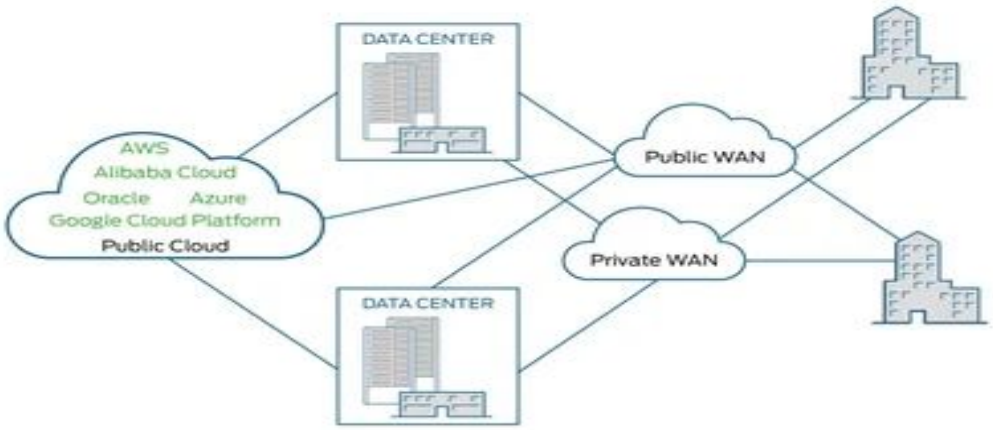
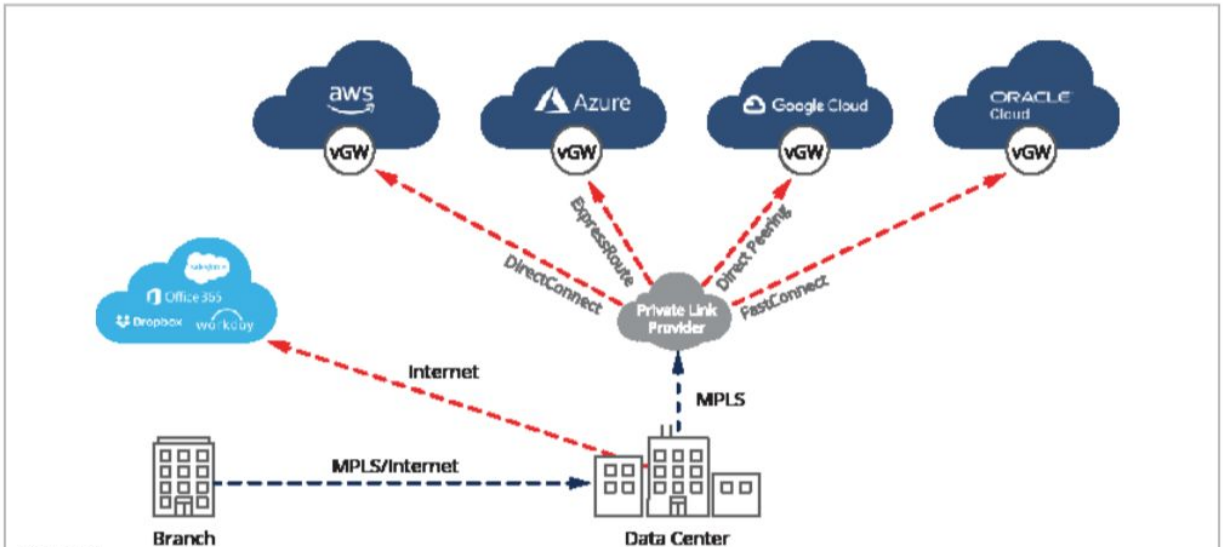
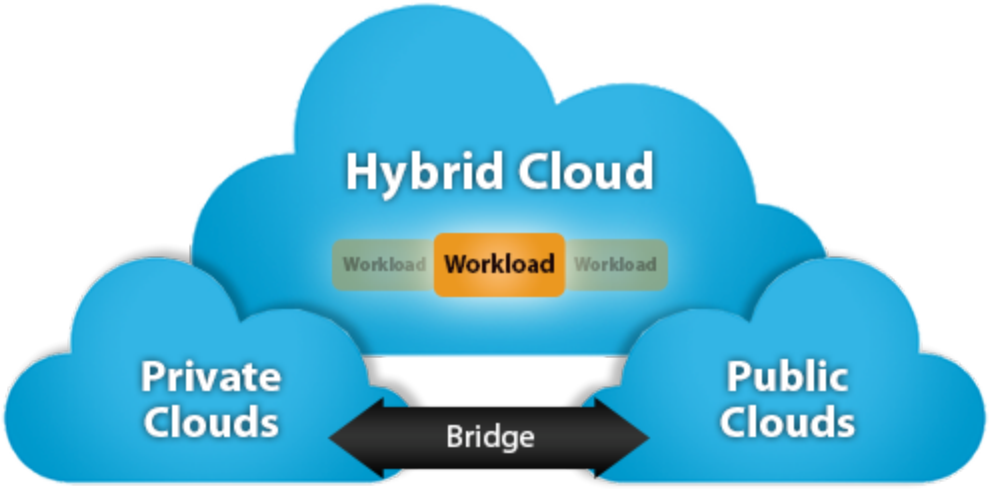
15th June:

