KubeCon

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Using Kubernetes APIs from Go

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Why we all love Kubernetes

- Features richness
- Designed to handle big workloads
- Robust releases
- Community

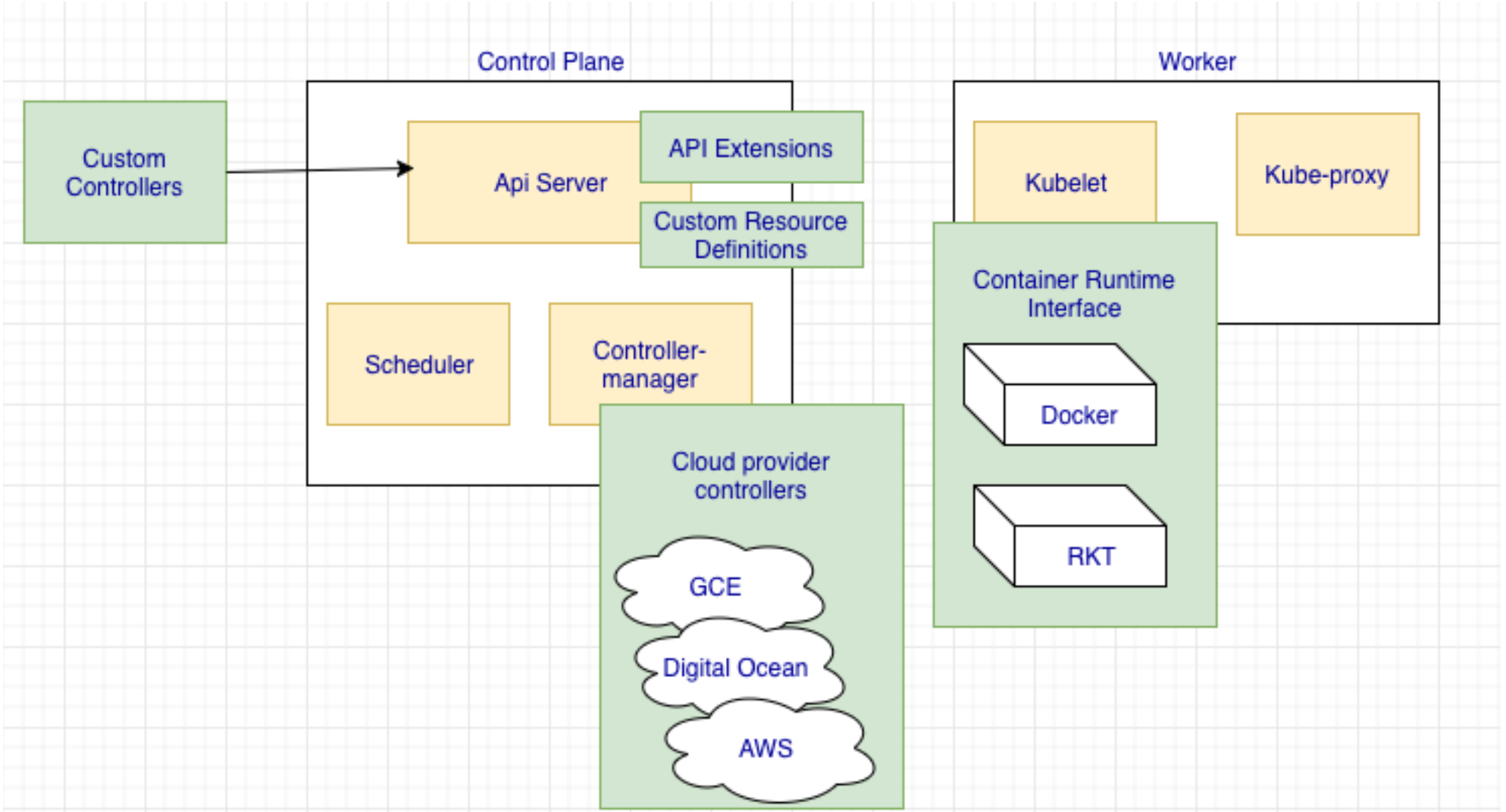
- **Extensibility** (API aggregation, Custom Resource Definitions, Container Runtime Interface)

Extensibility makes Kubernetes a platform

- Core features' set can be extended by third parties
- New user facing APIs can be plugged
- Custom controllers can be written to provide more functionality

Kubernetes ecosystem

Ways to extend Kubernetes



You will hear term “controller” a lot…

The most common definition: “Code that brings current state of the system to the desired state”

Example: Ingress controller

- Monitors ingress resource by talking to k8s APIs
- Configures external LB
- Updates ingress resource with the LB address

Ways to talk to Kubernetes API

- Dashboard
- kubectl
- Programmatic access: calling k8s APIs

Clients

- **Go: https://github.com/kubernetes/client-go**
- Python: https://github.com/kubernetes-incubator/client-python
- Java: https://github.com/fabric8io/kubernetes-client
- And many more: https://kubernetes.io/docs/reference/client-libraries/

We chose Go client, because…

- Kubernetes written in go implies faster updates for client-go bindings
- Language simplicity
- Static linking support

Lets build…

A tool that:

- Monitors k8s nodes
- Alert when storage occupied by the images, changes

https://github.com/alena1108/kubecon2017

Toos used for demo project

- **go-skel**: Go project skeleton tool(https://github.com/rancher/go-skel)
- **trash**: Go ./vendor dependencies manager (https://github.com/rancher/trash)
- **dapper**: Docker build wrapper for building and packaging an app as a container image (https://github.com/rancher/dapper)

Add client-go as a vendor

Make sure its version compatible with Kubernetes server version

vendor.conf

```
1  # package
2  github.com/rancher/kubecon
3
4  github.com/Sirupsen/logrus          v0.10.0
5  github.com/urfave/cli               v1.18.0
6  k8s.io/client-go v4.0.0 transitive=true
```

Chose the way to run the tool

- Inside the cluster – runs inside the pod, managed by Kubernetes
- Outside of cluster – run as an external app

Demo

Controller pieces

- Authenticate
- Watch for data
- Take action on the data

Thank you!