



CLOUD NATIVE + OPEN SOURCE

Virtual Summit China 2020

Kubernetes + OAM 让开发者更简单

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阿里云



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Virtual Summit China 2020

来自应用开发者的“灵魂拷问”

“**Kubernetes** 让 Devops 更复杂了！”

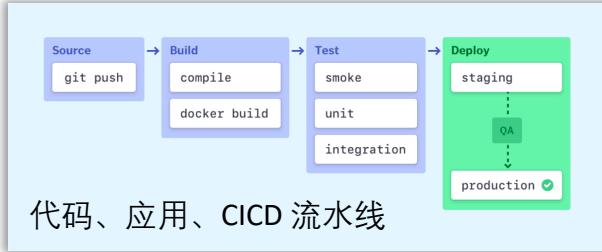


Kubernetes 对于应用开发复杂在哪里

1. 关注点不同



业务研发



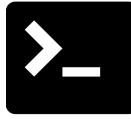
3. 交互与使用习惯不同



业务研发、运维



图形化界面



命令行工具



IaC 配置语言



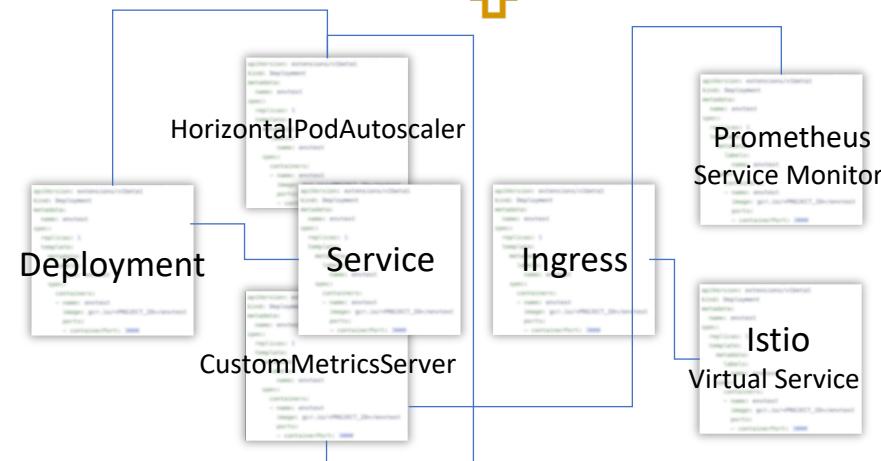
业务运维

扩容策略

- 当 RT 上升 10% 时，自动扩容 100 个实例

发布策略

- 当金丝雀实例通过 99% 的测试时，按每小时切 10% 流量的节奏进行发布



```

1  apiVersion: extensions/v1beta1
2  kind: Deployment
3  metadata:
4    name: nginx-deployment
5  spec:
6    revisionHistoryLimit: 2
7    minReadySeconds: 3
8    selector:
9      matchLabels:
10     app: nginx
11   strategy:
12     type: RollingUpdate
13     rollingUpdate:
14       maxUnavailable: 1
15       maxSurge: 1
16
17  apiVersion: extensions/v1beta1
18  kind: Deployment
19  metadata:
20    name: nginx-deployment
21  spec:
22    revisionHistoryLimit: 5
23    minReadySeconds: 10
24    selector:
25      matchLabels:
26        app: nginx
27        deployer: distelli
28   strategy:
29     type: RollingUpdate
30     rollingUpdate:
31       maxUnavailable: 1
32       maxSurge: 1
33
34  apiVersion: extensions/v1beta1
35  kind: Deployment
36  metadata:
37    name: nginx-deployment
38  spec:
39    revisionHistoryLimit: 10
40    minReadySeconds: 1
41    selector:
42      matchLabels:
43        app: nginx
44        deployer: distelli
45   strategy:
46     type: RollingUpdate
47     rollingUpdate:
48       maxUnavailable: 1
49       maxSurge: 1
50
51  apiVersion: extensions/v1beta1
52  kind: Deployment
53  metadata:
54    name: nginx-deployment
55  spec:
56    revisionHistoryLimit: 1
57    minReadySeconds: 1
58    selector:
59      matchLabels:
60        app: nginx
61        deployer: distelli
62   strategy:
63     type: RollingUpdate
64     rollingUpdate:
65       maxUnavailable: 1
66       maxSurge: 1
67
68  apiVersion: extensions/v1beta1
69  kind: Deployment
70  metadata:
71    name: nginx-deployment
72  spec:
73    revisionHistoryLimit: 1
74    minReadySeconds: 1
75    selector:
76      matchLabels:
77        app: nginx
78        deployer: distelli
79   strategy:
80     type: RollingUpdate
81     rollingUpdate:
82       maxUnavailable: 1
83       maxSurge: 1
84
85  apiVersion: extensions/v1beta1
86  kind: Deployment
87  metadata:
88    name: nginx-deployment
89  spec:
90    revisionHistoryLimit: 1
91    minReadySeconds: 1
92    selector:
93      matchLabels:
94        app: nginx
95        deployer: distelli
96   strategy:
97     type: RollingUpdate
98     rollingUpdate:
99       maxUnavailable: 1
100      maxSurge: 1
  
