Procedure:

Steps to install Kubernetes on windows :

A) CMD

1 . Open official website : install kubectl

https://kubernetes.io/docs/tasks/tools/install-kubectl-windows/

2. create a folder inside c drive named as kubectl and open cmd and go to home directory and add the installation command as:

curl -LO "https://dl.k8s.io/release/v1.25.0/bin/windows/amd64/kubectl.exe"

```
C:\Users>cd\tejaswini_IT

C:\tejaswini_IT>curl -LO "https://dl.k8s.io/release/v1.24.0/bin/windows/amd64/kubectl.exe"
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100   138  100   138    0     0    366      0 --:--:-- --:--:-- --:--:--   367
100 44.1M  100 44.1M    0     0  9502k      0  0:00:04  0:00:04 --:--:-- 11.1M

C:\tejaswini_IT>cd.

C:\tejaswini_IT>cd..
```

3.Check the directory using dir command

```
C:\kubectl>dir
 Volume in drive C has no label.
 Volume Serial Number is 481D-8D86

 Directory of C:\kubectl

08/12/2022  04:14 PM    <DIR>          .
08/22/2022  09:33 AM        46,279,680 kubectl.exe
               1 File(s)     46,279,680 bytes
               1 Dir(s)  180,591,529,984 bytes free
```

4. Validate the binary (optional)Download the kubectl checksum file:

curl -LO "https://dl.k8s.io/v1.25.0/bin/windows/amd64/kubectl.exe.sha256"

```
C:\kubectl>curl -LO "https://dl.k8s.io/v1.24.0/bin/windows/amd64/kubectl.exe.sha256"
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100   138  100   138    0     0    485      0 --:--:-- --:--:-- --:--:--   487
100    64  100    64    0     0    164      0 --:--:-- --:--:-- --:--:--   164
```

5. Validate the kubectl binary against the checksum file:

- Using Command Prompt to manually compare CertUtil's output to the checksum file downloaded:

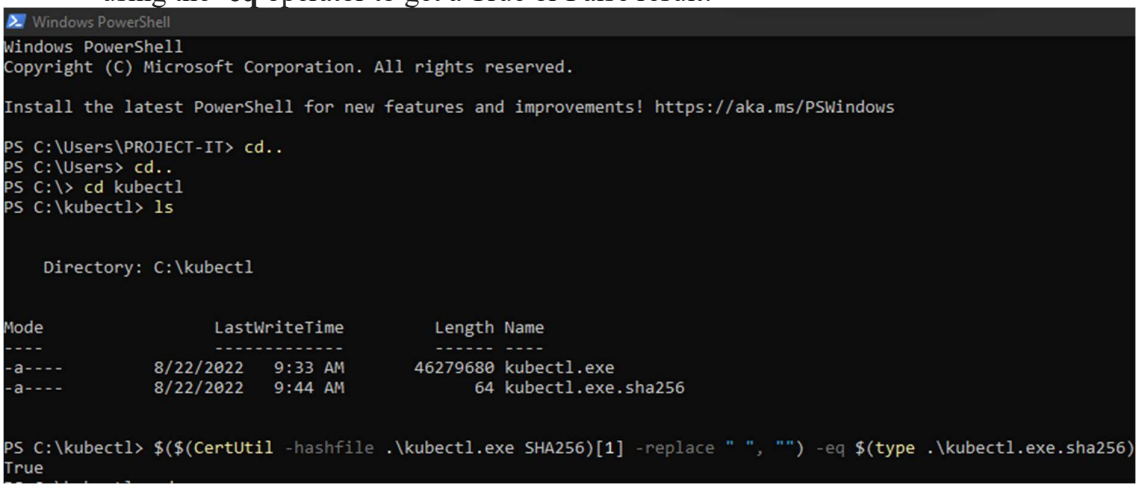
  CertUtil -hashfile kubectl.exe SHA256

  type kubectl.exe.sha256

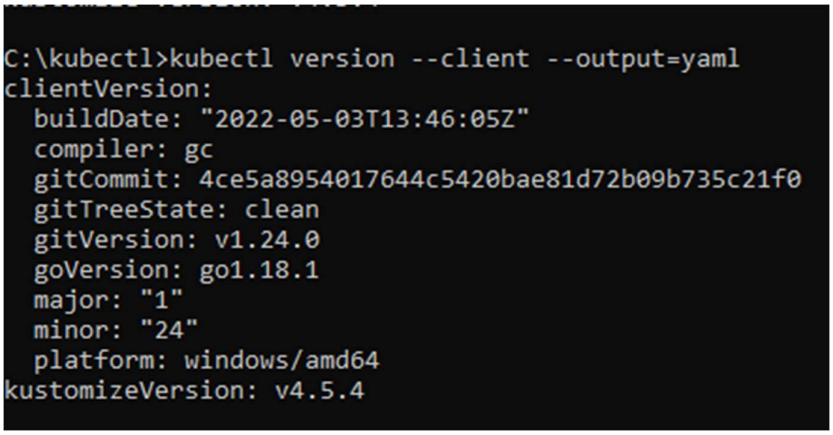
```
C:\kubectl>CertUtil -hashfile kubectl.exe SHA256
SHA256 hash of kubectl.exe:
451828659fef8636bd75fc26720c1d8ba7e20c11916954bec913d78c19f4dd4c
CertUtil: -hashfile command completed successfully.

C:\kubectl>type kubectl.exe.sha256
451828659fef8636bd75fc26720c1d8ba7e20c11916954bec913d78c19f4dd4c
C:\kubectl>kubectl version --client
WARNING: This version information is deprecated and will be replaced with the output from kubectl version --short.  Use --output=yaml|json to get the full version.
Client Version: version.Info{Major:"1", Minor:"24", GitVersion:"v1.24.0", GitCommit:"4ce5a8954017644c5420bae81d72b09b735c21f0", GitTreeState:"clean", BuildDate:"2022-05
-03T13:46:05Z", GoVersion:"go1.18.1", Compiler:"gc", Platform:"windows/amd64"}
Kustomize Version: v4.5.4
```

B) WINDOWS POWERSHELL

1 . Open windows powershell and go to home directory and open kubectl folder and then list all the files from kubectl Using PowerShell to automate the verification using the **-eq** operator to get a True or False result:



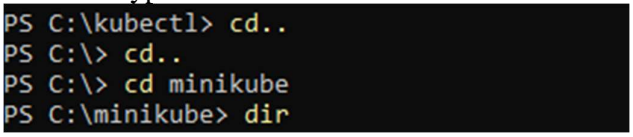
6. Set the environment variable inside : System - path - New – c:\kubectl
7. open cmd to check the version of kubectl : kubectl version –client
Or use this for detailed view of version : kubectl version --client --output=yaml



- **Steps to install minikube on windows :**

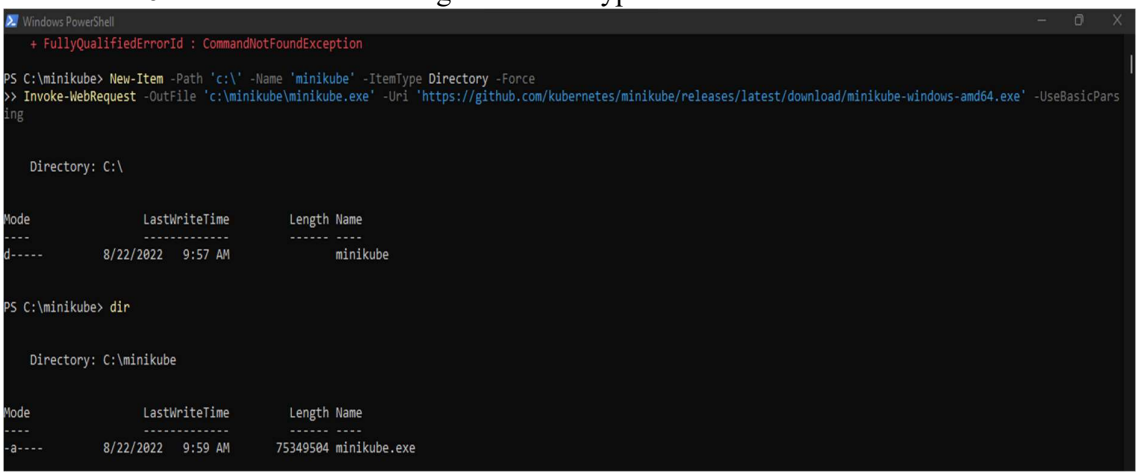
1. Now we have to install minikube :
   https://minikube.sigs.k8s.io/docs/start/

2.Create a new folder inside the c drive named as minikube open windows powershell and go inside root directory as minikube after inside minikube folder we have to download the minikube and type command as dir

