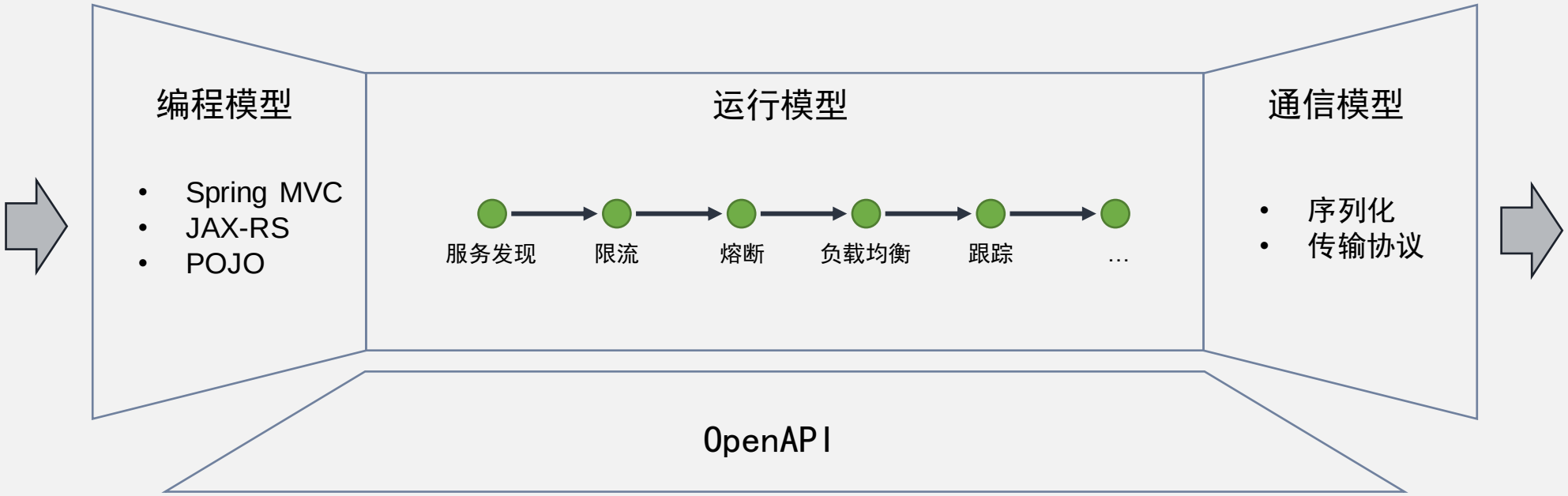
一个基于SDK的“传统”微服务框架



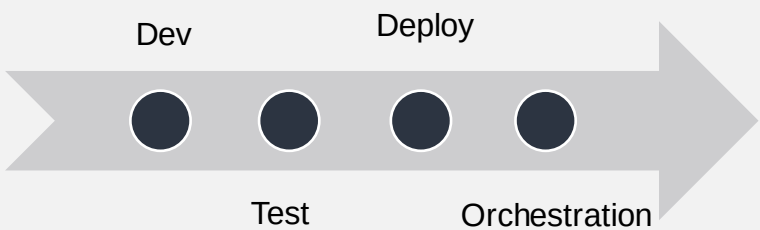
SDK架构


编程模型
Spring MVC
JAX-RS
POJO
运行模型
服务发现
限流
熔断
负载均衡
跟踪
…
通信模型
序列化
传输协议
OpenAPI

Service Mesh

- A service mesh is a dedicated infrastructure layer for **handling service-to-service communication**. It's responsible for the reliable delivery of requests through the complex topology of services that comprise a modern, cloud native application.
- In practice, the service mesh is typically implemented as an array of **lightweight network proxies** that are deployed alongside application code, without the application needing to be aware.

What's a service mesh? And why do I need one?