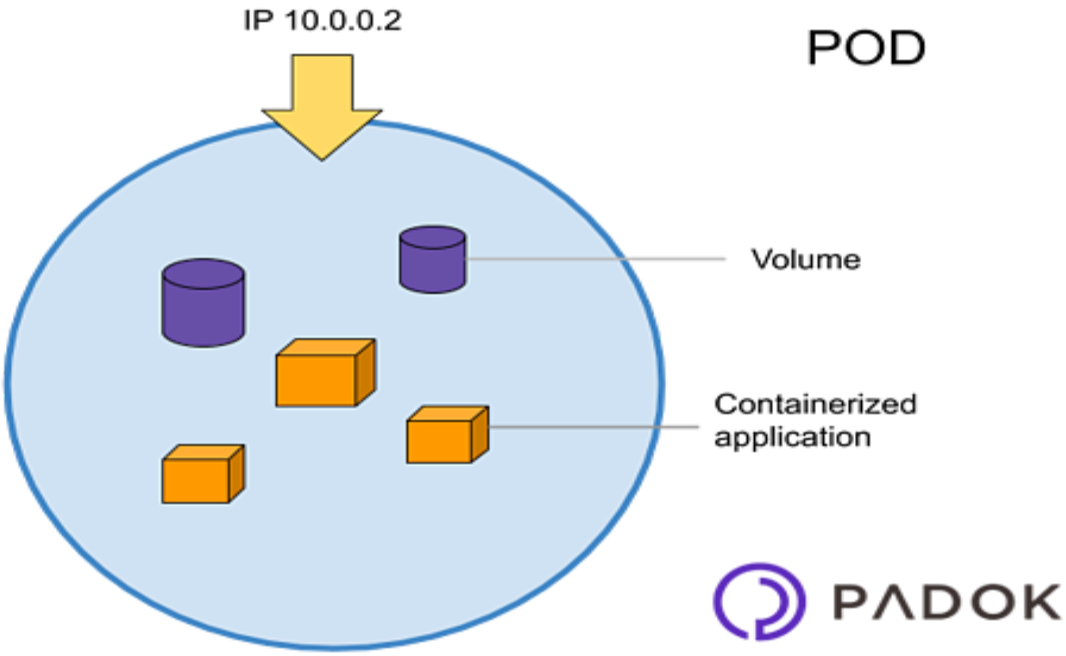
Multi-cloud: if a company use more than 1 cloud from the same domain







POD



C:\Users\user>kubectl create deployment myweb --image=vimal13/apache-webserver-php
deployment.apps/myweb created
C:\Users\user>kubectl get pods
NAME READY STATUS RESTARTS AGE
myweb-6bffb6b45c-c2f5p 1/1 Running 0 7s
C:\Users\user>kubectl describe pods
Name: **myweb-6bffb6b45c-c2f5p**
Namespace: default
Priority: 0

Node: minikube/192.168.99.100
Start Time: Mon, 15 Jun 2020 19:33:50 +0530
Labels: app=myweb
              pod-template-hash=6bffb6b45c
Annotations: <none>
Status: Running
IP: 172.17.0.4
IPs:
  IP: 172.17.0.4
Controlled By: ReplicaSet/myweb-6bffb6b45c
Containers:
  apache-webserver-php:
    Container ID:
docker://179456527d8f7fd1dde51ddbfa4f26d7bbdab28ab9e4dede71d9367cedf6d66e
    Image: **vimal13/apache-webserver-php**
    Image ID:
docker-pullable://vimal13/apache-webserver-php@sha256:faed0a5afaf9f04b6915d73f7247f6f5a
71db9274ca44118d38f4601c0080a91
    Port: <none>
    Host Port: <none>
    State: Running
      Started: Mon, 15 Jun 2020 19:33:56 +0530
    Ready: True
    Restart Count: 0
    Environment: <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from default-token-8llwm (ro)
Conditions:
  Type   Status
  Initialized   True
  Ready   True
  ContainersReady   True
  PodScheduled   True
Volumes:
  default-token-8llwm:
    Type: Secret (a volume populated by a Secret)
    SecretName: default-token-8llwm
    Optional: false
QoS Class: BestEffort
Node-Selectors: <none>
Tolerations: node.kubernetes.io/not-ready:NoExecute for 300s
                 node.kubernetes.io/unreachable:NoExecute for 300s
Events:

```
  Type    Reason     Age   From               Message
  ----    ------     ----  ----               -------
  Normal  Scheduled  61s   default-scheduler  Successfully assigned
default/myweb-6bffb6b45c-c2f5p to minikube
  Normal  Pulling    60s   kubelet, minikube  Pulling image "vimal13/apache-webserver-php"
  Normal  Pulled     56s   kubelet, minikube  Successfully pulled image
"vimal13/apache-webserver-php"
  Normal  Created    56s   kubelet, minikube  Created container apache-webserver-php
```

Normal Started 55s kubelet, minikube Started container apache-webserver-php

```
t an hour ago   Up About an hour                        k8s_etcd_etcd-minikube_k
ube-system_e3064b4cb5e1ec4220321aede0b3cc10_7
7301db2fbe30        k8s.gcr.io/pause:3.2          "/pause"                 Abou
t an hour ago   Up About an hour                        k8s_POD_etcd-minikube_ku
be-system_e3064b4cb5e1ec4220321aede0b3cc10_7
a1d08ee0dde3        a31f78c7c8ce                  "kube-scheduler --au▪"   Abou
t an hour ago   Up About an hour                        k8s_kube-scheduler_kube-
scheduler-minikube_kube-system_5795d0c442cb997ff93c49feeb9f6386_9
a64ac74f285c        d3e55153f52f                  "kube-controller-man▪"   Abou
t an hour ago   Up About an hour                        k8s_kube-controller-mana
ger_kube-controller-manager-minikube_kube-system_3016593d20758bbfe68aba26604a8e3
d_9
d494d3745b70        74060cea7f70                  "kube-apiserver --ad▪"   Abou
t an hour ago   Up About an hour                        k8s_kube-apiserver_kube-
apiserver-minikube_kube-system_90fc8f3b59010208ae7f84386223a7d3_8
ee41564dab10        k8s.gcr.io/pause:3.2          "/pause"                 Abou
t an hour ago   Up About an hour                        k8s_POD_kube-scheduler-m
inikube_kube-system_5795d0c442cb997ff93c49feeb9f6386_7
be0c0d1b8a52        k8s.gcr.io/pause:3.2          "/pause"                 Abou
t an hour ago   Up About an hour                        k8s_POD_kube-controller-
manager-minikube_kube-system_3016593d20758bbfe68aba26604a8e3d_7
9d138a1eab39        k8s.gcr.io/pause:3.2          "/pause"                 Abou
t an hour ago   Up About an hour                        k8s_POD_kube-apiserver-m
inikube_kube-system_90fc8f3b59010208ae7f84386223a7d3_7
$ docker ps_
```

```
be-system_e3064b4cb5e1ec4220321aede0b3cc10_7
a1d08ee0dde3        a31f78c7c8ce                  "kube-scheduler --au▪"   Abou
t an hour ago   Up About an hour                        k8s_kube-scheduler_kube-
scheduler-minikube_kube-system_5795d0c442cb997ff93c49feeb9f6386_9
a64ac74f285c        d3e55153f52f                  "kube-controller-man▪"   Abou
t an hour ago   Up About an hour                        k8s_kube-controller-mana
ger_kube-controller-manager-minikube_kube-system_3016593d20758bbfe68aba26604a8e3
d_9
d494d3745b70        74060cea7f70                  "kube-apiserver --ad▪"   Abou
t an hour ago   Up About an hour                        k8s_kube-apiserver_kube-
apiserver-minikube_kube-system_90fc8f3b59010208ae7f84386223a7d3_8
ee41564dab10        k8s.gcr.io/pause:3.2          "/pause"                 Abou
t an hour ago   Up About an hour                        k8s_POD_kube-scheduler-m
inikube_kube-system_5795d0c442cb997ff93c49feeb9f6386_7
be0c0d1b8a52        k8s.gcr.io/pause:3.2          "/pause"                 Abou
t an hour ago   Up About an hour                        k8s_POD_kube-controller-
manager-minikube_kube-system_3016593d20758bbfe68aba26604a8e3d_7
9d138a1eab39        k8s.gcr.io/pause:3.2          "/pause"                 Abou
t an hour ago   Up About an hour                        k8s_POD_kube-apiserver-m
inikube_kube-system_90fc8f3b59010208ae7f84386223a7d3_7
$ docker ps | grep vimal13
17945652 7d8f       vimal13/apache-webserver-php  "/usr/sbin/httpd -DF▪"   3 mi
nutes ago       Up 3 minutes                           k8s_apache-webserver-php
_myweb-6bffb6b45c-c2f5p_default_22919968-c533-45fa-bcd1-857d5cc8c2d1_0
$
```

