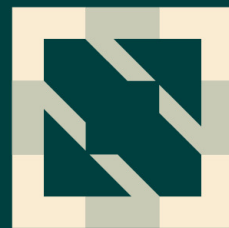




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What's new on controller-runtime of the day

-- *Siyu Wang*

Siyu Wang

- Staff Software Engineer @ Alibaba Cloud
- Co-founder and Maintainer of OpenKruise, Koordinator
- Maintainer of Kubernetes controller-runtime

Mainly focuses on cluster management, workloads, exploring AI jobs scheduling on Kubernetes.

What is controller-runtime

Kubebuilder/OperatorSDK:

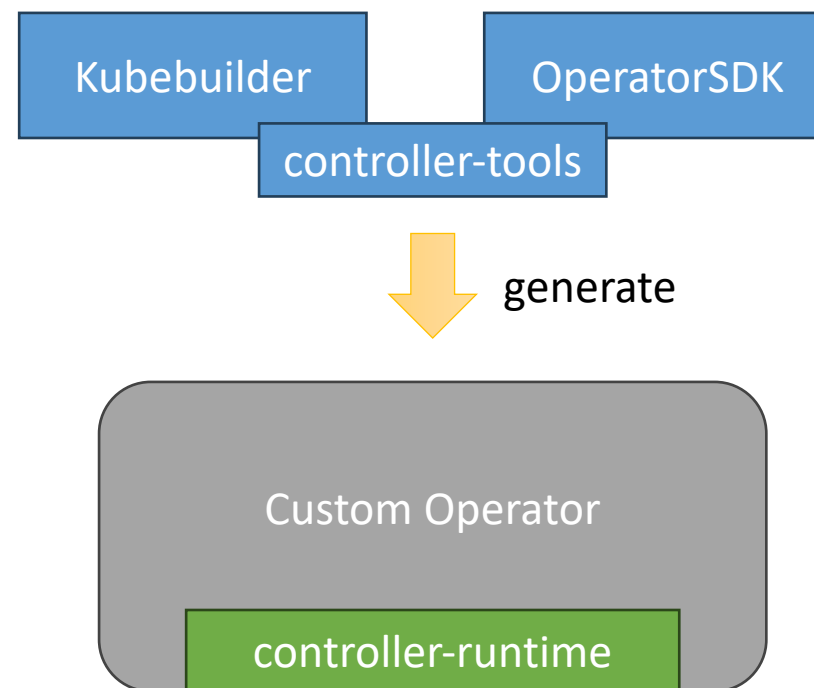
- generate the project and go types for custom resources

controller-tools:

- generate go files, e.g., deepcopy
- generate yaml files, e.g., CRD/Webhook/RBAC definition

controller-runtime:

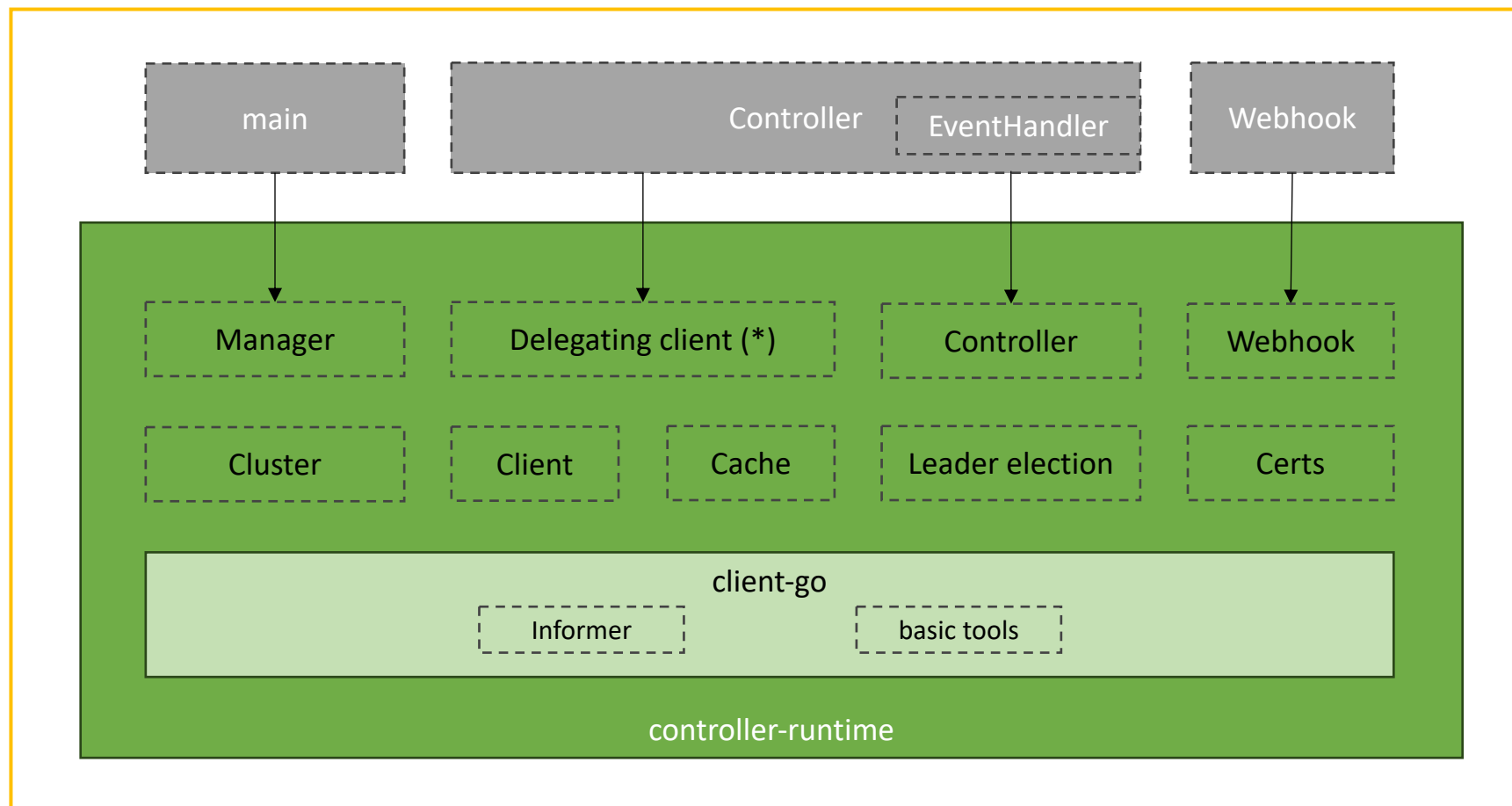
- a set of go libraries for building Controllers/Webhooks
- the core runtime sdk for all Operators



What is controller-runtime

Core concepts:

- Manager
- Client
- Controller
- Webhook



Versioning and Compatibility

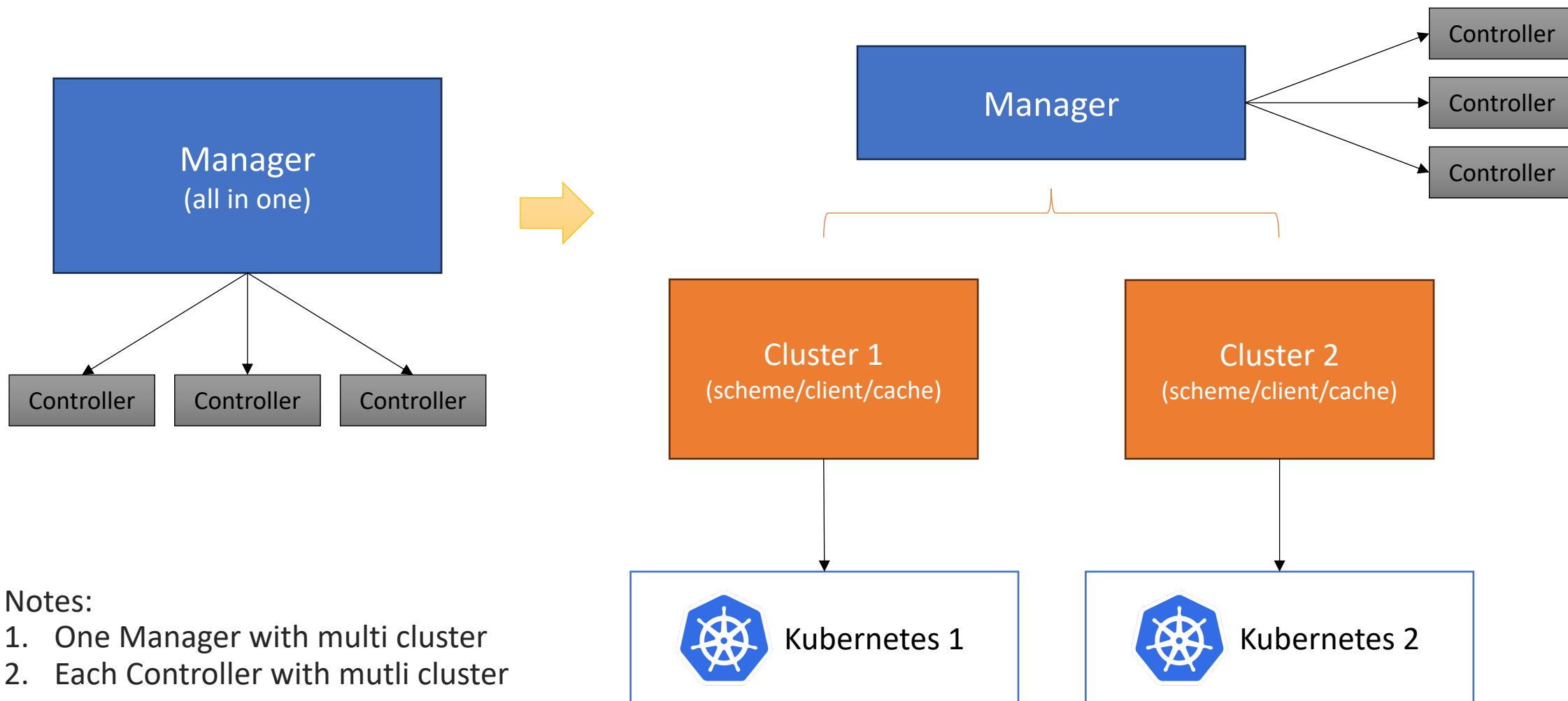
Kubebuilder	controller-runtime	Kubernetes
v1.x	v0.1.x	v1.13
v2.x	v0.2.x - v0.6.x	v1.14 - v1.18
v3.x	v0.7.x - ?	v1.19 - ?

