Lab 14B. ArgoCD

Following CI with Tekton, ArgoCD offers the missing piece of how to set up an automated and sophisticated continuous deployment and delivery system which are based on the principles of GitOps. In this lab exercise, you are going to learn:

- How to set up ArgoCD with a web UI inside an existing Kubernetes cluster.
- How to set up an automated deployment to Kubernetes using the principles of GitOps.

Setting Up ArgoCD

Install ArgoCD:

```
kubectl create namespace argocd
```

```
kubectl apply -n argocd -f
https://raw.githubusercontent.com/argoproj/argo-cd/stable/manifests/in
stall.yaml
```

Source: GitHub, install_argocd.md

Reset admin password to **password**:

```
#
bcrypt(password)=$2a$10$rRyBsGSHK6.uc8fntPwVIuLVHgsAhAX7TcdrqW/RADU0uh
7CaChLa
kubectl -n argocd patch secret argocd-secret \
  -p '{"stringData": {
    "admin.password":
"$2a$10$rRyBsGSHK6.uc8fntPwVIuLVHgsAhAX7TcdrqW/RADU0uh7CaChLa",
    "admin.passwordMtime": "'$(date +%FT%T%Z)'"
  }}'
```

Source: GitHub, reset-argo-passwd.md

Reference: GitHub, argo-cd/faq.md at master ○ argoproj/argo-cd

```
kubectl get all -n argocd
```

```
kubectl patch svc argocd-server -n argocd --patch \
  '{"spec": { "type": "NodePort", "ports": [ { "nodePort": 32100,
"port": 443, "protocol": "TCP", "targetPort": 8080 } ] } }'
```

Source: GitHub, patch_argo.md

```
kubectl get svc -n argocd
```

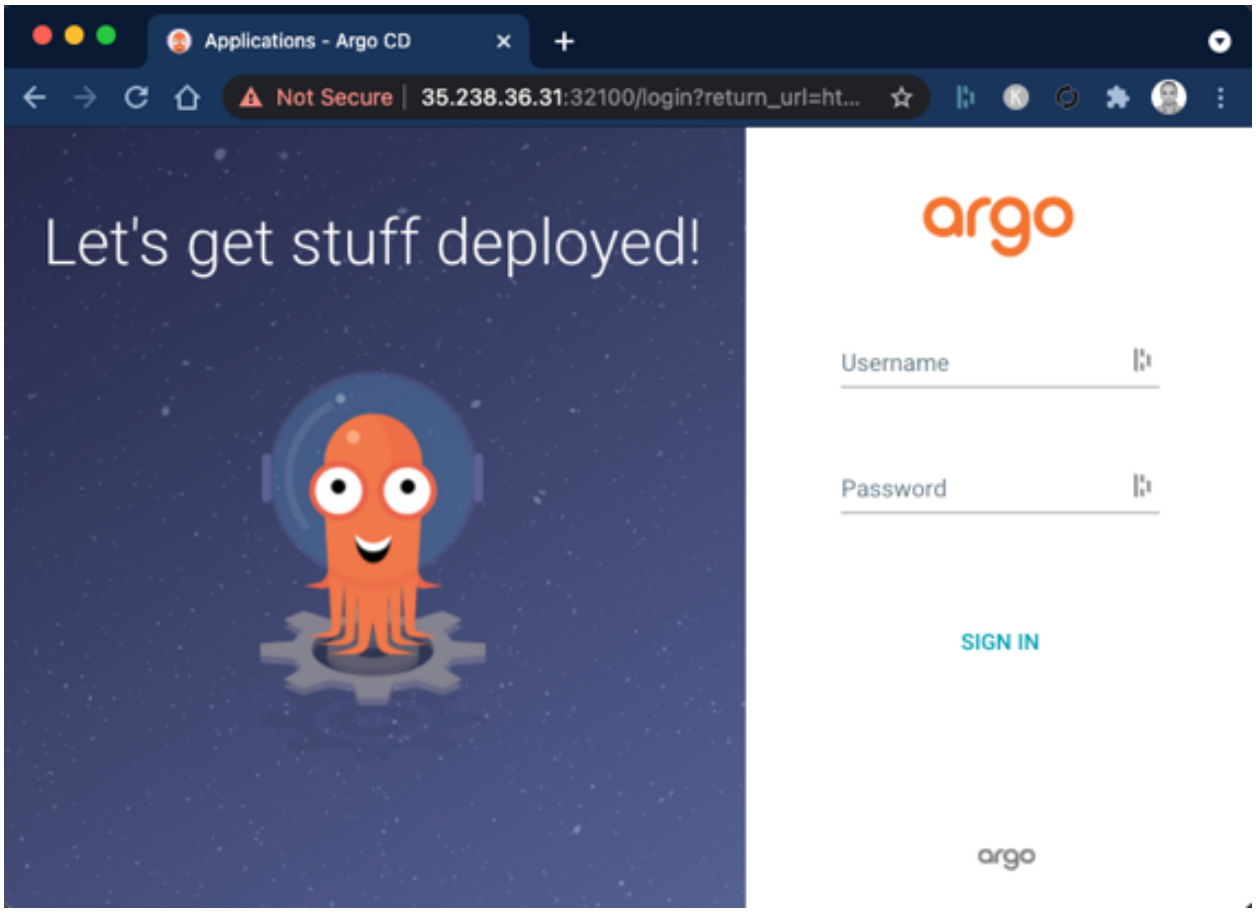
Find out the IP address for one of the nodes. One way to do that, is to run the following command:

```
kubectl get nodes -o wide
```

Write down the IP address for one of the nodes and browse to https://NODEIP:32100.