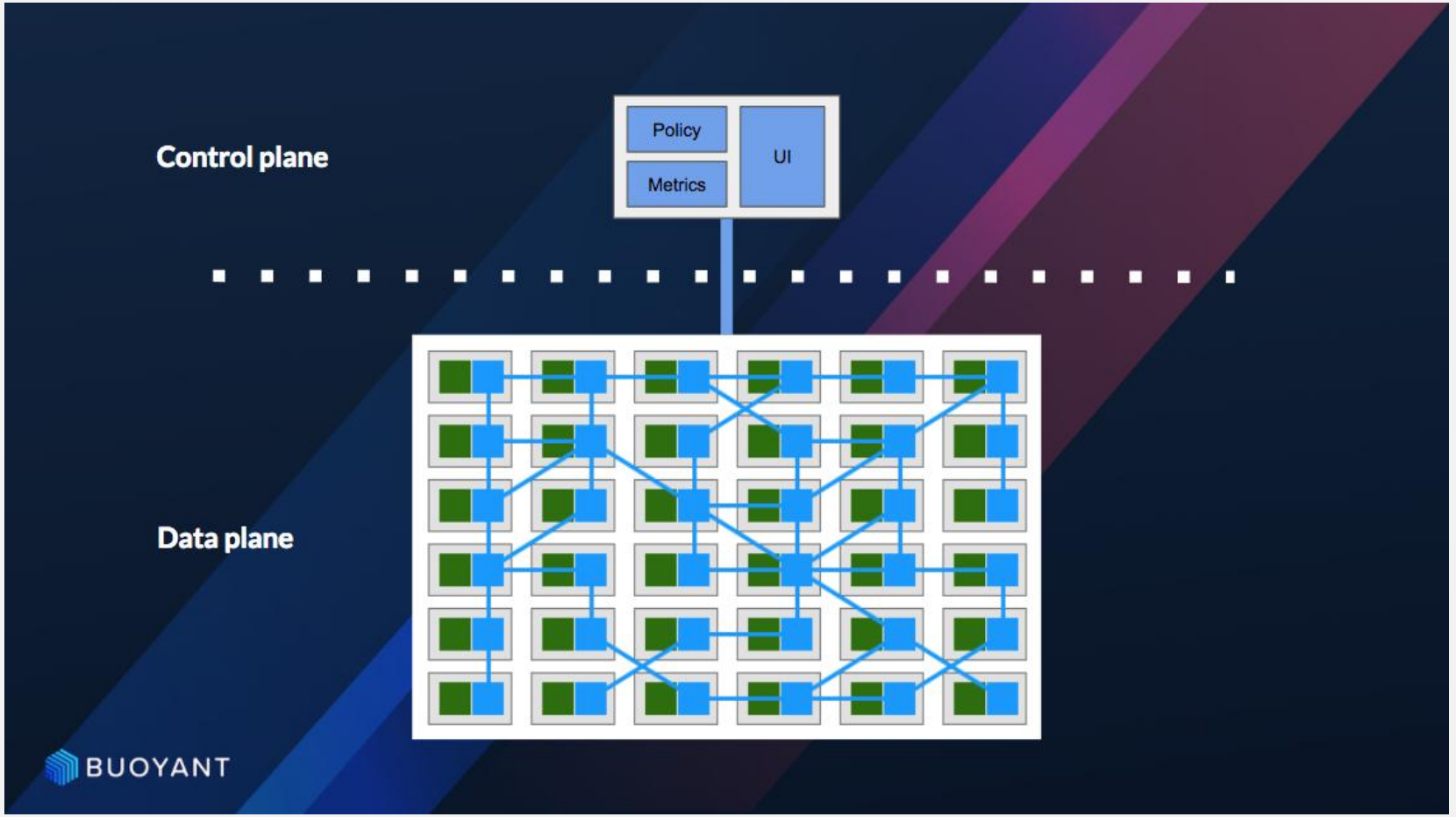


Service Mesh

William Morgan

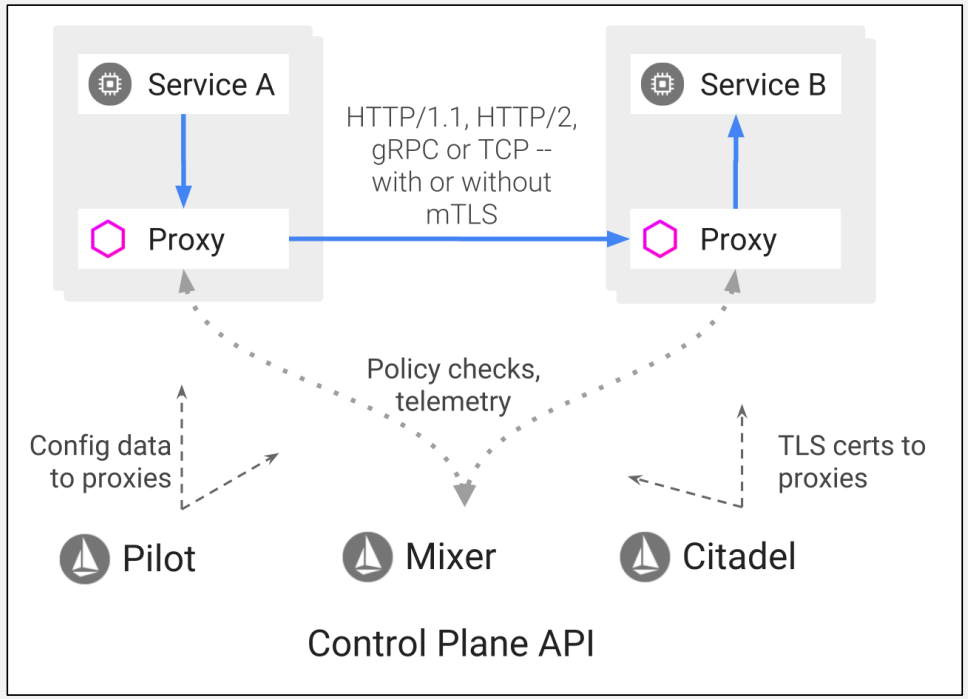
Service Mesh

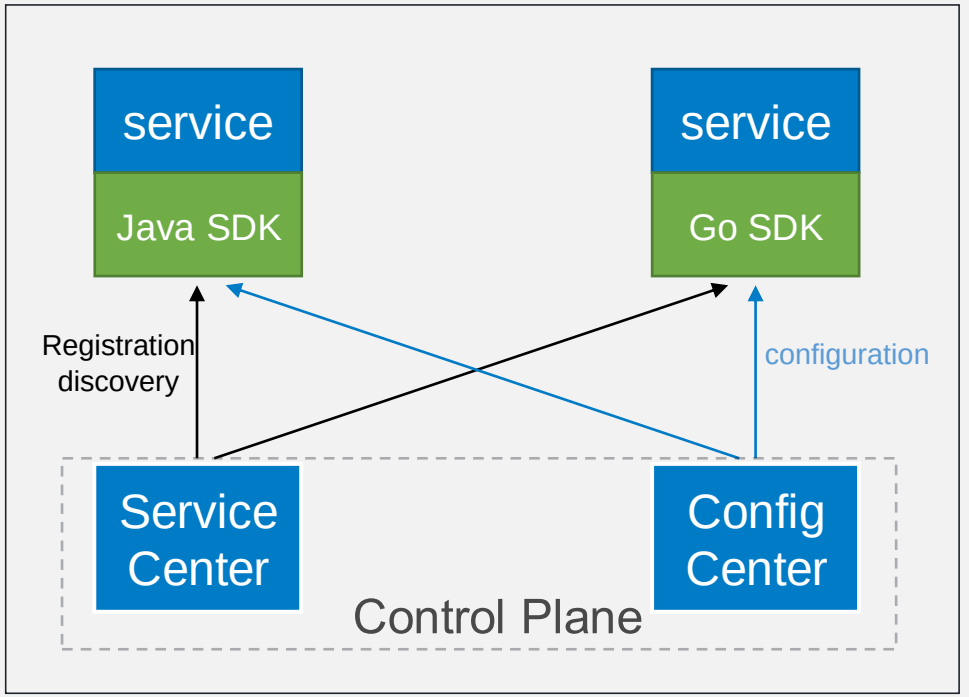