C:\Users\user>kubectl delete all --all
pod "myweb-6bffb6b45c-c2f5p" deleted
service "kubernetes" deleted
deployment.apps "myweb" deleted
C:\Users\user>kubectl run -h
Create and run a particular image in a pod.

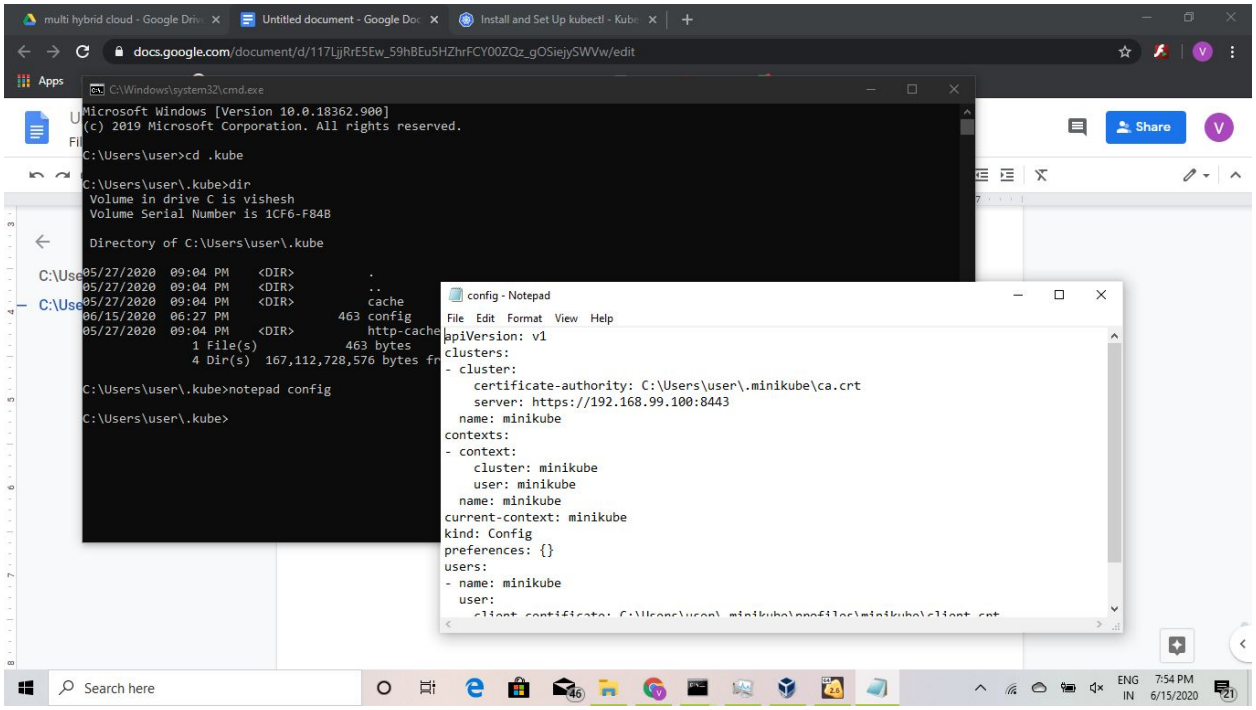
Examples:
  # Start a nginx pod.
  kubectl run nginx --image=nginx
 kubectl run nginx --image=nginx --overrides='{ "apiVersion": "v1", "spec": { ... } }
C:\Users\user>kubectl run mywebpod1 --image=vimall13/apache-webersver-php
pod/mywebpod1 created

C:\Users\user>kubectl get pods
NAME READY STATUS RESTARTS AGE
mywebpod1 0/1 ContainerCreating 0 4s
C:\Users\user>kubectl describe all
Name: mywebpod1
Namespace: default
Priority: 0
Node: minikube/192.168.99.100
Start Time: Mon, 15 Jun 2020 19:40:55 +0530
Labels: run=mywebpod1
C:\Users\user>kubectl delete pods mywebpod1
pod "mywebpod1" deleted

