Certification Project
Medicure
Healthcare Domain

Done By: Ganesh mudavath

Medicure is a super specialty hospital based in New York, USA and provide world class treatment and surgery including Heart, Liver, Kidney transplants and first robotic surgery center. The chain is owned and managed by Global Health Limited.
The Medicure would centrally like to manage all the doctor's and patient's data across the Medicure hospitals in various cities. They have developed an microservice, which offers these services. In order to reduce unnecessary maintenance cost and manual labor, they would like to automate their application build and deployment process using DevOps. They are fine to use any one of the (**AWS**, **Azure**, **GCP**) cloud platform as their primary cloud service provider.
The company's primary goal is to deliver the product updates frequently to production with High quality & Reliability. They also want to accelerate software delivery speed, quality and reduce feedback time between developers and testers. They would like to use Kubernetes to manage their container deployments, scaling and descaling of containers etc.
Initially, Medicure is facing multiple problems, because of involved complexity in application as well as Infrastructure.
Following are the problems:

In order to implement a POC, you are requested to develop a mavenized microservice using spring boot and in memory h2 database.
1. a microservice which exposes below mentioned endpoints as APIs and uses in memory h2 database to store the data.

a. /registerDoctor (HTTP Method : POST) (Request Body : JSON)
b. /updateDoctor/{doctorRegNo} (HTTP Method : PUT) (Request Body : JSON)
c. /searchDoctor/{doctorName} (HTTP Method : GET) (No Request Body)
d. /deletePolicy/{doctorRegNo} (HTTP Method : DELETE) (No Request Body)

2. Write necessary Junit testcase.
3. Generate HTML report using TestNG.
4. Push your code into your GitHub Repository.

Note : Preload some data into the database. www.staragile.com

Later, you need to implement Continuous Integration & Continuous Deployment using following tools:

- Jenkins - For continuous integration and continuous deployment
- Docker - For containerizing applications
- Ansible - Configuration management tools
- Selenium - For automating tests on the deployed web application
- Terraform - For creation of infrastructure.
- Kubernetes – for running containerized application in managed cluster.

This project will be about how to test the services and deploy code to dev/stage/prod etc, just on a click of button.

Business challenge/requirement

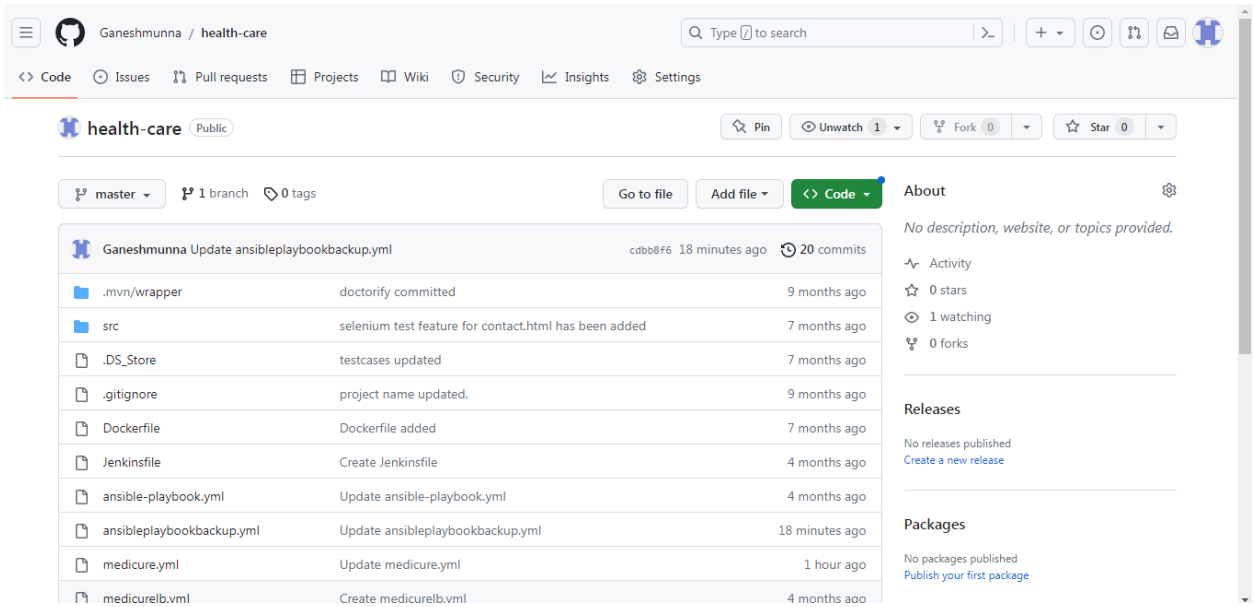
As soon as the developer pushes the updated code on the GIT master branch, the Jenkins pipeline should be triggered and code should be checkout, compiled, tested, packaged and containerized. A new test-cluster should be provisioned and configured automatically with all the required software's and as soon as the cluster is healthy and available, the application must be deployed to the test-server automatically using Kubernetes.