```

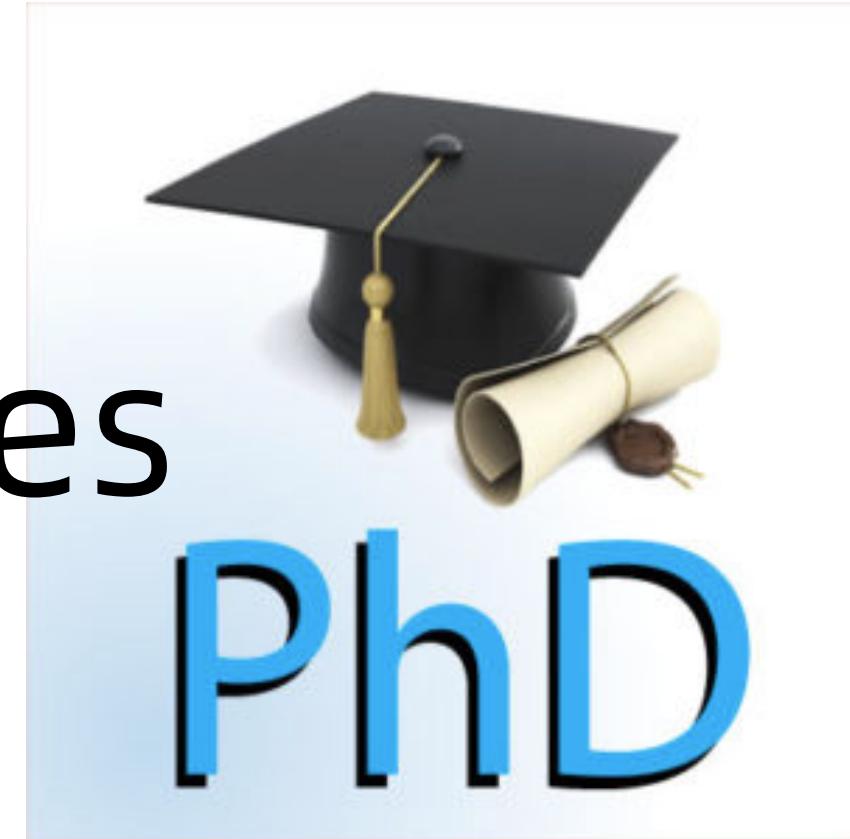
YAML 文档展示了 Kubernetes 部署（Deployment）的配置文件，强调了滚动更新策略（RollingUpdate）和其参数：maxUnavailable 和 maxSurge。不同的部署实例展示了不同的滚动更新策略参数设置。



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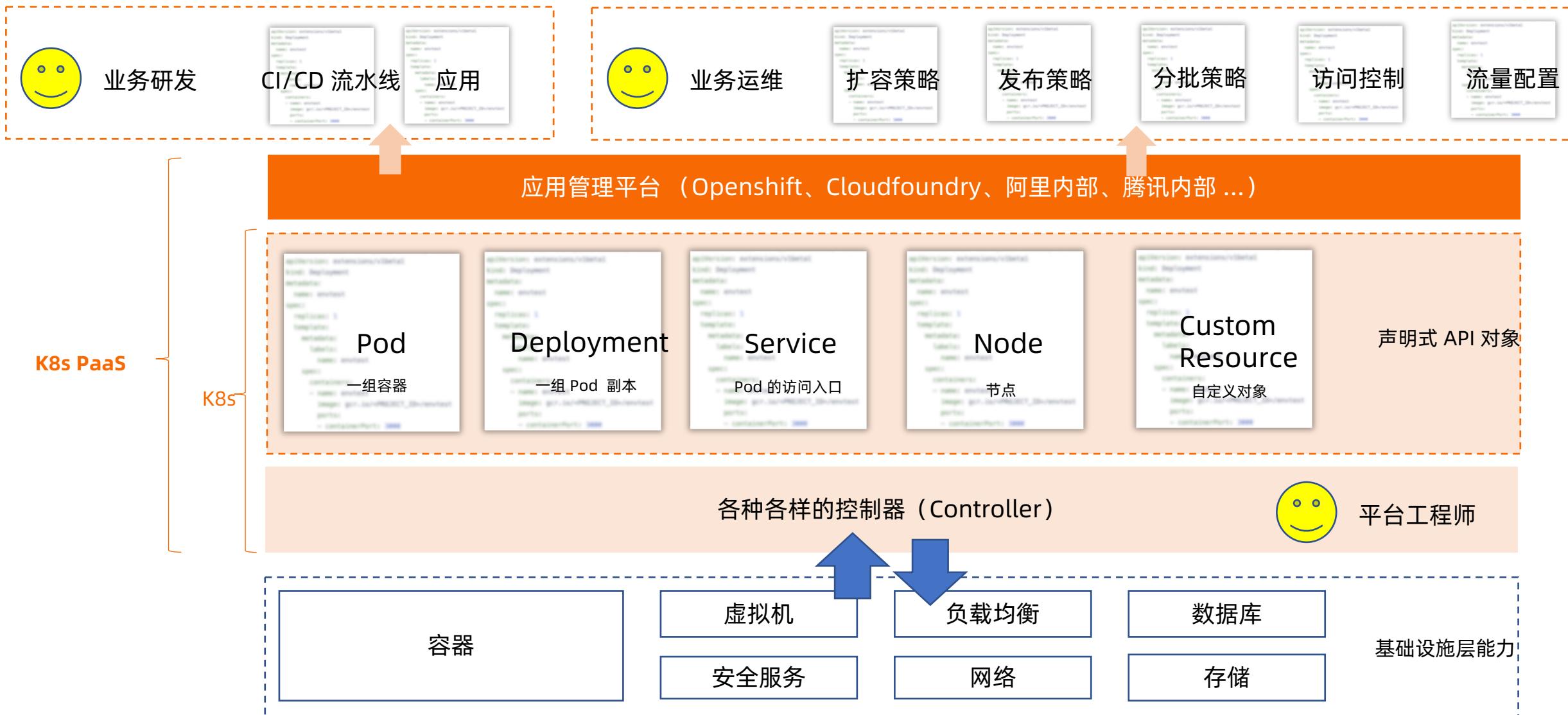
研发都要做 Kubernetes 专家？