Data plane & Control plane



典型项目： Istio

- Istio架构图



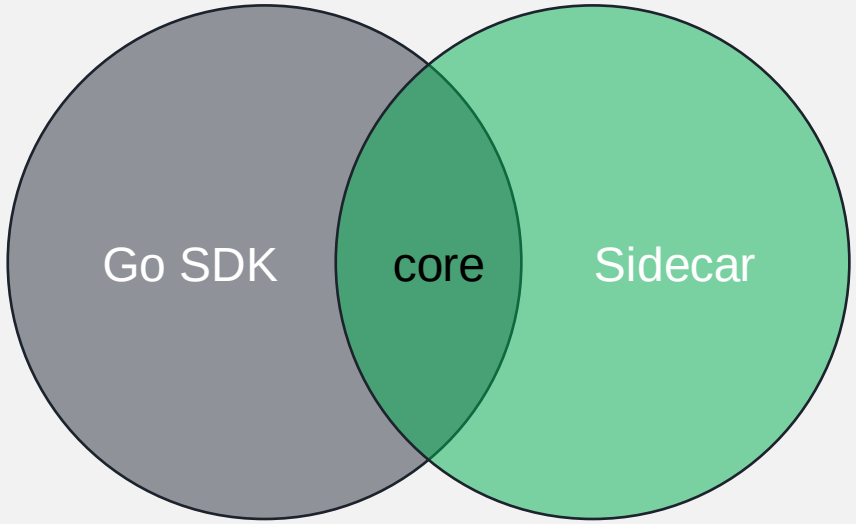


从SDK到透明代理

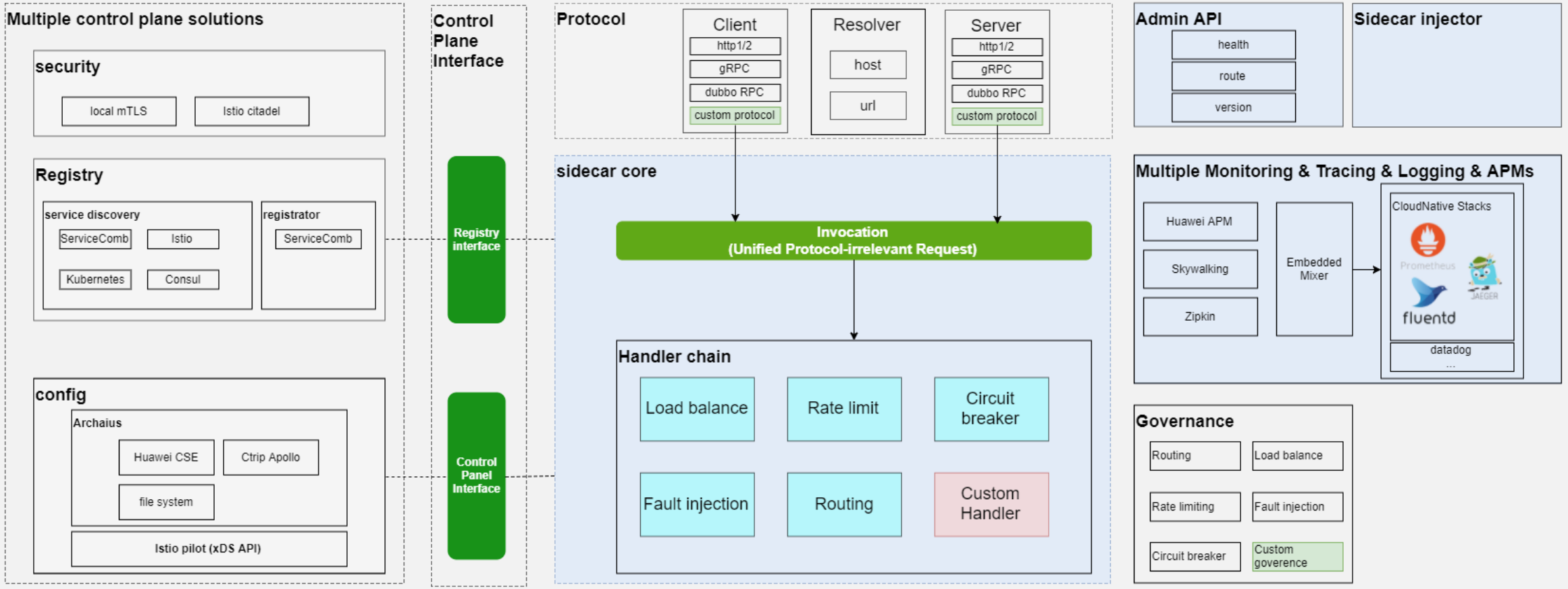
- Java SDK 还是 Go SDK?
- Go wins!