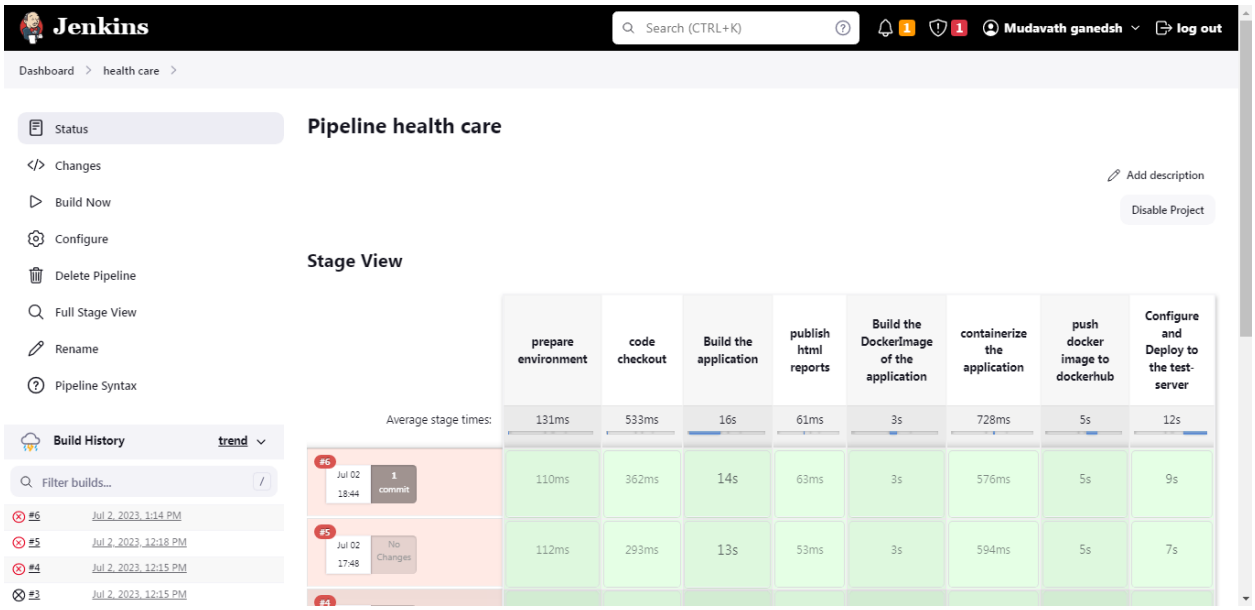
The deployment should then be tested using a test automation tool, and if the build is successful, it should be deployed to the prod server/cluster using Kubernetes. All this should happen automatically and should be triggered from a push to the GitHub master branch. Kubernetes cluster must contain at least 2 servers and must be monitored continuously using Prometheus and dashboard must be visualized using Grafana.

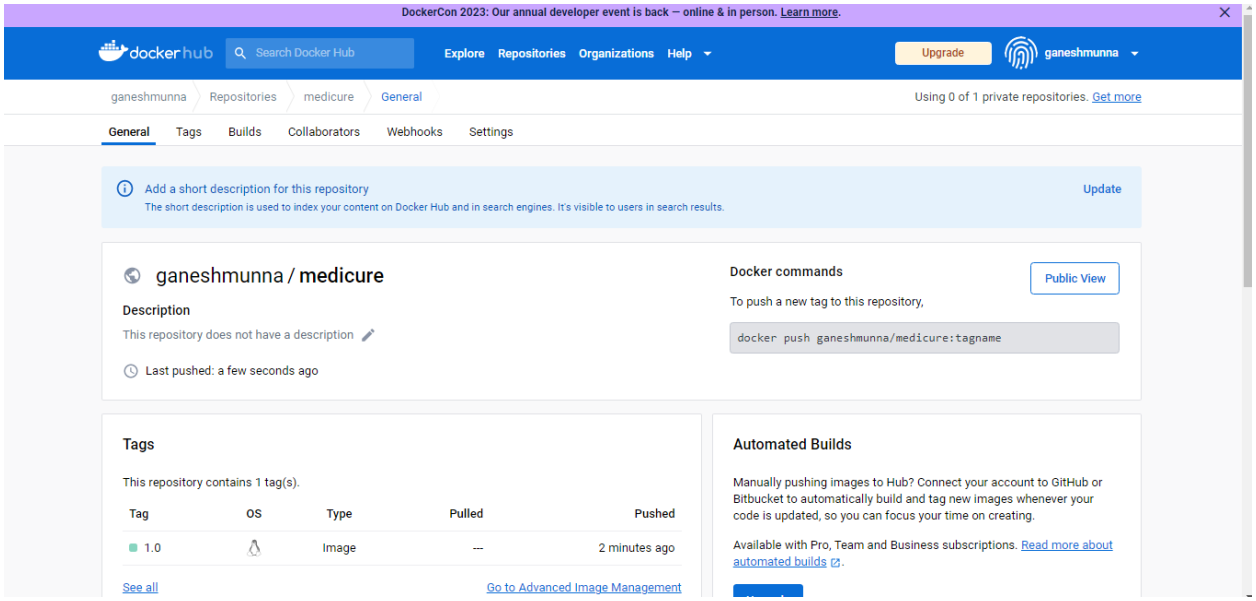
Link for the solution of Medicure project code is attached below, You can use it to validate your solution.

