Final Project Assessment

Deploy a WordPress on Kubernetes (using Minikube) with Helm and

automation with Jenkins.

Prerequisites:

1. Install the necessary tools: Minikube, Helm and Jenkins.

First you need to install Minikube , here the official site and documentation for installation: https://minikube.sigs.k8s.io/docs/start/

Here is the link to install Helm : https://helm.sh/docs/intro/install/

Here is the link to install Jenkins : https://www.jenkins.io/doc/book/installing/linux/

2. Separate repo in your GitHub Profile named: Final Project Assessment for Scalefocus Academy

Requirement for the Project Assessment:

1. Download Helm chart for WordPress. (Bitnami chart:

https://github.com/bitnami/charts/tree/main/bitnami/wordpress)

2. In values.yaml, you need to change line 543 from type: LoadBalancer to type: ClusterIP (Hint: there

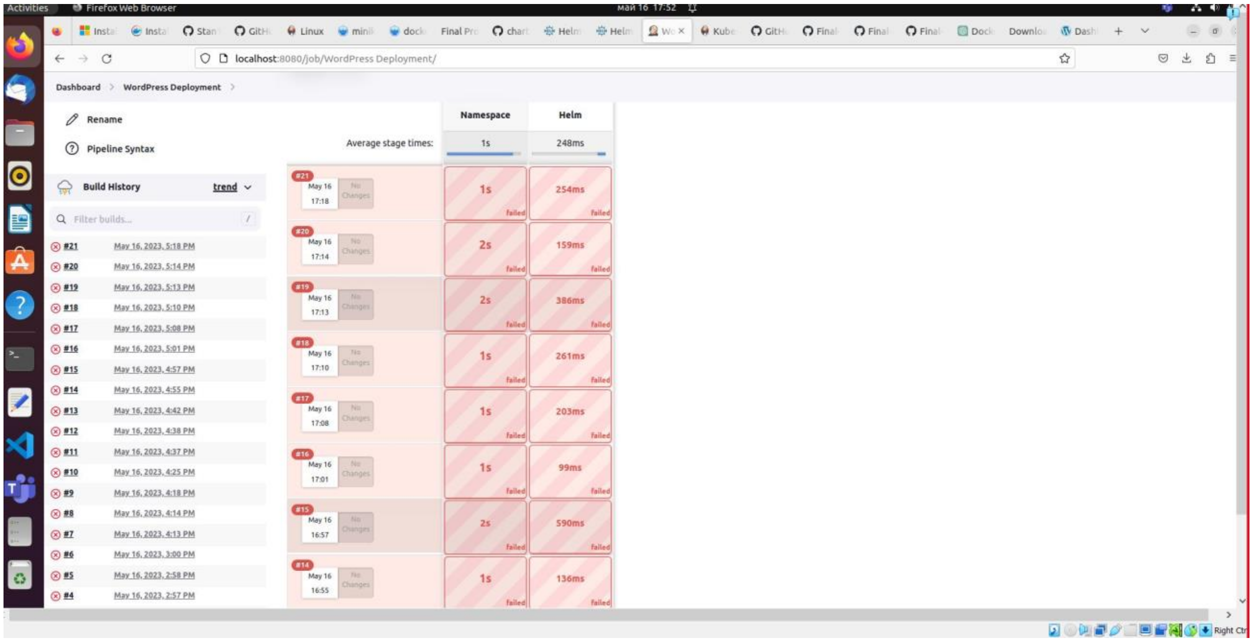
will be one more problem when deploying. Resolve it. – change the port forward for wordpress with a free port ,because port 8080 is used by Jenkins.

3. Create a Jenkins pipeline that checks if wp namespace exists, if it doesn't then it creates one.

Checks if WordPress exists, if it doesn't then it installs the chart.

I tried to create the pipeline but it game an error every time:

```
pipeline {
  agent any

  environment {
    KUBECONFIG = '/var/lib/jenkins/.kube/config'
  }

  stages {
    stage('Namespace') {
        steps {
            script {
                def namespaceExists = sh(script: 'kubectl get namespace wp', returnStatus: true) == 0

                if (namespaceExists) {
                    echo 'Namespace wp exists'
                    return
                } else {
                    echo 'Creating wp namespace'
                    sh 'kubectl create namespace wp'
                }
            }
        }
    }

    stage('Helm') {
        steps {
            script {
                sh 'helm dependency build ./bitnami/wordpress'
                sh 'helm upgrade --install final-project-wp-scalefocus ./bitnami/wordpress -n wp'
            }
        }
    }
  }
}
```