Chassis

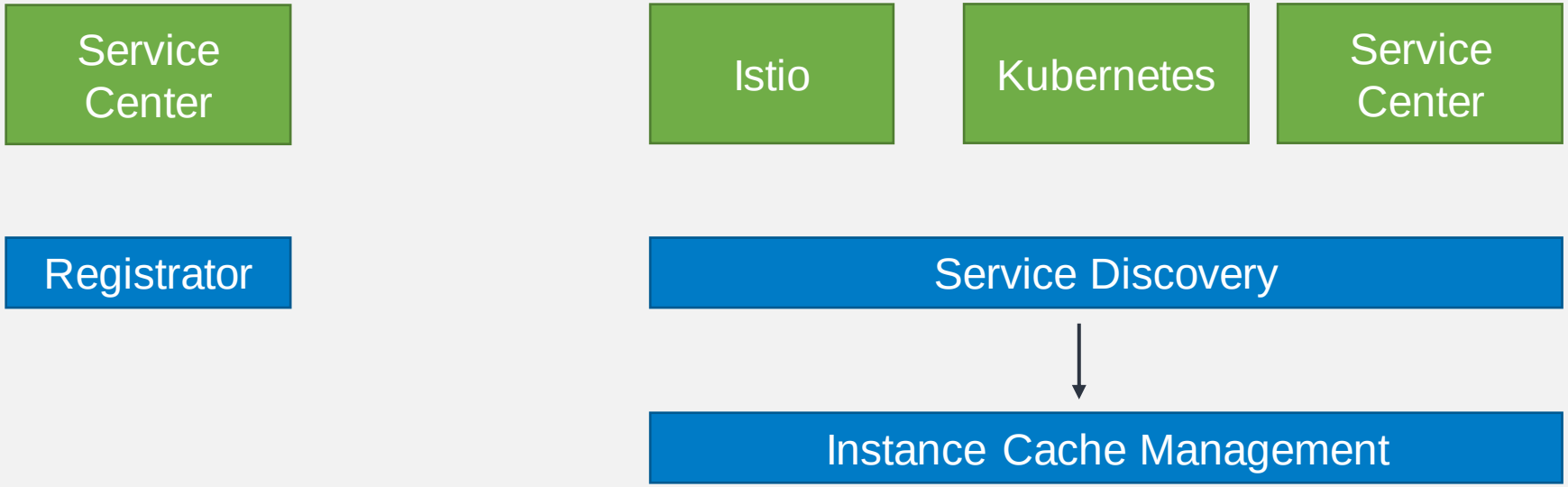
Sidecar



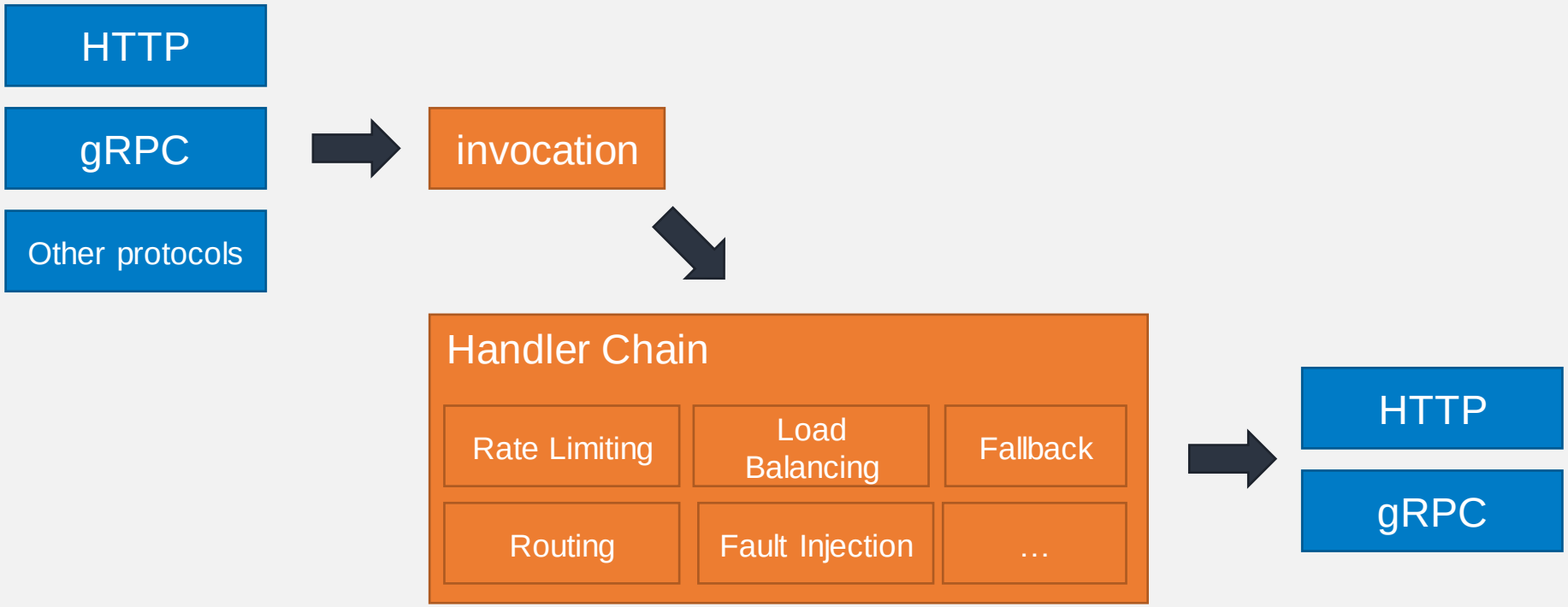
从SDK到透明代理


Multiple control plane solutions
security
local mTLS
Istio citadel
Registry
service discovery
ServiceComb
Istio
Kubernetes
Consul
registrator
ServiceComb
config
Archaius
Huawei CSE
Ctrip Apollo
file system
Istio pilot (xDS API)
Control Plane Interface
Registry interface
Control Panel Interface
Protocol
Client
http1/2
gRPC
dubbo RPC
custom protocol
Resolver
host
url
Server
http1/2
gRPC
dubbo RPC
custom protocol
sidecar core
Invocation