https://github.com/StarAgileDevOpsTraining/star-agile-health-care.git

Note : To have a detailed information about running the application and exposed APIs, Input/Output format, Refer to the README.md in the GitHub repository.


Ganeshmunna / health-care
Type / to search
Code
Issues
Pull requests
Projects
Wiki
Security
Insights
Settings
health-care
Public
Pin
Unwatch 1
Fork 0
Star 0
master
1 branch
0 tags
Go to file
Add file
Code
Ganeshmunna Update ansibleplaybookbackup.yml
cdbb8f6 18 minutes ago
20 commits
.mvn/wrapper doctorify committed 9 months ago
src selenium test feature for contact.html has been added 7 months ago
.DS_Store testcases updated 7 months ago
.gitignore project name updated. 9 months ago
Dockerfile Dockerfile added 7 months ago
Jenkinsfile Create Jenkinsfile 4 months ago
ansible-playbook.yml Update ansible-playbook.yml 4 months ago
ansibleplaybookbackup.yml Update ansibleplaybookbackup.yml 18 minutes ago
medicure.yml Update medicure.yml 1 hour ago
medicurelb.yml Create medicurelb.yml 4 months ago
About
No description, website, or topics provided.
Activity
0 stars
1 watching
0 forks
Releases
No releases published
Create a new release
Packages
No packages published
Publish your first package