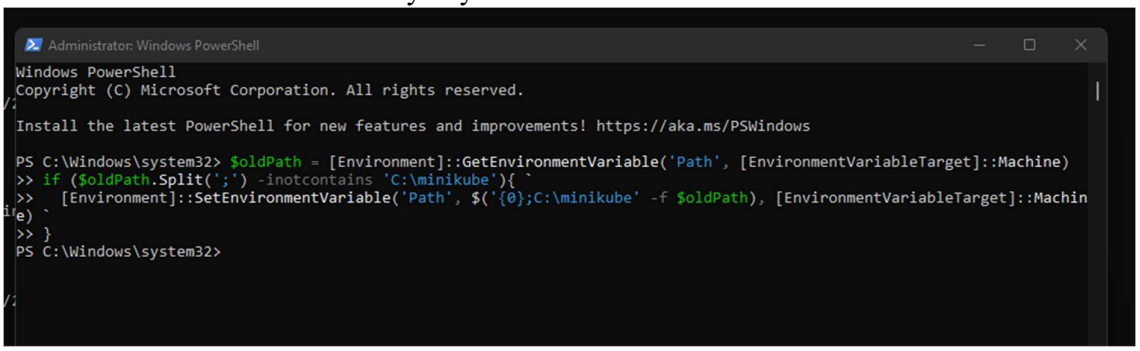


2. Download and run the installer for the latest release. Or if using PowerShell, use this command:

New-Item -Path 'c:\' -Name 'minikube' -ItemType Directory -ForceInvoke-WebRequest -OutFile 'c:\minikube\minikube.exe' -Uri 'https://github.com/kubernetes/minikube/releases/latest/download/minikube-windows-amd64.exe' -UseBasicParsing . And then type command as dir



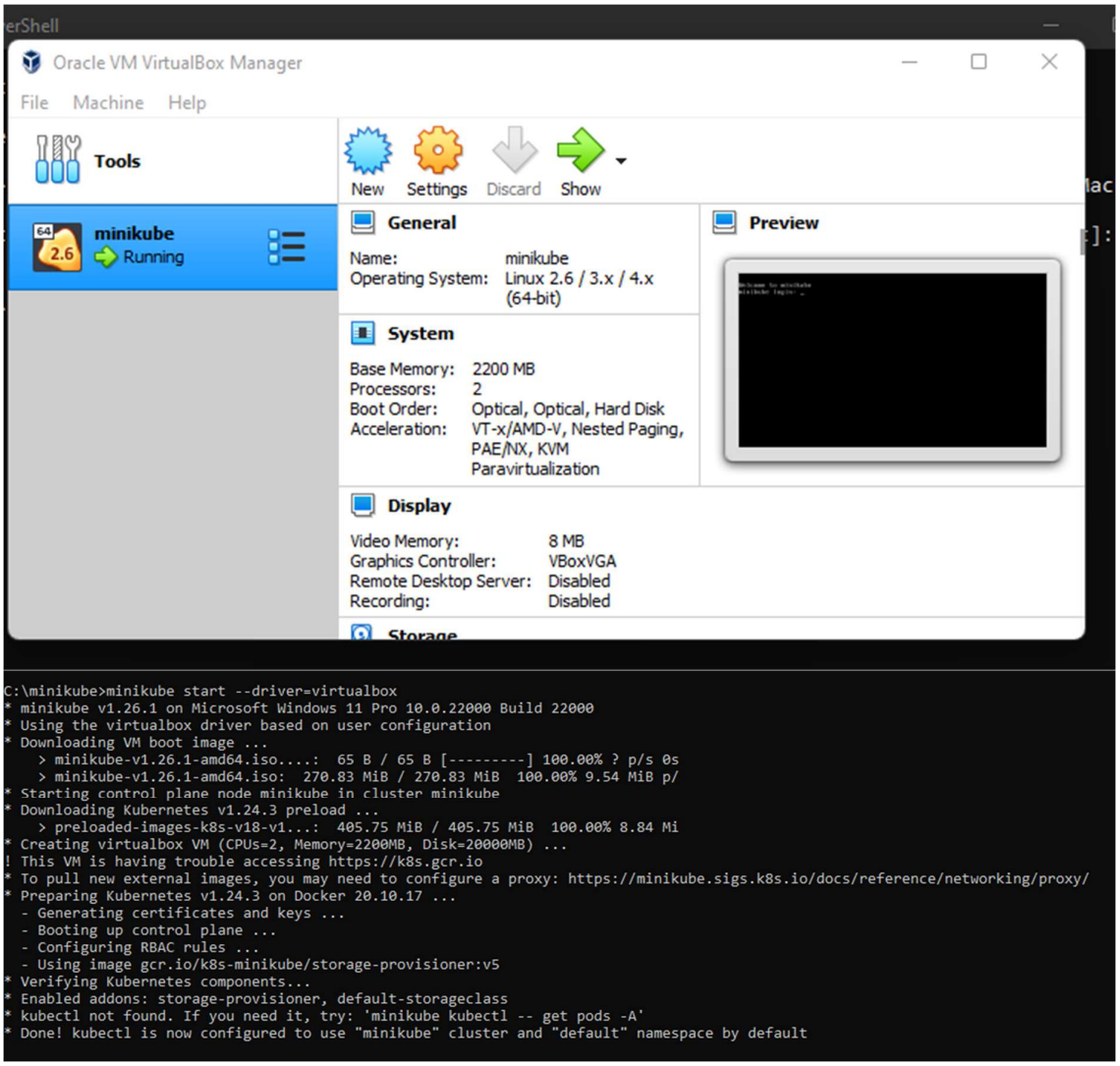
4. Open windows power-shell and run as administrator
Add the minikube.exe binary to your PATH.



