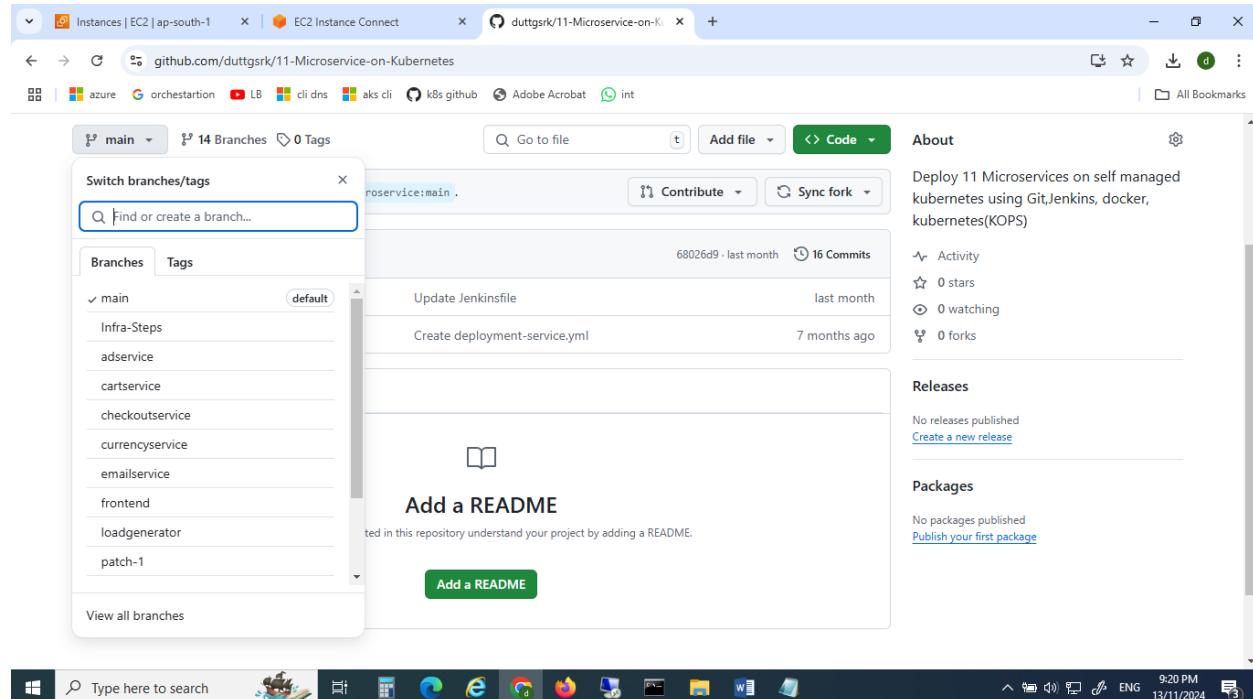
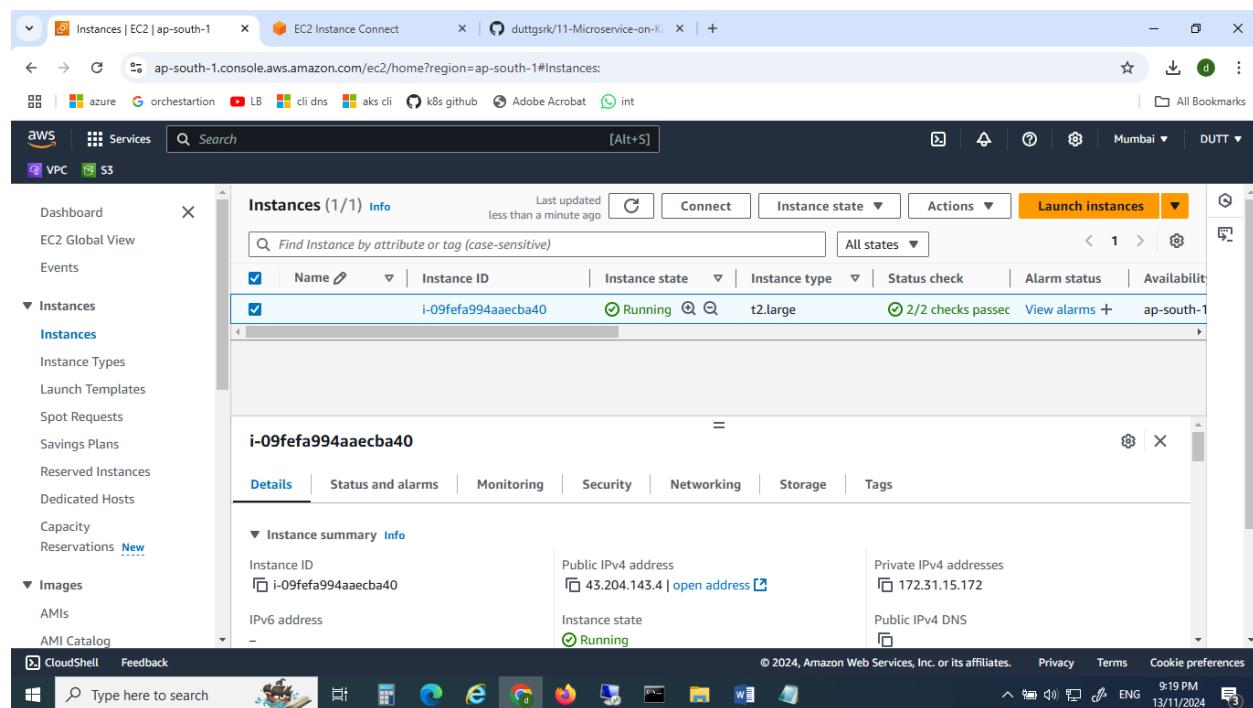


Deploy 11 Micro services on kubernetes using Git, Jenkins, docker, kubernetes(KOPS) and apply Network policies to secure deployments from default Namespace to Webapp Namespace

