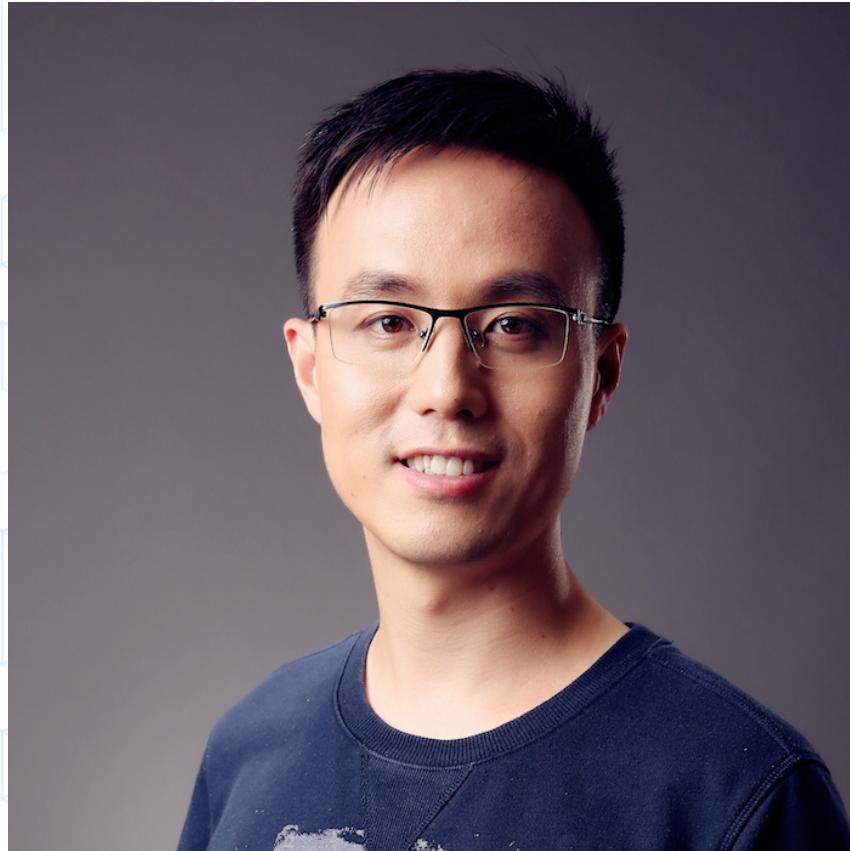


# Layotto - A new chapter of Service Mesh and Application Runtime

Jason Song



Staff Engineer @ Ant Group

Focus on cloud-native and microservice areas, such as Service Mesh, Serverless, Application Runtime, etc.



Open source enthusiast, PMC member of Apollo Config  
<https://github.com/nobodyiam>



Worked at Dianping and Ctrip, in charge of backend systems and middleware products

# CONTENTS

- 01 Service Mesh Review
- 02 Introduction to Layotto
- 03 Future plans

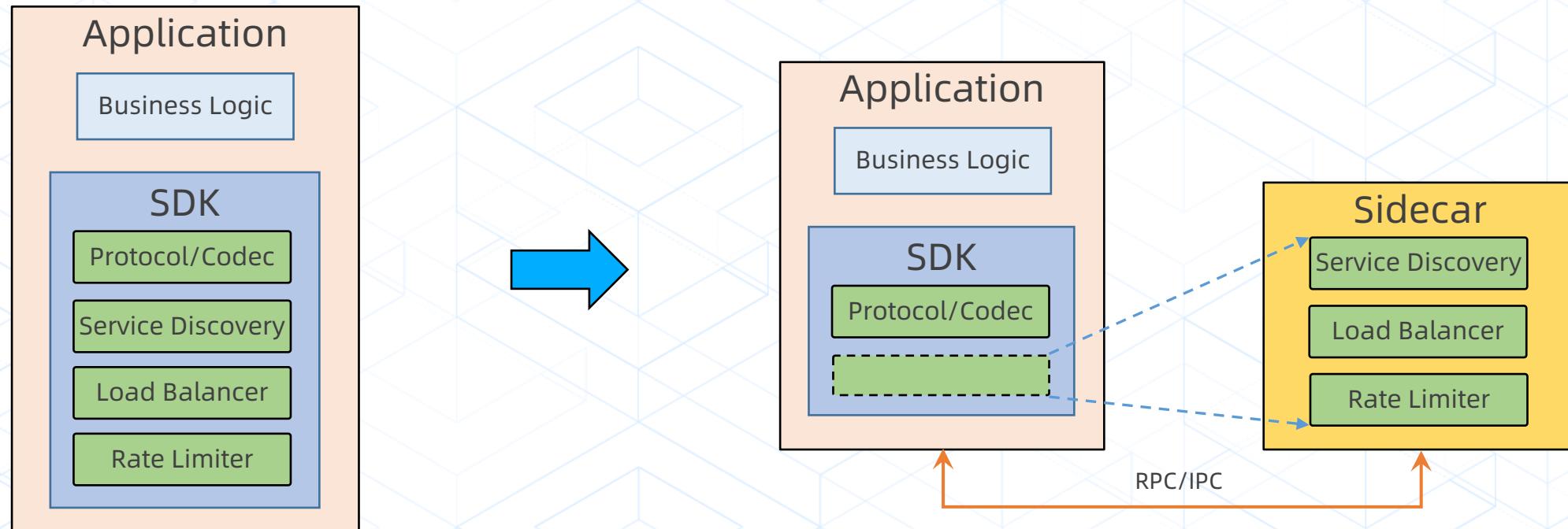


01

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# Service Mesh Review

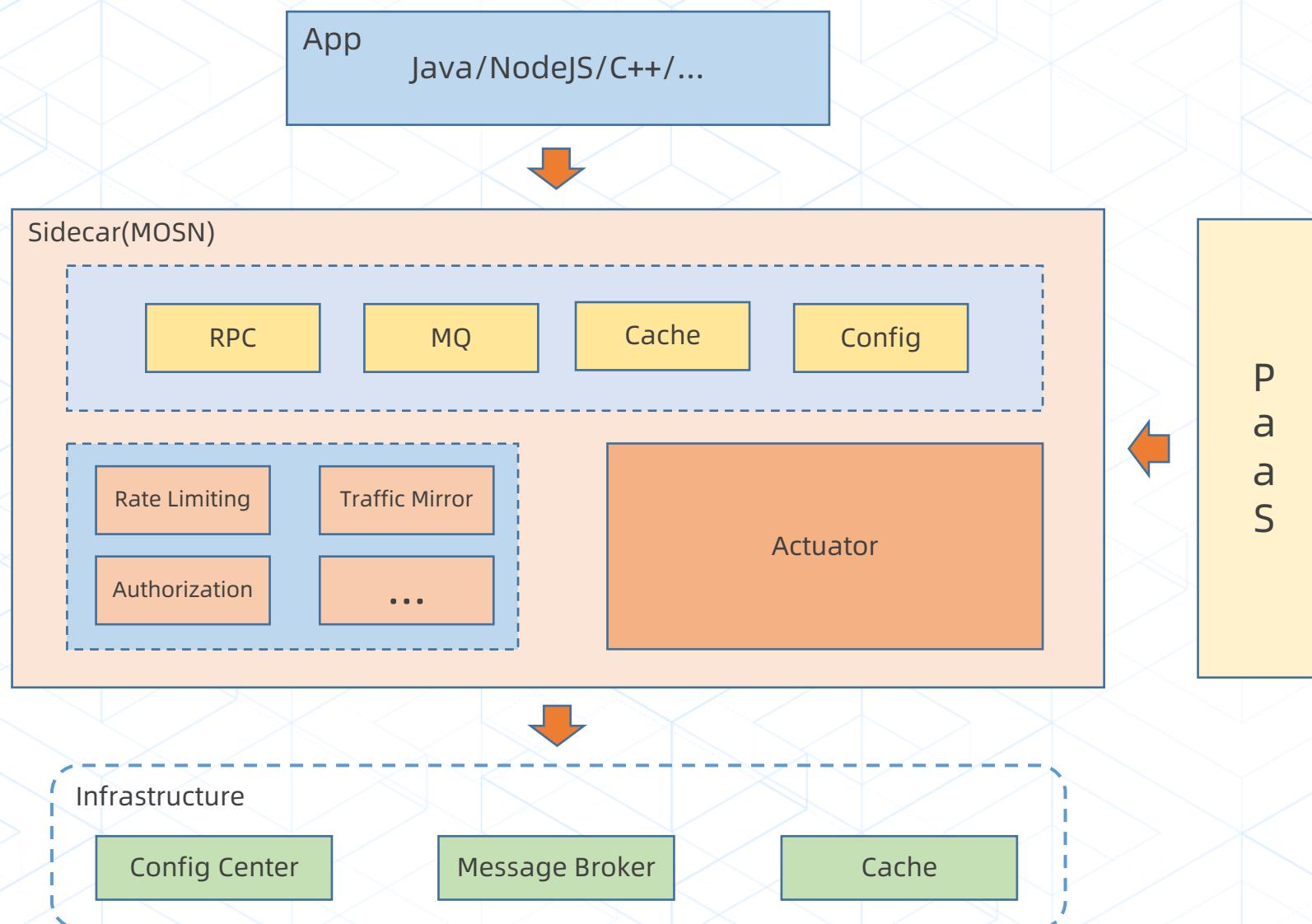
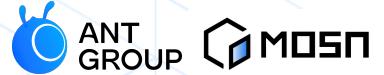
# Why Service Mesh?



