msup

ServiceMesh, Runtime, FaaS三位一体

马振军（古今）

讲师简介

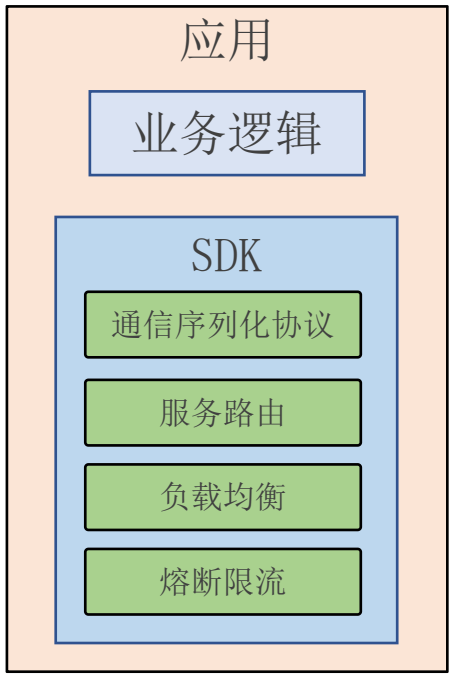
- 目前在蚂蚁集团中间件团队负责 MOSN、Layotto 等项目的开发。
- 花名“古今”，取自《增广贤文》中“观今宜鉴古，无古不成今”。
- 关注云原生，容器运行时，WebAssembly 等技术领域的发展。