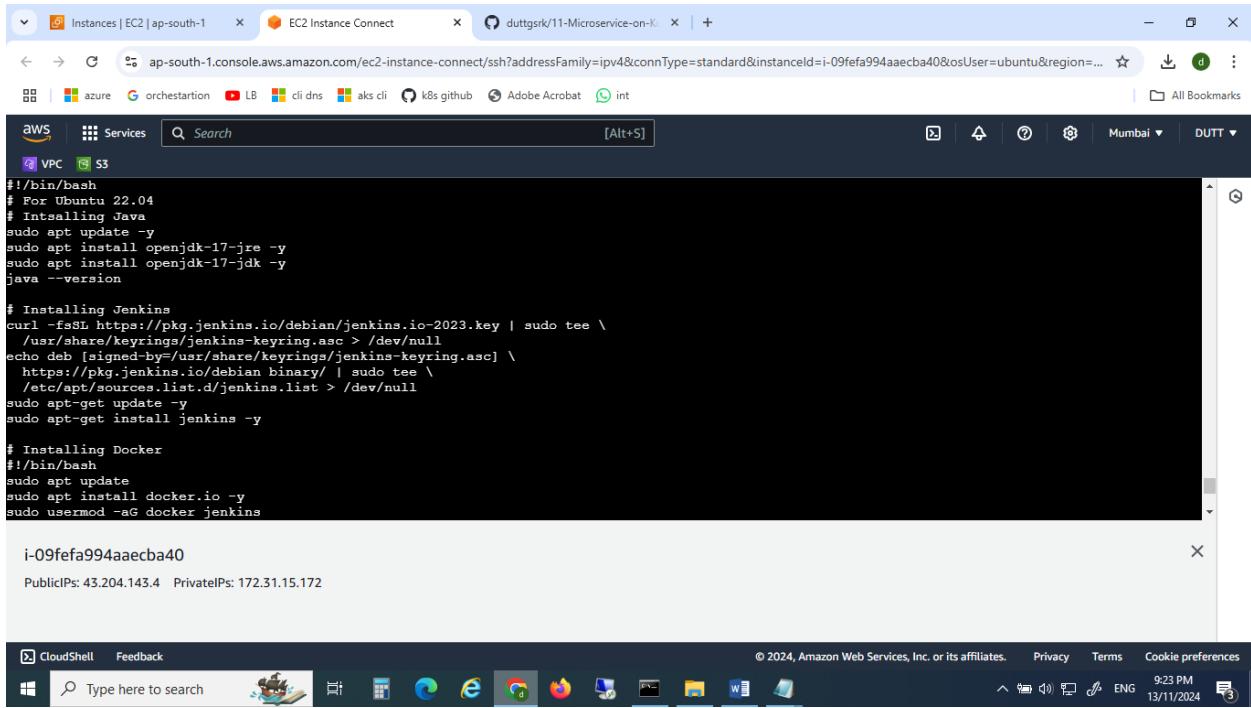
Please find the below code contains 11 micro services to be deployed on Kubernetes



Created Ubuntu t2.large instance for Jenkins with 25 gb space manually from Console



Installing tools such as docker, aws cli, Jenkins, Kubectl, KOPS, Java using shell scripting



```
#!/bin/bash
# For Ubuntu 22.04
# Installing Java
sudo apt update -y
sudo apt install openjdk-17-jre -y
sudo apt install openjdk-17-jdk -y
java --version

# Installing Jenkins
curl -fsSL https://pkg.jenkins.io/debian/jenkins.io-2023.key | sudo tee \
  /usr/share/keyrings/jenkins-keyring.asc > /dev/null
echo deb [signed-by=/usr/share/keyrings/jenkins-keyring.asc] \
  https://pkg.jenkins.io/debian binary/ | sudo tee \
  /etc/apt/sources.list.d/jenkins.list > /dev/null
sudo apt-get update -y
sudo apt-get install jenkins -y

# Installing Docker
#!/bin/bash
sudo apt update
sudo apt install docker.io -y
sudo usermod -aG docker jenkins
```

i-09fefa994aaecba40
PublicIPs: 43.204.143.4 PrivateIPs: 172.31.15.172

Downloaded plugins such as docker, docker pipeline, kubernetes, kubernetes cli, multi branch scan webhook trigger, pipeline stage view

Jenkins

Plugins

Search available plugins

Install

Install	Name	Released
<input type="checkbox"/>	JavaMail API 1.6.2-10 Library plugins (for use by other plugins)	5 mo 23 days ago
<input type="checkbox"/>	Command Agent Launcher 116.vd85919c54a_d4 Agent Management	21 hr ago
<input type="checkbox"/>	Oracle Java SE Development Kit Installer 80.v8a_dee33ed6f0 Allows the Oracle Java SE Development Kit (JDK) to be installed via download from Oracle's website.	3 mo 8 days ago
<input type="checkbox"/>	Pipeline: REST API 2.34 User Interface	1 yr 0 mo ago

Create tool docker

Tools [Jenkins]

Add Docker

Docker

Name: docker

Install automatically

Add Installer

Save Apply

Create docker credentials

The screenshot shows a web browser window with multiple tabs open. The active tab is 'Global credentials (unrestricted)' under the 'System' section of Jenkins. The page displays a table of credentials with one entry: 'docker-cred' (ID), 'dutt.gatiganti@gmail.com/******** (docker-cred)' (Name), 'Username with password' (Kind), and 'docker-cred' (Description). A blue button at the top right says '+ Add Credentials'. Below the table are icons for sorting by ID, Name, Kind, and Description.

Create multi branch pipeline for Micro Service project

The screenshot shows a 'New Item [Jenkins]' configuration page. It lists several item types: Pipeline, Multi-configuration project, Folder, Multibranch Pipeline, and Organization Folder. The 'Multibranch Pipeline' item is highlighted with a light gray background. At the bottom of the page is an 'OK' button. The status bar at the bottom of the screen shows the date and time as 13/11/2024 9:40 PM.

Create PAT for GIT configuration in Jenkins

The screenshot shows a Microsoft Edge browser window with multiple tabs open. The active tab is titled "New Personal Access Token" and displays the GitHub settings page for creating a new token. The left sidebar shows options like "GitHub Apps", "OAuth Apps", and "Personal access tokens". Under "Personal access tokens", "Tokens (classic)" is selected. A note field contains "Jenkins". The "Expiration" dropdown is set to "30 days", which will expire on Fri, Dec 13 2024. The "Select scopes" section lists various GitHub permissions with checkboxes, and "repo" is checked. The desktop taskbar at the bottom shows icons for various applications.