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

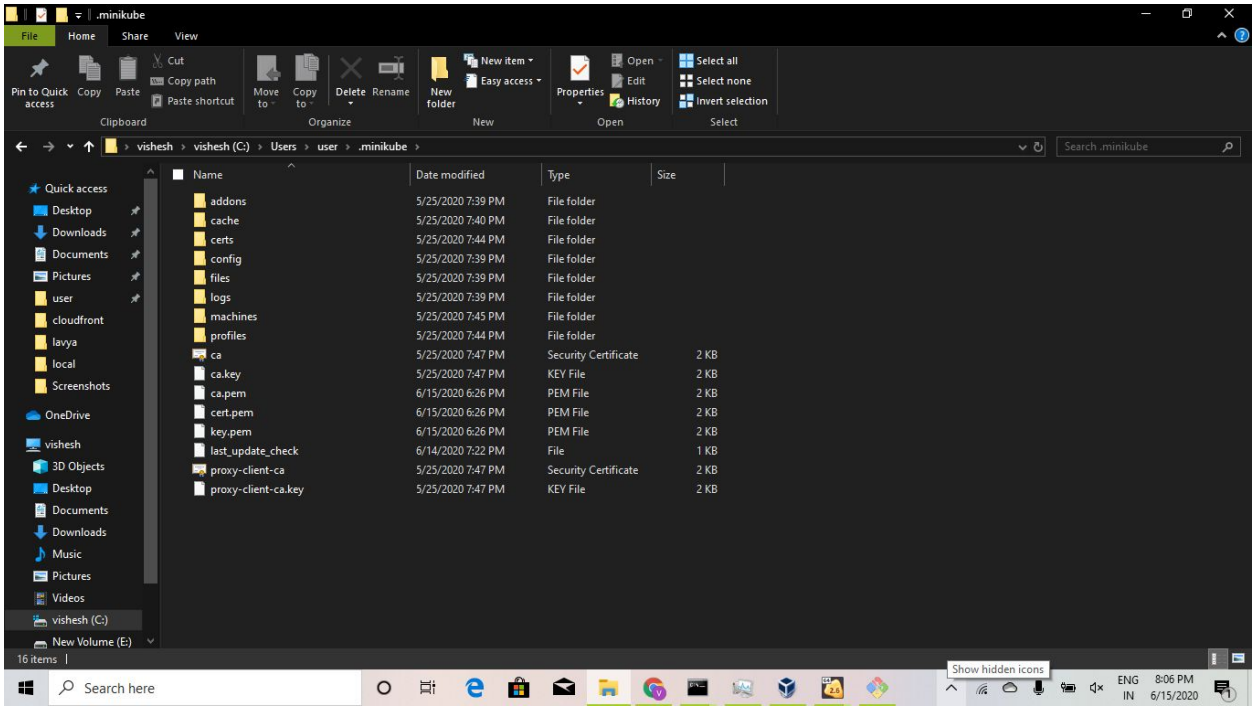
C:\Users\user>kubectl run mywebpod1 --image=vimall13/apache-webersver-php
pod/mywebpod1 created

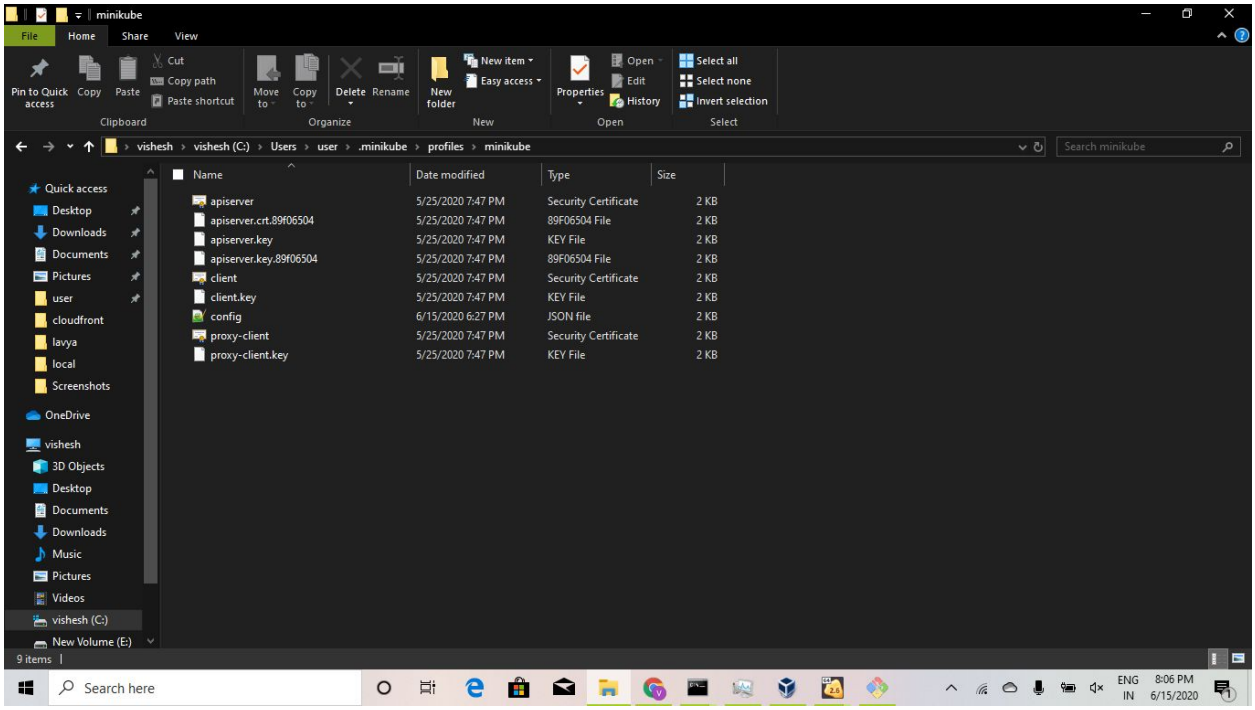
C:\Users\user>kubectl get pods
NAME READY STATUS RESTARTS AGE
mywebpod1 0/1 ContainerCreating 0 4s
Kubernetes api program(daemon):kubernetes connects with master