- High upgrade costs of SDK
- SDK version fragmentation
- Weak service governance for multi-language

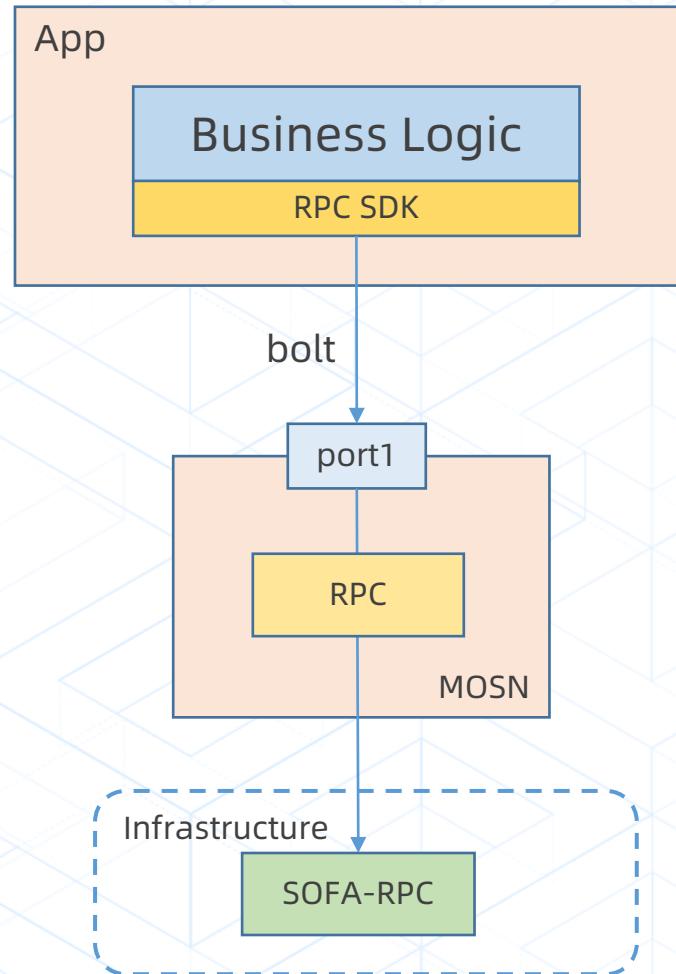
- Business logic decoupling
- Smooth upgrade
- Good service governance for multi-language

# Service Mesh Adoption Status in Ant Group

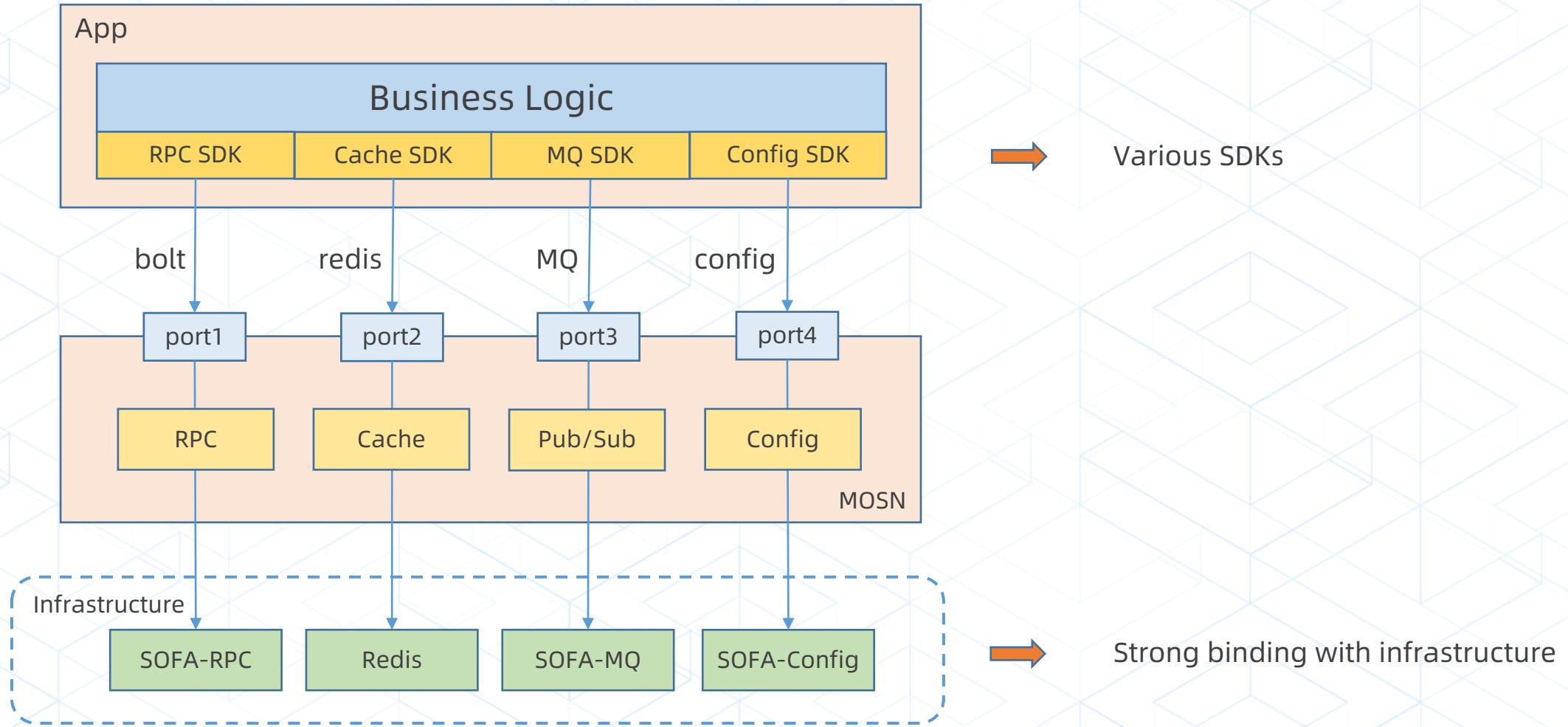


- 200K+ pods
- RT: +0.2ms
- CPU: +0%~+2%
- MEM: +15M

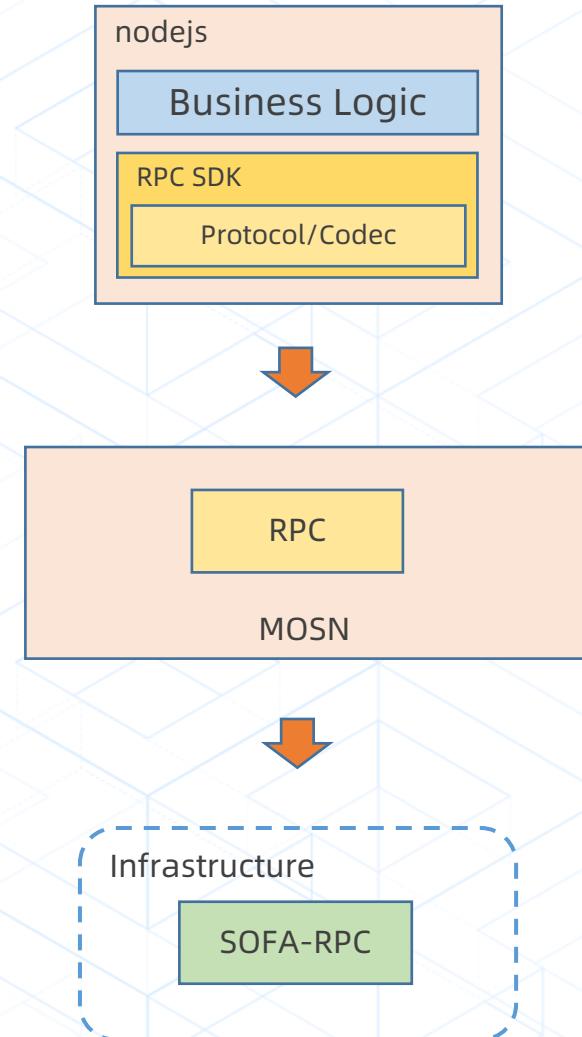
# New challenge: Strong binding between applications and infrastructure



