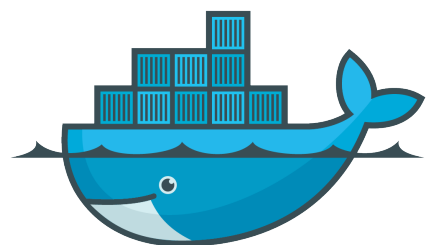


KubeFed

潘勋@IBM
10/13, 2019

概念



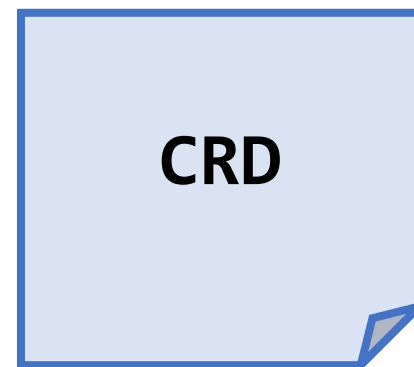
docker

容器



kubernetes

管理平台



平台扩展

原因背景

Multiple Cloud

Hybrid Cloud

Data Centers

Multiple
Kubernetes Clusters

多云

- 无服务提供商锁定
- 使用优势服务
- ...

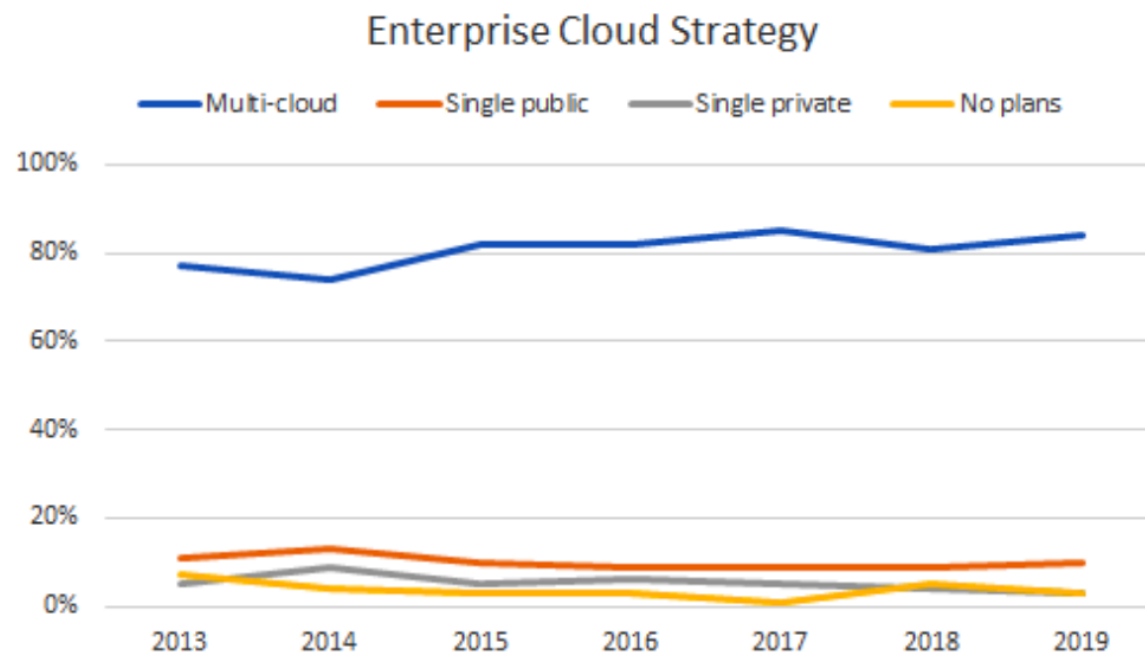


IDC

By **2021**

Over **90%**

adopts **Multi-cloud**



Data: Right Scale / Charts: ZDNet



Gartner

by **2021**

over **75%** midsize and large
organizations
adopts a multi-cloud or
hybrid IT strategy

混合云

- 安全
 - 有问提？
- 省钱
 - 9%调查对象 节省**50%** @2017 from [techtarget.com](https://www.techtarget.com)
- 灵活
 - Cloud Bursting
- ...