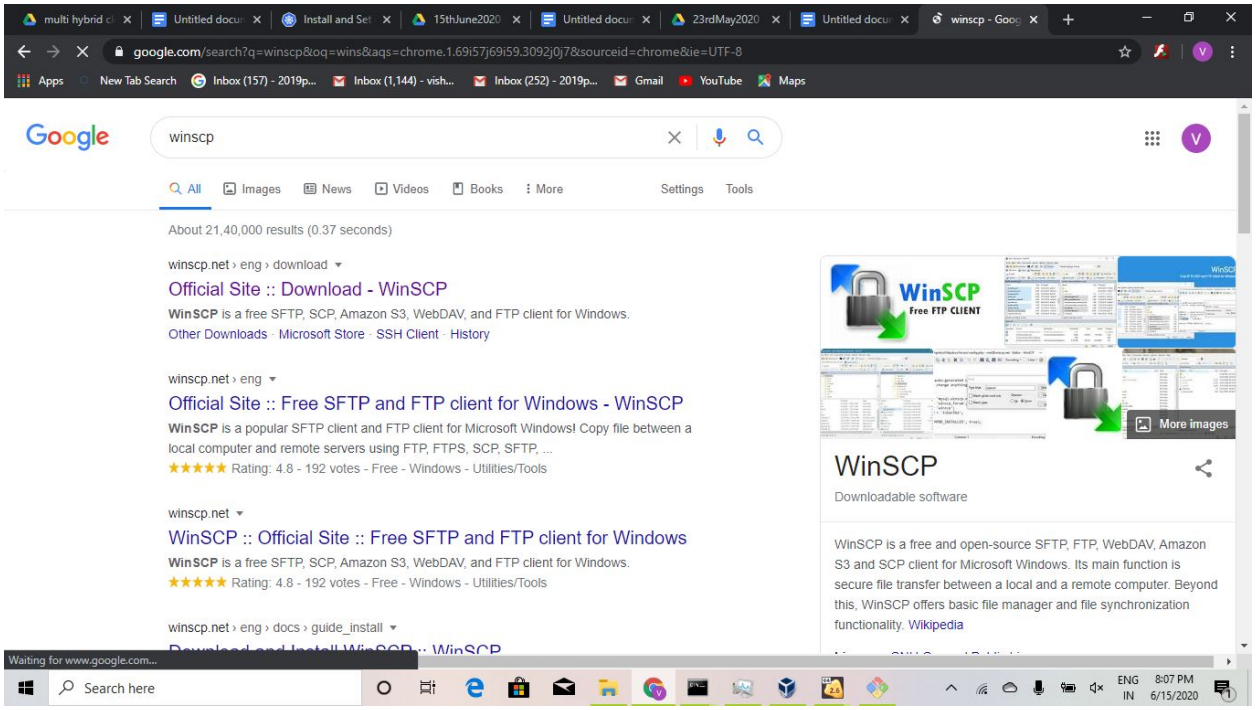



```
[root@localhost ~]# curl -LO https://storage.googleapis.com/kubernetes-release/release/`curl -s
https://storage.googleapis.com/kubernetes-release/release/stable.txt`/bin/linux/amd64/kubectl
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100 41.9M  100 41.9M    0     0  1366k      0  0:00:31  0:00:31 --:--:-- 2039k
[root@localhost ~]# kubectl version
bash: kubectl: command not found...
Failed to search for file: /run/media/root/RHEL-8-0-0-BaseOS-x86_64/AppStream was not found

C:\Users\user\.minikube>dir
 Volume in drive C is vishesh
 Volume Serial Number is 1CF6-F84B

 Directory of C:\Users\user\.minikube

06/15/2020  06:26 PM    <DIR>          .
06/15/2020  06:26 PM    <DIR>          ..
05/25/2020  07:39 PM    <DIR>          addons
05/25/2020  07:47 PM             1,066 ca.crt
05/25/2020  07:47 PM             1,679 ca.key
06/15/2020  06:26 PM             1,029 ca.pem
05/25/2020  07:40 PM    <DIR>          cache
06/15/2020  06:26 PM             1,070 cert.pem
05/25/2020  07:44 PM    <DIR>          certs
05/25/2020  07:39 PM    <DIR>          config
```

```
05/25/2020  07:39 PM    <DIR>          files
06/15/2020  06:26 PM             1,675 key.pem
06/14/2020  07:22 PM                29 last_update_check
05/25/2020  07:39 PM    <DIR>          logs
05/25/2020  07:45 PM    <DIR>          machines
05/25/2020  07:44 PM    <DIR>          profiles
05/25/2020  07:47 PM             1,074 proxy-client-ca.crt
05/25/2020  07:47 PM             1,675 proxy-client-ca.key
               8 File(s)          9,297 bytes
              10 Dir(s)  167,047,217,152 bytes free
```


.minikube
File Home Share View
Pin to Quick access Copy Paste Cut Copy path Paste shortcut
Move to Copy to Delete Rename New folder New item Easy access
Properties Open Edit History Select all Select none Invert selection
Clipboard Organize New Open Select
vishesh › vishesh (C:) › Users › user › .minikube ›
Search .minikube
Quick access Desktop Downloads Documents Pictures user cloudfront lavya local Screenshots
OneDrive
vishesh 3D Objects Desktop Documents Downloads Music Pictures Videos vishesh (C:) New Volume (E:)
Name Date modified Type Size
addons 5/25/2020 7:39 PM File folder
cache 5/25/2020 7:40 PM File folder
certs 5/25/2020 7:44 PM File folder
config 5/25/2020 7:39 PM File folder
files 5/25/2020 7:39 PM File folder
logs 5/25/2020 7:39 PM File folder
machines 5/25/2020 7:45 PM File folder
profiles 5/25/2020 7:44 PM File folder
ca 5/25/2020 7:47 PM Security Certificate 2 KB
ca.key 5/25/2020 7:47 PM KEY File 2 KB
ca.pem 6/15/2020 6:26 PM PEM File 2 KB
cert.pem 6/15/2020 6:26 PM PEM File 2 KB
key.pem 6/15/2020 6:26 PM PEM File 2 KB
last_update_check 6/14/2020 7:22 PM File 1 KB
proxy-client-ca 5/25/2020 7:47 PM Security Certificate 2 KB
proxy-client-ca.key 5/25/2020 7:47 PM KEY File 2 KB
16 items
Show hidden icons
Search here
ENG IN 8:06 PM 6/15/2020


minikube
File Home Share View
Pin to Quick access Copy Paste Cut Copy path Paste shortcut
Move to Copy to Delete Rename New folder New item Easy access
Properties Open Edit History Select all Select none Invert selection
Clipboard Organize New Open Select
vishesh › vishesh (C:) › Users › user › .minikube › profiles › minikube
Search minikube
Quick access Desktop Downloads Documents Pictures user cloudfront lavya local Screenshots
OneDrive
vishesh 3D Objects Desktop Documents Downloads Music Pictures Videos vishesh (C:) New Volume (E:)
Name Date modified Type Size
apiserver 5/25/2020 7:47 PM Security Certificate 2 KB
apiserver.crt.89f06504 5/25/2020 7:47 PM 89F06504 File 2 KB
apiserver.key 5/25/2020 7:47 PM KEY File 2 KB
apiserver.key.89f06504 5/25/2020 7:47 PM 89F06504 File 2 KB
client 5/25/2020 7:47 PM Security Certificate 2 KB
client.key 5/25/2020 7:47 PM KEY File 2 KB
config 6/15/2020 6:27 PM JSON file 2 KB
proxy-client 5/25/2020 7:47 PM Security Certificate 2 KB
proxy-client.key 5/25/2020 7:47 PM KEY File 2 KB
9 items
Search here
ENG IN 8:06 PM 6/15/2020