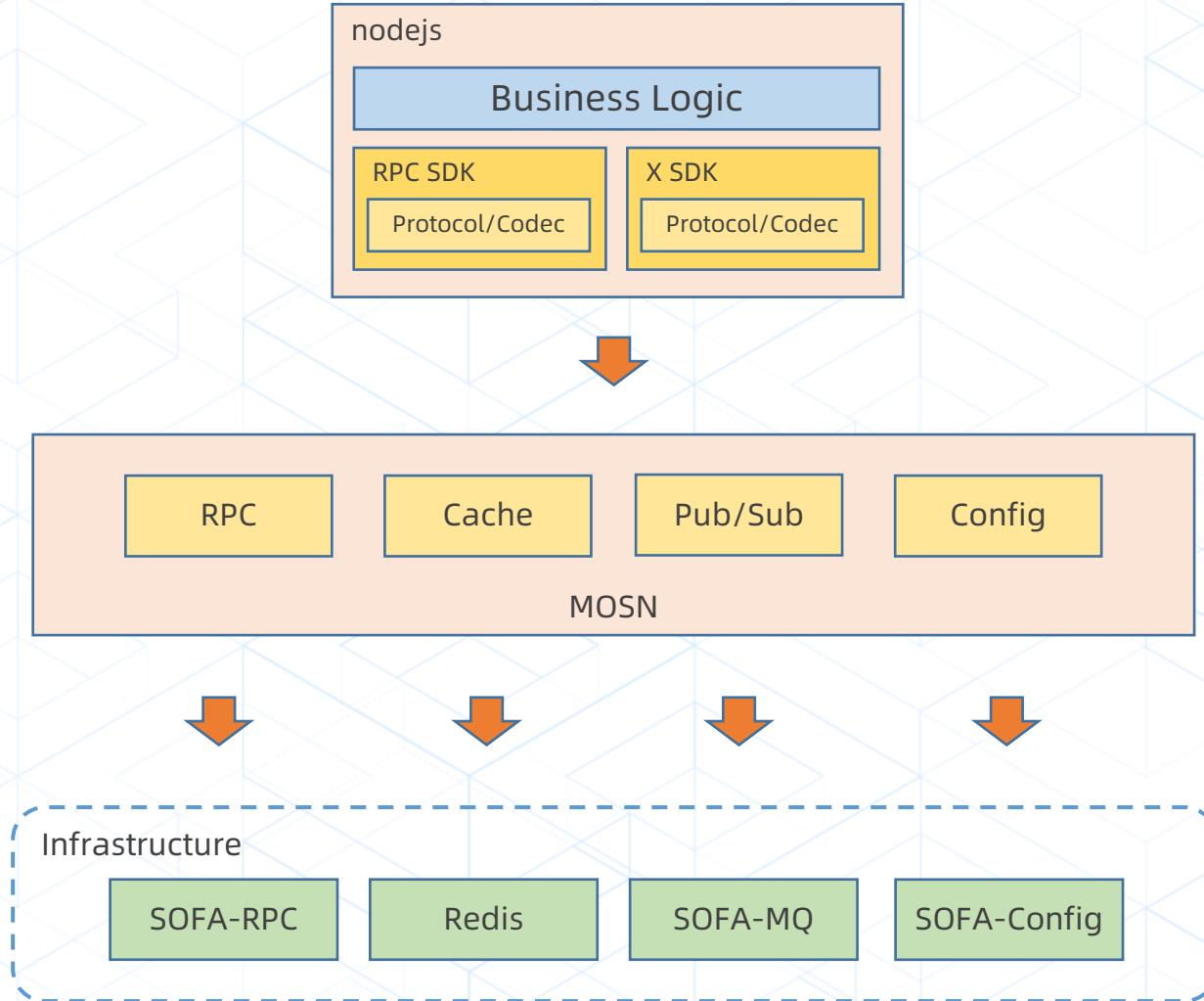
# New challenge: Strong binding between applications and infrastructure



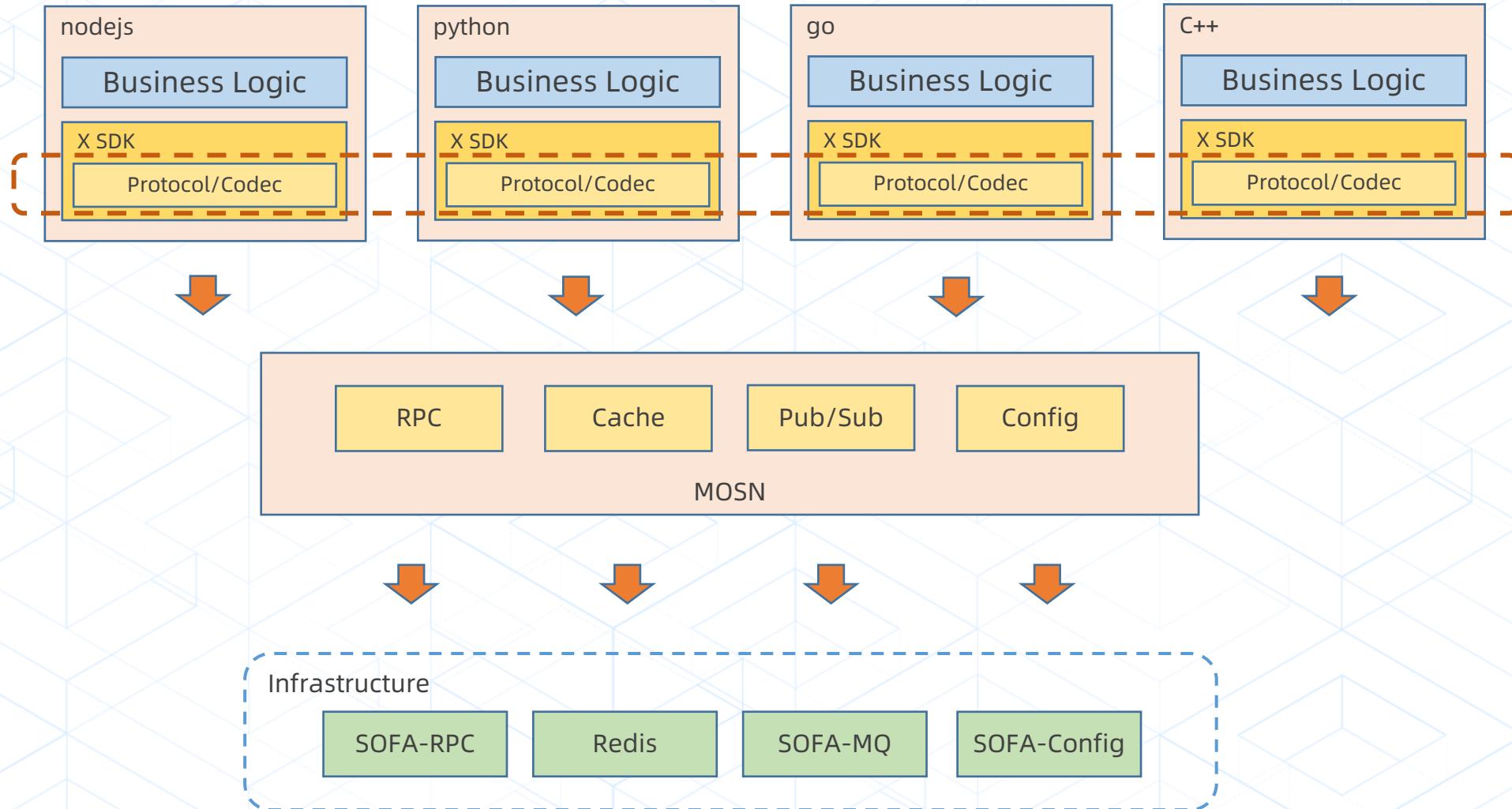
# New challenge: High cost of multi-language support



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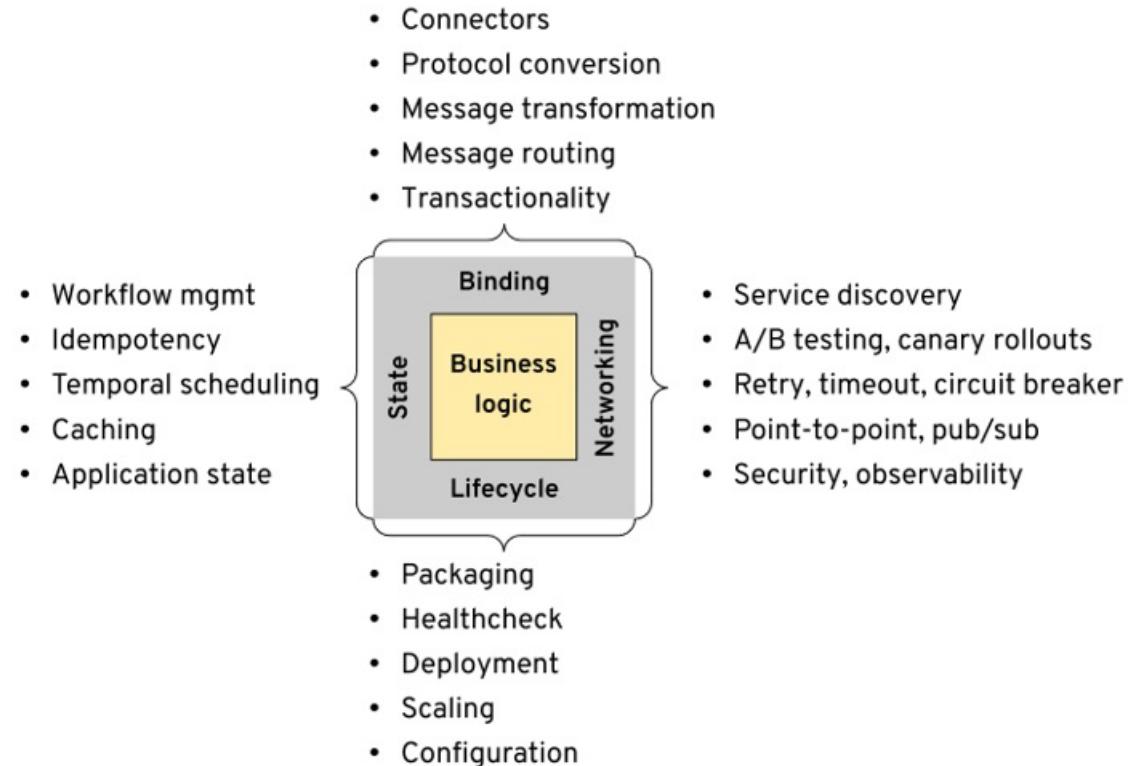