Data Centers

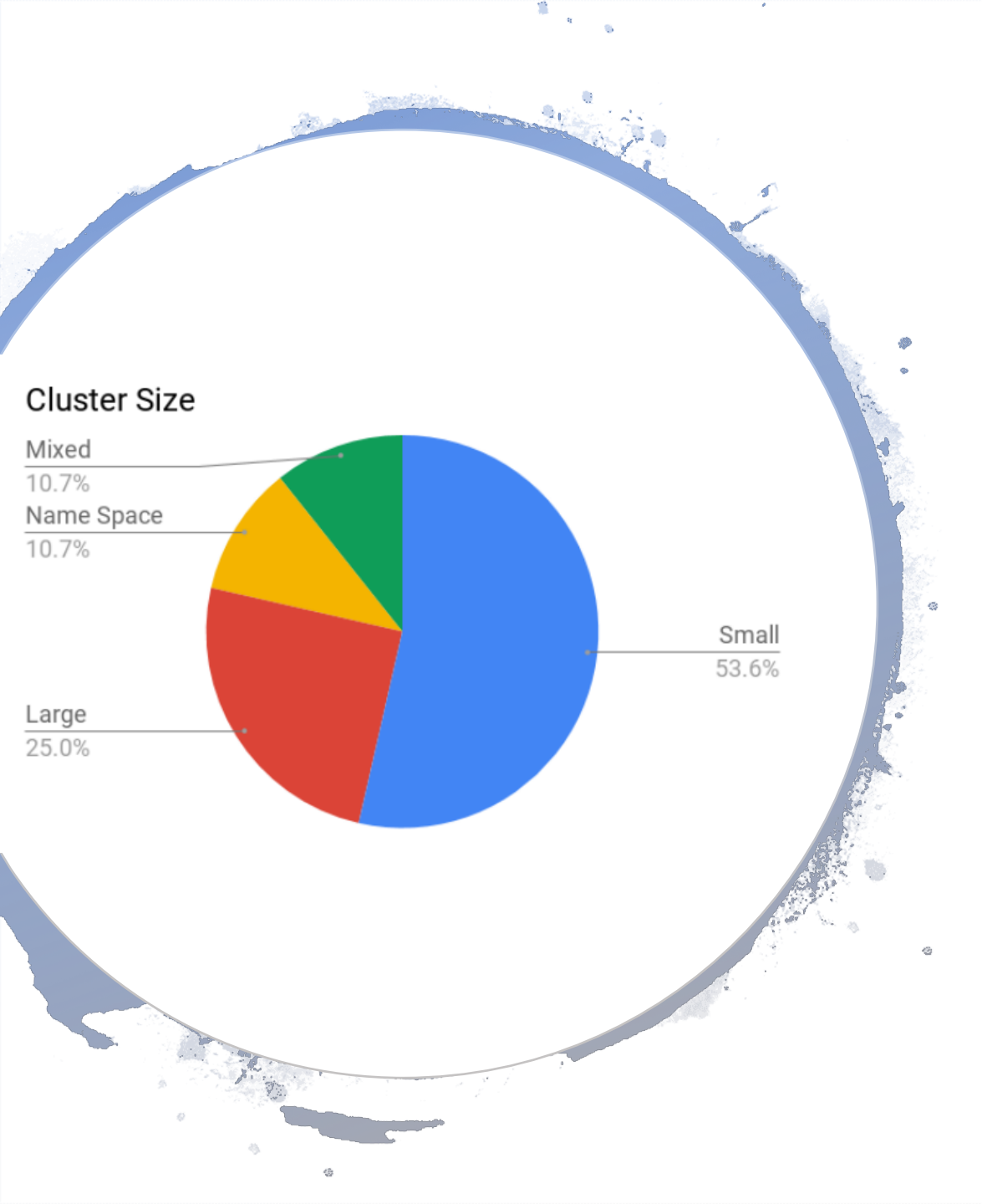
Region VS Zone

哪个地方？哪个机房？

网络！数据！

- 高可用性
- 安全
- 管理灵活
- ...





Multi-clusters

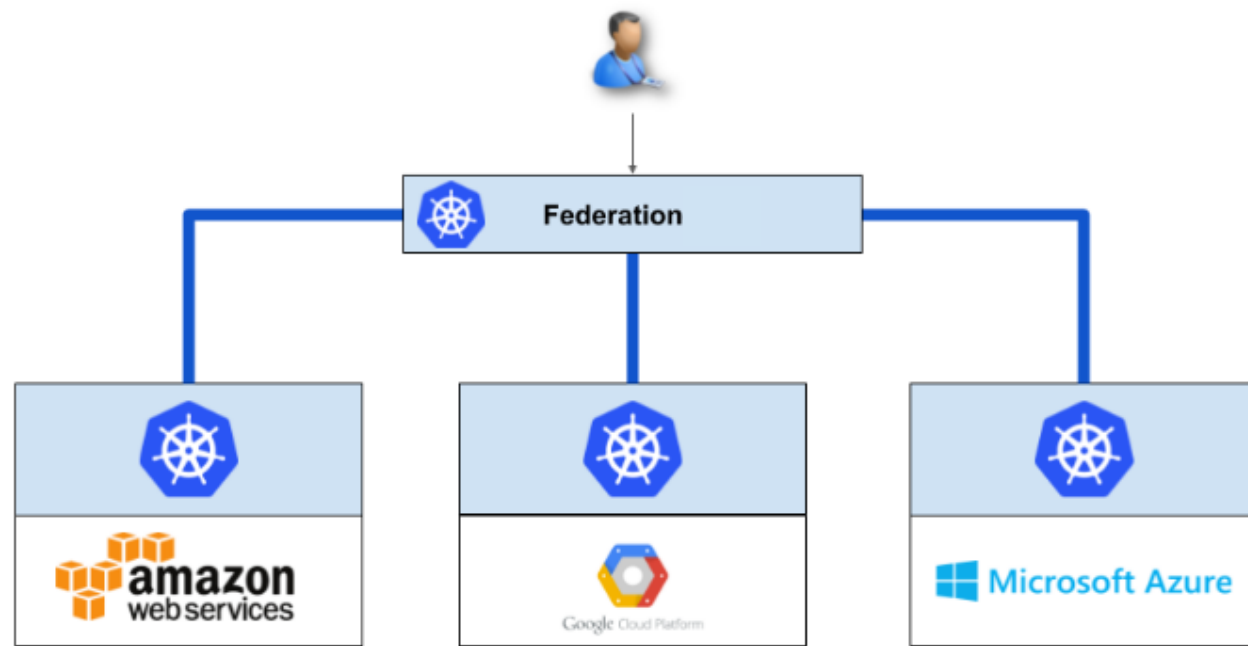
- Kubernetes集群实践中，数量多
 - 更好的隔离
 - 可用性
 - 灵活管理
 - ...