Generate token for Webhook trigger

The screenshot shows a Microsoft Edge browser window displaying the Jenkins configuration for a Multibranch Pipeline. The URL is 43.204.143.4:8080/job/Micro%20Services/configure. The "Script Path" is set to "Jenkinsfile". Under "Scan Multibranch Pipeline Triggers", the "Scan by webhook" option is selected, and the "Trigger token" field contains "t". A note below explains that the token must match the webhook token sent to `JENKINS_URL/multibranch-webhook-trigger/invoke?token=[Trigger token]`. The "Save" and "Apply" buttons are visible at the bottom. The desktop taskbar at the bottom shows icons for various applications.

The screenshot shows a web browser window with multiple tabs open at the top. The active tab is 'Instances | EC2 | ap-south-1'. Below the tabs, the address bar shows 'Not secure 43.204.143.4:8080/manage/credentials/store/system/domain/_/'. The main content area is the Jenkins 'Global credentials (unrestricted)' page. At the top right is a search bar with 'Search (CTRL+K)', a help icon, a user profile for 'Dutt', and a 'log out' link. Below the search bar is a blue button labeled '+ Add Credentials'. The main table lists two credentials:

ID	Name	Kind	Description
docker-cred	dutt.gatiganti@gmail.com/******** (docker-cred)	Username with password	docker-cred
git	git	Secret text	git

At the bottom left of the table are icons for sorting by ID (S), Name (M), and Description (L). The bottom right of the page shows 'REST API Jenkins 2.485'.

Configure generated token in git webhook

The screenshot shows a web browser window with multiple tabs open at the top. The active tab is 'Webhook - http://43.204.143.4:8080/manage/credentials/store/system/domain/_/'. Below the tabs, the address bar shows 'github.com/dutgtsrk/11-Microservice-on-Kubernetes/settings/hooks/512902670'. The main content area is the GitHub 'Webhooks / Manage webhook' page for the repository 'dutgtsrk / 11-Microservice-on-Kubernetes'. The left sidebar shows navigation links: General, Access, Collaborators, Moderation options, Code and automation, Branches, Tags, Rules, Actions, and Webhooks (which is selected). The right panel shows the 'Webhooks / Manage webhook' configuration form. It includes sections for 'Payload URL *' (set to 'http://43.204.143.4:8080/multibranch-webhook-trigger/invoke?token='), 'Content type *' (set to 'application/json'), and 'Secret' (an empty text input field). Below the form is a note about SSL verification. The bottom right of the page shows 'REST API Jenkins 2.485'.

Git webhook configured successfully

The screenshot shows a Microsoft Edge browser window with several tabs open. The active tab is 'Webhooks - Settings - duttgsrk' on GitHub. The page displays the 'Webhooks' section under the 'General' settings. A single webhook is listed, pointing to 'http://43.204.143.4:8080/multibranch... (push)'. The status indicates 'Last delivery was successful.' Below the sidebar, which includes options like 'Code', 'Pull requests', 'Actions', 'Projects', 'Security', 'Insights', and 'Settings', there's a search bar and a toolbar with various icons.

Multi branch pipeline create for trigger

The screenshot shows a Microsoft Edge browser window with several tabs open. The active tab is 'Micro Services Config [Jenkins]'. The page displays the Jenkins Pipeline configuration for 'Micro Services'. Under the 'Configuration' section, there are two main sections: 'Pipeline Libraries' and 'Kubernetes'. In 'Pipeline Libraries', it says 'Sharable libraries available to any Pipeline jobs inside this folder. These libraries will be untrusted, meaning their code runs in the Groovy sandbox.' There is an 'Add' button. In 'Kubernetes', it says 'Allow pipeline support for the following restricted Kubernetes Clouds' with a dropdown menu showing '-- none --'. At the bottom, there are 'Save' and 'Apply' buttons. The bottom of the screen shows the Windows taskbar with various pinned icons.

Executing Jobs in pipeline

S	W	Name	Last Success	Last Failure	Last Duration
...	...	adservice	N/A	N/A	N/A
...	...	cartservice	N/A	N/A	N/A
...	...	checkoutservice	N/A	N/A	N/A
...	...	currencyservice	N/A	N/A	N/A
...	...	emailservice	N/A	N/A	N/A
...	...	frontend	N/A	N/A	N/A
...	...	loadgenerator	N/A	N/A	N/A
...	...	main	N/A	53 sec #1	9.5 sec
...	...	patch-1	N/A	N/A	N/A
...	...	paymentservice	N/A	N/A	N/A

S	W	Name	Last Success	Last Failure	Last Duration
...	...	checkoutservice	N/A	N/A	N/A
...	...	currencyservice	N/A	N/A	N/A
...	...	emailservice	N/A	N/A	N/A
...	...	frontend	N/A	N/A	N/A
...	...	loadgenerator	N/A	N/A	N/A
...	...	main	N/A	5 min 36 sec #1	9.5 sec

adservice

Full project name: Micro Services/adservice

Stage View

Declarative: Checkout SCM	Build & Tag Docker Image	Push Docker Image
2s	2min 4s	16s

Average stage times:
(Average full run time: ~2min 33s)

Builds

#1 Nov 13 21:47	No Changes
2s	2min 4s
16s	

Permalinks

- Last build (#1), 3 min 59 sec ago

Jobs executed successfully

Dashboard > Micro Services >

Job	Duration	Last Build	Time Ago
cartservice	11 min	#1	N/A
checkoutservice	11 min	#1	N/A
currencyservice	11 min	#1	N/A
emailservice	11 min	#1	N/A
frontend	11 min	#1	N/A
loadgenerator	11 min	#1	N/A
patch-1	11 min	#1	N/A
paymentservice	11 min	#1	N/A
productcatalogservice	11 min	#1	N/A
recommendationservice	11 min	#1	N/A

Instances | EC2 | ap-s... | EC2 Instance Connect | Editing 11-Microservice-on-Kubernetes/edit/adservice/Jenkinsfile | Mastering-Kubernetes | Branches (13) [Micro] | ChatGPT

github.com/duttgsrc/11-Microservice-on-Kubernetes/edit/adservice/Jenkinsfile

All Bookmarks

duttgsrc / 11-Microservice-on-Kubernetes

Code Pull requests Actions Projects Security Insights Settings

Files adservice Jenkinsfile in adservice

Cancel changes Commit changes...