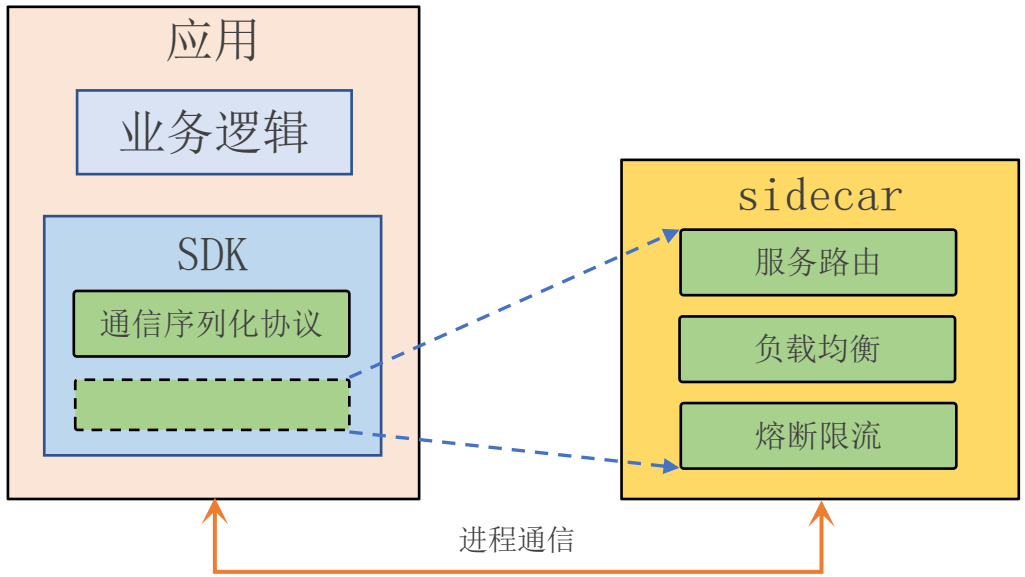
目录

01

Service Mesh回顾与总结

微服务 vs ServiceMesh

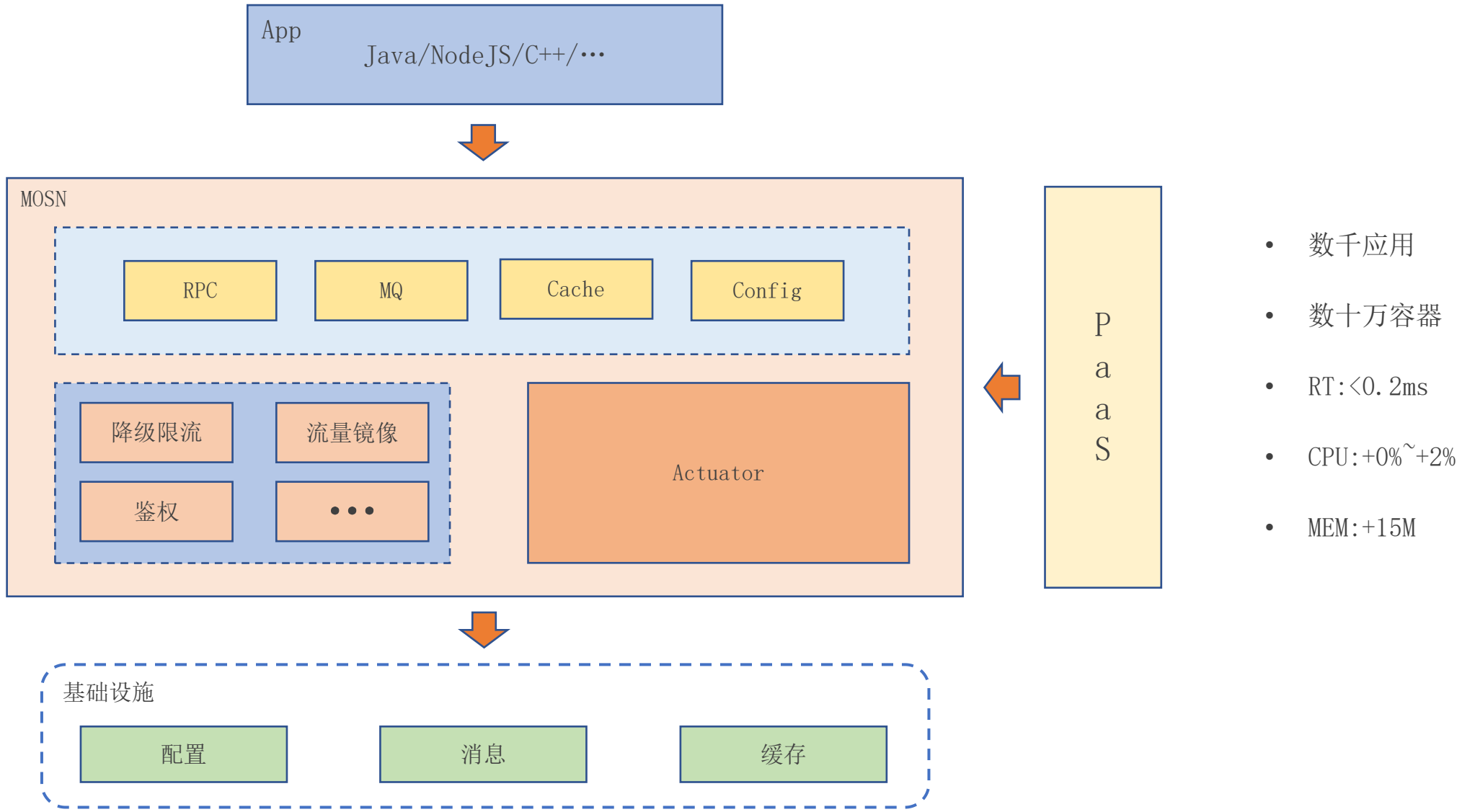




- 升级成本高
- SDK版本不统一
- 异构语言治理能力弱

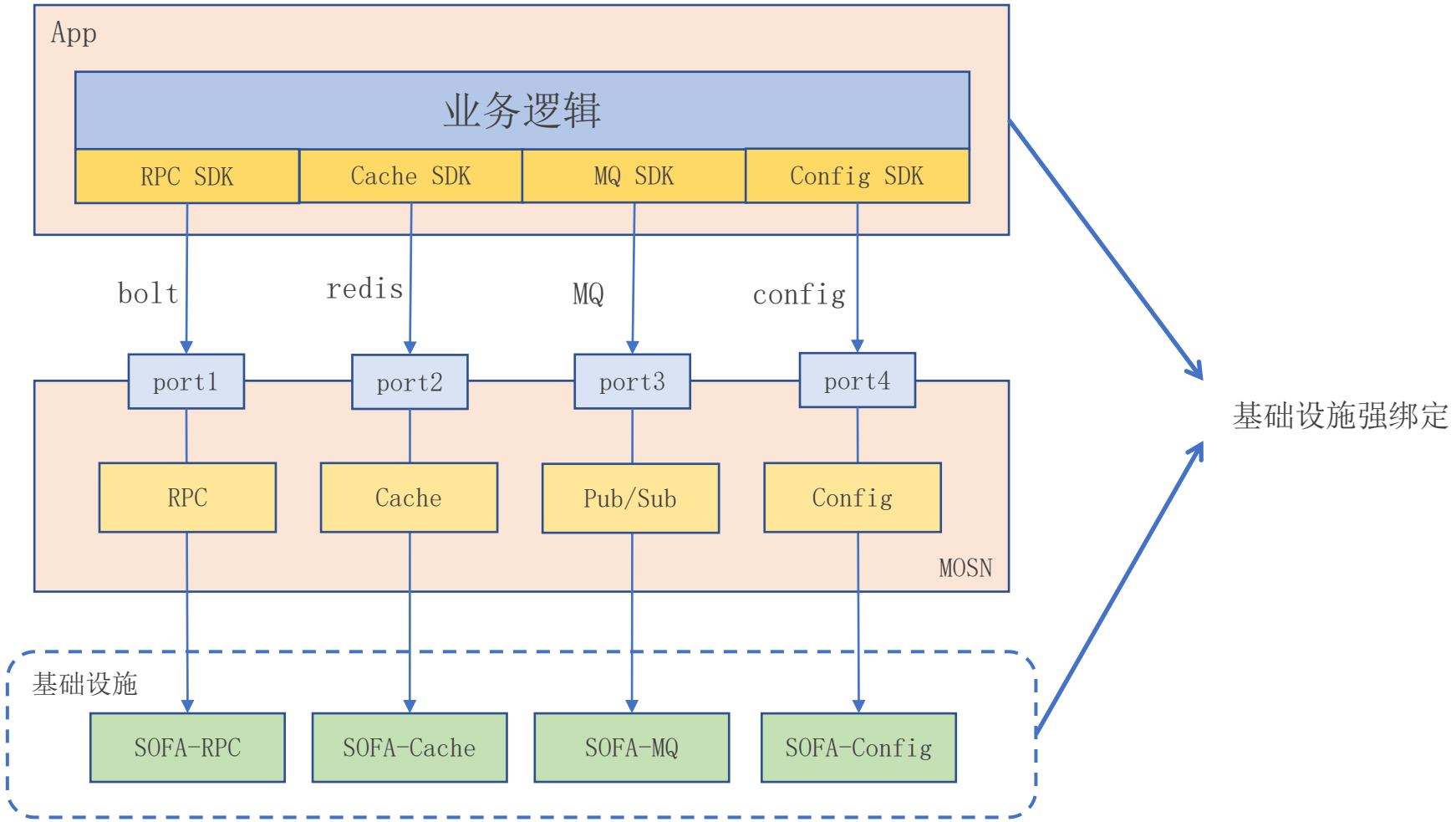
- 业务解耦
- 平滑升级
- 异构语言治理

Service Mesh的落地成果

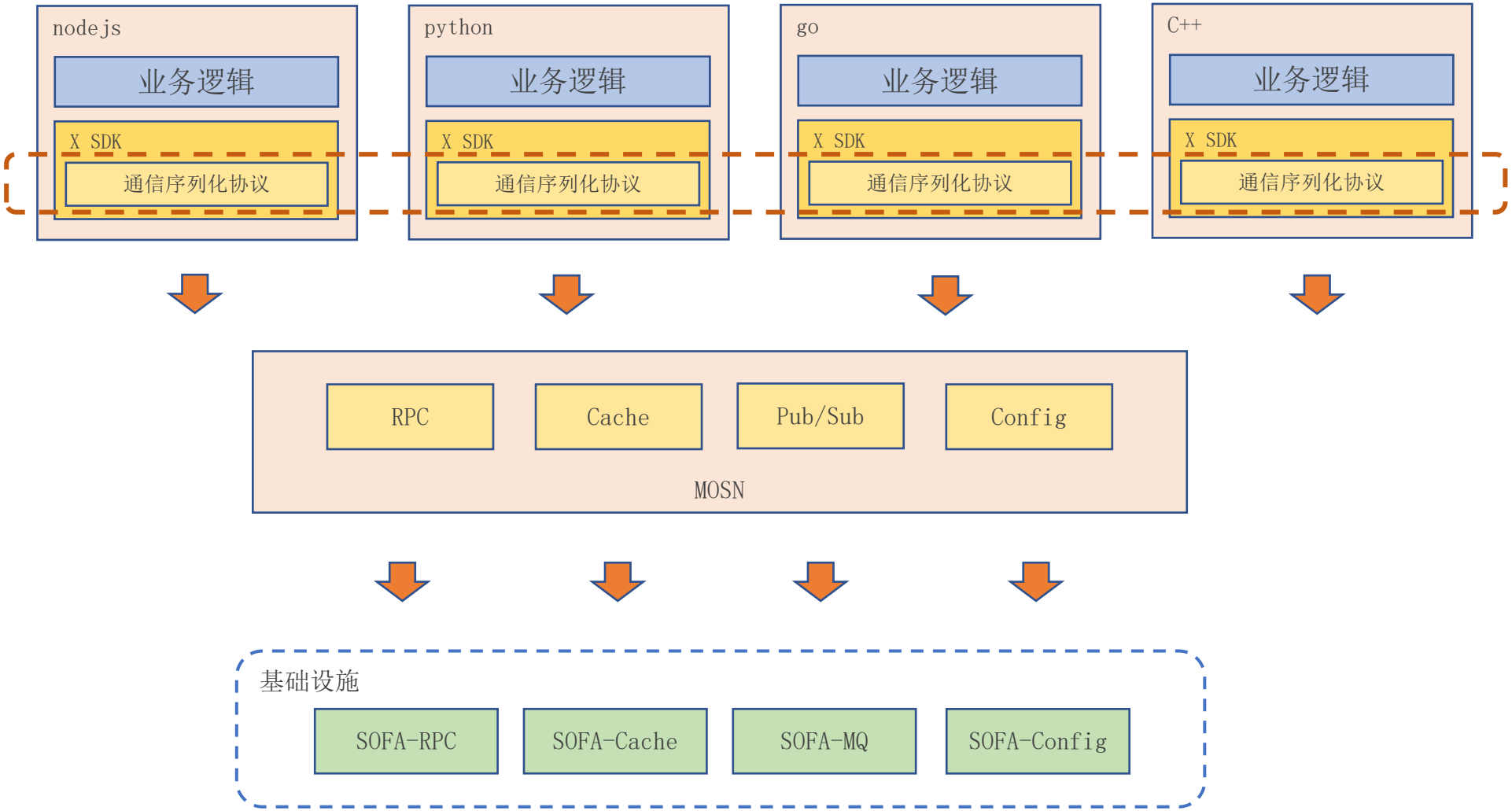


- 数千应用
- 数十万容器
- RT:<0.2ms
- CPU:+0%~+2%
- MEM:+15M

新的挑战1：应用跟基础设施强绑定

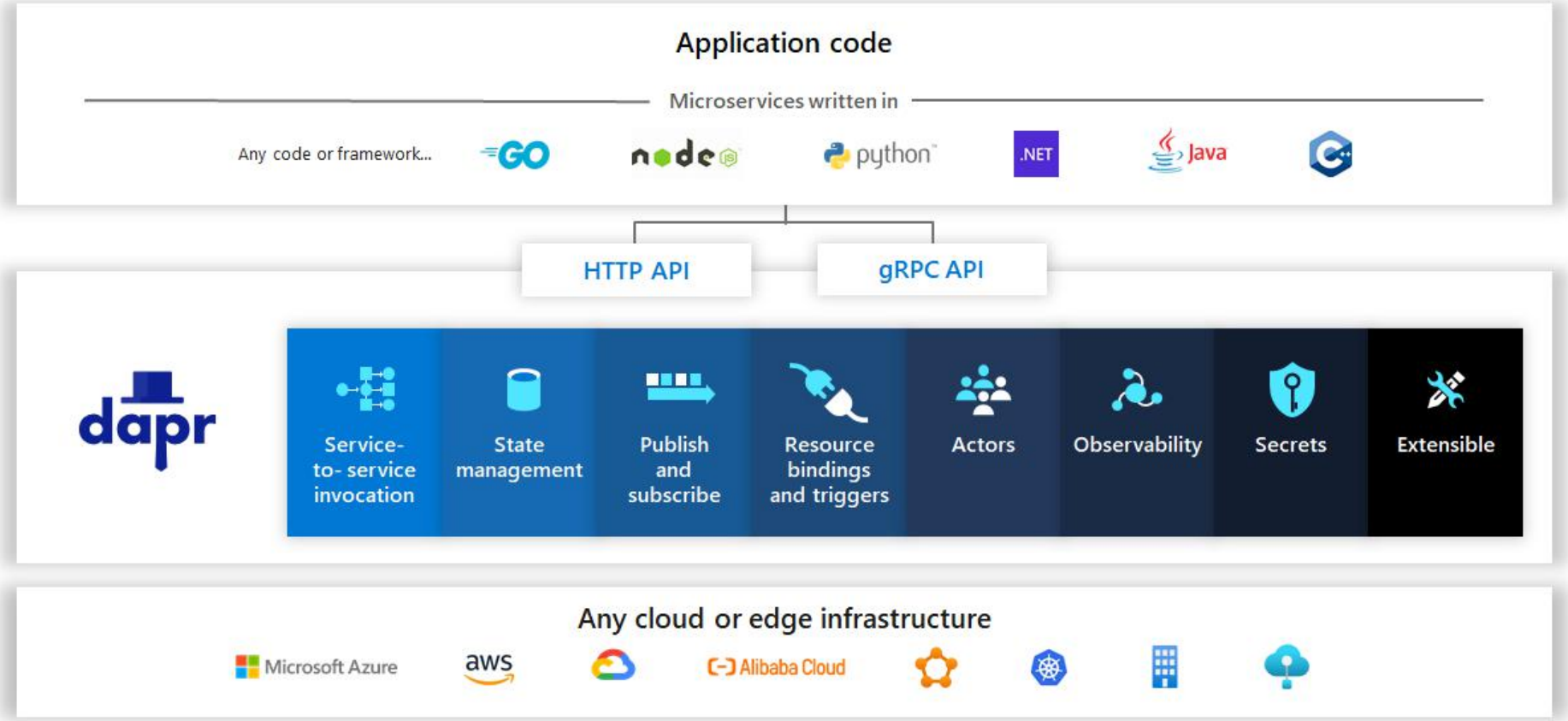


新的挑战2：异构语言接入成本高



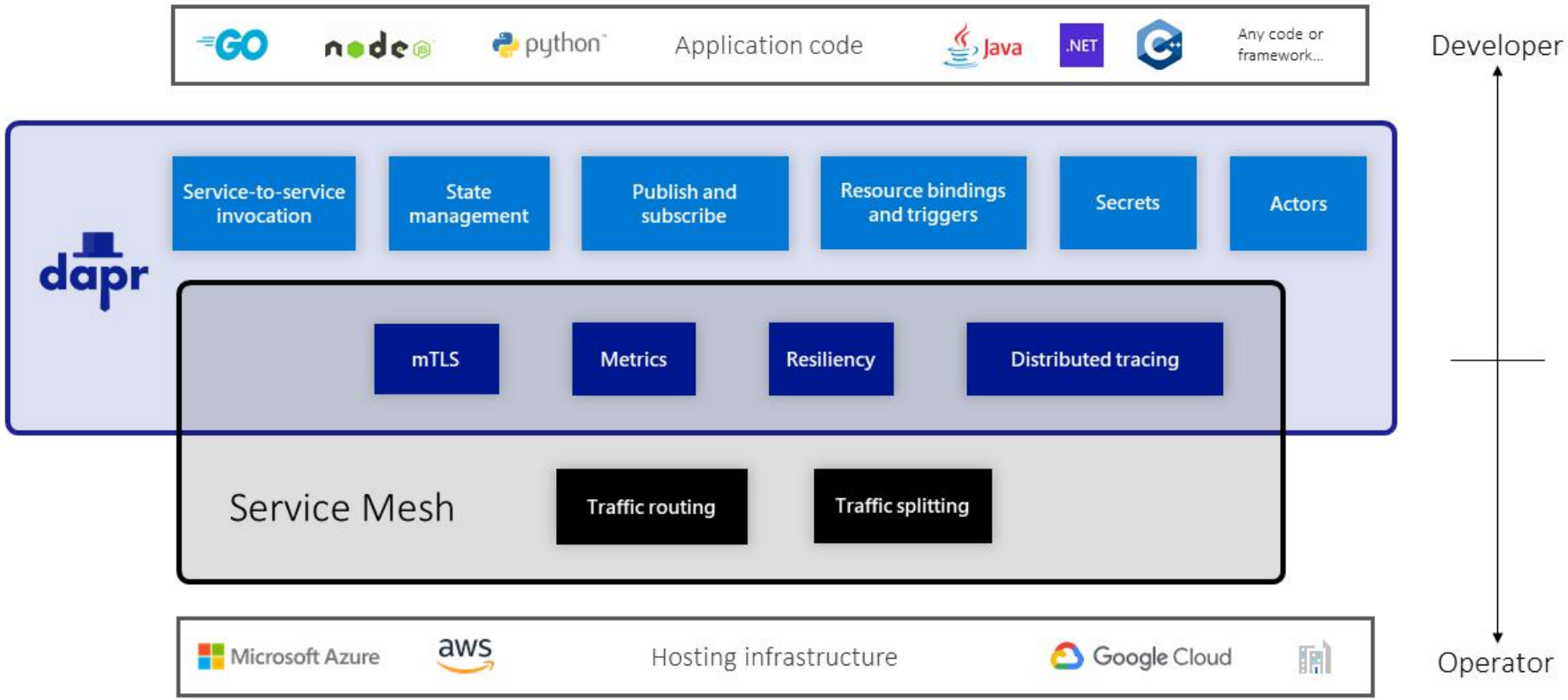
