

Phase II: Advanced DevOps Enhancements

1. Deploy to Production-Level Kubernetes (EKS)

Step 1 : Create aws infrastructure using terraform.

Github url : <https://github.com/jyotiraul/sparknet-motivation-web-app>

Infra/main.tf

Infra/output.tf

Infra/variable.tf

```
Destroy complete! Resources: 0 destroyed.
PS C:\assignment\Sparknet-Innovation\motivation-web-app\infra> terraform init
Initializing the backend...
Initializing provider plugins...
- Reusing previous version of hashicorp/null from the dependency lock file
- Reusing previous version of hashicorp/random from the dependency lock file
- Reusing previous version of hashicorp/aws from the dependency lock file
- Using previously-installed hashicorp/null v3.2.4
```

```
commands will detect it and remind you to do so if necessary.
PS C:\assignment\Sparknet-Innovation\motivation-web-app\infra> terraform validate
Success! The configuration is valid.
```

```
PS C:\assignment\Sparknet-Innovation\motivation-web-app\infra> terraform plan
var.key_name
  Name of your existing EC2 Key Pair

Enter a value: lab3
```

```
PS C:\assignment\Sparknet-Innovation\motivation-web-app\infra> terraform apply
var.key_name
  Name of your existing EC2 Key Pair
```

```
Do you want to perform these actions?
  Terraform will perform the actions described above.
  Only 'yes' will be accepted to approve.

Enter a value: yes
```

```
Apply complete! Resources: 21 added, 0 changed, 0 destroyed.

Outputs:

eks_cluster_endpoint = "https://57AF441AE0164DC2CAFB4BB4BF225D0A0.gr7.ap-south-1.eks.amazonaws.com"
eks_cluster_name     = "my-eks-cluster"
kubeconfig_command   = "aws eks --region ap-south-1 update-kubeconfig --name my-eks-cluster"
public_ip            = "43.205.142.242"
```

After logging in to your AWS account, you will see..

EC2 > Instances

EC2

Dashboard

EC2 Global View

Events

Instances

Instances

Instance Types

Launch Templates

Spot Requests

Instances (2) Info

Last updated less than a minute ago

Connect

Instance state

Actions

Launch instances

Find Instance by attribute or tag (case-sensitive)

All states

Instance state: running

Clear filters

	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IP
		i-05146b4c68a022465	Running	t3.medium	3/3 checks passed	View alarms +	ap-south-1b	ec2-13-1
	MotivationWe...	i-08e69c775586f5fb1	Running	t2.medium	2/2 checks passed	View alarms +	ap-south-1a	ec2-43-2

EC2 > Load balancers

EC2

Dashboard

EC2 Global View

Events

Instances

Instances

Instance Types

Launch Templates

Spot Requests

Savings Plans

Reserved Instances

Load balancers (4)

Elastic Load Balancing scales your load balancer capacity automatically in response to changes in incoming traffic.

Filter load balancers

	Name	DNS name	State	VPC ID	Availability Zones	Type	Date created
	a73daeda97016454d9e...	a73daeda97016454d9ef20...	-	vpc-05207bcd537ef5172	2 Availability Zones	classic	June 17,
	a95a97815bbf244099e...	a95a97815bbf244099e5c1...	-	vpc-05207bcd537ef5172	2 Availability Zones	classic	June 17,
	a72aa376effa40dd81a...	a72aa376effa40dd81a851...	-	vpc-05207bcd537ef5172	2 Availability Zones	classic	June 17,
	aadc0ffb3cfa84a4f8e34...	aadc0ffb3cfa84a4f8e3401d...	-	vpc-05207bcd537ef5172	2 Availability Zones	classic	June 17,

0 load balancers selected

Amazon Elastic Kubernetes Service

Dashboard

Clusters

Settings

Dashboard settings

Clusters (1) Info

Filter clusters

	Cluster name	Status	Kubernetes version	Support period	Upgrade policy	Created	Provider
	my-eks-cluster	Active	1.32 Upgrade now	Standard support until March 21, 2026	Extended	3 hours ago	EKS

Amazon Elastic Kubernetes Service > Clusters > my-eks-cluster

Amazon Elastic Kubernetes Service

Dashboard

Clusters

Settings

Dashboard settings

Console settings

Amazon EKS Anywhere

Enterprise Subscriptions

Related services

Amazon ECR

AWS Batch

Documentation

my-eks-cluster

Delete cluster

Upgrade version

Monitor cluster

End of standard support for Kubernetes version 1.32 is March 21, 2026. On that date, your cluster will enter the extended support period with additional fees. For more information, see the [pricing page](#).

Upgrade now

Cluster info

Status

Active

Kubernetes version

1.32

Support period

Standard support until March 21, 2026

Provider

EKS

Cluster health

0

Upgrade insights

4

Node health issues

0

Overview

Resources

Compute

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Access

Observability

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Amazon EKS Anywhere

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Related services

Amazon ECR

AWS Batch

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API server endpoint

https://57AF441AE0164DC2CAFBBB4BF225D0A0.gr7.ap-south-1.eks.amazonaws.com

Certificate authority

LS0tLS1CRUdJTTIBDVRVJUSUZJQ0FURSOtLS0tCk1JSURCVENDQWUyZ0F3SUJBZ0U0IPY1BQVDBTUWd3RFFZSkVWklodmNOQVFFFT

OpenID Connect provider URL

https://oidc.eks.ap-south-1.amazonaws.com/id/57AF441AE0164DC2CAFBBB4BF225D0A0

Cluster IAM role ARN

arn:aws:iam::448704111492:role/eks-cluster-role

View in IAM

Created

3 hours ago

Cluster ARN

arn:aws:eks:ap-south-1:448704111492:cluster/my-eks-cluster

Platform version

eks.12

Amazon Elastic Kubernetes Service

Dashboard [New](#)

Clusters

Settings

Amazon EKS Anywhere

Related services

Documentation

my-eks-cluster observability dashboard

Summary


Control plane monitoring


Cluster health


Upgrade insights


Node health issues

▼ How each tab works

**Control plane monitoring**
Inspect graphs and navigate logs to dig into a cluster's performance. View useful predefined queries for monitoring and troubleshooting.

**Cluster health**
Quickly see important notifications for your cluster. Take actions to address these identified issues.

**Cluster insights**
View automated observations about your cluster. Identify some potential issues before upgrading to a new Kubernetes version.

**Node health issues**
Identify and solve node issues to maintain high availability of your application.

Health and performance summary [Info](#)

Choose any of the numbers below to view more information about each category.

Cluster health
✔ 0

Upgrade insights
✔ 4

Node health issues
✔ 0

[View control plane monitoring](#)

Amazon Elastic Kubernetes Service

Dashboard [New](#)

Clusters

Settings

Amazon EKS Anywhere

Related services

Documentation

my-eks-cluster Observability dashboard

Upgrade insights (4) [Info](#)

The table below lists the insight checks performed by EKS against this cluster, along with their associated statuses. EKS automatically refreshes the status of each Insight, which can be seen in the last refresh time column.

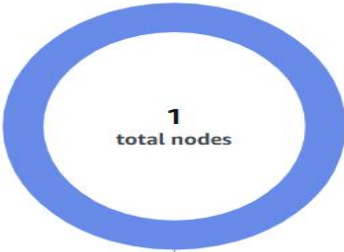
Q Filter insights by name, version or status

< 1 >

Name	Insight status	Version	Last refresh time (UTC+05:30)	Last transition time (UTC+05:30)	Description
EKS add-on version compatibility	✔ Passing	1.33	2 hours ago	2 hours ago	Checks version of installed EKS add-ons to ensure they are compatible with the next version of Kubernetes.
Cluster health issues	✔ Passing	1.33	2 hours ago	2 hours ago	Checks for any cluster health issues that prevent successful upgrade to the next Kubernetes version on EKS.
Kubelet version skew	✔ Passing	1.33	2 hours ago	2 hours ago	Checks for kubelet versions of worker nodes in the cluster to see if upgrade would cause non compliance with supported Kubernetes kubelet version skew policy.
kube-proxy version skew	✔ Passing	1.33	2 hours ago	2 hours ago	Checks version of kube-proxy in cluster to see if upgrade would cause non compliance with supported Kubernetes kube-proxy version skew policy.

Activate Windows

Nodes



1
total nodes

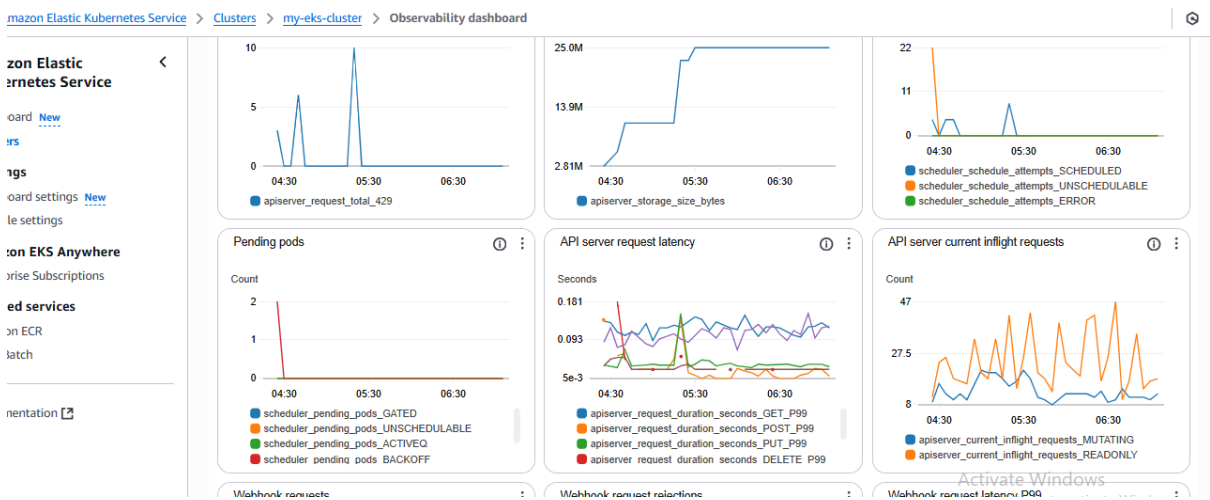
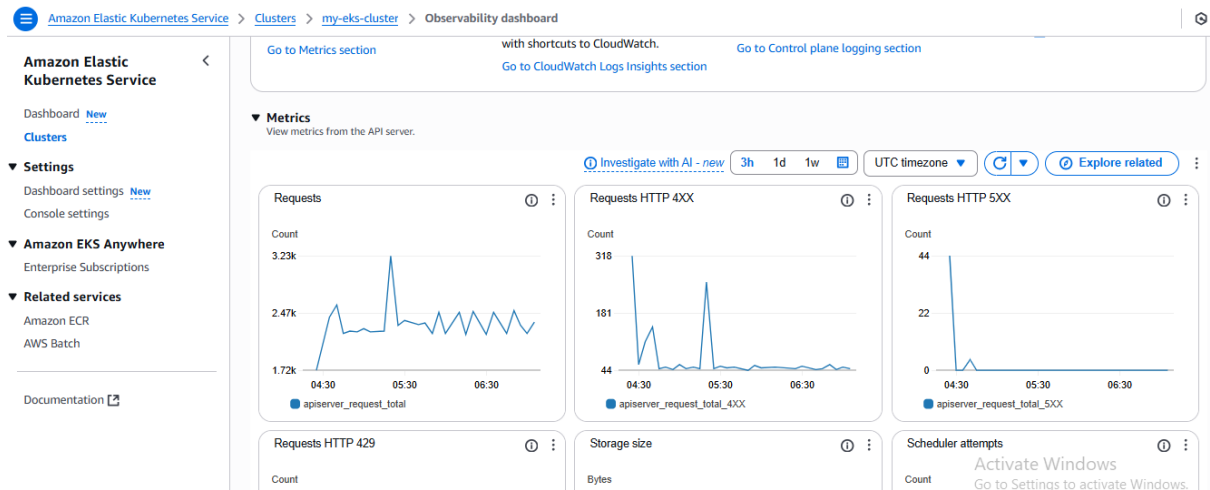
Nodes without health issues