02

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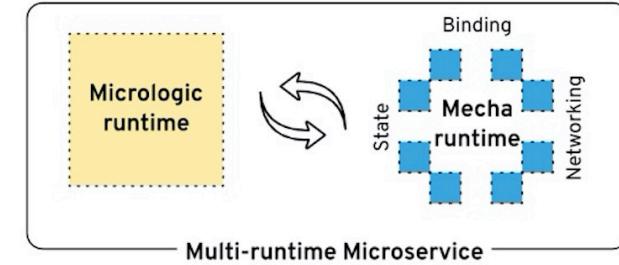
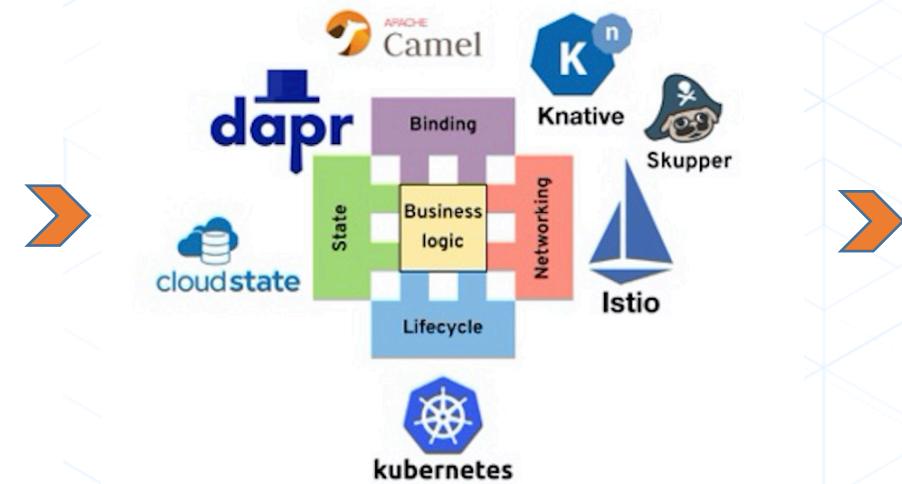
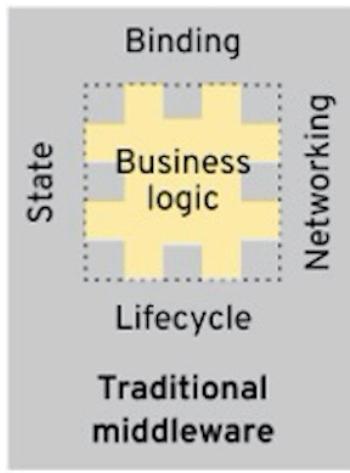
## Introduction to Layotto

# What is Multi-Runtime?



Reference: <https://www.infoq.com/articles/multi-runtime-microservice-architecture/>

# What is Multi-Runtime?

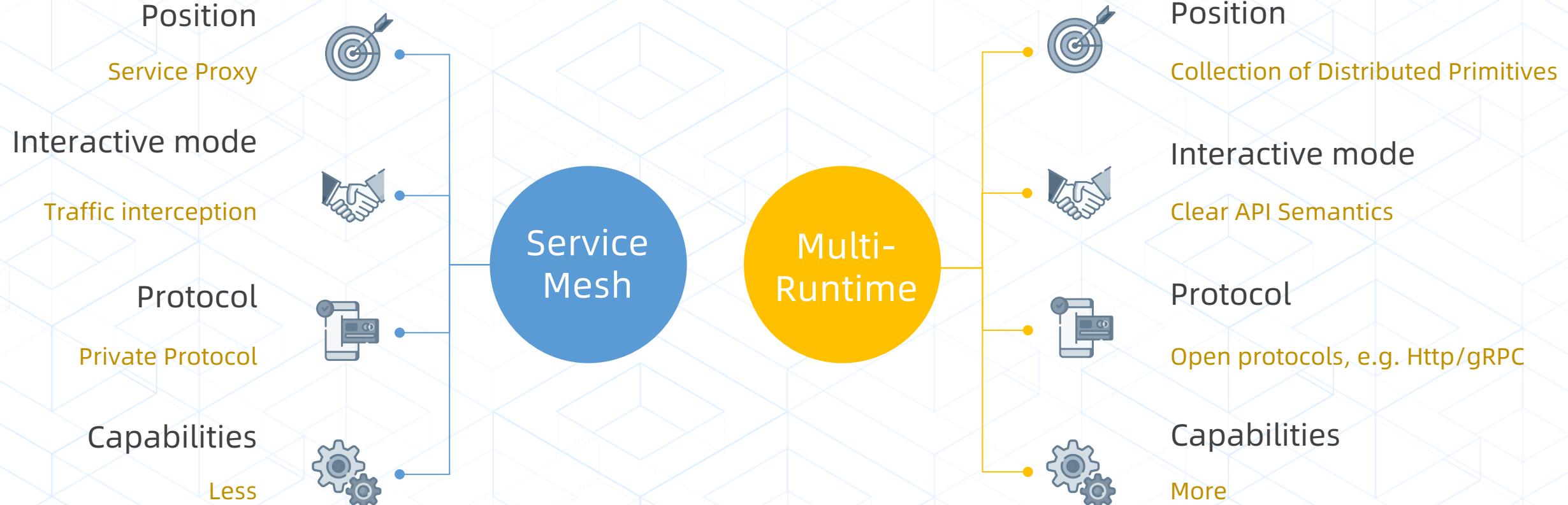


- Micrologic**
- Developed in-house
  - Custom business logic
  - Higher-level language
  - HTTP/gRPC, CloudEvents

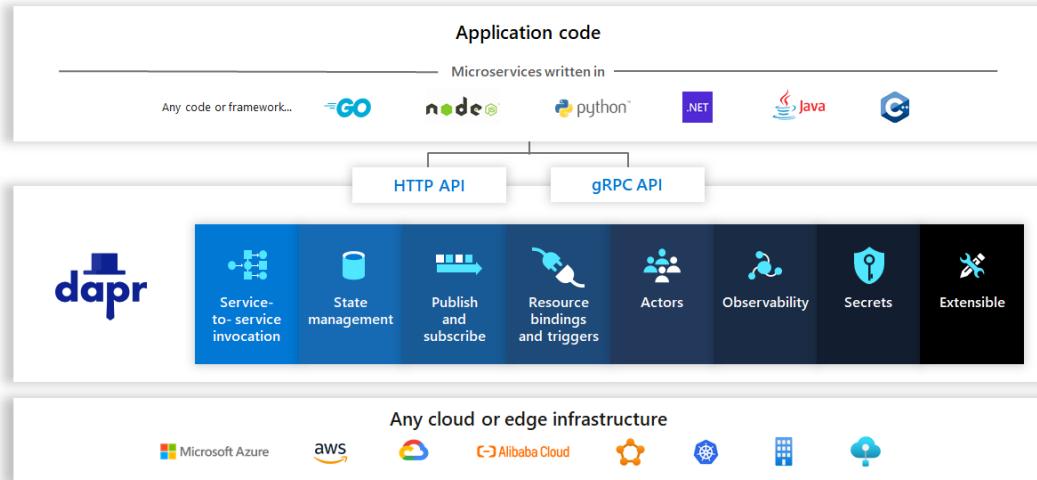
- Mecha**
- Off-the-shelf mechanincs
  - Configurable capabilities
  - Declarative (YAML, JSON)
  - OpenAPI, AsyncAPI, SQL

Reference: <https://www.infoq.com/articles/multi-runtime-microservice-architecture/>

# Service Mesh vs Multi-Runtime



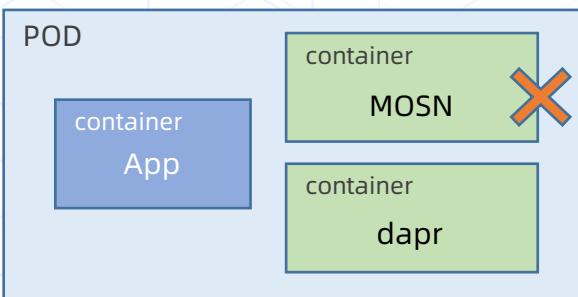
# How about dapr?



- Offers a variety of distributed capabilities
- Integrated with a lot of components

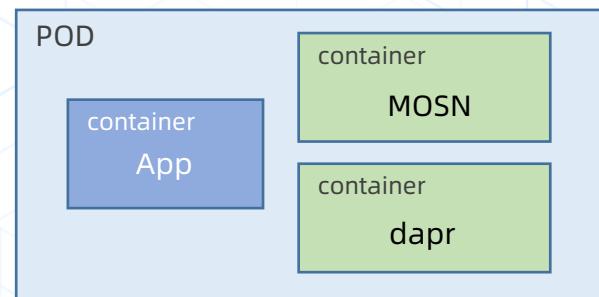
## How to adopt?

