

## 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 kubect1 folder and then list all the files from kubect1 Using PowerShell to automate the verification using the `-eq` operator to get a True or False result:

```
Windows PowerShell
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Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\PROJECT-IT> cd..
PS C:\Users> cd..
PS C:\> cd kubect1
PS C:\kubect1> ls

Directory: C:\kubect1

Mode                LastWriteTime         Length Name
----                -
-a----           8/22/2022   9:33 AM       46279680 kubect1.exe
-a----           8/22/2022   9:44 AM           64 kubect1.exe.sha256

PS C:\kubect1> $($CertUtil -hashfile .\kubect1.exe SHA256)[1] -replace " ", "" -eq $(type .\kubect1.exe.sha256)
True
```

6. Set the environment variable inside : System - path - New – c:\kubect1
7. open cmd to check the version of kubect1 : `kubect1 version –client`  
Or use this for detailed view of version : `kubect1 version --client --output=yaml`

```
C:\kubect1>kubect1 version --client --output=yaml
clientVersion:
  buildDate: "2022-05-03T13:46:05Z"
  compiler: gc
  gitCommit: 4ce5a8954017644c5420bae81d72b09b735c21f0
  gitTreeState: clean
  gitVersion: v1.24.0
  goVersion: go1.18.1
  major: "1"
  minor: "24"
  platform: windows/amd64
kustomizeVersion: v4.5.4
```

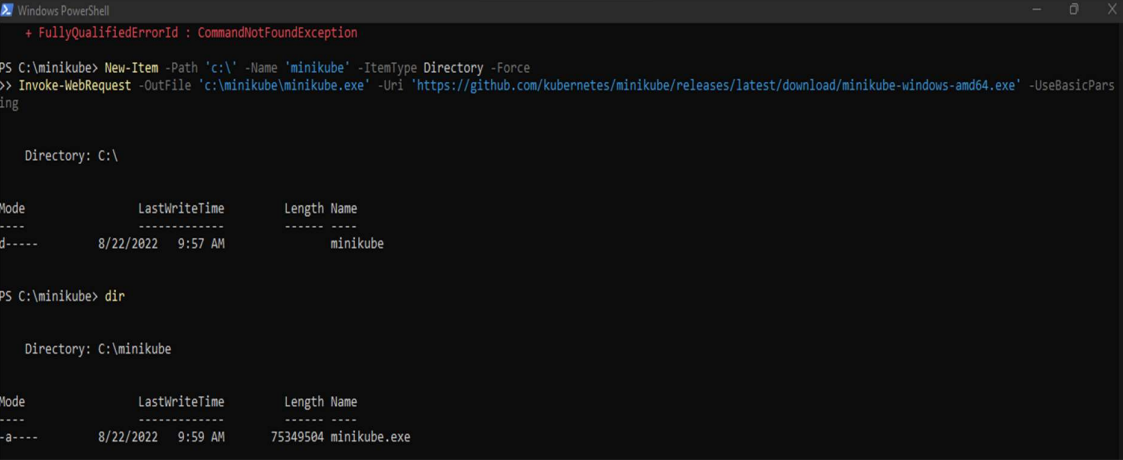
### ➤ Steps to install minikube on windows :

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

```
PS C:\kubect1> cd..
PS C:\> cd..
PS C:\> cd minikube
PS C:\minikube> 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 -Force  
Invoke-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



```
Windows PowerShell
+ FullyQualifiedErrorId : CommandNotFoundException

PS C:\minikube> New-Item -Path 'c:\' -Name 'minikube' -ItemType Directory -Force
>> Invoke-WebRequest -OutFile 'c:\minikube\minikube.exe' -Uri 'https://github.com/kubernetes/minikube/releases/latest/download/minikube-windows-amd64.exe' -UseBasicParsing