02

分布式应用运行时

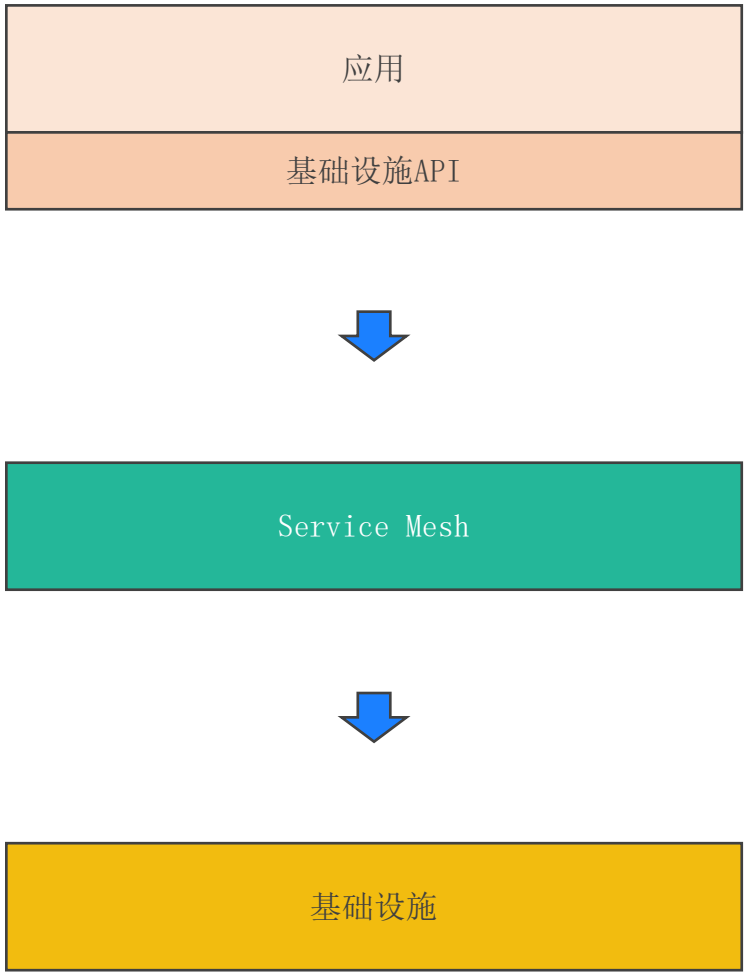


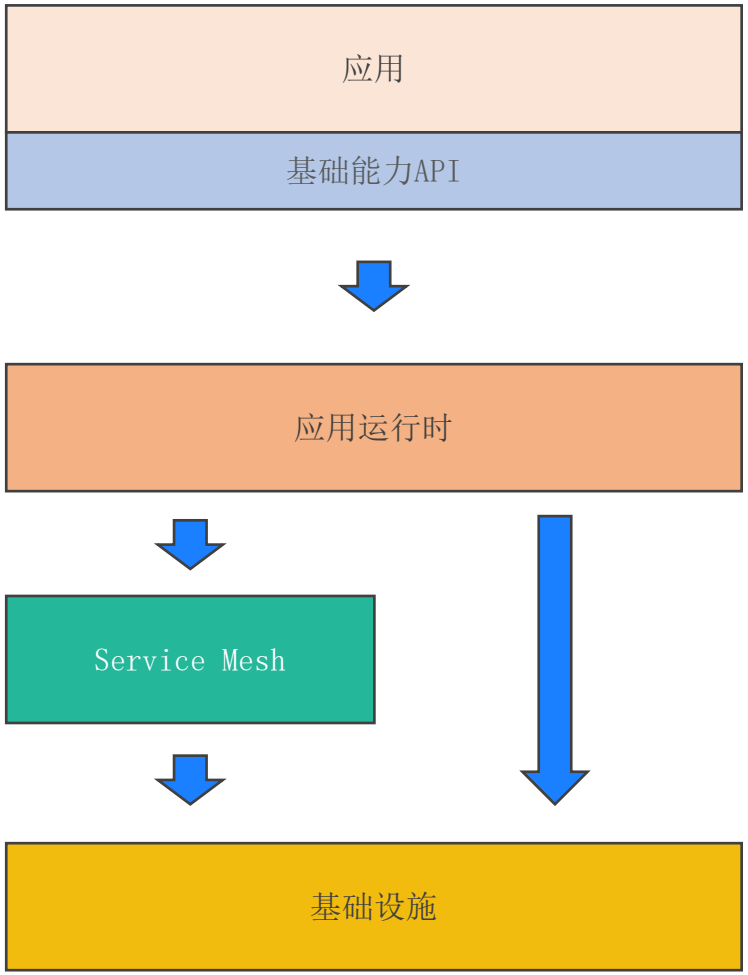
- 提供多种分布式能力
- 对接了丰富的基础组件

dapr vs ServiceMesh



应用运行时 vs ServiceMesh

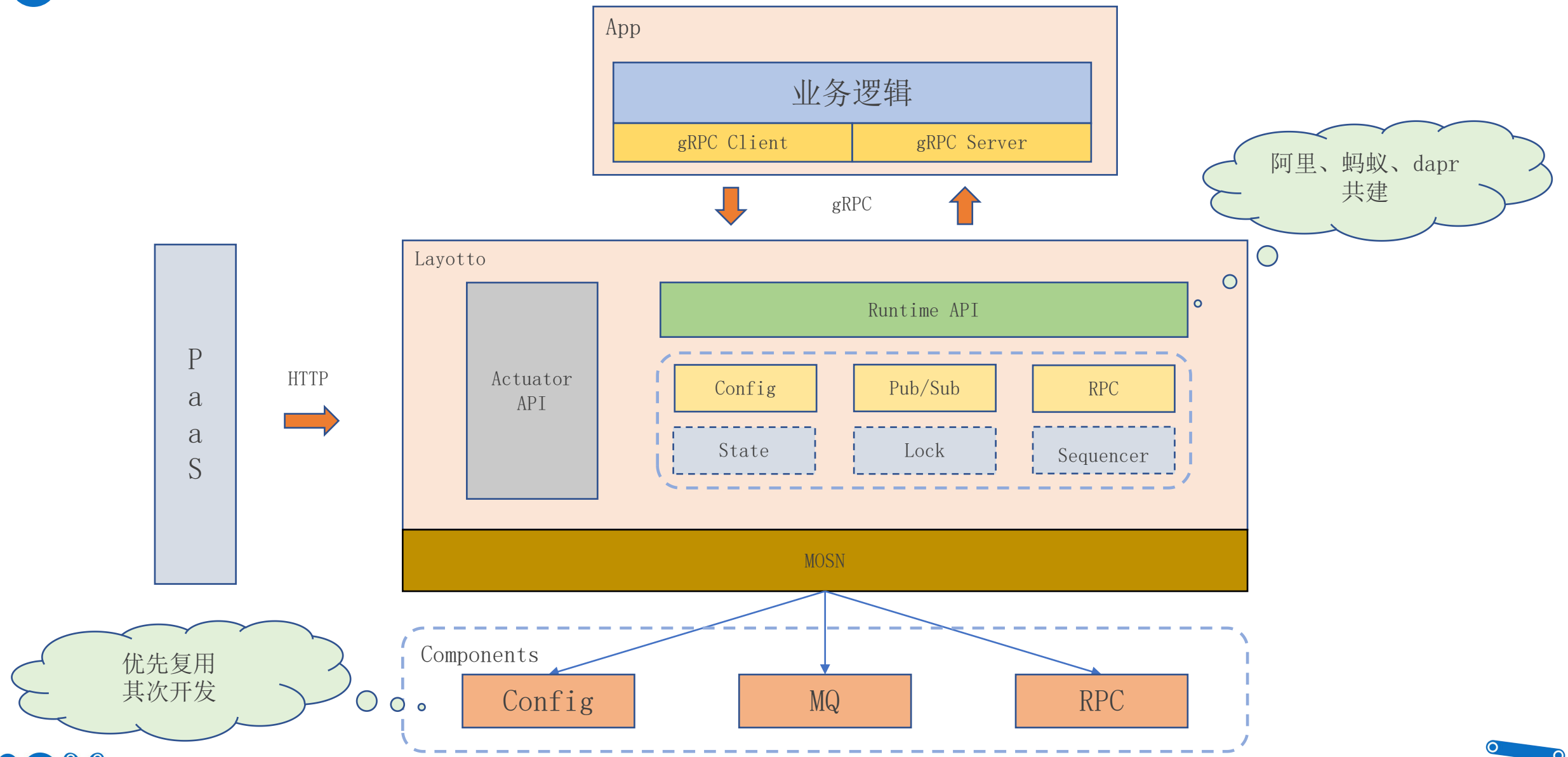




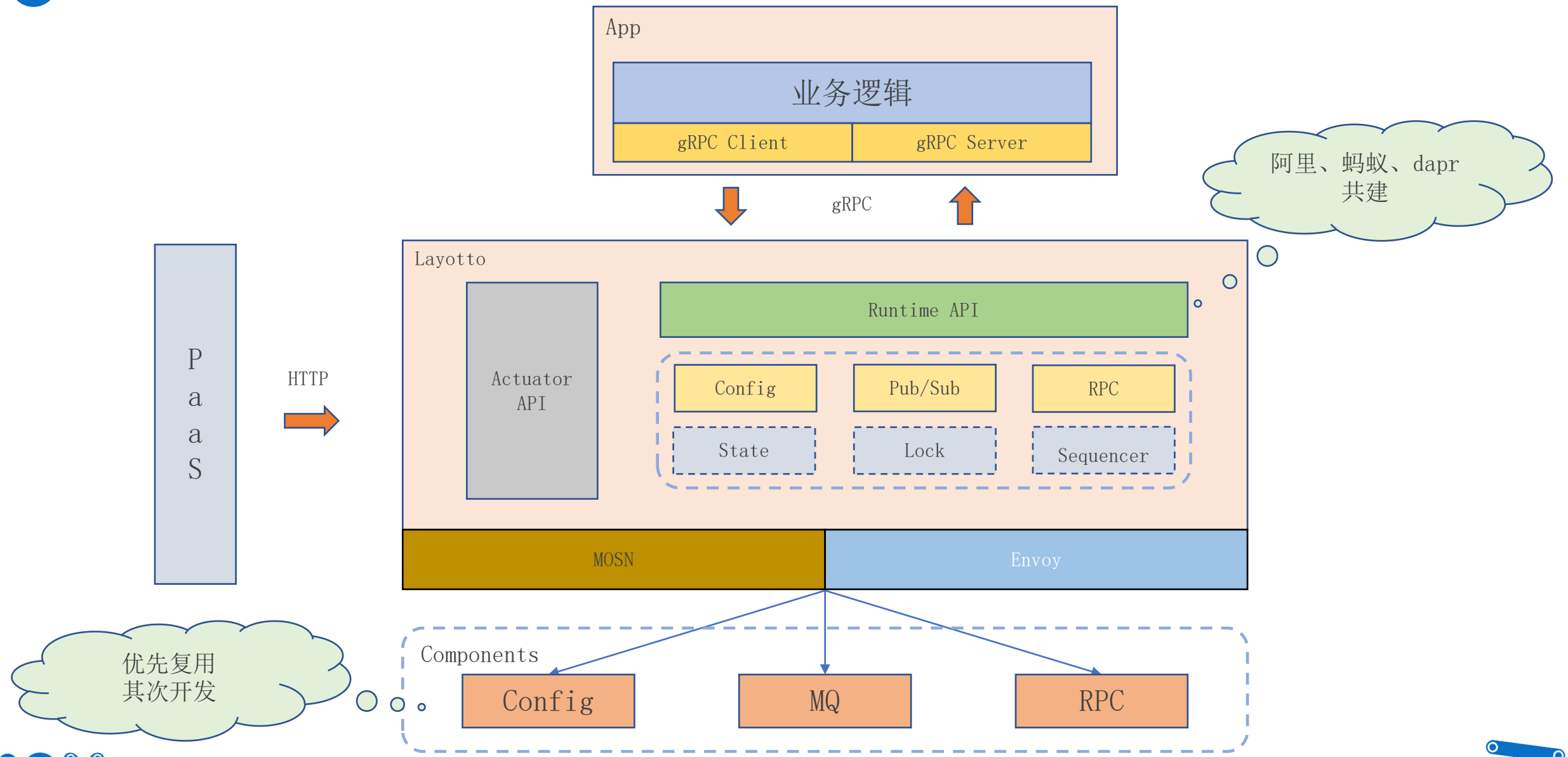
03

Layotto架构设计

Layotto架构


App
业务逻辑
gRPC Client
gRPC Server
gRPC
阿里、蚂蚁、dapr
共建
P
a
a
S
HTTP
Layotto
Actuator
API
Runtime API
Config
Pub/Sub
RPC
State
Lock
Sequencer
MOSN
优先复用
其次开发
Components
Config
MQ
RPC