Option 1: use dapr to replace MOSN



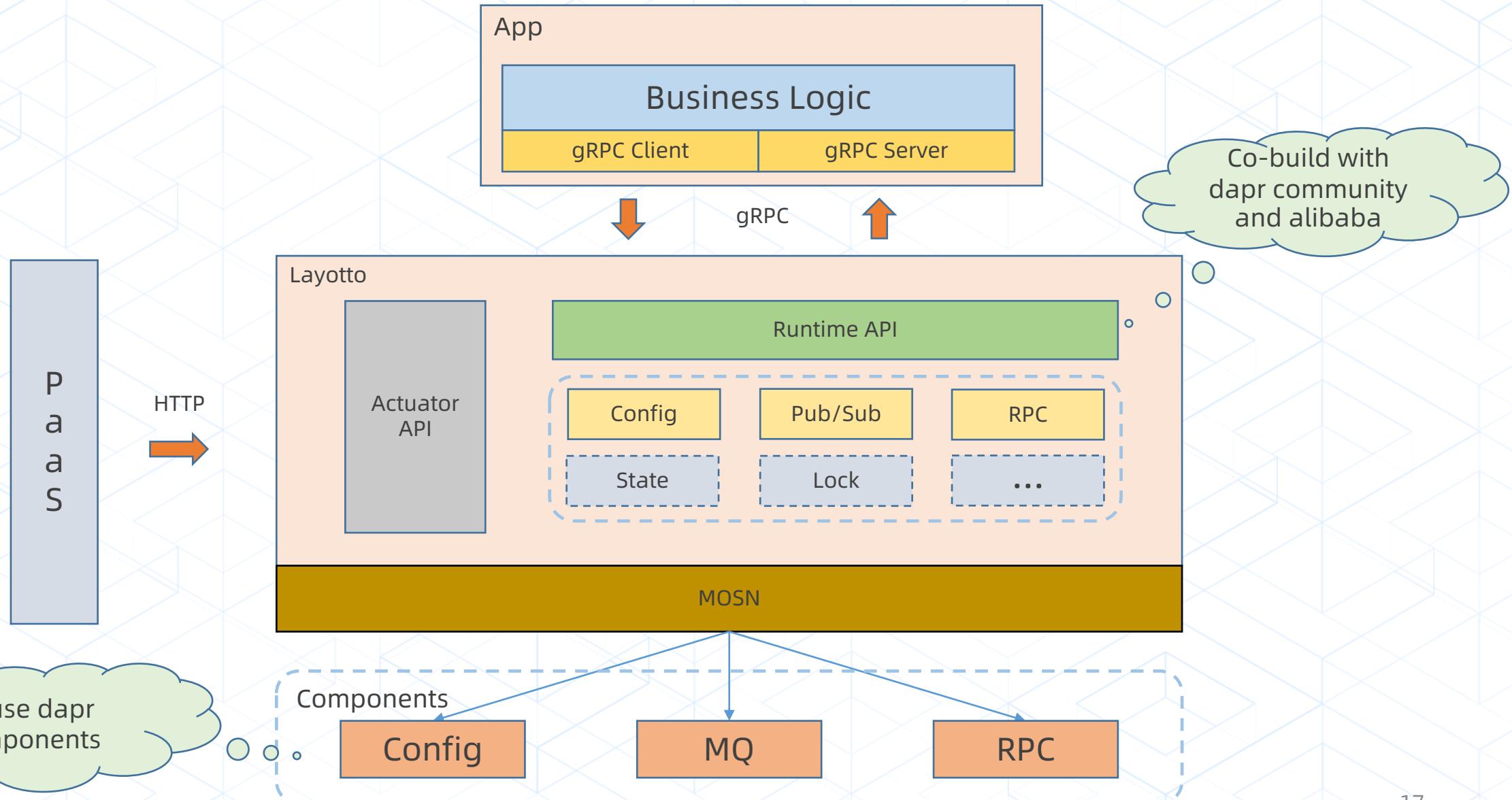
- Lack of Service Mesh capability
- Lack of legacy features support

Option 2: use dapr along with MOSN

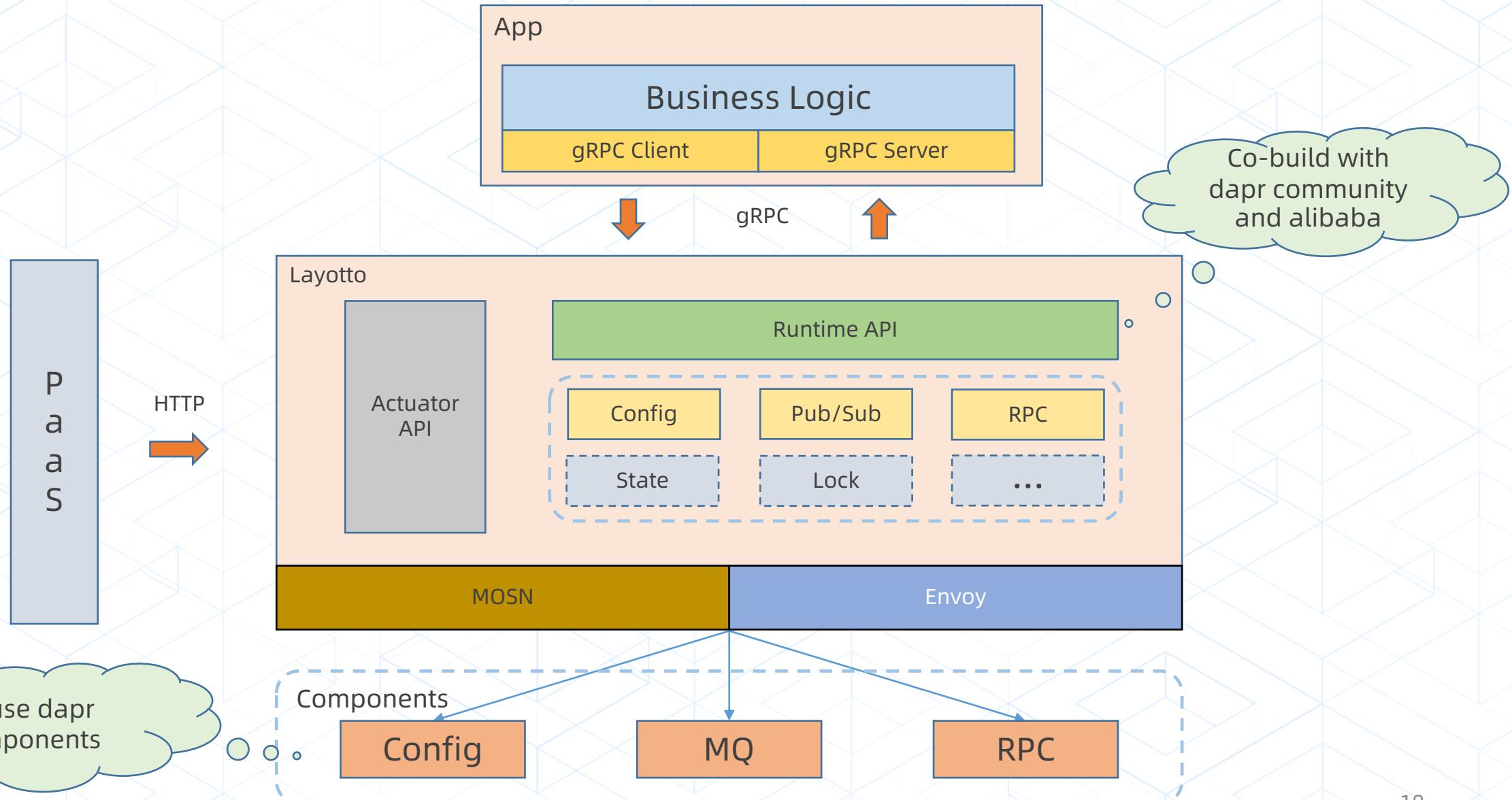
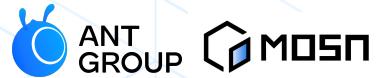