Spaces 4 No wrap

```

1 pipeline {
2     agent any
3
4     stages {
5         stage('Build & Tag Docker Image') {
6             steps {
7                 script {
8
9                     sh "docker build -t dutt1/adservice:latest ."
10
11                }
12            }
13        }
14
15        stage('Push Docker Image') {
16            steps {
17                script {
18                    withDockerRegistry(credentialsId: 'docker-cred', toolName: 'docker') {
19                        sh "docker push dutt1/adservice:latest"
20
21                }
22            }
23        }
24    }
25 }
```

Type [] to search

10:00 PM 13/11/2024

Instances | EC2 | ap-s... | EC2 Instance Connect | 11-Microservice-on-Kubernetes/job/Micro%20Services | Mastering-Kubernetes | Branches (13) [Micro] | ChatGPT

Not secure 43.204.143.4:8080/job/Micro%20Services

All Bookmarks

Dashboard > Micro Services >

Scan Multibranch Pipeline Log

Multibranch Pipeline Events

Delete Multibranch Pipeline

Build History

Rename

Pipeline Syntax

Credentials

Build Queue

No builds in the queue.

Build Executor Status 1/2

Micro Services	adservice	#2 (Build & Tag Docker Image)
●	○	

S	W	Name	Last Success	Last Failure	Last Duration
✓	☀️	adservice	12 min #1	N/A	2 min 33 sec
✓	☀️	cartservice	12 min #1	N/A	11 min
✓	☀️	checkoutservice	12 min #1	N/A	9 min 29 sec
✓	☀️	currencyservice	12 min #1	N/A	9 min 6 sec
✓	☀️	emailservice	12 min #1	N/A	9 min 56 sec
✓	☀️	frontend	12 min #1	N/A	7 min 5 sec
✓	☀️	loadgenerator	12 min #1	N/A	7 min 33 sec
✗	☁️	main	N/A	12 min #1	9.5 sec
✓	☀️	patch-1	12 min #1	N/A	2 min 32 sec
✓	☀️	paymentservice	12 min #1	N/A	11 min

Type here to search

10:01 PM 13/11/2024

Docker build Images pushed to docker hub

The screenshot shows a browser window with multiple tabs open, including 'Instances | EC2', 'EC2 Instance Co...', '11-Microservice', 'Mastering-Kube', 'adservice [Micro]', 'ChatGPT', and 'Docker Hub Com...'. The main content area displays a list of Docker repositories under the 'dutt1' user:

- dutt1 / adservice
- dutt1 / paymentservice
- dutt1 / cartservice
- dutt1 / emailservice
- dutt1 / checkoutservice
- dutt1 / currencyservice

Each repository entry includes a star icon, a pull count (e.g., 10, 9, 11), a 'Public' visibility link, and a 'Scout inactive' status. A sidebar on the right features icons for creating an organization and managing users.

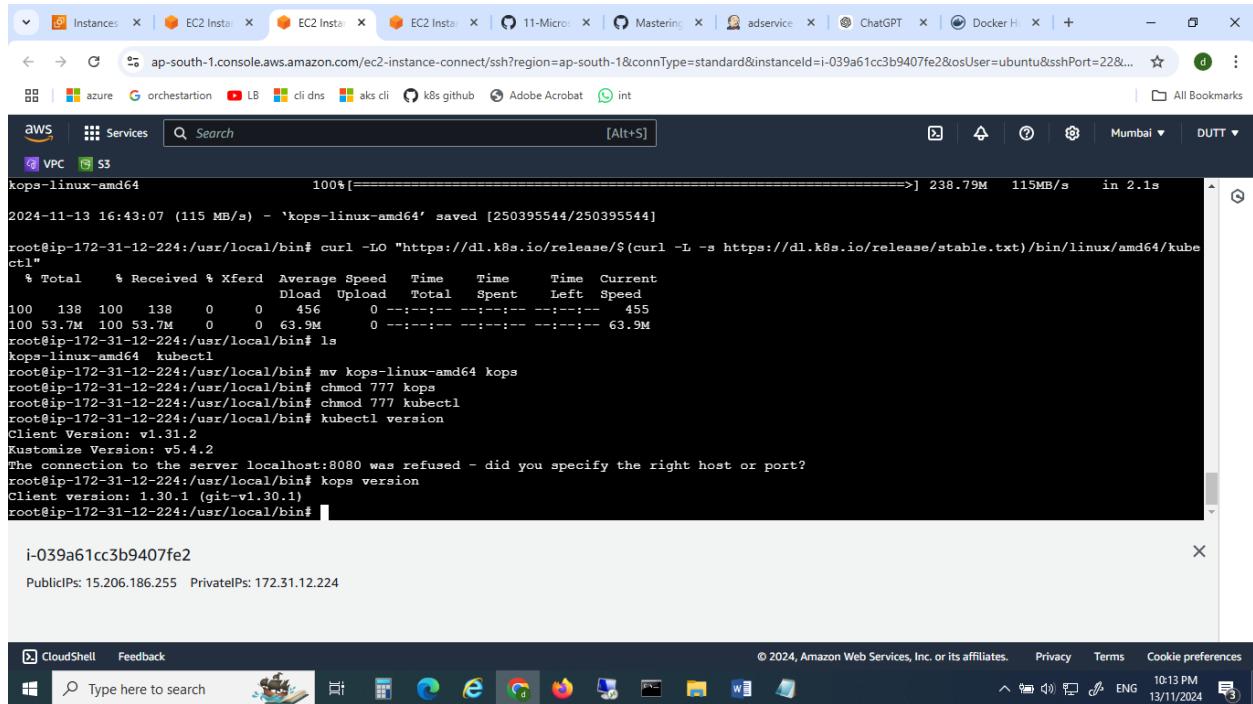
Generate ssh keys for KOPS

The screenshot shows an AWS CloudShell session with the URL <https://ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?region=ap-south-1&connType=standard&instanceId=i-039a61cc3b9407fe2&osUser=ubuntu&sshPort=22&...>. The terminal window displays the following command output:

```
root@ip-172-31-12-224:~# ssh-keygen
Generating public/private ed25519 key pair.
Enter file in which to save the key (/root/.ssh/id_ed25519):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /root/.ssh/id_ed25519
Your public key has been saved in /root/.ssh/id_ed25519.pub
The key fingerprint is:
SHA256:tKtMC7ZIK/DUGX+ieGnyz5RJ/nx8fVN6/RmrxsuGxuE root@ip-172-31-12-224
The key's randomart image is:
++-[ED25519 256]--+
| . . . .
| . . . .
| . . . .
| . = O+ E. oo| | |
| o + ==,o= o*| |
|=..+=..,* o.|| |
| o=oo .ooo..| |
+---[SHA256]---+
root@ip-172-31-12-224:~#
```

Below the terminal, the AWS navigation bar shows 'Services' selected, and the bottom status bar indicates 'CloudShell' and 'Feedback'.

