CI/CD con Jenkins y ArgoCD

Joe | 2023

GitOps

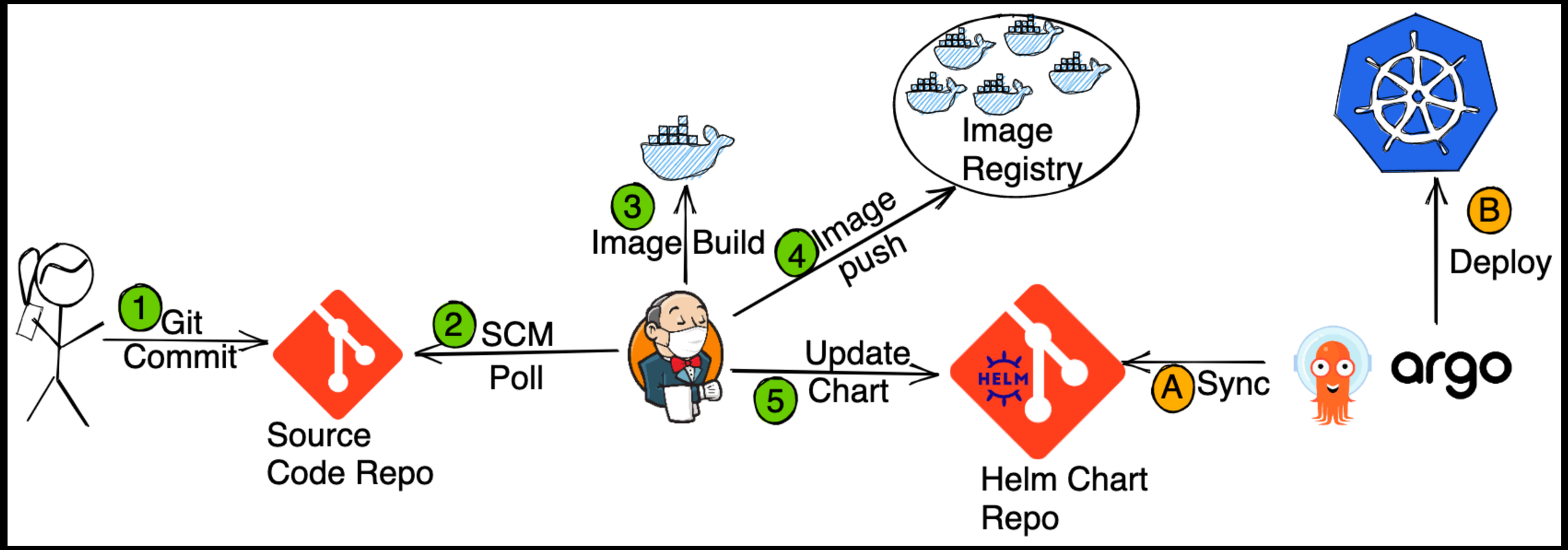
- Su nombre revela que nos gustaría administrar nuestras operaciones como implementación de aplicaciones, administración, escalamiento, etc. vía Git.
- Podemos commitear a Git y nuestra aplicación/infraestructura es instalada o actualizada.
- Hay muchas herramientas que soportan esto cómo: ArgoCD, Flux, entre otras. Veremos sólo ArgoCD.
- Las herramientas GitOps nos dan las siguientes características:
  - Declarativo
  - Observabilidad
  - Auditoría y compliance
  - Rollback

ArgoCD

https://argoproj.github.io/cd/

- Es uno de los proyectos bajo ArgoProj, el cual tiene otros proyecto como Argo Workflows, Argo Rollouts y Argo Events.