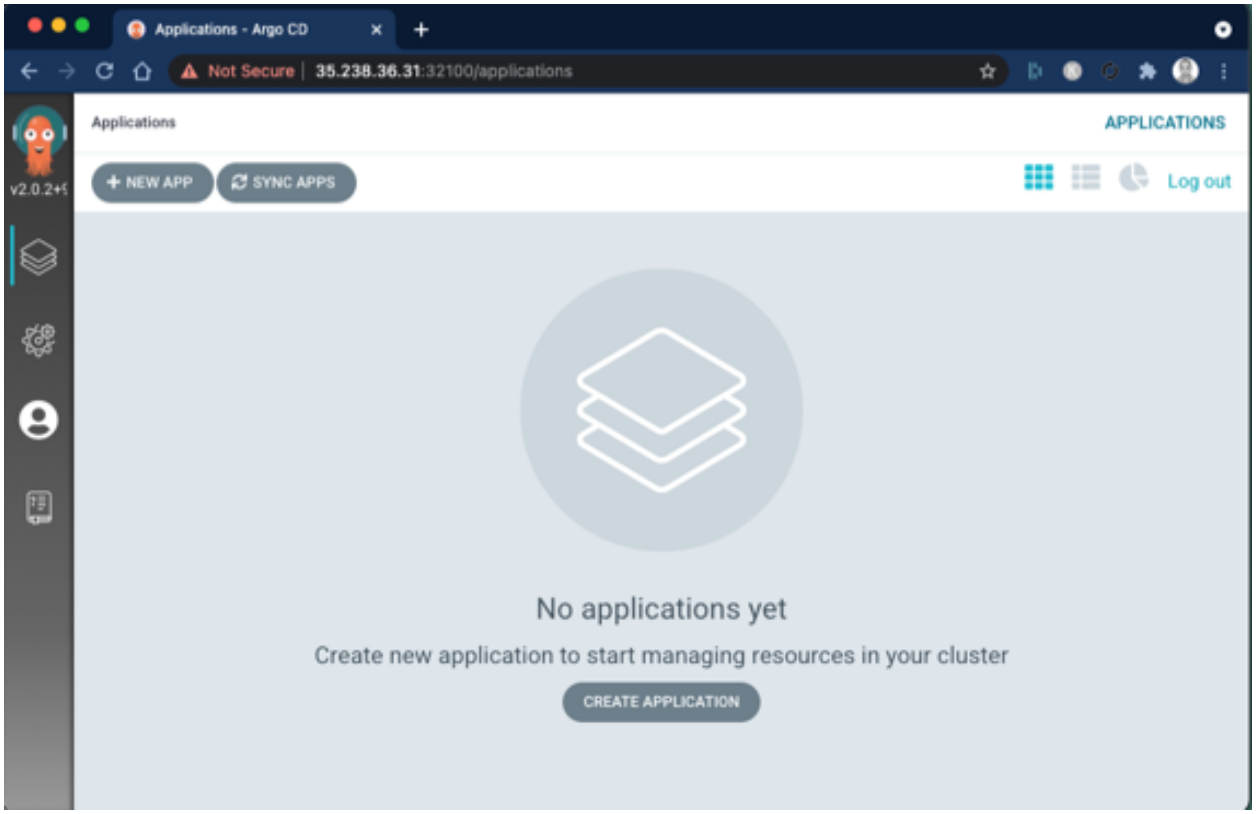
Replace **NODEIP** with the actual IP address of the node listed above.

You should be presented with the login page for ArgoCD:



- username = **`admin`**
- password = **`password`**

Once logged in, you should see a screen such as this one:



Preparing Application Deployment Manifests

Create a fork of GitHub's schoolofdevops/vote repository. Clone it to the host where **kubectl** is available and switch to it:

```
git clone https://github.com/xxxxxx/vote.git
cd vote
mkdir deploy
cd deploy
```

Replace **xxxxxx** with the actual user/organization name.

Generate YAML manifests to deploy **vote** app:

```
kubectl create deployment vote \
  --image=schoolofdevops/vote:v1 \
  --replicas=4 \
  --port=80 \
  --dry-run=client -o yaml  | tee  vote-deploy.yaml
```