1 units, 100.0%

Nodes without health issues

Nodes with health issues

Activate Windows
Go to Settings



Amazon Elastic Kubernetes Service > Clusters > my-eks-cluster

Overview Resources **Compute** Networking Add-ons Access Observability Update history Tags

Nodes (1) Info

Filter Nodes by property or value

Node name	Instance type	Compute	Managed by	Created	Status
ip-172-31-2-189.ap-south-1.compute.internal	t3.medium	Node group	example-node-group	3 hours ago	Ready

Node groups (1) Info

Node groups implement basic compute scaling through EC2 Auto Scaling groups.

Group name	Desired size	AMI release version	Launch template	Status
example-node-group	1	1.32.3-20250610	-	Active

Fargate profiles (0) Info

|--|--|--|

Step 2. Deploy the application on AWS EKS

I. Connect to the EC2 instance using SSH and its public IP address.

If a .pem key does not exist, follow these steps: Go to EC2 > Key Pairs > Click 'Create key pair' > Enter a name, select 'RSA' as the key type, and choose the '.pem' file format > Click 'Create key pair'.

Command : `ssh -i "path/yourkeyname.pem" ubuntu@ip-address`

```
PS C:\assignment\Sparknet-Innovation\motivation-web-app\infra> ssh -i "C:\Users\THE SHIKSHAK\Downloads\lab3.pem" ubuntu@43.205.142.242
Welcome to Ubuntu 22.04.2 LTS (GNU/Linux 5.19.0-1025-aws x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
```

If accessKey is not downloaded : I am-> users-> Click the username for whom you want to create the access key-> On the user details page, go to the **Security credentials** tab -> Scroll down to **Access keys** section -> Click **Create access key** -> fill details -> Click **Download .csv file**-> **Click Done**.

II. Configure AWS CLI

Command : `aws configure`

```
ubuntu@ip-172-31-1-134:~$ aws configure
AWS Access Key ID [*****5VU0]:
AWS Secret Access Key [*****/IXK]:
Default region name [ap-south-1]:
Default output format [None]:
```

III. Update kubeconfig for your EKS cluster

Command: `aws eks --region YOUR_REGION update-kubeconfig --name YOUR_CLUSTER_NAME`

```
ubuntu@ip-172-31-1-134:~$ aws eks --region ap-south-1 update-kubeconfig --name my-eks-cluster
Added new context arn:aws:eks:ap-south-1:448704111492:cluster/my-eks-cluster to /home/ubuntu/.kube/config
```

Folder hierarchy within the AWS-hosted Ubuntu environment

```
ubuntu@ip-172-31-1-134:~$ ls
certificate k8s
ubuntu@ip-172-31-1-134:~$ cd certificate/
ubuntu@ip-172-31-1-134:~/certificate$ ls
cluster-issuer.yaml
ubuntu@ip-172-31-1-134:~/certificate$ cd
ubuntu@ip-172-31-1-134:~$ cd k8s
ubuntu@ip-172-31-1-134:~/k8s$ ls
deployment.yaml ingress.yaml service.yaml
```

Note: The files are available in the k8s/ directory on GitHub. Copy the code from there.

IV. Write and run the YAML configuration files.

Command:

`nano deployment.yaml`

`nano service.yaml`

kubectl apply -f deployment.yaml

kubectl apply -f service.yaml

```
ubuntu@ip-172-31-1-134:~$ mkdir k8s
ubuntu@ip-172-31-1-134:~$ cd k8s
ubuntu@ip-172-31-1-134:~/k8s$ nano deployment.yaml
ubuntu@ip-172-31-1-134:~/k8s$ nano service.yaml
ubuntu@ip-172-31-1-134:~/k8s$ kubectl apply -f deployment.yaml
deployment.apps/motivation-app created
ubuntu@ip-172-31-1-134:~/k8s$ kubectl apply -f service.yaml
service/motivation-service created
```

Kubectl get po

Kubectl get svc

```
ubuntu@ip-172-31-1-134:~/k8s$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
motivation-app-bbcb5b595-8nhgc      1/1     Running   0           51s
ubuntu@ip-172-31-1-134:~/k8s$ kubectl get svc
NAME            TYPE        CLUSTER-IP   EXTERNAL-IP   PORT(S)   AGE
kubernetes      ClusterIP   10.100.0.1    <none>        443/TCP   11m
motivation-service  LoadBalancer  10.100.86.13  a73daeda97016454d9ef20bec588ca5-2027478013.ap-south-1.elb.amazonaws.com  80:31018/TCP  48s
```

Step 3: Implement Ingress Controller (NGINX)

I. Add NGINX Ingress Helm Repo

helm repo add ingress-nginx https://kubernetes.github.io/ingress-nginx

helm repo update

II. Install NGINX Ingress Controller

helm upgrade --install ingress-nginx ingress-nginx \

--repo https://kubernetes.github.io/ingress-nginx \

--namespace ingress-nginx --create-namespace \

--set controller.ingressClass=nginx \

--set controller.ingressClassResource.name=nginx

```
ubuntu@ip-172-31-1-134:~/k8s$ helm repo add ingress-nginx https://kubernetes.github.io/ingress-nginx
"ingress-nginx" has been added to your repositories
ubuntu@ip-172-31-1-134:~/k8s$ helm repo update
Hang tight while we grab the latest from your chart repositories...
...Successfully got an update from the "ingress-nginx" chart repository
Update Complete. ✨Happy Helming!✨
ubuntu@ip-172-31-1-134:~/k8s$ helm upgrade --install ingress-nginx ingress-nginx \
> --repo https://kubernetes.github.io/ingress-nginx \
> --namespace ingress-nginx --create-namespace \
> --set controller.ingressClass=nginx \
> --set controller.ingressClassResource.name=nginx
Release "ingress-nginx" does not exist. Installing it now.
NAME: ingress-nginx
LAST DEPLOYED: Tue Jun 17 04:38:17 2025
NAMESPACE: ingress-nginx
STATUS: deployed
REVISION: 1
TEST SUITE: None
NOTES:
```

Note: The file is available in the k8s/ directory on GitHub. Copy the code from there.

Command : Nano ingress.yml

```
kubectl apply -f ingress.yaml
```

```
kubectl get ingress
```

```
ubuntu@ip-172-31-1-134:~/k8s$ nano ingress.yaml
ubuntu@ip-172-31-1-134:~/k8s$ kubectl apply -f ingress.yaml
ingress.networking.k8s.io/motivation-ingress created
ubuntu@ip-172-31-1-134:~/k8s$ kubectl get ingress
NAME                CLASS    HOSTS                ADDRESS      PORTS      AGE
motivation-ingress  nginx    web.motivationapp.click  80, 443     8s
```

Step 4: Use a **custom domain** with **SSL** via Let's Encrypt (cert-manager).

I. Register a domain

Navigate to AWS Route 53, then go to **Registered Domains** and click on **Register Domain**.

Route 53 > Registered domains > Register domains

Register domains [Info](#)

Pricing for domain names varies by top-level domain (TLD). For more information, view [price with different TLDs](#).

Search for domain

Check availability for a domain

× Search

► **Standard pricing**

Pricing for domain names varies by top-level domain (TLD), such as .com or .org.

Select domain and click on proceed to checkout.

Route 53 > Registered domains > Register domains

Suggested available domains (9)

You can register up to five domains at a time.

Domain	Price/year	Actions
motivationapp.net	15.00 USD	Selected
motivationapp.io	71.00 USD	Select
motivationapp.co	31.00 USD	Select
motivationappmarketing.com	14.00 USD	Select
motivationapp.info	25.00 USD	Select
motivationappnetwork.com	14.00 USD	Select
motivationappnetwork.net	14.00 USD	Select

Selected domains (1/5)

Domain registration fee

motivationapp.net Remove

15.00 USD
Renews at 15.00 USD

Subtotal: **15.00 USD**

The domain registration fee displayed is for 1 year. You can change duration on the next page.

Proceed to checkout

Register domain

Find and register an available domain, or [transfer your existing domains](#) to Route 53.

