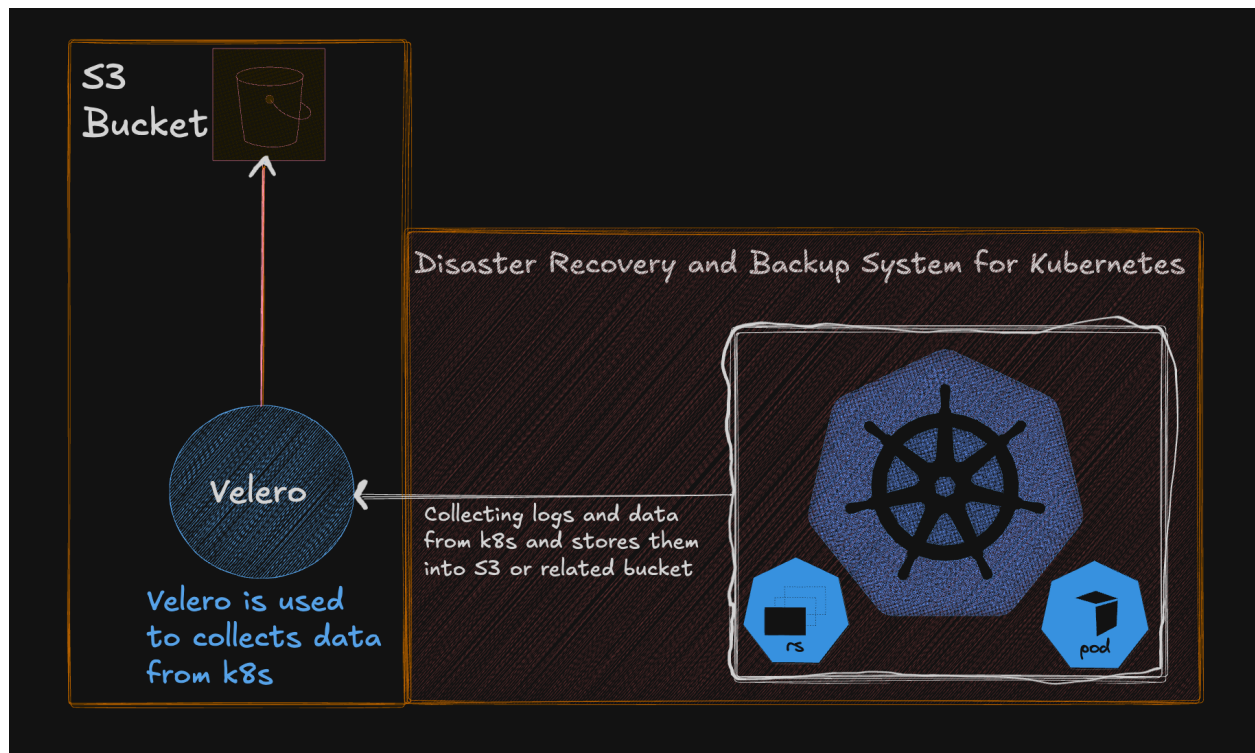


# Project-2 → Kubernetes Disaster Recovery and backup using Velero.

## Architecture Diagram :-



## Step 1 →

Firstly create a Kubernetes cluster to any of cloud provider such as **EKS, AKS, GKE** or you can simply setup **Minikube or Kind** cluster into your local computer.