Latest version matched:

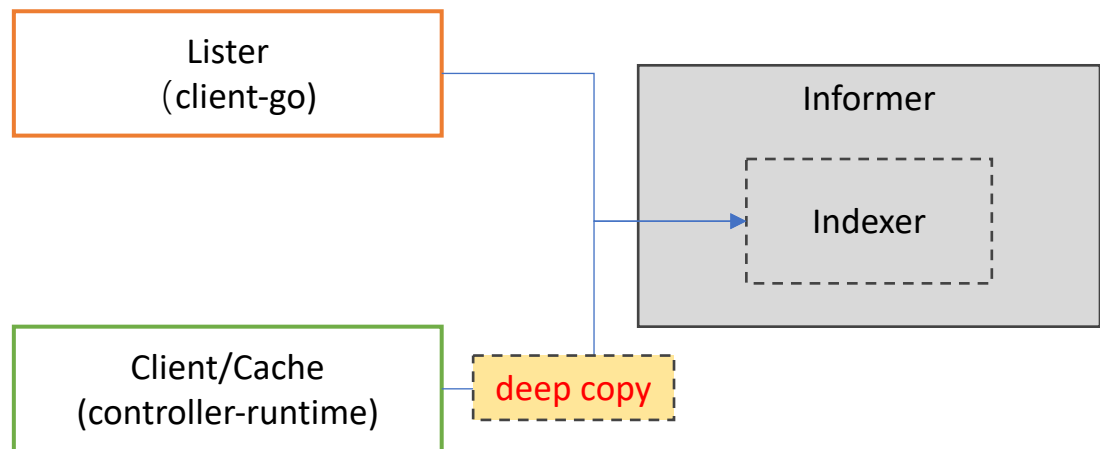
- controller-runtime v0.X <-> Kubernetes v0.{X+12}

Kubernetes	client-go	controller-runtime
v1.4	v1.4	--
v1.5	v1.5, v2.0	--
v1.6 – v1.13	v3.0 – v10.0	--
v1.14	v11.0	v0.2
v1.15	v12.0, v0.15	v0.3
v1.16-v1.28	v0.16 – v0.28	v0.4 – v0.16