(Unified Protocol-irrelevant Request)
Handler chain
Load balance
Rate limit
Circuit breaker
Fault injection
Routing
Custom Handler
Admin API
health
route
version
Sidecar injector
Multiple Monitoring & Tracing & Logging & APMs
Huawei APM
Skywalking
Zipkin
Embedded Mixer
CloudNative Stacks
Prometheus
JAEGER
fluentd
datadog
...
Governance
Routing
Load balance
Rate limiting
Fault injection
Circuit breaker
Custom goverence

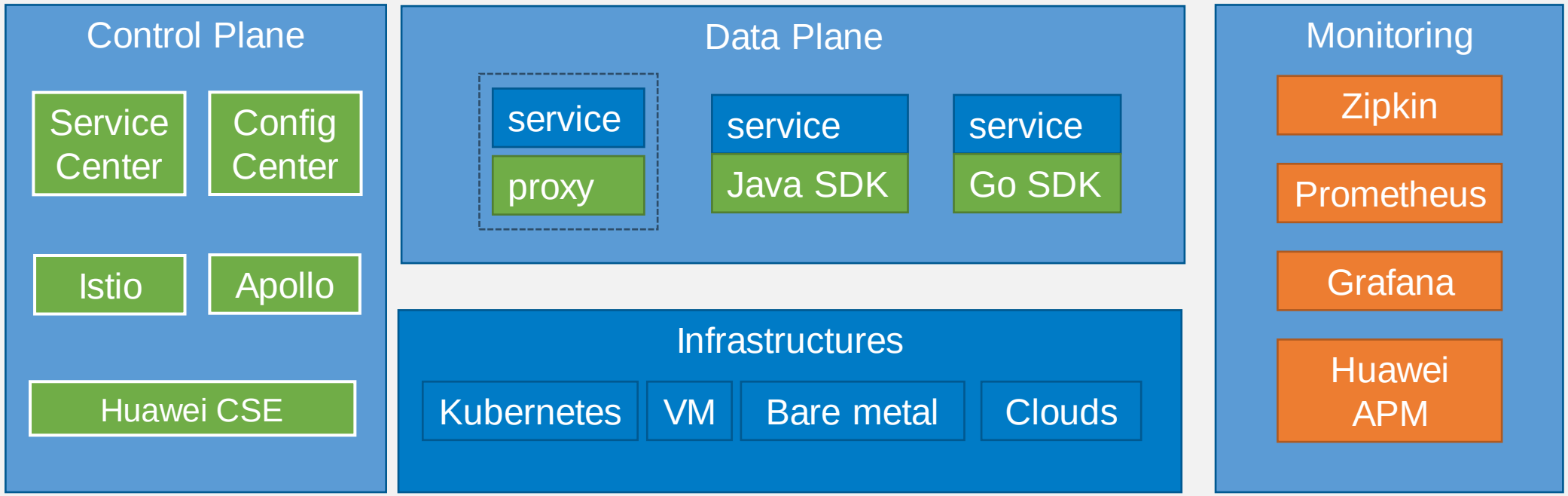
服务注册&发现


Service Center
Istio
Kubernetes
Service Center
Registrator
Service Discovery
Instance Cache Management

