

阿里云 × CLOUD NATIVE
COMPUTING FOUNDATION
云原生技术公开课

第 23 讲

Kubernetes API编程范式

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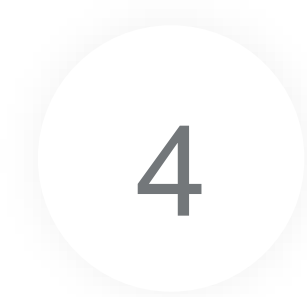
需求来源



用例解读



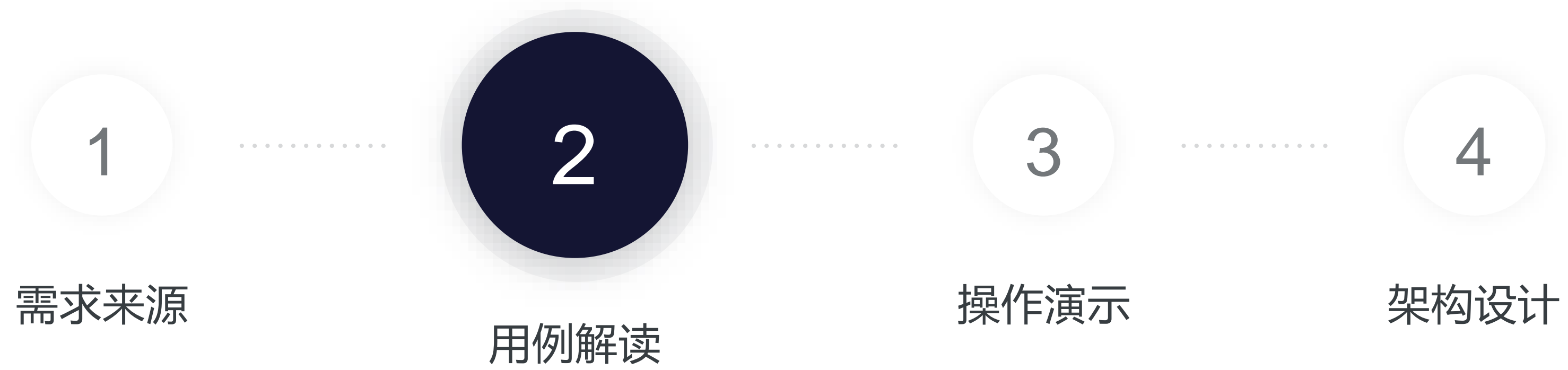
操作演示



架构设计

Custom resources definition ([CRD](#)) 背景问题

- 用户自定义资源需求比较多
- 希望Kubernetes提供聚合各个子资源的功能
- Kubernetes 原生资源无法满足需求
- Kubernetes API Server 扩展比较复杂



Custom resources definition ([CRD](#)) 介绍

- 在Kubernetes 1.7版本被引入
- 可以根据自己的需求添加自定义Kubernetes 对象资源
- 自定义资源与Kubernetes原生内置资源一样共用kubectl CLI、安全、RBAC等功能
- 用户同时可以开发自定义控制器感知或者操作自定义资源的变化

Custom resources definition ([CRD](#)) 例子

```
apiVersion: apiextensions.k8s.io/v1beta1
kind: CustomResourceDefinition
metadata:
  name: foos.samplecontroller.k8s.io
spec:
  group: samplecontroller.k8s.io
  version: v1alpha1
  names:
    kind: Foo
    plural: foos
  scope: Namespaced
```

```
apiVersion: samplecontroller.k8s.io/v1alpha1
kind: Foo
metadata:
  name: example-foo
spec:
  deploymentName: example-foo
  replicas: 1
```

Custom resources definition ([CRD](#)) 校验

```
apiVersion: apiextensions.k8s.io/v1beta1
kind: CustomResourceDefinition
metadata:
  name: foos.samplecontroller.k8s.io
spec:
  group: samplecontroller.k8s.io
  version: v1alpha1
  names:
    kind: Foo
    plural: foos
  scope: Namespaced
  validation:
    openAPIV3Schema:
      properties:
        spec:
          properties:
            replicas:
              type: integer
              minimum: 1
              maximum: 10
```

```
apiVersion: samplecontroller.k8s.io/v1alpha1
kind: Foo
metadata:
  name: example-foo
spec:
  deploymentName: example-foo
  replicas: 1
```