Section.1 multi cluster



Section.2 disable deep copy

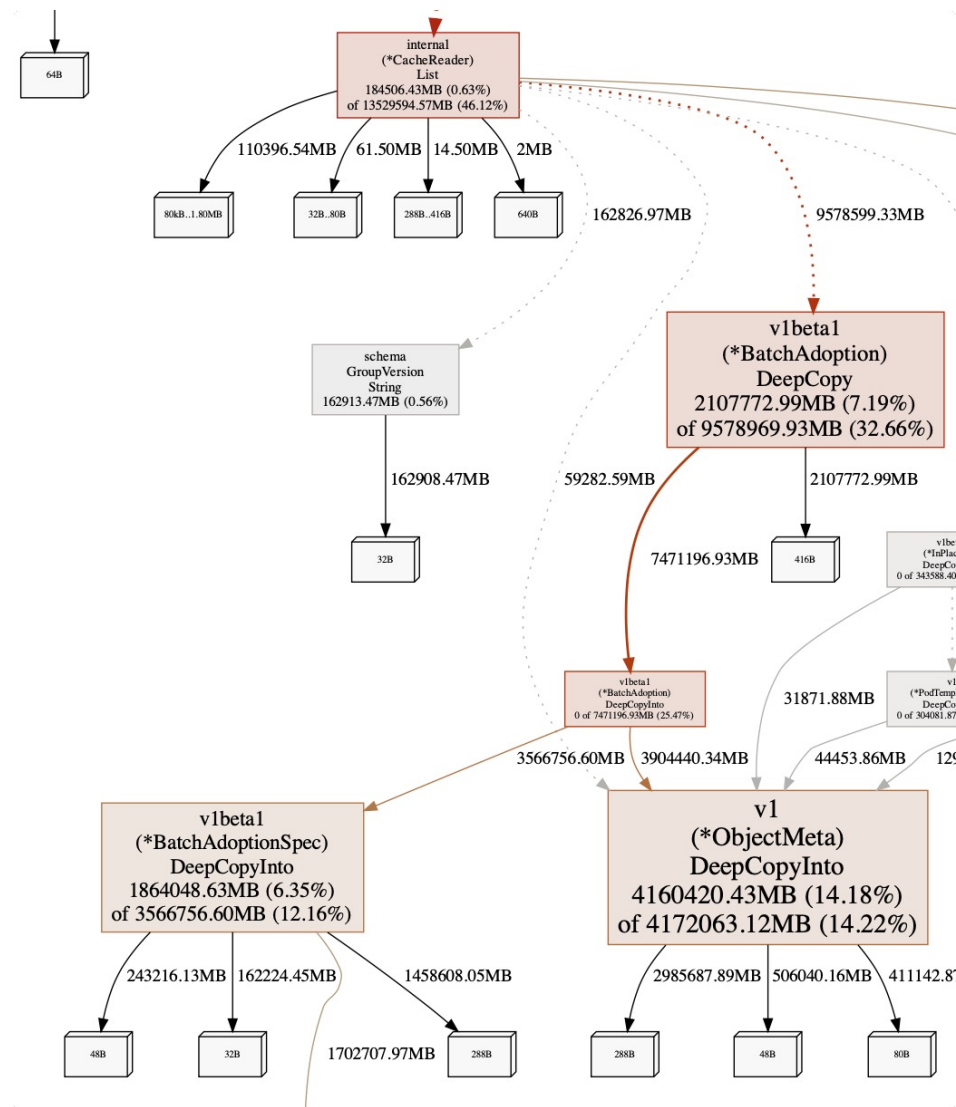


Since v0.10 (cache options refactored in v0.15):