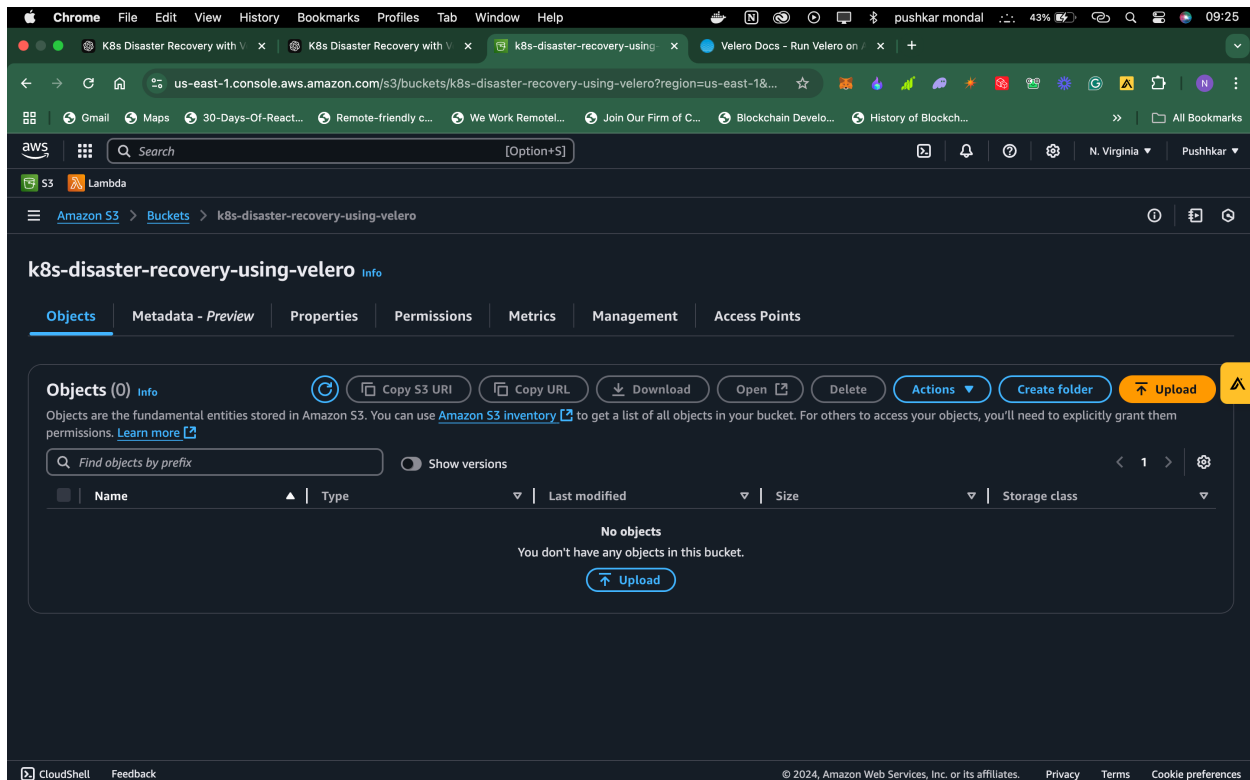
- **For this tutorial I am using Minikube to setup a local cluster.**

```
Warp File Edit View Tab Blocks Drive Window Help
..@NISHIT--MacBook-Air:~ +
~ git:(main)±1086 (0.722s)
minikube status
minikube
type: Control Plane
host: Running
kubelet: Running
apiserver: Running
kubeconfig: Configured

~ git:(main)±1086
clear ✨
```

## Step 2 →

Now create a S3 bucket in your AWS Console.



- P.S:- Export your Bucket name and region to your console using →

```
export BUCKET=k8s-disaster-recovery-using-velero
export REGION=us-east-1
```

- And also save your **AWS Access Key** and **AWS Secret Access Key** to some file.

## Step 3 →

Install Velero into your local setup by clicking the below link according to your device configuration →

<https://velero.io/docs/v1.8/basic-install/>

## Step 4 →

Now run this command

```
velero install \
  --provider aws \
  --plugins velero/velero-plugin-for-aws:v1.8.0 \
  --bucket $BUCKET \
  --secret-file ./credentials-velero \
  --backup-location-config region=$REGION \
  --snapshot-location-config region=$REGION
```

- In Velero docs it is not mentioned that you have to use the `--plugin` flag, otherwise you will get an error.

## Step 5 →

- Create a namespace using `kubectl create ns <namespace_name>`
- Now create a simple deployment using yaml file or using command line.