GitOps Workflow



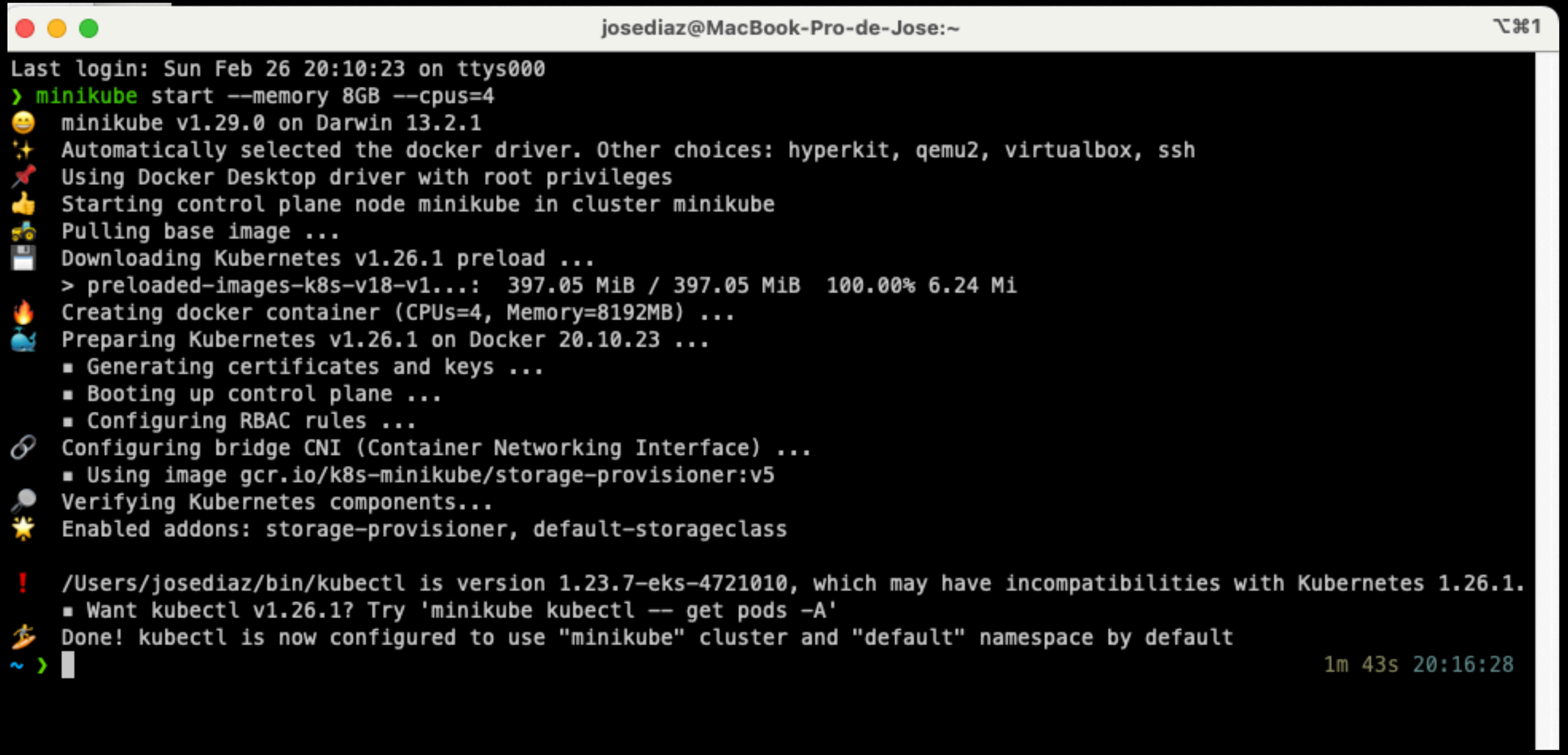
Desplegando una aplicación con ArgoCD

Minikube

https://minikube.sigs.k8s.io/docs/start/

- curl -LO https://storage.googleapis.com/minikube/releases/latest/minikube-darwin-amd64
- sudo install minikube-darwin-amd64 /usr/local/bin/minikube