Kubernetes PhD





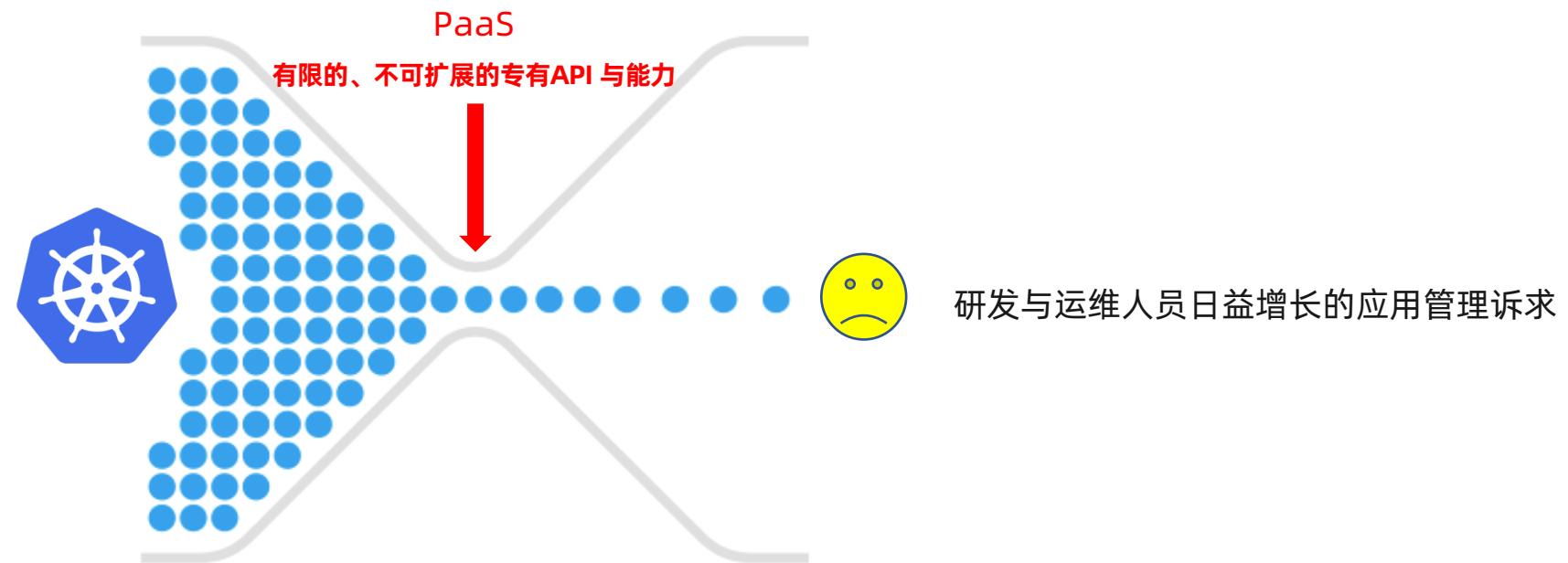
构建 Platform on Kubernetes





但是，K8s PaaS 正面临着“能力困境”