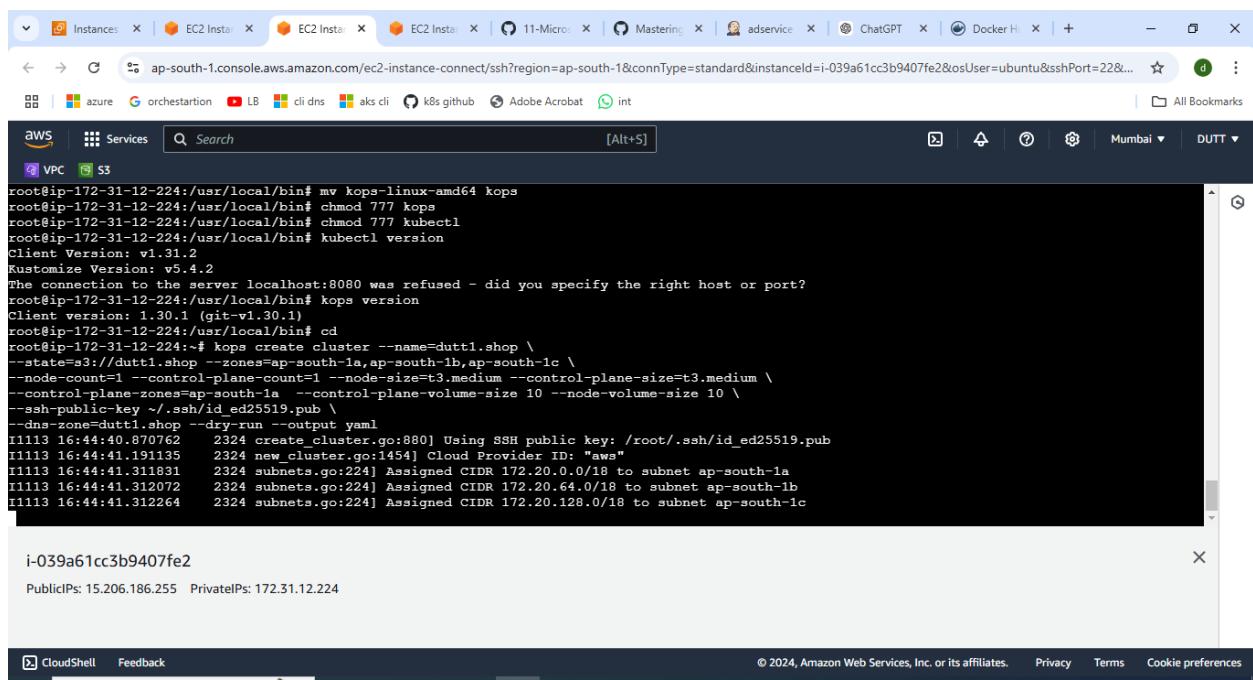
Download KOPS and kubectl



```
kops-linux-amd64          100%[=====] 238.79M  115MB/s  in 2.1s
2024-11-13 16:43:07 (115 MB/s) - 'kops-linux-amd64' saved [250395544/250395544]

root@ip-172-31-12-224:/usr/local/bin# curl -LO "https://dl.k8s.io/release/$(curl -L -s https://dl.k8s.io/release/stable.txt)/bin/linux/amd64/kube
ctl"
  % Total    % Received % Xferd  Average Speed   Time      Time     Current
     0     0     0     0      0      0 --:--:-- --:--:-- --:--:-- 455
 100  53.7M  100  53.7M      0      0      0      0      63.9M
root@ip-172-31-12-224:/usr/local/bin# ls
kops-linux-amd64  kubectl
root@ip-172-31-12-224:/usr/local/bin# mv kops-linux-amd64 kops
root@ip-172-31-12-224:/usr/local/bin# chmod 777 kops
root@ip-172-31-12-224:/usr/local/bin# chmod 777 kubectl
root@ip-172-31-12-224:/usr/local/bin# kubectl version
Client Version: v1.31.2
Kustomize Version: v5.4.2
The connection to the server localhost:8080 was refused - did you specify the right host or port?
root@ip-172-31-12-224:/usr/local/bin# kops version
Client version: 1.30.1 (git-v1.30.1)
root@ip-172-31-12-224:/usr/local/bin#
```

i-039a61cc3b9407fe2
PublicIPs: 15.206.186.255 PrivateIPs: 172.31.12.224



```
root@ip-172-31-12-224:/usr/local/bin# mv kops-linux-amd64 kops
root@ip-172-31-12-224:/usr/local/bin# chmod 777 kops
root@ip-172-31-12-224:/usr/local/bin# chmod 777 kubectl
root@ip-172-31-12-224:/usr/local/bin# kubectl version
Client Version: v1.31.2
Kustomize Version: v5.4.2
The connection to the server localhost:8080 was refused - did you specify the right host or port?
root@ip-172-31-12-224:/usr/local/bin# kops version
Client version: 1.30.1 (git-v1.30.1)
root@ip-172-31-12-224:/usr/local/bin# cd
root@ip-172-31-12-224:# kops create cluster --name=dutt1.shop \
--state=s3://dutt1.shop --zones=ap-south-1a,ap-south-1b,ap-south-1c \
--node-count=1 --control-plane-count=1 --node-size=t3.medium --control-plane-size=t3.medium \
--control-plane-zones=ap-south-1a --control-plane-volume-size 10 --node-volume-size 10 \
--ssh-public-key ~/.ssh/id_ed25519.pub \
--dns-zone=dutt1.shop --dry-run --output yaml
I1113 16:44:40.870762 2324 create_cluster.go:880] Using SSH public key: /root/.ssh/id_ed25519.pub
I1113 16:44:41.191135 2324 new_cluster.go:1454] Cloud Provider ID: "aws"
I1113 16:44:41.311831 2324 subnets.go:224] Assigned CIDR 172.20.0.0/18 to subnet ap-south-1a
I1113 16:44:41.312072 2324 subnets.go:224] Assigned CIDR 172.20.64.0/18 to subnet ap-south-1b
I1113 16:44:41.312264 2324 subnets.go:224] Assigned CIDR 172.20.128.0/18 to subnet ap-south-1c
```