Layotto架构


App
业务逻辑
gRPC Client
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P
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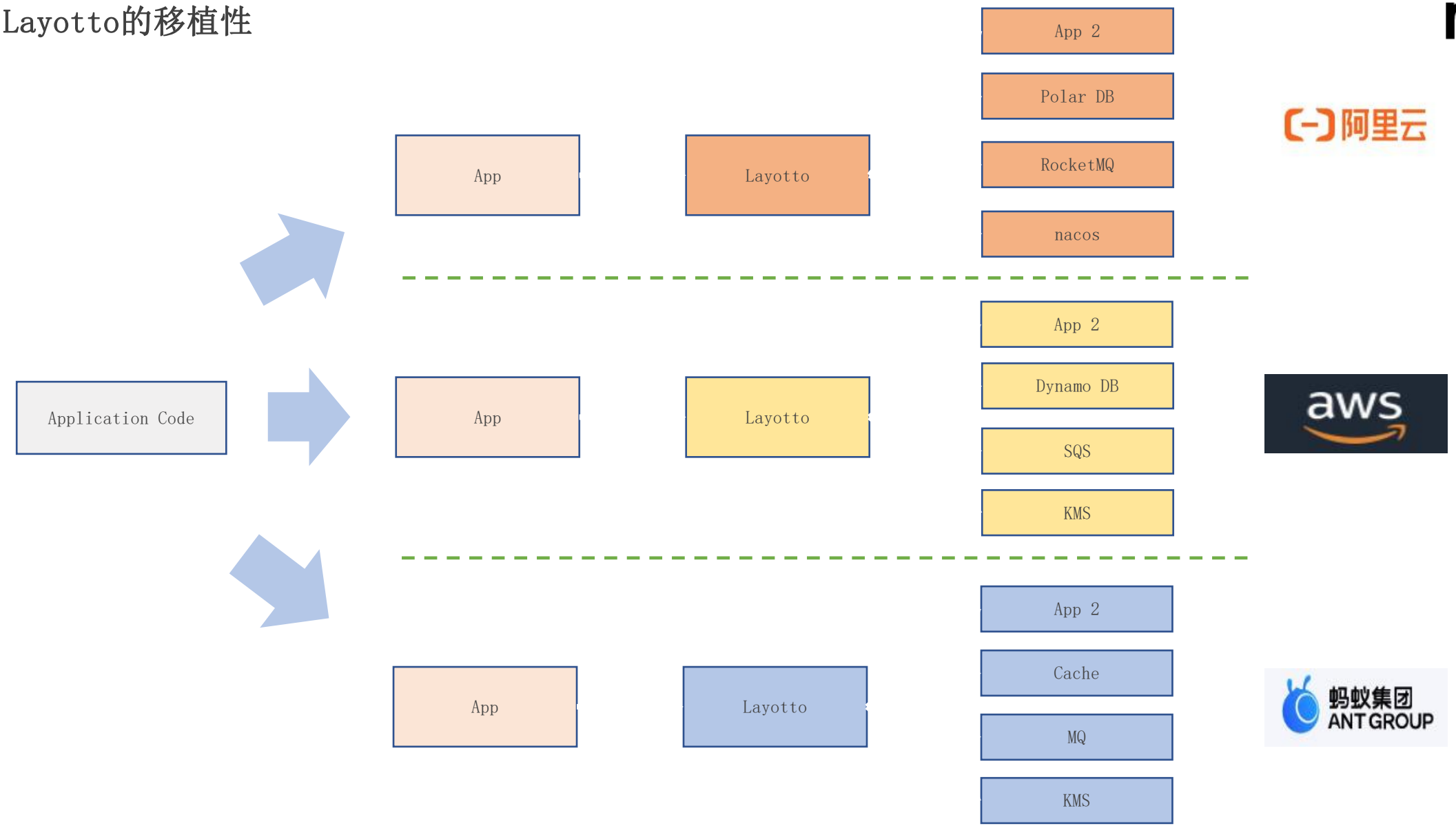
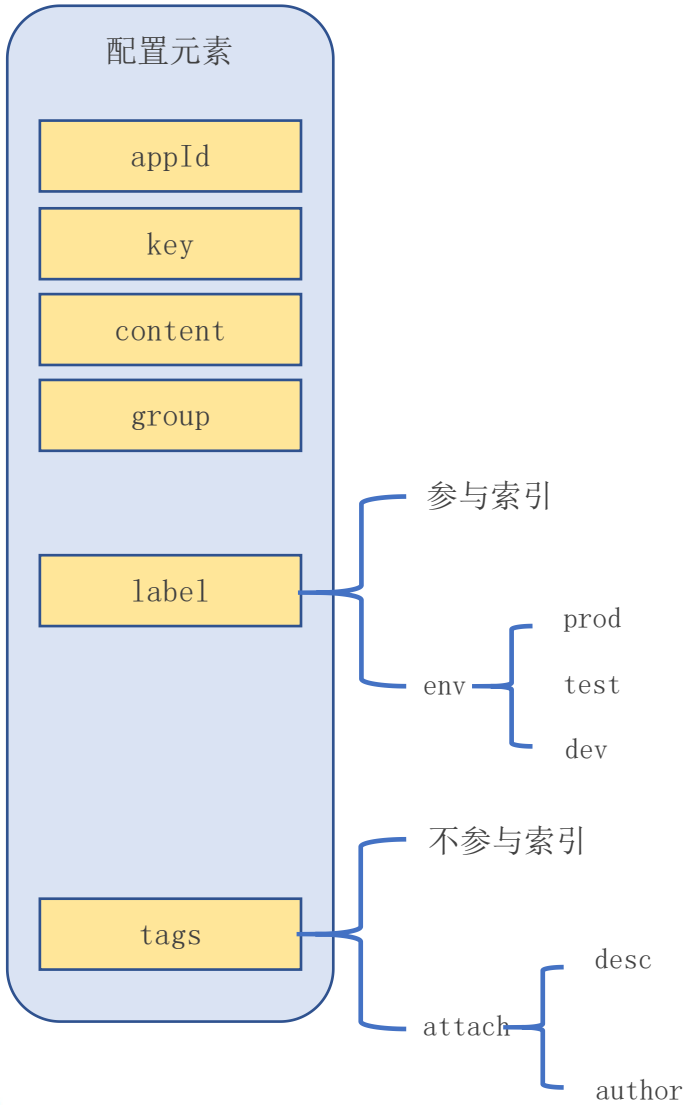
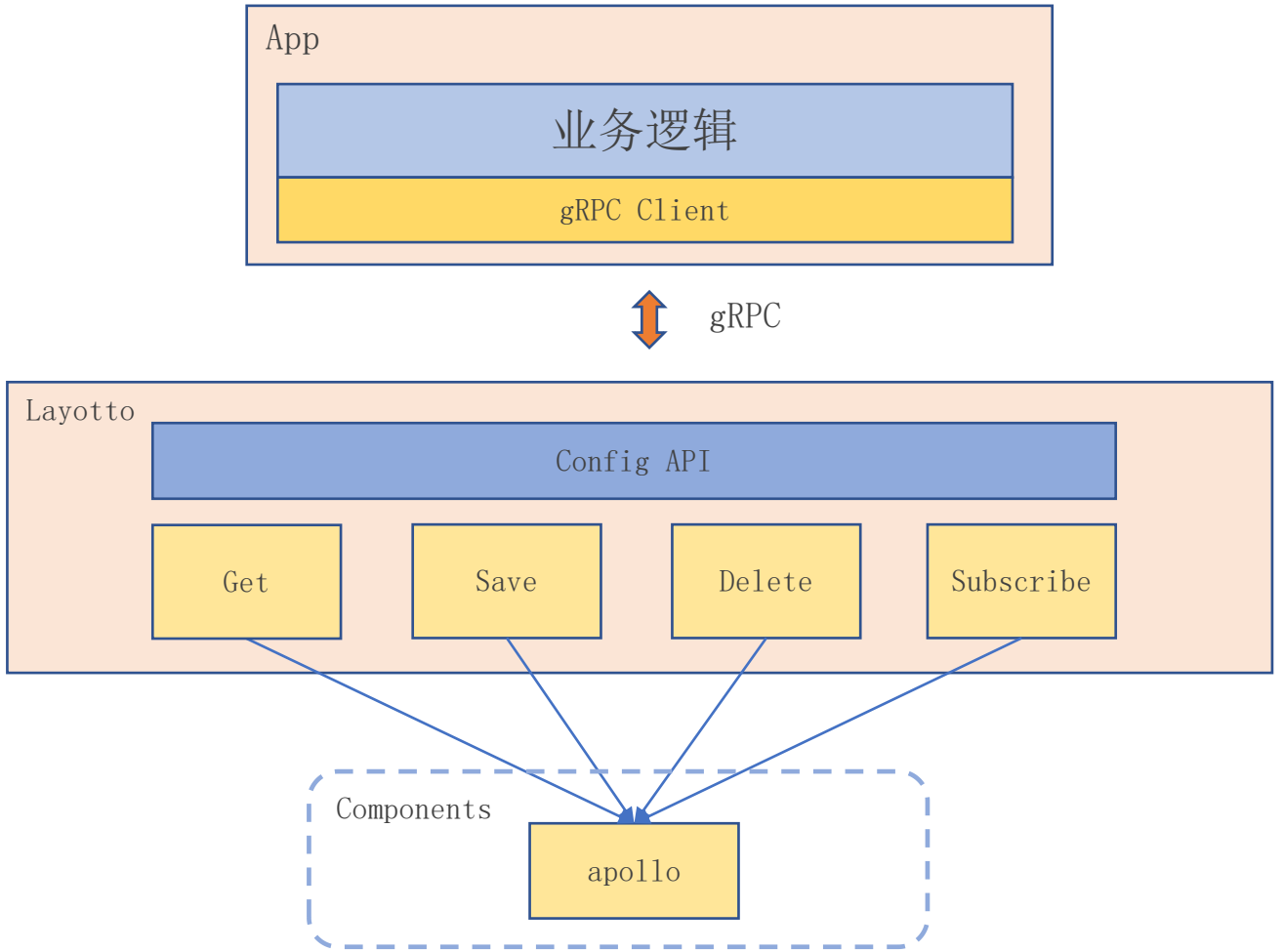
a
S
HTTP
Layotto
Actuator
API
Runtime API
Config
Pub/Sub
RPC
State
Lock
Sequencer
MOSN
Envoy
优先复用
其次开发
Components
Config
MQ
RPC