localhost:8080/job/WordPress Deployment/

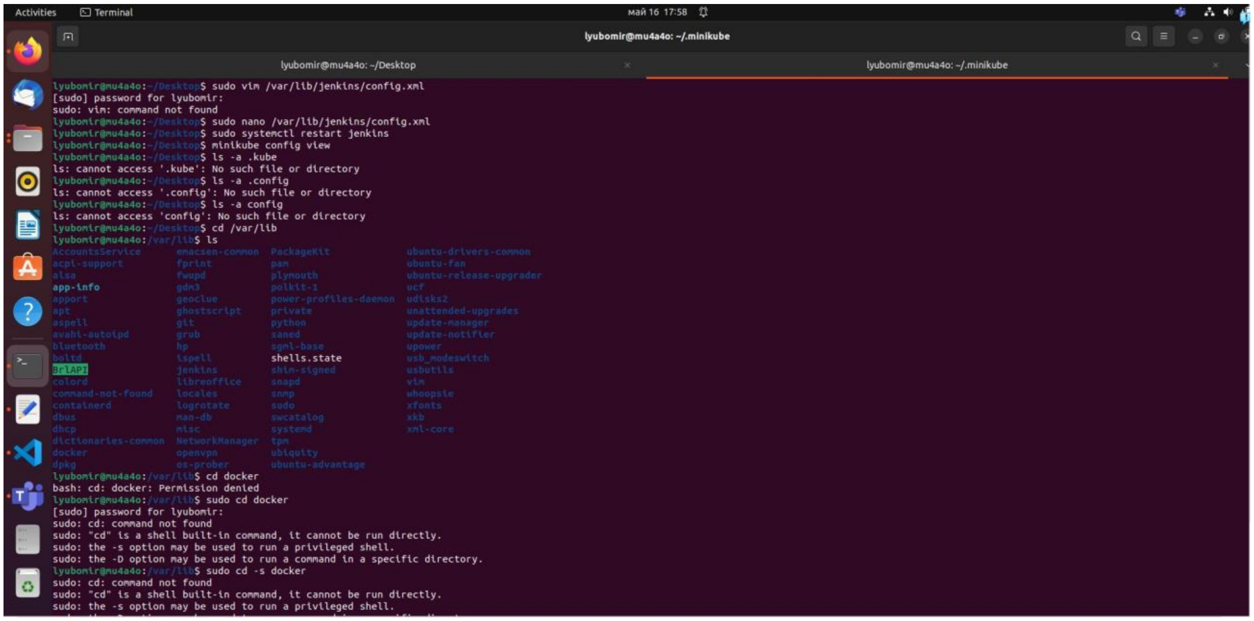
Dashboard > WordPress Deployment >

Build History

Build	Date
#21	May 16, 2023, 5:18 PM
#20	May 16, 2023, 5:14 PM
#19	May 16, 2023, 5:13 PM
#18	May 16, 2023, 5:10 PM
#17	May 16, 2023, 5:08 PM
#16	May 16, 2023, 5:01 PM
#15	May 16, 2023, 4:57 PM
#14	May 16, 2023, 4:55 PM
#13	May 16, 2023, 4:42 PM
#12	May 16, 2023, 4:38 PM
#11	May 16, 2023, 4:37 PM
#10	May 16, 2023, 4:25 PM
#9	May 16, 2023, 4:18 PM
#8	May 16, 2023, 4:14 PM
#7	May 16, 2023, 4:13 PM
#6	May 16, 2023, 3:00 PM
#5	May 16, 2023, 2:58 PM
#4	May 16, 2023, 2:57 PM

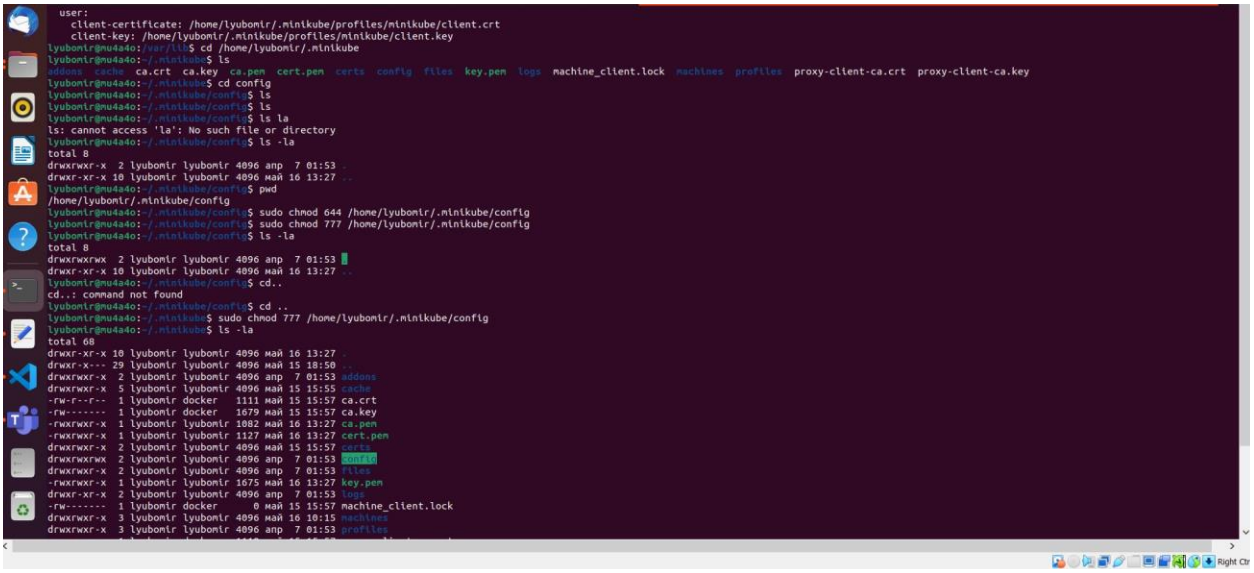
	Namespace	Helm
Average stage times:	1s	248ms
#21 May 16 17:18 No Changes	1s failed	254ms failed
#20 May 16 17:14 No Changes	2s failed	159ms failed
#19 May 16 17:13 No Changes	2s failed	386ms failed
#18 May 16 17:10 No Changes	1s failed	261ms failed
#17 May 16 17:08 No Changes	1s failed	203ms failed
#16 May 16 17:01 No Changes	1s failed	99ms failed
#15 May 16 16:57 No Changes	2s failed	590ms failed
#14 May 16 16:55 No Changes	1s failed	136ms failed