Enter a domain name

Each label (each part between dots) can be up to 63 characters long and must start with a-z or 0-9. Maximum length: 255 characters, including dots. Valid and - (hyphen)

Check

Notifications 1

Find notifications

Resource	Status	Last update
motivationapp.click	✔ Domain registration successful	2025-06-13 20:04:59

II. Add cert-manager policy –

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [
        "route53:GetChange",
        "route53:ChangeResourceRecordSets",
        "route53:ListResourceRecordSets",
        "route53:ListHostedZones"
      ],
      "Resource": "*"
    }
  ]
}
```

Identity and Access Management (IAM)

Dashboard

Access management

- User groups
- Users**
- Roles
- Policies
- Identity providers
- Account settings
- Root access management New

cert-manager

Policy name Type Attached via

☐ ☒ [cert-manager-policy](#) Customer inline Inline

cert-manager-policy [Copy JSON](#) [Edit](#)

```
1 {
2   "Version": "2012-10-17",
3   "Statement": [
4     {
5       "Effect": "Allow",
6       "Action": [
7         "route53:GetChange",
8         "route53:ChangeResourceRecordSets",
9         "route53:ListResourceRecordSets",
10        "route53:ListHostedZones"
11      ],
12      "Resource": "*"
13    }
14  ]
15 }
```


III.Set Up Cert-Manager in Kubernetes Using Helm

Commands:

```
kubectl create namespace cert-manager
```

```
helm repo add jetstack https://charts.jetstack.io
```

```
helm repo update
```

```
helm install cert-manager jetstack/cert-manager \
```

```
--namespace cert-manager \
```

```
--set installCRDs=true
```

```
ubuntu@ip-172-31-1-147:~$ kubectl create namespace cert-manager
namespace/cert-manager created
ubuntu@ip-172-31-1-147:~$ helm repo add jetstack https://charts.jetstack.io
"jetstack" has been added to your repositories
ubuntu@ip-172-31-1-147:~$ helm install cert-manager jetstack/cert-manager \
> --namespace cert-manager \
> --set installCRDs=true

NAME: cert-manager
LAST DEPLOYED: Mon Jun 16 03:43:29 2025
NAMESPACE: cert-manager
STATUS: deployed
```

IV. Create a Kubernetes secret for AWS credentials

```
kubectl create secret generic route53-credentials-secret --namespace cert-manager --from-literal=aws_access_key_id=<Access key ID>--from-literal=aws_secret_access_key=<'Secret access key'>
```

Replace with your actual key.

```
ubuntu@ip-172-31-1-134:~/certificates$ kubectl create secret generic route53-credentials-secret --namespace cert-manager --from-literal=aws_access_key_id=  
AKIAI44QH8DHBEXAMPLE --from-literal=aws_secret_access_key='NUSK38UHDFB54NKLWJLIZANVBZ40CRBNL0I/K'X'  
secret/route53-credentials-secret created
```

V. Create a ClusterIssuer using Route 53 (DNS-01)

Note: The file is located in the certificate/ directory on GitHub. You can copy the code from there.

Commands :

Nano cluster-issuer.yaml

```
kubectl apply -f cluster-issuer.yaml
```

```
ubuntu@ip-172-31-1-134:~/certificate$ nano cluster-issuer.yaml
ubuntu@ip-172-31-1-134:~/certificate$ kubectl apply -f cluster-issuer.yaml
clusterissuer.cert-manager.io/letsencrypt-dns created
```

```
kubectl get svc ingress-nginx-controller -n ingress-nginx
```

```
nslookup web.motivationapp.click
```

```

ubuntu@ip-172-31-1-134:~/certificate$ kubectl get svc ingress-nginx-controller -n ingress-nginx
NAME                                TYPE                CLUSTER-IP      EXTERNAL-IP                                                                 PORT(S)
ingress-nginx-controller            LoadBalancer        10.100.94.68     a95a97815bbf244099e5c1af140d1463-1595644490.ap-south-1.elb.amazonaws.com 80:31567/TCP,443:31442/TCP
ubuntu@ip-172-31-1-134:~/certificate$ nslookup web.motivationapp.click
Server:      127.0.0.53
Address:     127.0.0.53#53

** server can't find web.motivationapp.click: NXDOMAIN

```

VI. Copy the **EXTERNAL-IP**, and go to your domain provider and **point motivationapp.click to that IP** via an A record.

The screenshot shows the AWS Route 53 console interface for creating a new record. The breadcrumb navigation is: Route 53 > Hosted zones > motivationapp.click > Create record. The 'Record 1' section is active, showing a 'Record name' of 'web' and a 'Record type' of 'A - Routes traffic to an IPv4 address and some AWS resources'. The 'Value' field contains the external IP: 'a95a97815bbf244099e5c1af140d1463-1595644490.ap-south-1.elb.amazonaws.com'. The 'TTL (seconds)' is set to '300', and the 'Routing policy' is 'Simple routing'.

```

ubuntu@ip-172-31-1-134:~/certificate$ nslookup web.motivationapp.click
Server:      127.0.0.53
Address:     127.0.0.53#53

Non-authoritative answer:
web.motivationapp.click canonical name = a95a97815bbf244099e5c1af140d1463-1595644490.ap-south-1.elb.amazonaws.com.
Name:   a95a97815bbf244099e5c1af140d1463-1595644490.ap-south-1.elb.amazonaws.com
Address: 15.206.35.123
Name:   a95a97815bbf244099e5c1af140d1463-1595644490.ap-south-1.elb.amazonaws.com
Address: 43.204.42.33

```

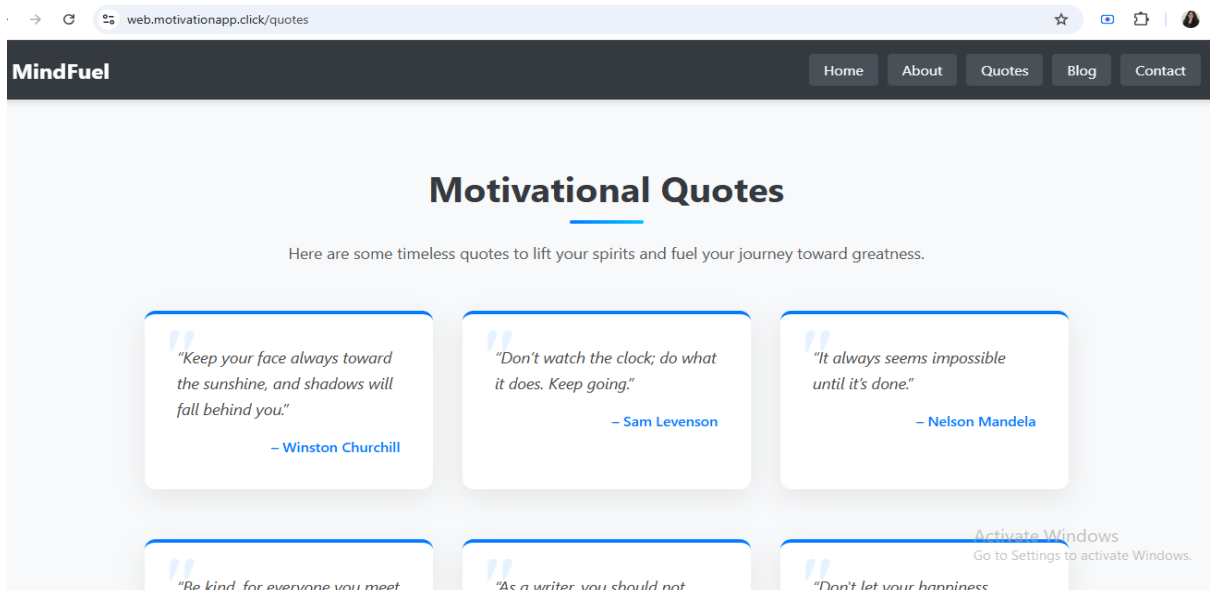
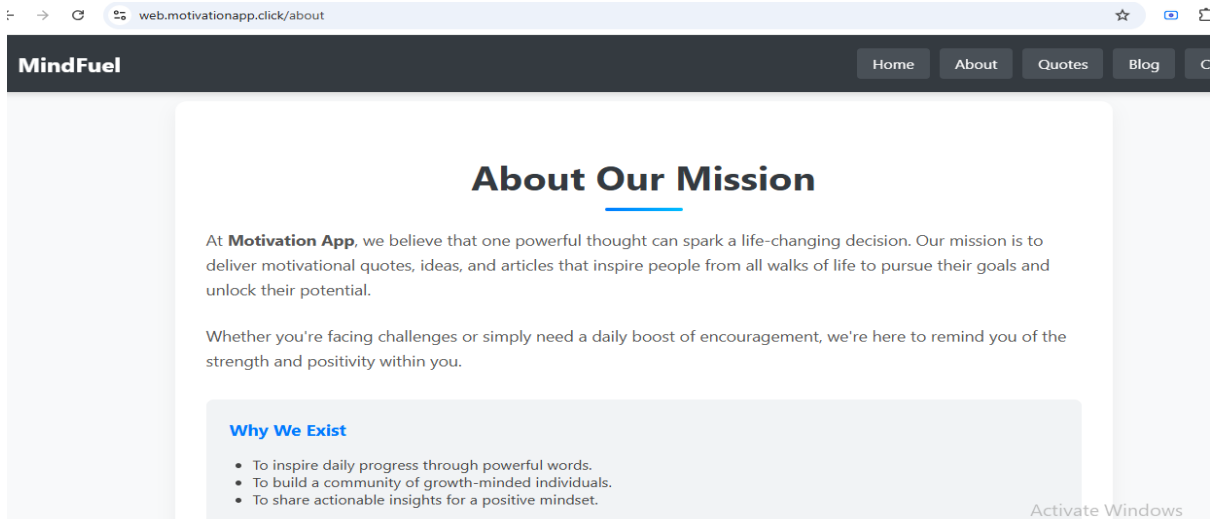
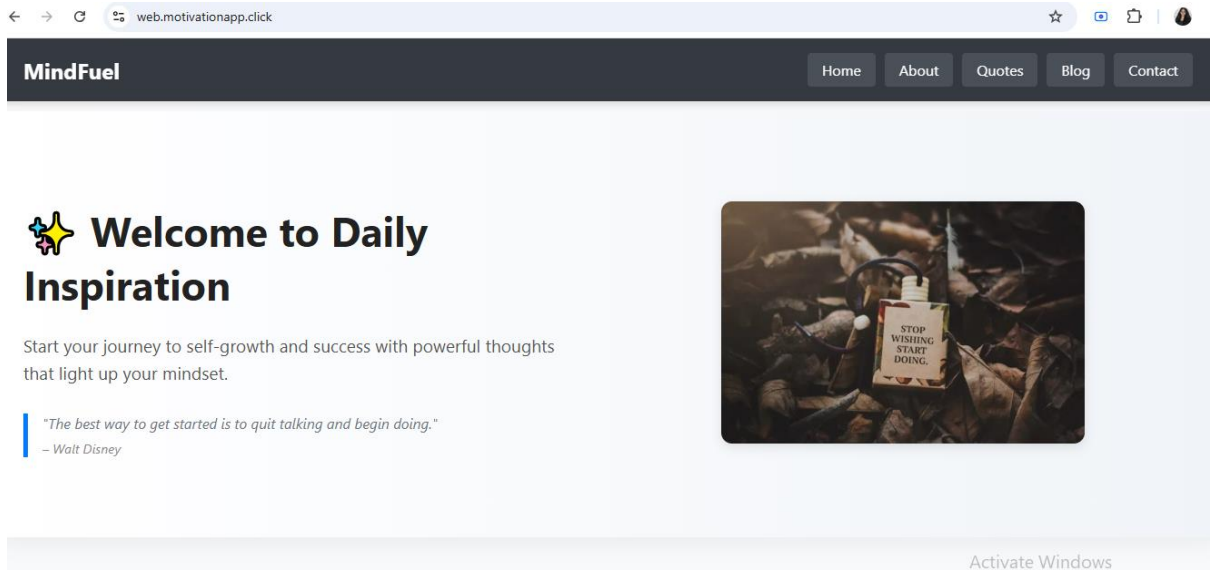
```