多协议支持

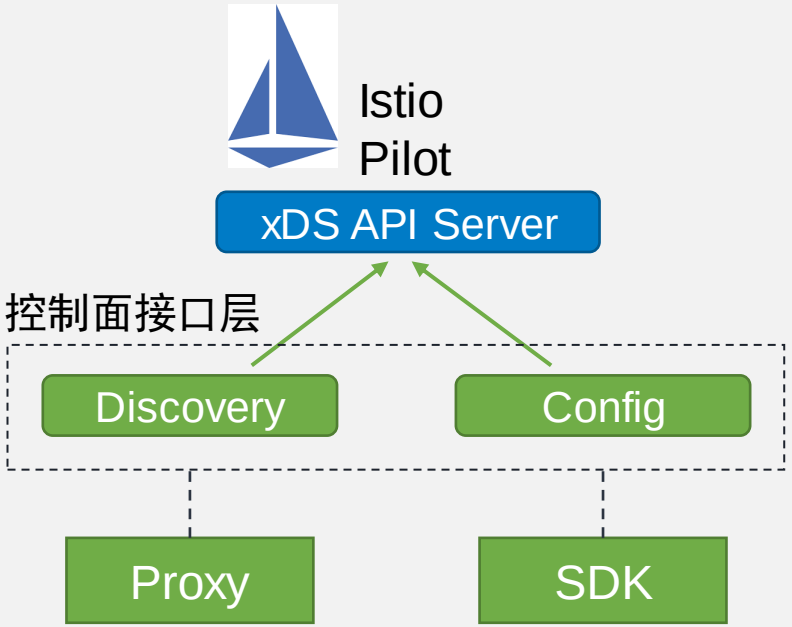

HTTP
gRPC
Other protocols
invocation
Handler Chain
Rate Limiting
Load Balancing
Fallback
Routing
Fault Injection
…
HTTP
gRPC

混合式方案：SDK + Sidecar



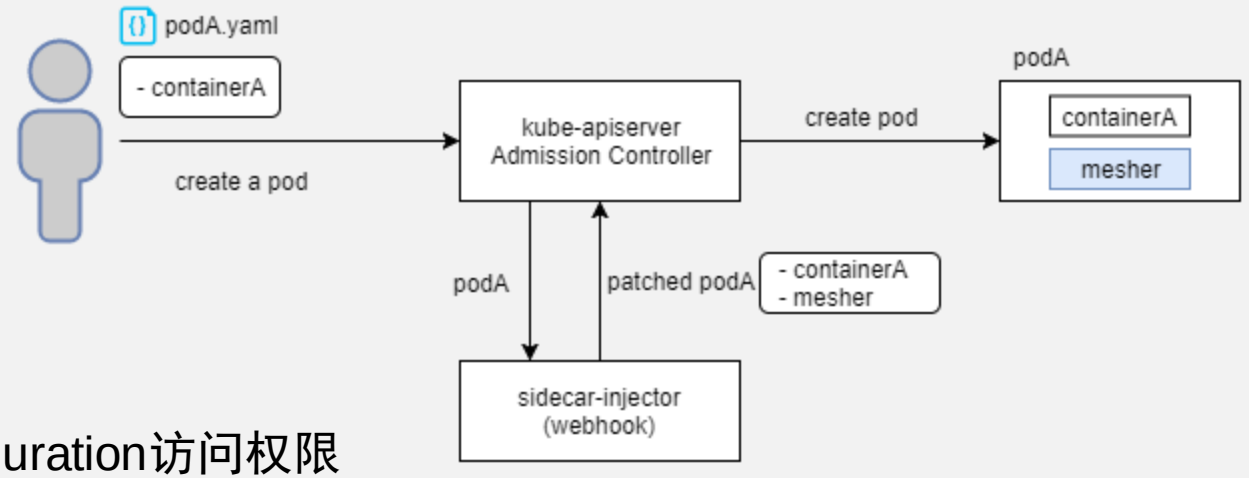
拥抱Istio开源生态

- Envoy Sidecar替换方案
- Go SDK接入Istio
- 网络代理替代Iptables流量劫持
- Handler chain接入不同生态，不依赖Mixer



拥抱Cloud Native技术

- sidecar-injector



满足条件：

- Kubernetes 1.9 or later
- MutatingAdmissionWebhook开启
- Namespace, configmap, mutatingwebhookconfiguration访问权限