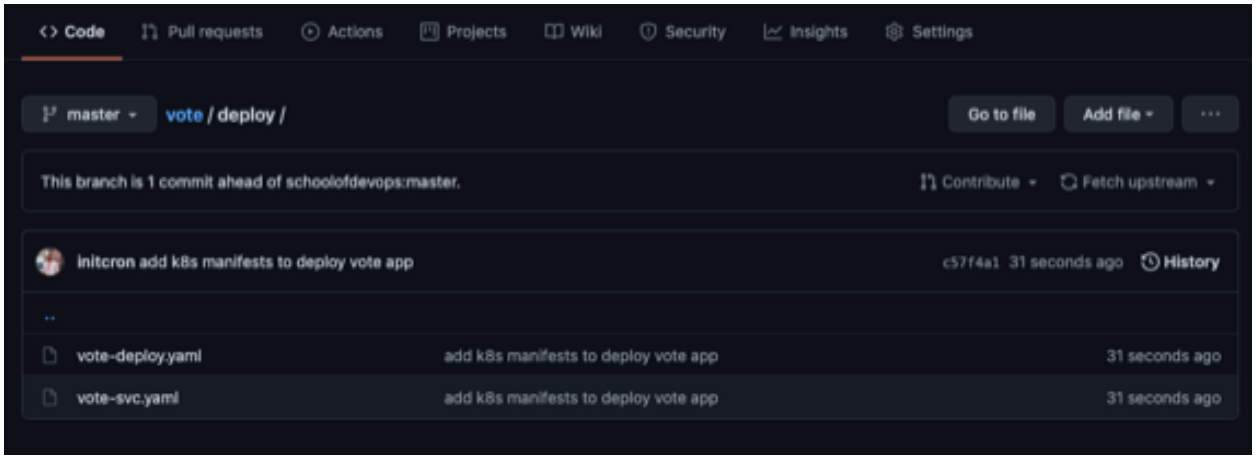
Generate manifest to create a Load Balancer (Service):

```
kubectl create service nodeport \
  vote --tcp=80 \
  --node-port=30100 \
  --dry-run -o yaml | tee vote-svc.yaml
```

Add and commit to the git repository:

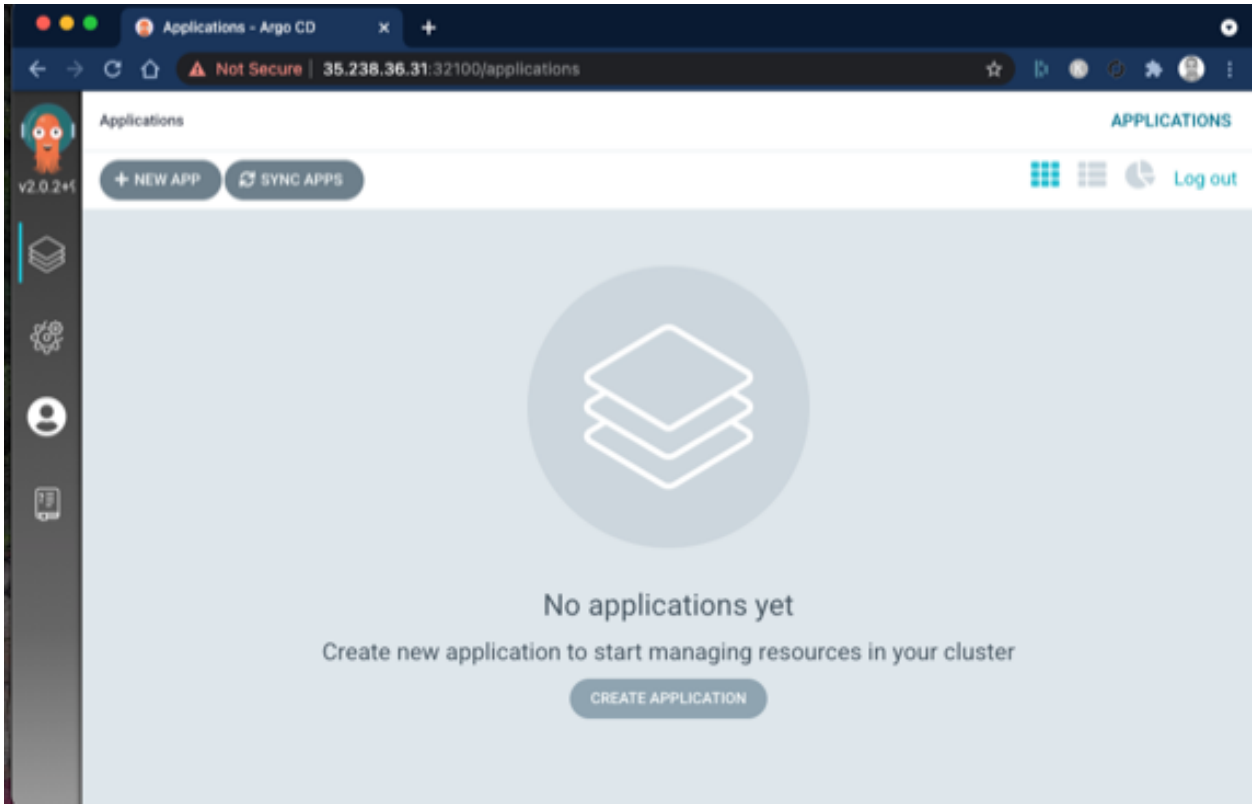
```
git add vote-deploy.yaml vote-svc.yaml
git commit -am "add k8s manifests to deploy vote app"
git push origin master
```

Validate that these manifests are reflected in your git repository:



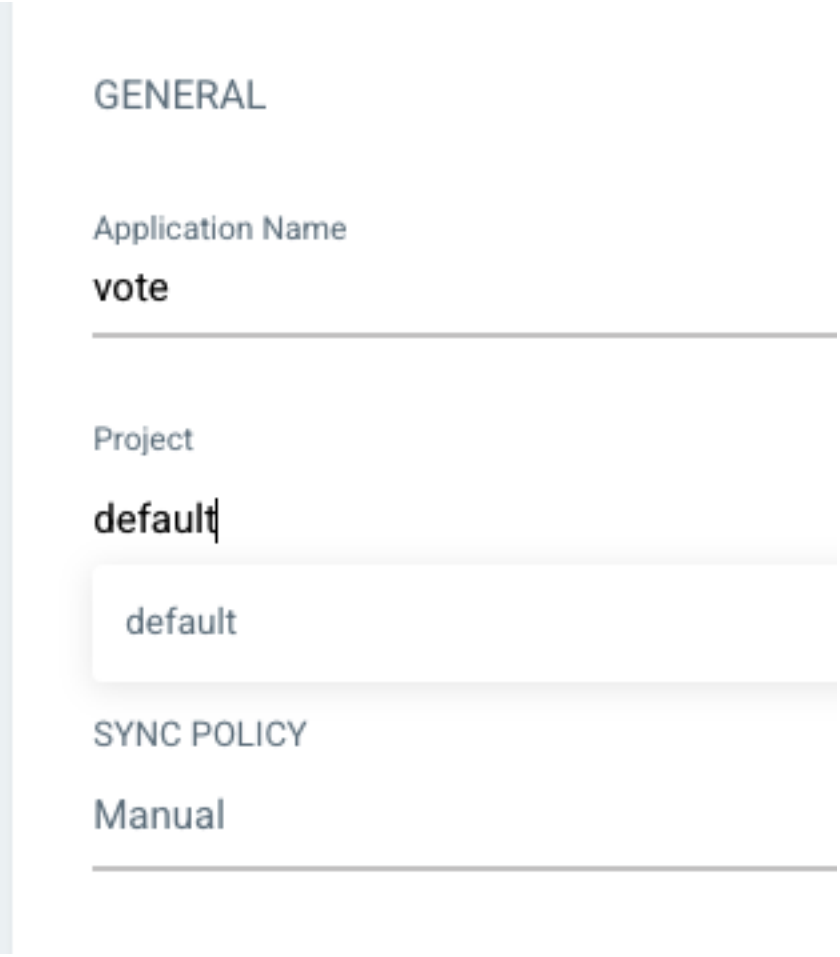
Setting Up an Automated Deployment with ArgoCD

Browse to ArgoCD web console and click on *Create Application*:



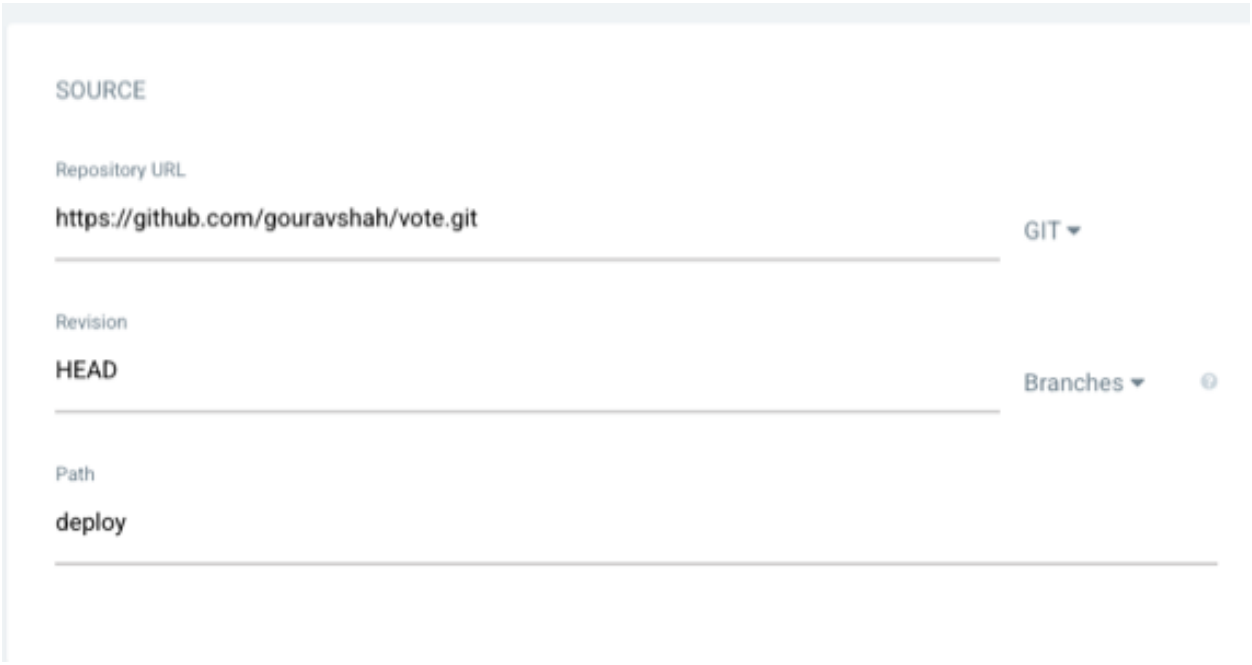
In *General* set the following options:

- Application Name: “vote”
- Project: “default”
- Sync Policy: “Manual”



