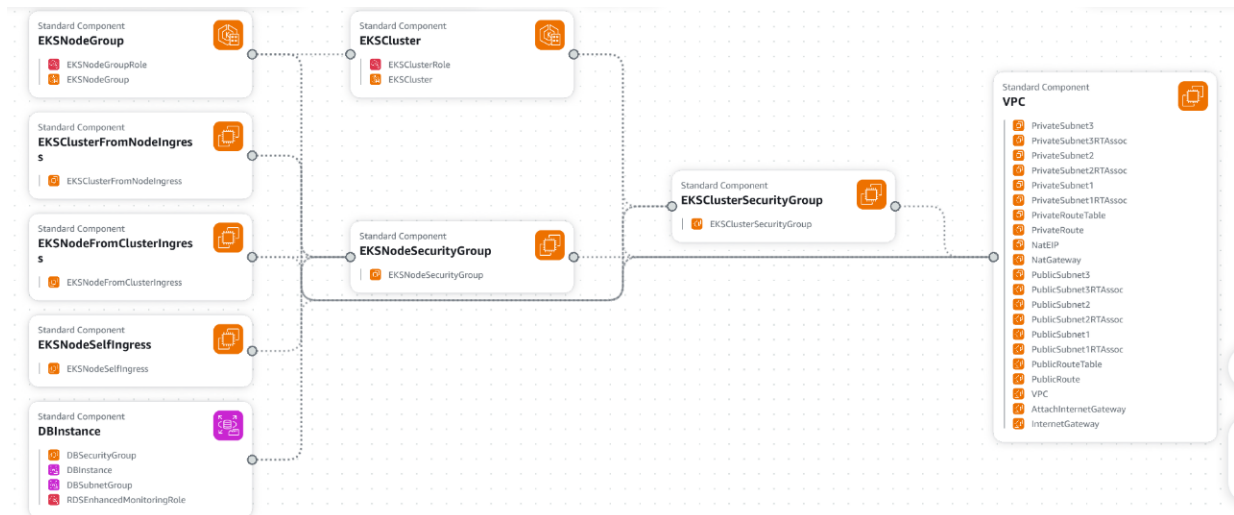
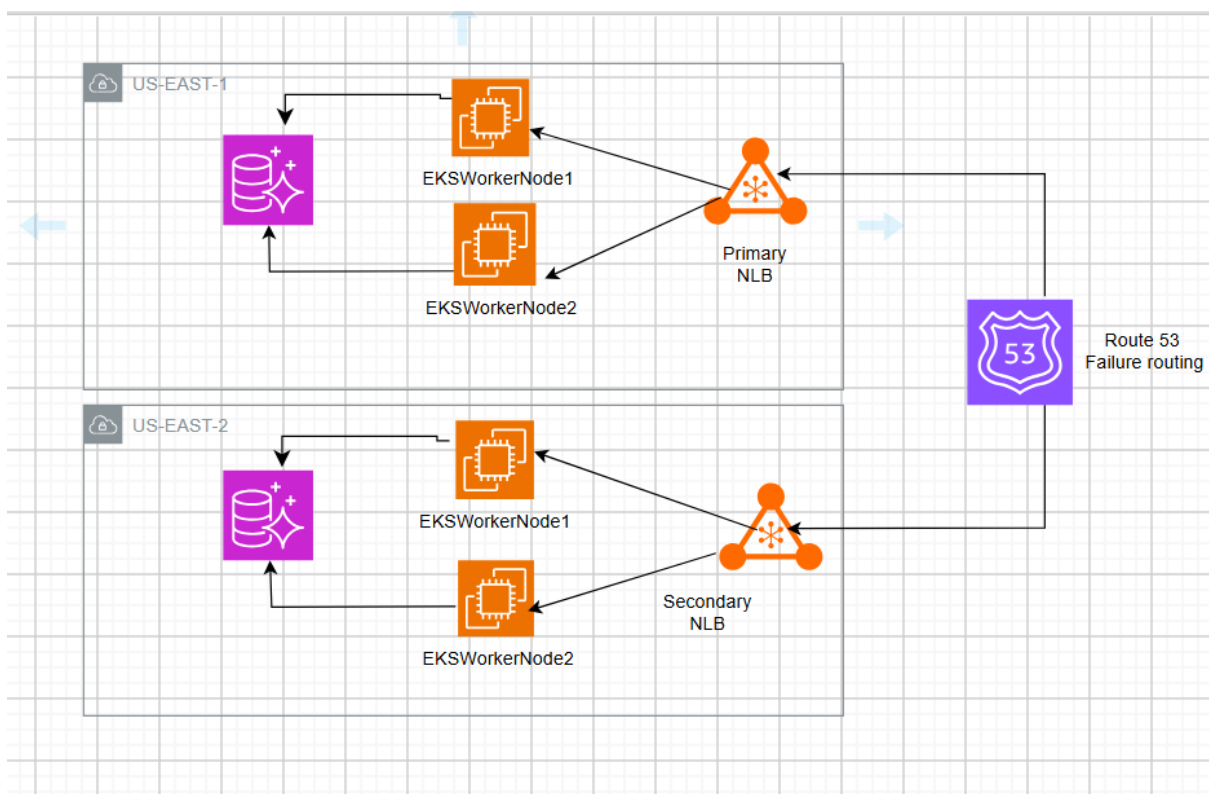


