KubeCon
CloudNativeCon
North America 2019

Virtual Kubelet Deep Dive

Brian Goff @cpuguy83
Deep Kapur @dkkapur

What is a Kubelet?

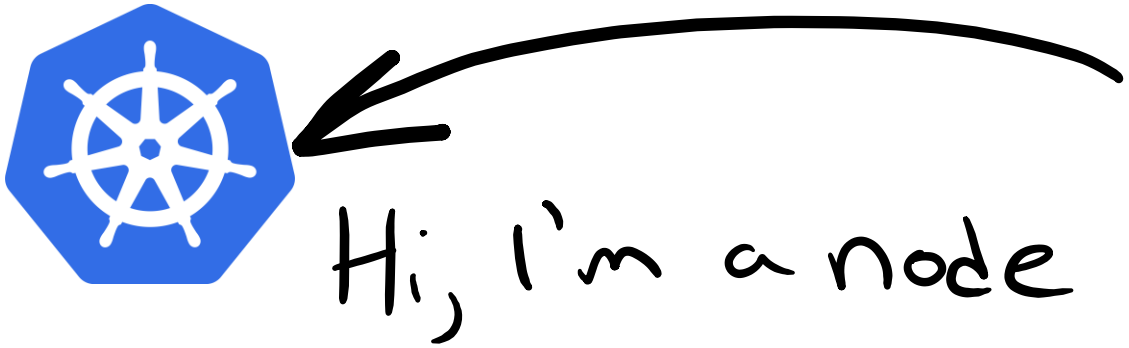
kubelet

kube•let

noun

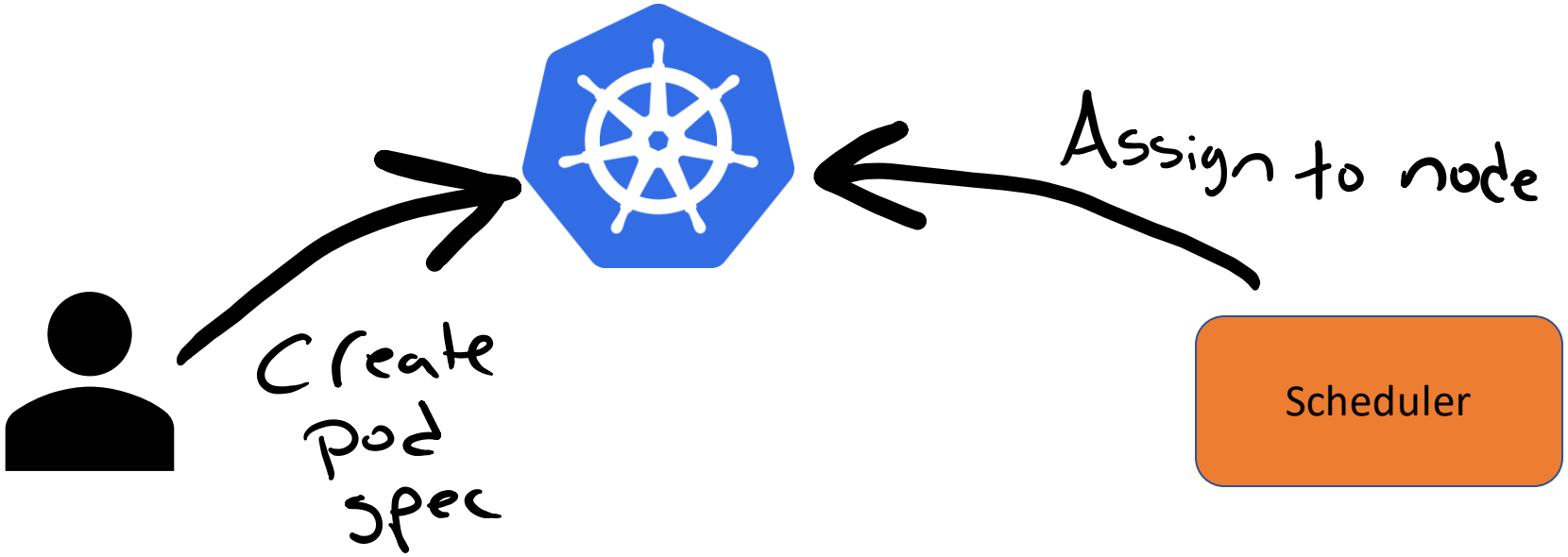
An agent that runs on **each node** in the cluster. It makes sure that **containers are running** in a pod.