Jenkins
Search (CTRL+K)
Mudavath ganedsh
log out
Dashboard
health care
Status
Changes
Build Now
Configure
Delete Pipeline
Full Stage View
Rename
Pipeline Syntax
Build History
trend
Filter builds...
#6 Jul 2, 2023, 1:14 PM
#5 Jul 2, 2023, 12:18 PM
#4 Jul 2, 2023, 12:15 PM
#3 Jul 2, 2023, 12:15 PM
Pipeline health care
Add description
Disable Project
Stage View
prepare environment
code checkout
Build the application
publish html reports
Build the DockerImage of the application
containerize the application
push docker image to dockerhub
Configure and Deploy to the test-server
Average stage times:
131ms
533ms
16s
61ms
3s
728ms
5s
12s
#6 Jul 02 18:44 1 commit
110ms
362ms
14s
63ms
3s
576ms
5s
9s
#5 Jul 02 17:48 No Changes
112ms
293ms
13s
53ms
3s
594ms
5s
7s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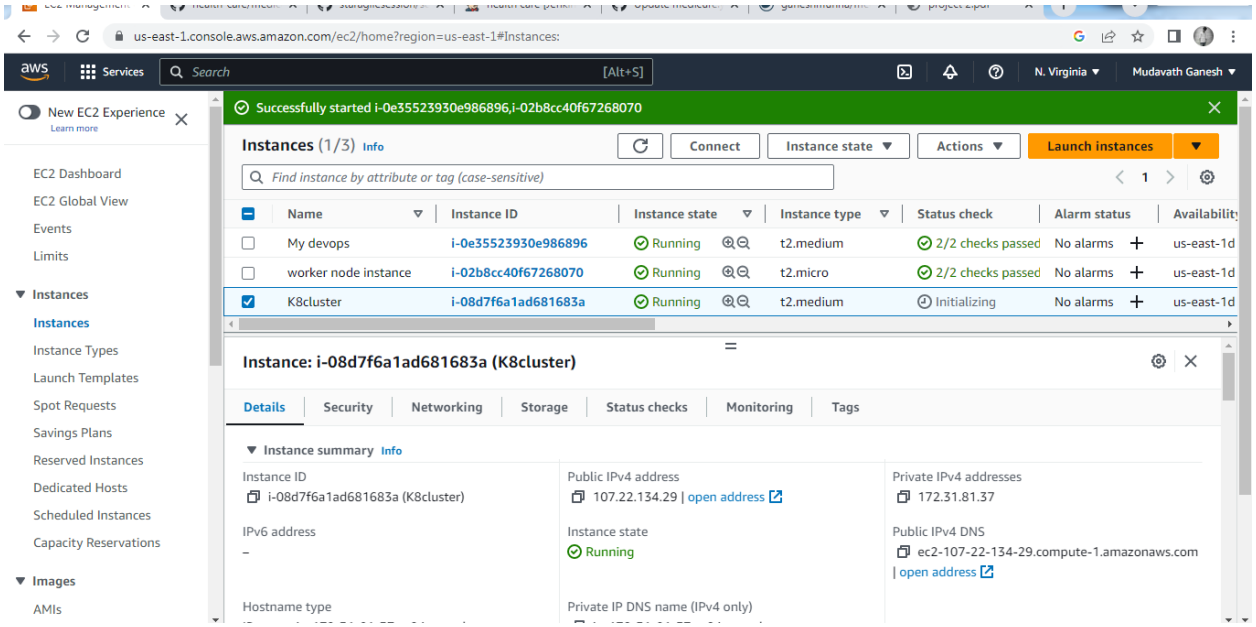
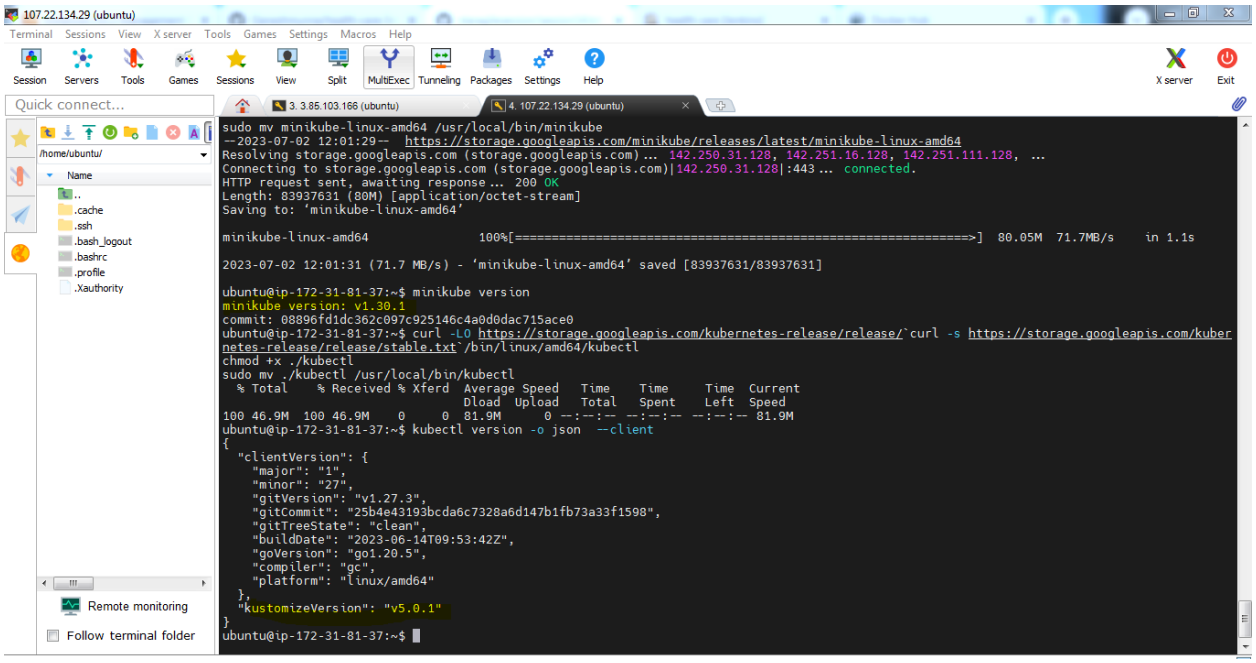
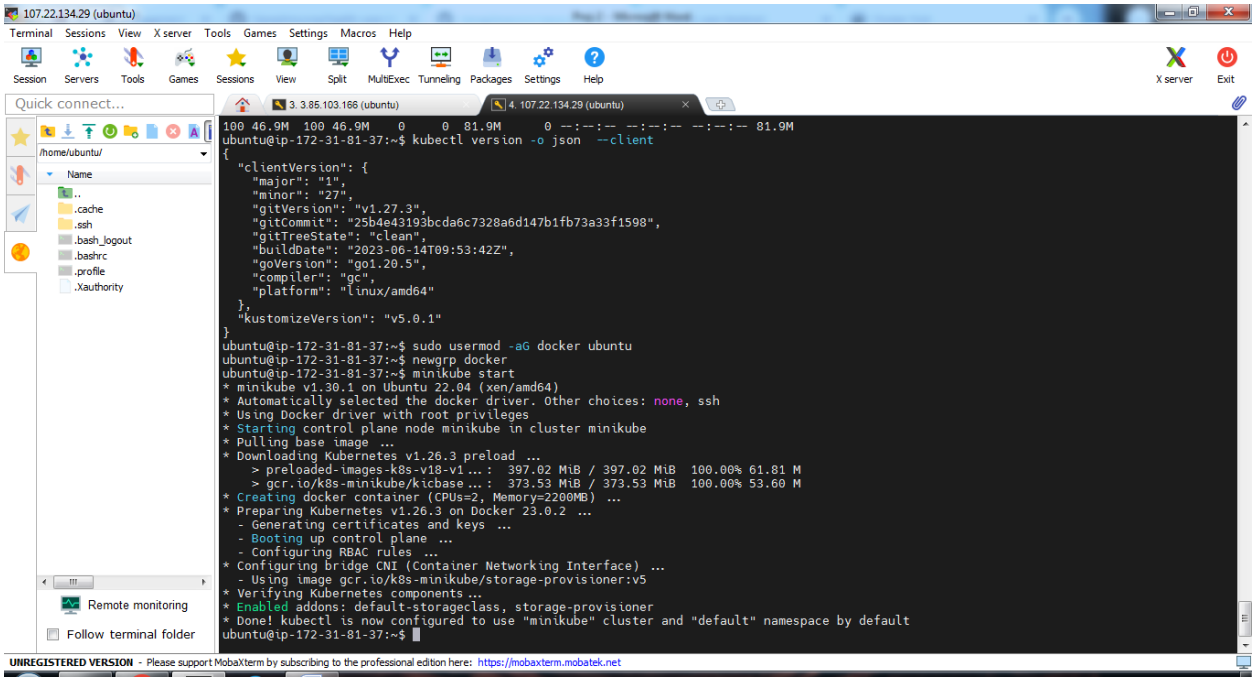
docker hub
Search Docker Hub
Explore
Repositories
Organizations
Help
Upgrade
ganeshmunna
ganeshmunna / Repositories / medicure / General
Using 0 of 1 private repositories. Get more
General
Tags
Builds
Collaborators
Webhooks
Settings
Add a short description for this repository
The short description is used to index your content on Docker Hub and in search engines. It's visible to users in search results.
Update
ganeshmunna / medicure
Description
This repository does not have a description
Last pushed: a few seconds ago
Docker commands
Public View
To push a new tag to this repository,
docker push ganeshmunna/medicure:tagname
Tags
This repository contains 1 tag(s).
Tag
OS
Type
Pulled
Pushed
1.0
Image
---
2 minutes ago
See all
Go to Advanced Image Management
Automated Builds
Manually pushing images to Hub? Connect your account to GitHub or Bitbucket to automatically build and tag new images whenever your code is updated, so you can focus your time on creating.
Available with Pro, Team and Business subscriptions. Read more about automated builds.