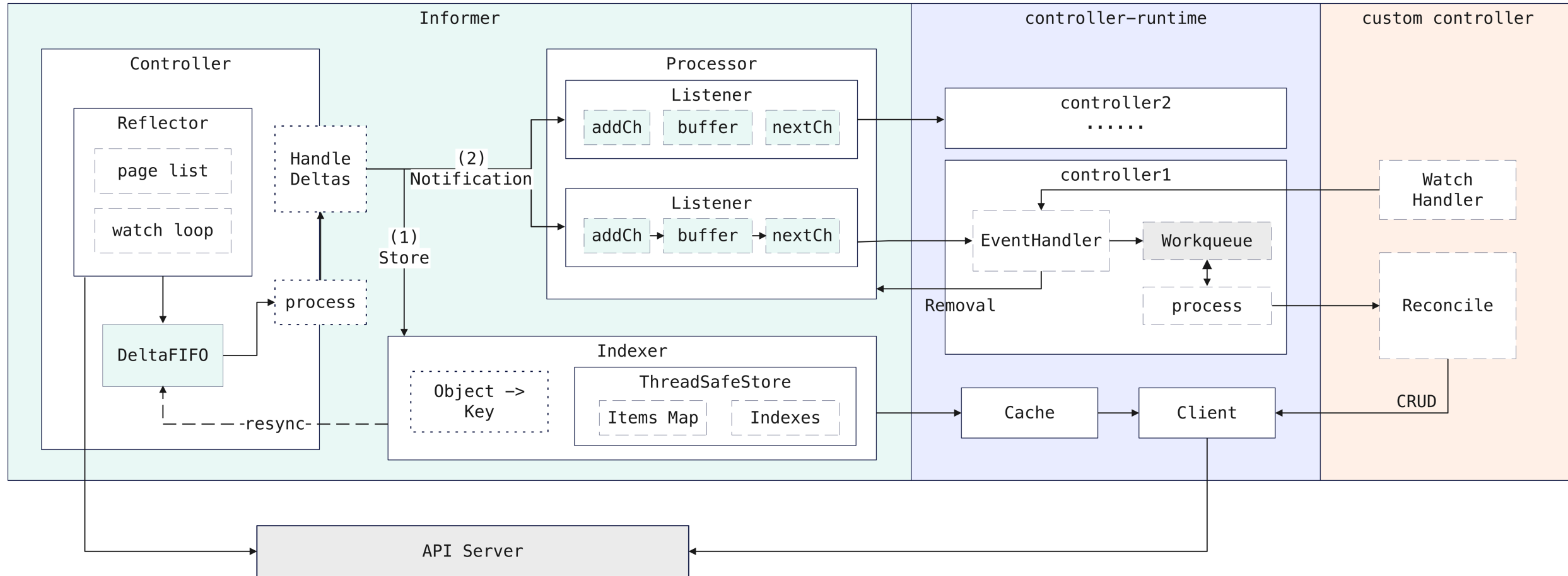
1. DefaultUnsafeDisableDeepCopy
2. UnsafeDisableDeepCopy By Object

Since v0.14:

1. UnsafeDisableDeepCopyOption



Section.3 Cache overview



Section.4 More: ControllerMesh (alpha)

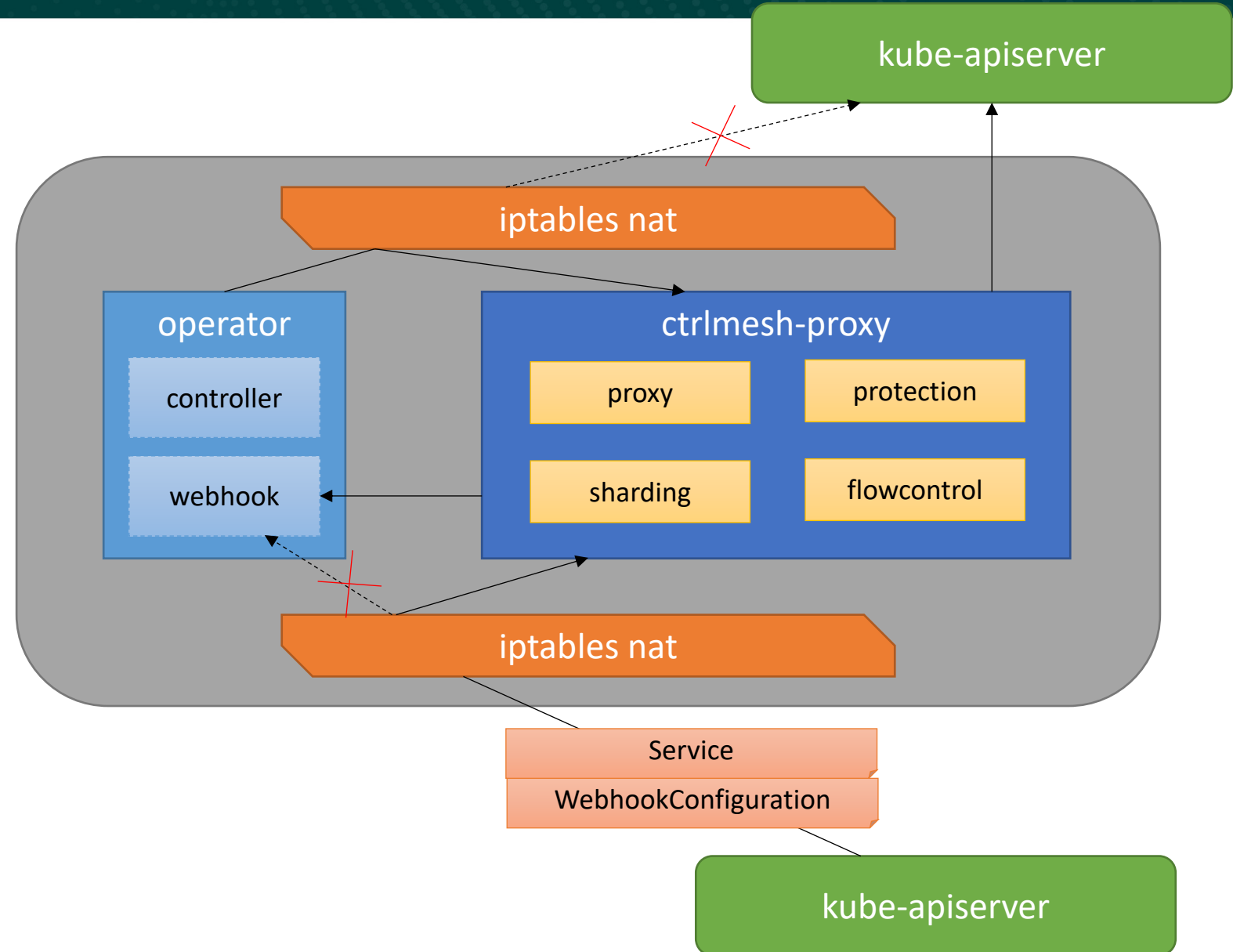
- Canary update: the controllers can be updated in canary progress instead of one time replace.
- Fault injection: it helps developers to verify their reconcile logic in some fault scenarios.
- Flexible isolation: limits resources of which namespaces can be queried by a controller.
- Client-side rate-limit and blown.