怎么管理多集群？

所以

- 需要多集群管理解决方案
- Kubernetes Federation

多云 → 多集群
多区域 → 多集群
数据中心 → 多应用 → 多集群





KubeFed

Kubernetes **Fed**eration Cluster

Federation

Kubernetes Federation

弃用

Use of Federation v1 is strongly discouraged. Federation V1 never achieved GA status and is no longer under active development. Documentation is for historical purposes only.

<https://kubernetes.io/docs/concepts/cluster-administration/federation/>

→ Kubernetes Federation v2 →

替代Federation

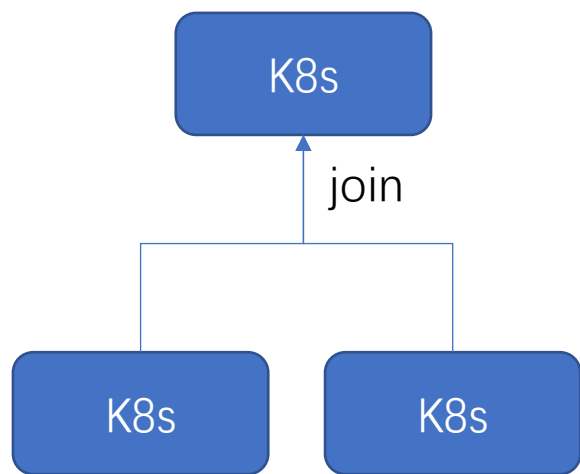
KubeFed

新命名v2

- 单一API管理多集群的访问配置
- Kubernetes对象的生命周期管理
- 提供基础的多集群对象分发API

使用方式

```
$ kubefedctl join/unjoin  
$ kubefedctl enable/disable  
$ kubefedctl federate
```