INFRASTRUCTURE

Infrastructure resources created through cloud formation and terraform (infrastructure seen in cloud formation infrastructure composer)



Overall infrastructure with route53 failover routing



Git repo containing the whole code

<https://github.com/SelmiNazeeb/FinalProject-Devops.git>

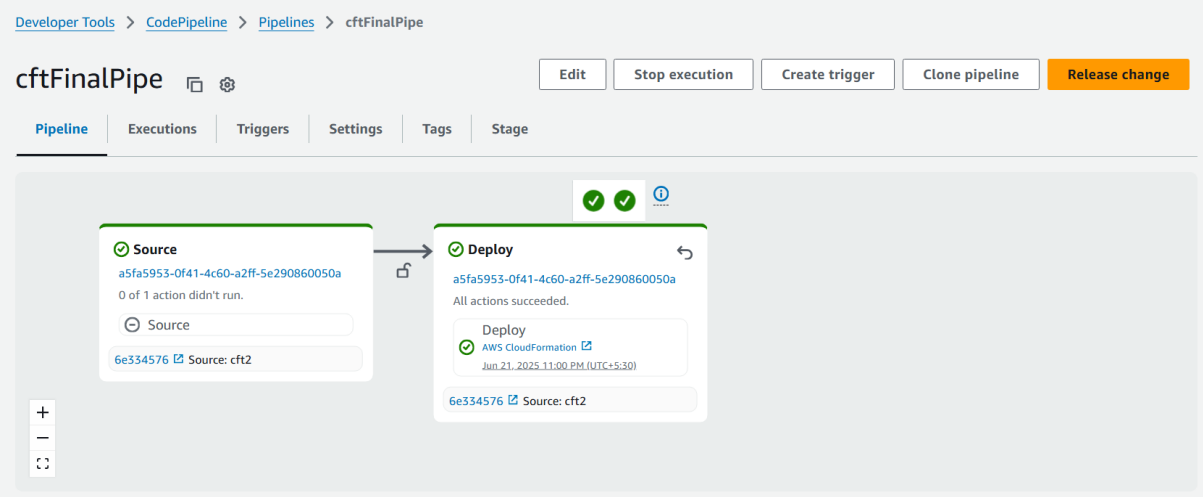
TASK1 :

CREATING INFRASTRUCTURE THROUGH CLOUDFORMATION IN REGION1 (US-EAST-1)