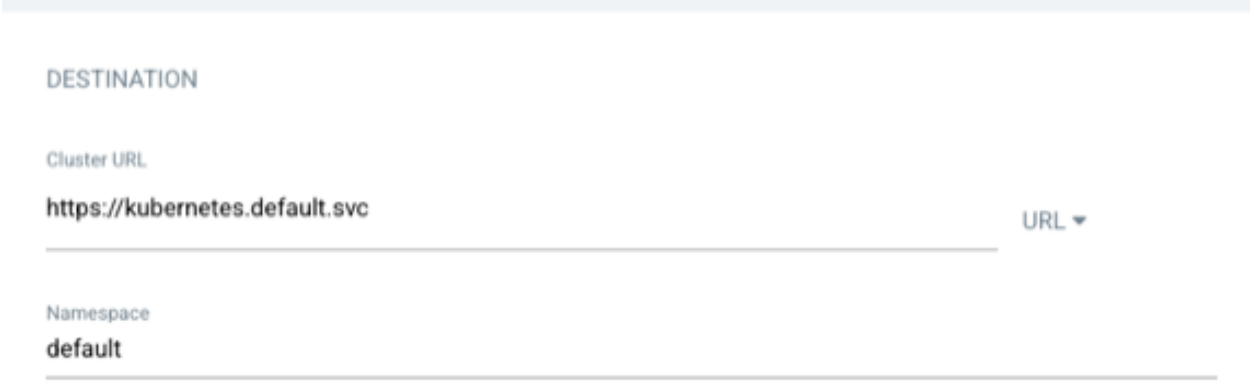
In *Source* set the following options:

- Repository URL: Your repository URL (https)
- Revision: “HEAD”
- Path: “deploy”

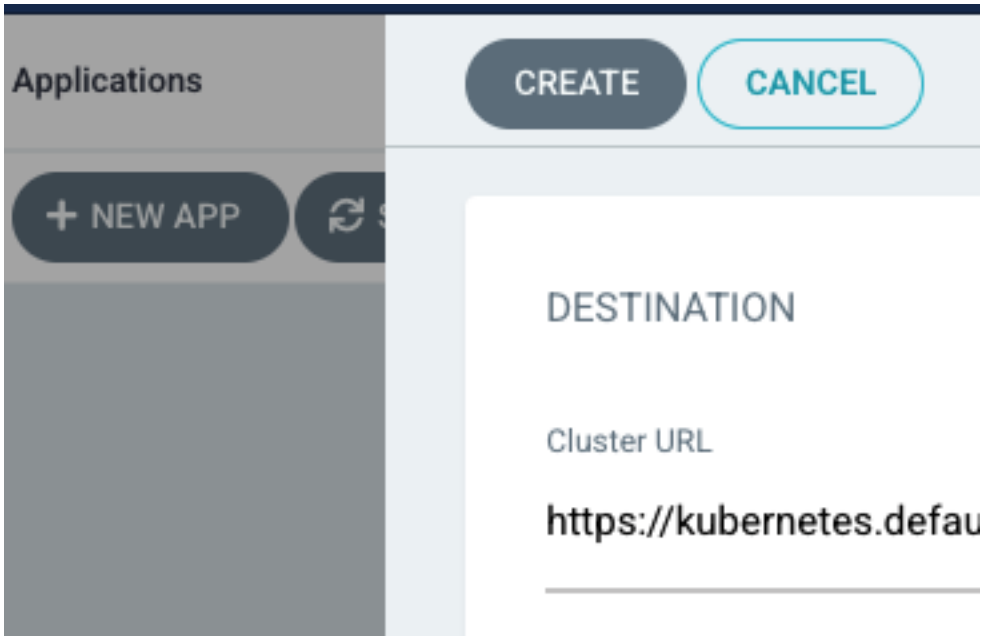


In *Destination* set the following options:

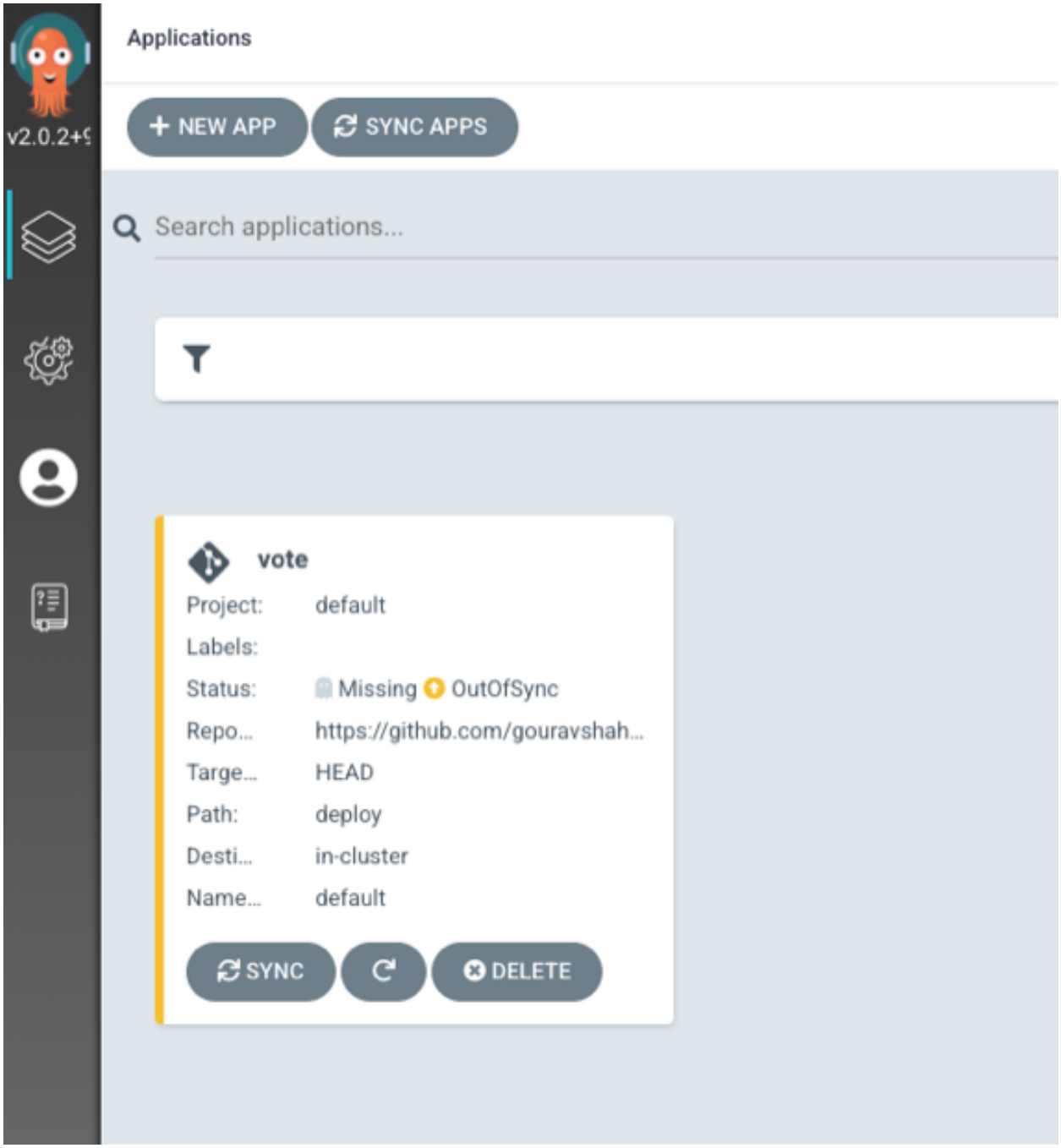
- Cluster URL: https://kubernetes.default.svc (default)
- Namespace: “default”