Again add the environment variable to system path as : System – path – new path

5.Now download the virtual box from the official website for windows
https://www.virtualbox.org/wiki/Downloads/
restart the cmd

6. Start a cluster using the virtualbox driver : minikube start --driver=virtualbox



7. To make virtualbox the default driver: minikube config set driver virtualbox

```
C:\minikube>minikube config set driver virtualbox
! These changes will take effect upon a minikube delete and then a minikube start

C:\minikube>minikube status
minikube
type: Control Plane
host: Running
kubelet: Running
apiserver: Running
kubeconfig: Configured
```

8.Check the kubectl nodes by going to kubectl directory and run the following commands

1. Kubectl get nodes : check all the nodes
2. Kubectl get po -A :Check all the components
3. Kubectl get pods :Checks any previous pods were created or not

```
C:\>kubectl get nodes
'kubectl' is not recognized as an internal or external command,
operable program or batch file.

C:\>cd kubectl

C:\kubectl>kubectl get nodes
NAME       STATUS   ROLES           AGE   VERSION
minikube   Ready    control-plane   11m   v1.24.3

C:\kubectl>kubectl get po -A
NAMESPACE     NAME                               READY   STATUS    RESTARTS      AGE
kube-system   coredns-6d4b75cb6d-rww7v           1/1     Running   0             11m
kube-system   etcd-minikube                      1/1     Running   0             12m
kube-system   kube-apiserver-minikube            1/1     Running   0             12m
kube-system   kube-controller-manager-minikube   1/1     Running   0             12m
kube-system   kube-proxy-ffphp                   1/1     Running   0             11m
kube-system   kube-scheduler-minikube            1/1     Running   0             12m
kube-system   storage-provisioner                1/1     Running   1 (11m ago)   12m

C:\kubectl>kubectl get pods
No resources found in default namespace.
```

9. Create a sample deployment and expose it on port 80:
   kubectl create deployment hello-minikube --image=docker.io/nginx:1.23
   kubectl expose deployment hello-minikube --type=NodePort --port=8080

```
C:\kubectl>kubectl create deployment hello-minikube --image=k8s.gcr.io/echoserver:1.4
deployment.apps/hello-minikube created

C:\kubectl>kubectl get pods
NAME                              READY   STATUS    RESTARTS   AGE
hello-minikube-5c5f5cddb9-ck2kr   1/1     Running   0          17s

C:\kubectl>kubectl get pods
NAME                              READY   STATUS    RESTARTS   AGE
hello-minikube-5c5f5cddb9-ck2kr   1/1     Running   0          39s

C:\kubectl>kubectl expose deployment hello-minikube --type=NodePort --port=8080
service/hello-minikube exposed
```