Layotto的移植性



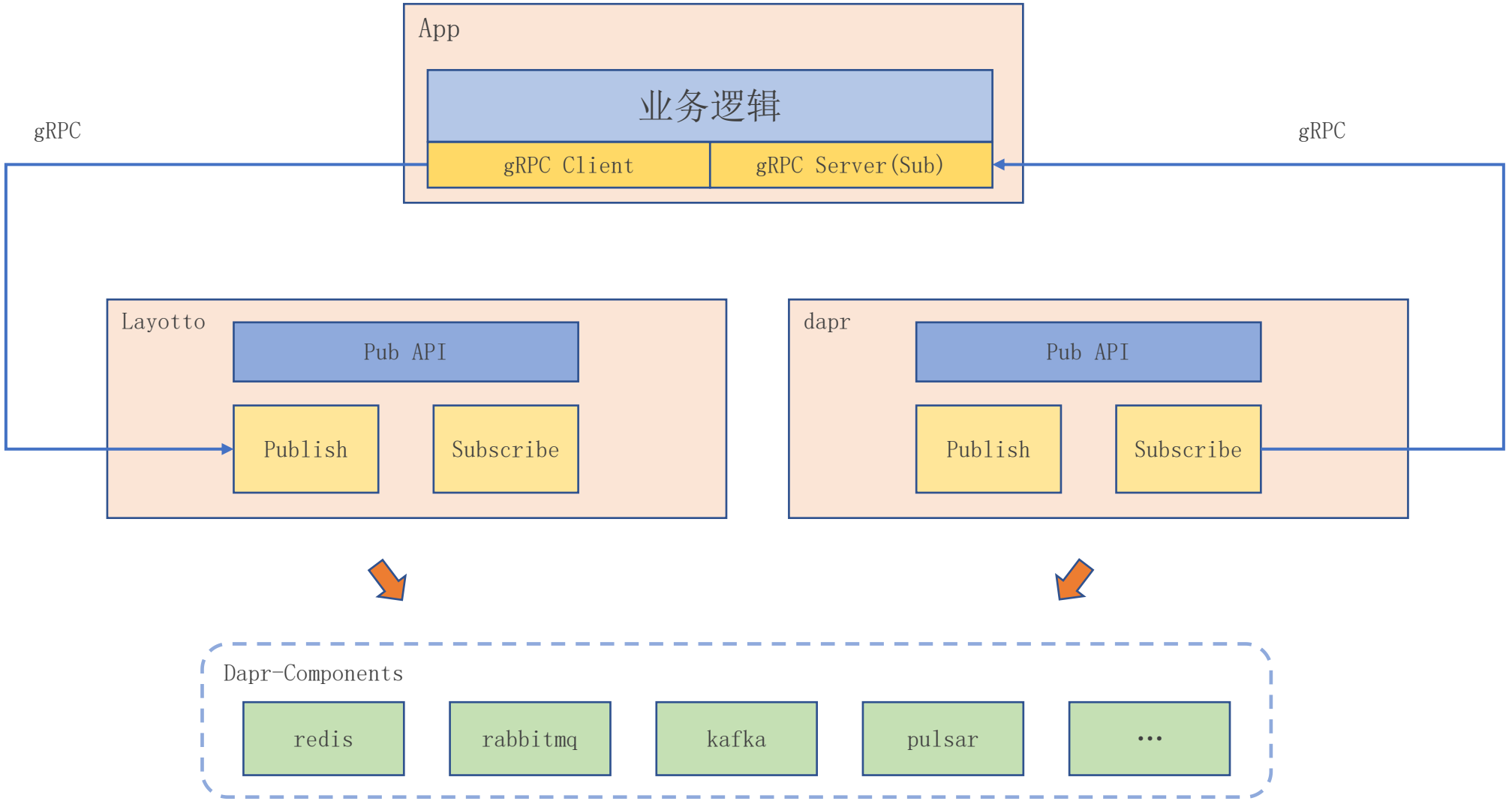
配置能力



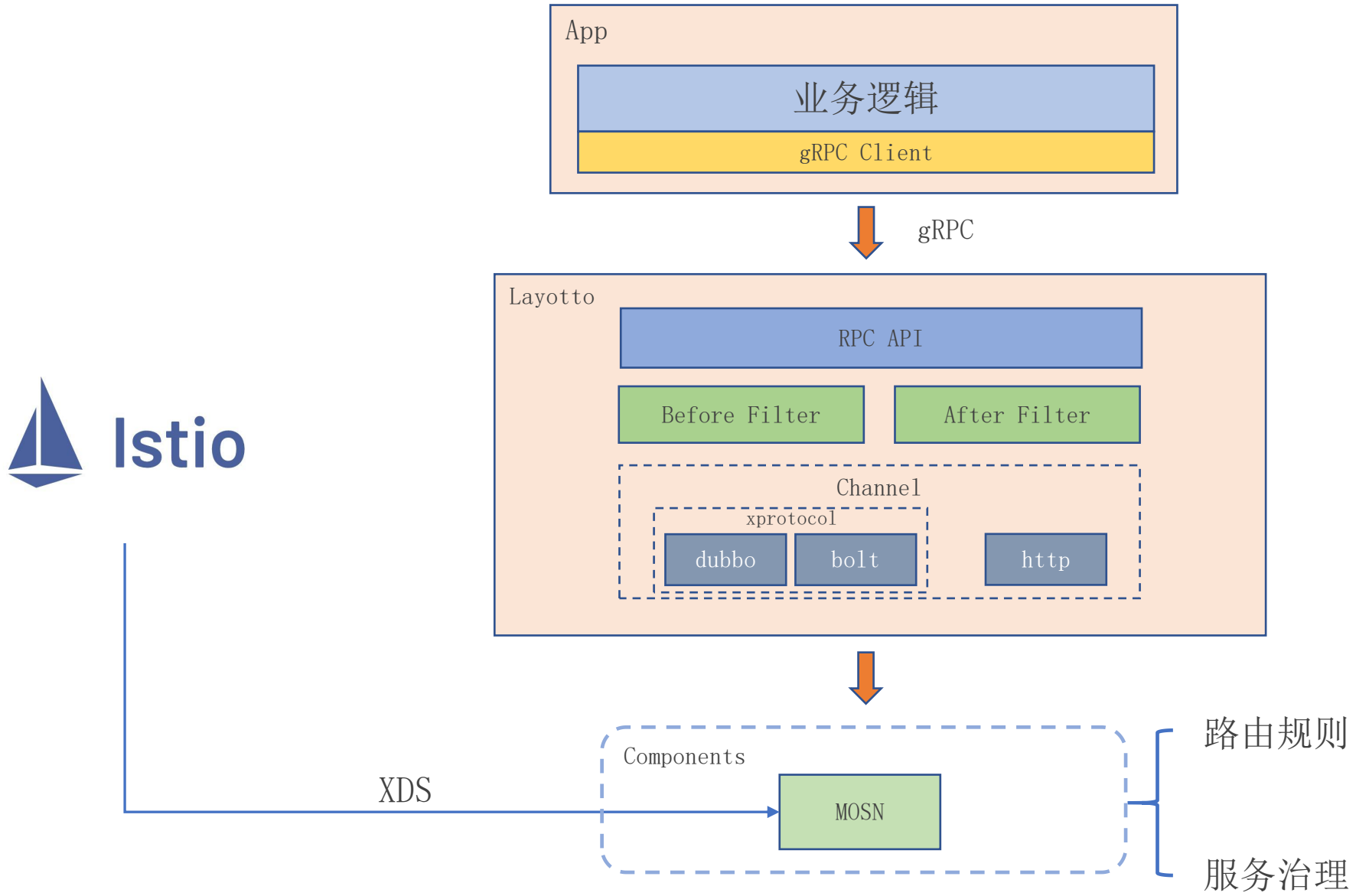


Reference：https://github.com/dapr/dapr/issues/2988

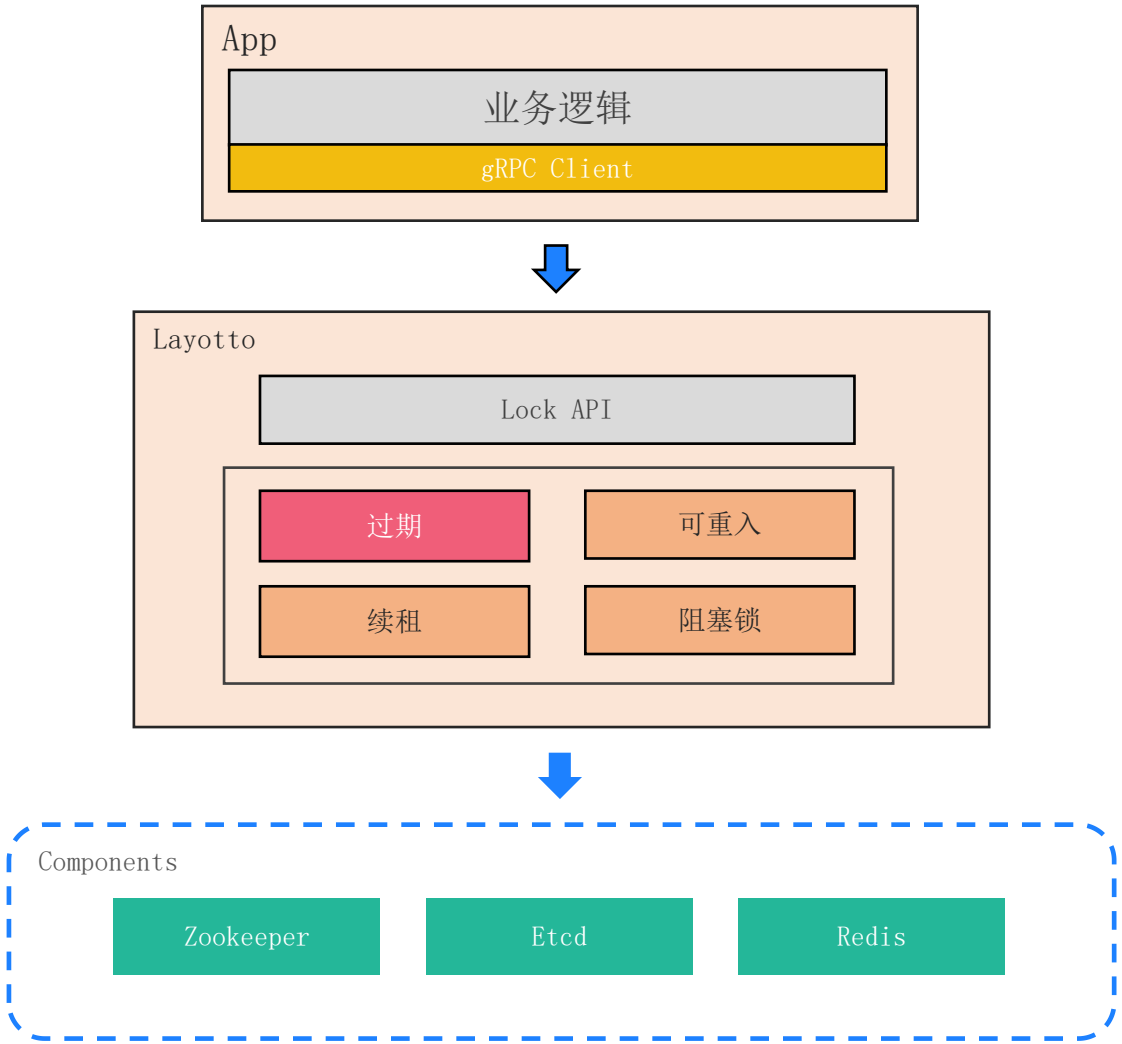
Pub/Sub能力



Reference: https://github.com/dapr/dapr/issues/3276

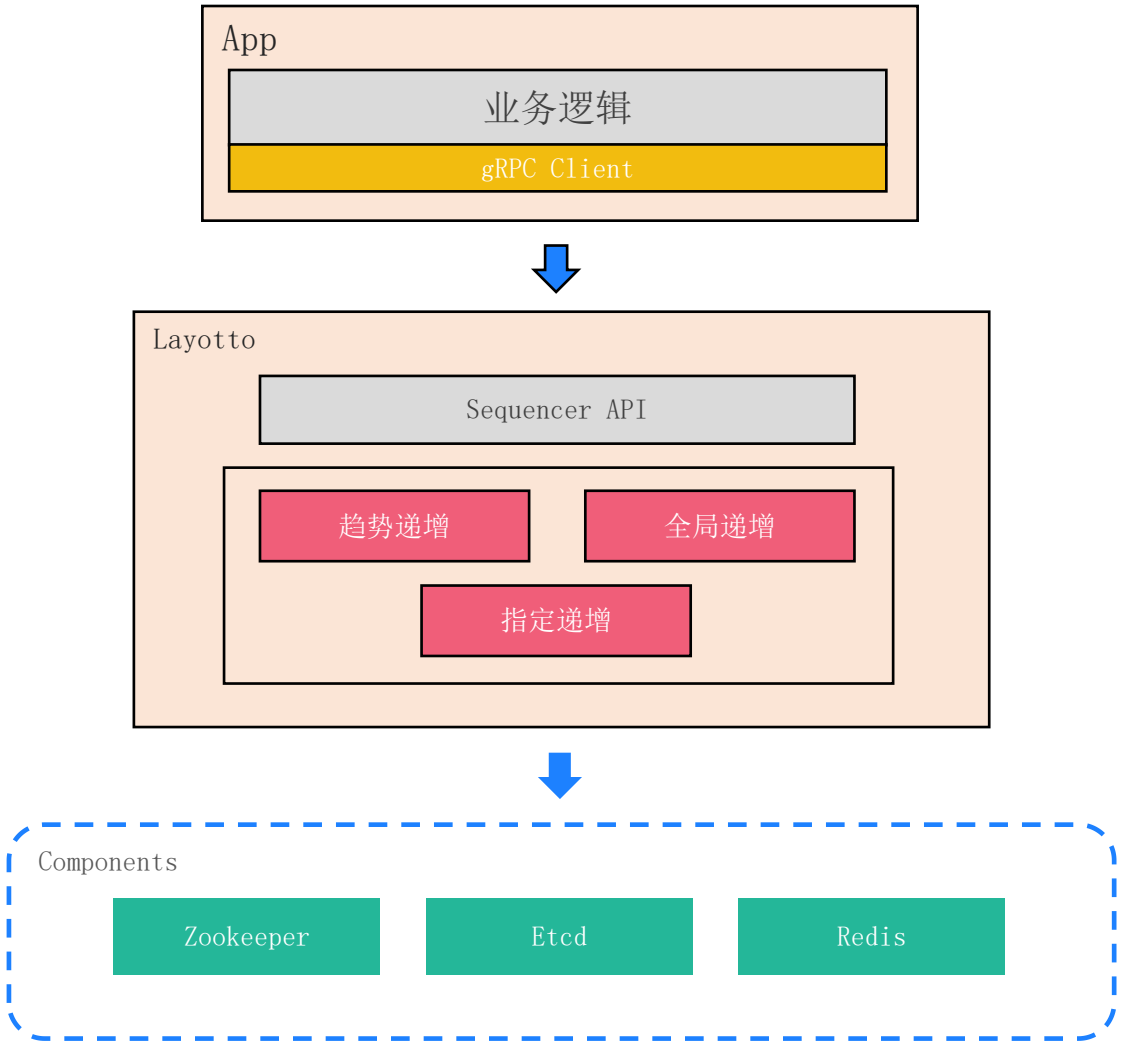

App
业务逻辑
gRPC Client
gRPC
Layotto
RPC API
Before Filter
After Filter
Channel
xprotocol
dubbo
bolt
http
Istio
XDS
Components
MOSN
路由规则
服务治理

Lock能力



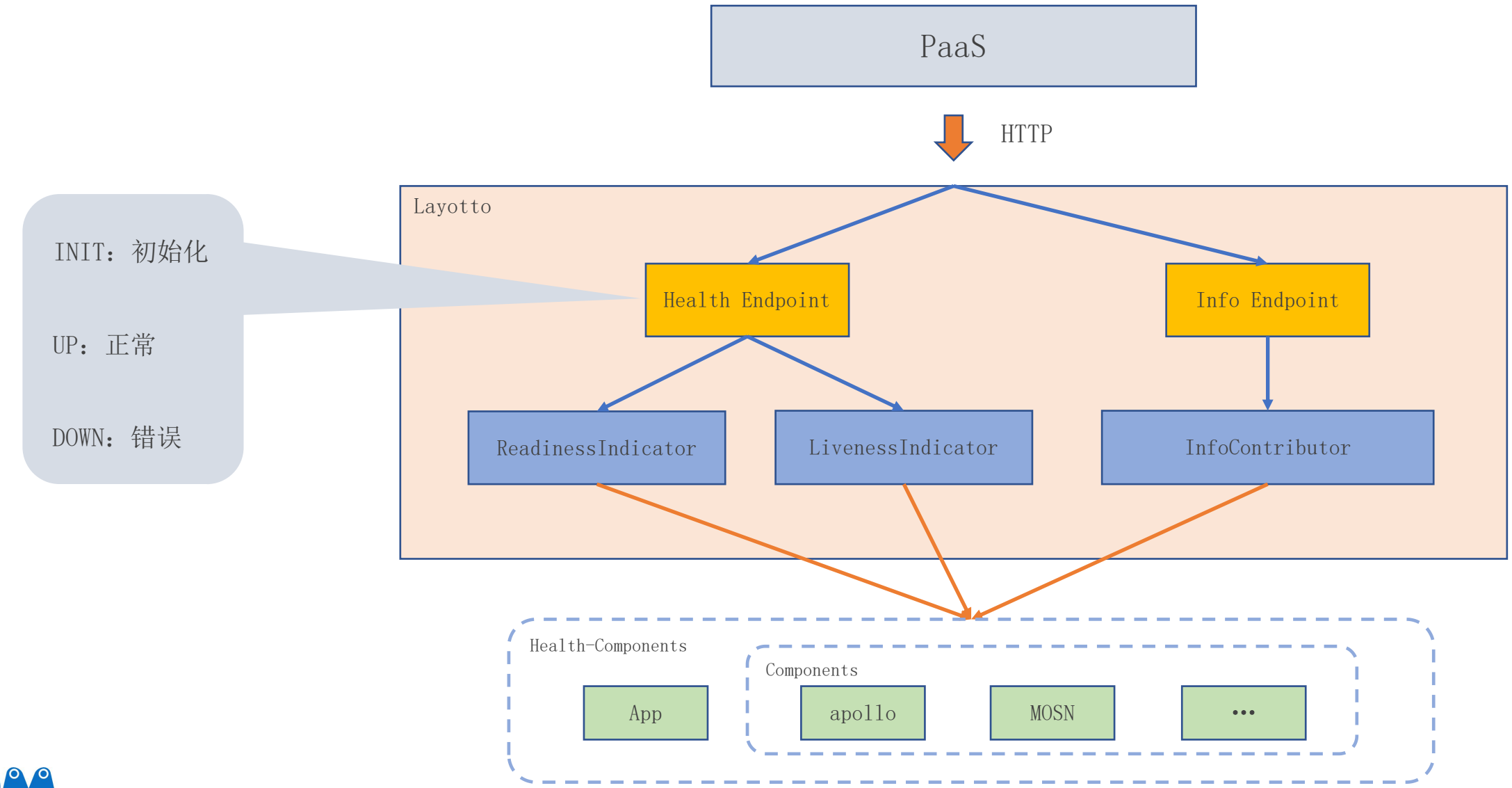
设计文档：https://mosn.io/layotto/#/zh/design/lock/lock-api-design

Sequencer能力



设计文档：https://mosn.io/layotto/#/zh/design/sequencer/design

Actuator能力

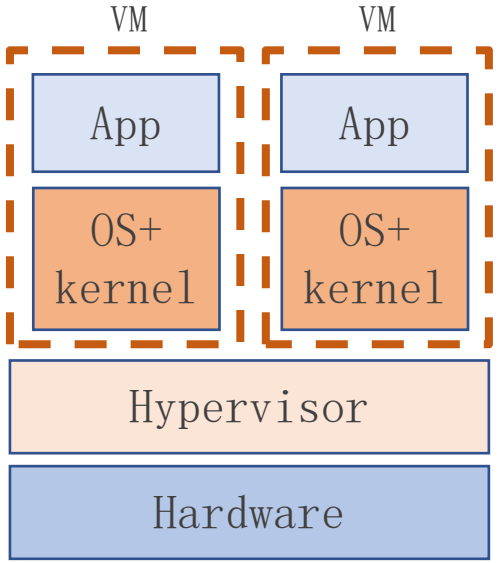

PaaS
HTTP
Layotto
Health Endpoint
Info Endpoint
ReadinessIndicator
LivenessIndicator
InfoContributor
INIT：初始化
UP：正常
DOWN：错误
Health-Components
App
Components
apollo
MOSN
...