Click on the *CREATE* button on the top:



You should now see a `vote` application created.

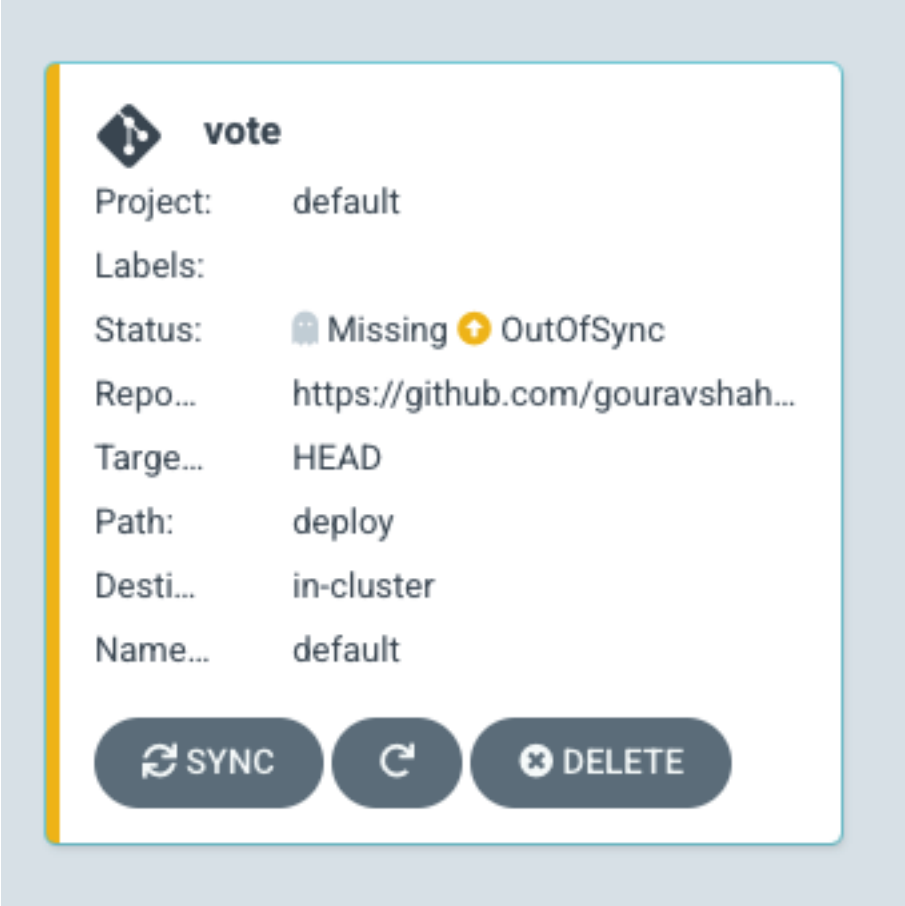


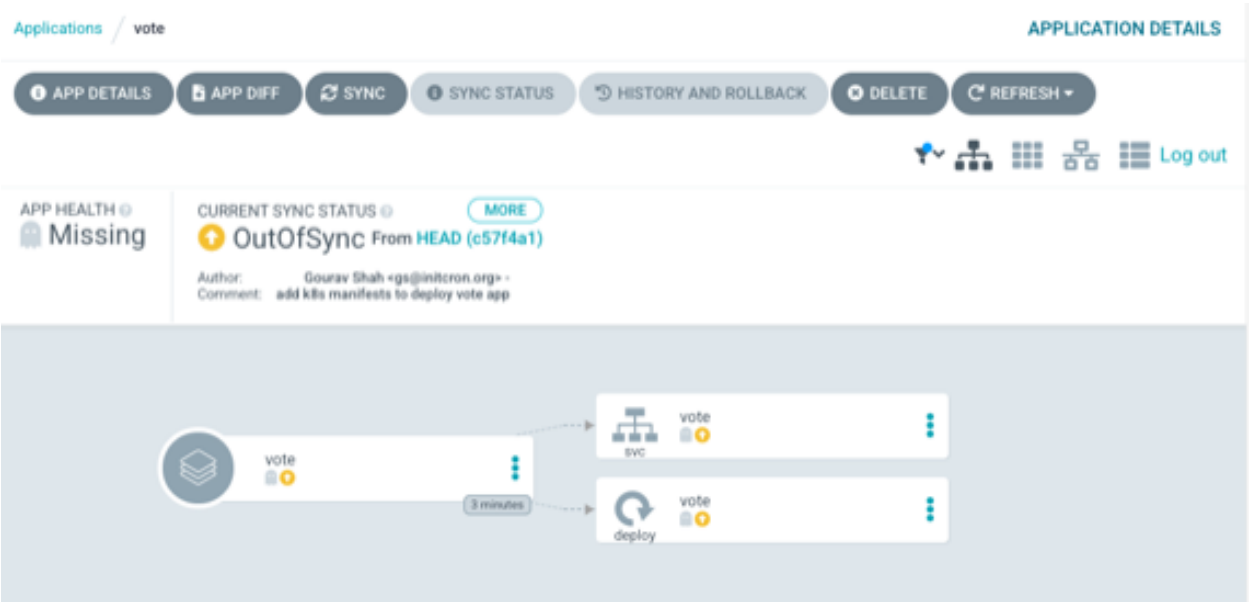
Deploy to Kubernetes