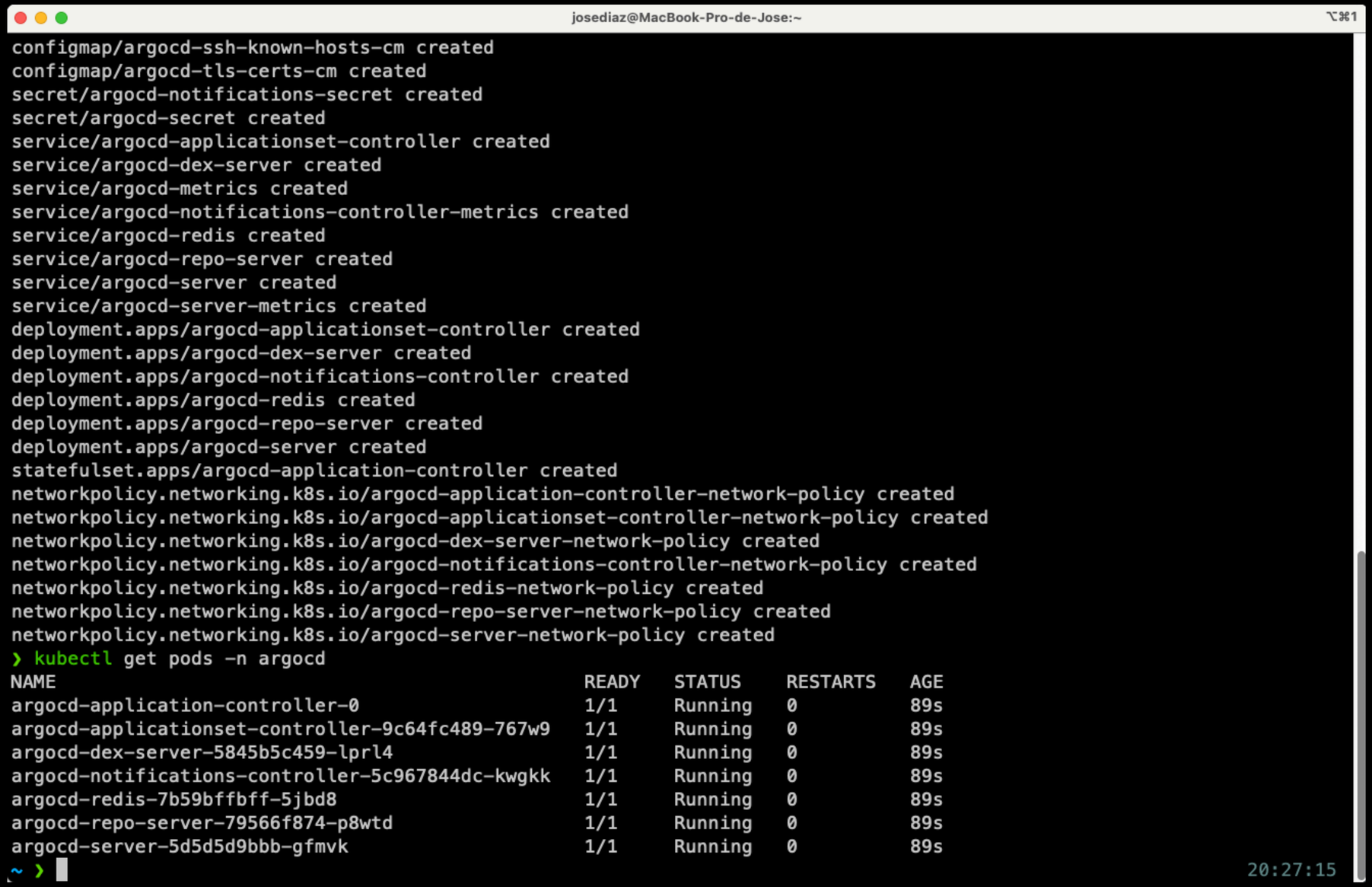
minikube start --memory 8GB --cpus=4



Instalar ArgoCD

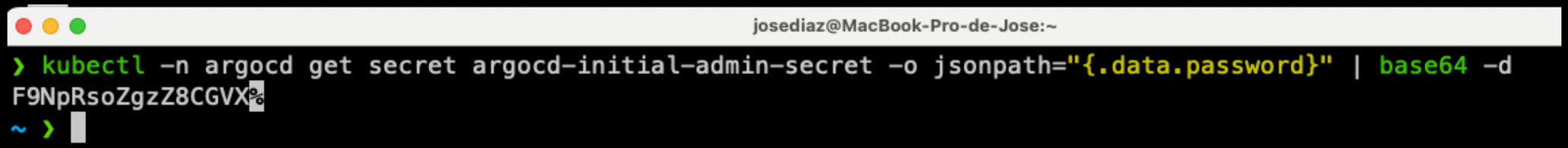
- kubectl create ns argocd
- kubectl apply -n argocd -f https://raw.githubusercontent.com/argoproj/argo-cd/stable/manifests/install.yaml
- kubectl get pods -n argocd

kubectl get pods -n argocd



Instalar ArgoCD

- Una vez que los pods están Running, podemos acceder a la UI con el usuario admin, pero, hay que ejecutar este comando para obtener el password:
- kubectl -n argocd get secret argocd-initial-admin-secret -o jsonpath="{.data.password}" | base64 -d



Instalar ArgoCD

- Para acceder a la UI de ArgoCD ejecuta este comando:
- kubectl port-forward svc/argocd-server -n argocd 8080:443

```
❯ kubectl port-forward svc/argocd-server -n argocd 8080:443
Forwarding from 127.0.0.1:8080 -> 8080
Forwarding from [::1]:8080 -> 8080
```

Applications Tiles - Argo CD

Not Secure | https://localhost:8080/login?return_url=https%3A%2F%2Flocalhost%3A8080%2Fapplications

Let's get stuff deployed!