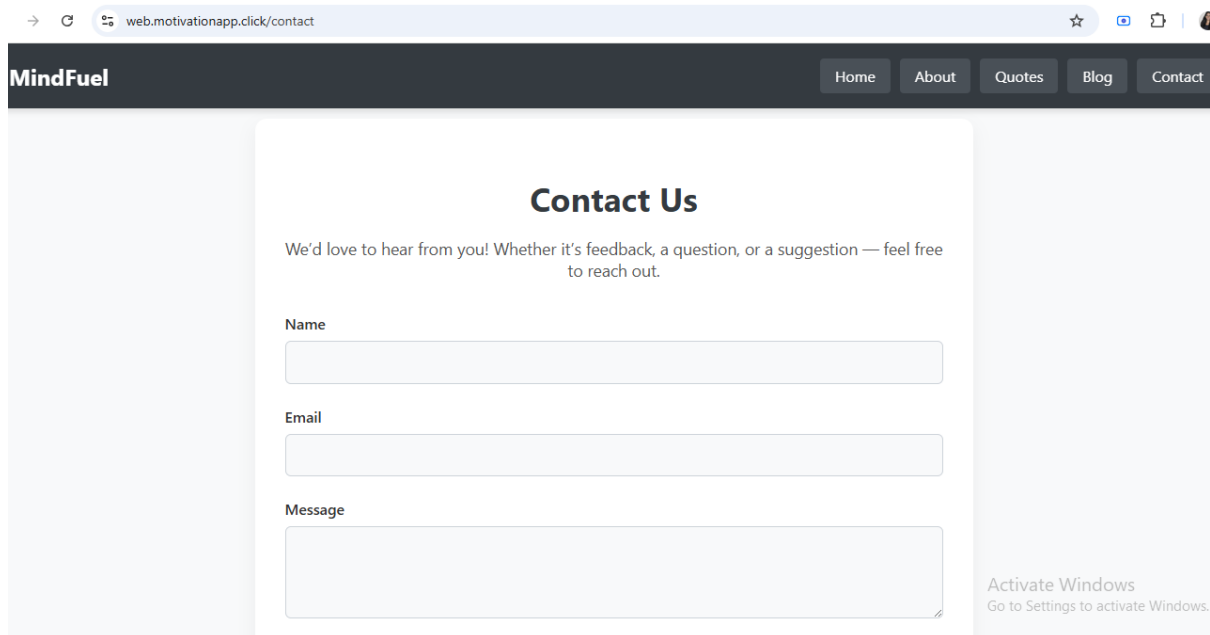
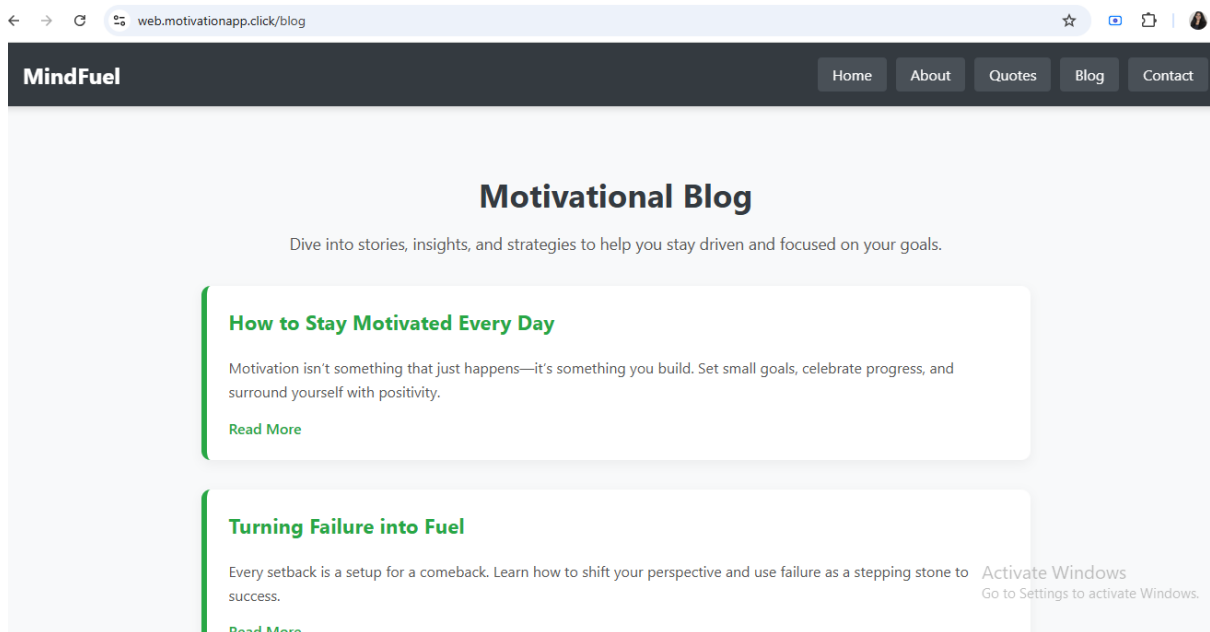
ubuntu@ip-172-31-1-134:~/certificate$ kubectl get certificate
NAME                                READY    SECRET    AGE
motivationapp-tls                  True     motivationapp-tls    27m

```

The application is accessible at:

<https://web.motivationapp.click/>





2. Integrate GitHub Actions as a CI Alternative

I.Create a GitHub Actions workflow

.github/workflows/deploy.yaml

II.Required GitHub Secrets:

Go to GitHub Repo > Settings > Secrets and variables > Actions > New repository secret, and add:

Codespaces

Pages

Security

Advanced Security

Deploy keys

Secrets and variables

Actions

Codespaces

Dependabot

Integrations

GitHub Apps

Email notifications

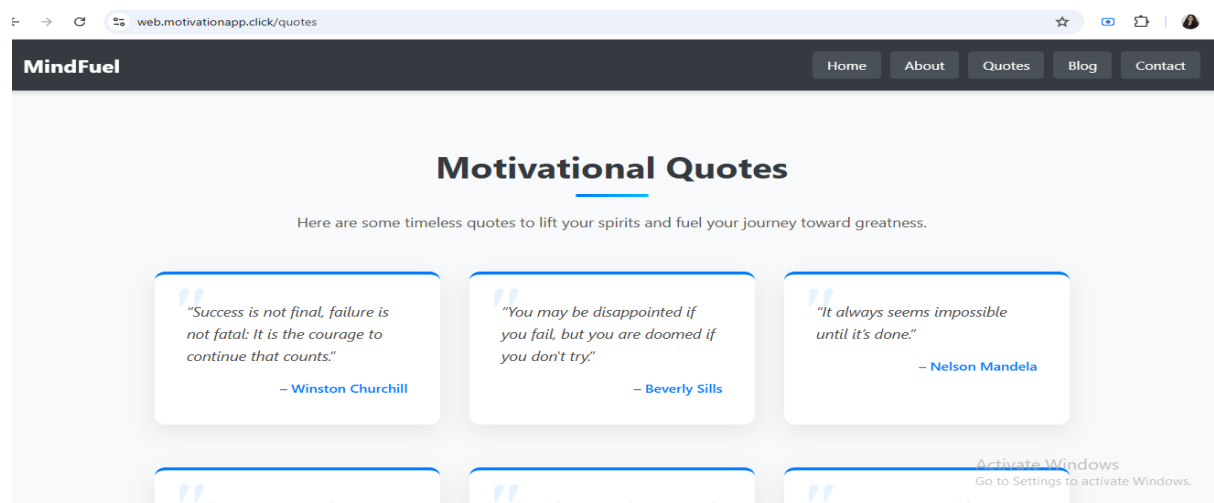
Repository secrets

New repository secret

Name ↕	Last updated
AWS_ACCESS_KEY_ID	14 hours ago
AWS_SECRET_ACCESS_KEY	14 hours ago
DOCKER_PASSWORD	14 hours ago
DOCKER_USERNAME	14 hours ago
EKS_CLUSTER_NAME	14 hours ago
KUBE_CONFIG	13 hours ago

III. Check CI/CD working properly or not –

Changes in app/templates/quotes.html:



```

<p class="intro">
  Here are some timeless quotes to lift your spirits and fuel your journey toward greatness.
</p>
<div class="quote-cards">
  <div class="quote-card">
    "Experience is a hard teacher because she gives the test first, the lesson afterward."<br>
    <span>Vernon Sanders Law</span>
  </div>
  <div class="quote-card">
    "You may be disappointed if you fail, but you are doomed if you don't try."<br>
    <span>Beverly Sills</span>
  </div>
  <div class="quote-card">
    "It always seems impossible until it's done."
  </div>
  <div class="quote-card">
    "Believe you can and you're halfway there."
  </div>
  <div class="quote-card">
    "The only way to do great work is to love what you do."
  </div>
  <div class="quote-card">
    "You are never too old to set a new goal or to dream a new dream."
  </div>
</div>

```