us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#Instances:
aws
Services
Search
[Alt+S]
N. Virginia
Mudavath Ganesh
New EC2 Experience
Learn more
Successfully started i-0e35523930e986896,i-02b8cc40f67268070
EC2 Dashboard
EC2 Global View
Events
Limits
Instances
Instances
Instance Types
Launch Templates
Spot Requests
Savings Plans
Reserved Instances
Dedicated Hosts
Scheduled Instances
Capacity Reservations
Images
AMIs
Instances (1/3) Info
Connect
Instance state
Actions
Launch instances
Find instance by attribute or tag (case-sensitive)
Name
Instance ID
Instance state
Instance type
Status check
Alarm status
Availabilit
My devops
i-0e35523930e986896
Running
t2.medium
2/2 checks passed
No alarms
us-east-1d
worker node instance
i-02b8cc40f67268070
Running
t2.micro
2/2 checks passed
No alarms
us-east-1d
K8cluster
i-08d7f6a1ad681683a
Running
t2.medium
Initializing
No alarms
us-east-1d
Instance: i-08d7f6a1ad681683a (K8cluster)
Details
Security
Networking
Storage
Status checks
Monitoring
Tags
Instance summary Info
Instance ID
i-08d7f6a1ad681683a (K8cluster)
IPv6 address
–
Hostname type
Public IPv4 address
107.22.134.29 | open address
Instance state
Running
Private IP DNS name (IPv4 only)
Private IPv4 addresses
172.31.81.37
Public IPv4 DNS
ec2-107-22-134-29.compute-1.amazonaws.com | open address