Custom resources definition ([CRD](#)) 增加状态字段

```
apiVersion: apiextensions.k8s.io/v1beta1
kind: CustomResourceDefinition
metadata:
  name: foos.samplecontroller.k8s.io
spec:
  group: samplecontroller.k8s.io
  version: v1alpha1
  names:
    kind: Foo
    plural: foos
  scope: Namespaced
  subresources:
    status: {}
```

```
status:
  availableReplicas: 1
  conditions:
  - lastTransitionTime: 2019-09-20T07:43:52Z
    lastUpdateTime: 2019-09-20T07:43:52Z
    message: Deployment has minimum availability.
    reason: MinimumReplicasAvailable
    status: "True"
    type: Available
  - lastTransitionTime: 2019-09-20T07:43:43Z
    lastUpdateTime: 2019-09-20T07:43:52Z
    message: ReplicaSet "chartmuseum-6bddcc8865" has successfully progressed.
    reason: NewReplicaSetAvailable
    status: "True"
    type: Progressing
  observedGeneration: 1
  readyReplicas: 1
  replicas: 1
  updatedReplicas: 1
```


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需求来源

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用例解读

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操作演示

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架构设计

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需求来源

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操作演示

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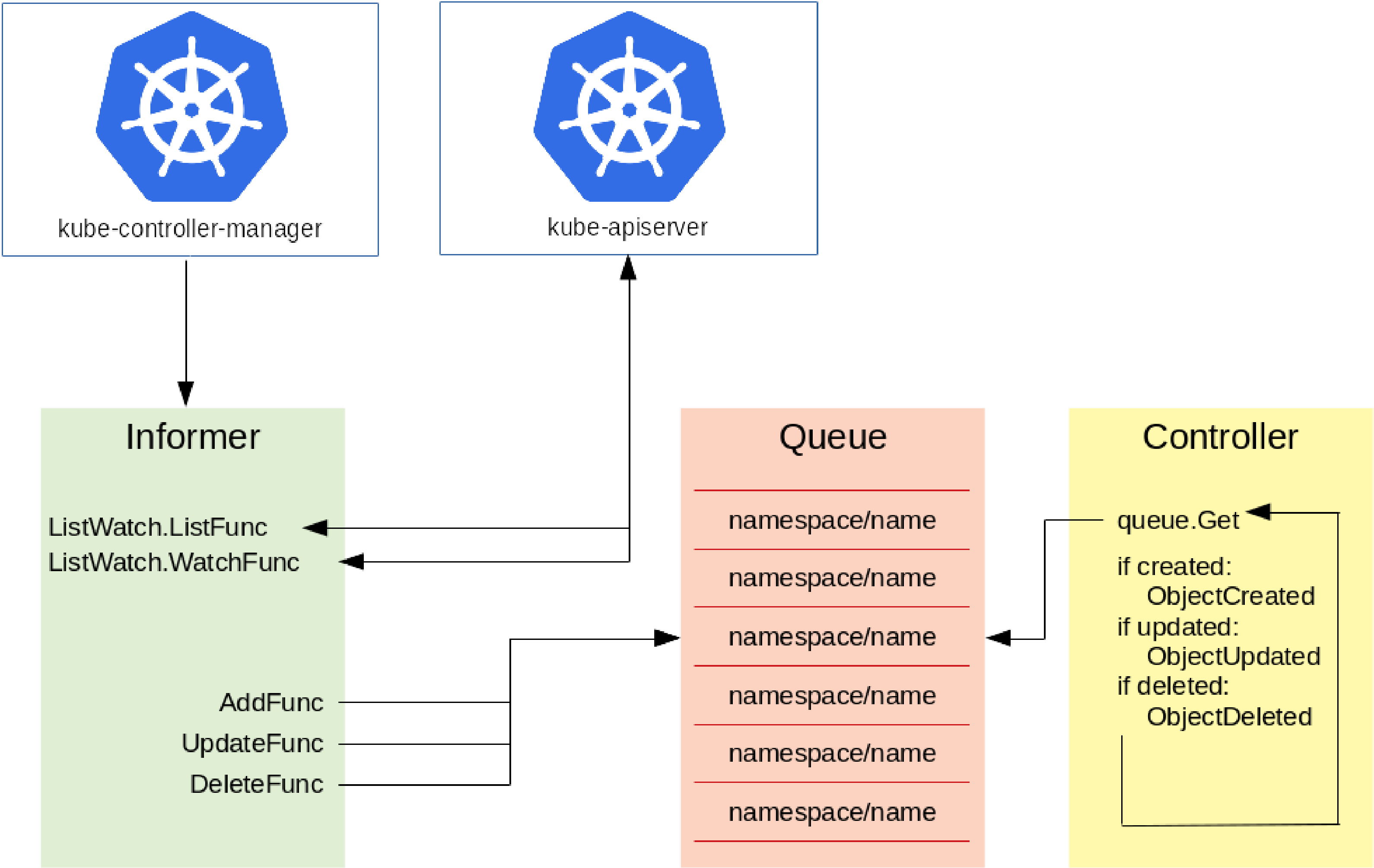
4