argo

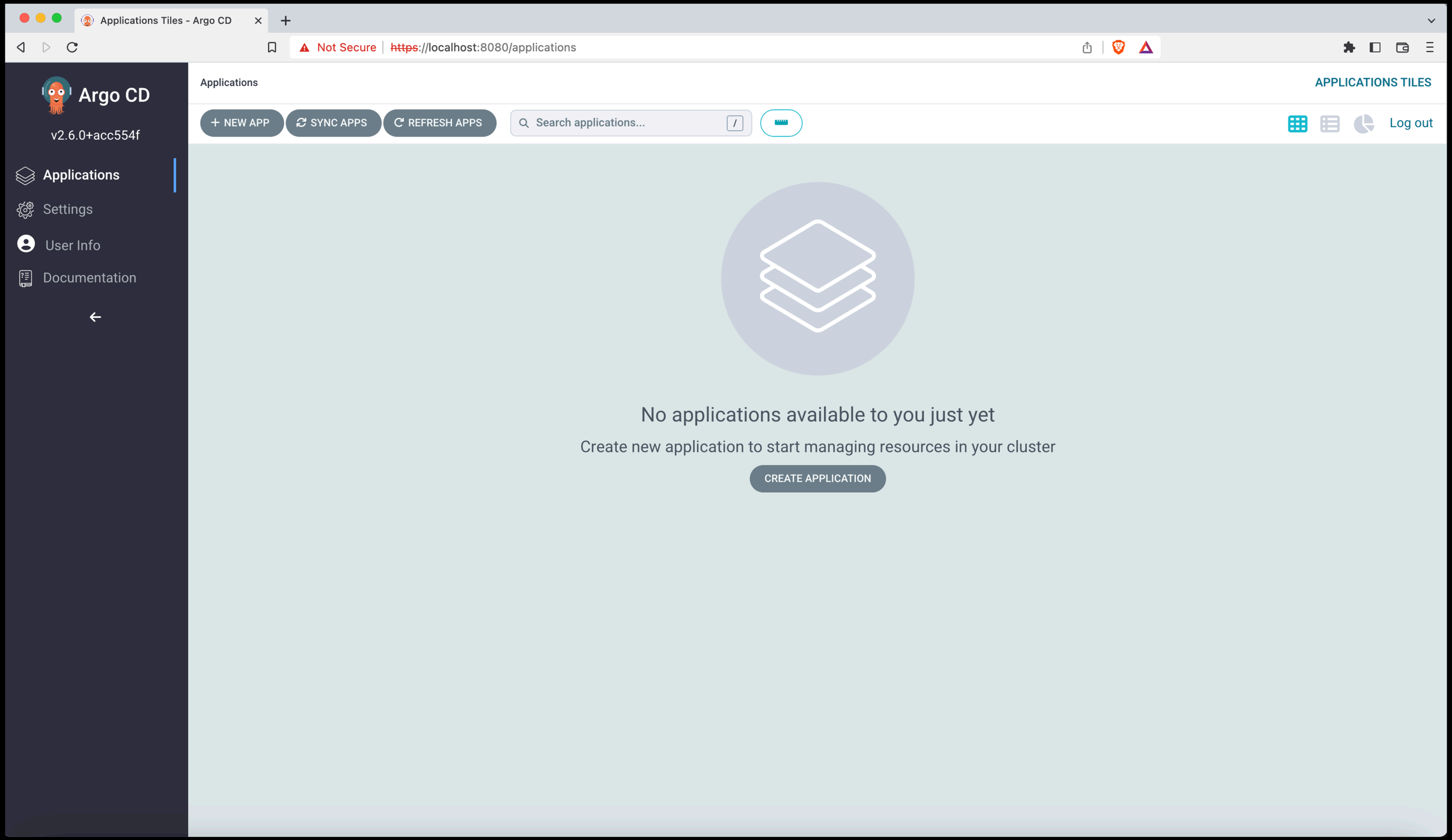
Username

admin

Password

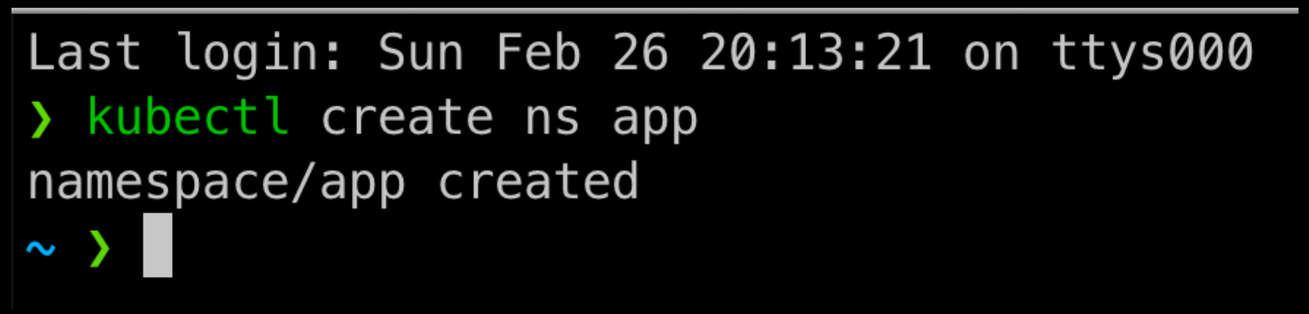
SIGN IN

argo


Applications Tiles - Argo CD
Not Secure
https://localhost:8080/applications
Argo CD
v2.6.0+acc554f
Applications
Settings
User Info
Documentation
Applications
APPLICATIONS TILES
+ NEW APP
SYNC APPS
REFRESH APPS
Search applications...
/
Log out
No applications available to you just yet
Create new application to start managing resources in your cluster
CREATE APPLICATION

Crear namespace app

- kubectl create ns app



Pasos para crear una aplicación

- Forkear proyecto: https://github.com/joedayz/rsvpapp-helm-cicd
- Login a ArgoCD
- Clic en new app y actualizar con lo siguiente
- Dar como nombre de aplicación: rsvapp
- Seleccionar el proyecto. Por ahora escoger el nombre default, el cual es automáticamente presentado después de la instalación de ArgoCD
- Establecer SyncPolicy Automatic.
- Habilitar la opción Prune Resources
- Habilitar SELF HEAL

CREATE CANCEL

EDIT AS YAML

GENERAL

Application Name

rsvpapp

Project Name

default

SYNC POLICY

Automatic

- [x] PRUNE RESOURCES
- [x] SELF HEAL

- [ ] SET DELETION FINALIZER

SYNC OPTIONS

- [ ] SKIP SCHEMA VALIDATION
- [ ] PRUNE LAST
- [ ] RESPECT IGNORE DIFFERENCES
- [ ] AUTO-CREATE NAMESPACE
- [ ] APPLY OUT OF SYNC ONLY
- [ ] SERVER-SIDE APPLY

PRUNE PROPAGATION POLICY: foreground

- [ ] REPLACE
- [ ] RETRY

Pasos para crear una aplicación

- Definir el repositorio del URL con la demo que se ha forkeado https://github.com/joedayz/rsvapp-helm-cicd.git
- Establecer revision HEAD
- El path es la ubicación del archivo de configuración. Escoger .
- Destination: Es el cluster donde se va a desplegar la aplicación.
- Selecciona el Cluster: https://kubernetes.default.svc.
- Selecciona el namespace: app
- Clic en create.

SOURCE

Repository URL

https://github.com/joedayz/rsvpapp-helm-cicd.git GIT

Revision

HEAD Branches

Path

.