Directory: C:\

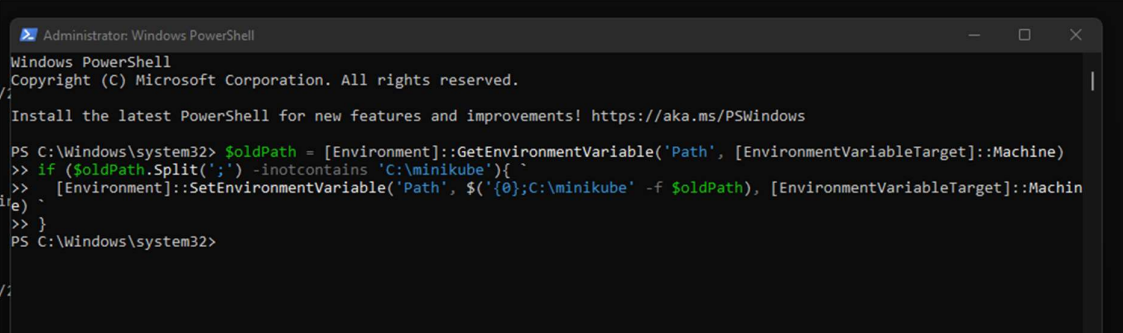
Mode                LastWriteTime         Length Name
----                -
d-----          8/22/2022   9:57 AM             minikube

PS C:\minikube> dir

Directory: C:\minikube

Mode                LastWriteTime         Length Name
----                -
-a----          8/22/2022   9:59 AM       75349504 minikube.exe
```

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



```
Administrator: Windows PowerShell
Windows PowerShell
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PS C:\Windows\system32> $oldPath = [Environment]::GetEnvironmentVariable('Path', [EnvironmentVariableTarget]::Machine)
>> if ($oldPath.Split(';') -notcontains 'C:\minikube'){
>> [Environment]::SetEnvironmentVariable('Path', $('{};C:\minikube' -f $oldPath), [EnvironmentVariableTarget]::Machine)
>> }
PS C:\Windows\system32>
```

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

```

C:\minikube>minikube start --driver=virtualbox
* minikube v1.26.1 on Microsoft Windows 11 Pro 10.0.22000 Build 22000
* Using the virtualbox driver based on user configuration
* Downloading VM boot image ...
  > minikube-v1.26.1-amd64.iso....: 65 B / 65 B [-----] 100.00% ? p/s 0s
  > minikube-v1.26.1-amd64.iso: 270.83 MiB / 270.83 MiB 100.00% 9.54 MiB p/
* Starting control plane node minikube in cluster minikube
* Downloading Kubernetes v1.24.3 preload ...
  > preloaded-images-k8s-v18-v1...: 405.75 MiB / 405.75 MiB 100.00% 8.84 Mi
* Creating virtualbox VM (CPUs=2, Memory=2200MB, Disk=20000MB) ...
! This VM is having trouble accessing https://k8s.gcr.io
* To pull new external images, you may need to configure a proxy: https://minikube.sigs.k8s.io/docs/reference/networking/proxy/
* Preparing Kubernetes v1.24.3 on Docker 20.10.17 ...
  - Generating certificates and keys ...
  - Booting up control plane ...
  - Configuring RBAC rules ...
  - Using image gcr.io/k8s-minikube/storage-provisioner:v5
* Verifying Kubernetes components...
* Enabled addons: storage-provisioner, default-storageclass
* kubectl not found. If you need it, try: 'minikube kubectl -- get pods -A'
* Done! kubectl is now configured to use "minikube" cluster and "default" namespace by default

```

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:\kubect1>cd.

C:\kubect1>cd..

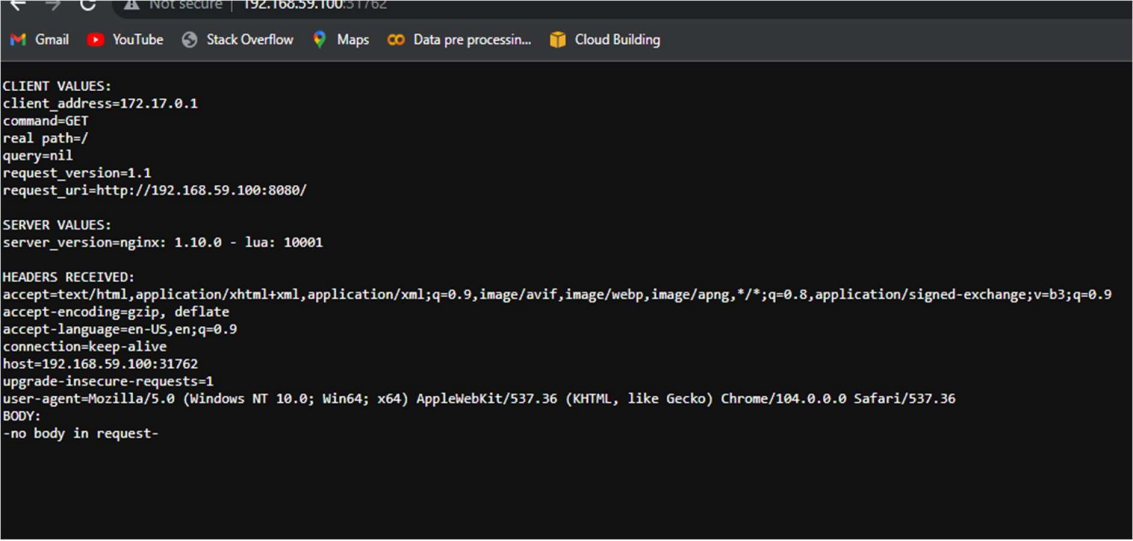
C:\>cd minikube

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



The screenshot shows a web browser window with the address bar displaying '192.168.59.100:31762'. The browser's developer tools or console shows the following log output:

```

CLIENT VALUES:
client_address=172.17.0.1
command=GET
real path=/
query=nil
request_version=1.1
request_uri=http://192.168.59.100:8080/

SERVER VALUES:
server_version=nginx: 1.10.0 - lua: 10001

HEADERS RECEIVED:
accept=text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,image/apng,*/*;q=0.8,application/signed-exchange;v=b3;q=0.9
accept-encoding=gzip, deflate
accept-language=en-US,en;q=0.9
connection-keep-alive
host=192.168.59.100:31762
upgrade-insecure-requests=1
user-agent=Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/104.0.0.0 Safari/537.36
BODY:
-no body in request-

```

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 kubect1
The system cannot find the path specified.

C:\minikube>cd ..

C:\>cd kubect1

C:\kubect1>kubect1 get pods
NAME                                READY   STATUS    RESTARTS   AGE
hello-minikube-5c5f5cddb9-ck2kr    1/1     Running   0           6m16s

C:\kubect1>kubect1 run nginx --image=nginx
pod/nginx created

C:\kubect1>kubect1 get pods
NAME                                READY   STATUS    RESTARTS   AGE
hello-minikube-5c5f5cddb9-ck2kr    1/1     Running   0           7m49s
nginx                               1/1     Running   0           21s

C:\kubect1>kubect1 get pods
NAME                                READY   STATUS    RESTARTS   AGE
hello-minikube-5c5f5cddb9-ck2kr    1/1     Running   0           8m29s
nginx                               1/1     Running   0           61s

C:\kubect1>kubect1 get deployments
NAME            READY   UP-TO-DATE   AVAILABLE   AGE
hello-minikube  1/1     1             1           9m6s

C:\kubect1>kubect1 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 kubect1 services and again checks the pods and deployments. Also stop the minikube

```
C:\kubect1>kubect1 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:\kubect1>kubect1 delete service hello-minikube
service "hello-minikube" deleted

C:\kubect1>kubect1 get service
NAME          TYPE        CLUSTER-IP   EXTERNAL-IP   PORT(S)        AGE
kubernetes    ClusterIP    10.96.0.1     <none>         443/TCP         41m

C:\kubect1>kubect1 delete deployment hello-minikube
deployment.apps "hello-minikube" deleted

C:\kubect1>kubect1 get deployments
No resources found in default namespace.

C:\kubect1>kubect1 get pods
NAME    READY   STATUS    RESTARTS   AGE
nginx   1/1     Running   0           19m

C:\kubect1>cd.

C:\kubect1>cd..

C:\>cd minikube

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