Before you begin deployment, go to the **`kubectl`** console and start looking for changes in the default namespace:

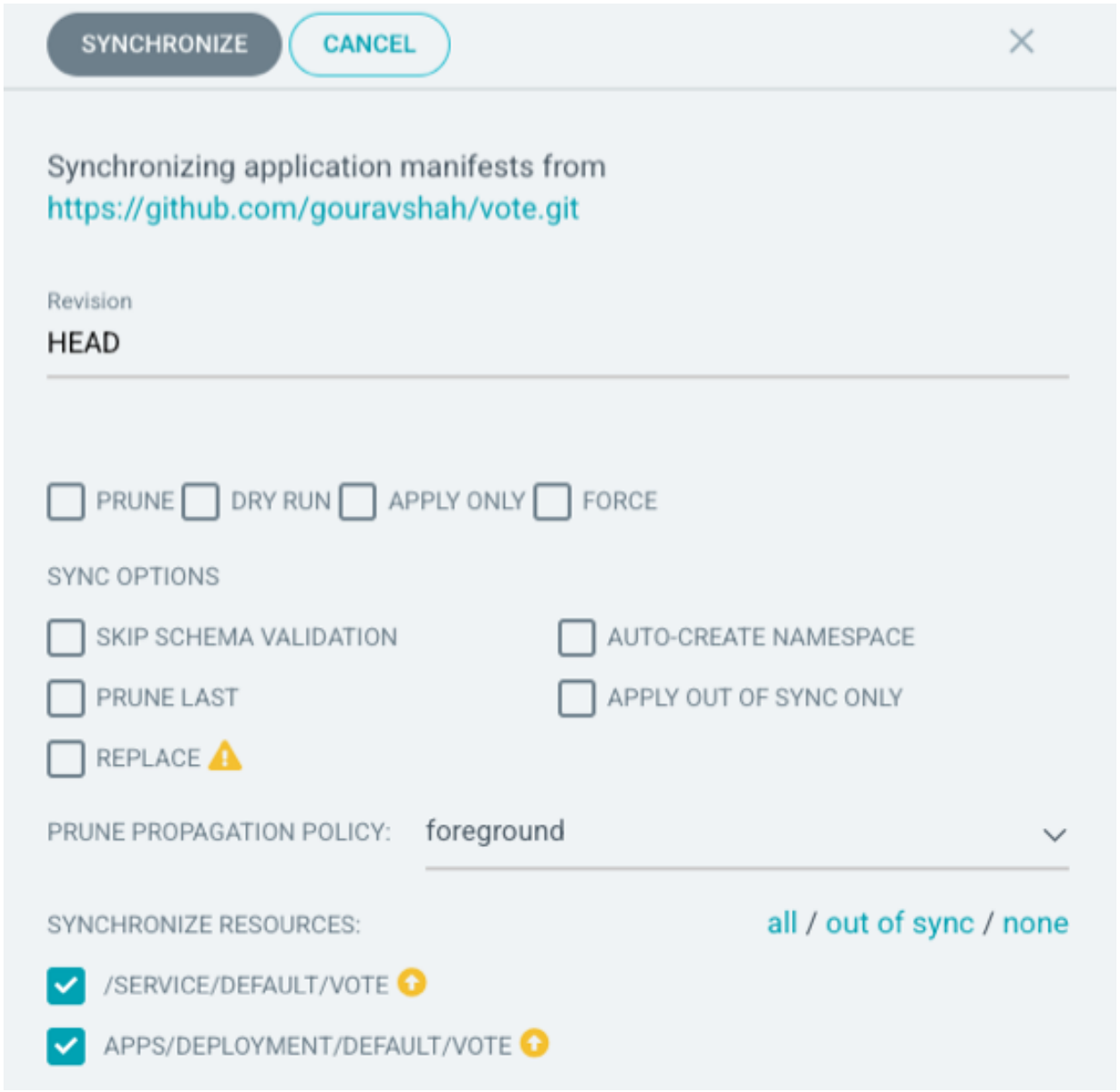
```
watch kubectl get all -n default
```