winscp
About 21,40,000 results (0.37 seconds)
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Official Site :: Download - WinSCP
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★★★★★ Rating: 4.8 - 192 votes - Free - Windows - Utilities/Tools
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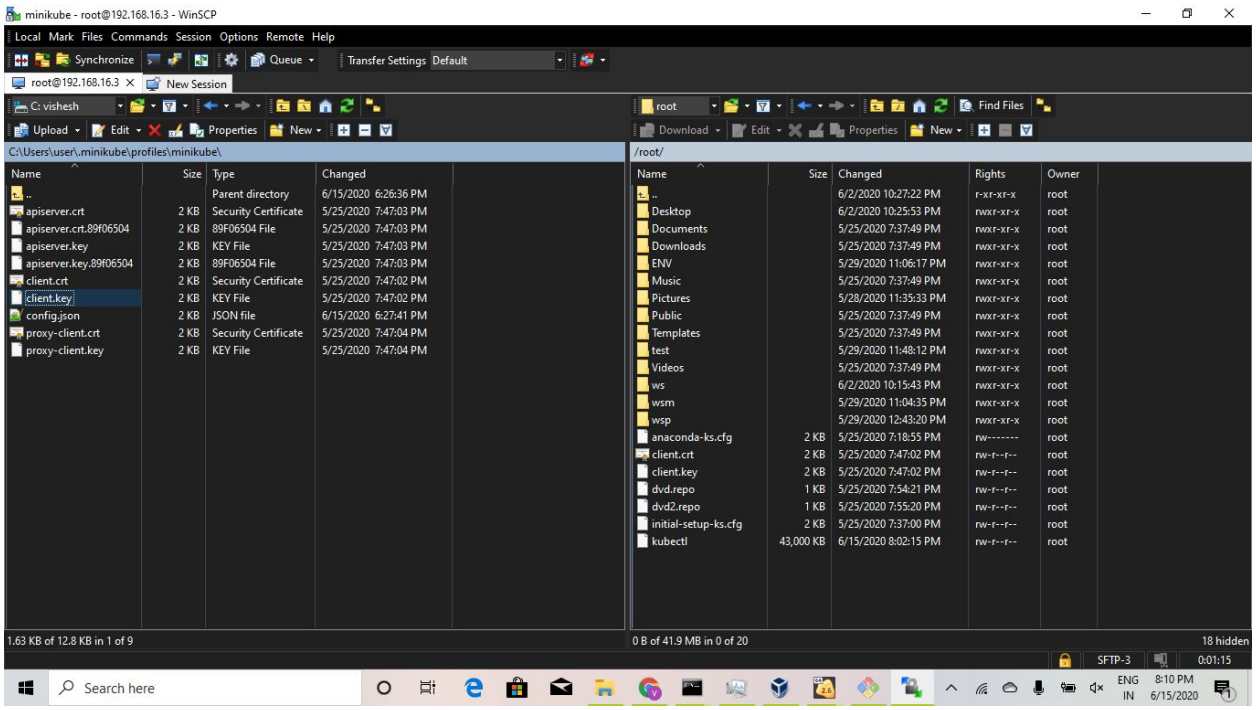
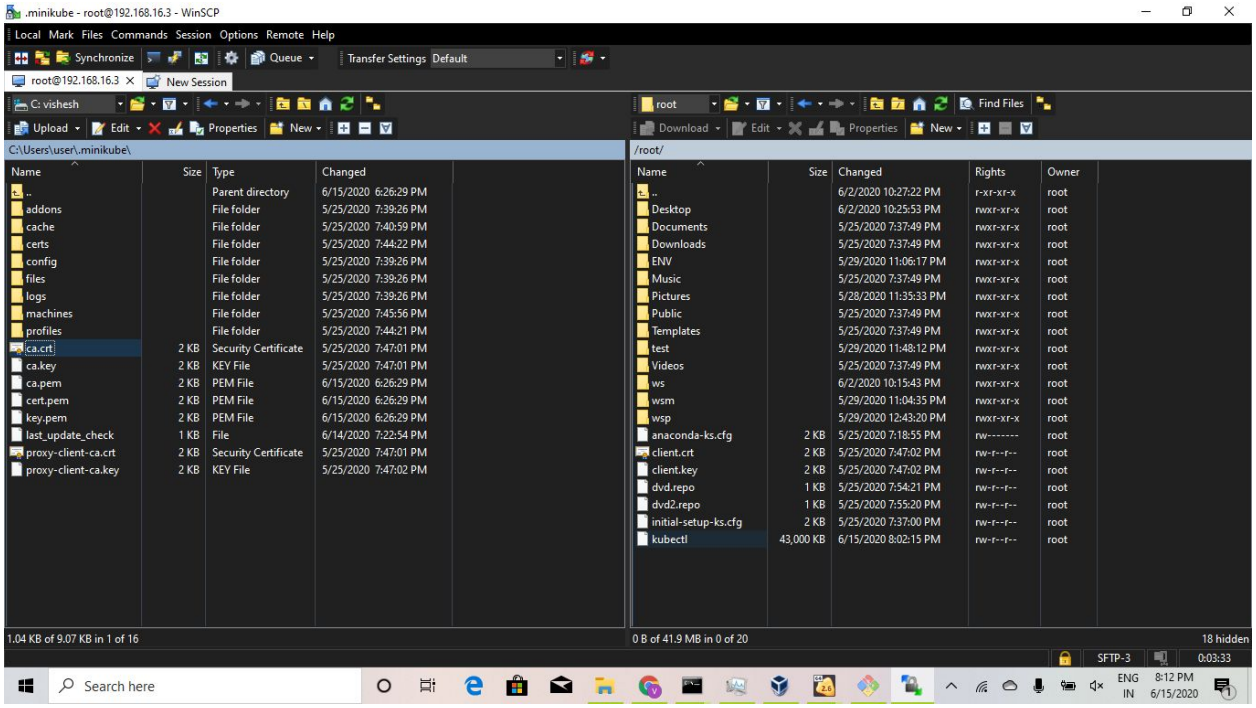
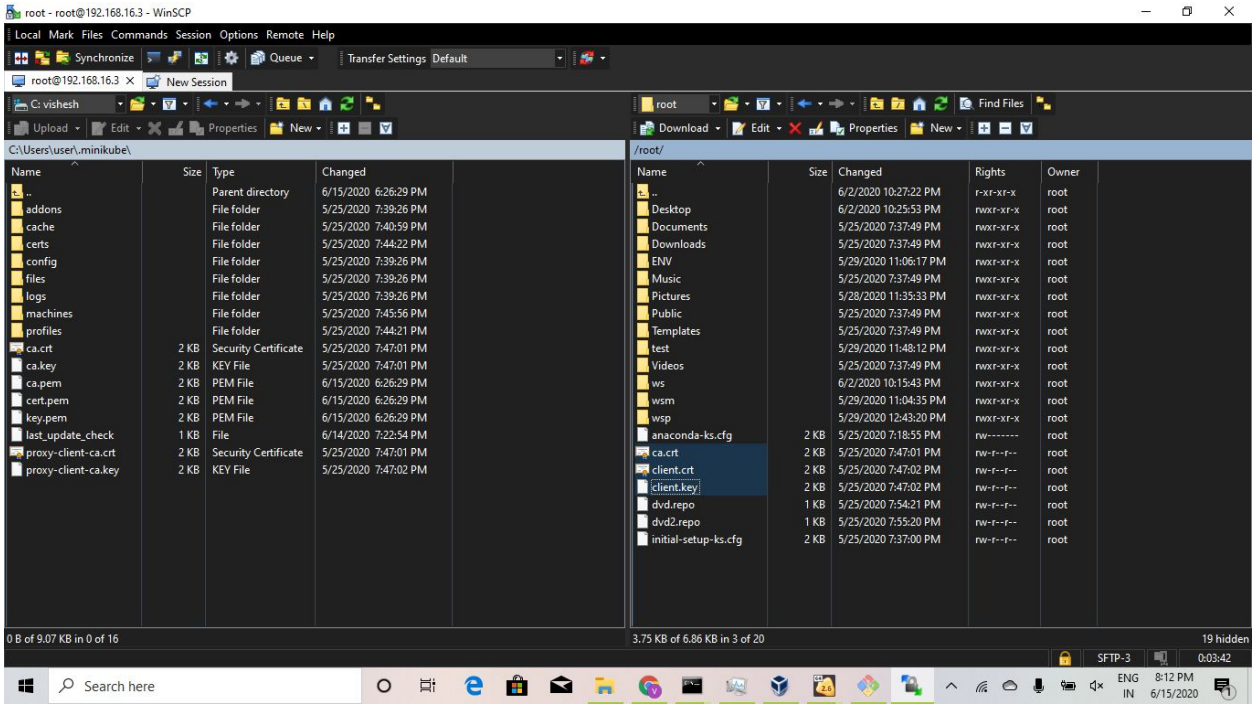
WinSCP :: Official Site :: Free SFTP and FTP client for Windows
WinSCP is a free SFTP, SCP, Amazon S3, WebDAV, and FTP client for Windows.
★★★★★ Rating: 4.8 - 192 votes - Free - Windows - Utilities/Tools
winscp.net › eng › docs › guide_install
WinSCP
Downloadable software
WinSCP is a free and open-source SFTP, FTP, WebDAV, Amazon S3 and SCP client for Microsoft Windows. Its main function is secure file transfer between a local and a remote computer. Beyond this, WinSCP offers basic file manager and file synchronization functionality. Wikipedia
More images