<https://github.com/openkruise/controllermesh>

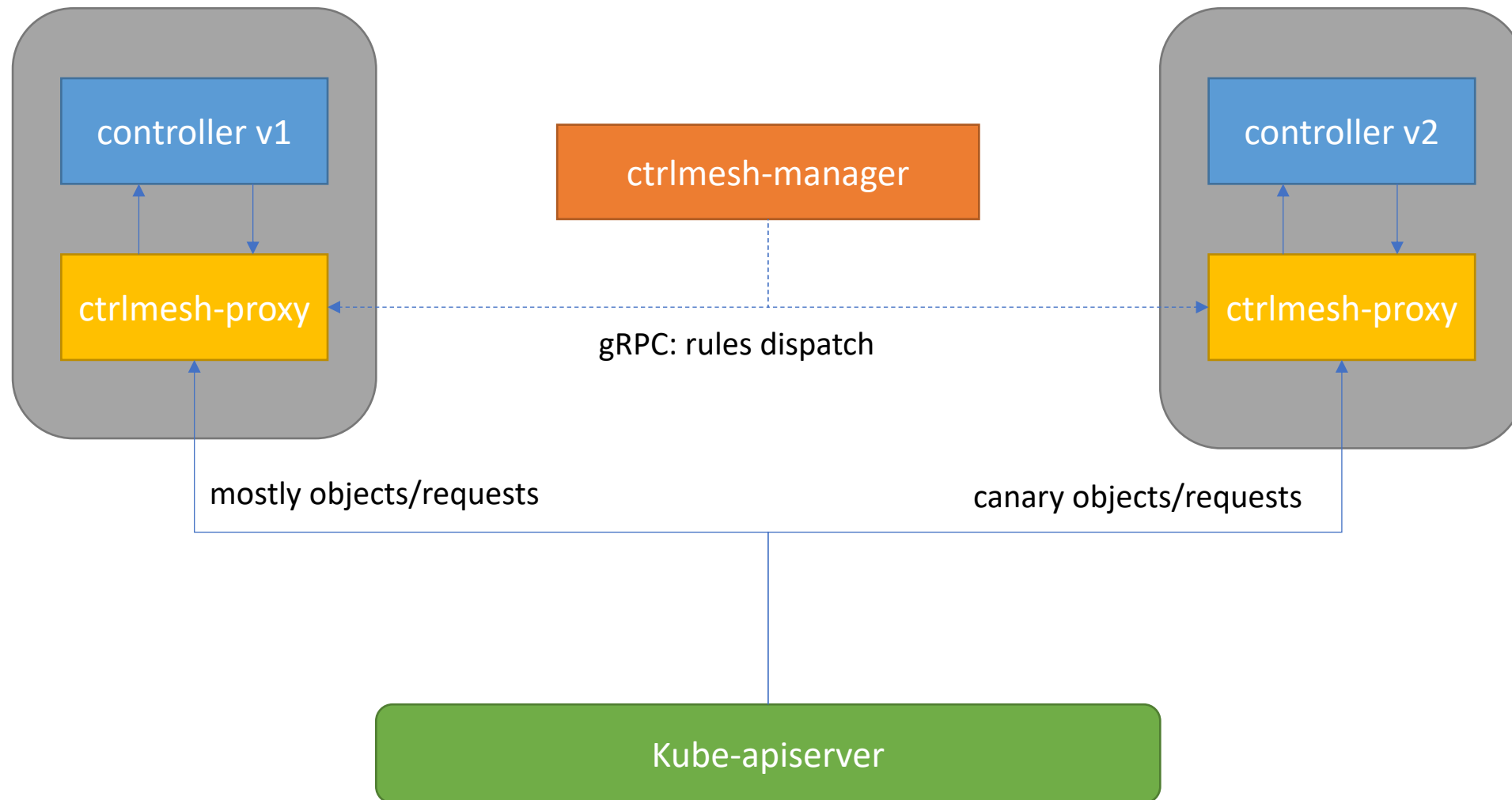
Section.4 More: ControllerMesh (alpha)