It gave me a permission error ,I tried to fix it but with no success ☹

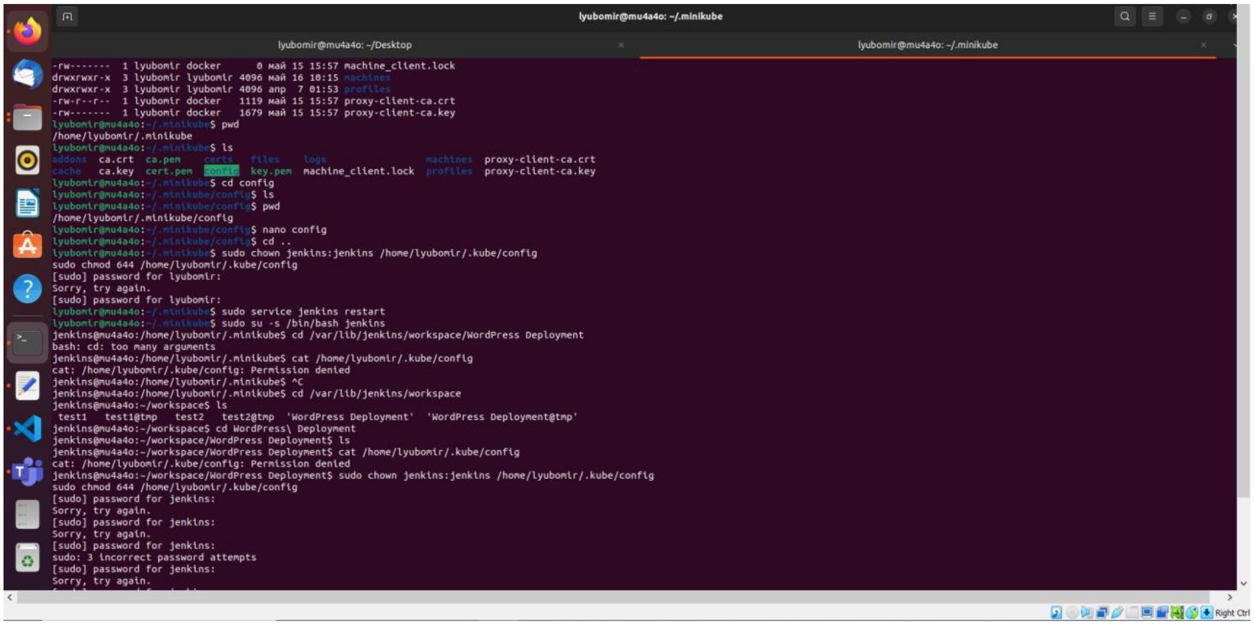


Activities
Terminal
Май 16 17:58
lyubomir@mu4a4o: ~/.minikube
lyubomir@mu4a4o: ~/Desktop
lyubomir@mu4a4o: ~/.minikube