107.22.134.29 (ubuntu)
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help X server Exit
Quick connect...
3. 3.85.103.166 (ubuntu)
4. 107.22.134.29 (ubuntu)
/home/ubuntu/
Name
.cache
.ssh
.bash_logout
.bashrc
.profile
.Xauthority
Remote monitoring
Follow terminal folder
sudo mv minikube-linux-amd64 /usr/local/bin/minikube
--2023-07-02 12:01:29-- https://storage.googleapis.com/minikube/releases/latest/minikube-linux-amd64
Resolving storage.googleapis.com (storage.googleapis.com)... 142.250.31.128, 142.251.16.128, 142.251.111.128, ...
Connecting to storage.googleapis.com (storage.googleapis.com)|142.250.31.128|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 83937631 (80M) [application/octet-stream]
Saving to: 'minikube-linux-amd64'
minikube-linux-amd64 100%[=>] 80.05M 71.7MB/s in 1.1s
2023-07-02 12:01:31 (71.7 MB/s) - 'minikube-linux-amd64' saved [83937631/83937631]
ubuntu@ip-172-31-81-37:~$ minikube version
minikube version: v1.30.1
commit: 08896fd1dc362c097c925146c4a0d0dac715ace0
ubuntu@ip-172-31-81-37:~$ curl -LO https://storage.googleapis.com/kubernetes-release/release/`curl -s https://storage.googleapis.com/kubernetes-release/release/stable.txt`/bin/linux/amd64/kubectl
chmod +x ./kubectl
sudo mv ./kubectl /usr/local/bin/kubectl
% Total % Received % Xferd Average Speed Time Time Time Current
Dload Upload Total Spent Left Speed
100 46.9M 100 46.9M 0 0 81.9M 0 --:--:-- --:--:-- --:--:-- 81.9M
ubuntu@ip-172-31-81-37:~$ kubectl version -o json --client
{
"clientVersion": {
"major": "1",
"minor": "27",
"gitVersion": "v1.27.3",
"gitCommit": "25b4e43193bcda6c7328a6d147b1fb73a33f1598",
"gitTreeState": "clean",
"buildDate": "2023-06-14T09:53:42Z",
"goVersion": "go1.20.5",
"compiler": "gc",
"platform": "linux/amd64"
},
"kustomizeVersion": "v5.0.1"
}
ubuntu@ip-172-31-81-37:~$