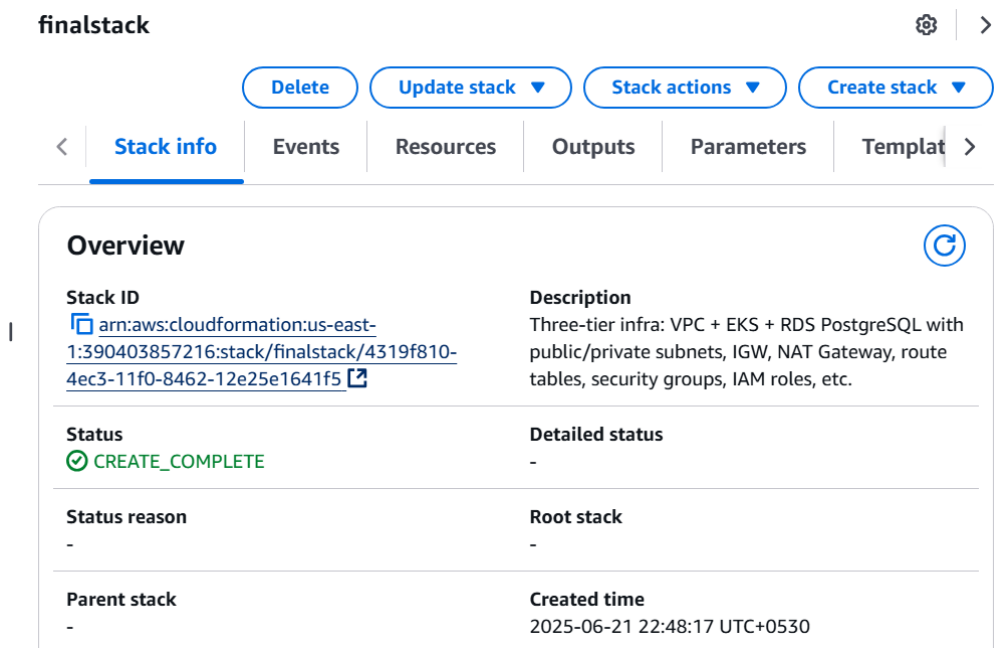
Permissions needed

- Cloud formation role – full admin access
- Pipeline role - [AmazonEKSClusterPolicy](#), [AWSCloudFormationFullAccess](#)

Pipeline of infrastructure creation : success



Cloud formation stack created through pipeline



Resources created through stack

Resources (34)

Q Search resources

< 1 >

Logical ID	Physical ID	Type	Status	Module
AttachInternetGateway	igw/vpc-0a15dad6dfa654dd5	AWS::EC2::VPCGatewayAttachment	CREATE_COMPLETE	-
DBInstance	task-db-postgres	AWS::RDS::DBInstance	CREATE_COMPLETE	-
DBSecurityGroup	sg-0b884508425083b44	AWS::EC2::SecurityGroup	CREATE_COMPLETE	-
DBSubnetGroup	task-db-postgres-subnet-group	AWS::RDS::DBSubnetGroup	CREATE_COMPLETE	-
EKSCluster	three-tier-eks-cluster	AWS::EKS::Cluster	CREATE_COMPLETE	-
EKSClusterFromNodeIngress	sgr-05c25fc400cd957fb	AWS::EC2::SecurityGroupIngress	CREATE_COMPLETE	-
EKSClusterRole	finalstack-EKSClusterRole-3nVJOcCjuPVL	AWS::IAM::Role	CREATE_COMPLETE	-
EKSClusterSecurityGroup	sg-03d366fdb055a8abf	AWS::EC2::SecurityGroup	CREATE_COMPLETE	-
EKSNodeFromClusterIngress	sgr-0a9b238f8163ef5b0	AWS::EC2::SecurityGroupIngress	CREATE_COMPLETE	-
EKSNodeGroup	three-tier-eks-cluster/app-node-group	AWS::EKS::Nodegroup	CREATE_COMPLETE	-
EKSNodeGroupRole	finalstack-EKSNodeGroupRole-pgB2ZjUW4tVs	AWS::IAM::Role	CREATE_COMPLETE	-
EKSNodeSecurityGroup	sg-079b9e86378fbb1af	AWS::EC2::SecurityGroup	CREATE_COMPLETE	-
EKSNodeSelfIngress	sgr-0aa0fad27f71bd69e	AWS::EC2::SecurityGroupIngress	CREATE_COMPLETE	-
InternetGateway	igw-021f3dab7cfea1f0b	AWS::EC2::InternetGateway	CREATE_COMPLETE	-
PrivateSubnet2RTAssoc	rtbassoc-0ed8252df0690f5f0	AWS::EC2::SubnetRouteTableAssociation	CREATE_COMPLETE	-
PrivateSubnet3	subnet-0bce62677f3a6f609	AWS::EC2::Subnet	CREATE_COMPLETE	-
PrivateSubnet3RTAssoc	rtbassoc-00c3d839b8c3b5875	AWS::EC2::SubnetRouteTableAssociation	CREATE_COMPLETE	-
PublicRoute	rtb-04f9c8025c03e2860 0.0.0.0/0	AWS::EC2::Route	CREATE_COMPLETE	-
PublicRouteTable	rtb-04f9c8025c03e2860	AWS::EC2::RouteTable	CREATE_COMPLETE	-
PublicSubnet1	subnet-06ee189155b033a24	AWS::EC2::Subnet	CREATE_COMPLETE	-
PublicSubnet1RTAssoc	rtbassoc-0ea7d0da7a5b0ca1f	AWS::EC2::SubnetRouteTableAssociation	CREATE_COMPLETE	-
PublicSubnet2	subnet-04b6cd1ed6eacdabb	AWS::EC2::Subnet	CREATE_COMPLETE	-
PublicSubnet2RTAssoc	rtbassoc-0fe1c507ce20148ed	AWS::EC2::SubnetRouteTableAssociation	CREATE_COMPLETE	-
PublicSubnet3	subnet-02e0c106269a659a6	AWS::EC2::Subnet	CREATE_COMPLETE	-
PublicSubnet3RTAssoc	rtbassoc-0aee15f2ed39589a5	AWS::EC2::SubnetRouteTableAssociation	CREATE_COMPLETE	-
RDSEnhancedMonitoringRole	finalstack-RDSEnhancedMonitoringRole-m7vEBzEzbQLT	AWS::IAM::Role	CREATE_COMPLETE	-
VPC	vpc-0a15dad6dfa654dd5	AWS::EC2::VPC	CREATE_COMPLETE	-