04

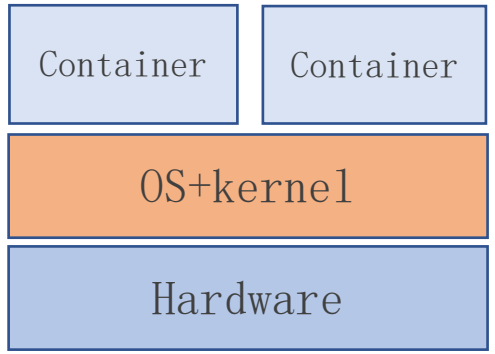
FaaS 产品化的探索

虚拟化技术的发展

虚拟机

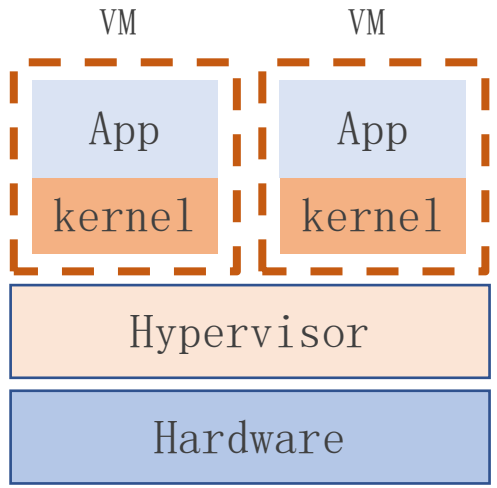


VS

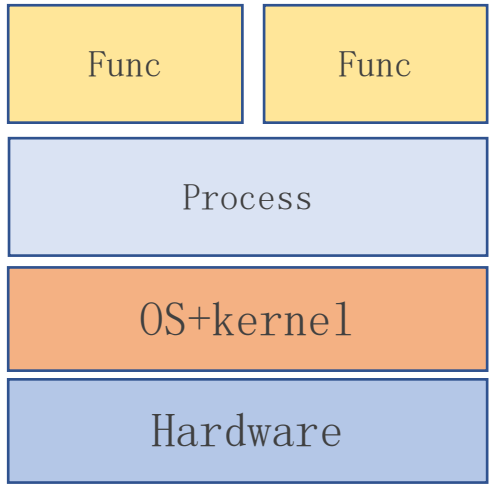


容器

Unikernel



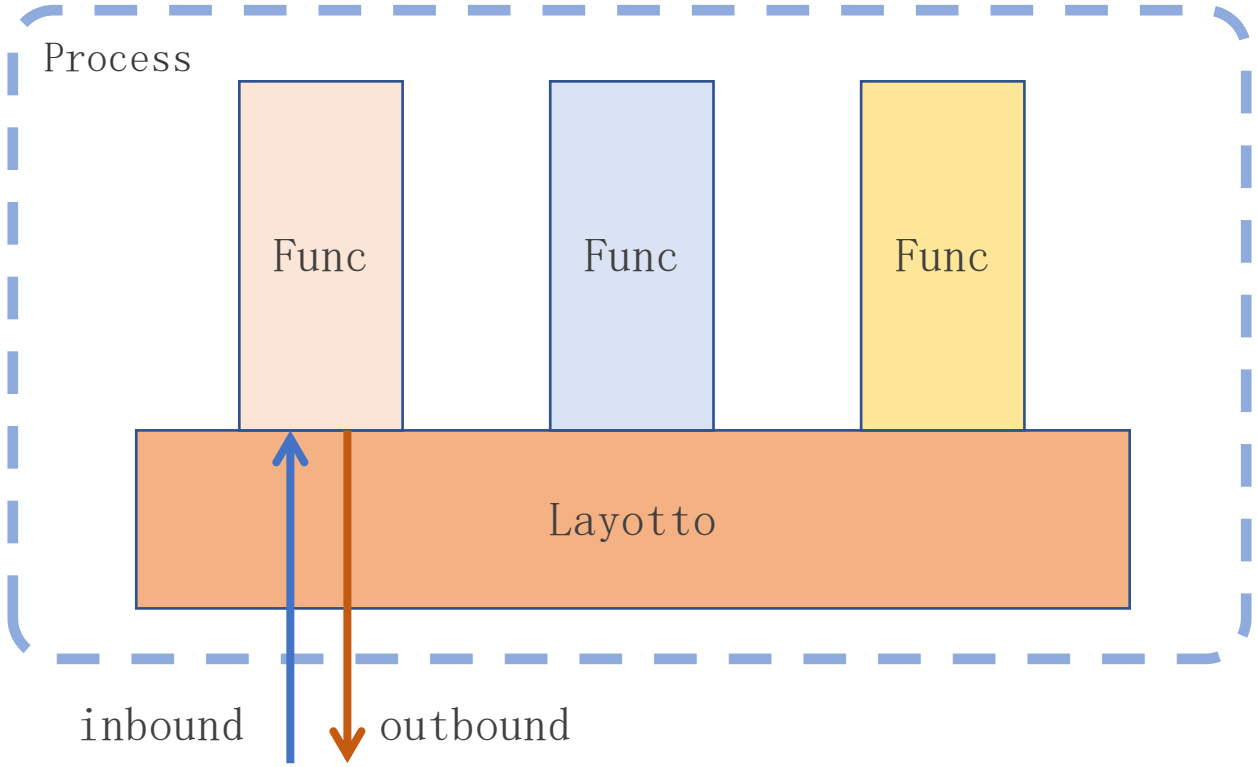
VS

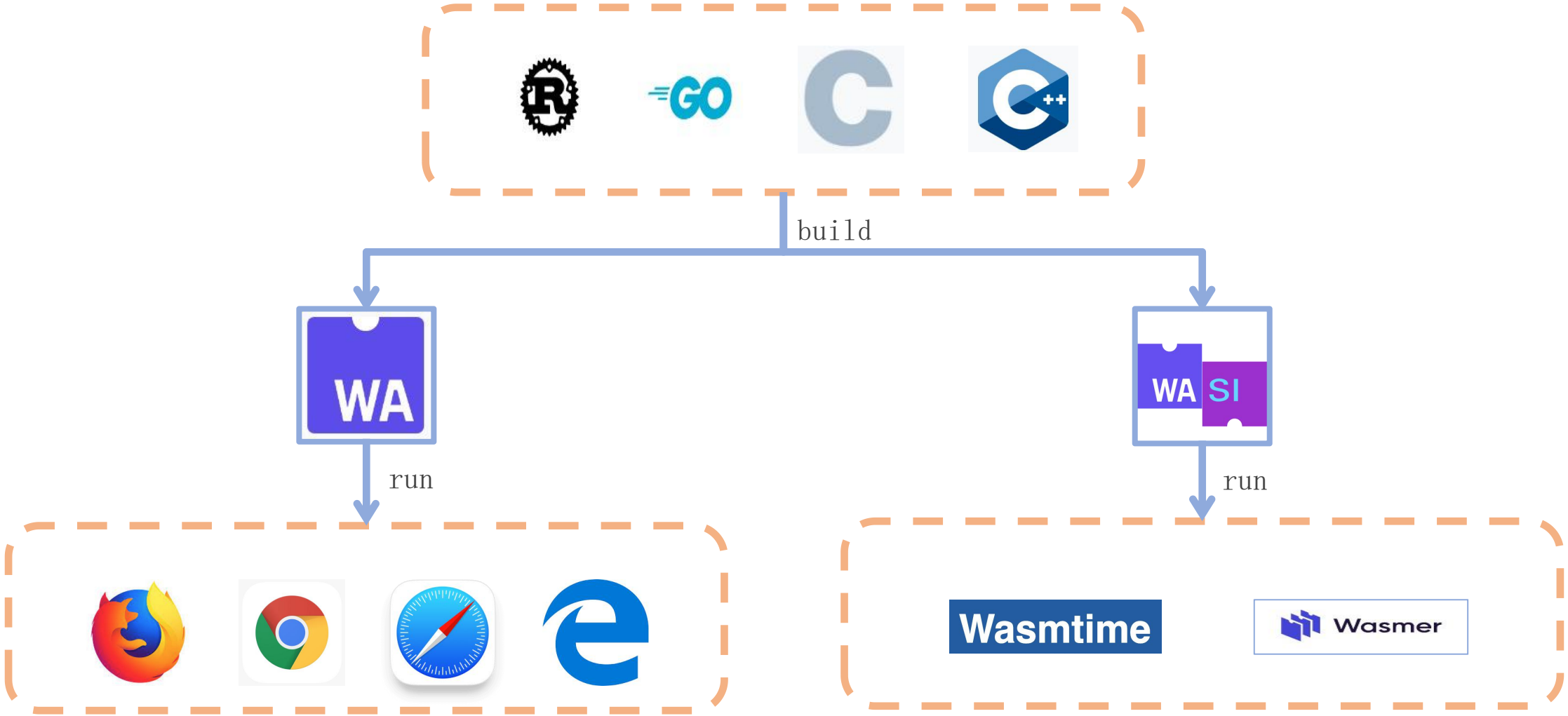


nanoprocess

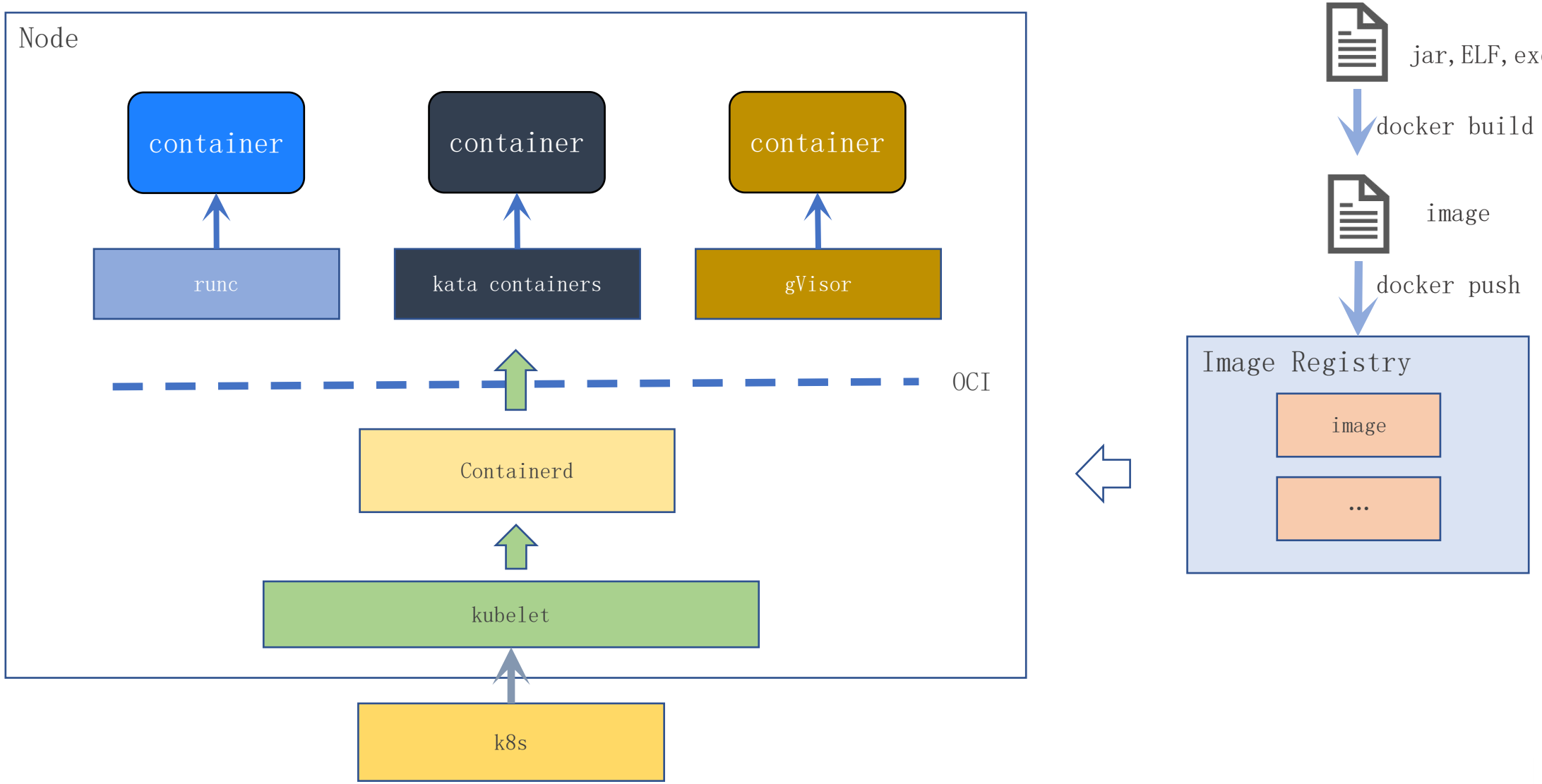
预期Function模型

- 多语言
- 隔离性
- 安全性
- 资源限制



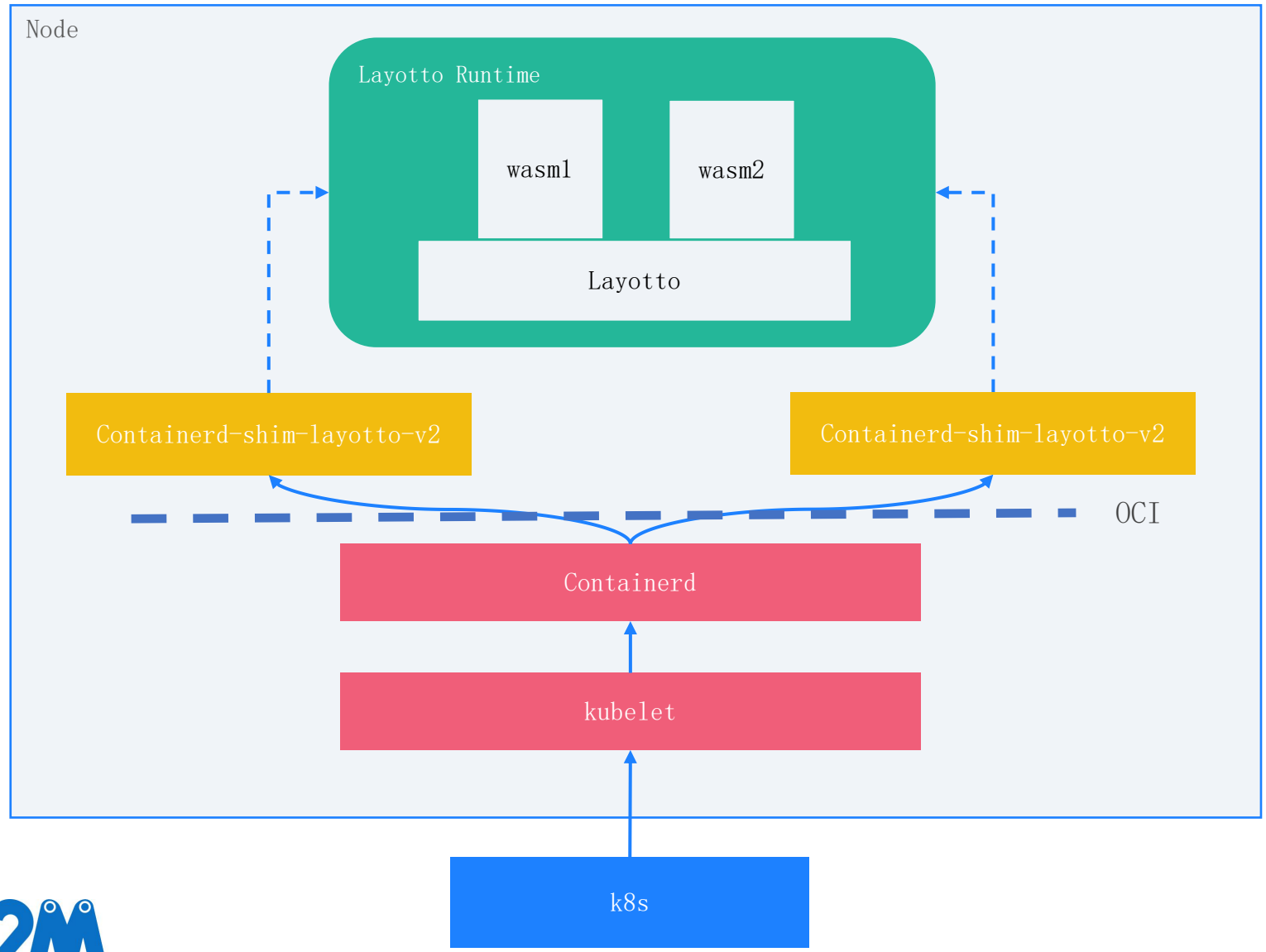

build
WA
run
WA SI
run
Wasmtime
Wasmer

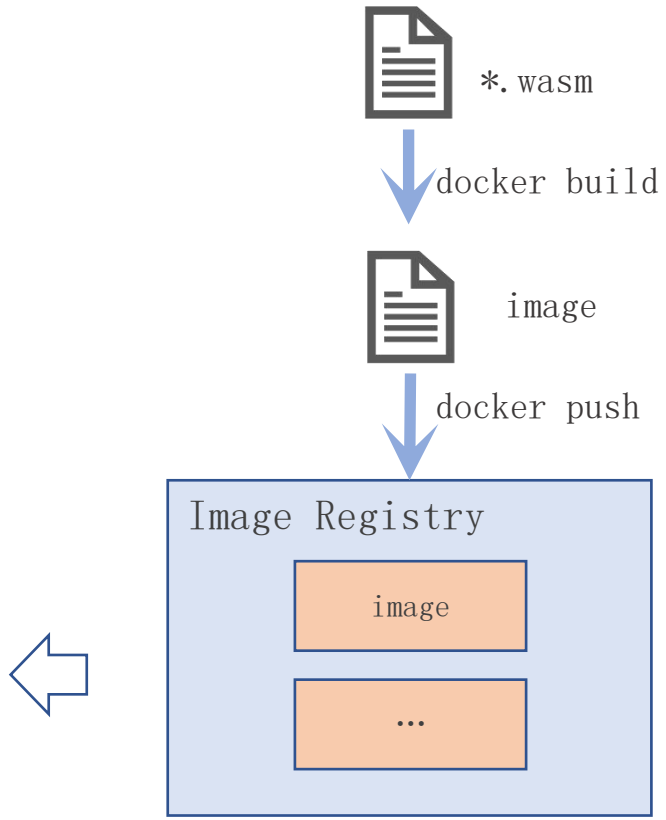
K8s调度


Node
container
container
container
runc
kata containers
gVisor
OCI
Containerd
kubelet
k8s

jar, ELF, exe
docker build
image
docker push
Image Registry
image
...

K8s调度wasm


Node
Layotto Runtime
wasm1
wasm2
Layotto
Containerd-shim-layotto-v2
Containerd-shim-layotto-v2
OCI
Containerd