→ If you are using command line you can use this command

```
k create deployment backup --image=nginx --replicas=2 -n backup
```

Or if you using yaml file then you can use this yaml file below

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: backup
  namespace: backup
spec:
  replicas: 2
  selector:
    matchLabels:
      app: backup
  template:
    metadata:
      labels:
```

```
    app: backup
  spec:
    containers:
    - name: nginx
      image: nginx
      ports:
      - containerPort: 80
```

- And then use `kubectl create -f <yaml_file_name>`

## Step 6 →

Now create a service, i am using Minikube and I am using NodePort service.

```
k expose deployment backup --name=backup-service --type=NodePort --port=80 -n backup
```

## Step 7→

Now you can use port forward to see if the server is running or not using below command →

```
kubectl port-forward svc/backup-service 8000:80 -n backup
```

## Step 8→

- Now create a namespace to any name as per you choice.
- Now run this below command to create a backup →

```
velero backup create test-backup-2 --include-namespaces backup1
```

- Now run this command to see is the backup is completed or not →

```
velero backup describe test-backup-2
```

It ill look like this →

```
Warp File Edit View Tab Blocks Drive Window Help
@NISHIT-MacBook-Air-~ ...MacBook-Air-~/velero + v
Share 🔍 📌 ⚙️

~/velero git:(main)±1091 (1.293s)
velero backup logs test-backup-2

~/velero git:(main)±1091 (1.583s)
velero backup describe test-backup-2

Name:      test-backup-2
Namespace: velero
Labels:    velero.io/storage-location=default
Annotations: velero.io/resource-timeout=10m0s
              velero.io/source-cluster-k8s-gitversion=v1.31.0
              velero.io/source-cluster-k8s-major-version=1
              velero.io/source-cluster-k8s-minor-version=31

Phase: Completed

Namespaces:
Included:  backup1
Excluded: <none>

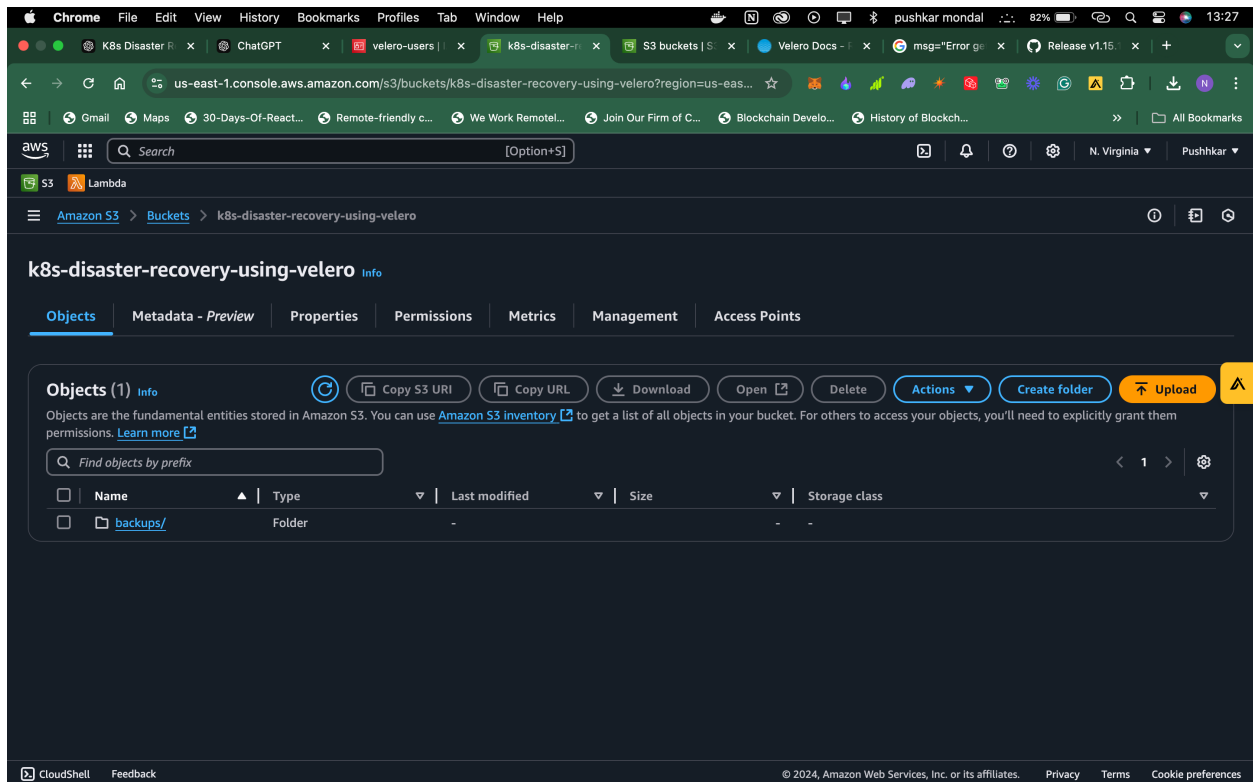
Resources:
Included:  *
Excluded:  <none>
Cluster-scoped: auto

