Viettel Digital Talent Program Cloud - 2022

Internship Report

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Internship Report

- Mentee: Nguyễn Tấn Huy
- Mentor: Phạm Tường Chiến
- Senior Buddy: Trần Văn Thắng

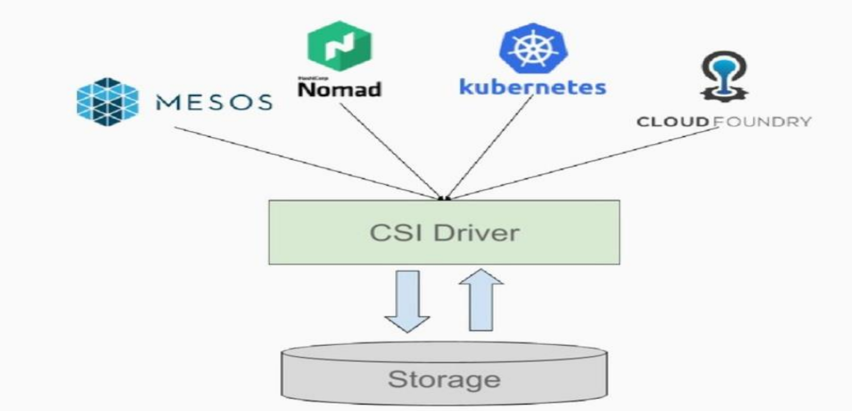
What did mentor and mentee do during this time ?

- Learn about Cinder-CSI.
- Deploy Cinder-CSI and test its features on VM.
- Learn about Helm.
- Learn about CRD, Custom Controller, how to write Custom Controller.
- Write HelmChart Controller.

Cinder-CSI

What is CSI

CONTAINER STORAGE INTERFACE



- an initiative to unify the storage interface of Container Orchestrator Systems (Cos) like Kubernetes, Mesos, … combined with storage vendors like Ceph, Portworx, NetApp,..
- a single CSI for a storage vendor is guaranteed to work with all COs

CSI provides container orchestrators with following capabilities.

CONTAINER STORAGE INTERFACE

- Create or delete volumes.
- Mount/Unmount a volume from a host node.
- Format volumes.
- Create/Delete snapshots.
- Attach/Detach volumes from a host node.

Cinder-CSI

❑ Part of Cloud Openstack Provider

❑ Supports:

- Dynamic Provisioning
- Volume Expansion Example
- Using Block Volume
- Snapshot Create and Restore

....

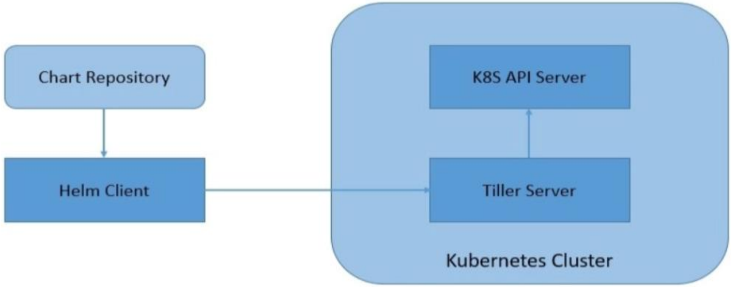
Helm-Chart

Helm

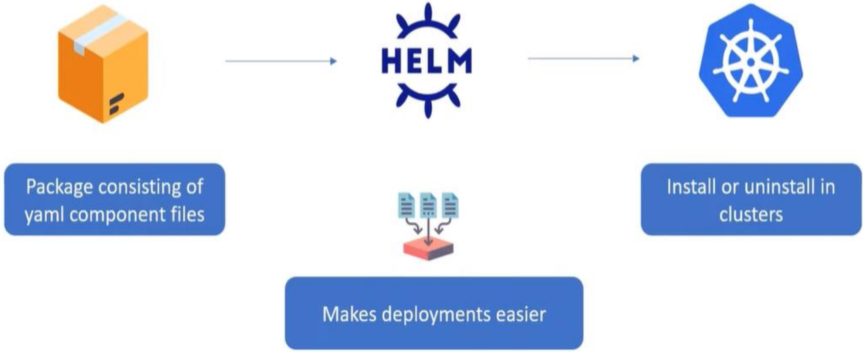
Package manager for Kubernetes

Deploys charts

Meant to reduce complexity



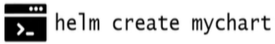
Helm Chart



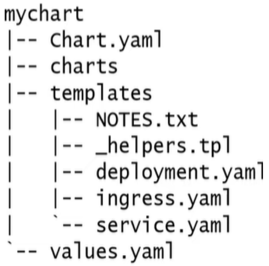
Package consisting of yaml component files