What is a Kubelet?

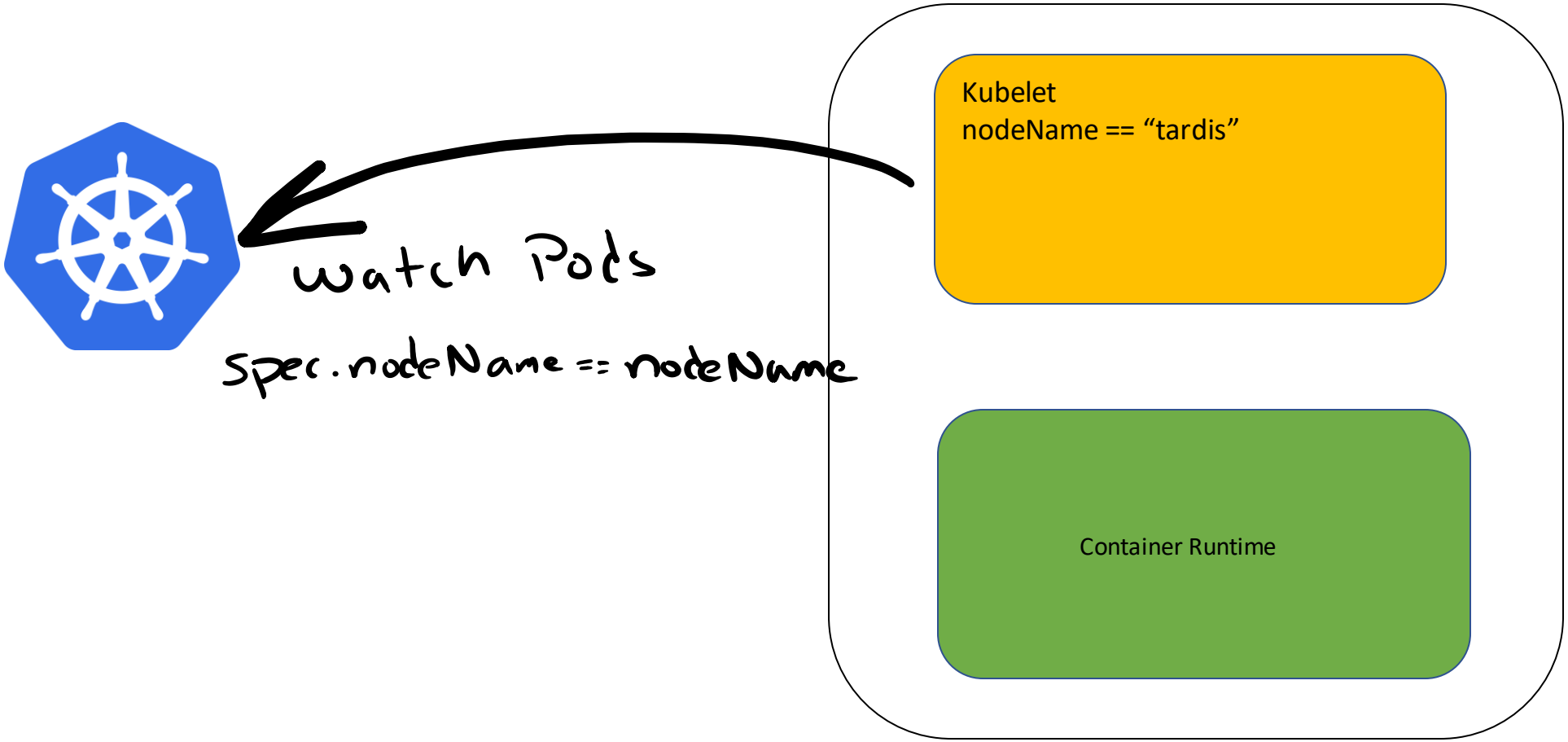


Kubelet
nodeName == “tardis”