Deployment

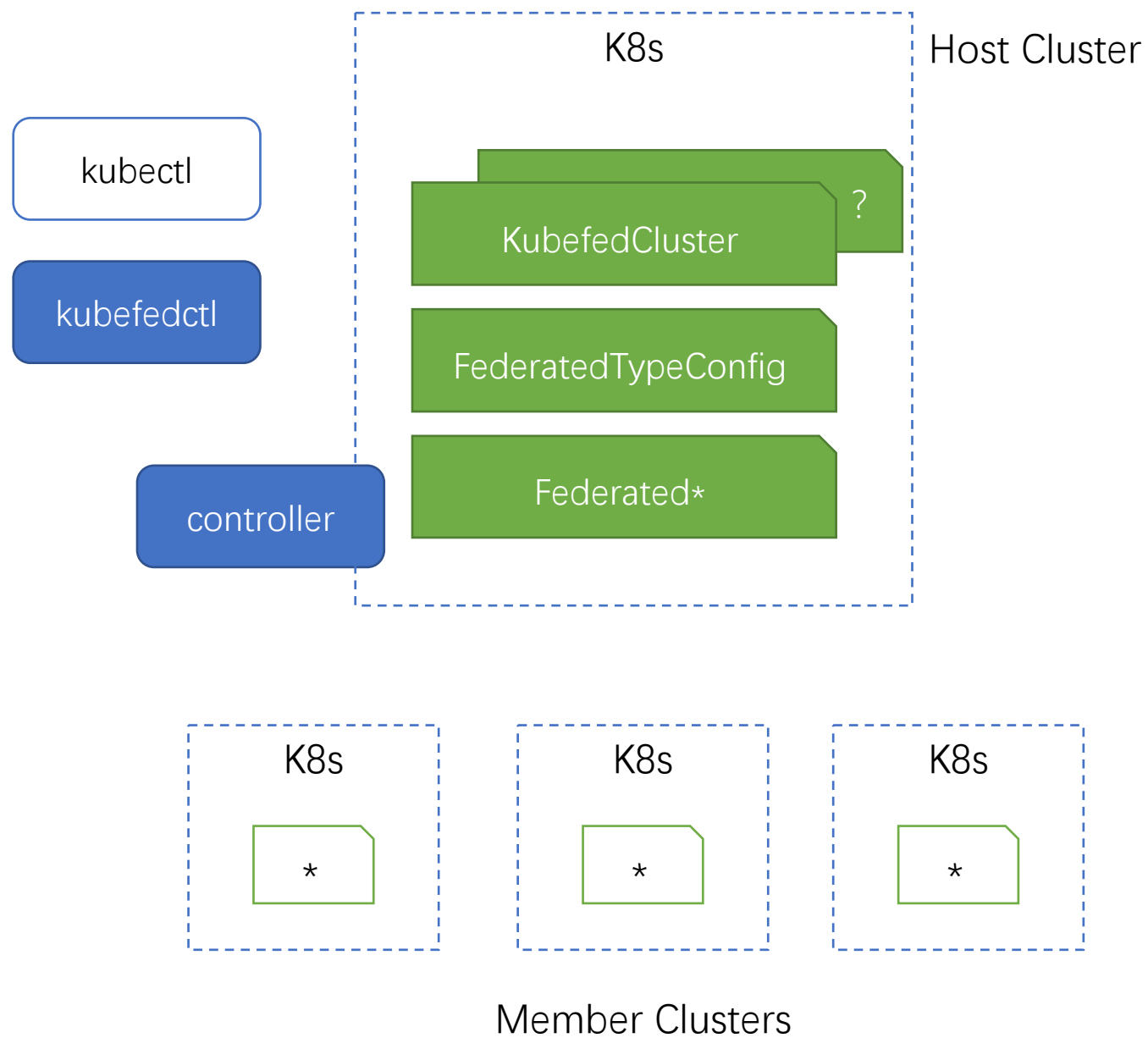
Federated
Deployment

可分发类型

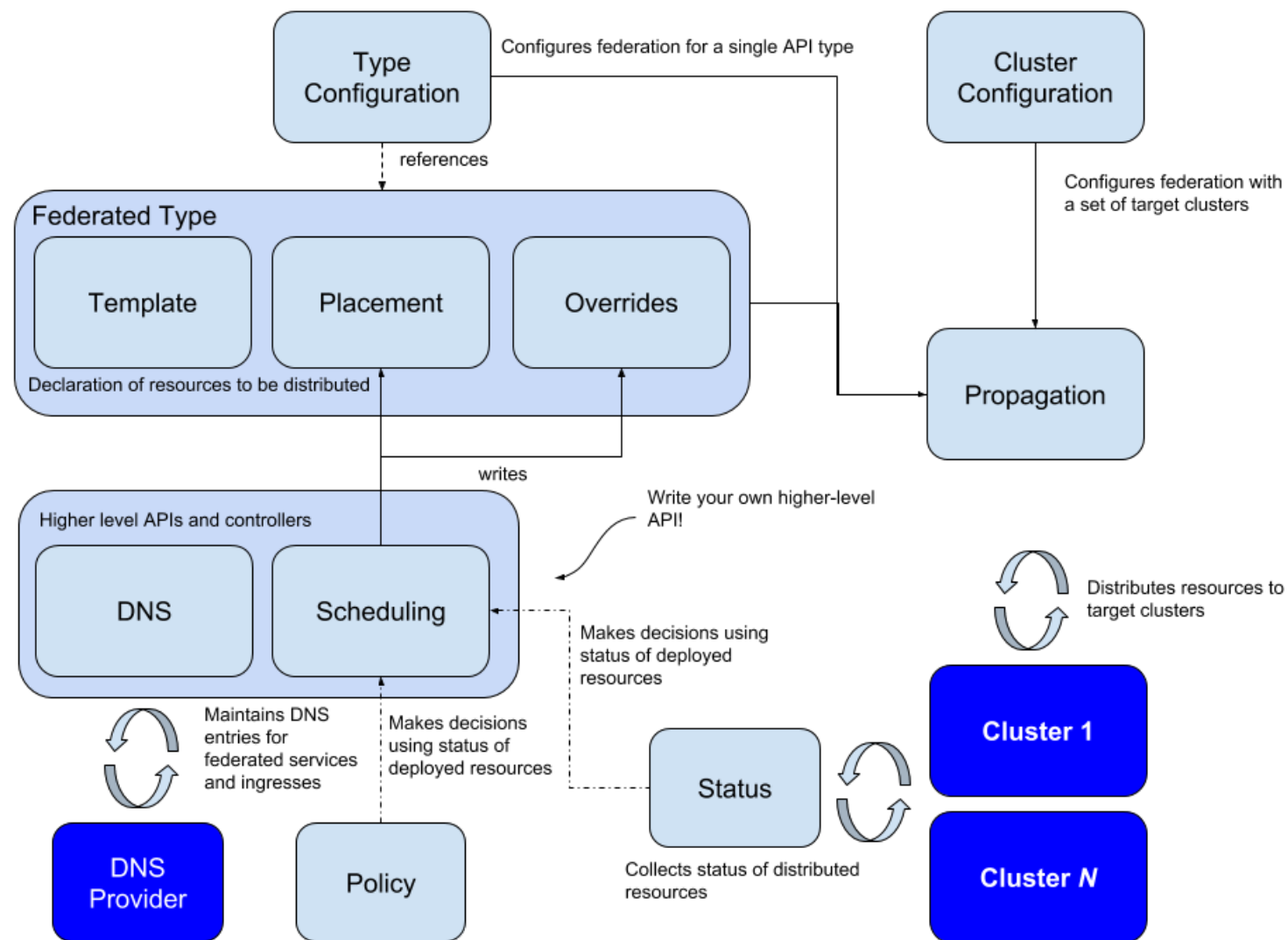
Deployment
Name: nginx

分发对象

KubeFed 体系结构



KubedFed controller



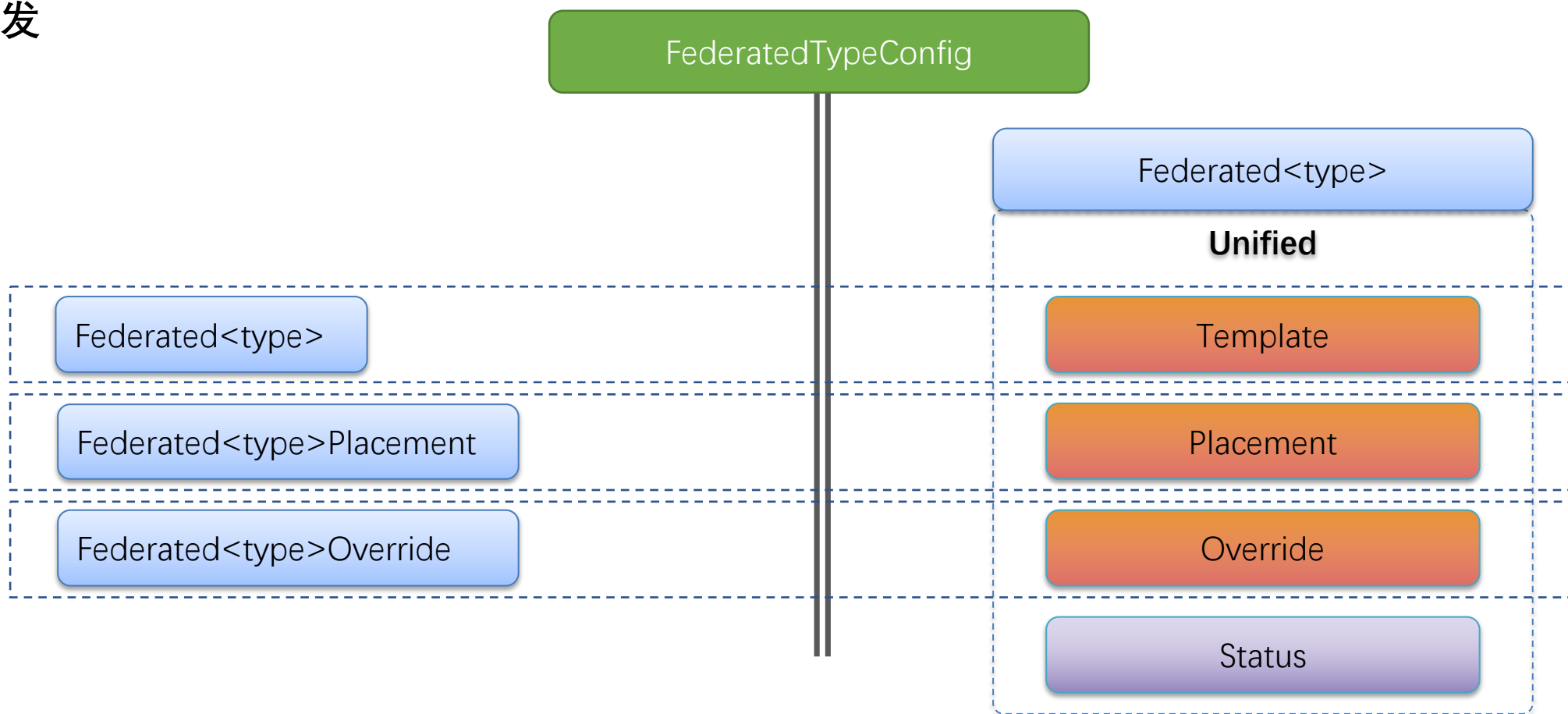
CRDs

FederatedTypeConfig

对象分发

NOW

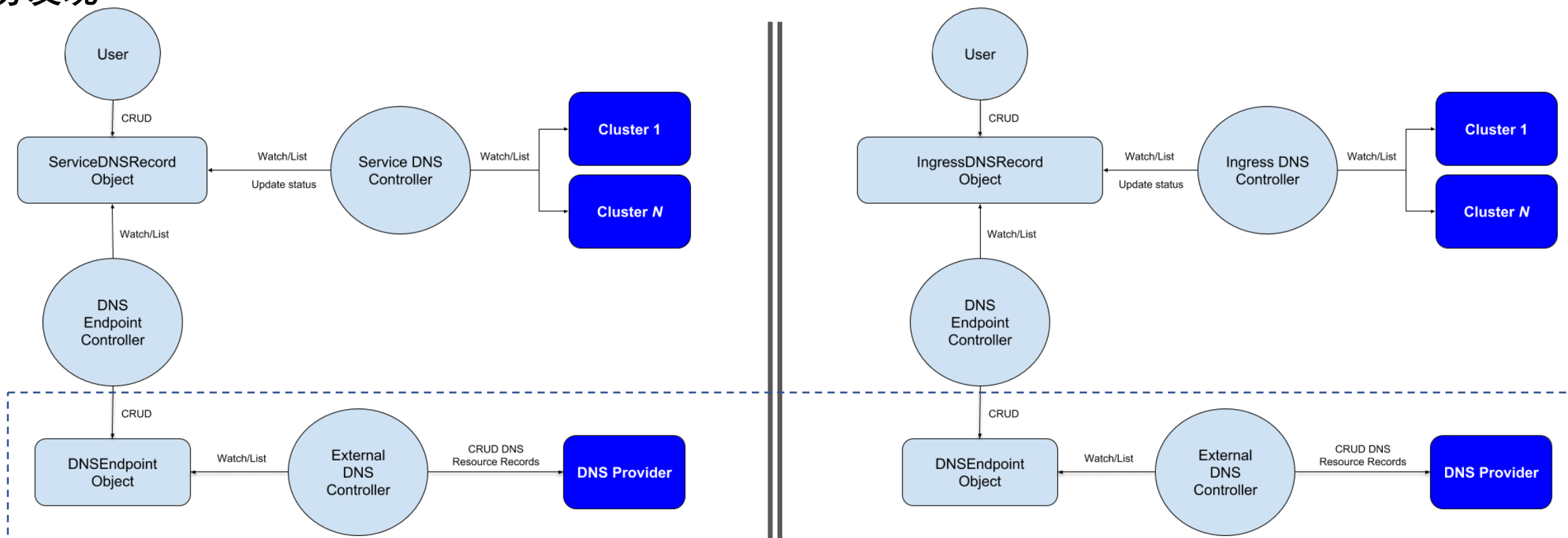
THIS



CRDs

[Service | Ingress]DNSRecord

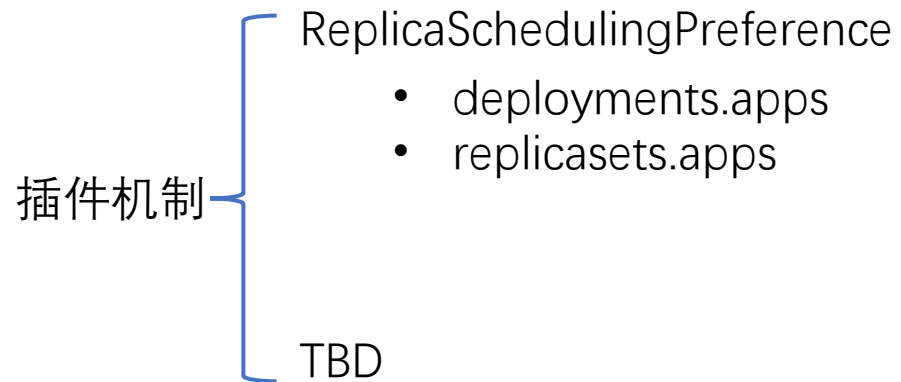
服务发现



CRDs

ReplicaSchedulingPreference

调度策略



```
apiVersion:
scheduling.kubefed.io/v1alpha1
kind: ReplicaSchedulingPreference