```

PS C:\assignment\Sparknet-Innovation\motivation-web-app> git add app/templates/quotes.html
PS C:\assignment\Sparknet-Innovation\motivation-web-app> git commit -m "modified for testing CI/CD"
[main d145d36] modified for testing CI/CD
1 file changed, 2 insertions(+), 2 deletions(-)
PS C:\assignment\Sparknet-Innovation\motivation-web-app> git push origin main
Enumerating objects: 9, done.
Counting objects: 100% (9/9), done.
Delta compression using up to 4 threads
Compressing objects: 100% (5/5), done.
Writing objects: 100% (5/5), 522 bytes | 261.00 KiB/s, done.
Total 5 (delta 4), reused 0 (delta 0), pack-reused 0 (from 0)
remote: Resolving deltas: 100% (4/4), completed with 4 local objects.
To https://github.com/jyotiraul/sparknet-motivation-web-app.git
6579ae9..d145d36 main -> main

```

The screenshot shows the GitHub Actions interface for the workflow **build-and-deploy** in the repository **sparknet-motivation-web-app**. The workflow is marked as **modified for testing CI/CD #4** and has successfully completed. The job steps are as follows:

Step	Duration
Set up job	0s
Checkout code	1s
Log in to Docker Hub	1s
Build Docker image	8s
Push Docker image	4s
Configure AWS credentials	1s
Update kubeconfig	2s
Set image in Kubernetes manifest	0s
Deploy to EKS	10s

The workflow summary includes links for **Summary**, **Jobs**, **Run details**, **Usage**, and **Workflow file**. The **build-and-deploy** job is highlighted as successful.

The screenshot displays the **MindFuel** website, which features a collection of motivational quotes. The website has a dark header with navigation links: **Home**, **About**, **Quotes**, **Blog**, and **Contact**. The main heading is **Motivational Quotes**, followed by the text: "Here are some timeless quotes to lift your spirits and fuel your journey toward greatness."

The quotes are presented in a grid of six cards, each with a quote and its author:

- "Experience is a hard teacher because she gives the test first, the lesson afterward." — Vernon Sanders Law
- "You may be disappointed if you fail, but you are doomed if you don't try." — Beverly Sills
- "It always seems impossible until it's done." — Nelson Mandela
- "Believe you can and you're halfway there."
- "The only way to do great work is to love what you do."
- "You are never too old to set a new goal or dream a new dream."

3. Add Kubernetes-Based Monitoring with Prometheus + Grafana-

-What is Prometheus?

Prometheus is an open source monitoring tool Provides out-of-the-box monitoring capabilities for the Kubernetes container orchestration platform.

It can monitor servers and databases as well.

Collects and stores metrics as time-series data, recording information with a timestamp It is based on pull and collects metrics from targets by scraping metrics HTTP endpoints.

-What is Grafana?

Grafana is an open source visualization and analytics software.

-Helm chart - Using helm to install Prometheus Operator including Grafana

-Why to use Helm? Helm is a package manager for Kubernetes. Helm simplifies the installation of all components in one command. Install using Helm is recommended as you will not be missing any configuration steps and very efficient.

Dashboard ids from Grafana.com

Metric Type	Dashboard Name	Dashboard ID
CPU & Memory	Node Exporter Full	1860
Request Count	Kubernetes Cluster Monitoring (via Prometheus)	6417
Error Rates	API / Web Service Monitoring	11074

```
ubuntu@ip-172-31-1-134:~$ kubectl get nodes
NAME                                STATUS    ROLES    AGE   VERSION
ip-172-31-2-189.ap-south-1.compute.internal  Ready    <none>   152m  v1.32.3-eks-473151a
ubuntu@ip-172-31-1-134:~$ kubectl get pods
NAME                                READY    STATUS    RESTARTS   AGE
motivation-app-bbcb5b595-8nhgc      1/1      Running   0           145m
```

I. Implementation steps

helm repo add stable <https://charts.helm.sh/stable>

```
ubuntu@ip-172-31-1-134:~$ helm repo add stable https://charts.helm.sh/stable
"stable" already exists with the same configuration, skipping
```

helm repo add prometheus-community <https://prometheus-community.github.io/helm-charts>

```
ubuntu@ip-172-31-1-134:~$ helm repo add prometheus-community https://prometheus-community.github.io/helm-charts
"prometheus-community" already exists with the same configuration, skipping
```

Create Prometheus namespace

```
ubuntu@ip-172-31-1-134:~$ kubectl create namespace prometheus
namespace/prometheus created
ubuntu@ip-172-31-1-134:~$
```

II.Install kube-prometheus-stack

helm install stable prometheus-community/kube-prometheus-stack -n Prometheus

kubectl get pods -n Prometheus

```
ubuntu@ip-172-31-1-134:~$ kubectl get pods -n prometheus
NAME                                                    READY   STATUS    RESTARTS   AGE
alertmanager-stable-kube-prometheus-sta-alertmanager-0 2/2     Running   0           40s
prometheus-stable-kube-prometheus-sta-prometheus-0     2/2     Running   0           40s
stable-grafana-f4567f969-nvsbt                         3/3     Running   0           47s
stable-kube-prometheus-sta-operator-7969f4d7d8-d826v    1/1     Running   0           47s
stable-kube-state-metrics-7fc6b5c5d4-clptg             1/1     Running   0           47s
stable-prometheus-node-exporter-rjg2z                  1/1     Running   0           47s
```

kubectl get svc -n prometheus

```
ubuntu@ip-172-31-1-134:~$ kubectl get svc -n prometheus
NAME                                TYPE        CLUSTER-IP      EXTERNAL-IP  PORT(S)                                AGE
alertmanager-operated              ClusterIP    None             <none>       9093/TCP,9094/TCP,9094/UDP            109s
prometheus-operated                ClusterIP    None             <none>       9090/TCP                              109s
stable-grafana                     ClusterIP    10.100.1.51      <none>       80/TCP                                116s
stable-kube-prometheus-sta-alertmanager ClusterIP    10.100.192.126   <none>       9093/TCP,8080/TCP                    116s
stable-kube-prometheus-sta-operator ClusterIP    10.100.105.250   <none>       443/TCP                                           116s
stable-kube-prometheus-sta-prometheus ClusterIP    10.100.155.181   <none>       9090/TCP,8080/TCP                    116s
stable-kube-state-metrics           ClusterIP    10.100.36.6      <none>       8080/TCP                                           116s
stable-prometheus-node-exporter     ClusterIP    10.100.44.83     <none>       9100/TCP                                           116s
```

III.Edit Prometheus Service

kubectl edit svc stable-kube-prometheus-sta-prometheus -n Prometheus

```
ubuntu@ip-172-31-1-134:~$ kubectl edit svc stable-kube-prometheus-sta-prometheus -n prometheus
service/stable-kube-prometheus-sta-prometheus edited
ubuntu@ip-172-31-1-134:~$
```

```
selector:
  app.kubernetes.io/name: prometheus
  operator.prometheus.io/name: stable-kube
sessionAffinity: None
type: LoadBalancer
status:
  loadBalancer: {}
```

IV.Edit Grafana Service

kubectl edit svc stable-grafana -n Prometheus

```
ubuntu@ip-172-31-1-134:~$ kubectl edit svc stable-grafana -n prometheus
service/stable-grafana edited
ubuntu@ip-172-31-1-134:~$
```