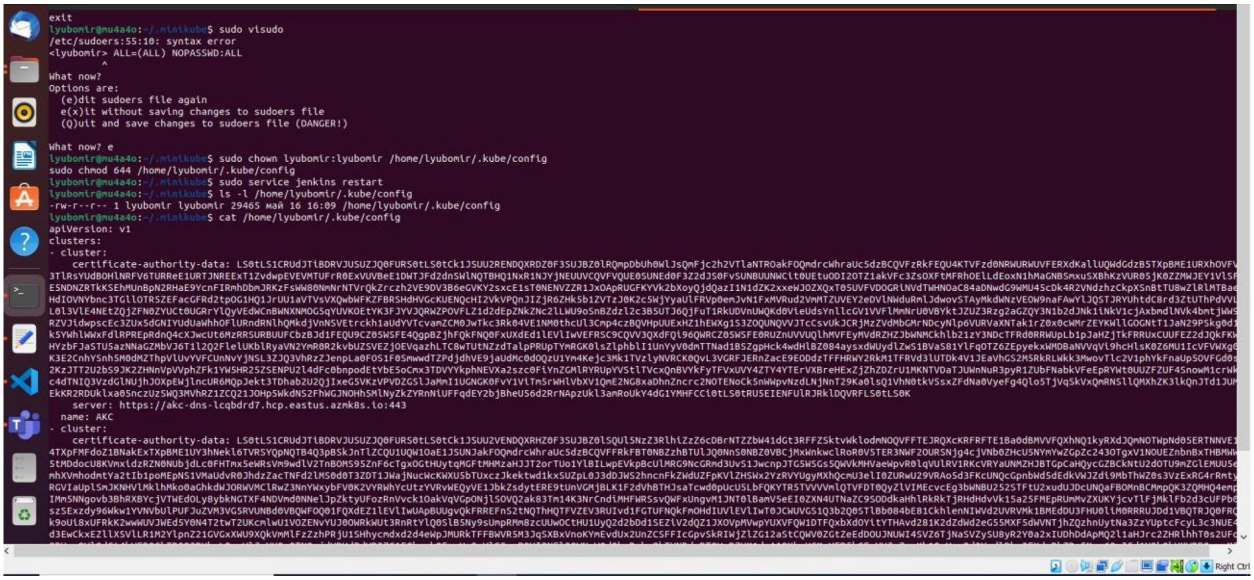
```
lyubomir@mu4a4o:~/Desktop$ sudo vim /var/lib/jenkins/config.xml
[sudo] password for lyubomir:
sudo: vim: command not found
lyubomir@mu4a4o:~/Desktop$ sudo nano /var/lib/jenkins/config.xml
lyubomir@mu4a4o:~/Desktop$ sudo systemctl restart jenkins
lyubomir@mu4a4o:~/Desktop$ minikube config view
lyubomir@mu4a4o:~/Desktop$ ls -a .kube
ls: cannot access '.kube': No such file or directory
lyubomir@mu4a4o:~/Desktop$ ls -a .config
ls: cannot access '.config': No such file or directory
lyubomir@mu4a4o:~/Desktop$ ls -a config
ls: cannot access 'config': No such file or directory
lyubomir@mu4a4o:~/Desktop$ cd /var/lib
lyubomir@mu4a4o:/var/lib$ ls
AccountsService       emacsen-common  PackageKit            ubuntu-drivers-common
acpi-support          fprint          pam                   ubuntu-fan
alsa                  fwupd           plymouth              ubuntu-release-upgrader
app-info              gdm3            polkit-1              ucf
apport                geoclue         power-profiles-daemon udisks2
apt                   ghostscript     private               unattended-upgrades
aspell                git             python                update-manager
avahi-autoipd         grub            saned                 update-notifier
bluetooth             hp              sgml-base             upower
boltd                 ispell          shells.state          usb_modeswitch
BrlAPI                jenkins         shim-signed           usbutils
colord                libreoffice     snapd                 vim
command-not-found     locales         snmp                  whoopsie
containerd            logrotate       sudo                  xfonts
dbus                  man-db          swcatalog             xkb
dhcp                  misc            systemd               xml-core
dictionaries-common   NetworkManager  tpm
docker                openvpn         ubiquity
dpkg                  os-prober       ubuntu-advantage
lyubomir@mu4a4o:/var/lib$ cd docker
bash: cd: docker: Permission denied
lyubomir@mu4a4o:/var/lib$ sudo cd docker
[sudo] password for lyubomir:
sudo: cd: command not found
sudo: "cd" is a shell built-in command, it cannot be run directly.
sudo: the -s option may be used to run a privileged shell.
sudo: the -D option may be used to run a command in a specific directory.
lyubomir@mu4a4o:/var/lib$ sudo cd -s docker
sudo: cd: command not found
sudo: "cd" is a shell built-in command, it cannot be run directly.
sudo: the -s option may be used to run a privileged shell.
```



```
  user:
    client-certificate: /home/lyubomir/.minikube/profiles/minikube/client.crt
    client-key: /home/lyubomir/.minikube/profiles/minikube/client.key
lyubomir@mu4a4o:/var/lib$ cd /home/lyubomir/.minikube
lyubomir@mu4a4o:~/.minikube$ ls
addons  cache  ca.crt  ca.key  ca.pem  cert.pem  certs  config  files  key.pem  logs  machine_client.lock  machines  profiles  proxy-client-ca.crt  proxy-client-ca.key
lyubomir@mu4a4o:~/.minikube$ cd config
lyubomir@mu4a4o:~/.minikube/config$ ls
lyubomir@mu4a4o:~/.minikube/config$ ls
lyubomir@mu4a4o:~/.minikube/config$ ls la
ls: cannot access 'la': No such file or directory
lyubomir@mu4a4o:~/.minikube/config$ ls -la
total 8
drwxrwxr-x  2 lyubomir lyubomir 4096 апр  7 01:53 .
drwxr-xr-x 10 lyubomir lyubomir 4096 май 16 13:27 ..
lyubomir@mu4a4o:~/.minikube/config$ pwd
/home/lyubomir/.minikube/config
lyubomir@mu4a4o:~/.minikube/config$ sudo chmod 644 /home/lyubomir/.minikube/config
lyubomir@mu4a4o:~/.minikube/config$ sudo chmod 777 /home/lyubomir/.minikube/config
lyubomir@mu4a4o:~/.minikube/config$ ls -la
total 8
drwxrwxrwx  2 lyubomir lyubomir 4096 апр  7 01:53 .
drwxr-xr-x 10 lyubomir lyubomir 4096 май 16 13:27 ..
lyubomir@mu4a4o:~/.minikube/config$ cd..
cd..: command not found
lyubomir@mu4a4o:~/.minikube/config$ cd ..
lyubomir@mu4a4o:~/.minikube$ sudo chmod 777 /home/lyubomir/.minikube/config
lyubomir@mu4a4o:~/.minikube$ ls -la
total 68
drwxr-xr-x 10 lyubomir lyubomir 4096 май 16 13:27 .
drwxr-x--- 29 lyubomir lyubomir 4096 май 15 18:50 ..
drwxrwxr-x  2 lyubomir lyubomir 4096 апр  7 01:53 addons
drwxrwxr-x  5 lyubomir lyubomir 4096 май 15 15:55 cache
-rw-r--r--  1 lyubomir docker   1111 май 15 15:57 ca.crt
-rw-------  1 lyubomir docker   1679 май 15 15:57 ca.key
-rwxrwxr-x  1 lyubomir lyubomir 1082 май 16 13:27 ca.pem
-rwxrwxr-x  1 lyubomir lyubomir 1127 май 16 13:27 cert.pem
drwxrwxr-x  2 lyubomir lyubomir 4096 май 15 15:57 certs
drwxrwxrwx  2 lyubomir lyubomir 4096 апр  7 01:53 config
drwxrwxr-x  2 lyubomir lyubomir 4096 апр  7 01:53 files
-rwxrwxr-x  1 lyubomir lyubomir 1675 май 16 13:27 key.pem
drwxr-xr-x  2 lyubomir lyubomir 4096 апр  7 01:53 logs
-rw-------  1 lyubomir docker      0 май 15 15:57 machine_client.lock
drwxrwxr-x  3 lyubomir lyubomir 4096 май 16 10:15 machines
drwxrwxr-x  3 lyubomir lyubomir 4096 апр  7 01:53 profiles
```