metadata:
  name: test-deployment
  namespace: test-ns
spec:
  targetKind: FederatedDeployment
  totalReplicas: 9
  clusters:
    A:
      weight: 1
    B:
      weight: 2
```

Demo

- deploy-kubefed
- deploy-federated-nginx

部署方式

源代码



Thank you!

Q&A

部署方式

- Cluster
 - kubefed管所有namespace
- Namespaced
 - 一个kubefed管一个namespace

?



源代码

• 代码树

`sigs.k8s.io/kubefed/`

```
└─ charts/
└─ cmd/
    └─ controller-manager/
    └─ hyperfed/
    └─ kubefedctl/
    └─ webhook/
└─ pkg/
    └─ apis/
    └─ controller/
        └─ dnsendpoint/
        └─ federatedtypeconfig/
        └─ ingressdns/
        └─ kubefedcluster/
        └─ schedulingmanager/
        └─ schedulingpreference/
        └─ servicedns/
        └─ status/
        └─ sync/
        └─ webhook/
    └─ kubefedctl/
    └─ schedulingtypes/
    └─ version/
    └─ webhook/
└─ scripts/
└─ vendor/
```

helm chart

命令行

CRD

Controller

客户端命令行代码

webhook
辅助脚本
第三方包

控制器

- 功能控制

leaderelection.`NewKubeFedLeaderElector`(opts, startControllers)