i-039a61cc3b9407fe2
PublicIPs: 15.206.186.255 PrivateIPs: 172.31.12.224

```

Instances EC2 Insta EC2 Insta EC2 Insta 11-Micro Mastering adservice ChatGPT Docker H
← → ⌂ ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?region=ap-south-1&connType=standard&instanceId=i-039a61cc3b9407fe2&osUser=ubuntu&sshPort=22&...
azur orchestartion LB cli dns aks cli k8s github Adobe Acrobat int
AWS Services Search [Alt+S]
VPC S3
Kind: SSHCredential
metadata:
  creationTimestamp: null
  labels:
    kops.k8s.io/cluster: dutt1.shop
  name: admin
spec:
  publicKey: ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAICu9Aj5pE07hje2wzE3gcWhPLCANT31D9h7XAYioojFZ
root@ip-172-31-12-224:~# vi c.yaml
root@ip-172-31-12-224:~# kops create -f c.yaml

Created cluster/dutt1.shop
Created instancegroup/control-plane-ap-south-1a
Created instancegroup/nodes-ap-south-1a
Created instancegroup/nodes-ap-south-1b
Created instancegroup/nodes-ap-south-1c
Added ssh credential

To deploy these resources, run: kops update cluster --name dutt1.shop --yes
root@ip-172-31-12-224:~# 

i-039a61cc3b9407fe2
PublicIPs: 15.206.186.255 PrivateIPs: 172.31.12.224

```

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Created KOPS cluster

```

Instances EC2 Insta EC2 Insta EC2 Insta 11-Micro Mastering adservice ChatGPT Docker H
← → ⌂ ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?region=ap-south-1&connType=standard&instanceId=i-039a61cc3b9407fe2&osUser=ubuntu&sshPort=22&...
azur orchestartion LB cli dns aks cli k8s github Adobe Acrobat int
AWS Services Search [Alt+S]
VPC S3
INSTANCE GROUPS
NAME ROLE MACHINETYPE MIN MAX SUBNETS
control-plane-ap-south-1a ControlPlane t3.medium 1 1 ap-south-1a
nodes-ap-south-1a Node t3.medium 1 1 ap-south-1a
nodes-ap-south-1b Node t3.medium 0 0 ap-south-1b
nodes-ap-south-1c Node t3.medium 0 0 ap-south-1c

NODE STATUS
NAME ROLE READY

VALIDATION ERRORS
KIND NAME MESSAGE
dns apiserver Validation Failed

The dns-controller Kubernetes deployment has not updated the Kubernetes cluster's API DNS entry to the correct IP address. The API DNS IP address is the placeholder address that kops creates: 203.0.113.123. Please wait about 5-10 minutes for a control plane node to start, dns-controller to launch, and DNS to propagate. The protokube container and dns-controller deployment logs may contain more diagnostic information. Etcd and the API DNS entries must be updated for a kops Kubernetes cluster to start.

Validation Failed
W1113 16:46:59.608660 2346 validate_cluster.go:234] (will retry): cluster not yet healthy

i-039a61cc3b9407fe2
PublicIPs: 15.206.186.255 PrivateIPs: 172.31.12.224

```

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```

Instances | EC2 | ap-south-1 EC2 Instance Connect 11-Microservice-on-Kubernetes Install Prometheus on Ubuntu Comparing duttigantim...
ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?region=ap-south-1&connType=standard&instanceId=i-039a61cc3b9407fe2&osUser=ubuntu&sshPort=22&...
azur... orchestartion LB cli dns aks cli k8s github Adobe Acrobat int
AWS Services Search [Alt+S] Mumbai DUTT
VPC S3
Pod kube-system/coredns-6b4469b66d-m4tgx system-cluster-critical pod "coredns-6b4469b66d-m4tgx" is pending
Pod kube-system/ebs-csi-node-5db4z system-node-critical pod "ebs-csi-node-5db4z" is pending
Pod kube-system/ebs-csi-node-7j452 system-node-critical pod "ebs-csi-node-7j452" is pending
Pod kube-system/ebs-csi-node-b5ps6 system-node-critical pod "ebs-csi-node-b5ps6" is pending

Validation Failed
M1113 17:27:46.120440 2524 validate_cluster.go:234] (will retry): cluster not yet healthy
INSTANCE GROUPS
NAME ROLE MACHINETYPE MIN MAX SUBNETS
control-plane-ap-south-1a ControlPlane t3.medium 1 1 ap-south-1a
nodes-ap-south-1a Node t3.medium 1 1 ap-south-1a
nodes-ap-south-1b Node t3.medium 1 1 ap-south-1b
nodes-ap-south-1c Node t3.medium 1 1 ap-south-1c

NODE STATUS
NAME ROLE READY
i-037be8aa4fa0ac512 node True
i-0c373522ad7b1be30 control-plane True
i-0c9cdef02004ca41c node True
i-0e30dd35fa2a5e1ce node True

Your cluster dutt1.shop is ready

i-039a61cc3b9407fe2
PublicIPs: 15.206.186.255 PrivateIPs: 172.31.12.224

```

Cluster is now ready

Take key from config file to configure in Jenkins for deployment Job