Label selector: <none>

~/velero git:(main)±1091
clear ↵
```

## Step 9 →

Now go to your AWS console and then your S3 bucket and now your bucket look like this →



## Step 10 →

Now delete the namespace that you have created for your application.

```
Warp File Edit View Tab Blocks Drive Window Help
@NISHIT-MacBook-Air-~ ...MacBook-Air-~/velero + v
~/velero git:(main)±1091 (10.776s)
k delete ns backup1

~/velero git:(main)±1091 (0.055s)
clear

~/velero git:(main)±1091 (0.165s)
k get ns
NAME          STATUS    AGE
backup        Active   3h38m
default        Active   4d1h
kube-node-lease Active   4d1h
kube-public    Active   4d1h
kube-system    Active   4d1h
velero         Active   64m

~/velero git:(main)±1091 (10.739s)
k delete ns backup
namespace "backup" deleted

~/velero git:(main)±1091 (1.293s)
velero backup logs test-backup-2

~/velero git:(main)±1091
clear
```

## Step 11 →

Now run this below command to restore the backup again `velero restore create new-backup-restore --from-backup test-backup-2`

```
~/velero git:(main)±1091 (0.423s)
velero restore create new-backup-restore --from-backup test-backup-2
Restore request "new-backup-restore" submitted successfully.
Run `velero restore describe new-backup-restore` or `velero restore logs new-backup-restore` for more details.

~/velero git:(main)±1091 (6.819s)
velero restore describe new-backup-restore
Name:          new-backup-restore
Namespace:     velero
Labels:        <none>
Annotations:   <none>

Phase:          InProgress
Estimated total items to be restored: 7
Items restored so far: 7

~/velero git:(main)±1091
```



Now check the backup progress using this command `velero restore describe new-backup-restore`

```
Warp File Edit View Tab Blocks Drive Window Help
@NISHIT-MacBook-Air-~ ...MacBook-Air-~/velero + v
~/velero git:(main)±1091 (2.772s)
velero restore describe new-backup-restore
Name:          new-backup-restore
Namespace:     velero
Labels:        <none>
Annotations:   <none>

Phase:          Completed
Total items to be restored: 7
Items restored: 7

Started:        2024-12-30 13:34:29 +0530 IST
Completed:      2024-12-30 13:34:59 +0530 IST

Warnings:
  Velero:        <none>
  Cluster:       <none>
  Namespaces:
    backup1:     could not restore, ConfigMap "kube-root-ca.crt" already exists. Warning: the in-cluster version is different than the backed-up version

Backup: test-backup-2

Namespaces:
  Included:      all namespaces found in the backup
  Excluded:      <none>

~/velero git:(main)±1091
k get pods -n velero
```

## Step 12 →

Now as you can see we restored our namespace again.

```
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@NISHIT-MacBook-Air-~ ...MacBook-Air-~/velero + v
Share 🔍 📌 📁 ⚙️ 13:41

~/velero git:(main)±1091 (0.295s)
k get ns

NAME          STATUS   AGE
backup1       Active  4m47s
default       Active  4d1h
kube-node-lease Active  4d1h
kube-public   Active  4d1h
kube-system   Active  4d1h
velero        Active  82m

~/velero git:(main)±1091
k delete ns backup *
```