- High operational cost
- Hard to keep high stability

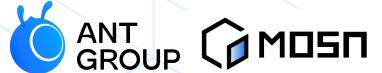
# Layotto Architecture



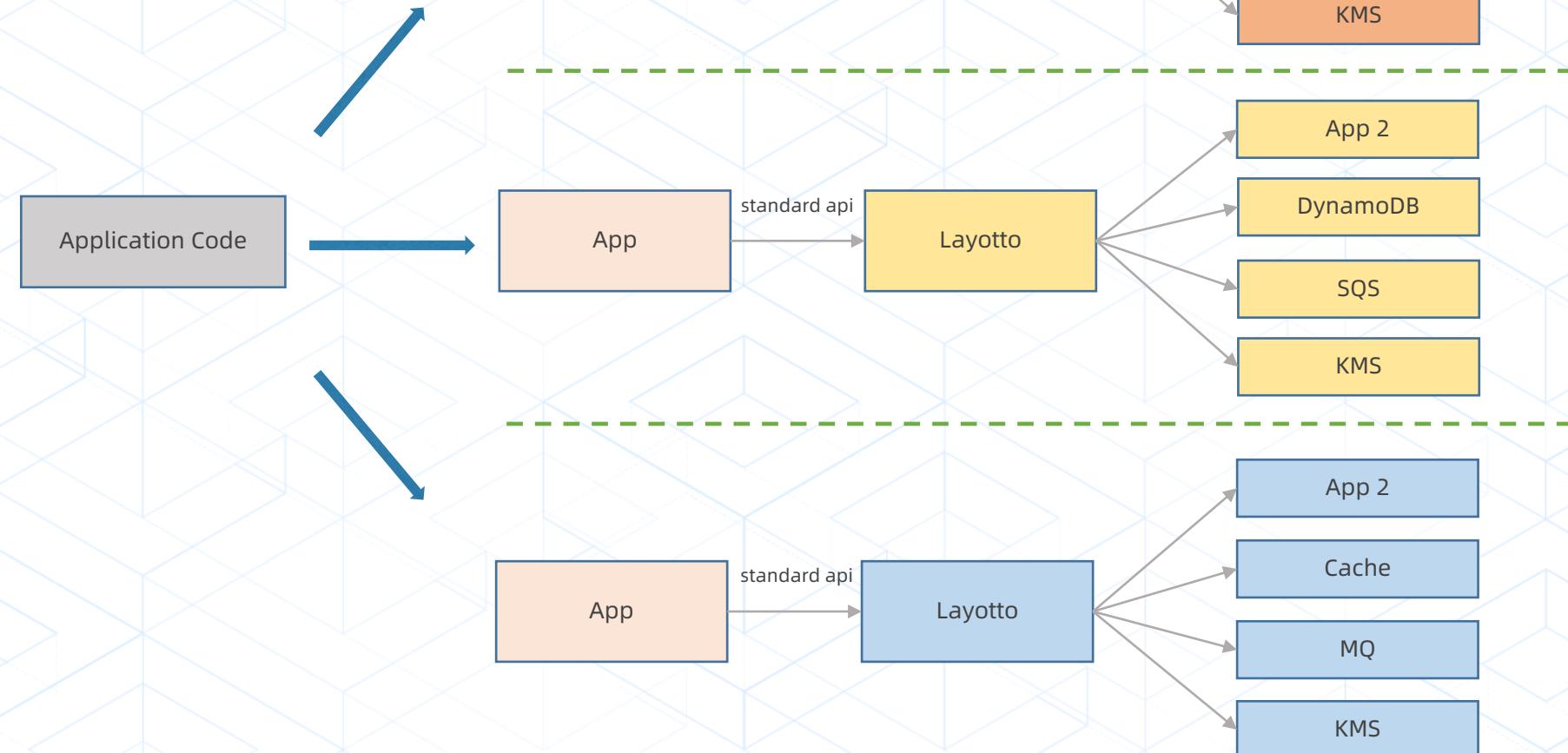
# Layotto Architecture



# Portability of Layotto

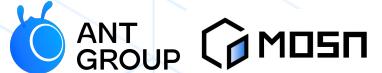


Alibaba Cloud

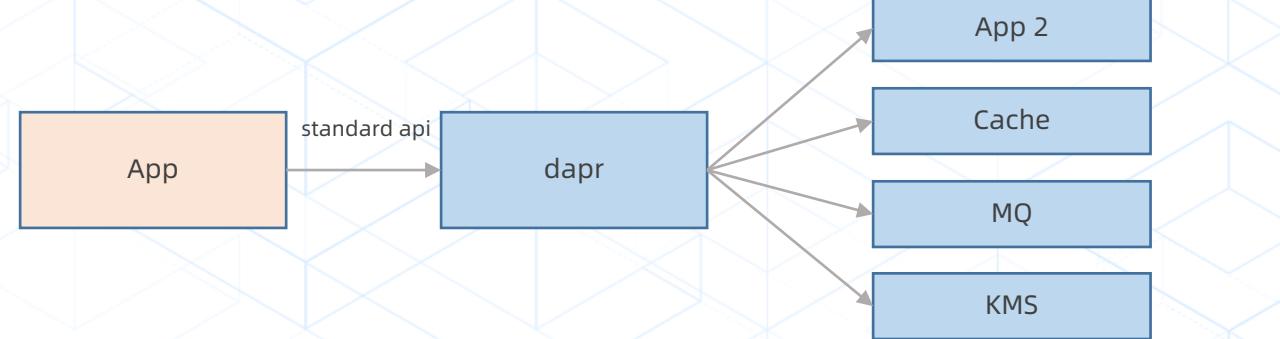
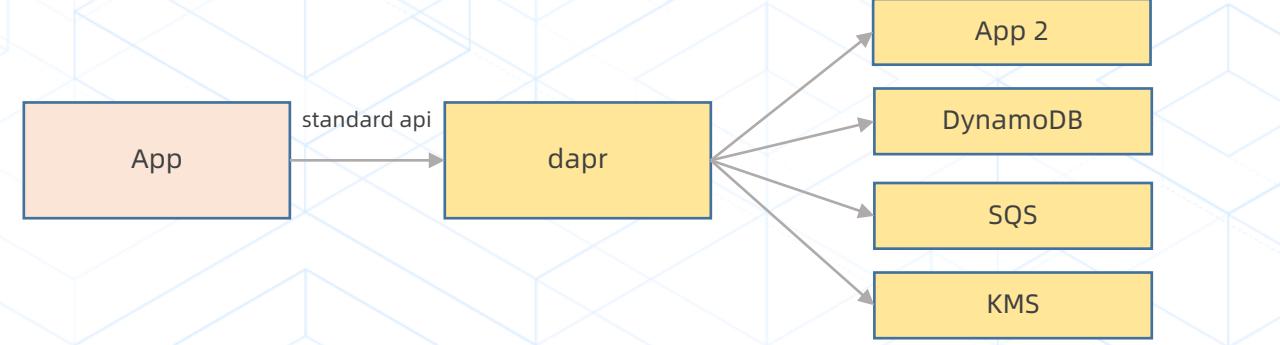
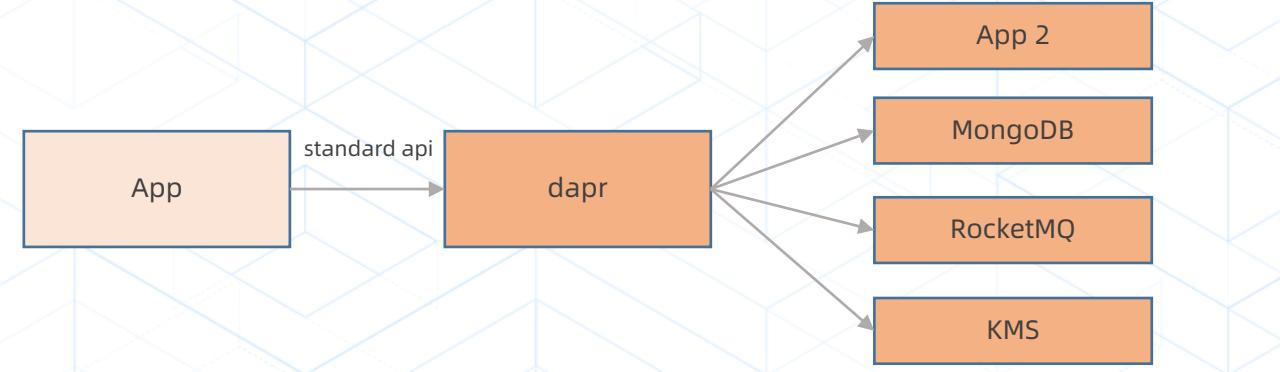
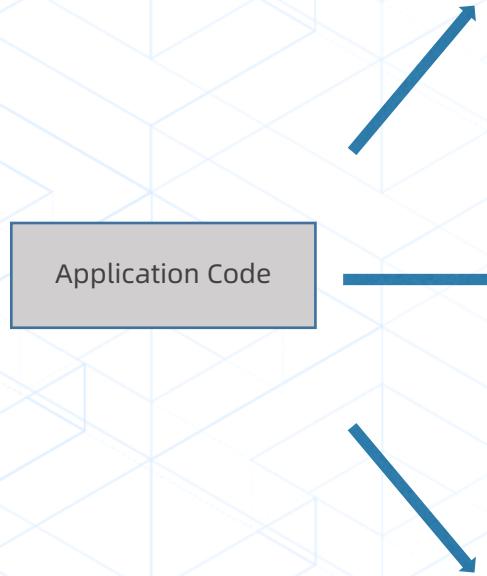


**Write once, Run anywhere!**

# Portability of Layotto



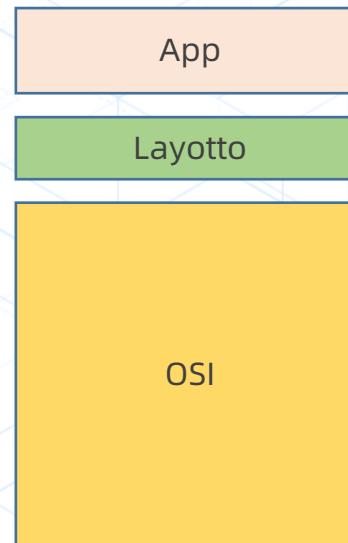
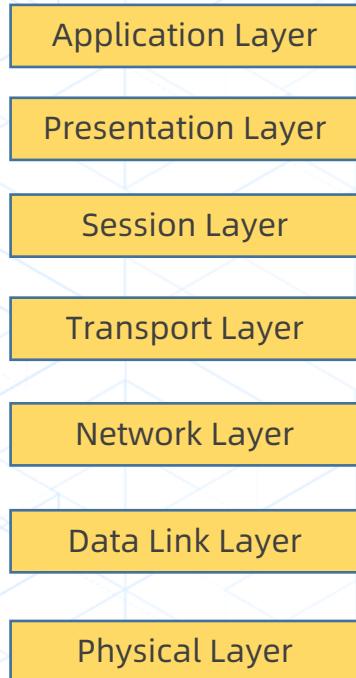
Alibaba Cloud



# What's the meaning of Layotto?

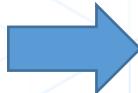


OSI Model



The 8<sup>th</sup> layer

Seven Layers



Layer8



Layer + 8



Layer + otto(Italian)