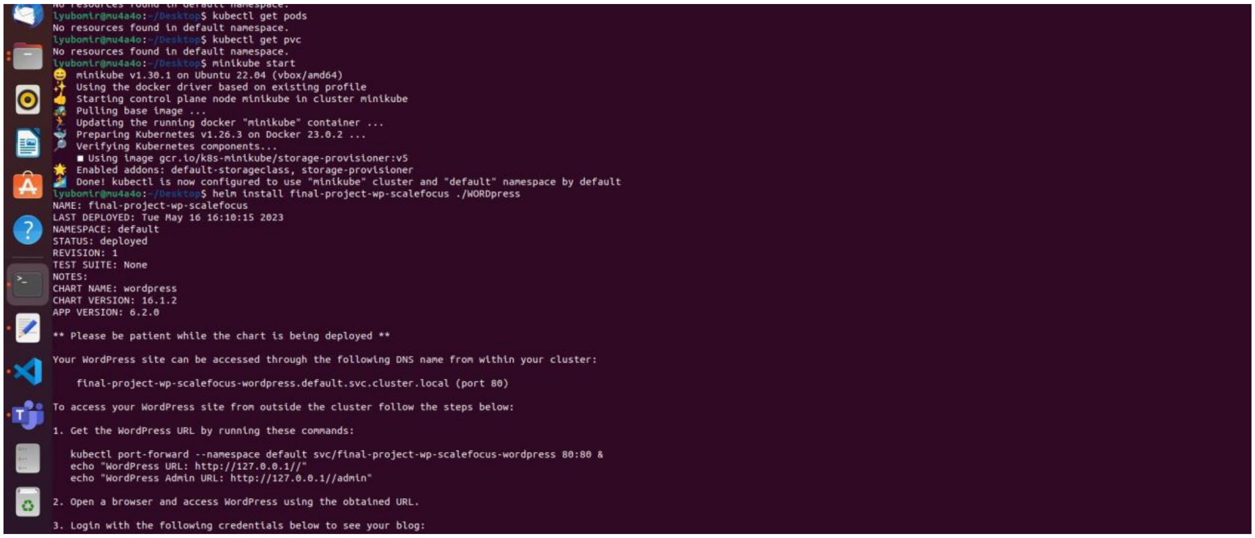

lyubomir@mu4a4o: ~/.minikube
lyubomir@mu4a4o: ~/Desktop
lyubomir@mu4a4o: ~/.minikube

```
-rw-------  1 lyubomir docker      0 май 15 15:57 machine_client.lock
drwxrwxr-x  3 lyubomir lyubomir 4096 май 16 10:15 machines
drwxrwxr-x  3 lyubomir lyubomir 4096 апр  7 01:53 profiles
-rw-r--r--  1 lyubomir docker   1119 май 15 15:57 proxy-client-ca.crt
-rw-------  1 lyubomir docker   1679 май 15 15:57 proxy-client-ca.key
lyubomir@mu4a4o:~/.minikube$ pwd
/home/lyubomir/.minikube
lyubomir@mu4a4o:~/.minikube$ ls
addons  ca.crt  ca.pem    certs   files    logs                 machines  proxy-client-ca.crt
cache   ca.key  cert.pem  config  key.pem  machine_client.lock  profiles  proxy-client-ca.key
lyubomir@mu4a4o:~/.minikube$ cd config
lyubomir@mu4a4o:~/.minikube/config$ ls
lyubomir@mu4a4o:~/.minikube/config$ pwd
/home/lyubomir/.minikube/config
lyubomir@mu4a4o:~/.minikube/config$ nano config
lyubomir@mu4a4o:~/.minikube/config$ cd ..
lyubomir@mu4a4o:~/.minikube$ sudo chown jenkins:jenkins /home/lyubomir/.kube/config
sudo chmod 644 /home/lyubomir/.kube/config
[sudo] password for lyubomir:
Sorry, try again.
[sudo] password for lyubomir:
lyubomir@mu4a4o:~/.minikube$ sudo service jenkins restart
lyubomir@mu4a4o:~/.minikube$ sudo su -s /bin/bash jenkins
jenkins@mu4a4o:/home/lyubomir/.minikube$ cd /var/lib/jenkins/workspace/WordPress Deployment
bash: cd: too many arguments
jenkins@mu4a4o:/home/lyubomir/.minikube$ cat /home/lyubomir/.kube/config
cat: /home/lyubomir/.kube/config: Permission denied
jenkins@mu4a4o:/home/lyubomir/.minikube$ ^C
jenkins@mu4a4o:/home/lyubomir/.minikube$ cd /var/lib/jenkins/workspace
jenkins@mu4a4o:~/workspace$ ls