```
selector:
  app.kubernetes.io/instance: stable
  app.kubernetes.io/name: grafana
sessionAffinity: None
type: LoadBalancer
status:
  loadBalancer: {}
```


Verify if service is changed to LoadBalancer and also to get the Load Balancer URL.

kubectl get svc -n Prometheus

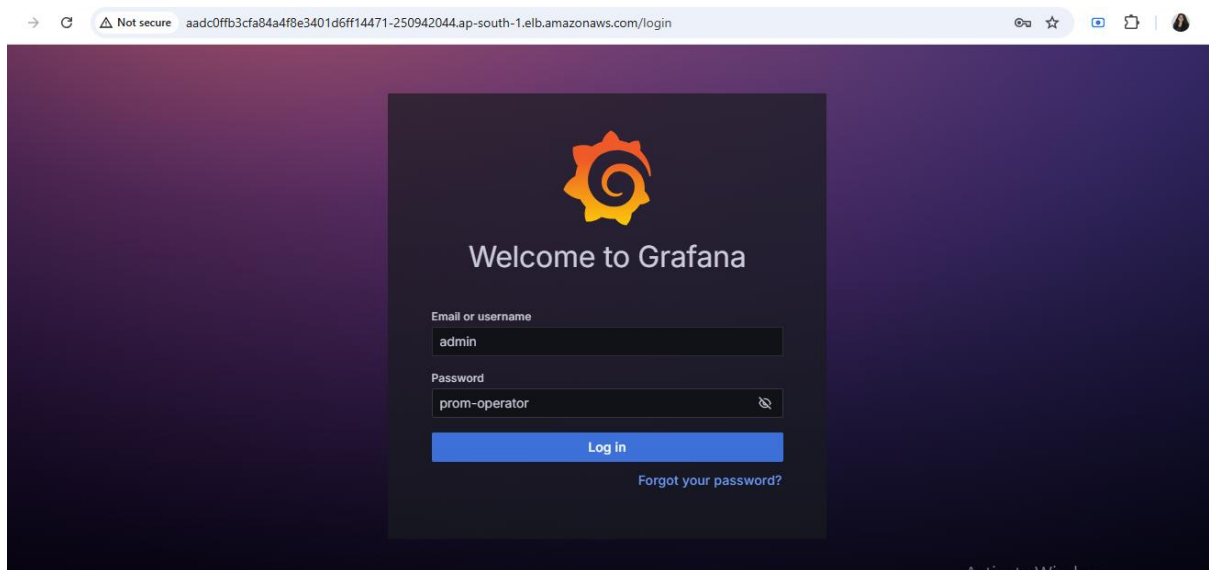
prometheus-operated		ClusterIP	None	<none>	9090
/TCP	6m34s				
stable-grafana		LoadBalancer	10.100.1.51	aadc0ffb3cfa84a4f8e3401d6ff14471-250942044.ap-south-1.elb.amazonaws.com	80:3
0273/TCP	6m41s				
stable-kube-prometheus-sta-alertmanager		ClusterIP	10.100.192.126	<none>	9093
/TCP,8080/TCP	6m41s				
stable-kube-prometheus-sta-operator		ClusterIP	10.100.105.250	<none>	443/
TCP	6m41s				
stable-kube-prometheus-sta-prometheus		LoadBalancer	10.100.155.181	a72aa376feffa40dd81a851ce822c9ae-651167376.ap-south-1.elb.amazonaws.com	9090
:30173/TCP,8080:32490/TCP	6m41s				
stable-kube-state-metrics		ClusterIP	10.100.36.6	<none>	8080
/TCP	6m41s				
stable-prometheus-node-exporter		ClusterIP	10.100.44.83	<none>	9100
/TCP	6m41s				

V.Access Grafana UI in the browser

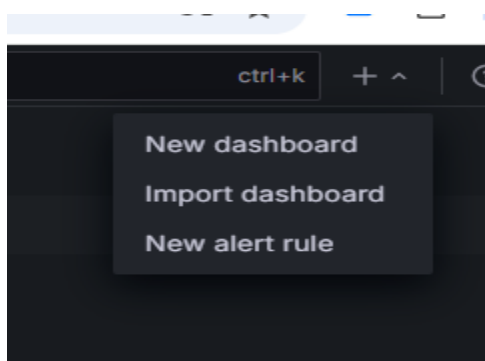
Get the URL from the above screenshot and put in the browser

UserName: admin

Password: prom-operator



VI.Create Kubernetes Monitoring Dashboard



Dashboard id 1860 - Metric Type : CPU & Memory

Home

Bookmarks

Starred

Dashboards

Explore

Drilldown New!

Alerting

Connections

Add new connection

Data sources

Administration

Published by

rfmoz

Updated on

2025-06-13 01:36:17

Options

Name

Node Exporter Full (CPU & Memory)

Folder

Dashboards

Unique Identifier (UID)

The unique identifier (UID) of a dashboard can be used for uniquely identify a dashboard between multiple Grafana installs. The UID allows having consistent URLs for accessing dashboards so changing the title of a dashboard will not break any bookmarked links to that dashboard.

rYdddlPWk

Change uid

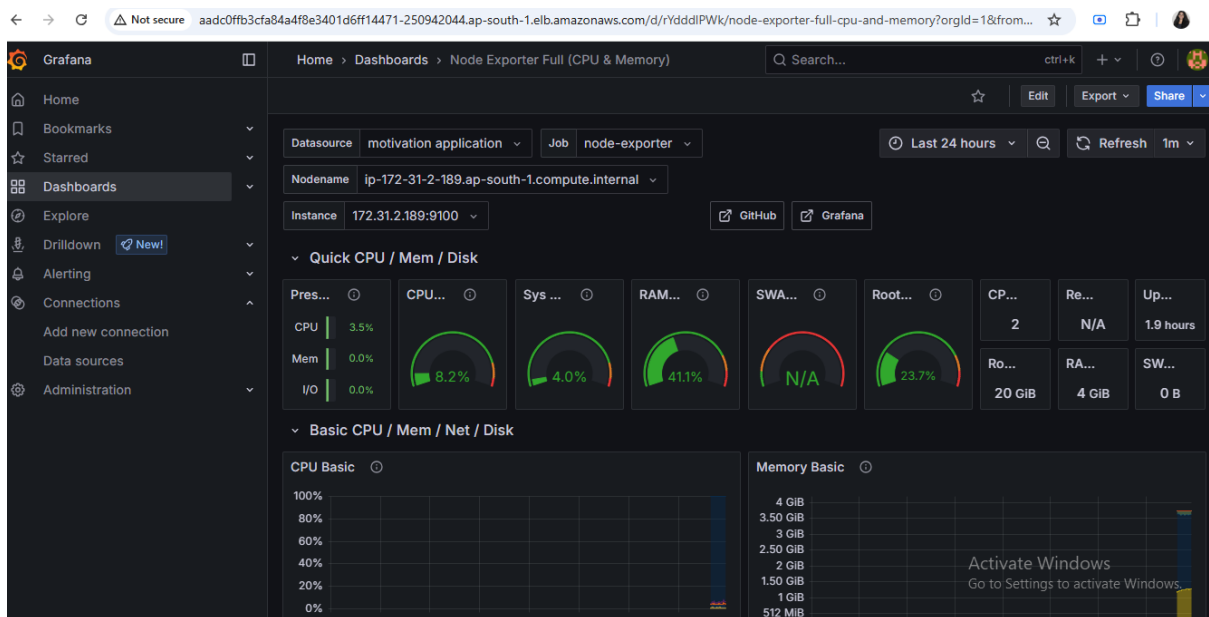
Dashboard named 'Node Exporter Full (CPU & Memory)' in folder 'General' has the same UID

prometheus

prometheus-1

Import (Overwrite)

Cancel



Dashboard id 6417 - Metric Type : Request count

Drag and drop here or click to browse
Accepted file types: .json, .txt

Find and import dashboards for common applications at grafana.com/dashboards

6417 Load

Import via dashboard JSON model

Grafana

Home > Dashboards > Import dashboard

Q Search... ctrl+k +

Importing dashboard from Grafana.com

Published by sekka1

Updated on 2018-06-07 05:21:56

Options

Name
Kubernetes Cluster (Prometheus)

Folder
Dashboards

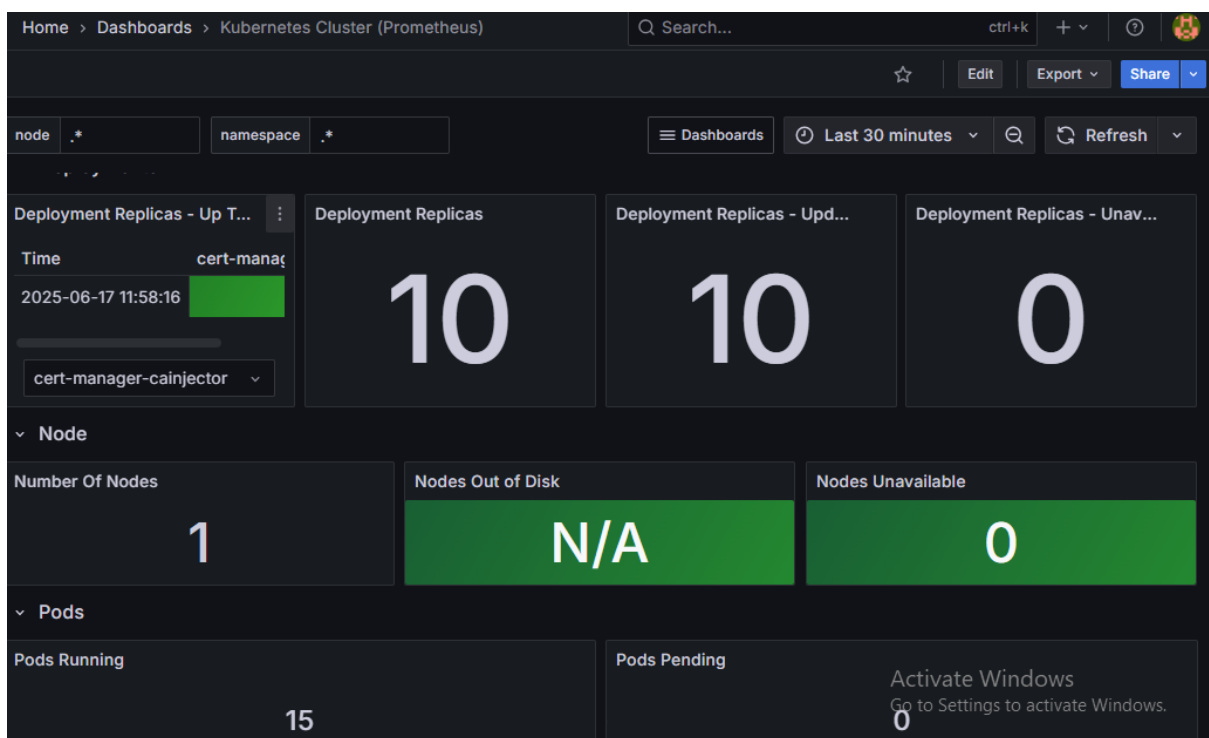
Unique Identifier (UID)
The unique identifier (UID) of a dashboard can be used to uniquely identify a dashboard between multiple Grafana installs. The UID allows having consistent URLs for accessing dashboards so changing the title of a dashboard will not break any bookmarked links to that dashboard.

4XuMd2liz Change uid

prometheus
prometheus-1

Import Cancel

Activate Windows
Go to Settings to activate



Dashboard id 11074- Metric Type : Error rates

Upload dashboard JSON file

Drag and drop here or click to browse

Accepted file types: .json, .txt

Find and import dashboards for common applications at grafana.com/dashboards

11074

Load

Import via dashboard JSON model