107.22.134.29 (ubuntu)
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help X server Exit
Quick connect...
3. 3.85.103.166 (ubuntu)
4. 107.22.134.29 (ubuntu)
/home/ubuntu/
Name
.cache
.ssh
.bash_logout
.bashrc
.profile
.Xauthority
Remote monitoring
Follow terminal folder
100 46.9M 100 46.9M 0 0 81.9M 0 --:--:-- --:--:-- --:--:-- 81.9M
ubuntu@ip-172-31-81-37:~$ kubectl version -o json --client
{
"clientVersion": {
"major": "1",
"minor": "27",
"gitVersion": "v1.27.3",
"gitCommit": "25b4e43193bcda6c7328a6d147b1fb73a33f1598",
"gitTreeState": "clean",
"buildDate": "2023-06-14T09:53:42Z",
"goVersion": "go1.20.5",
"compiler": "gc",
"platform": "linux/amd64"
},
"kustomizeVersion": "v5.0.1"
}
ubuntu@ip-172-31-81-37:~$ sudo usermod -aG docker ubuntu
ubuntu@ip-172-31-81-37:~$ newgrp docker
ubuntu@ip-172-31-81-37:~$ minikube start
* minikube v1.30.1 on Ubuntu 22.04 (xen/amd64)
* Automatically selected the docker driver. Other choices: none, ssh
* Using Docker driver with root privileges
* Starting control plane node minikube in cluster minikube
* Pulling base image ...
* Downloading Kubernetes v1.26.3 preload ...
> preloaded-images-k8s-v18-v1 ... : 397.02 MiB / 397.02 MiB 100.00% 61.81 M
> gcr.io/k8s-minikube/kicbase ... : 373.53 MiB / 373.53 MiB 100.00% 53.60 M
* Creating docker container (CPUs=2, Memory=2200MB) ...
* Preparing Kubernetes v1.26.3 on Docker 23.0.2 ...
- Generating certificates and keys ...
- Booting up control plane ...
- Configuring RBAC rules ...
* Configuring bridge CNI (Container Networking Interface) ...
- Using image gcr.io/k8s-minikube/storage-provisioner:v5
* Verifying Kubernetes components...
* Enabled addons: default-storageclass, storage-provisioner
* Done! kubectl is now configured to use "minikube" cluster and "default" namespace by default
ubuntu@ip-172-31-81-37:~$
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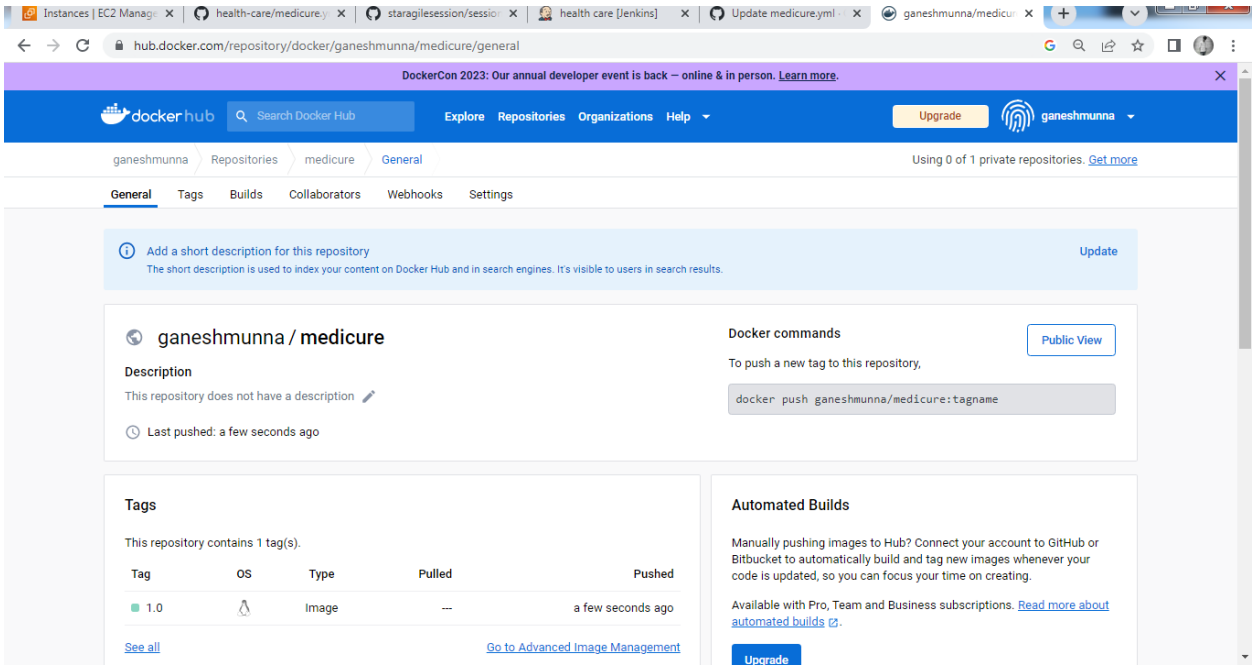
hub.docker.com/repository/docker/ganeshmunna/medicure/general
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docker hub
Search Docker Hub
Explore
Repositories
Organizations
Help
Upgrade
ganeshmunna
ganeshmunna
Repositories
medicure
General
Using 0 of 1 private repositories. Get more
General
Tags
Builds
Collaborators
Webhooks
Settings
Add a short description for this repository
The short description is used to index your content on Docker Hub and in search engines. It's visible to users in search results.
Update
ganeshmunna / medicure
Description
This repository does not have a description
Last pushed: a few seconds ago
Docker commands
Public View
To push a new tag to this repository,
docker push ganeshmunna/medicure:tagname
Tags
This repository contains 1 tag(s).
Tag
OS
Type
Pulled
Pushed
1.0
Image
---
a few seconds ago
See all
Go to Advanced Image Management
Automated Builds
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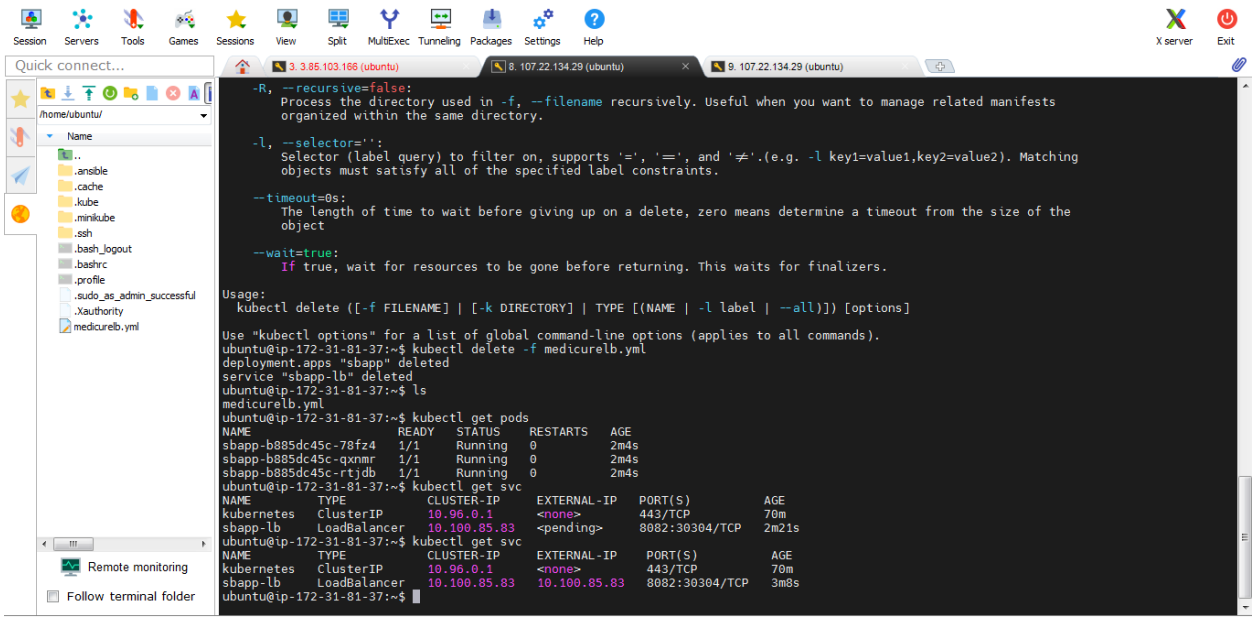
Upgrade