Makes deployments easier

Install or uninstall in clusters

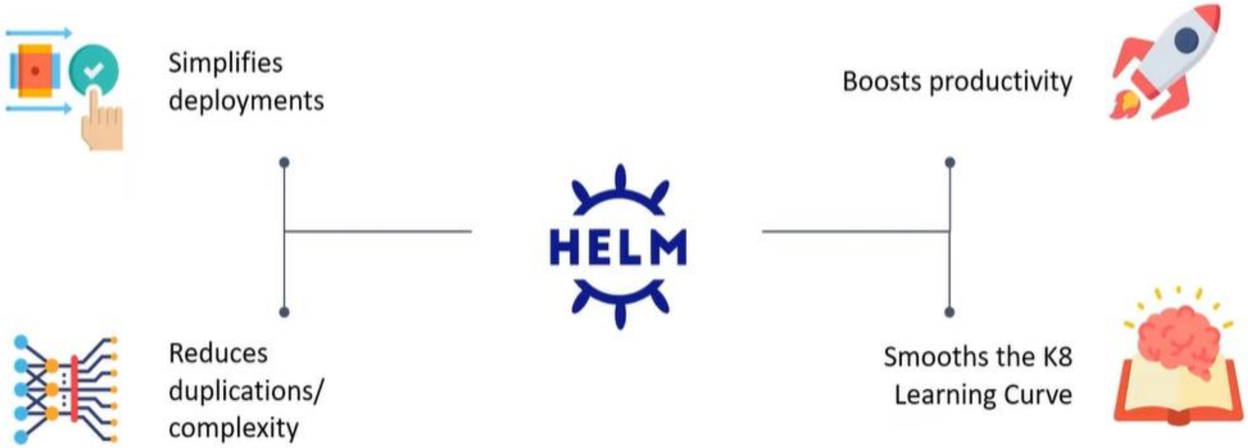


```
helm create mychart
```



```
mychart
|-- Chart.yaml
|-- charts
|-- templates
|   |-- NOTES.txt
|   |-- _helpers.tpl
|   |-- deployment.yaml
|   |-- ingress.yaml
|   `-- service.yaml
`-- values.yaml
```

Why is Helm used ?



Simplifies deployments
Boosts productivity
HELM
Reduces duplications/ complexity
Smooths the K8 Learning Curve

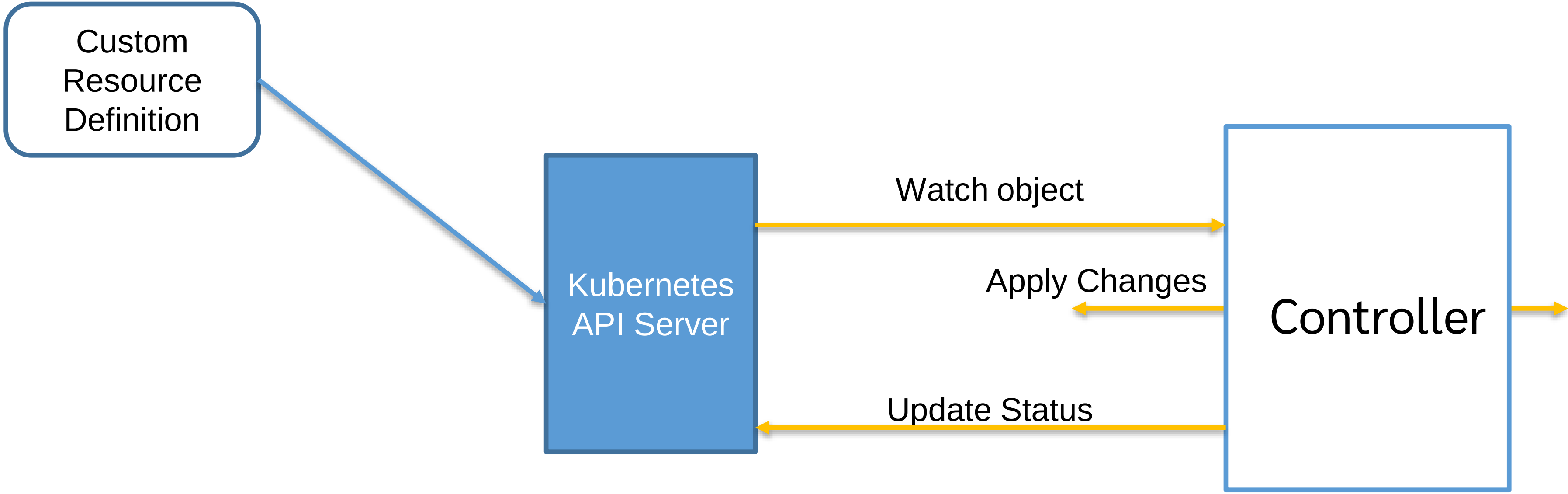
CRD

- Custom Resources: is an extension of the Kubernetes API.
- CRD is the way to tell instructions Kubernetes some Custom Resources properties like “template”
- The CustomResourceDefinition API resource allows you to define custom resources.
- Defining a CRD object creates a new custom resource with a name and scheme that you specify.
- Do not require programming