```
{
  "title": "Example - Repeating Dictionary variables",
  "uid": "_OHnEoN4z",
  "panels": [...]
  ...
}
```

Grafana

Home

Bookmarks

Starred

Dashboards

Explore

Drilldown

Alerting

Connections

Add new connection

Data sources

Administration

Home > Dashboards > Import dashboard

Q Search...

ctrl+k + ⓘ

Importing dashboard from Grafana.com

Published by

StarsL.cn

Updated on

2023-07-07 13:10:39

Options

Name

Node Exporter Dashboard EN 20201010-StarsL.cn

Folder

Dashboards

Unique Identifier (UID)

The unique identifier (UID) of a dashboard can be used for uniquely identify a dashboard between multiple Grafana installs. The UID allows having consistent URLs for accessing dashboards so changing the title of a dashboard will not break any bookmarked links to that dashboard.

xfpJB9FGz

Change uid

VictoriaMetrics

prometheus-1

Import

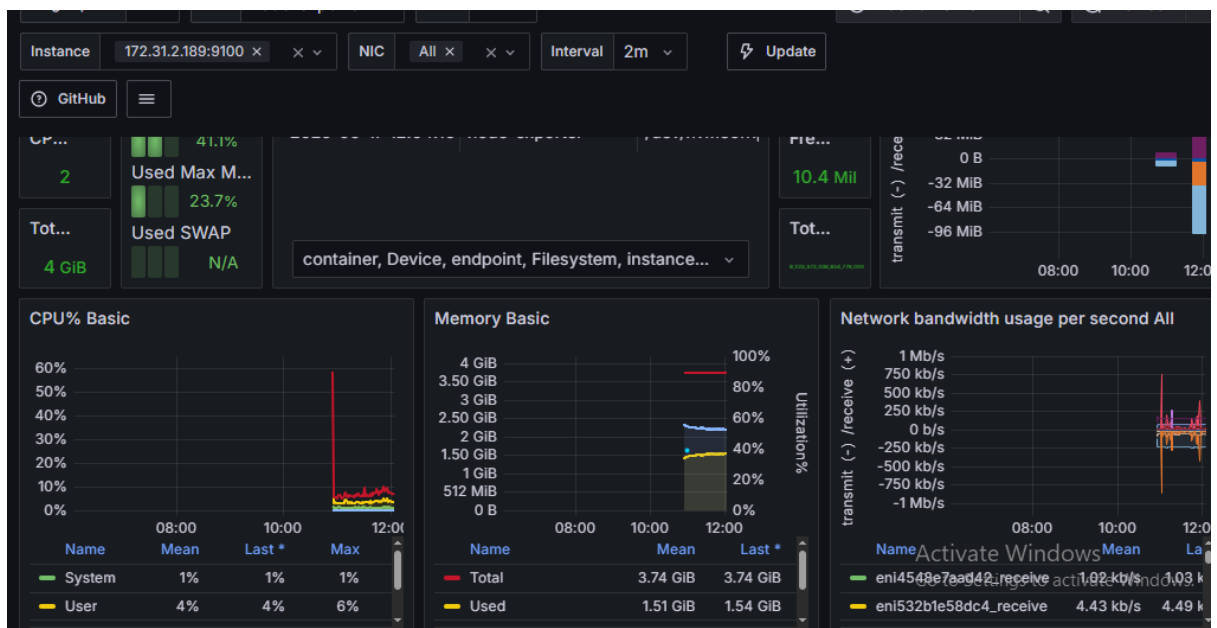
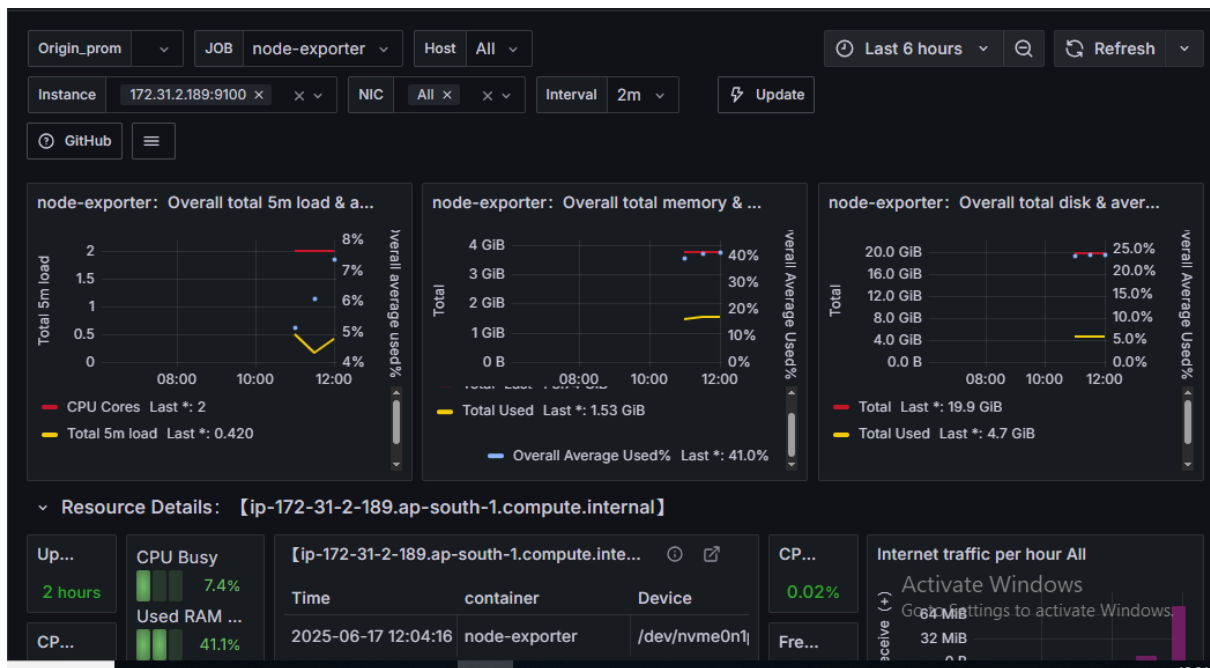
Cancel

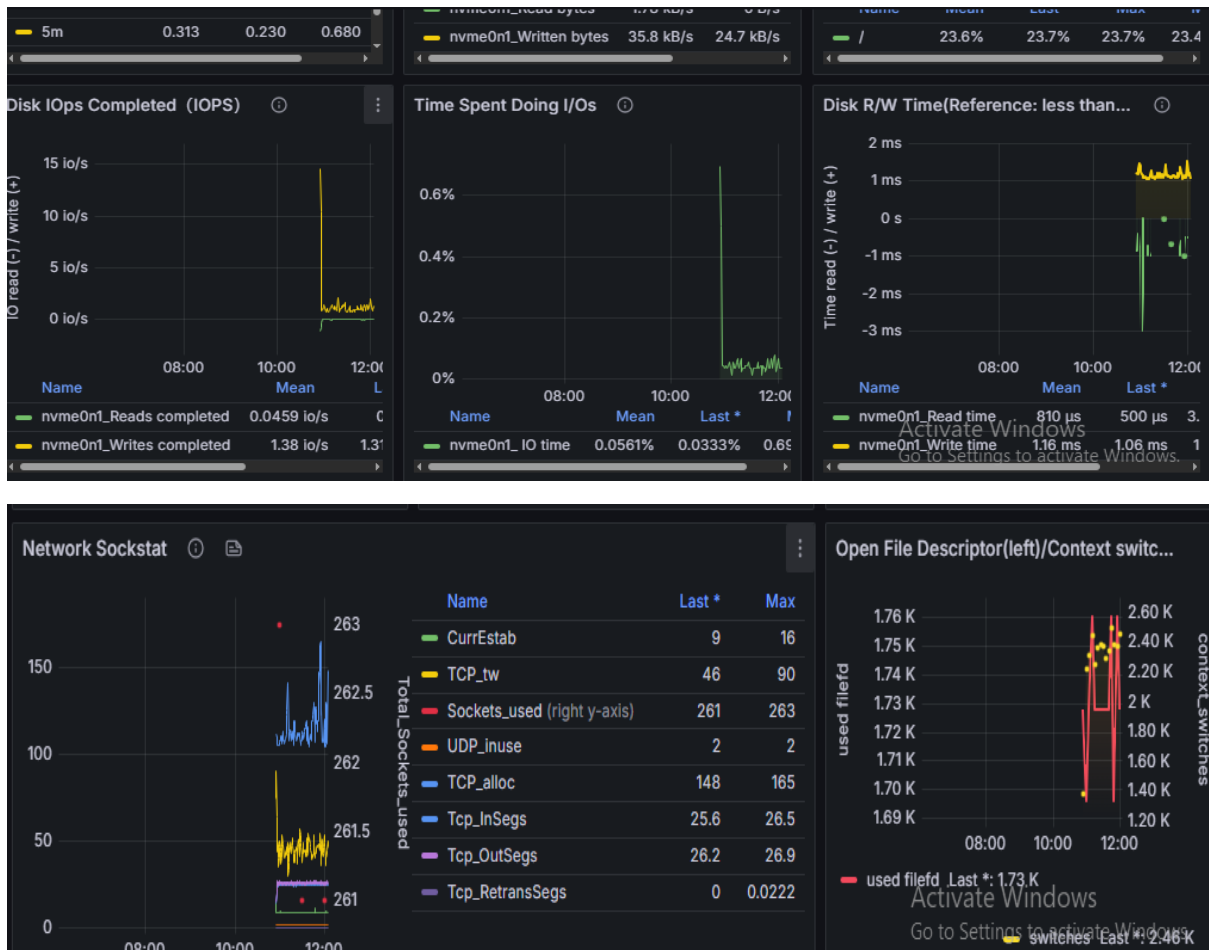
Activate Windows

Go to Settings to activate Windows

Server Resource Overview [JOB: node-exporter, Total: 1]

Time	container	domainname	endpoint	IP (Link to details)	job	ma
2025-06-17 12:04:16	node-exporter	(none)	http-metrics	172.31.2.189:9...	node-exporter	x8l





VII. Using query-

1.Memory Usage %

- $100 - ((\text{node_memory_MemAvailable bytes} / \text{node_memory_MemTotal bytes}) * 100)$

Browser address bar: a72aa376feffa40dd81a851ce822c9ae-651167376.ap-south-1.elb.amazonaws.com:9090/query?g0.expr=100+-+%28%28node_memory_MemAvailable_bytes%2Fnode_memory_MemTotal_bytes%29*100%29

Prometheus Query interface:

Query: `>_ 100 - ((node_memory_MemAvailable_bytes / node_memory_MemTotal_bytes) * 100)`

Buttons: Table, Graph, Explain

Load time: 138ms Result series: 1

Container info: `{container="node-exporter", endpoint="http-metrics", instance="172.31.2.189:9100", job="node-exporter", namespace="prometheus", pod="stable-prometheus-node-exporter-rjg2z", service="stable-prometheus-node-exporter"}`

Graph-

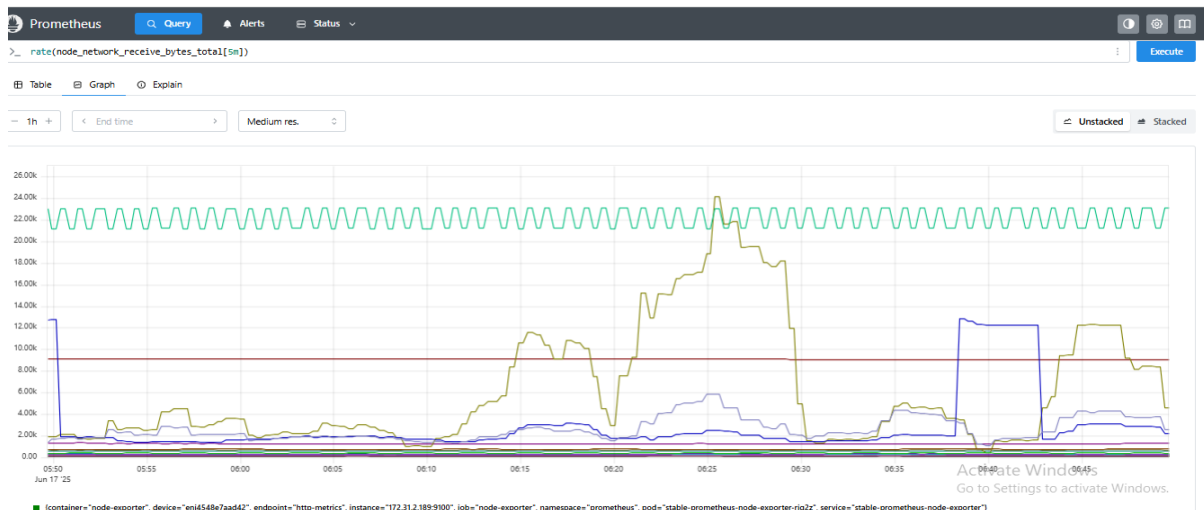


2.Network Usage

`rate(node_network_receive_bytes_total[5m])`

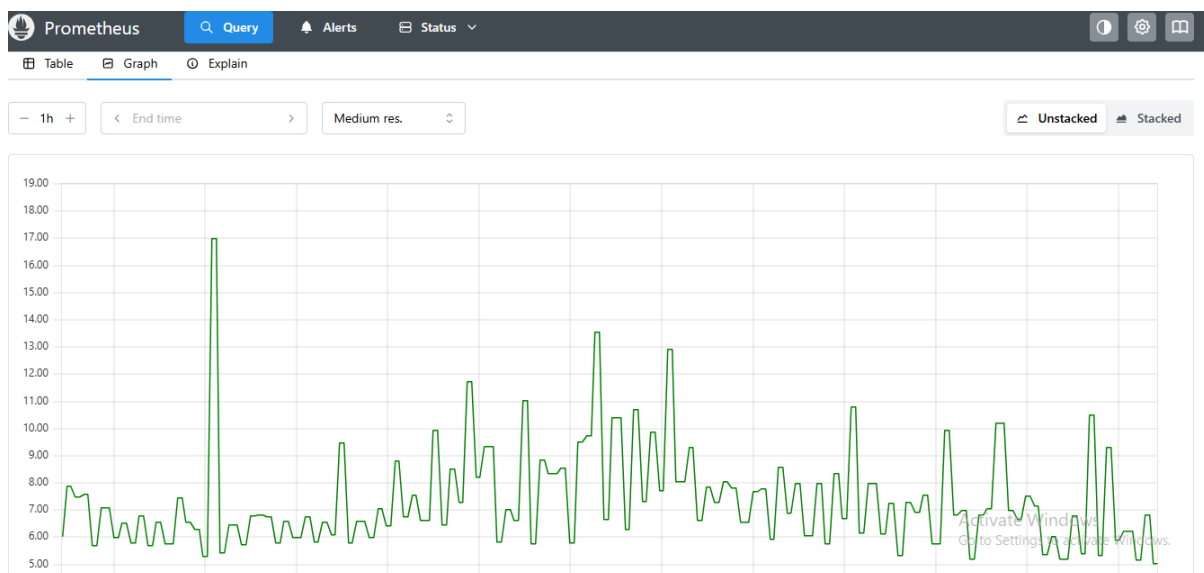
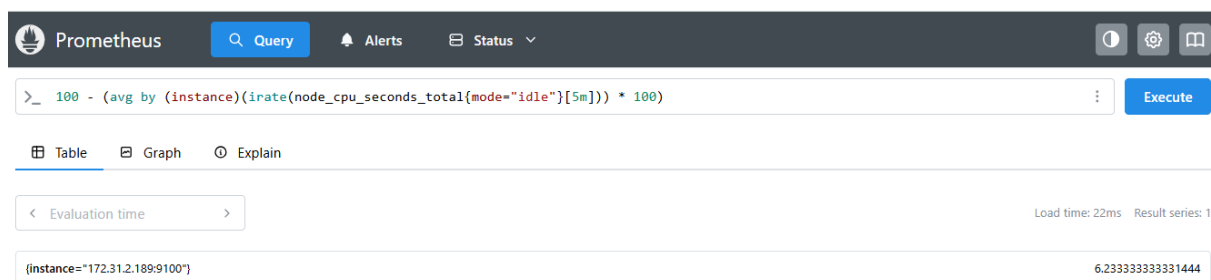
The table displays the query results for the Prometheus query: `rate(node_network_receive_bytes_total[5m])`. The table has 2 columns: a long identifier string and a numerical value. The data is shown for 7 different instances of the node-exporter service.

Identifier	Value
<code>(container="node-exporter", device="eni4548e7aad42", endpoint="http-metrics", instance="172.31.2.189:9100", job="node-exporter", namespace="prometheus", pod="stable-prometheus-node-exporter-rjg2z", service="stable-prometheus-node-exporter")</code>	134.91111111111113
<code>(container="node-exporter", device="eni532b1e58dc4", endpoint="http-metrics", instance="172.31.2.189:9100", job="node-exporter", namespace="prometheus", pod="stable-prometheus-node-exporter-rjg2z", service="stable-prometheus-node-exporter")</code>	558.7111111111111
<code>(container="node-exporter", device="eni5996520e86a", endpoint="http-metrics", instance="172.31.2.189:9100", job="node-exporter", namespace="prometheus", pod="stable-prometheus-node-exporter-rjg2z", service="stable-prometheus-node-exporter")</code>	9042.74074074074
<code>(container="node-exporter", device="eni7447fa4c66b", endpoint="http-metrics", instance="172.31.2.189:9100", job="node-exporter", namespace="prometheus", pod="stable-prometheus-node-exporter-rjg2z", service="stable-prometheus-node-exporter")</code>	1296.962962962963