minikube - root@192.168.16.3 - WinSCP
Local Mark Files Commands Session Options Remote Help
root@192.168.16.3
New Session
C:\Users\user\.minikube\profiles\minikube\
/root/
1.63 KB of 12.8 KB in 1 of 9
0 B of 41.9 MB in 0 of 20
18 hidden
SFTP-3
0:01:15






```
[root@localhost ~]# kubectl version
bash: kubectl: command not found...
Failed to search for file: /run/media/root/RHEL-8-0-0-BaseOS-x86_64/AppStream was not found
[root@localhost ~]# ls -l kubectl
-rw-r--r--. 1 root root 44032000 Jun 15 20:02 kubectl
[root@localhost ~]# chmod +x kubectl
[root@localhost ~]# ls -l kubectl
```

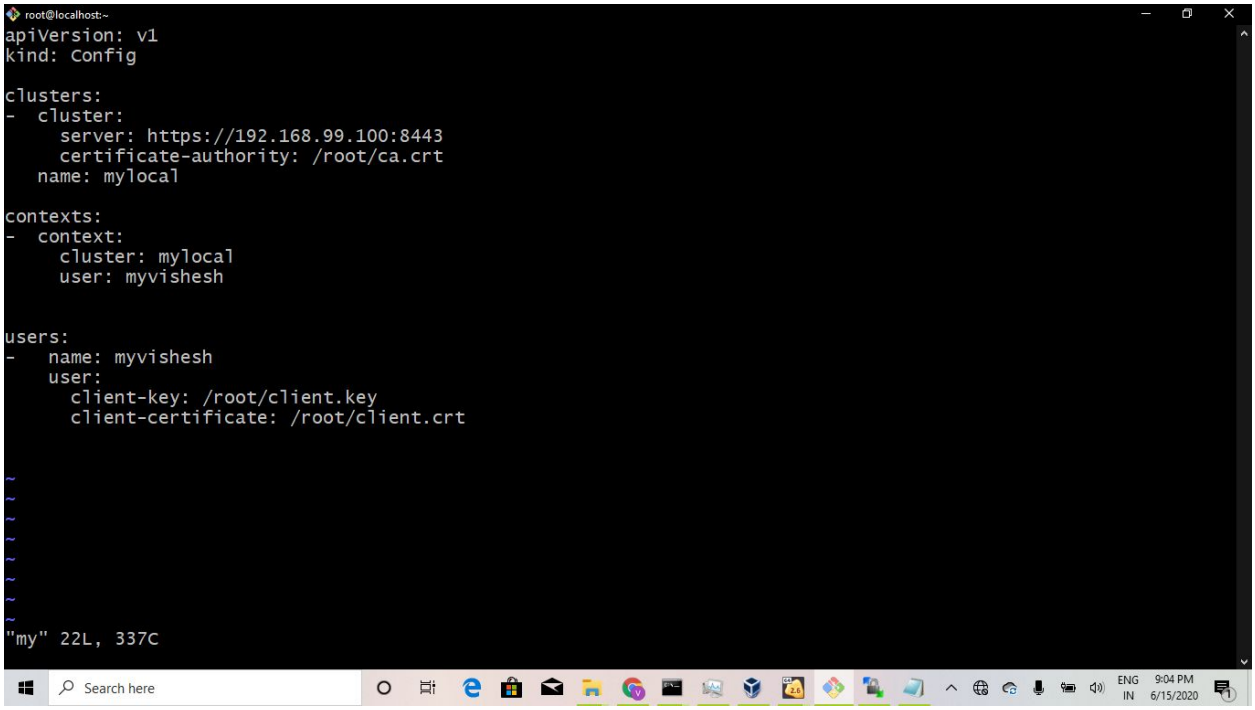
```
-rwxr-xr-. 1 root root 44032000 Jun 15 20:02 kubectl
[root@localhost ~]# pwd
/root
[root@localhost ~]# mv kubectl /usr/bin
[root@localhost ~]# kubectl version
Client Version: version.Info{Major:"1", Minor:"18", GitVersion:"v1.18.3",
GitCommit:"2e7996e3e2712684bc73f0dec0200d64eec7fe40", GitTreeState:"clean",
BuildDate:"2020-05-20T12:52:00Z", GoVersion:"go1.13.9", Compiler:"gc",
Platform:"linux/amd64"}
Error from server (Forbidden): <html><head><meta http-equiv='refresh'
content='1;url=/login?from=%2Fversion%3Ftimeout%3D32s'/><script>window.location.replace('/
login?from=%2Fversion%3Ftimeout%3D32s');</script></head><body
style='background-color:white; color:white;'>


Authentication required
<!--
You are authenticated as: anonymous
Groups that you are in:

Permission you need to have (but didn't): hudson.model.Hudson.Read
 ... which is implied by: hudson.security.Permission.GenericRead
 ... which is implied by: hudson.model.Hudson.Administer
-->

</body></html>

[root@localhost ~]#  kubectl get pods --server https://192.168.99.100:8443  --client-key
/client.key   --client-certificate /client.crt  --certificate-authority /ca.crt
Error in configuration:
* unable to read client-cert /client.crt for  due to open /client.crt: no such file or directory
* unable to read client-key /client.key for  due to open /client.key: no such file or directory
* unable to read certificate-authority /ca.crt for  due to open /ca.crt: no such file or directory
[root@localhost ~]#  kubectl get pods --server https://192.168.99.100:8443  --client-key
/root/client.key   --client-certificate /root/client.crt  --certificate-authority /root/ca.crt
NAME        READY   STATUS    RESTARTS   AGE
mywebpod1   1/1     Running   0          20m
```




```
[root@localhost ~]# vi my
[root@localhost ~]# kubectl get pods --kubeconfig my
NAME       READY   STATUS    RESTARTS   AGE
mywebpod1   1/1     Running   0          66m
[root@localhost ~]# kubectl config view
apiVersion: v1
clusters: null
contexts: null
current-context: ""
kind: Config
preferences: {}
users: null
[root@localhost ~]# cd .kube
[root@localhost .kube]# ls
cache  http-cache
[root@localhost .kube]# cd ..
[root@localhost ~]# cp my .kube/config
[root@localhost ~]# cd ..
[root@localhost /]# cd .kube
-bash: cd: .kube: No such file or directory
[root@localhost /]# cd /root/.kube
[root@localhost .kube]# ls
cache  config  http-cache
[root@localhost .kube]# kubectl config view
apiVersion: v1
```

```
clusters:
- cluster:
    certificate-authority: /root/ca.crt
    server: https://192.168.99.100:8443
  name: mylocal
contexts:
- context:
    cluster: mylocal
    user: myvishesh
  name: ""
current-context: ""
kind: Config
preferences: {}
users:
- name: myvishesh
  user:
    client-certificate: /root/client.crt
    client-key: /root/client.key

C:\Users\user\Desktop\terraform\kubernetes>terraform init

Initializing the backend...

Initializing provider plugins...
- Checking for available provider plugins...
- Downloading plugin for provider "kubernetes" (hashicorp/kubernetes) 1.11.3...

The following providers do not have any version constraints in configuration,
so the latest version was installed.

To prevent automatic upgrades to new major versions that may contain breaking
changes, it is recommended to add version = "..." constraints to the
corresponding provider blocks in configuration, with the constraint strings
suggested below.

* provider.kubernetes: version = "~> 1.11"

Terraform has been successfully initialized!

You may now begin working with Terraform. Try running "terraform plan" to see
any changes that are required for your infrastructure. All Terraform commands
should now work.
```

If you ever set or change modules or backend configuration for Terraform,
rerun this command to reinitialize your working directory. If you forget, other
commands will detect it and remind you to do so if necessary.
C:\Users\user\Desktop\terraform\kubernetes>terraform apply --auto-approve
kubernetes_pod.my-pod1: Creating...
kubernetes_pod.my-pod1: Creation complete after 6s [id=default/my-pod1]

Apply complete! Resources: 1 added, 0 changed, 0 destroyed.

C:\Users\user\Desktop\terraform\kubernetes>kubectl get pod
NAME READY STATUS RESTARTS AGE
my-pod1 1/1 Running 0 13s
mywebpod1 1/1 Running 0 74m

kube - Notepad

File Edit Format View Help

```
provider "kubernetes" {
  config_context_cluster = "minikube"
}

resource "kubernetes_pod" "my-pod1" {
  metadata {
    name = "my-pod1"
     }
  spec {
    container{
    image = "vimal13/apache-webserver-php"
    name  = "my-pod1"
    }
  }
}
```

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terraform.io/docs/providers/kubernetes/guides/getting-started.html

Apps | New Tab Search | Inbox (157) - 2019p... | Inbox (1,144) - vish... | Inbox (252) - 2019p... | Gmail | YouTube | Maps

Unlike in this simple example you'd commonly run more than a single instance of your application in production to reach high availability and adding labels will allow Kubernetes to find all pods (instances) for the purpose of forwarding the traffic to the exposed port.

```
resource "kubernetes_pod" "nginx" {
  metadata {
    name = "nginx-example"
    labels = {
      App = "nginx"
    }
  }

  spec {
    container {
      image = "nginx:1.7.8"
      name  = "example"

      port {
        container_port = 80
      }
    }
  }
}
```

The simplest way to expose your application to users is via Service. Service is capable of provisioning a load-balancer in some cloud providers and managing the relationship between pods and that load balancer as new