 test1   test1@tmp   test2   test2@tmp  'WordPress Deployment'  'WordPress Deployment@tmp'
jenkins@mu4a4o:~/workspace$ cd WordPress\ Deployment
jenkins@mu4a4o:~/workspace/WordPress Deployment$ ls
jenkins@mu4a4o:~/workspace/WordPress Deployment$ cat /home/lyubomir/.kube/config
cat: /home/lyubomir/.kube/config: Permission denied
jenkins@mu4a4o:~/workspace/WordPress Deployment$ sudo chown jenkins:jenkins /home/lyubomir/.kube/config
sudo chmod 644 /home/lyubomir/.kube/config
[sudo] password for jenkins:
Sorry, try again.
[sudo] password for jenkins:
Sorry, try again.
[sudo] password for jenkins:
sudo: 3 incorrect password attempts
[sudo] password for jenkins:
Sorry, try again.
```

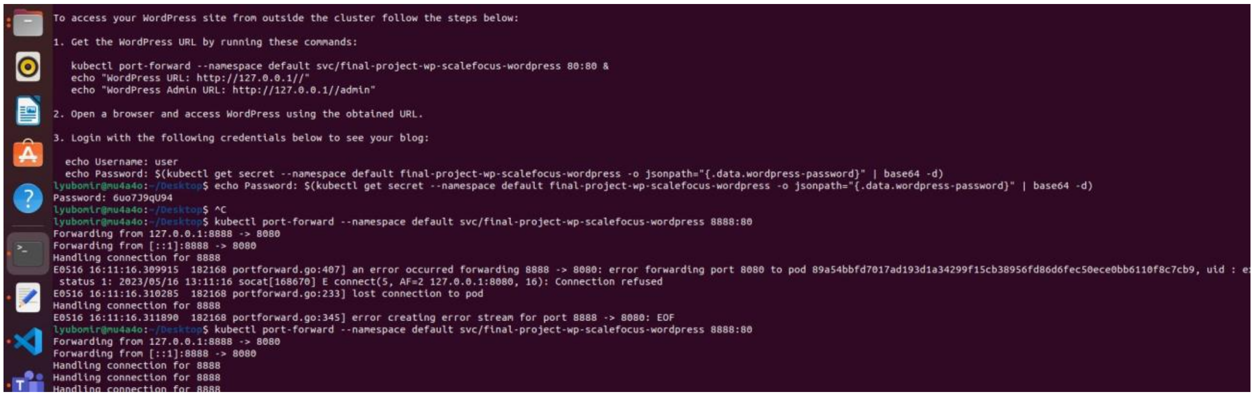


```
exit
lyubomir@mu4a4o:~/.minikube$ sudo visudo
/etc/sudoers:55:10: syntax error
<lyubomir> ALL=(ALL) NOPASSWD:ALL
         ^
What now?
Options are:
  (e)dit sudoers file again
  e(x)it without saving changes to sudoers file
  (Q)uit and save changes to sudoers file (DANGER!)

What now? e
lyubomir@mu4a4o:~/.minikube$ sudo chown lyubomir:lyubomir /home/lyubomir/.kube/config
sudo chmod 644 /home/lyubomir/.kube/config
lyubomir@mu4a4o:~/.minikube$ sudo service jenkins restart
lyubomir@mu4a4o:~/.minikube$ ls -l /home/lyubomir/.kube/config
-rw-r--r-- 1 lyubomir lyubomir 29465 май 16 16:09 /home/lyubomir/.kube/config
lyubomir@mu4a4o:~/.minikube$ cat /home/lyubomir/.kube/config
apiVersion: v1
clusters:
- cluster:
    certificate-authority-data: LS0tLS1CRUdJTiBDRVJUSUZJQ0FURS0tLS0tCk1JSUU2RENDQXRDZ0F3SUJBZ0lRQmpDbUh0WlJ
    server: https://akc-dns-lcqbdrd7.hcp.eastus.azmk8s.io:443
  name: AKC
- cluster:
    certificate-authority-data: LS0tLS1CRUdJTiBDRVJUSUZJQ0FURS0tLS0tCk1JSUU2VENDQXRHZ0F3SUJBZ0lSQUl5NzZ3Rlh
```