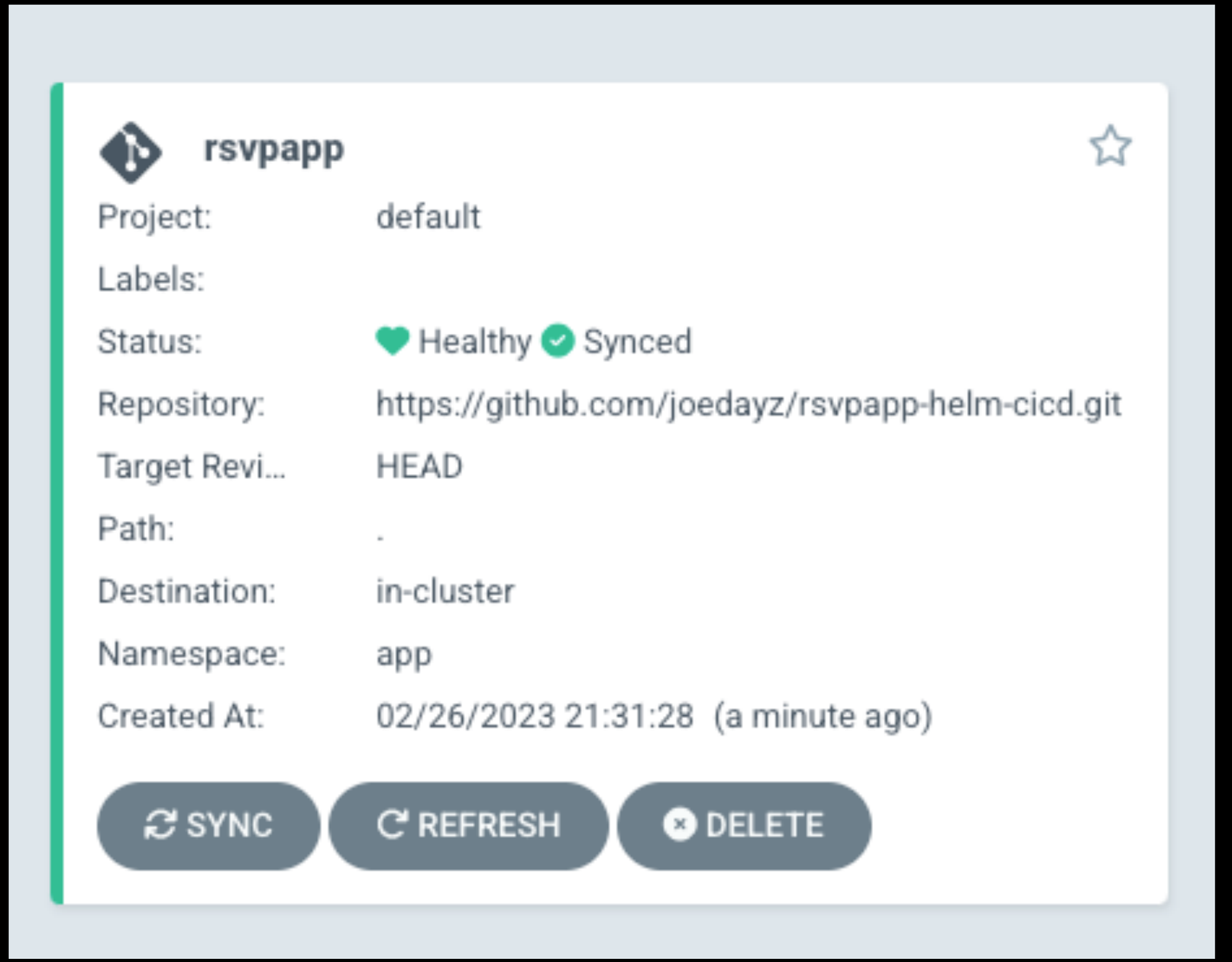
DESTINATION

Cluster URL

https://kubernetes.default.svc URL

Namespace

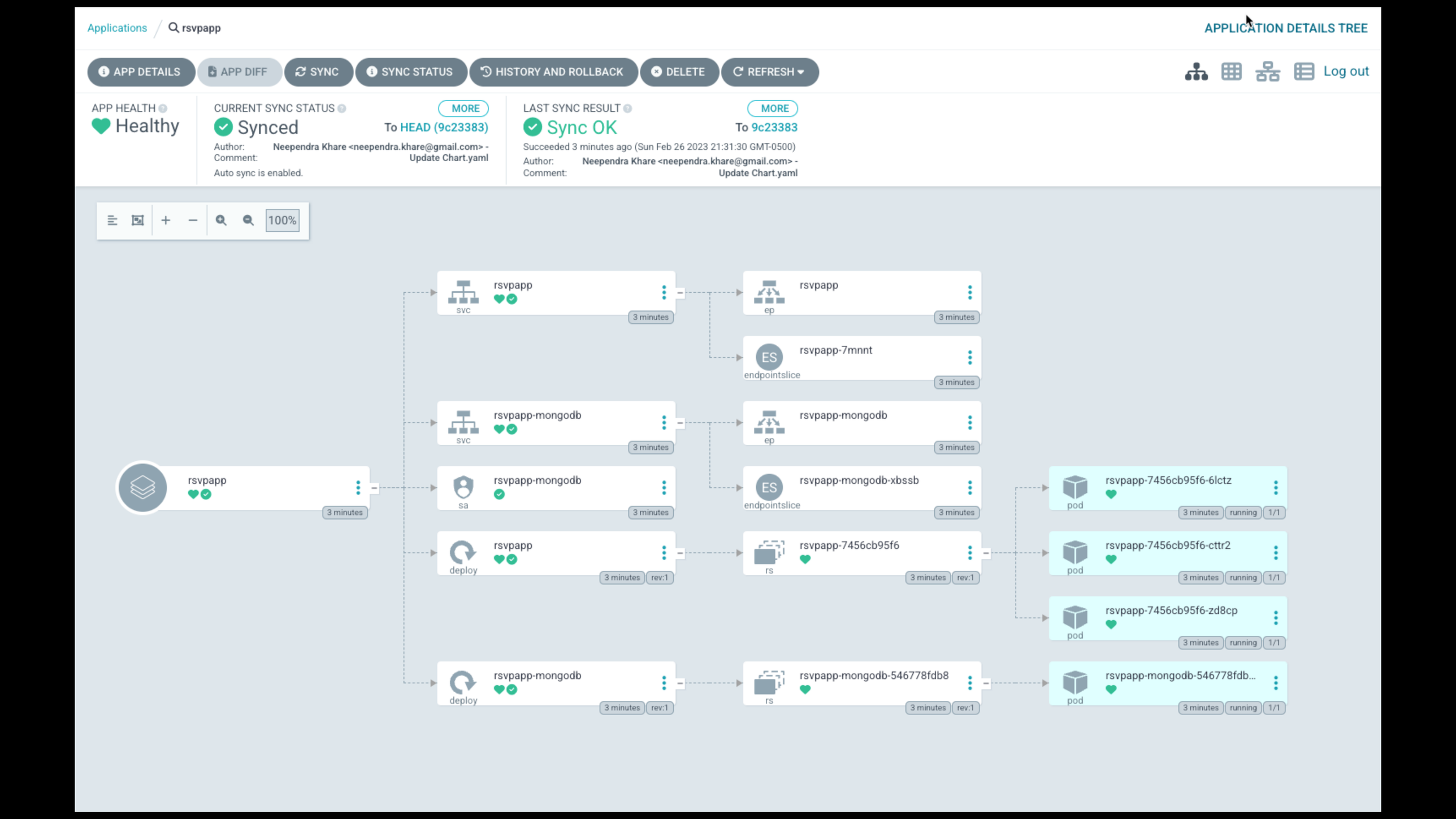
app


rsvpapp
Project: default
Labels:
Status: Healthy Synced
Repository: https://github.com/joedayz/rsvpapp-helm-cicd.git
Target Revi... HEAD
Path: .
Destination: in-cluster
Namespace: app
Created At: 02/26/2023 21:31:28 (a minute ago)
SYNC
REFRESH
DELETE

kubectl get pods,svc -n app

```
❯ kubectl get pods,svc -n app
NAME                                   READY   STATUS    RESTARTS   AGE
pod/rsvpapp-7456cb95f6-6lctz           1/1     Running   0          108s
pod/rsvpapp-7456cb95f6-cttr2           1/1     Running   0          108s
pod/rsvpapp-7456cb95f6-zd8cp           1/1     Running   0          108s
pod/rsvpapp-mongodb-546778fdb8-wnt7c   1/1     Running   0          108s

NAME                      TYPE        CLUSTER-IP     EXTERNAL-IP   PORT(S)     AGE
service/rsvpapp           ClusterIP   10.108.65.29   <none>        80/TCP      108s
service/rsvpapp-mongodb   ClusterIP   10.108.47.98   <none>        27017/TCP   108s
~ ❯
```