Transparent proxy:

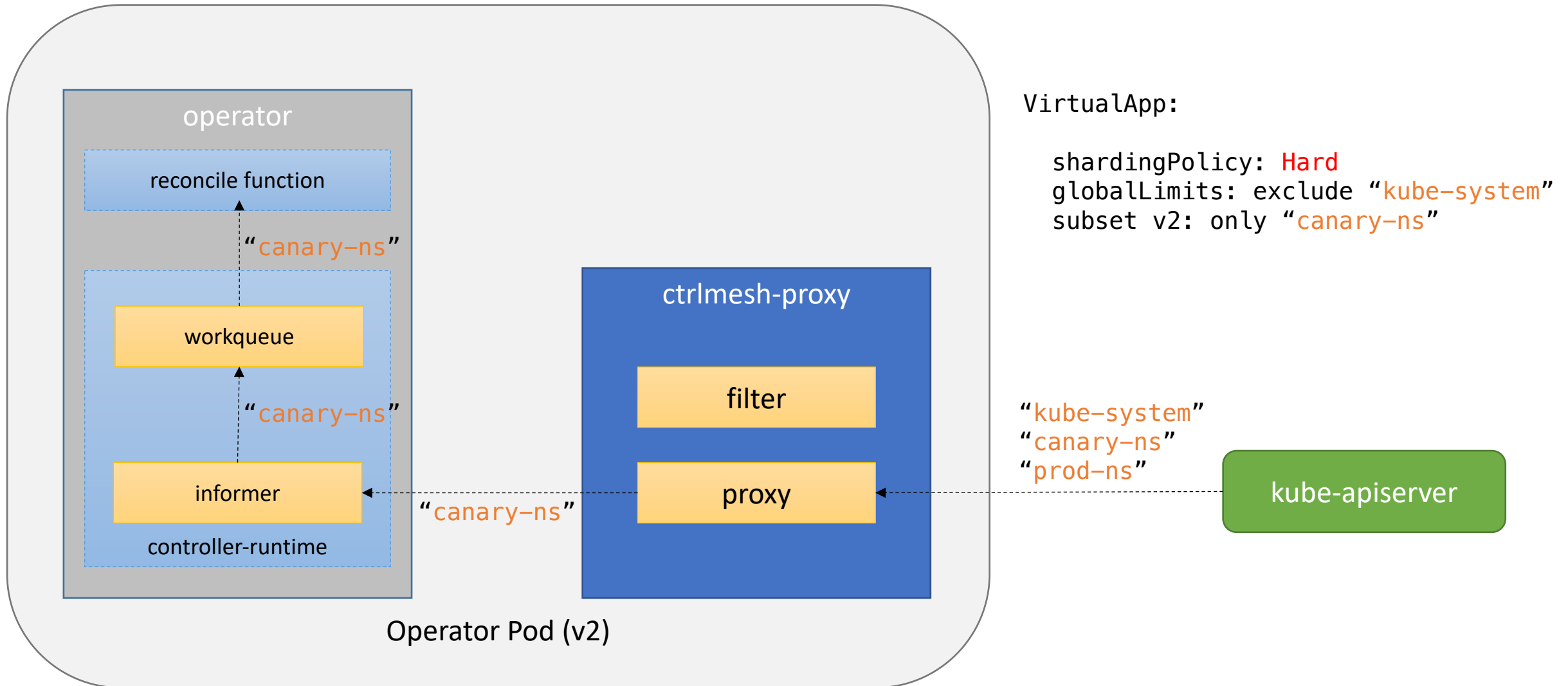
- Router
- Filter
- Circuit breaker
- Monitor