4. Name the Helm Deployment as: final-project-wp-scalefocus.



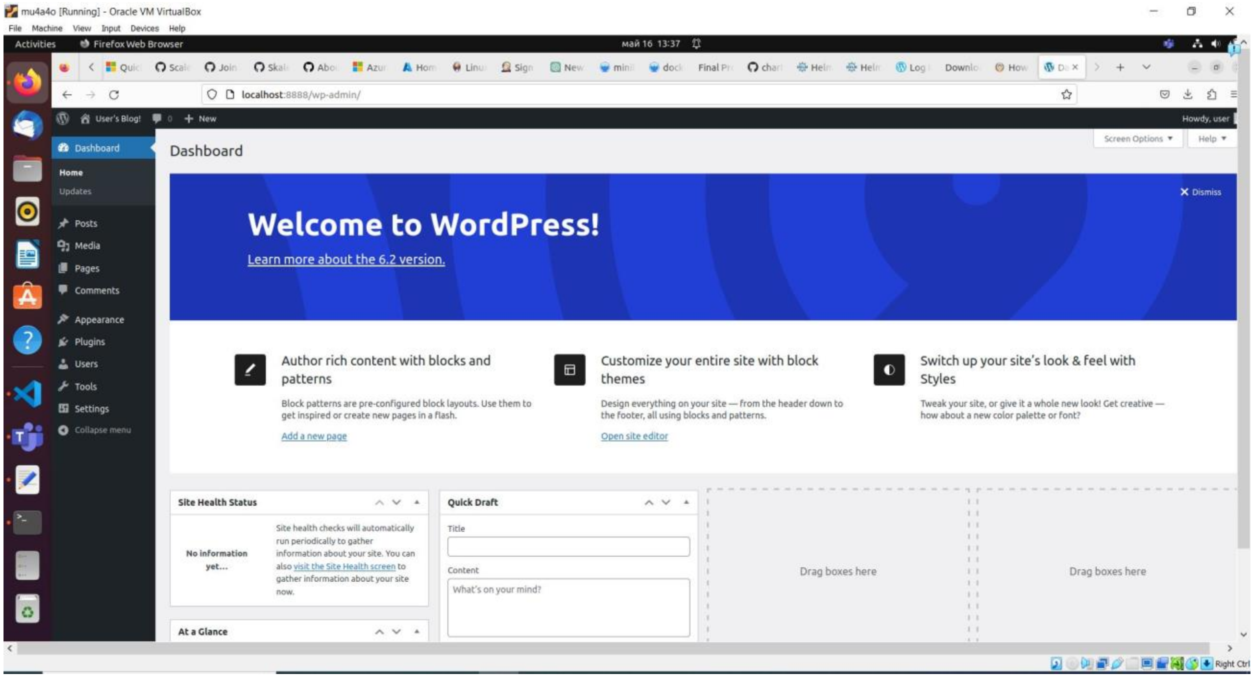
```
lyubomir@mu4a4o:~/Desktop$ kubectl get pods
No resources found in default namespace.
lyubomir@mu4a4o:~/Desktop$ kubectl get pvc
No resources found in default namespace.
lyubomir@mu4a4o:~/Desktop$ minikube start
😄  minikube v1.30.1 on Ubuntu 22.04 (vbox/amd64)
✨  Using the docker driver based on existing profile
👍  Starting control plane node minikube in cluster minikube
🚜  Pulling base image ...
🏃  Updating the running docker "minikube" container ...
🐳  Preparing Kubernetes v1.26.3 on Docker 23.0.2 ...
🔎  Verifying Kubernetes components...
    ■ Using image gcr.io/k8s-minikube/storage-provisioner:v5
🌟  Enabled addons: default-storageclass, storage-provisioner
🏄  Done! kubectl is now configured to use "minikube" cluster and "default" namespace by default
lyubomir@mu4a4o:~/Desktop$ helm install final-project-wp-scalefocus ./WORDpress
NAME: final-project-wp-scalefocus
LAST DEPLOYED: Tue May 16 16:10:15 2023
NAMESPACE: default
STATUS: deployed
REVISION: 1
TEST SUITE: None
NOTES:
CHART NAME: wordpress
CHART VERSION: 16.1.2
APP VERSION: 6.2.0

** Please be patient while the chart is being deployed **

Your WordPress site can be accessed through the following DNS name from within your cluster:

    final-project-wp-scalefocus-wordpress.default.svc.cluster.local (port 80)

To access your WordPress site from outside the cluster follow the steps below:

1. Get the WordPress URL by running these commands:

   kubectl port-forward --namespace default svc/final-project-wp-scalefocus-wordpress 80:80 &
   echo "WordPress URL: http://127.0.0.1//"
   echo "WordPress Admin URL: http://127.0.0.1//admin"

2. Open a browser and access WordPress using the obtained URL.

3. Login with the following credentials below to see your blog:
```



```
To access your WordPress site from outside the cluster follow the steps below:

1. Get the WordPress URL by running these commands:

   kubectl port-forward --namespace default svc/final-project-wp-scalefocus-wordpress 80:80 &
   echo "WordPress URL: http://127.0.0.1//"
   echo "WordPress Admin URL: http://127.0.0.1//admin"

2. Open a browser and access WordPress using the obtained URL.

3. Login with the following credentials below to see your blog:

  echo Username: user
  echo Password: $(kubectl get secret --namespace default final-project-wp-scalefocus-wordpress -o jsonpath="{.data.wordpress-password}" | base64 -d)
lyubomir@mu4a4o:~/Desktop$ echo Password: $(kubectl get secret --namespace default final-project-wp-scalefocus-wordpress -o jsonpath="{.data.wordpress-password}" | base64 -d)
Password: 6uo7J9qU94
lyubomir@mu4a4o:~/Desktop$ ^C
lyubomir@mu4a4o:~/Desktop$ kubectl port-forward --namespace default svc/final-project-wp-scalefocus-wordpress 8888:80
Forwarding from 127.0.0.1:8888 -> 8080
Forwarding from [::1]:8888 -> 8080
Handling connection for 8888
E0516 16:11:16.309915  182168 portforward.go:407] an error occurred forwarding 8888 -> 8080: error forwarding port 8080 to pod 89a54bbfd7017ad193d1a34299f15cb38956fd86d6fec50ece0bb6110f8c7cb9, uid : e
 status 1: 2023/05/16 13:11:16 socat[168670] E connect(5, AF=2 127.0.0.1:8080, 16): Connection refused
E0516 16:11:16.310285  182168 portforward.go:233] lost connection to pod
Handling connection for 8888
E0516 16:11:16.311890  182168 portforward.go:345] error creating error stream for port 8888 -> 8080: EOF
lyubomir@mu4a4o:~/Desktop$ kubectl port-forward --namespace default svc/final-project-wp-scalefocus-wordpress 8888:80
Forwarding from 127.0.0.1:8888 -> 8080
Forwarding from [::1]:8888 -> 8080
Handling connection for 8888
Handling connection for 8888
Handling connection for 8888
```