kubelet
k8s


*.wasm
docker build
image
docker push
Image Registry
image
...

```
→  containerd cat wasm-1.yaml
apiVersion: v1
kind: Pod
metadata:
 name: wasm-1
spec:
 runtimeClassName: layotto
 containers:
 - name: wasm-1
   image: lingfenglangshao/wasm_1
→  containerd
```

```
→  containerd kubectl apply -f wasm-1.yaml
pod/wasm-1 created
```

```
→  containerd kubectl get pod
NAME     READY   STATUS    RESTARTS   AGE
wasm-1   1/1     Running   0          2m39s
wasm-2   1/1     Running   0          2m22s
→  containerd
```

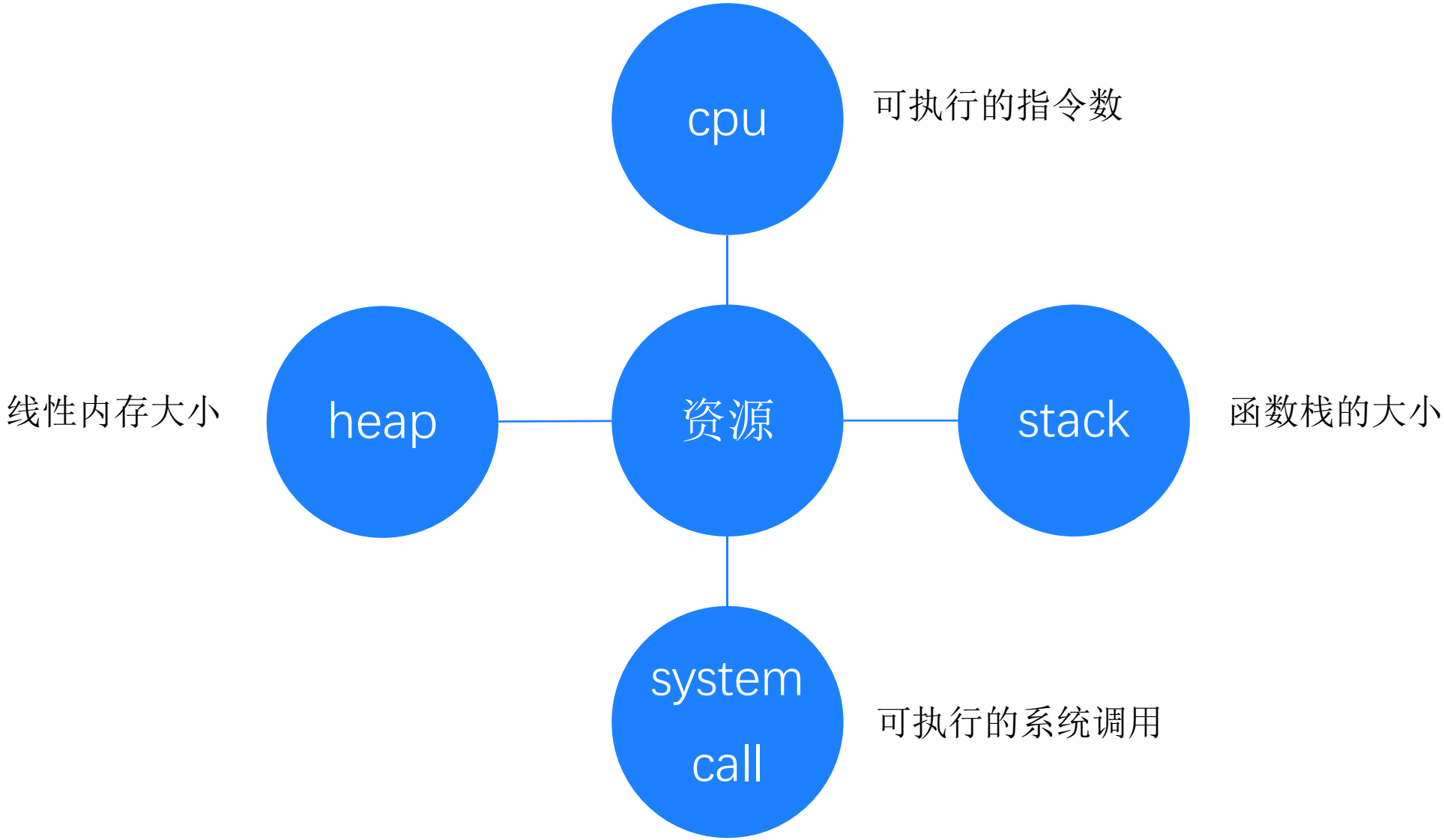
```
→  containerd kubectl delete pod wasm-1
pod "wasm-1" deleted
→  containerd kubectl get pod
NAME     READY   STATUS    RESTARTS   AGE
wasm-2   1/1     Running   0          3m42s
→  containerd
```