Session
Servers
Tools
Games
Sessions
View
Split
MultiExec
Tunneling
Packages
Settings
Help
X server
Exit
Quick connect...
3. 3.85.103.166 (ubuntu)
8. 107.22.134.29 (ubuntu)
9. 107.22.134.29 (ubuntu)
/home/ubuntu/
Name
.ansible
.cache
.kube
.minikube
.ssh
.bash_logout
.bashrc
.profile
.sudo_as_admin_successful
.Xauthority
medicurelb.yml
Remote monitoring
Follow terminal folder
-R, --recursive=false:
Process the directory used in -f, --filename recursively. Useful when you want to manage related manifests organized within the same directory.
-l, --selector='':
Selector (label query) to filter on, supports '=', '==', and '≠'.(e.g. -l key1=value1,key2=value2). Matching objects must satisfy all of the specified label constraints.
--timeout=0s:
The length of time to wait before giving up on a delete, zero means determine a timeout from the size of the object
--wait=true:
If true, wait for resources to be gone before returning. This waits for finalizers.
Usage:
kubectl delete ([-f FILENAME] | [-k DIRECTORY] | TYPE [(NAME | -l label | --all)]) [options]
Use "kubectl options" for a list of global command-line options (applies to all commands).
ubuntu@ip-172-31-81-37:~$ kubectl delete -f medicurelb.yml
deployment.apps "sbapp" deleted
service "sbapp-lb" deleted
ubuntu@ip-172-31-81-37:~$ ls
medicurelb.yml
ubuntu@ip-172-31-81-37:~$ kubectl get pods
NAME READY STATUS RESTARTS AGE
sbapp-b885dc45c-78fz4 1/1 Running 0 2m4s
sbapp-b885dc45c-qxnmr 1/1 Running 0 2m4s
sbapp-b885dc45c-rtjdb 1/1 Running 0 2m4s
ubuntu@ip-172-31-81-37:~$ kubectl get svc
NAME TYPE CLUSTER-IP EXTERNAL-IP PORT(S) AGE
kubernetes ClusterIP 10.96.0.1 <none> 443/TCP 70m
sbapp-lb LoadBalancer 10.100.85.83 <pending> 8082:30304/TCP 2m21s
ubuntu@ip-172-31-81-37:~$ kubectl get svc
NAME TYPE CLUSTER-IP EXTERNAL-IP PORT(S) AGE
kubernetes ClusterIP 10.96.0.1 <none> 443/TCP 70m
sbapp-lb LoadBalancer 10.100.85.83 10.100.85.83 8082:30304/TCP 3m8s
ubuntu@ip-172-31-81-37:~$