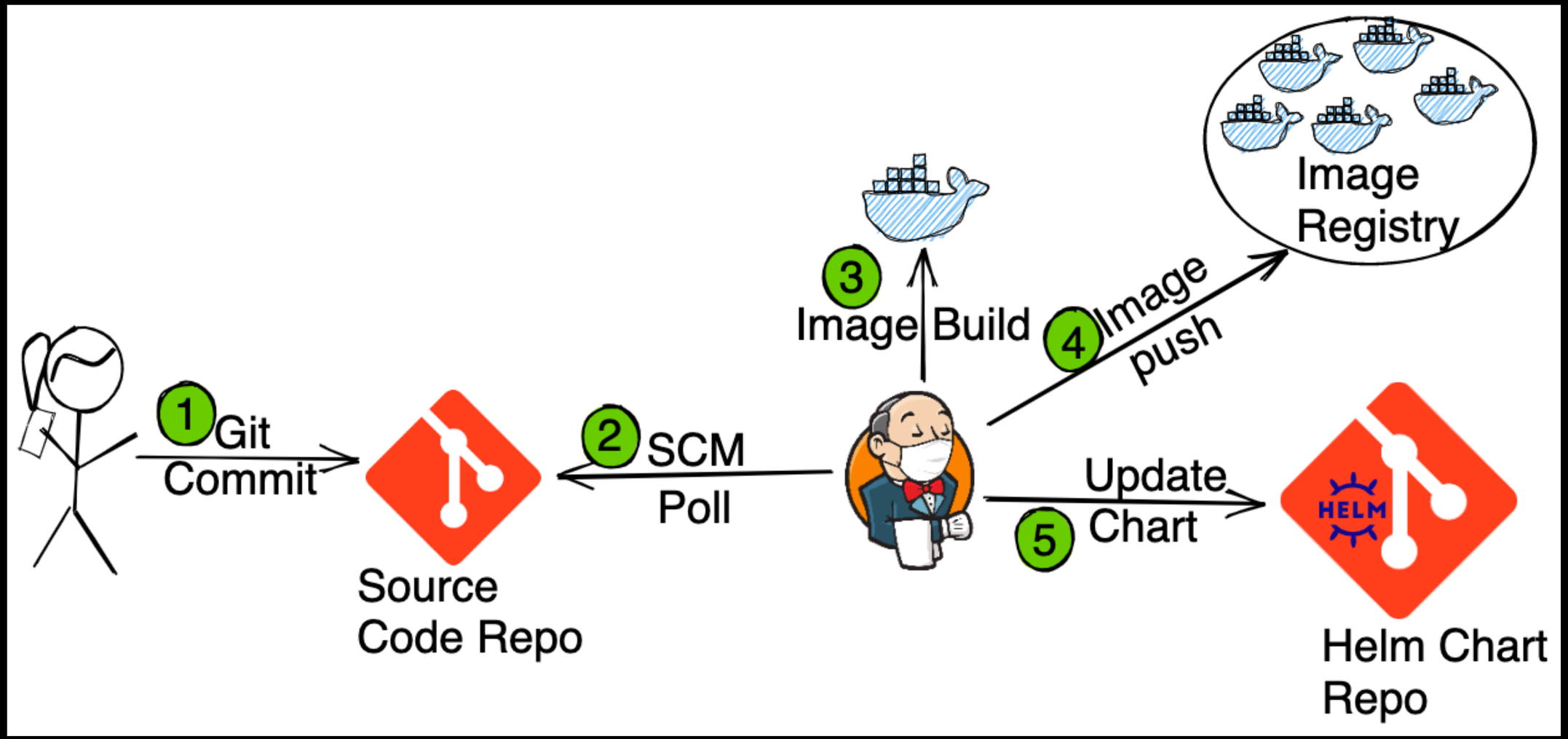

Applications
rsvpapp
APPLICATION DETAILS TREE
APP DETAILS
APP DIFF
SYNC
SYNC STATUS
HISTORY AND ROLLBACK
DELETE
REFRESH
Log out
APP HEALTH
Healthy
CURRENT SYNC STATUS
Synced
MORE
To HEAD (9c23383)
Author: Neependra Khare <neependra.khare@gmail.com> -
Comment: Update Chart.yaml
Auto sync is enabled.
LAST SYNC RESULT
Sync OK
MORE
To 9c23383
Succeeded 3 minutes ago (Sun Feb 26 2023 21:31:30 GMT-0500)
Author: Neependra Khare <neependra.khare@gmail.com> -
Comment: Update Chart.yaml
100%
rsvpapp
3 minutes
svc
rsvpapp
3 minutes
ep
rsvpapp
3 minutes
ES
endpointslice
rsvpapp-7mnnt
3 minutes
svc
rsvpapp-mongodb
3 minutes
ep
rsvpapp-mongodb
3 minutes
sa
rsvpapp-mongodb
3 minutes
ES
endpointslice
rsvpapp-mongodb-xbssb
3 minutes
deploy
rsvpapp
3 minutes
rev:1
rs
rsvpapp-7456cb95f6
3 minutes
rev:1
pod
rsvpapp-7456cb95f6-6lctz
3 minutes
running
1/1
pod
rsvpapp-7456cb95f6-cttr2
3 minutes
running
1/1
pod
rsvpapp-7456cb95f6-zd8cp
3 minutes
running
1/1
deploy
rsvpapp-mongodb
3 minutes
rev:1
rs
rsvpapp-mongodb-546778fdb8
3 minutes
rev:1
pod
rsvpapp-mongodb-546778fdb...
3 minutes
running
1/1