```

Instances | EC2 | ap-south-1 EC2 Instance Connect 11-Microservice-on-Kubernetes Install Prometheus on Ubuntu Comparing duttigantim...
ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?region=ap-south-1&connType=standard&instanceId=i-039a61cc3b9407fe2&osUser=ubuntu&sshPort=22&...
azur... orchestartion LB cli dns aks cli k8s github Adobe Acrobat int
AWS Services Search [Alt+S] Mumbai DUTT
VPC S3
-rwxrwxrwx 1 root root 250395544 Sep 13 16:26 kops*
-rwxrwxrwx 1 root root 56381592 Nov 13 16:41 kubectl*
drwx 3 root root 4096 Nov 13 16:36 snap/
root@ip-172-31-12-224:~$ cd .kube/
root@ip-172-31-12-224:~/~.kube# ls
cache config
root@ip-172-31-12-224:~/~.kube# cat config
apiVersion: v1
clusters:
- cluster:
    certificate-authority-data: LS0tLS1CRUdJTiBDRVJUSUZJQ0FURS0tLS0tck1JSUMrRENQWVD20F3SUJBZ01NR0F1VzBiWj1sNDA4RzRtcE1BMeDU3FHU01iM0RERUJDd1VBTUJneE2qQVUKQmdOvkJBfVREv3QxWkWJtVjBaWE10WFJFd0hoy05NelF4TVRPeE1UV3lNRv3V2hjTk16XkhNVEV4TVrjeOpNREv3V2pBW1SWXkGQV1Ev1FREv3MXjkV0psxY201bGRhVnpMV05eTU1JQklqQU5C22txaGtpRz13MEJBuuVGckFBT0NBUThBTU1JQknN0NbNUUVBcFhmeUFHjtJUWHJM8XNEbhIxSHNWUnVuTkRaTkWbGhIN2zmLzJU2RGR1AKN31WUCtnewtKMFNmek1occ93WUzUVM5VzdLrtk4ahzhL1pnQndRvgVptBok0joQ2pUa0sp2jNwTtdnODB4dap2S19qbDREQkN5WD16QKN2eG11MDNGMG1H7kjl0EVMDG1kRDE4YU96VGMsSmR6b711RzdM23VjQ1kvB2R4dnFkjcjrU1ywvQzK29h3nRSC9jWld5eH15djmNdFFxTBxkdV1z2wHN3aVgQXWVzFFQzNyR3jWzNjNittFOFAkCmduFNPaVdvjBzandkQvNmOXFDUGvzZ0xTxzD2Uhpu7zRcDIy1g4dmw2b2VFcE45QmJkb3NTRH0r229Eywp0RjRRQVbc9kXVvCE2WmtkVz1vMkdjUUDpeThMNNU0VfzeWjVVMFJREFRQUJvME13UURB00nt1Z1UphCCKkPmOEVCQUDQVFZd0R3WURWUjBUQVFTl0JBVXkddVCL3pBZEJnTlZ1IUTFRRmdRV15VgXjejBaWdjzWplcm8QkjvQmNaNjFMNTR3FFZktWk1odmNOQVFFTEJRQRUrN20VCCQUVizk5rQkRnZn1YeGrlWWlkRMWQ3VUszT1VnagordfhPMXvhQ21SEFtek1YeGjd0Xykow8EtXWnJGbz1u2nBPTD1kVeln1u2t3Uvd7TQa3NHCjhgB05nQTR2ULZXMetvSEVtmdtaGrNcVNHeU90WFrRd0tSGIxCTMrNPFk4sU9Llb1E4aONEM1JUWG1wRmdJYWK7jB4WRpMYTRzOhhsdxF8VUTrQzgwUGZjUHV0OnVBVORNdG1XdnNuRE5XWHRNaPMwdkNHTGtMMU5Uc05aHMdgwpvVEJGcEY8khQzPlay0pTWnJh2V4UFNhait1M1BPVkyccFgjG1vYHU0azxUoQ326K3h0N2xVRXrkMwlDgPMcKpwCtPNVYwL0E4dl1wV3jBS3orMepDdGJqmcohdM6YXkVmjdoSURTZHVOUcvTHFnCjU3sjzJUVRrPQotL80tLUJvORCBDRVJUSUZJQ0FURS0tL80tgc==
server: https://api.dutt1.shop

i-039a61cc3b9407fe2
PublicIPs: 15.206.186.255 PrivateIPs: 172.31.12.224

```

Configure secret file in Jenkins credentials to connect KOPS cluster

The screenshot shows a browser window with several tabs open, including 'Instances | EC2 | ap-south-1', 'EC2 Instance Connect', '11-Microservice-on-Kubernetes', and 'New credentials [Jenkins]'. The main content area is the 'Manage Jenkins > Credentials > System > Global credentials (unrestricted)' section. A 'Secret file' credential is being configured with the following details:

- Kind:** Secret file
- Scope:** Global (Jenkins, nodes, items, all child items, etc)
- File:** Choose File k13.txt
- ID:** k8-token
- Description:** k8-token

A blue 'Create' button is at the bottom right.

Generate kubeconfig script to paste in Jenkins job

The screenshot shows a browser window with tabs for 'Instances | EC2 | ap-south-1', 'EC2 Instance Connect', 'Editing 11-Microservice-on...', and 'Pipeline Syntax: Snippet Gen...'. The main content is the 'Pipeline Syntax: Snippet Generator' page under 'Micro Services > Pipeline Syntax'. The 'Overview' section includes:

- Snippet Generator:** Declarative Directive Generator, Declarative Online Documentation, Steps Reference, Global Variables Reference, Online Documentation, Examples Reference, IntelliJ IDEA GDSL.
- Steps:** Sample Step: withKubeConfig: Configure Kubernetes CLI (kubectl)
- Credentials:** k13.txt (k8-token)

A blue 'withKubeConfig' button is visible. The Jenkins logo is in the top left of the browser window.

Instances | EC2 | ap-south-1 | EC2 Instance Connect | EC2 Instance Connect | Editing 11-Microservice-on-Kubernetes | Pipeline Syntax: Snippet Generator

Not secure 43.204.98.28:8080/job/Micro%20Services/pipeline-syntax/

azure orchestration LB cli dns aks cli k8s github Adobe Acrobat int

All Bookmarks

Dashboard > Micro Services > Pipeline Syntax

Restrict access to kubeconfig file ?

Generate Pipeline Script

```
withKubeConfig(caCertificate: '', clusterName: '', contextName: '', credentialsId: 'k8-token', namespace: 'webapps', restrictKubeConfigAccess: false, serverUrl: '') {  
    // some block  
}
```

Global Variables

There are many features of the Pipeline that are not steps. These are often exposed via global variables, which are not supported by the snippet generator. See the [Global Variables Reference](#) for details.

Paste generated script in Jenkins file

github.com/duttgsrk/11-Microservice-on-Kubernetes/edit/main/Jenkinsfile

Code Preview Code 55% faster with GitHub Copilot