kubefedcluster.`StartClusterController`

features.`SchedulerPreferences`



schedulingmanager.`StartSchedulingManager`

features.`CrossClusterServiceDiscovery`



servicedns.`StartController`
dnsepoint.`StartServiceDNSEndpointController`

features.`FederatedIngress`



ingressdns.`StartController`
dnsepoint.`StartIngressDNSEndpointController`

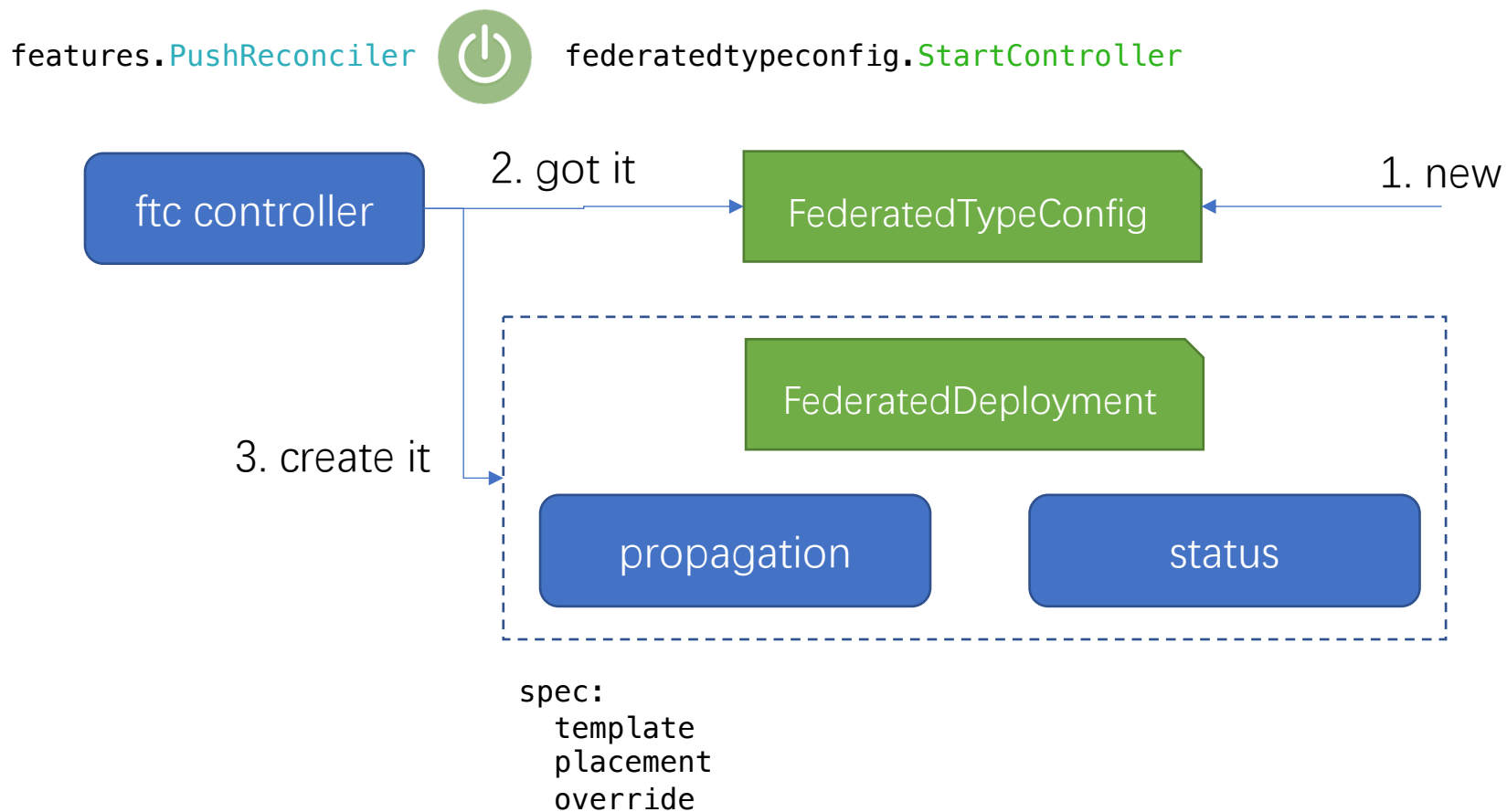
features.`PushReconciler`



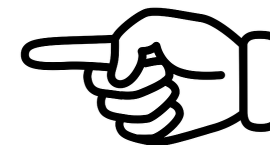
federatedtypeconfig.`StartController`

控制器

- 逻辑细节



手动控制



propagation: Disabled

控制器