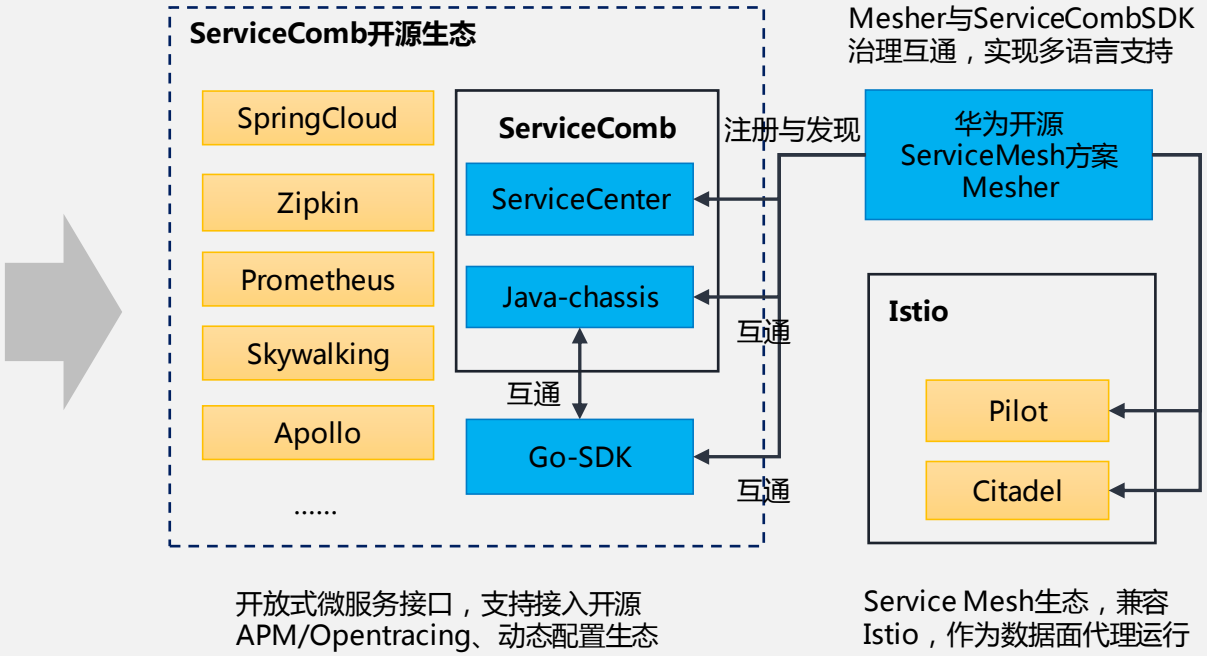
服务配置：

- Pod Spec注解：**`sidecar.mesher.io/inject: "yes"`**
- Namespace标签：**`kubectl label myns sidecar-injector=enabled`**

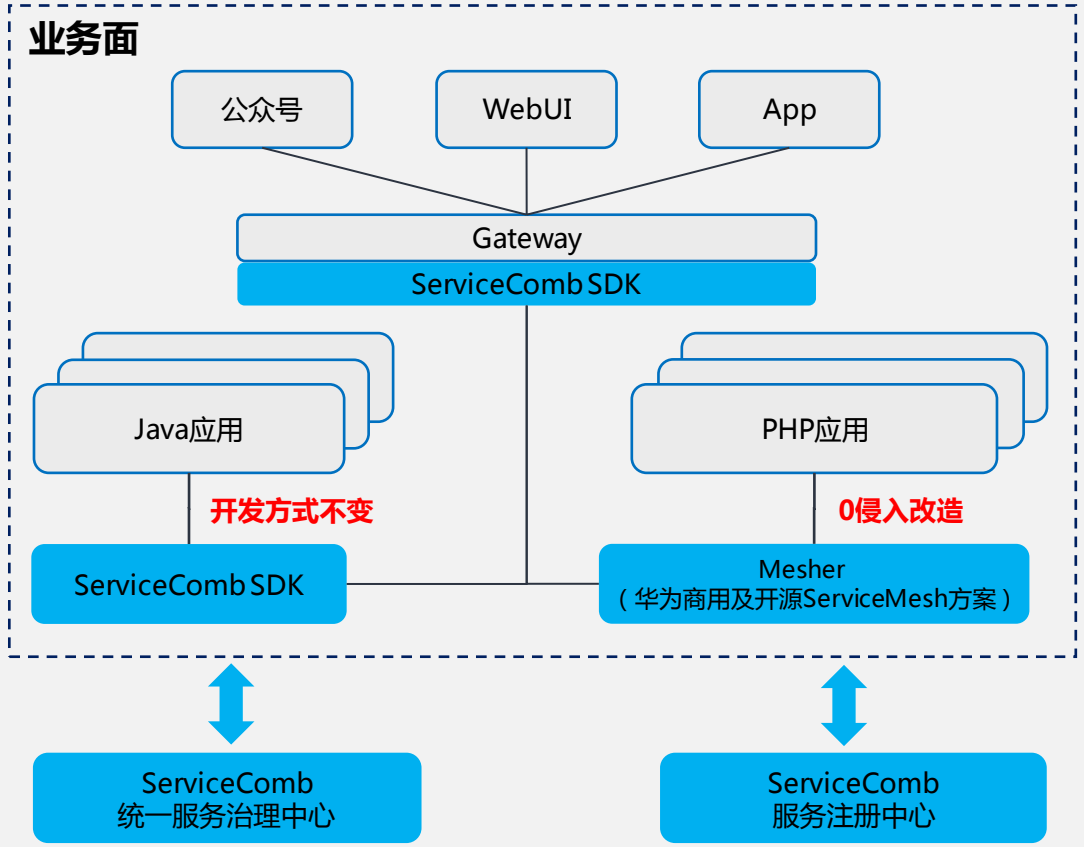
用户案例

原则

- 架构稳定，有可持续发展、演进能力
- 支持多语言、传统微服务和新兴ServiceMesh微服务架构混合场景部署
- 有大型成功商用案例
- 无商业强绑定，高自由度，企业自主可控
- 完整的生态栈，涵盖开源主流微服务运维和安全领域
- 低学习成本，有编程语言基础即可快速上手