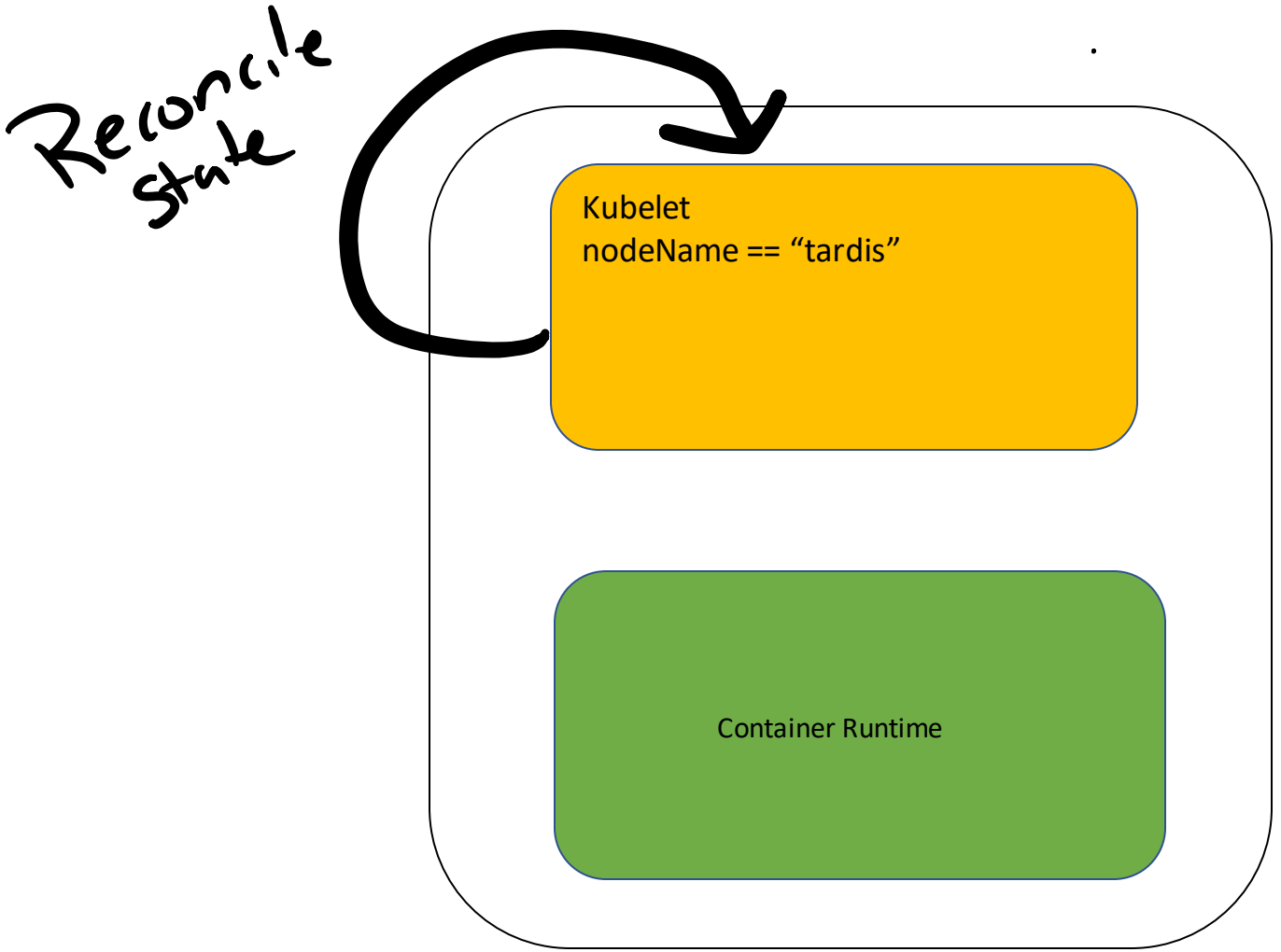
What is a Kubelet?