Output in cloud formation stack

finalstack ⚙️ >

[Delete](#) [Update stack](#) [Stack actions](#) [Create stack](#)

[Stack info](#) [Events](#) [Resources](#) [Outputs](#) [Parameters](#) [Template](#) [Change sets](#) [Git sync](#)

Outputs (3)

< 1 > ⚙️

Key	Value	Description	Export name
ClusterEndpoint	https://07EC244C5F63EFE19C7C8D99187E74F3.gr7.us-east-1.eks.amazonaws.com	-	finalstack-ClusterEndpoint
DBEndpoint	task-db-postgres.czs2i4meqfm1.us-east-1.rds.amazonaws.com	-	finalstack-DBEndpoint
DBPort	5432	-	finalstack-DBPort

Postgresql Database

Databases (1) ⚙️ [Group resources](#) [Modify](#) [Actions](#) [Create database](#)

< 1 > ⚙️

<input type="checkbox"/> DB identifier	Status	Role	Engine	Region ...	Size
task-db-postgres	Available	Instance	PostgreSQL	us-east-1c	db.t3.micro

EKS cluster

three-tier-eks-cluster ⚙️ [Delete cluster](#) [Upgrade version](#) [Monitor cluster](#)

⚠️ Your cluster's Kubernetes version (1.28) will reach the end of extended support on November 26, 2025. If you don't upgrade your cluster to a later version before that date, it will be automatically upgraded to Kubernetes version 1.29. [Upgrade now](#)

Cluster info

Status Active	Kubernetes version 1.28	Support period Extended support until November 26, 2025	Provider EKS
Cluster health 0	Upgrade insights 6	Node health issues 0	

[Overview](#) [Resources](#) [Compute](#) [Networking](#) [Add-ons](#) [Access](#) [Observability](#) [Update history](#) [Tags](#)

Access configuration

Authentication mode
EKS API and ConfigMap [Manage access](#)

Permission to user to access EKS cluster

Select EKS cluster -> Access -> Add access entry -> give user arn -> next -> add “AmazonEKSClusterAdminPolicy” -> save

arn:aws:iam::390403857216:user/terraform-user

Standard

arn:aws:iam::390403857216:user/terraform-user

-

AmazonEKSClusterAdminPolicy

TASK 2:

DEPLOYING APPLICATION ON THE INFRASTRUCTURE CREATED BY CLOUD FORMATION

Permissions needed

- pipeline role – Access entry in EKS cluster

Select EKS cluster -> Access -> Add access entry -> give pipeline role arn -> next -> add “AmazonEKSAAdminPolicy” -> save

IAM access entries (4) [Info](#) [View details](#) [Edit](#) [Delete](#) [Create access entry](#)

Find access entry by property filtering

IAM principal ARN	Type	Username	Group names	Access policies
arn:aws:iam::390403857216:role/service-role/AWSCodePipelineServiceRole-us-east-1-buildpipelineeksRDS	Standard	arn:aws:sts::390403857216:assumed-role/AWSCodePipelineServiceRole-us-east-1-buildpipelineeksRDS/{{SessionName}}	-	AmazonEKSAAdminPolicy