K8s 生态“无限”的应用基础设施能力





而且，PaaS 还面临着严重分化

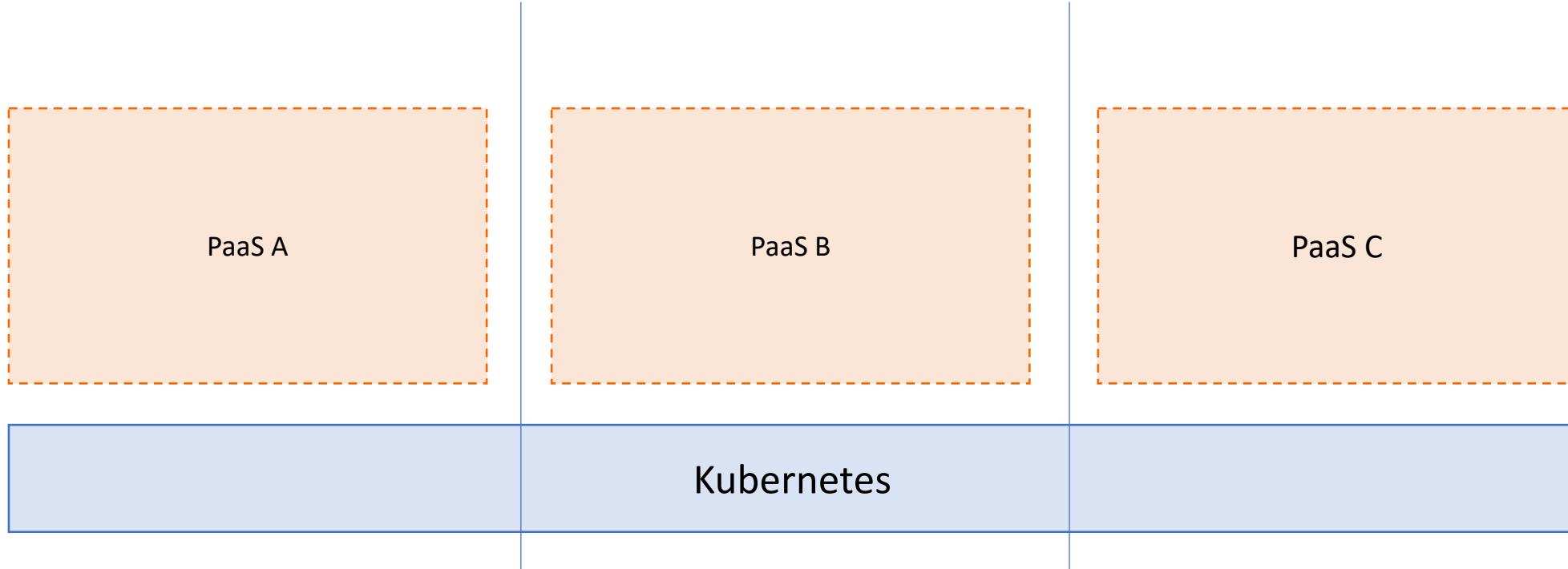
同一个公司内数个 PaaS on Kubernetes



学习成本



研发效率





理想中的应用管理平台

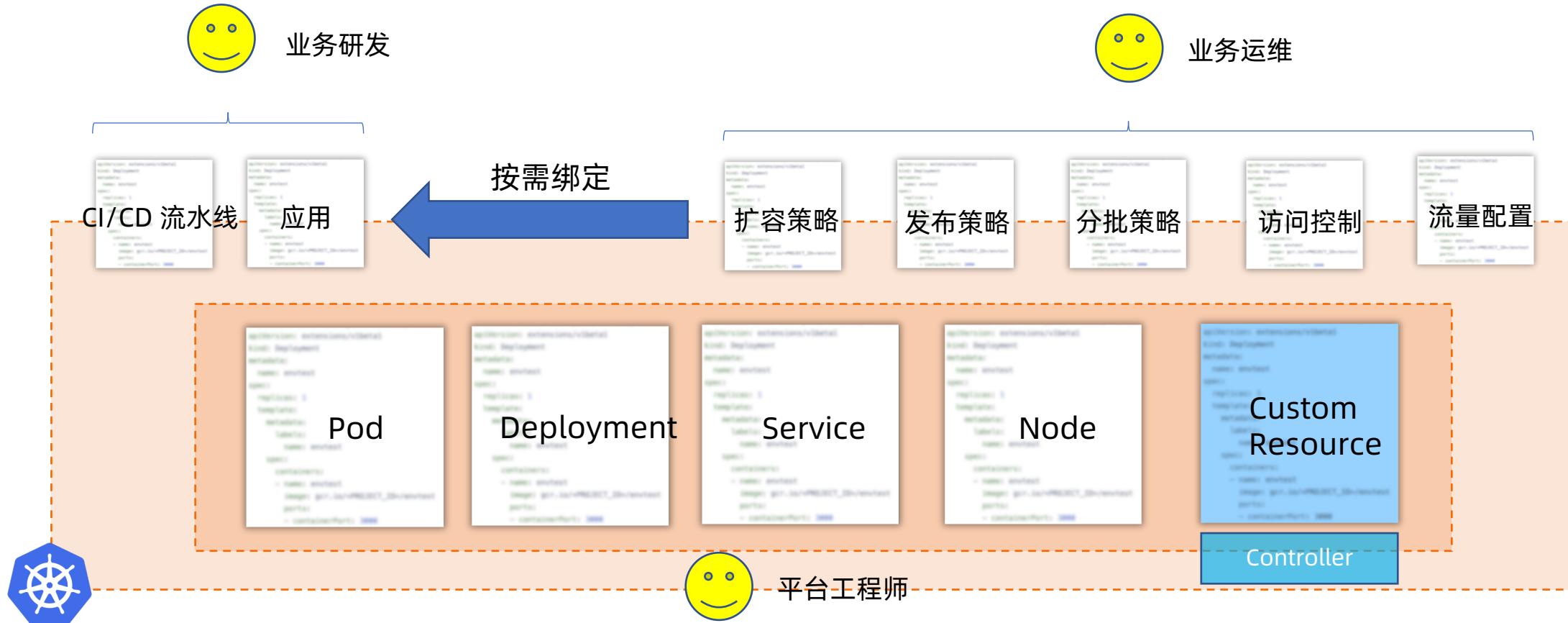
思考：

1. 基于 Kubernetes
2. 用户友好、高可扩展
3. 统一、标准化



目标一：一个面向用户，应用为中心