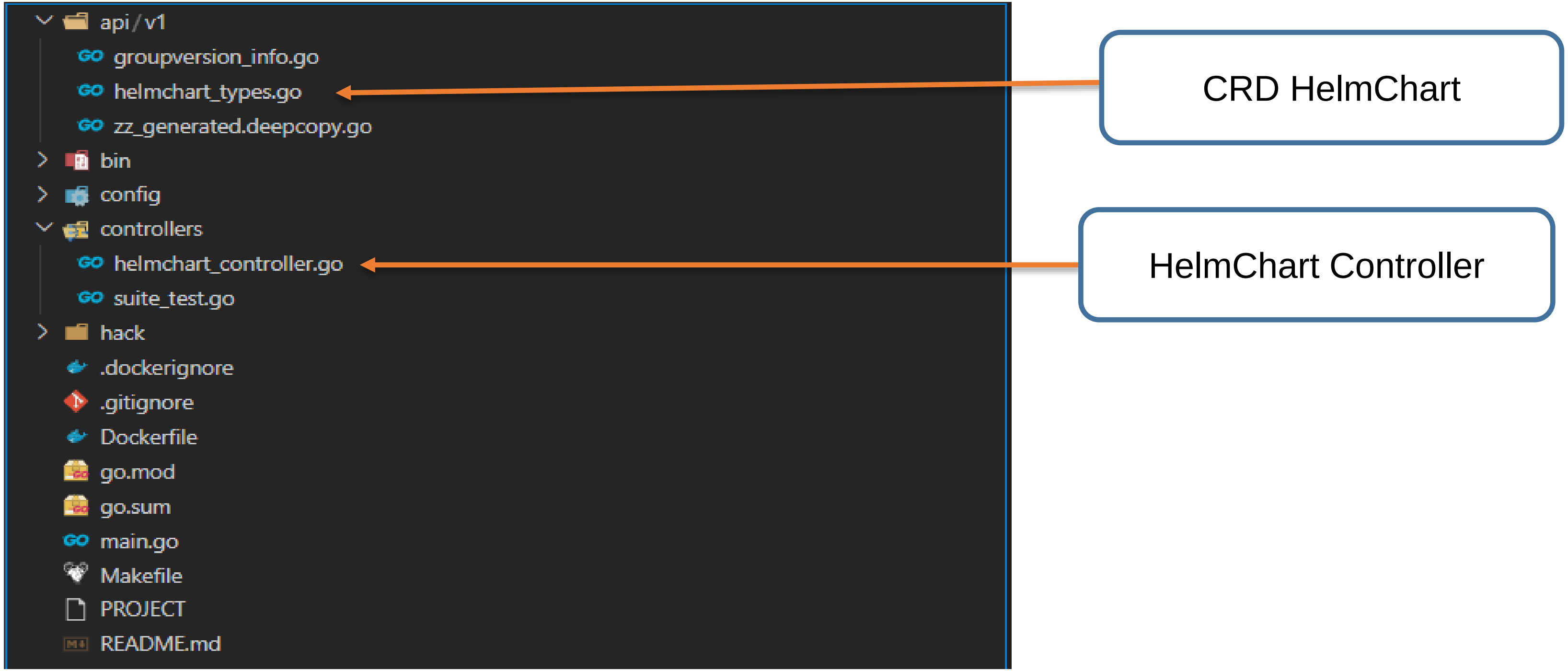
Custom Controller

- Watches Kubernetes Resources
- To extend existing Kubernetes functionality to achieve some desired behavior.
- Enhances platform behavior or introduces new features.