用户案例

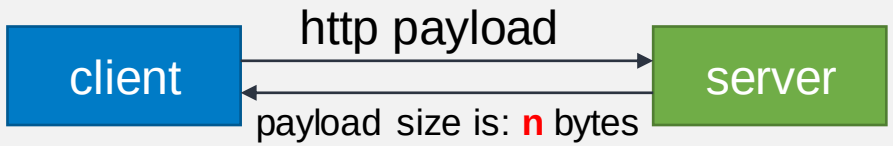


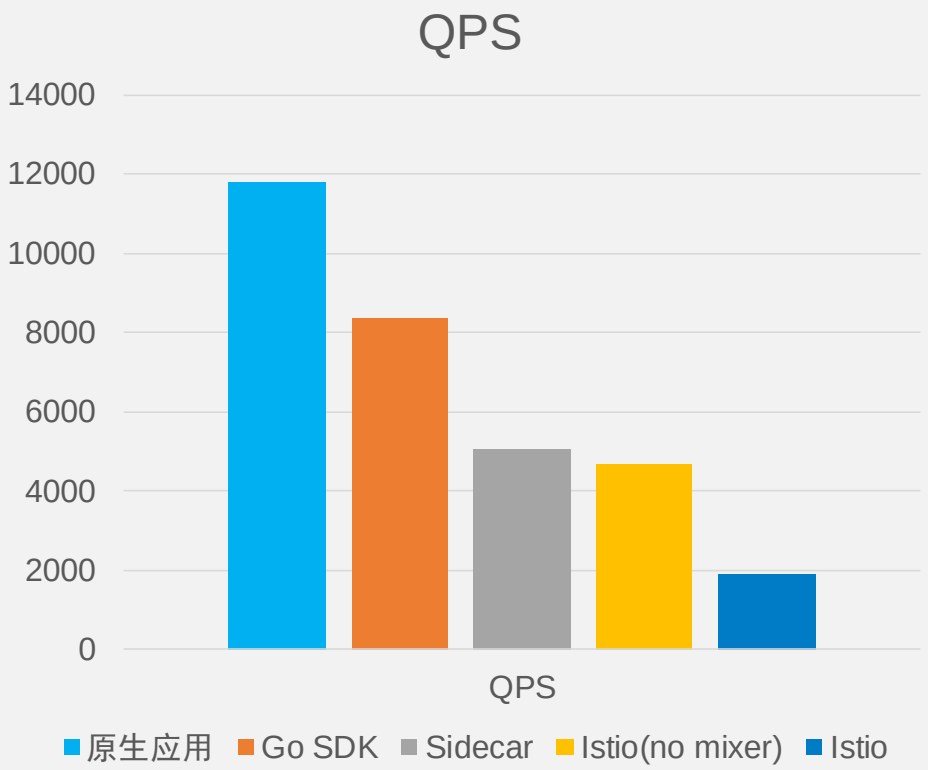
- 支持多种开发语言
  - ✓ 解决Java和PHP共存场景
- 传统与新兴微服务化方式共存
  - ✓ 混合部署、协同治理
- 丰富的监控运维
  - ✓ 细化到业务层面的微服务监控运维
- 遗留应用0改造
  - ✓ 支持0侵入业务代码，使用成本低，对原有业务无影响

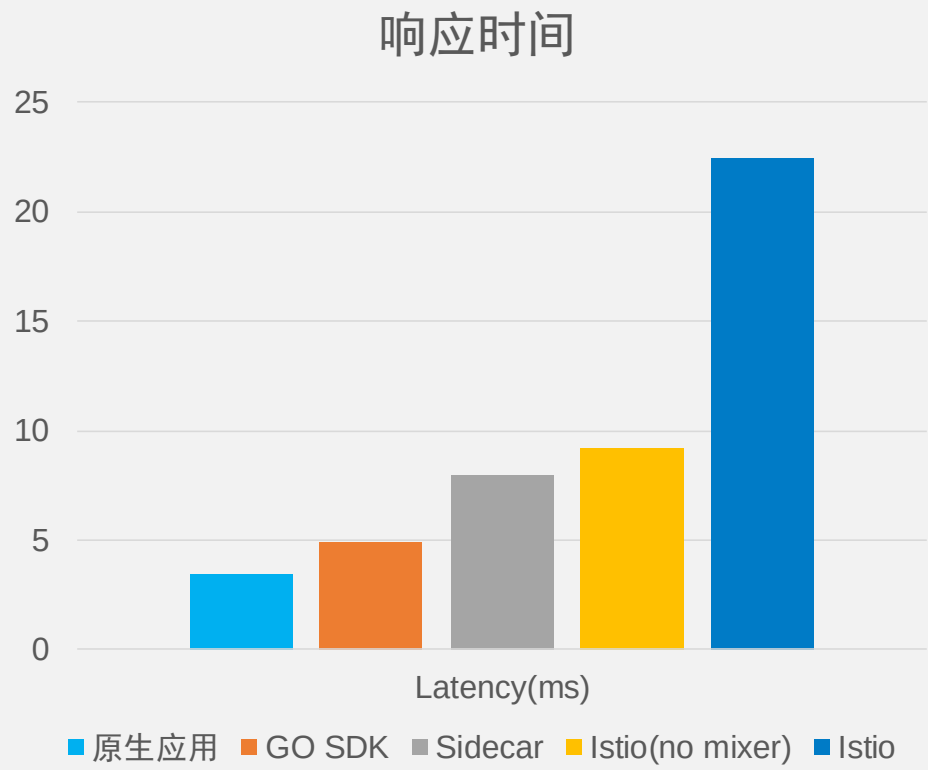
性能测试

Kubernetes Cluster: 3 VM Nodes(6Core, 4G Mem)

```
wrk -c40 -n20 -d10s http://client-host:port
```







相关资源

PRs & Issues are welcome!

https://github.com/apache?q=ServiceComb

- Apache ServiceComb项目网站

  http://servicecomb.apache.org/

- ServiceComb混合部署示例项目

  https://github.com/go-mesh/mesher-examples

- Mesher性能测试

  https://github.com/go-mesh/mesher-tools/tree/master/perf

THANKS