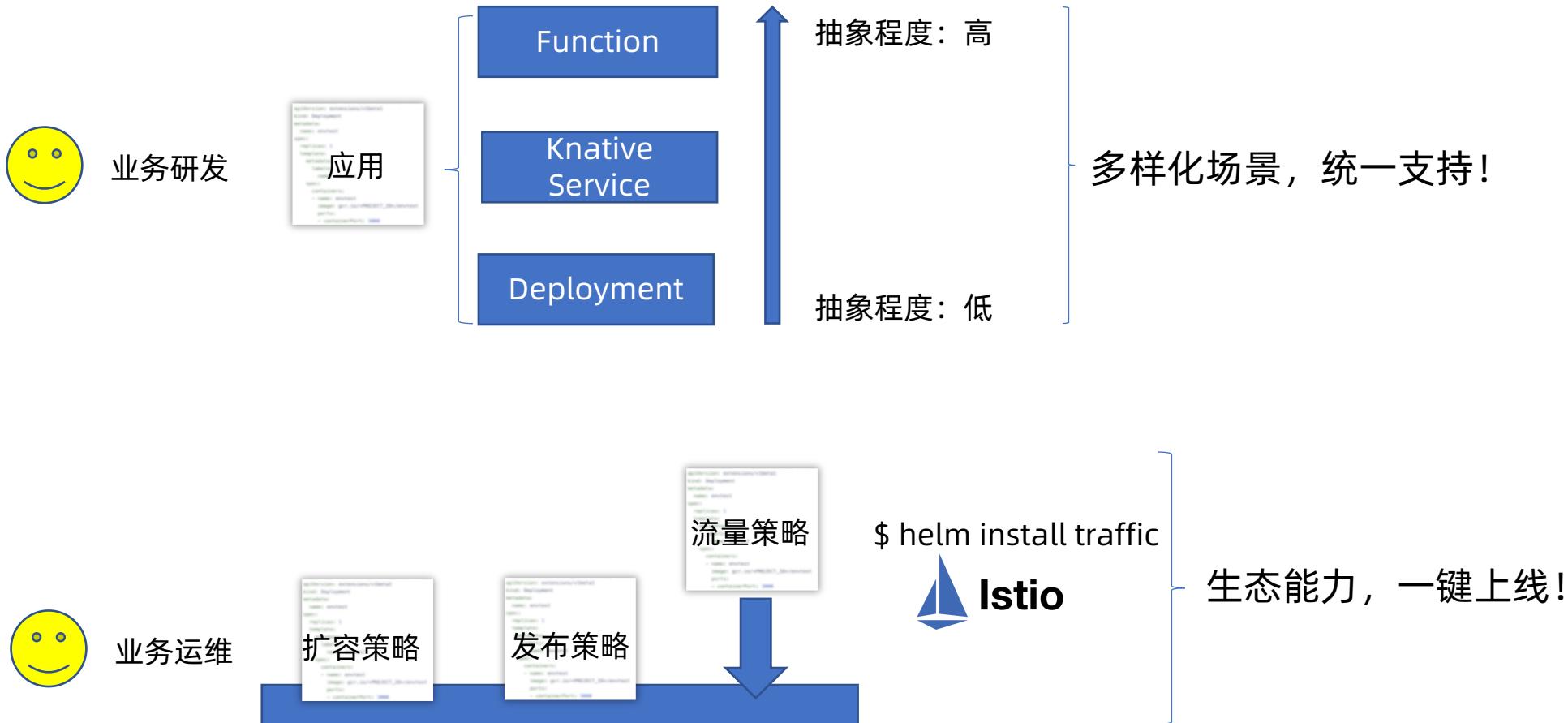
关键词：用户友好，应用层语义和抽象



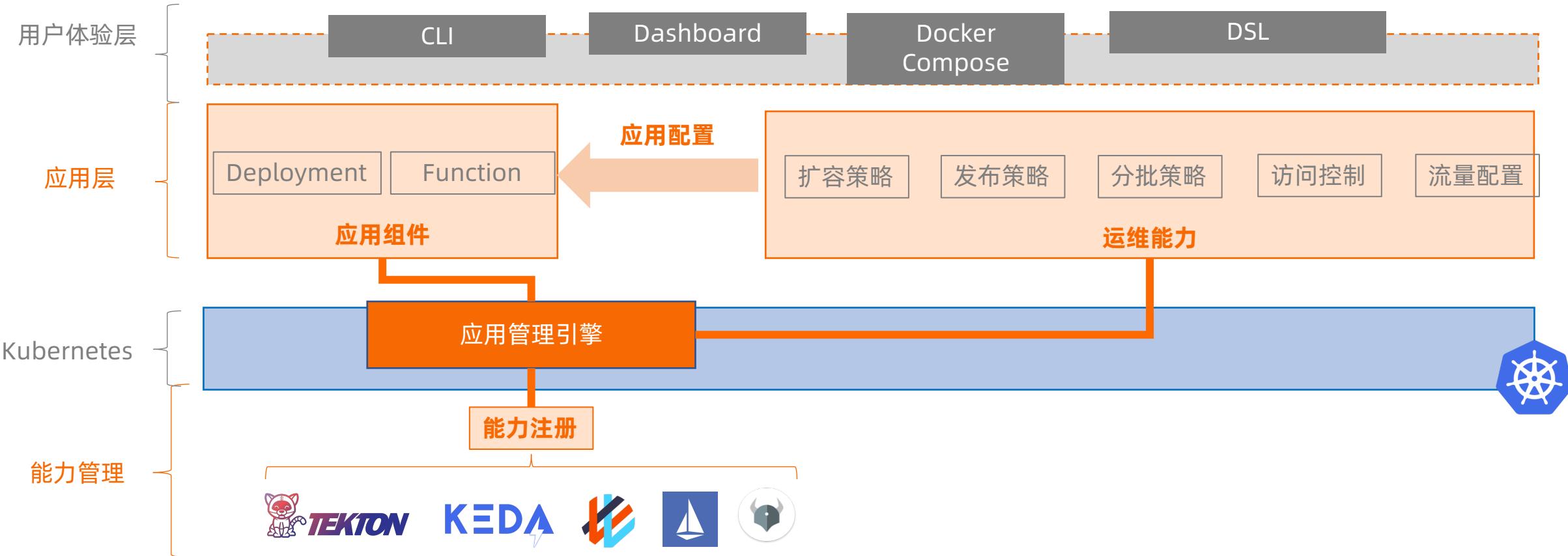


目标二：一个高可扩展的应用管理平台

关键词：可插拔，可扩展，模块化，没有抽象程度锁定



目标三：一个统一、标准化的应用管理引擎





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Open Application Model (OAM)