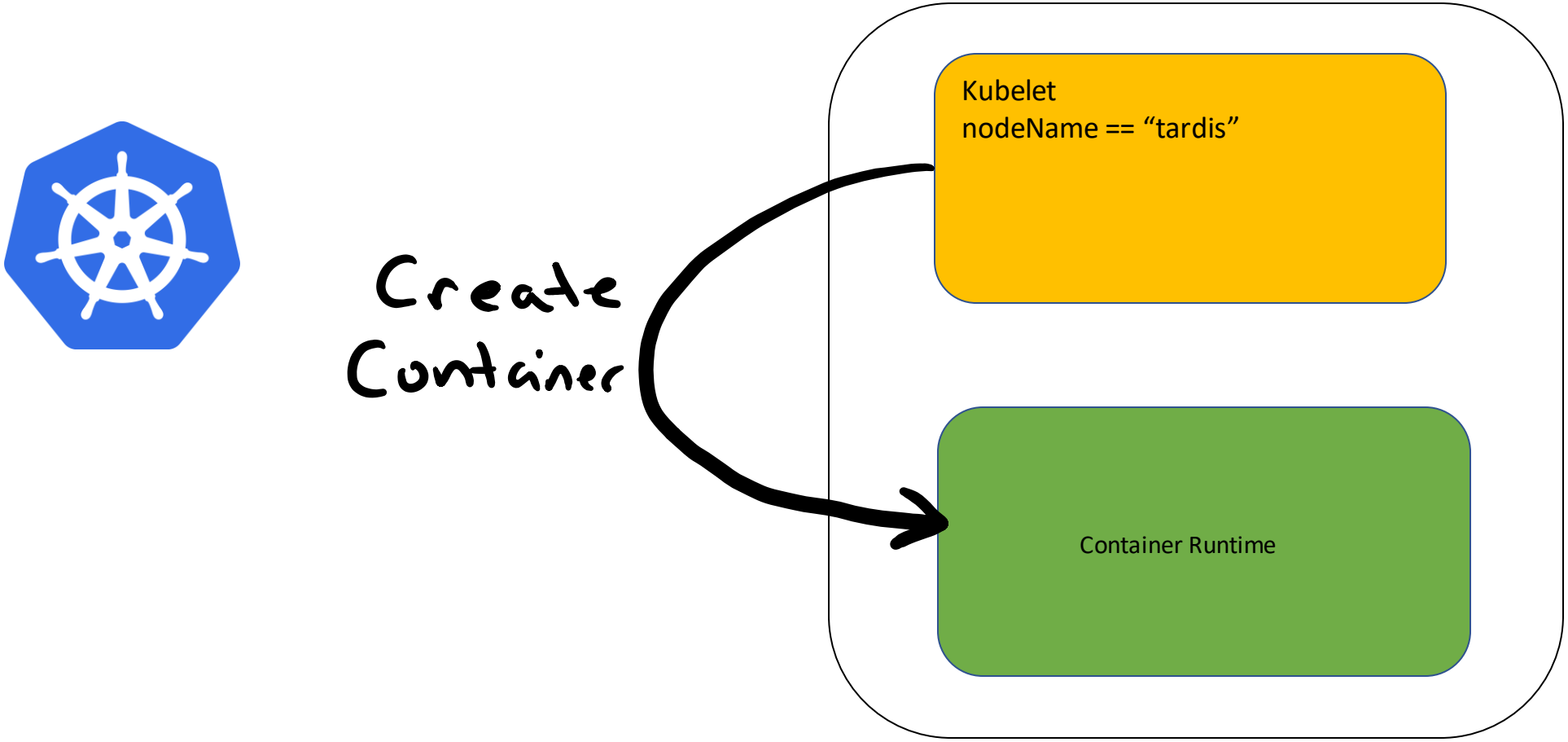
What is a Kubelet?