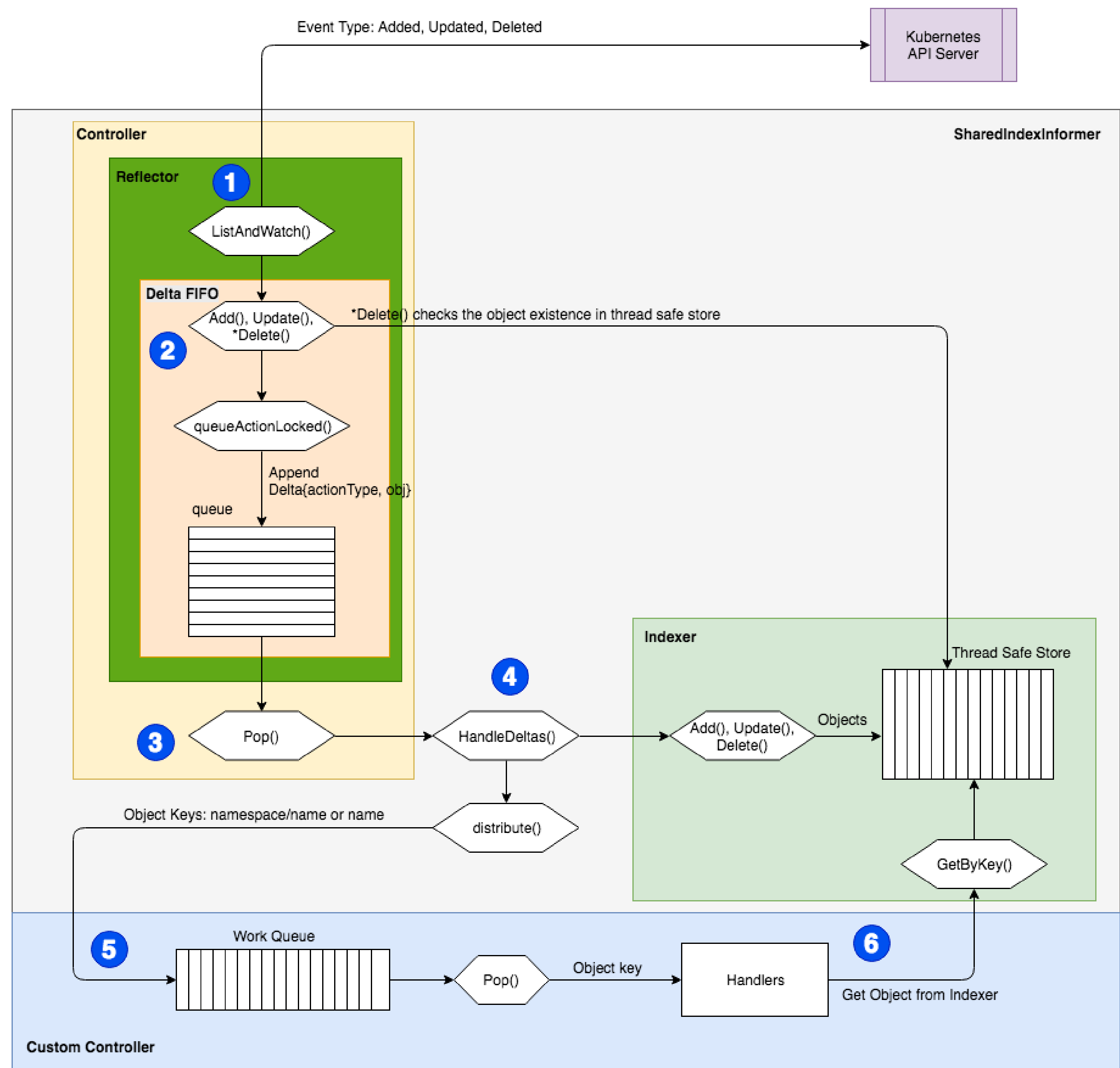
架构设计

Controller 控制器概览

- Kubernetes提供一种可拔插式的方法来扩展或者控制声明式Kubernetes资源
- 控制器是Kubernetes的大脑，负责控制大部分资源的操作
- Deployment 等就是通过kube-controller-manager来部署对应的Pod并维护Pod指定的数量和状态
- 用户声明完成CRD后,需要创建一个控制器来操作自定义资源完成目标

Controller 工作流程概览







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