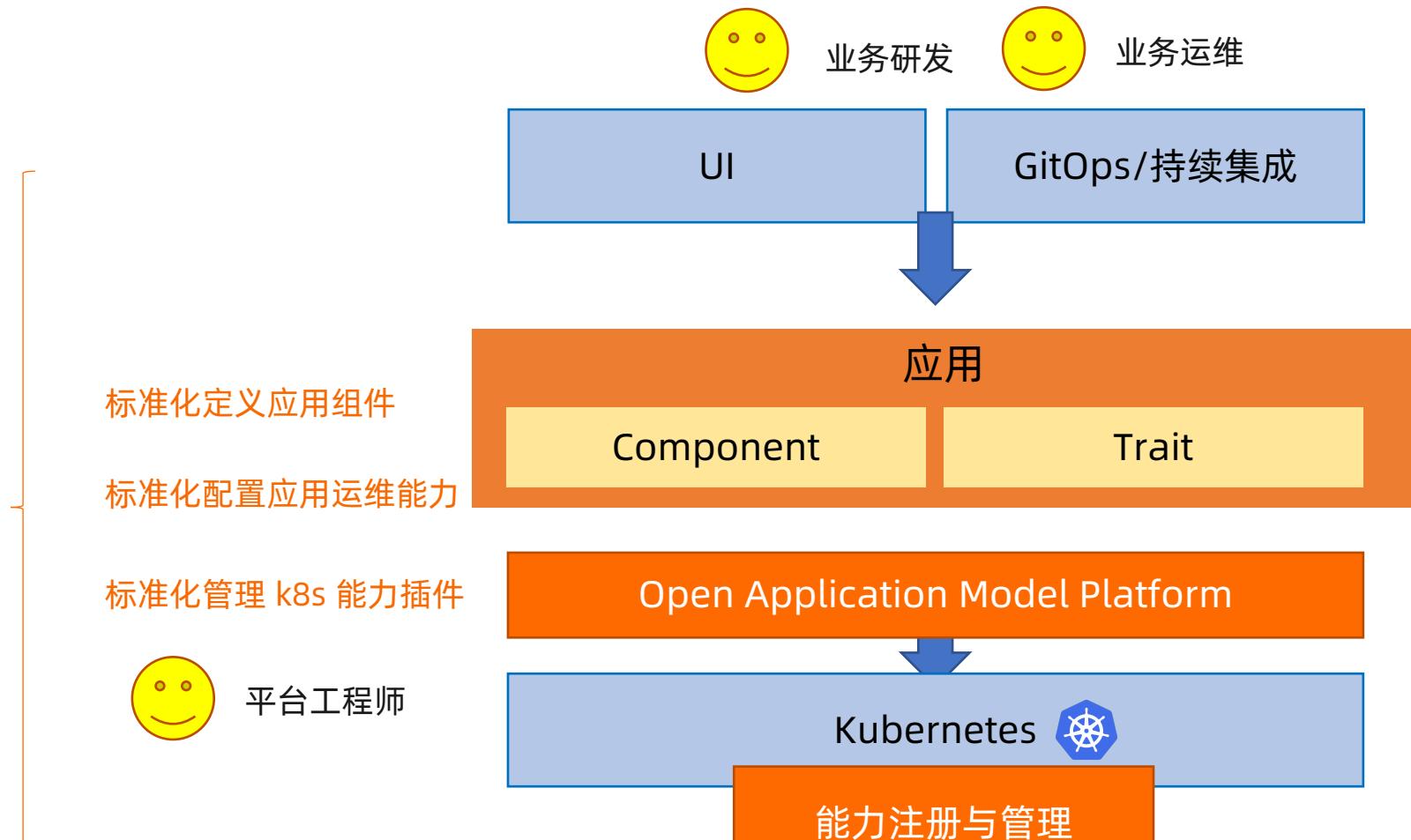
一个用来构建云原生应用管理平台的标准规范与核心框架

阿里云 × Microsoft
Azure



OAM + OAM Platform

统一、标准、高可扩展的云原生应用管理平台



TEKTON

KEDA





Component: 应用中的一个组成部分，例如容器、Function或者云服务等

```
$ kubectl get components
```

NAME	WORKLOAD
------	----------

frontend	deployment.apps.k8s.io
----------	------------------------

```
$ kubectl get deployment
```

NAME	REVISION	AGE
------	----------	-----

frontend-c8bb659c5	1	2d15h
--------------------	---	-------

```
apiVersion: core.oam.dev/v1alpha2
kind: Component
metadata:
  name: frontend
  annotations:
    description: Container workload
spec:
  workload:
    apiVersion: apps/v1
    kind: Deployment
    spec:
      template:
        spec:
          containers:
            - name: web
              image: 'php:latest'
              env:
                - name: OAM_TEXTURE
                  value: texture.jpg
            ports:
              - containerPort: 8001
                name: http
                protocol: TCP
```



- 运维特征 (Trait)
- 声明式的运维能力的描述

```
- componentName: frontend
traits:
- trait:
  apiVersion: autoscaling/v2beta2
  kind: HorizontalPodAutoscaler
  spec:
    minReplicas: 1
    maxReplicas: 10
- trait:
  apiVersion: networking.alibaba-
  inc.com/v1
  kind: APIGateway
  spec:
    hostname: app.alibaba.com
    path: /
    service_port: 8001
```



应用配置 (Application Configuration)

面向应用维度配置运维能力与组件

Deployment Function

应用组件



Open Application Model Platform

```
apiVersion: core.oam.dev/v1alpha2
kind: ApplicationConfiguration
metadata:
  name: helloworld
spec:
  components:
    # 1st component
    - componentName: frontend
      traits:
        - trait:
            apiVersion: autoscaling/v2beta2
            kind: HorizontalPodAutoscaler
            spec:
              minReplicas: 1
              maxReplicas: 10
        - trait:
            apiVersion: networking.alibaba-inc.com/v1
            kind: APIGateway
            spec:
              hostname: app.alibaba.com
              path: /
              service_port: 8001
    # 2nd component
    - componentName: redis
```



Workload 与 Trait 注册与发现机制



示例：将 Istio VirtualService 注册为平台的流量管理能力

```
apiVersion: core.oam.dev/v1alpha2
kind: TraitDefinition
metadata:
  name: virtualservices.networking.istio.io
  annotations:
    alias: traffic
spec:
  appliesTo:
    - apps.k8s.io
  conflictsWith:
    - services.k8s.io
  definition: virtualservices.networking.istio.io
```