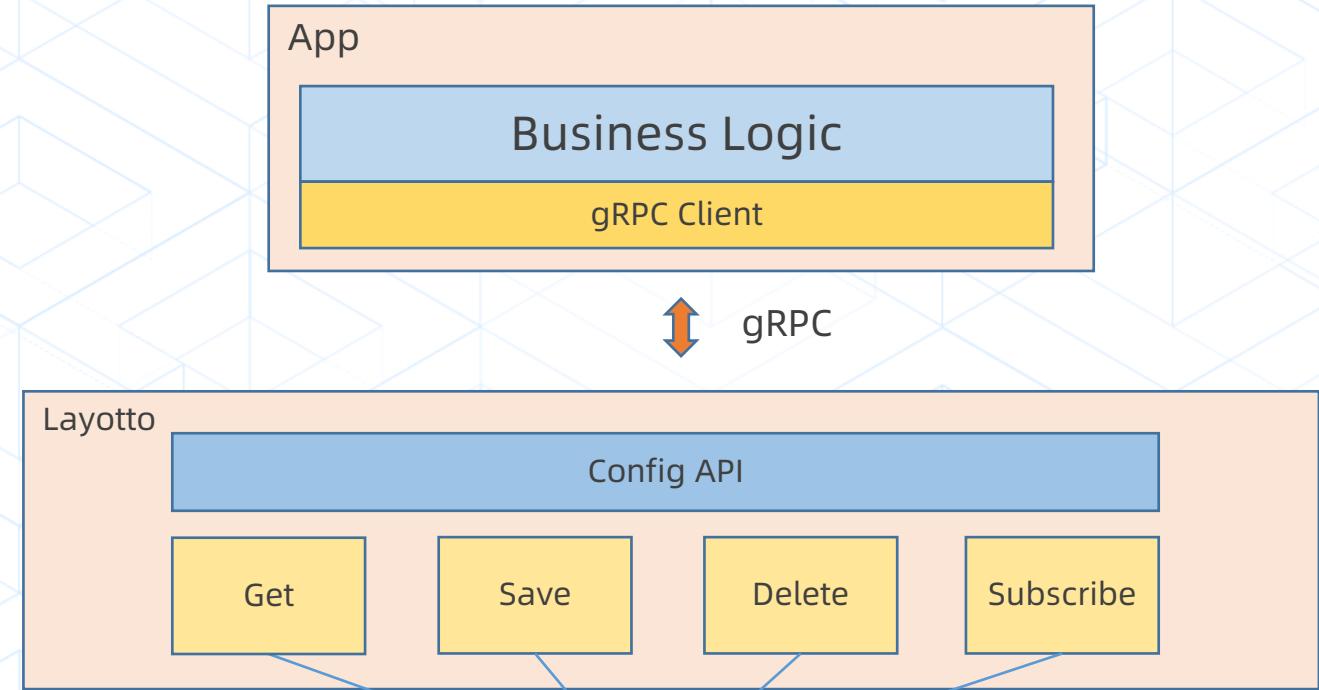
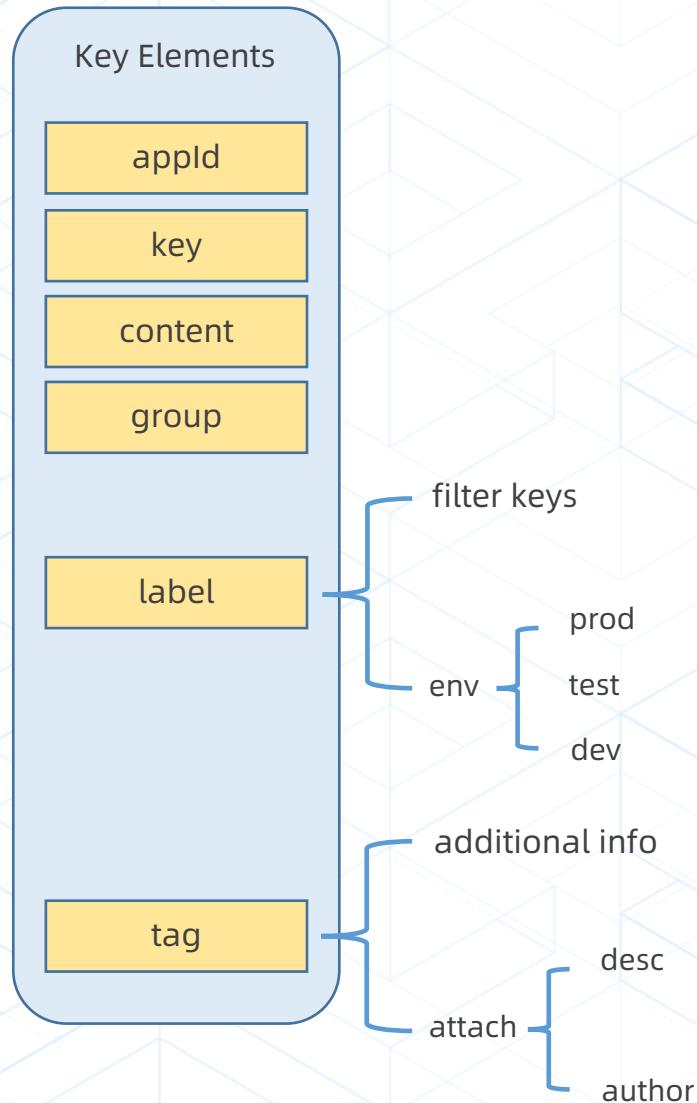


Layotto(L8)



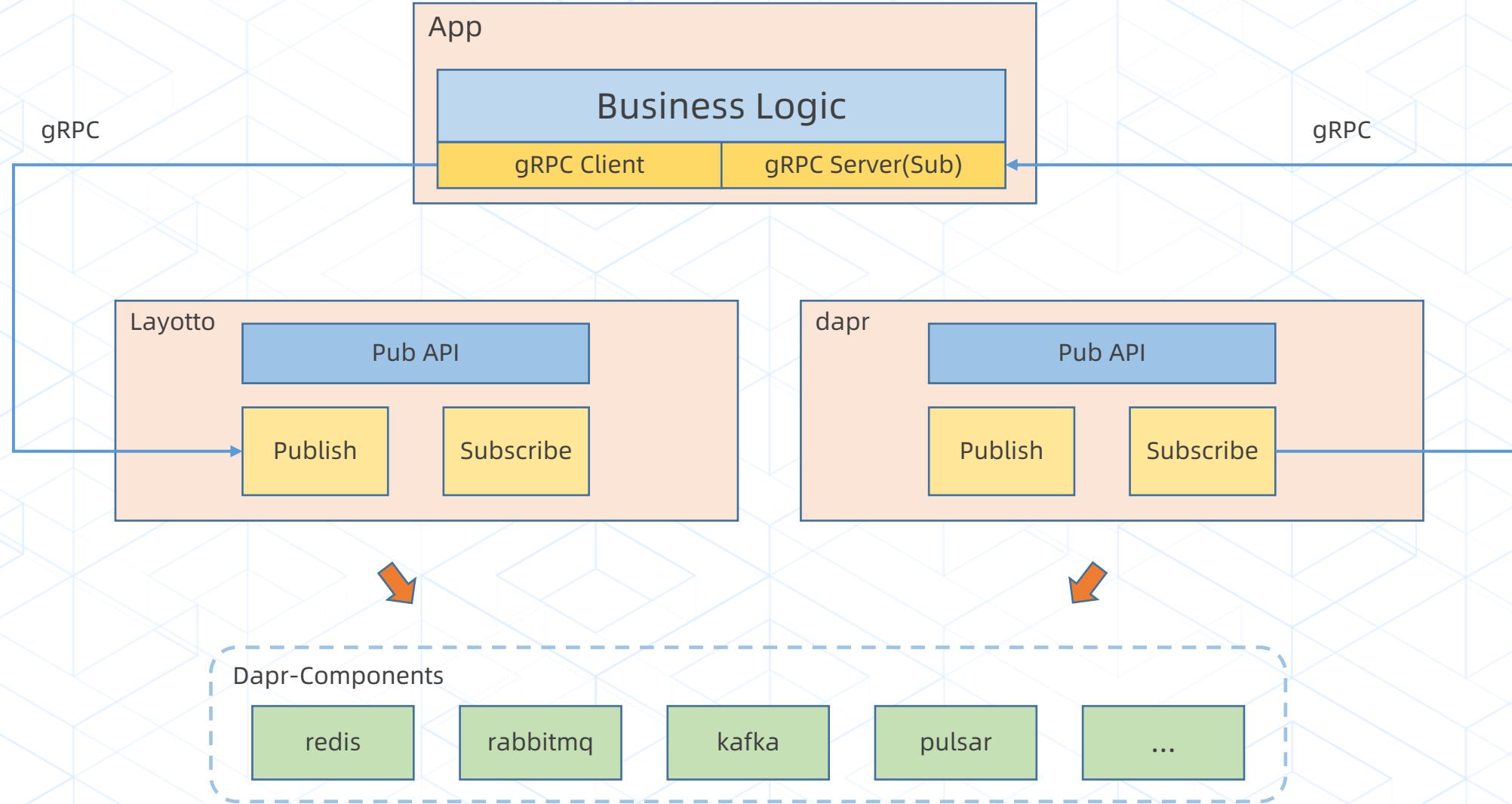
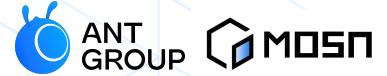
**Layotto**