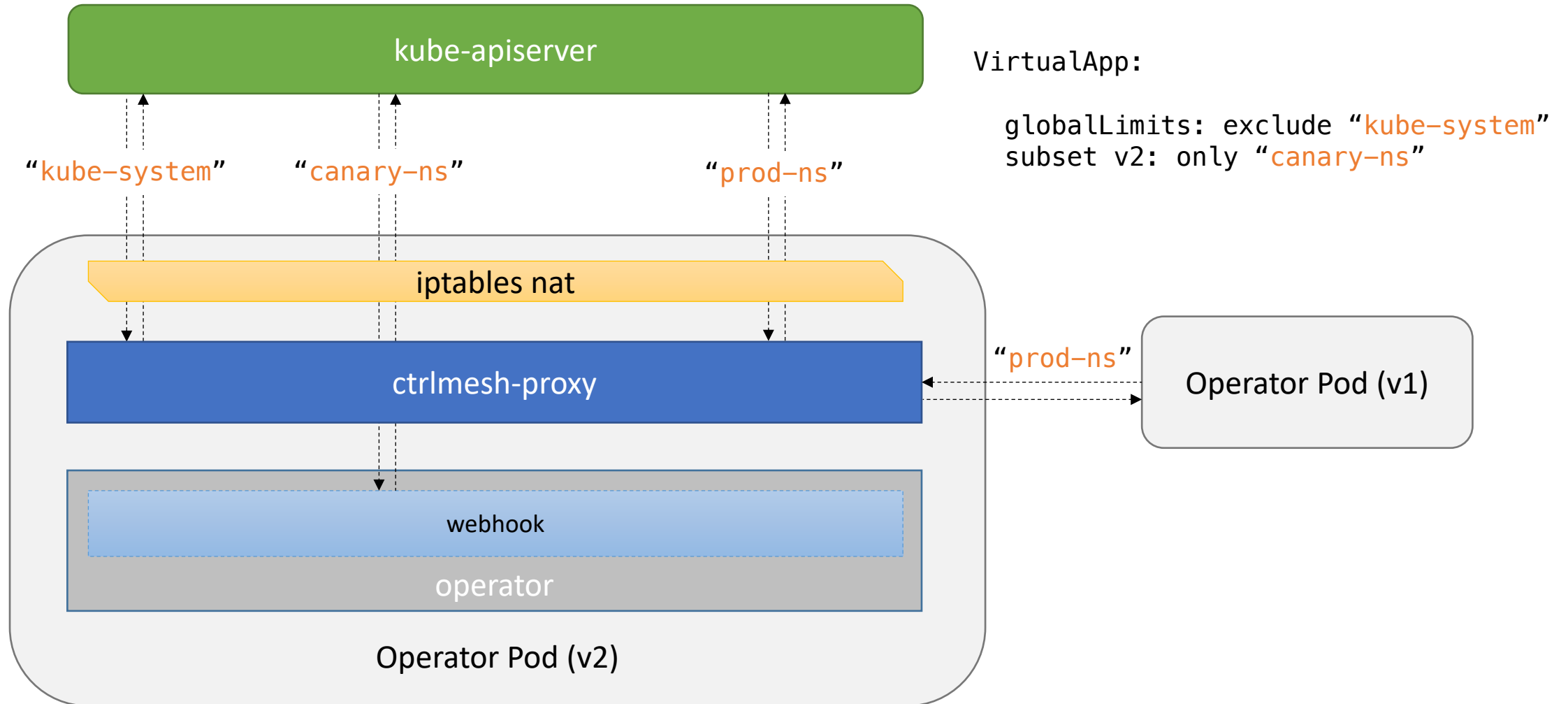
Section.4 More: ControllerMesh (alpha)



Section.4 More: ControllerMesh (alpha)



Section.4 More: ControllerMesh (alpha)





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Thanks

Q&A