\$ kubectl get traits

NAME	DEFINITION	APPLIES TO	CONFLICTS WITH
traffic	virtualservices.networking.istio.io	apps.k8s.io	services.k8s.io
route	route.core.oam.dev	apps.k8s.io	
tls	tls.core.oam.dev	apps.k8s.io	



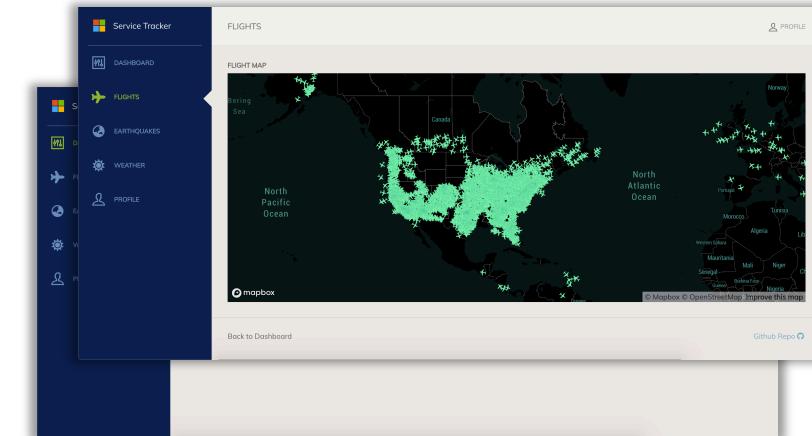
示例：使用 OAM 模型管理应用

```
apiVersion: core.oam.dev/v1alpha2
kind: ContainerizedWorkload
metadata:
  name: flights-api
spec:
  osType: linux
  arch: amd64
  containers:
    - name: flights-api
      image: sonofjorel/rudr-flights-api:0.49
      env:
        - name: DATA_SERVICE_URI
          value: "foo"
      ports:
        - name: http
          containerPort: 3003
          protocol: TCP
```

示例：容器化工作负载

```
apiVersion: core.oam.dev/v1alpha2
kind: ApplicationConfiguration
metadata:
  name: service-tracker
spec:
  components:
    - componentName: tracker-postgres-db
    - componentName: data-api
    - componentName: flights-api
    traits:
      - trait:
          apiVersion: core.oam.dev/v1alpha2
          kind: ManualScalerTrait
          metadata:
            name: flights-api
          spec:
            replicaCount: 2
      - componentName: quakes-api
        traits:
          - trait:
              apiVersion: core.oam.dev/v1alpha2
              kind: ManualScalerTrait
              metadata:
                name: quakes-api
              spec:
                replicaCount: 2
      - componentName: weather-api
        traits:
          - trait:
              apiVersion: core.oam.dev/v1alpha2
              kind: ManualScalerTrait
              metadata:
                name: weather-api
              spec:
                replicaCount: 2
  - componentName: service-tracker-ui
```

示例：手动扩容策略



[查看完整演示](#)