<code>(container="node-exporter", device="eni874ea633073", endpoint="http-metrics", instance="172.31.2.189:9100", job="node-exporter", namespace="prometheus", pod="stable-prometheus-node-exporter-rjg2z", service="stable-prometheus-node-exporter")</code>	8379.285185185185
<code>(container="node-exporter", device="eni8a27312cce6", endpoint="http-metrics", instance="172.31.2.189:9100", job="node-exporter", namespace="prometheus", pod="stable-prometheus-node-exporter-rjg2z", service="stable-prometheus-node-exporter")</code>	74.25555555555556
<code>(container="node-exporter", device="eni98d6b62d933", endpoint="http-metrics", instance="172.31.2.189:9100", job="node-exporter", namespace="prometheus", pod="stable-prometheus-node-exporter-rjg2z", service="stable-prometheus-node-exporter")</code>	2788.659259259259



3.CPU Usage

$100 - (\text{avg by (instance)}(\text{irate}(\text{node_cpu_seconds_total}\{\text{mode}=\text{"idle"}\}[5\text{m}])) * 100$



←

→

↺

⚠ Not secure

a72aa376effa40dd81a851ce822c9ae-651167376.ap-south-1.elb.amazonaws.com:9090/targets


🔍

☆

🔗

🖨

👤

 Prometheus

🔍 Query

🔔 Alerts

Status > Target health ▾

🔊

⚙

📖

Select scrape pool ▾

🔍 Filter by target health ▾

🔍 Filter by endpoint or labels

🔗

📘 Hiding pools with no matching targets

Hiding 3 empty pools due to filters or no targets. [Show empty pools](#)

serviceMonitor/prometheus/stable-kube-prometheus-sta-alertmanager/0

1 / 1 up 🟢 ^

Endpoint	Labels	Last scrape	State
http://172.31.2.128:9093/metrics	<div>container="alertmanager" endpoint="http-web" instance="172.31.2.128:9093"</div> <div>job="stable-kube-prometheus-sta-alertmanager" namespace="prometheus"</div> <div>pod="alertmanager-stable-kube-prometheus-sta-alertmanager-0"</div> <div>service="stable-kube-prometheus-sta-alertmanager"</div>	<div>🕒 21.352s ago</div> <div>📏 6ms</div>	UP

serviceMonitor/prometheus/stable-kube-prometheus-sta-alertmanager/1

1 / 1 up 🟢 ^

Endpoint	Labels	Last scrape	State
http://172.31.2.128:8080/metrics	<div>container="config-reloader" endpoint="reloader-web" instance="172.31.2.128:8080"</div> <div>job="stable-kube-prometheus-sta-alertmanager" namespace="prometheus"</div> <div>pod="alertmanager-stable-kube-prometheus-sta-alertmanager-0"</div> <div>service="stable-kube-prometheus-sta-alertmanager"</div>	<div>🕒 488ms ago</div> <div>📏 2ms</div>	UP

Activate Windows
Go to Settings to activate Windows.

serviceMonitor/prometheus/stable-kube-prometheus-sta-kubelet/0

1 / 1 up 🟢 ^

Endpoint	Labels	Last scrape	State
https://172.31.2.189:10250/metrics	<div>endpoint="https-metrics" instance="172.31.2.189:10250" job="kubelet" metrics_path="/metrics"</div> <div>namespace="kube-system" node="ip-172-31-2-189.ap-south-1.compute.internal"</div> <div>service="stable-kube-prometheus-sta-kubelet"</div>	<div>🕒 40.341s ago</div> <div>📏 36ms</div>	UP

serviceMonitor/prometheus/stable-kube-prometheus-sta-kubelet/1

1 / 1 up 🟢 ^

Endpoint	Labels	Last scrape	State
https://172.31.2.189:10250/metrics/cadvisor	<div>endpoint="https-metrics" instance="172.31.2.189:10250" job="kubelet" metrics_path="/metrics/cadvisor"</div> <div>namespace="kube-system" node="ip-172-31-2-189.ap-south-1.compute.internal"</div> <div>service="stable-kube-prometheus-sta-kubelet"</div>	<div>🕒 39.543s ago</div> <div>📏 62ms</div>	UP

serviceMonitor/prometheus/stable-kube-prometheus-sta-kubelet/2

1 / 1 up 🟢 ^

Endpoint	Labels	Last scrape	State
https://172.31.2.189:10250/metrics/probes	<div>endpoint="https-metrics" instance="172.31.2.189:10250" job="kubelet" metrics_path="/metrics/probes"</div>	<div>🕒 52.222s ago</div> <div>📏 5ms</div>	UP

Activate Windows
Go to Settings to activate Windows.