# Configuration primitive



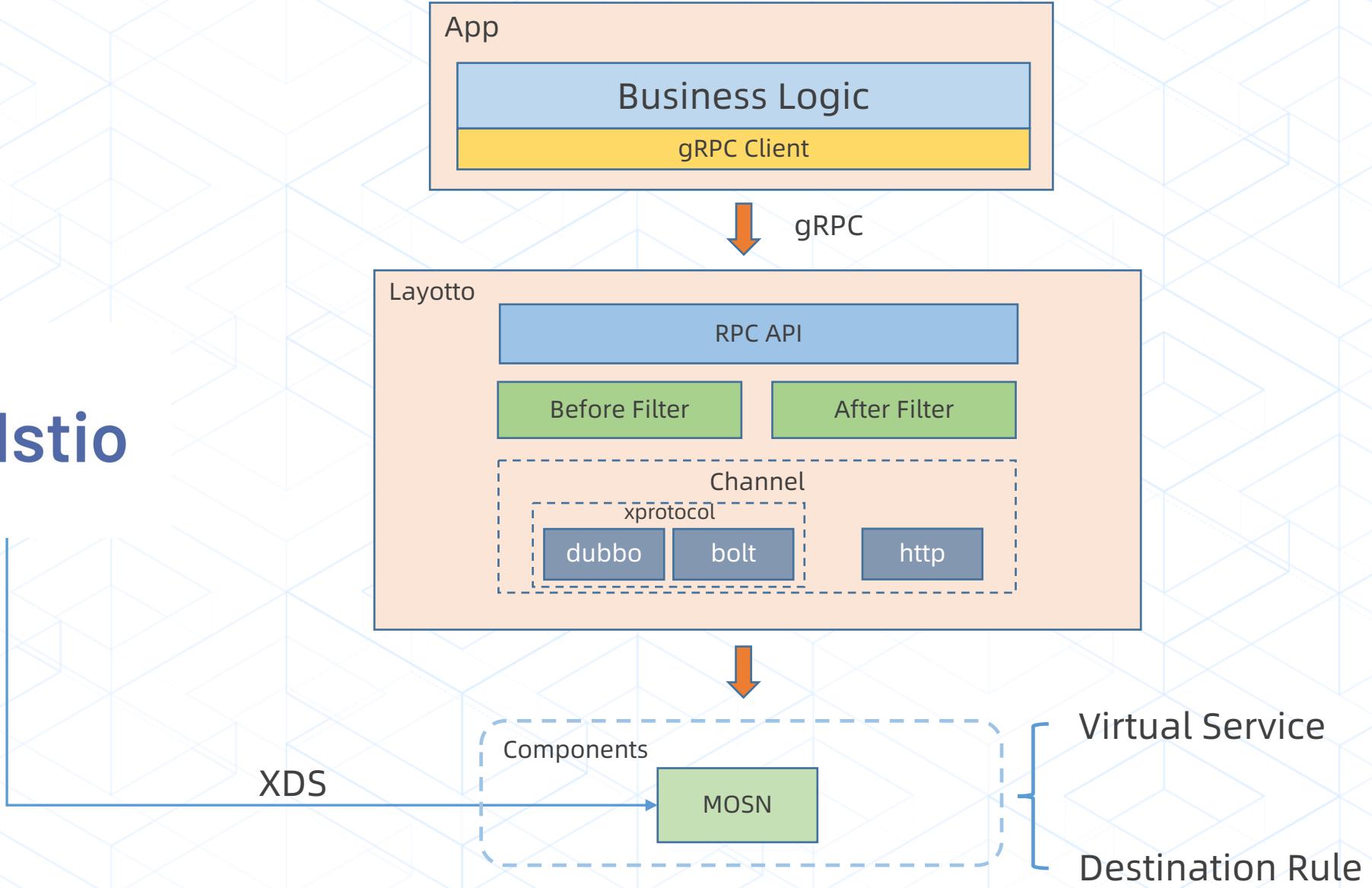
Reference: <https://github.com/dapr/dapr/issues/2988>

# Pub/Sub primitive

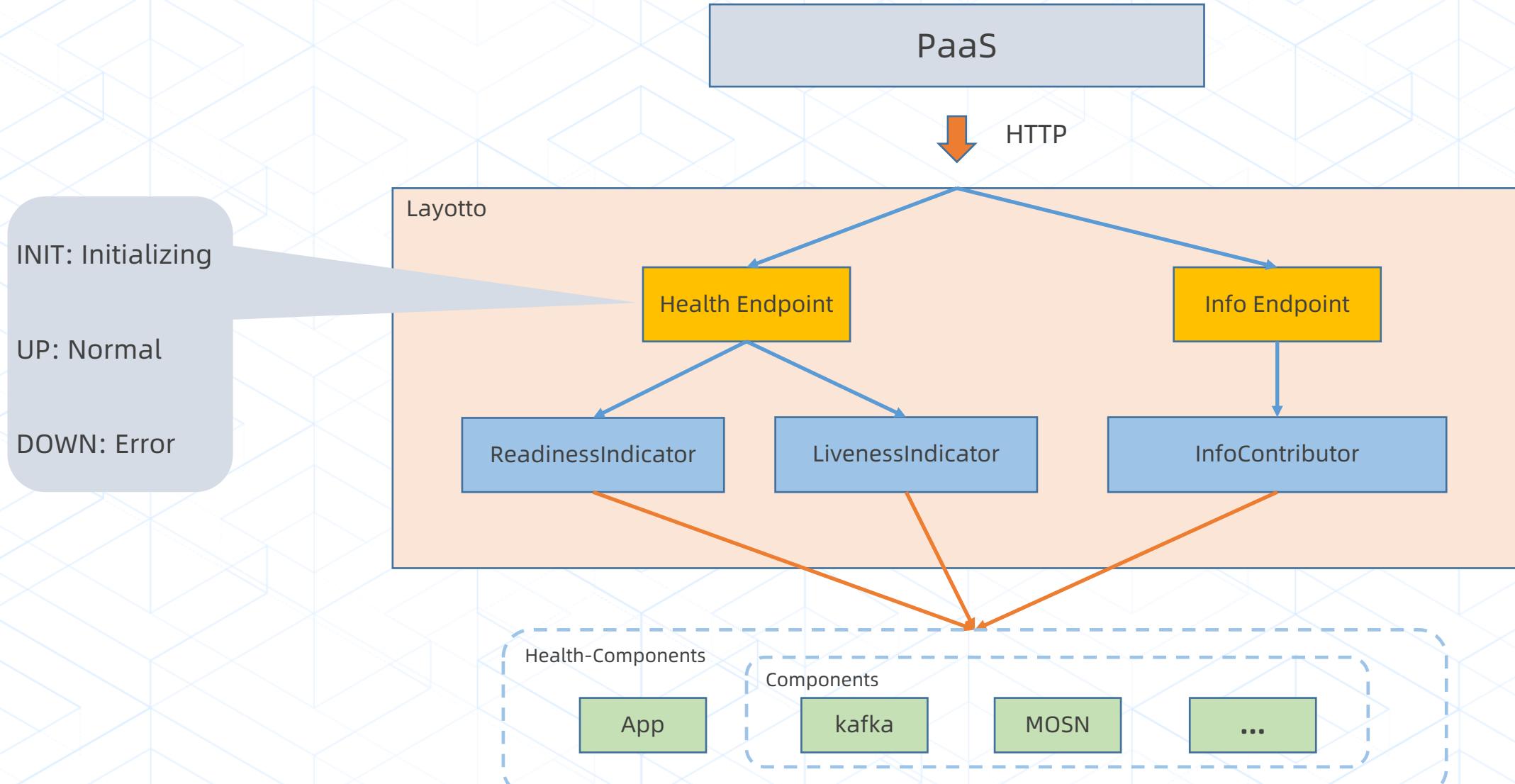


Reference: <https://github.com/dapr/dapr/issues/3276>

# RPC primitive



# Actuator primitive



03

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## Future plans

# Layotto vs Dapr



Distributed primitives	dapr	Layotto
Service Invocation	✓	✓
Service Mesh	✗	✓
Config	🚀	✓
Pub/Sub	✓	✓
State	✓	✓
Actor	✓	✗
Metadata	✓	✗
Actuator	✗	✓
WebAssembly	✗	✓

Legend:

- ✓ Supported
- ✗ Not Supported
- 🚀 Under Construction

Principles of feature building:

1. adopted in Layotto first
2. then migrate to standard api

# Community Co-building



envoyproxy / envoy

Code Issues 1k Pull requests 136 Actions Projects Wiki Security 31 Insights

## Does Envoy intend to evolve to an application runtime? #15113

[Open](#) nobodyiam opened this issue on 19 Feb · 1 comment

nobodyiam commented on 19 Feb

dapr / dapr

Code Issues 333 Pull requests 45 Actions Security Insights

## [Discussion] Future plans for dapr api #2817

[Open](#) nobodyiam opened this issue on 18 Feb · 17 comments

nobodyiam commented on 18 Feb

mosn / mosn

Code Issues 126 Pull requests 17 Actions Projects 1 Security Insights

## [Proposal] Mosn to evolve to an application runtime #1591

[Open](#) nobodyiam opened this issue on 19 Feb · 6 comments

nobodyiam commented on 19 Feb

dapr / dapr

Code Issues 333 Pull requests 45 Actions Security Insights

## [Feature Request] PublishEvent API returns a response with concrete semantics and extensible metadata #3276

[Open](#) RayneHwang opened this issue 3 days ago · 0 comments

RayneHwang commented 3 days ago · edited

In what area(s)?

/area runtime

envoyproxy / envoy

Code Issues 1k Pull requests 143 Actions Projects Wiki Security 31 Insights

## A proposal of high-performance L7 network GoLang extension for Envoy.

[Open](#) wangfakang opened this issue on 23 Feb · 31 comments

wangfakang commented on 23 Feb · edited

Background

# Roadmap



2021.11

Feature

Build 6 Runtime API

FaaS PoC

2022.02

Exploration

Layotto on Envoy

FaaS in Production

2022.05

Standard

Merge new API to dapr

50K Pods in Production





<https://github.com/mosn/layotto>

# Write once, Run anywhere!

# Thanks!