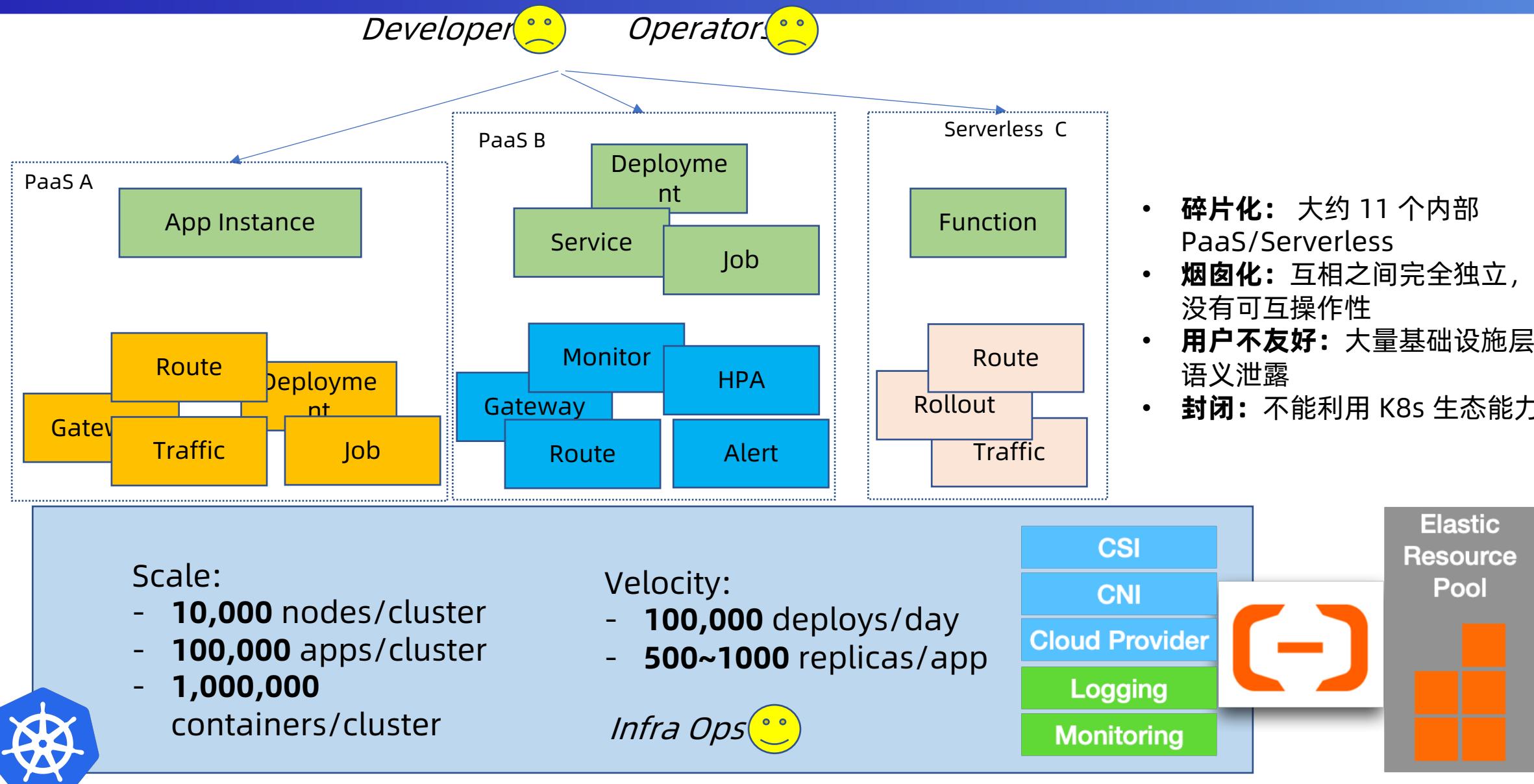
1. 创建应用组件

2. 绑定运维特征

3. 应用部署成功

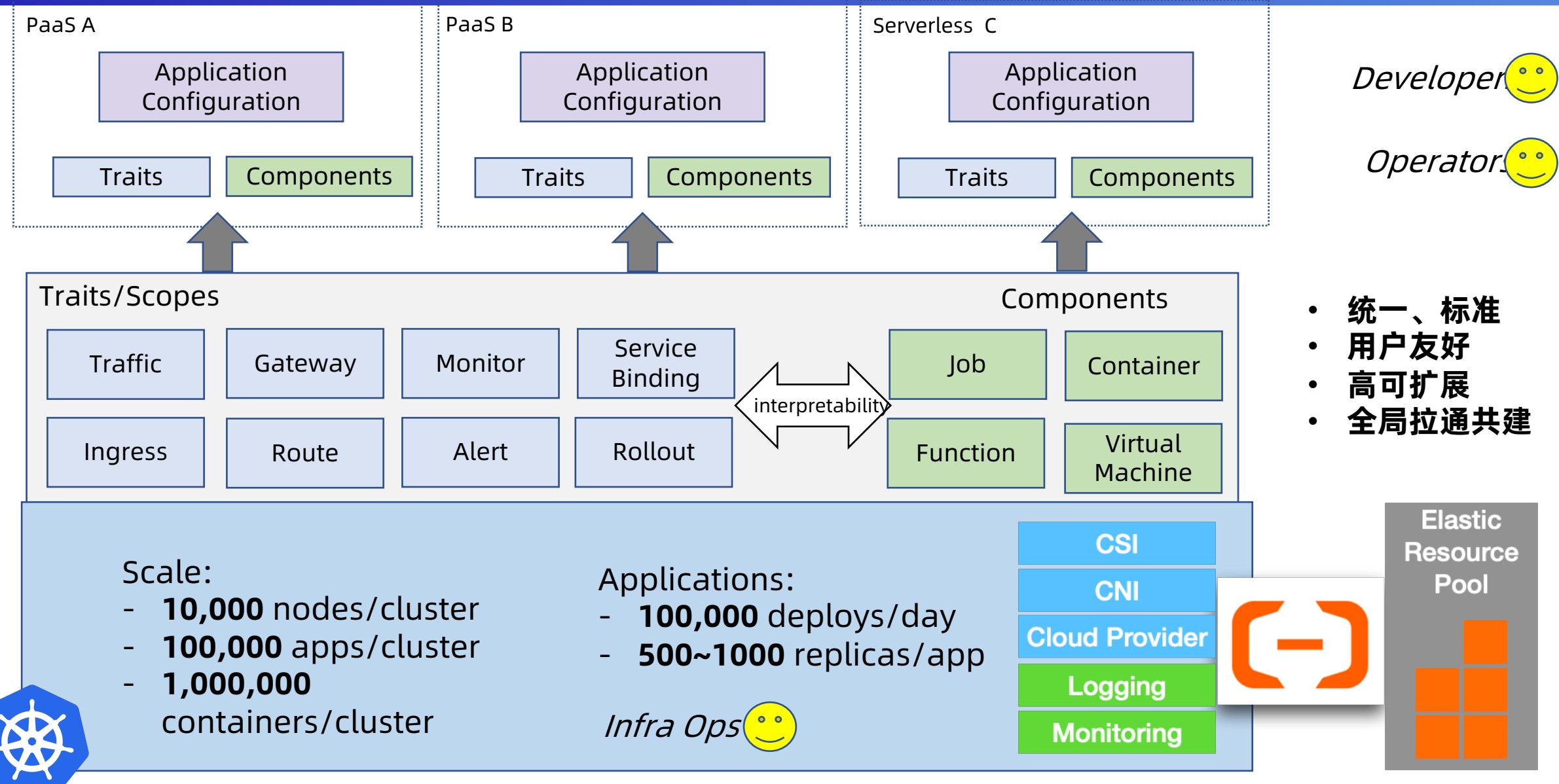


案例：过去的阿里巴巴应用管理平台





案例：今天的阿里巴巴应用管理



OAM 社区欢迎大家! ❤

- **The OAM spec:**
 - <https://github.com/oam-dev/spec#community>
- **OAM Kubernetes 官方插件 (CNCF Sandbox 项目) :**
 - <https://github.com/crossplane/oam-kubernetes-runtime>
 - *A join effort with Crossplane* 
- **OAM Kubernetes 云原生应用基础平台 - 9月即将开源**
 - **早期项目成员与合作伙伴招募中！**



云原生应用管理交流千人钉钉群

We Are Hiring!
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x.li@alibaba-inc.com



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