5. Deploy the helm chart using the Jenkins pipeline.

6. Load the home page of the WordPress to see the final result.


mu4a4o [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities
Firefox Web Browser
май 16 13:37
localhost:8888/wp-admin/
User's Blog!
0
New
Howdy, user
Dashboard
Home
Updates
Posts
Media
Pages
Comments
Appearance
Plugins
Users
Tools
Settings
Collapse menu
Screen Options
Help
Dismiss
Site Health Status
Quick Draft
Title
Content
What's on your mind?
At a Glance
Drag boxes here
Drag boxes here
Right Ctrl

Dashboard

Welcome to WordPress!

Learn more about the 6.2 version.

Author rich content with blocks and patterns

Block patterns are pre-configured block layouts. Use them to get inspired or create new pages in a flash.

Add a new page

Customize your entire site with block themes

Design everything on your site — from the header down to the footer, all using blocks and patterns.

Open site editor

Switch up your site's look & feel with Styles

Tweak your site, or give it a whole new look! Get creative — how about a new color palette or font?

No information yet...

Site health checks will automatically run periodically to gather information about your site. You can also visit the Site Health screen to gather information about your site now.

7. Explain the project directly in a README.md file in your project repo.

BONUS POINTS:

- Instead of using Minicube, consider using a different Kubernetes flavor of your choice, like k3s, k8s, microK8s for bonus points during the grading.

8. Send the URL of your Project repo on email to ana.zjovanovska@scalefocus.com & kiro.velkovski@scalefocus.com titled “Final Project Assessment for Scalefocus Academy”.