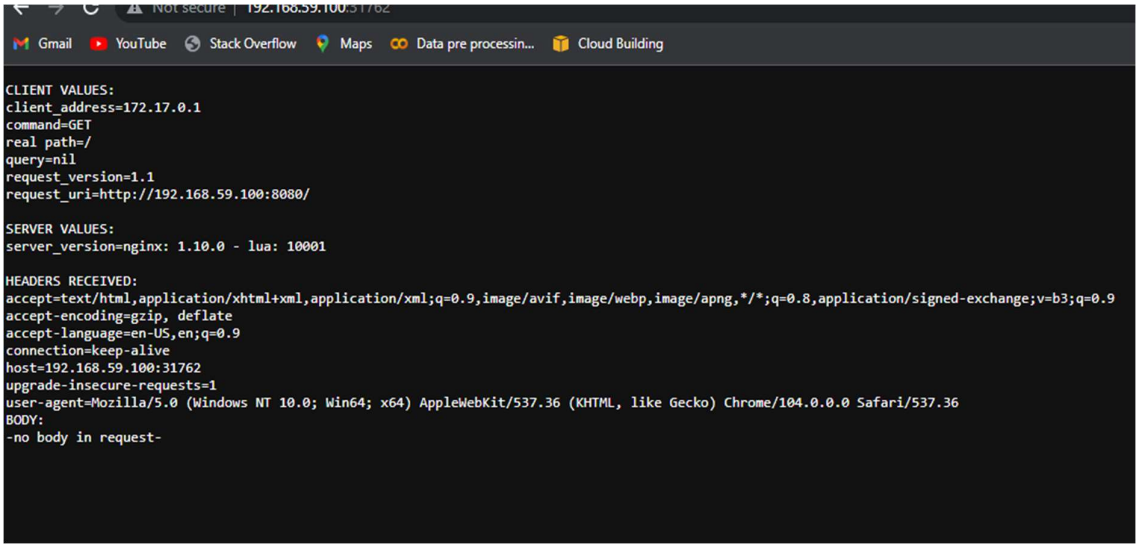
10 . To see the services provide by kubectl: kubectl get services hello-minikube

```
C:\kubectl>kubectl get pods
NAME                              READY   STATUS    RESTARTS   AGE
hello-minikube-5c5f5cddb9-ck2kr   1/1     Running   0          87s

C:\kubectl>kubectl get services hello-minikube
NAME             TYPE       CLUSTER-IP   EXTERNAL-IP   PORT(S)          AGE
hello-minikube   NodePort   10.99.1.84   <none>        8080:31762/TCP   48s
```

11. After that goto minikube directory and check the url

```
C:\kubectl>cd.

C:\kubectl>cd..

C:\>cd minikube

C:\minikube>minikube service hello-minikube --url.
Error: unknown flag: --url.
See 'minikube service --help' for usage.

C:\minikube>minikube service hello-minikube --url
http://192.168.59.100:31762
```

12. Copy the url and paste it into the browser and open it



13 . create new services as nginx and check the all the pods , deployments and services also

```
C:\minikube>cd.

C:\minikube>cd.

C:\minikube>cd kubectl
The system cannot find the path specified.

C:\minikube>cd ..

C:\>cd kubectl

C:\kubectl>kubectl get pods
NAME                              READY   STATUS    RESTARTS   AGE
hello-minikube-5c5f5cddb9-ck2kr   1/1     Running   0          6m16s

C:\kubectl>kubectl run nginx --image=nginx
pod/nginx created

C:\kubectl>kubectl get pods
NAME                              READY   STATUS    RESTARTS   AGE
hello-minikube-5c5f5cddb9-ck2kr   1/1     Running   0          7m49s
nginx                             1/1     Running   0          21s

C:\kubectl>kubectl get pods
NAME                              READY   STATUS    RESTARTS   AGE
hello-minikube-5c5f5cddb9-ck2kr   1/1     Running   0          8m29s
nginx                             1/1     Running   0          61s

C:\kubectl>kubectl get deployments
NAME             READY   UP-TO-DATE   AVAILABLE   AGE
hello-minikube   1/1     1            1           9m6s

C:\kubectl>kubectl get service
NAME             TYPE        CLUSTER-IP   EXTERNAL-IP   PORT(S)          AGE
hello-minikube   NodePort    10.99.1.84   <none>        8080:31762/TCP   8m7s
kubernetes       ClusterIP   10.96.0.1    <none>        443/TCP          26m
```

11. Delete the kubectl services and again checks the pods and deployments. Also stop the minikube

```
C:\kubectl>kubectl get service
NAME             TYPE        CLUSTER-IP   EXTERNAL-IP   PORT(S)          AGE
hello-minikube   NodePort    10.99.1.84   <none>        8080:31762/TCP   8m7s
kubernetes       ClusterIP   10.96.0.1    <none>        443/TCP          26m

C:\kubectl>kubectl delete service hello-minikube
service "hello-minikube" deleted

C:\kubectl>kubectl get service
NAME         TYPE        CLUSTER-IP   EXTERNAL-IP   PORT(S)   AGE
kubernetes   ClusterIP   10.96.0.1    <none>        443/TCP   41m

C:\kubectl>kubectl delete deployment hello-minikube
deployment.apps "hello-minikube" deleted

C:\kubectl>kubectl get deployments
No resources found in default namespace.

C:\kubectl>kubectl get pods
NAME    READY   STATUS    RESTARTS   AGE
nginx   1/1     Running   0          19m

C:\kubectl>cd.

C:\kubectl>cd..

C:\>cd minikube

C:\minikube>minikube stop
* Stopping node "minikube"  ...
```