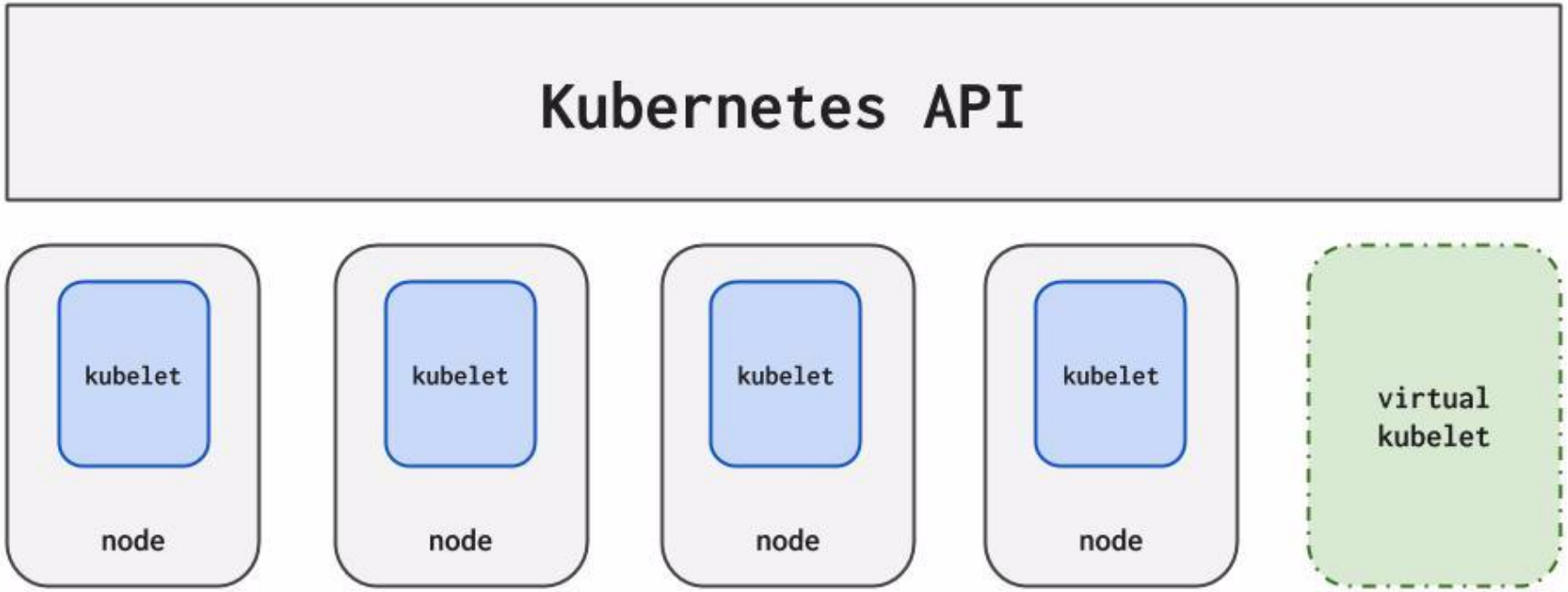
What is a Kubelet?



What is a Kubelet?



What is Virtual Kubelet?



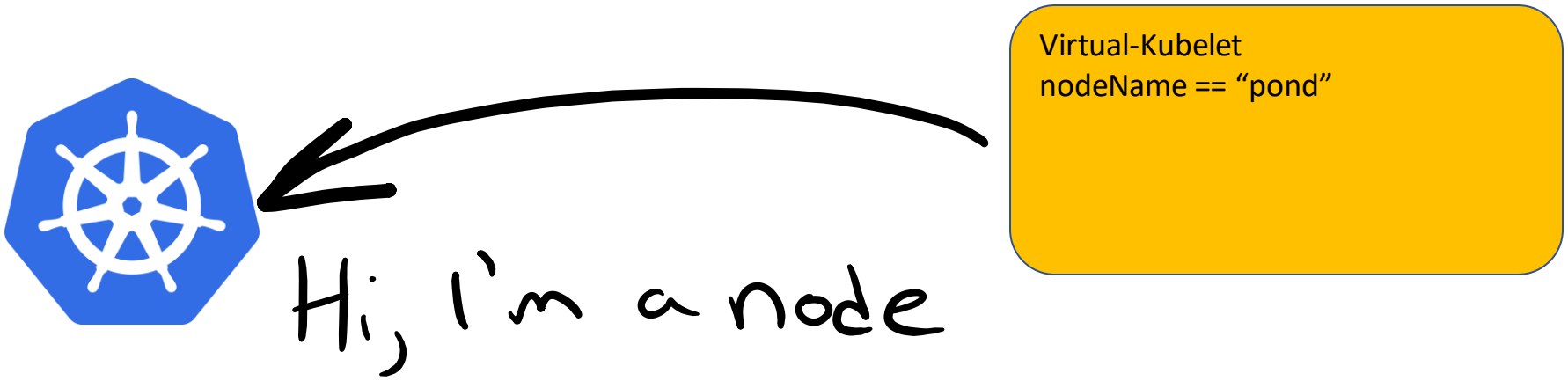
Typical kubelets implement the pod and container operations for each node as usual.

Virtual kubelet registers itself as a “node” and allows developers to program their own behaviors for operations on pods and containers.