```
1 pipeline {  
2     agent any  
3  
4     stages {  
5         stage('Deploy To Kubernetes') {  
6             steps {  
7                 withKubeConfig(caCertificate: '', clusterName: '', contextName: '', credentialsId: 'k8-token', namespace: 'webapps', restrictKubeConfigAccess: false, serverUrl: '') {  
8                     sh "kubectl create ns webapps"  
9                     sh "kubectl apply -f deployment-service.yml -n webapps"  
10                }  
11            }  
12        }  
13    }  
14  
15    stage('verify Deployment') {  
16        steps {  
17            withKubeConfig(caCertificate: '', clusterName: '', contextName: '', credentialsId: 'k8-token', namespace: 'webapps', restrictKubeConfigAccess: false, serverUrl: '') {  
18                sh "kubectl get svc"  
19            }  
20        }  
21    }  
}
```

Execute deployment job

Instance details | EC2 | ap-southeast-1 | duttgsrk/11-Microservice-on | main [Micro Services] | Jenkins

Not secure 43.204.98.28:8080/job/Micro%20Services/job/main/

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Dashboard > Micro Services > main >

Status

</> Changes Full project name: Micro Services/main

Build Now

View Configuration

Full Stage View

Stages

Pipeline Syntax

Builds

No builds

Filter

Average stage times: (Average full run time: ~11s)

	Declarative: Checkout SCM	Deploy To Kubernetes	verify Deployment
#1 Nov 13 23:16 3 commits	1s	2s	395ms
#2 Nov 13 21:58 No Changes			
#3 Nov 13 21:47 No Changes	1s	249ms failed	284ms failed

Declarative: Checkout SCM Deploy To Kubernetes verify Deployment

1s 2s 395ms

1s 5s 507ms

1s 249ms failed 284ms failed

Type here to search

11:16 PM 13/11/2024

Deployments created

Instance details | EC2 | ap-southeast-1 | duttgsrk/11-Microservice-on | main [Micro Services] | Jenkins

Not secure 43.204.98.28:8080/job/Micro%20Services/job/main/

azure orchestration LB cli dns aks cli k8s github Adobe Acrobat int

Stage Logs (Deploy To Kubernetes)

Shell Script -- kubectl create ns webapps (self time 560ms)
+ kubectl create ns webapps
namespace/webapps created

Shell Script -- kubectl apply -f deployment-service.yaml -n webapps (self time 2s)

Build Now

View Configuration

Full Stage View

Stages

Pipeline Syntax

Builds

Today #3 5:46 PM

Filter

Average stage times: (Average full run time: ~11s)

	Declarative: Checkout SCM	Deploy To Kubernetes	verify Deployment
#1 Nov 13 23:16 3 commits	1s	2s	395ms
#2 Nov 13 21:58 No Changes			
#3 Nov 13 21:47 No Changes	1s	249ms failed	284ms failed

Declarative: Checkout SCM Deploy To Kubernetes verify Deployment

1s 2s 395ms

1s 5s 507ms

1s 249ms failed 284ms failed

Type here to search

11:18 PM 13/11/2024

```

Stage Logs (Deploy To Kubernetes)

Shell Script -- kubectl create ns webapps (self time 560ms)
Shell Script -- kubectl apply -f deployment-service.yml -n webapps (self time 2s)

+ kubectl apply -f deployment-service.yml -n webapps
deployment.apps/emailservice created
service/emailservice created
deployment.apps/checkoutservic created
service/checkoutservic created
deployment.apps/recommendationservic created
service/recommendationservic created
deployment.apps/frontend created
service/frontend created
service/frontend-external created
deployment.apps/paymentservice created
service/paymentservice created
deployment.apps/productcatalogservice created
service/productcatalogservice created
deployment.apps/cartservice created
service/cartservice created
deployment.apps/loadgenerator created
deployment.apps/currencieservice created
service/currencyserice created

```

Nov 13 21:58 No Changes

Today #3 5:46 PM

Type here to search 11:18 PM 13/11/2024 ENG

I am able to access app but not able to provide screenshot

Network policies to secure deployment from default namespace by deny traffic from default namespace

```

root@def1:/# exit
exit
command terminated with exit code 1
root@ip-172-31-12-224:~# ls
c.yaml i.yaml kops kubelet np.yaml snap
root@ip-172-31-12-224:~# cat np.yaml
apiVersion: networking.k8s.io/v1
kind: NetworkPolicy
metadata:
  name: deny-default-ns
  namespace: webapps
spec:
  podSelector: {}
  policyTypes:
    - Ingress
  ingress:
    - from:
        - namespaceSelector:
            matchLabels:
              name: webapps
root@ip-172-31-12-224:~#

```

i-039a61cc3b9407fe2
PublicIPs: 3.111.37.245 PrivateIPs: 172.31.12.224

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Checking ping from default namespace to frontend pod before applying network policies

A screenshot of a Windows desktop environment. At the top, there are several browser tabs: 'Instances | EC2 | ap-south-1', 'EC2 Instance Connect', 'Mastering-Kubernetes/Day 11', and 'Install Prometheus on Ubuntu'. Below the tabs, the taskbar shows icons for various applications like Azure, orchestration, LB, cli dns, aks cli, k8s github, Adobe Acrobat, and int. In the center, there is a large terminal window titled 'CloudShell' with the AWS logo. The terminal is displaying a command-line session on an EC2 instance. The session starts with:

```
root@ip-172-31-12-224:~# kubectl get pods
```

and continues with several lines of pod status output. Then it runs:

```
root@ip-172-31-12-224:~# ping 100.96.5.145
```

and shows the ping results. Finally, it runs:

```
root@ip-172-31-12-224:~# kubectl exec -it def1 -- bash
```

and enters a bash shell. Inside the shell, it runs:

```
root@def1:~# ping 100.96.5.145
```

and shows the ping results. The terminal window has a title bar 'i-039a61cc3b9407fe2' and says 'PublicIPs: 3.111.37.245 PrivateIPs: 172.31.12.224'.

Apply Network policy and check connectivity to frontend pod which was not able to connect

A screenshot of a Windows desktop environment, similar to the previous one. It shows the same browser tabs and taskbar. The central terminal window is now displaying a different command-line session. It starts with:

```
root@ip-172-31-12-224:~# cat np.yaml
```

and shows the YAML configuration for a NetworkPolicy named 'deny-default-ns'. Then it runs:

```
root@ip-172-31-12-224:~# kubectl apply -f np.yaml
```

and shows the confirmation that the networkpolicy was created. Finally, it runs:

```
root@ip-172-31-12-224:~# kubectl exec -it def1 -- bash
```

and enters a bash shell. Inside the shell, it runs:

```
root@def1:~# ping 100.96.5.145
```

and shows the ping results. The terminal window has a title bar 'i-039a61cc3b9407fe2' and says 'PublicIPs: 3.111.37.245 PrivateIPs: 172.31.12.224'.