Select the `vote` application on ArgoCD to access more details:





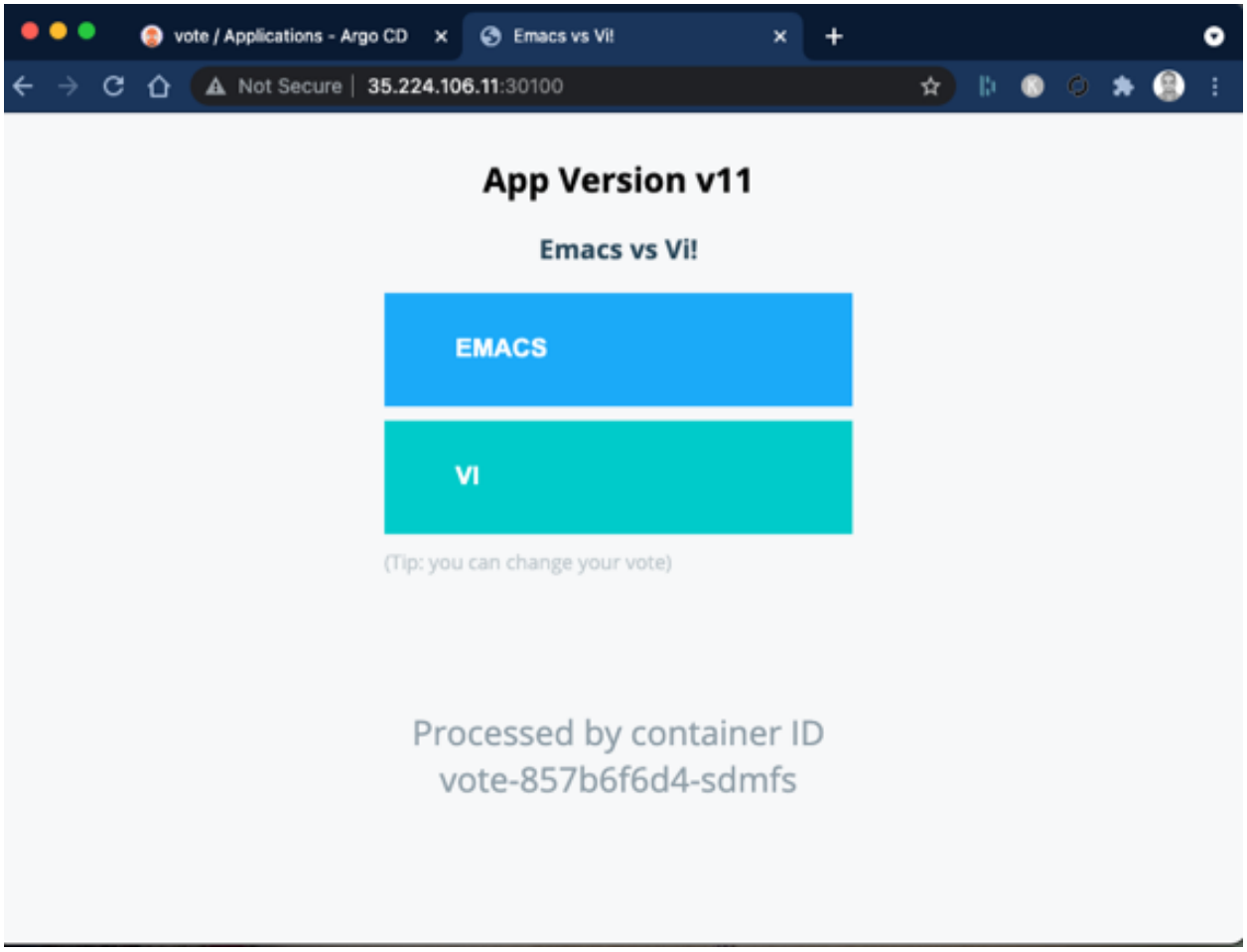
Go ahead and click on the *SYNC* button. You should see screen such as one below:



Keep everything as is and click on the *SYNCHRONIZE* button.

Watch for the changes in the console as well as in Argo. You should see the application synced from the git repository to the Kubernetes cluster in a few seconds.

Validate by accessing the **`vote`** application on http://NODEIP:30100.



Now:

- Enable auto-sync by browsing to *App Details* → *ENABLE AUTO-SYNC*.
- Try modifying YAML manifests in git and either do a Manual sync, or wait for the Auto sync to see if changes in git are reflected in the cluster. Some configurations you can play with include:
  - image: **`schoolfodevops/vote: vxx`** (you can use tags v1 to v9 which are available on Docker Hub)
  - replicas
  - nodePort in service
- Create YAML manifests for a **`sysfoo`** application, add it to the repository and have it synced automatically with ArgoCD.

Additional Resources

- *"Getting Started with Argo"*

Summary

GitOps is an up and coming technology, with ArgoCD and FluxCD being the two most popular options to implement it. In this exercise, you have learned just enough about GitOps to get you curious and explore this topic further. You can start diving deeper into the world of GitOps with the Linux Foundation's course: *"GitOps: Continuous Delivery on Kubernetes with Flux" (LFS269)*.