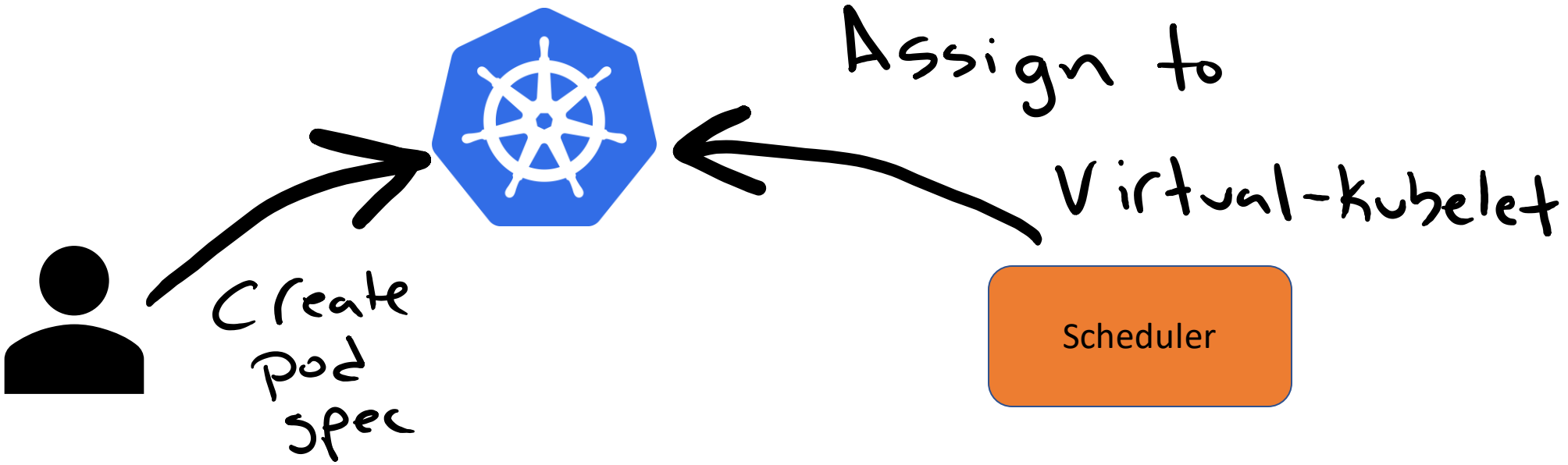
How it works

How it works

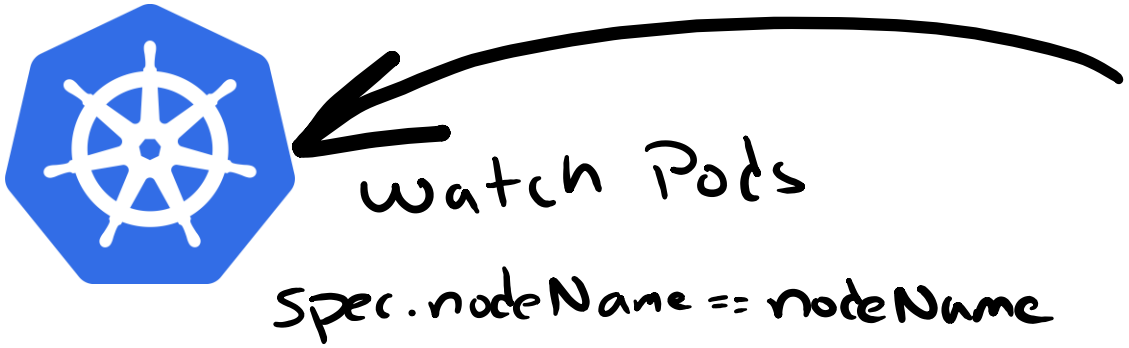
How it actually works



How it actually works



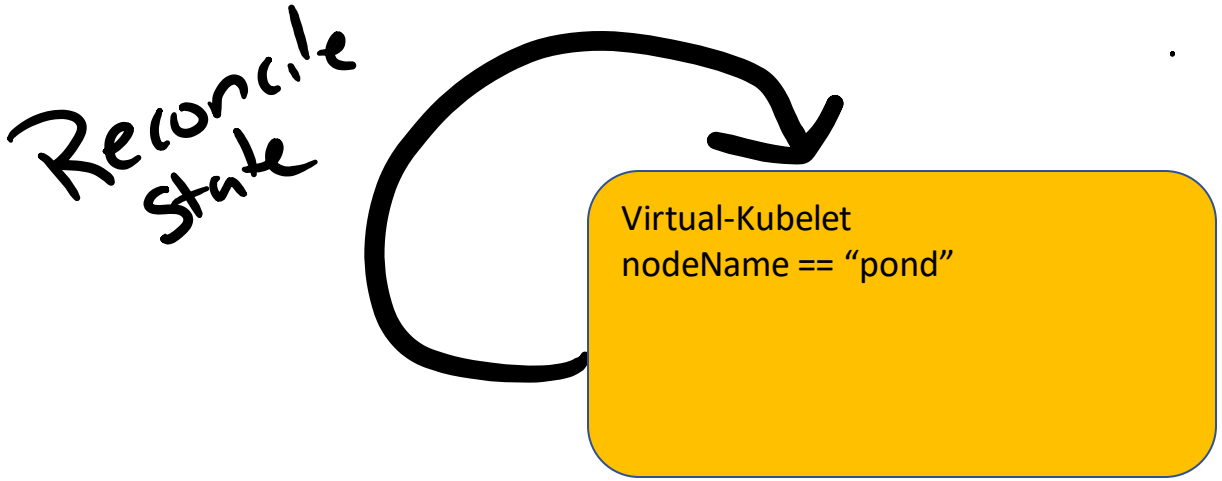
How it actually works



Virtual-Kubelet
nodeName == “pond”