Helm Chart Controller



Helm Chart Controller



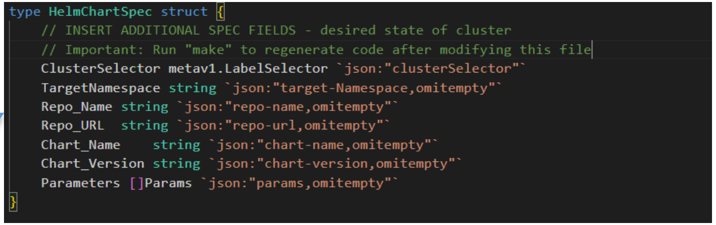
```
api/v1
    groupversion_info.go
    helmchart_types.go
    zz_generated.deepcopy.go
bin
config
controllers
    helmchart_controller.go
    suite_test.go
hack
.dockerignore
.gitignore
Dockerfile
go.mod
go.sum
main.go
Makefile
PROJECT
README.md
```

CRD HelmChart

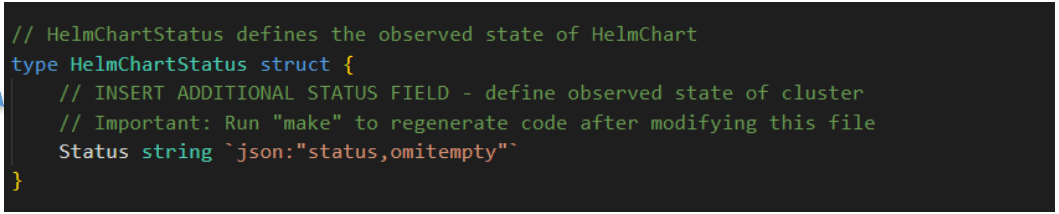
HelmChart Controller

Helm Chart Controller

CRD HelmChart

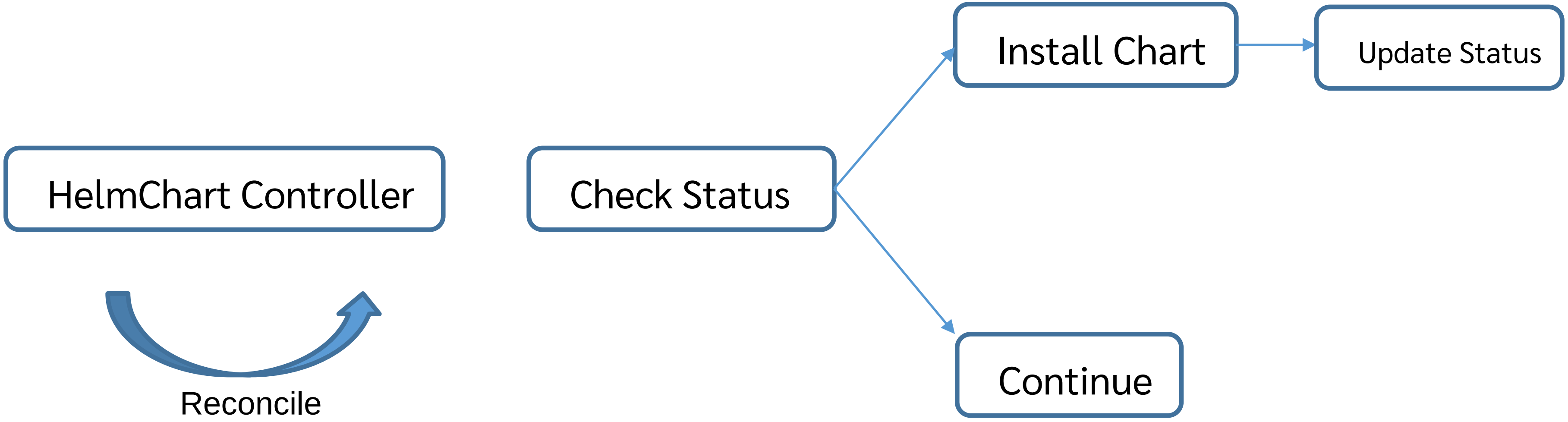


```go
type HelmChartSpec struct {
    // INSERT ADDITIONAL SPEC FIELDS - desired state of cluster
    // Important: Run "make" to regenerate code after modifying this file
    ClusterSelector metav1.LabelSelector `json:"clusterSelector"`
    TargetNamespace string `json:"target-Namespace,omitempty"`
    Repo_Name string `json:"repo-name,omitempty"`
    Repo_URL  string `json:"repo-url,omitempty"`
    Chart_Name    string `json:"chart-name,omitempty"`
    Chart_Version string `json:"chart-version,omitempty"`
    Parameters []Params `json:"params,omitempty"`
}
```



```go
// HelmChartStatus defines the observed state of HelmChart
type HelmChartStatus struct {
    // INSERT ADDITIONAL STATUS FIELD - define observed state of cluster
    // Important: Run "make" to regenerate code after modifying this file
    Status string `json:"status,omitempty"`
}
```

Helm Chart Controller



Thank you!