Crear el ingress para nuestro deployment

```yaml
apiVersion: networking.k8s.io/v1
kind: Ingress
metadata:
  name: rsvp-ingress
spec:
  rules:
  - http:
      paths:
      - path: /
        pathType: Prefix
        backend:
          service:
            name: rsvpapp
            port:
              number: 80
```

```
❯ vi rvsp-ingress.yaml
❯ kubectl apply -f rsvp-ingress.yaml -n app
ingress.networking.k8s.io/rsvp-ingress created
~/Downloads ❯
```

Configurar CI con Jenkins



Instalar jenkins

Jenkins-install.sh

FROM nginx:1.11-alpine | rsvp-ingress.yaml | jenkins-install.sh | argo-install.yaml

```
curl -fsSL -o get_helm.sh https://raw.githubusercontent.com/helm/helm/master/scripts/get-helm-3
chmod 700 get_helm.sh
./get_helm.sh
sleep 3
echo "installed helm"

helm repo add jenkins https://charts.jenkins.io

kubectl create ns jenkins

helm install jenkins \
--set controller.serviceType=NodePort,controller.image=teamcloudyuga/cyjenkins,controller.tag=2.289,controller.installPlugins=false,controller.nodePort=31000,persistence.enabled=false \
--namespace=jenkins \
jenkins/jenkins
echo "installed jenkins with helm "
```

Instalar jenkins

Jenkins-install.sh

```
❯ chmod +x jenkins-install.sh
❯ sh jenkins-install.sh
Helm v3.11.1 is already latest
installed helm
"jenkins" already exists with the same configuration, skipping
namespace/jenkins created
NAME: jenkins
LAST DEPLOYED: Sun Feb 26 21:42:09 2023
NAMESPACE: jenkins
STATUS: deployed
REVISION: 1
NOTES:
1. Get your 'admin' user password by running:
  kubectl exec --namespace jenkins -it svc/jenkins -c jenkins -- /bin/cat /run/secrets/additional/chart-admin-password && echo
2. Get the Jenkins URL to visit by running these commands in the same shell:
  export NODE_PORT=$(kubectl get --namespace jenkins -o jsonpath="{.spec.ports[0].nodePort}" services jenkins)
  export NODE_IP=$(kubectl get nodes --namespace jenkins -o jsonpath="{.items[0].status.addresses[0].address}")
  echo http://$NODE_IP:$NODE_PORT

3. Login with the password from step 1 and the username: admin
4. Configure security realm and authorization strategy
5. Use Jenkins Configuration as Code by specifying configScripts in your values.yaml file, see documentation: http://$NODE_IP:$NODE_PORT/configuration-as-code and examples: https://github.com/jenkinsci/configuration-as-code-plugin/tree/master/demos

For more information on running Jenkins on Kubernetes, visit:
https://cloud.google.com/solutions/jenkins-on-container-engine

For more information about Jenkins Configuration as Code, visit:
https://jenkins.io/projects/jcasc/


#################################################################################
######   WARNING: Persistence is disabled!!! You will lose your data when   #####
######            the Jenkins pod is terminated.                            #####
#################################################################################
installed jenkins with helm
~/Downloads ❯                                                          8s 21:42:09
```

Instalar jenkins

kubectl get pods -n jenkins

```
❯ kubectl get pods -n jenkins
NAME        READY   STATUS    RESTARTS   AGE
jenkins-0   2/2     Running   0          117s
~/Downloads ❯
```

Instalar jenkins

Obtener el password del admin

- kubectl exec --namespace jenkins -it svc/jenkins -c jenkins -- /bin/cat /run/secrets/additional/chart-admin-password && echo

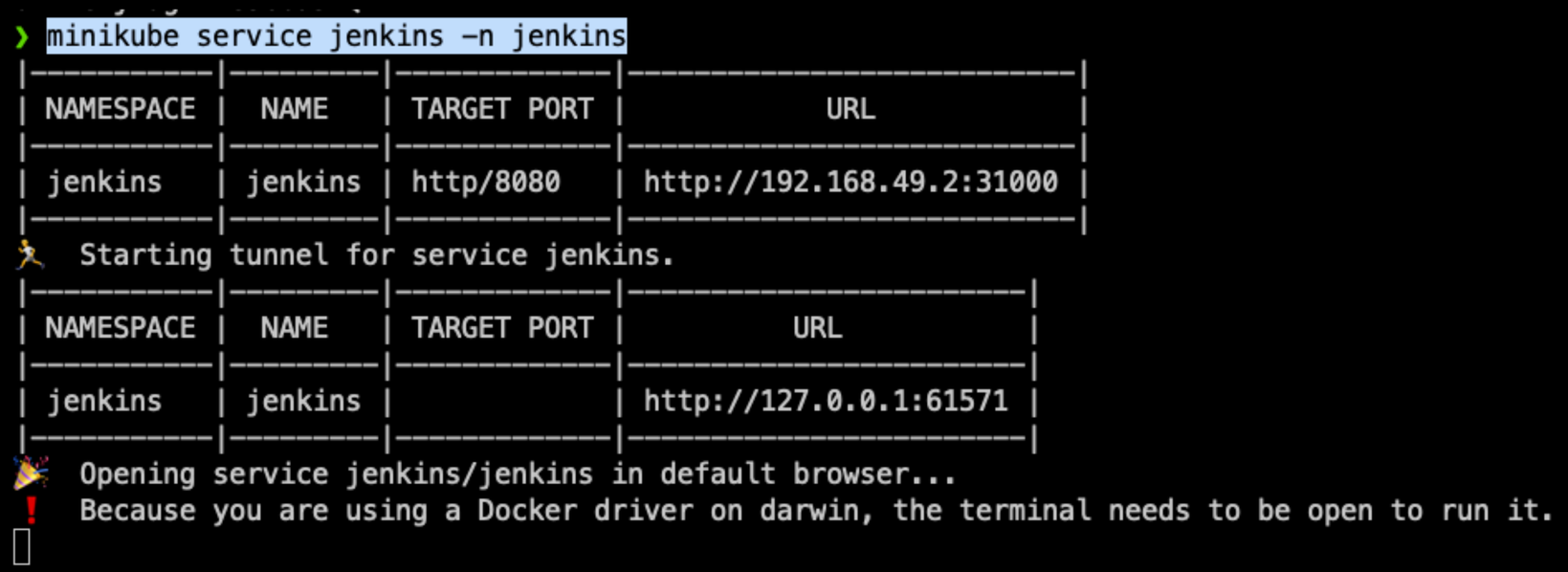
```
❯ kubectl exec --namespace jenkins -it svc/jenkins -c jenkins -- /bin/cat /run/secrets/additional/cha
rt-admin-password && echo

OLMfcKjiug4I1esGbaJwQX
~/Downloads ❯                                                                          21:47:13
```