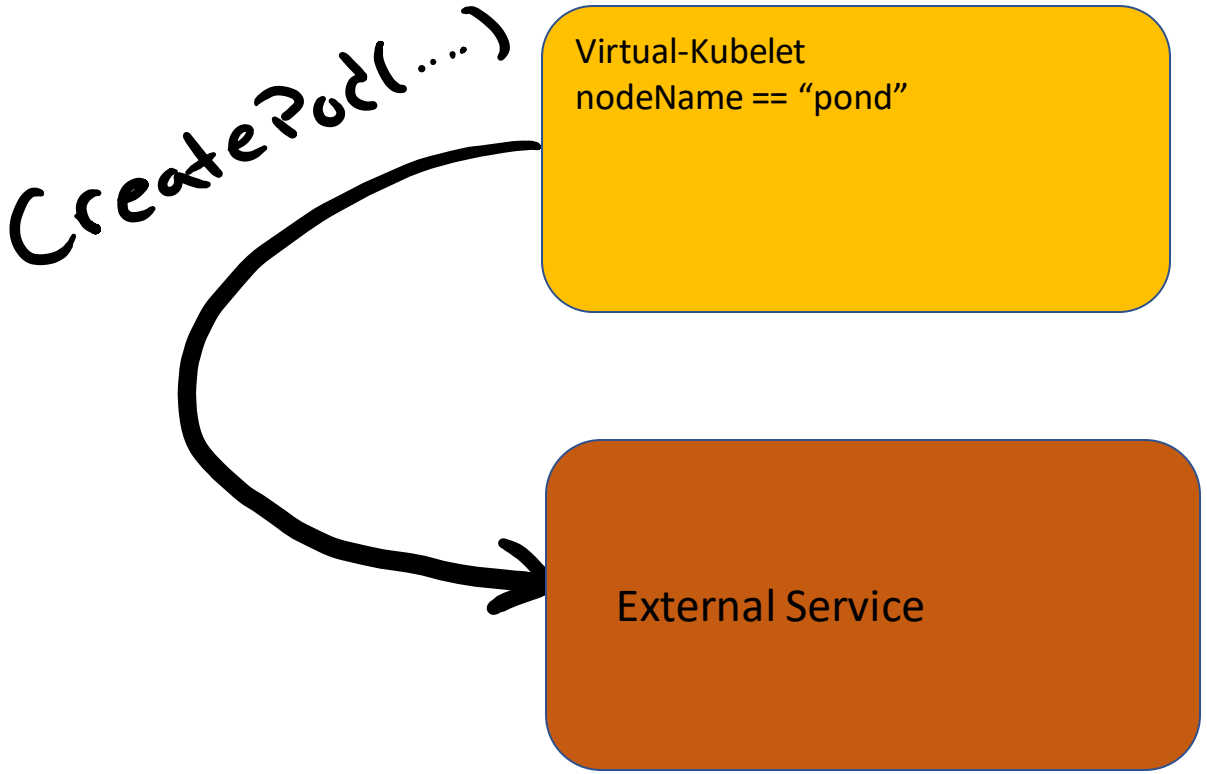
External Service

How it actually works

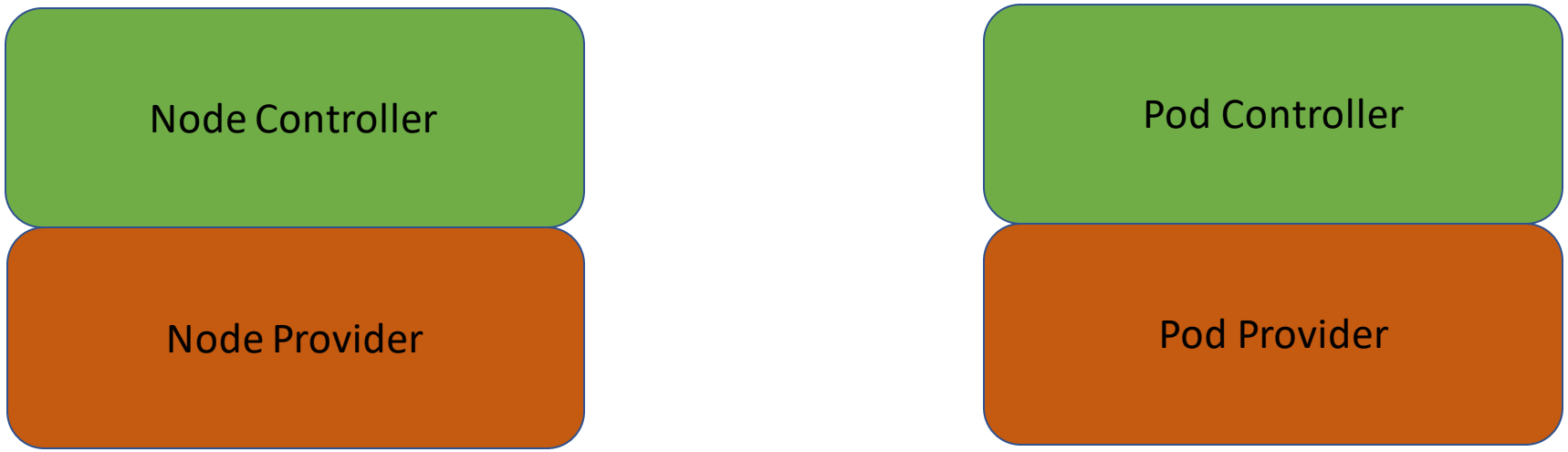


External Service

How it actually works



Anatomy of Virtual Kubelet



Anatomy of Virtual Kubelet

Pod Controller

Sets up watches for pods scheduled to the specified node. When pods are added, updated, deleted in Kubernetes, calls the appropriate handler on the pod provider.
Also populates pod specs from the downward API.

Pod Provider

Provide the back-end plumbing necessary to support the lifecycle management of pods, containers and supporting resources in the context of Kubernetes.

This is your code.

Anatomy of Virtual Kubelet

Node Controller

Registers and ensures node is active in Kubernetes by providing status updates and node leases.

Node Provider

Notifies the node controller when there is a status change for the node.

Anatomy of Virtual Kubelet

Code Example!

Providers

- Azure - ACI
- AWS
- Alibaba
- Huawei
- VMWare
- Azure - IoT Edge

Providers

Code Example!

Since last we met!

- 1.0 released on July 9th, 2019
  - Stabilized provider interfaces
  - Moved all providers out of tree, all now consume Virutal Kubelet as a library
- 1.1 released on September 18, 2019
  - Mostly bug fixes
  - Minor version bump due to changes to underlying Kubernetes libs
- 1.2 released on November 6, 2019
  - Support for graceful pod deletion

The Road ahead

- Custom Pod GC policies
- Metrics

Are we missing some functionality you'd like to see? Open an issue and/or bring it to the community sync meeting.

Join us!

http://github.com/virtual-kubelet/virtual-kubelet

Slack channel in Kubernetes #virtual-kubelet

VK Community meetings every other week on Wednesdays at 11am PST

Virtual Kubelet is a CNCF Sandbox project!

Q/A