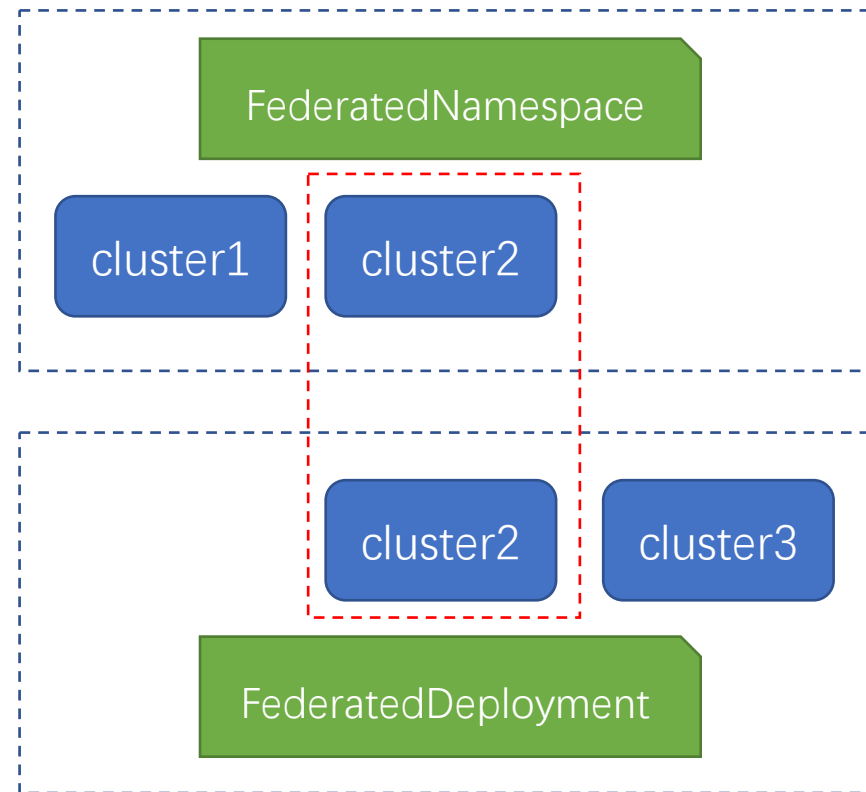
- 行为细节

features.[PushReconciler](#)



federatedtypeconfig.[StartController](#)

```
spec:
  placement:
    clusters: []
    - name: cluster2
    - name: cluster1
  clusterSelector:
    matchLabels:
      foo: bar
```

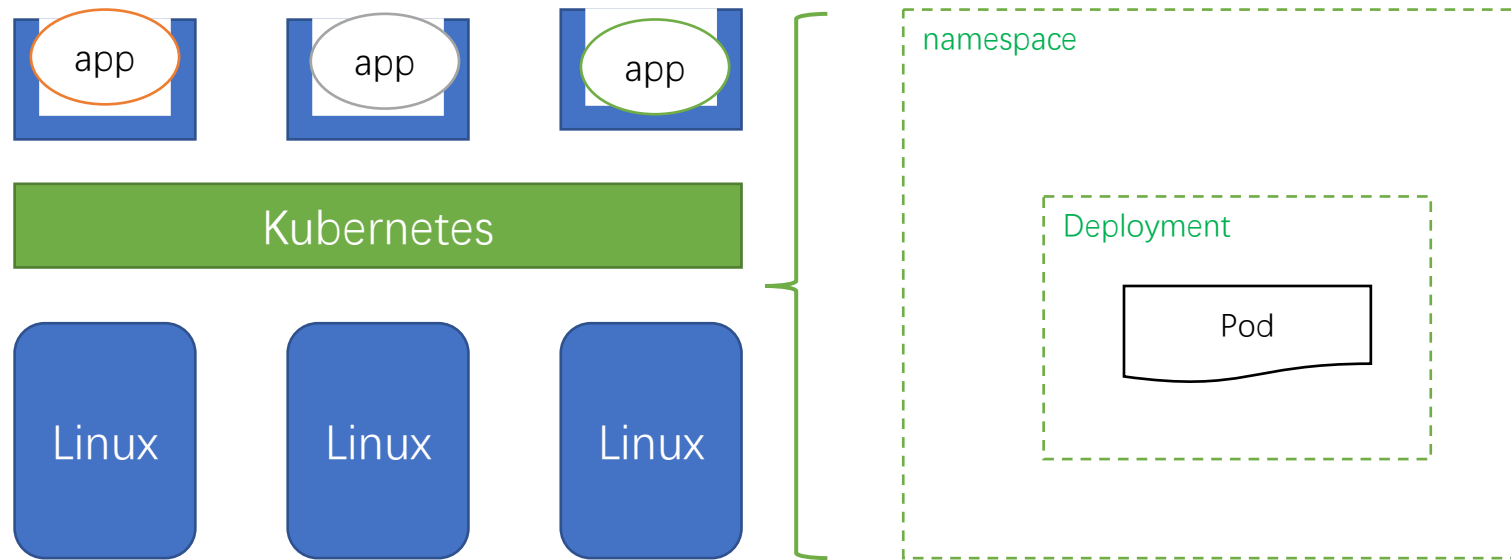


☒ DONE!

Kubernetes

Kubernetes (commonly stylized as K8s) is an open-source container-orchestration system for automating deployment, scaling and management of containerized applications.

<https://en.wikipedia.org/wiki/Kubernetes>



CRD

- Custom Resource Definitions