Instalar jenkins

Lanzar la UI de Jenkins

- minikube service jenkins -n jenkins



Sign in [Jenkins]

127.0.0.1:61571/login?from=%2F

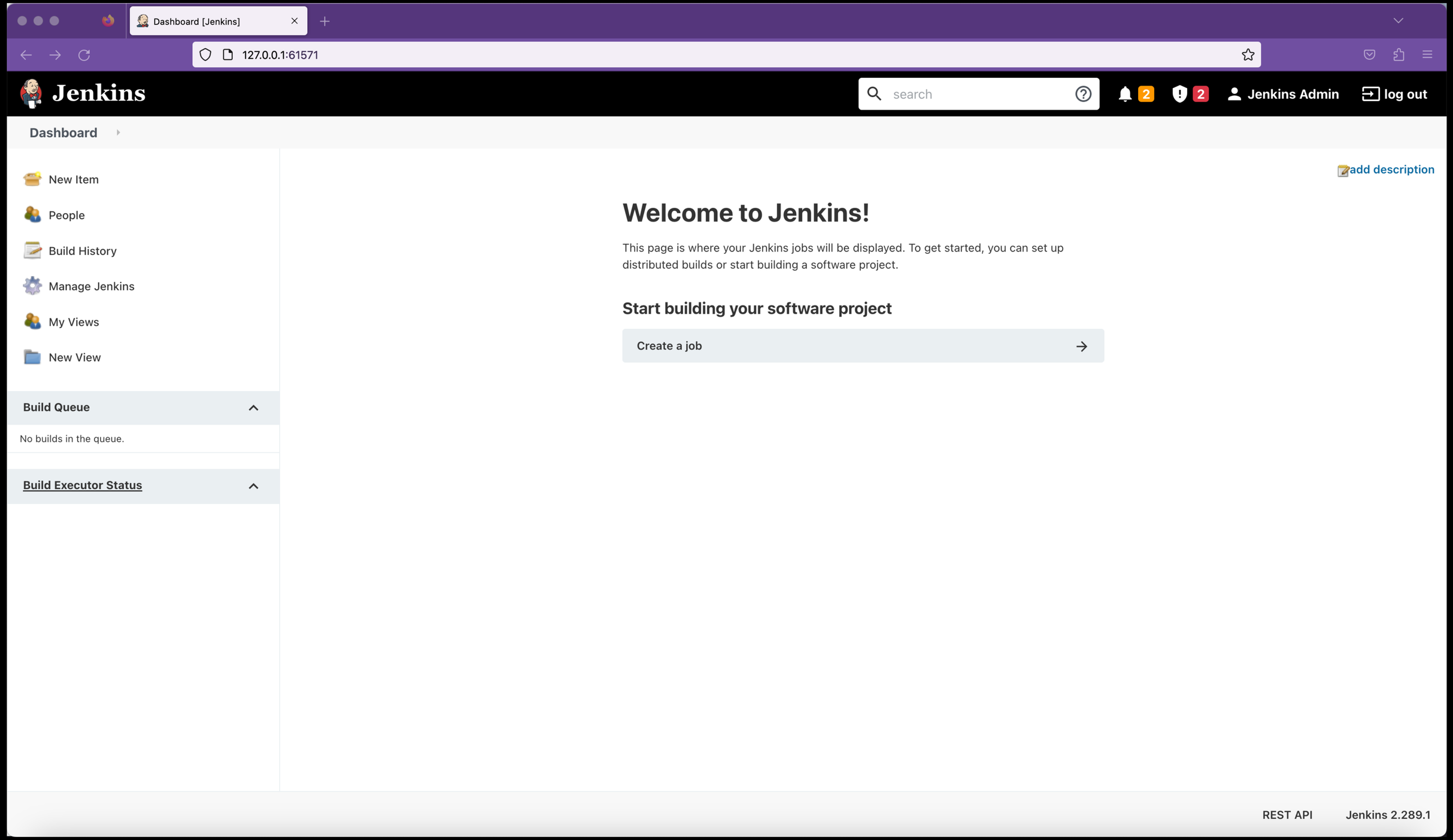
Welcome to Jenkins!

Username

Password

Sign in

Keep me signed in


Dashboard [Jenkins]
127.0.0.1:61571
Jenkins
search
2
2
Jenkins Admin
log out
Dashboard
New Item
People
Build History
Manage Jenkins
My Views
New View
Build Queue
No builds in the queue.
Build Executor Status
add description
Welcome to Jenkins!
This page is where your Jenkins jobs will be displayed. To get started, you can set up distributed builds or start building a software project.
Start building your software project
Create a job
REST API
Jenkins 2.289.1