JS函数运行演示

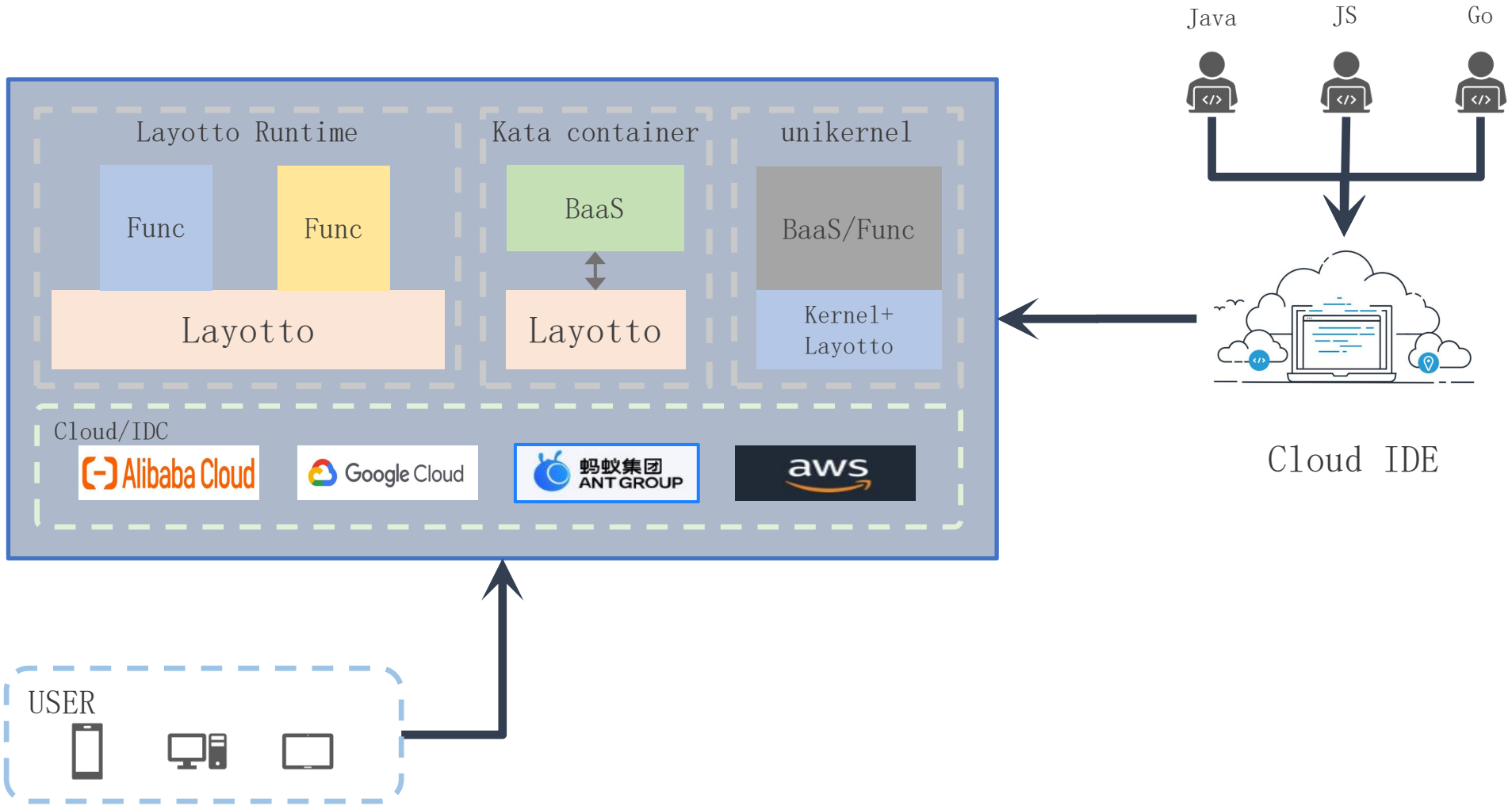
```
import {GetState} from 'runtime'

export function execute (key){
    internal_func(key)
    let r = GetState("redis", key)
    return "there is " + r + " in " + key
}

function internal_func (key){
    print("internal_func" + key)
}
```

```
→ [redacted] git:(main) ✗ curl -H 'id:id_1' 'localhost:2045?name=book1'
there is 99 in book1%
→ [redacted] git:(main) ✗
```

Function资源限制



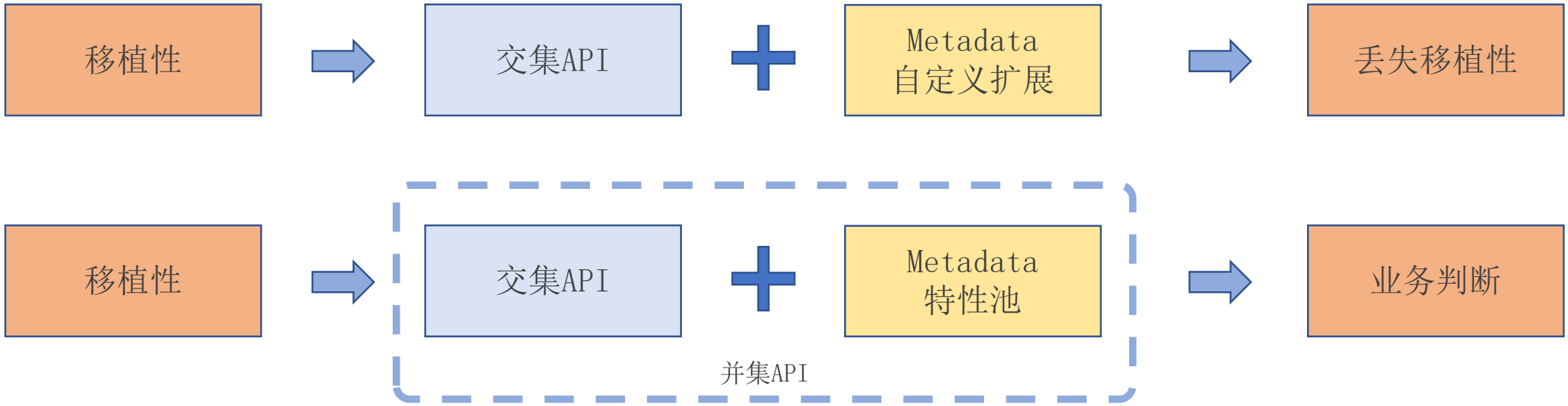
Function展望


Java
JS
Go
Layotto Runtime
Kata container
unikernel
Func
Func
BaaS
BaaS/Func
Layotto
Layotto
Kernel+
Layotto
Cloud/IDC
Alibaba Cloud
Google Cloud
蚂蚁集团
ANT GROUP
aws
Cloud IDE
USER

05

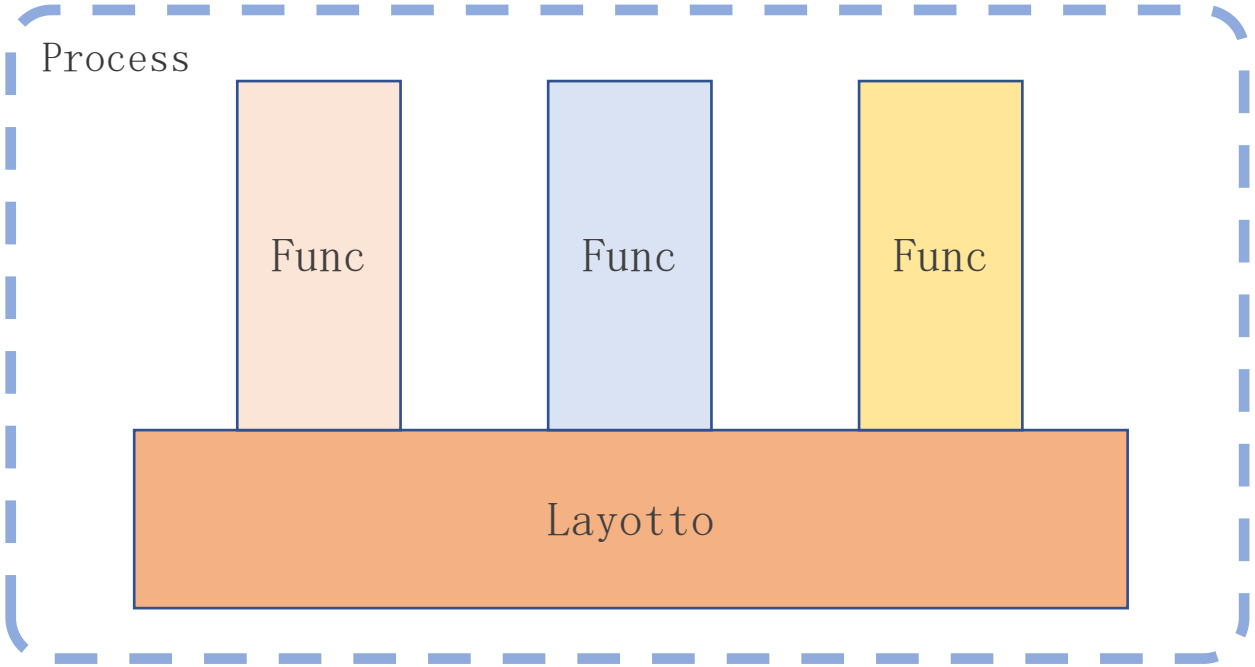
开源与共赢

移植性-并集 API



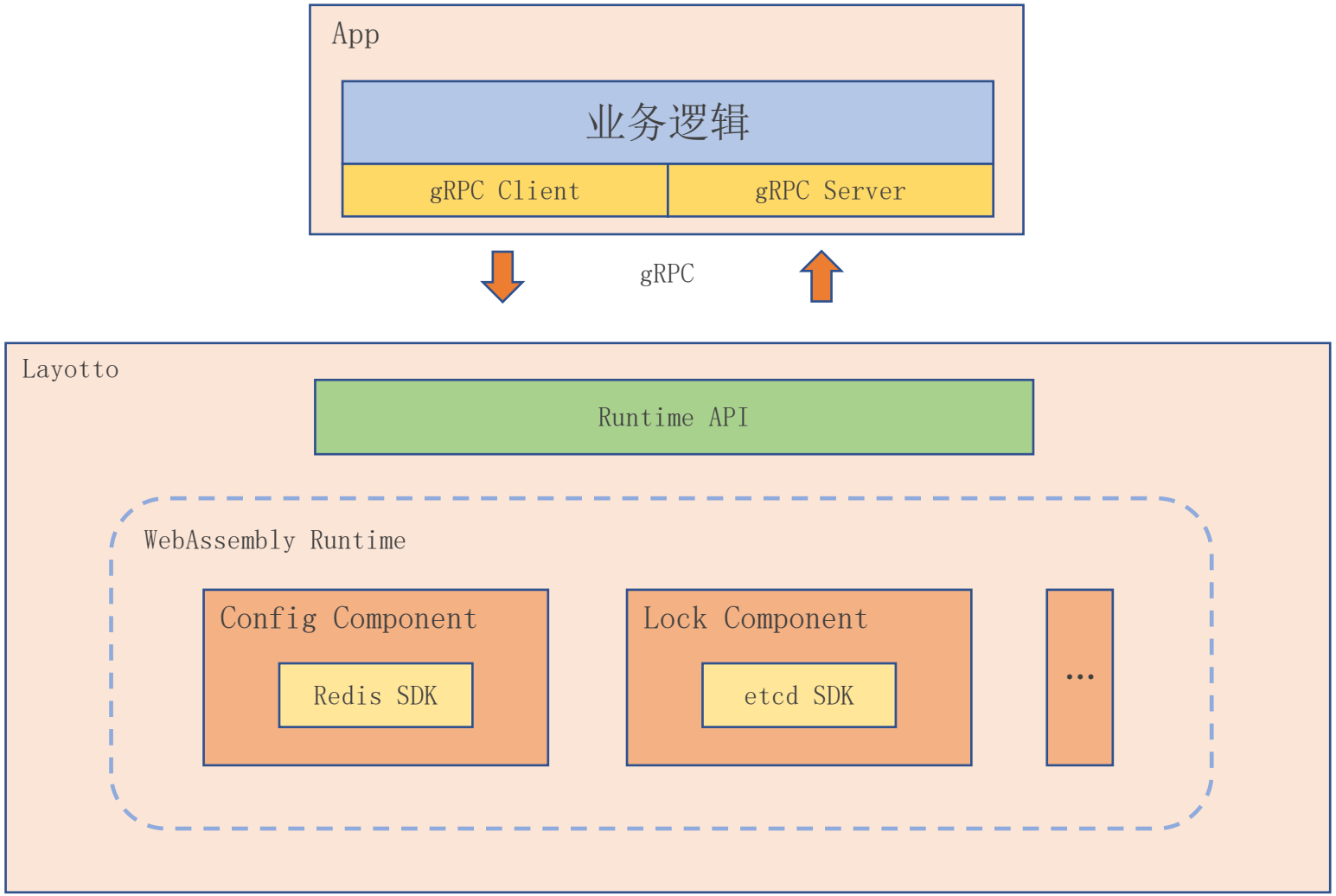
Metadata特性池：

Feature Key	组件A	组件B
key1	✓	✗
key2	✗	✓
key3	✓	✓



- 多语言支持（Java，Go，JS）
- WASM ABI（ proxy-wasm/spec ）
- 生态建设（Troubleshooting， 资源限制，高级特性）

新技术探索方向-WebAssembly



其他事项

- 跨云部署示例
- 集成 kubernates
- 集成eBPF

欢迎交流

https://github.com/mosn/layotto

Layotto 2群

该二维码7天内(4月26日前)有效，重新进入将更新

微信群

Layotto 用户交流群

213人

扫一扫群二维码，立刻加入该群。

钉钉群

关注msup公众号

获取更多AI落地实践

麦思博(msup)有限公司是一家面向技术型企业的培训咨询机构，携手2000余位中外客座导师，服务于技术团队的能力提升、软件工程效能和产品创新迭代，超过3000余家企业续约学习，是科技领域占有率第1的客座导师品牌，msup以整合全球领先经验实践为己任，为中国产业快速发展提供智库。