- Code build role - [AmazonEC2ContainerRegistryPowerUser](#)

Success pipeline of application deployment

buildpipelineeksRDS [Edit](#) [Stop execution](#) [Create trigger](#) [Clone pipeline](#) [Release change](#)

[Pipeline](#) [Executions](#) [Triggers](#) [Settings](#) [Tags](#) [Stage](#)

✓ ✓ ✓

Source

961c718a-5e15-4243-96b7-aada45477ab9

0 of 1 action didn't run.

Source

abf300d5 Source: config

Build

961c718a-5e15-4243-96b7-aada45477ab9

All actions succeeded.

Build

✓ AWS CodeBuild

Jun 22, 2025 1:15 PM (UTC+5:30)

abf300d5 Source: config

Deploy

291e5175-9cc8-4b95-8fc7-88417e5f7be4

All actions succeeded.

Deploy

✓ Amazon EKS

Jun 22, 2025 1:27 PM (UTC+5:30)

abf300d5 Source: config

>>> Now all containers, pods, deployment and services are running

Load Balancer created for the application

Load balancers (2) [Actions](#) [Create load balancer](#)

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
<input type="checkbox"/>	acac655f892824cb58fe...	acac655f892824cb58fe835...	Active	vpc-0a15dad6dfa654dd5	3 Availability Zones	network	June 22, 2025,

acac655f892824cb58fe835909f65563

Actions

▼ Details

Load balancer type

Network

Status

Active

VPC

[vpc-0a15dad6dfa654dd5](#)

Load balancer IP address type

IPv4

Scheme

Internet-facing

Hosted zone

Z26RL4JYFTOTI

Availability Zones

[subnet-06ec189155b033a24](#) us-east-1a (use1-az4)

[subnet-04b6cd1ed6eacdbbd](#) us-east-1b (use1-az6)

[subnet-02e0c106269a659a6](#) us-east-1c (use1-az1)

Date created

June 22, 2025, 12:11 (UTC+05:30)

Load balancer ARN

[arn:aws:elasticloadbalancing:us-east-1:390403857216:loadbalancer/net/acac655f892824cb58fe835909f65563/c574172a6ac64731](#)

DNS name

[acac655f892824cb58fe835909f65563-c574172a6ac64731.elb.us-east-1.amazonaws.com](#) (A Record)

Listeners

Network mapping

Resource map

Security

Monitoring

Integrations

Attributes

Capacity

Tags

Listeners (1)

Actions

Add listener

A listener checks for connection requests using the protocol and port that you configure. Traffic received by a Network Load Balancer listener is forwarded to the selected target group.

Filter listeners

< 1 >

☐

Protocol:Port

▼

☐

Default action

▼

☐

ARN

▼

☐

Security policy

▼

☐

Default SSL/TLS certificate

▼

☐

ALPN policy

▼

☐

Tags

▼

☐

[TCP-80](#)

Forward to target group

[k8s-tasksn-frontend-f6ae5deda7](#)

[ARN](#)

Not applicable

Not applicable

None

[2 tags](#)

In Browser – paste load balancer arn (Application is working)

Frontend of Task management APP – Adding a new task (task1 – give title and description -> add task)

TaskFlow Dashboard

Organize Your Workflow

Add New Task

Task deleted successfully!

Task Title

task1

Task Description

cloud formation success

+ ADD TASK

Your Tasks (1)

new

yes

Added task and stored in Database

TaskFlow Dashboard

Organize Your Workflow

Add New Task

Task added successfully!

Task Title

Task Description

+ ADD TASK

Your Tasks (2)

task1

cloud formation success

new

yes

TASK3 :

CREATING INFRASTRUCTURE THROUGH TERRAFORM IN REGION2 (US-EAST-2)

Permissions needed

- Code build role - policy should be attached (added in github -> permissions/terraform-build-policy)
[AmazonS3FullAccess](#), [AmazonVPCFullAccess](#)

Infrastructure creation : success

Developer Tools > CodeBuild > Build projects > terraform-build

terraform-build

Actions ▼ Create trigger Edit Clone Debug build Start build with overrides **Start build**

Configuration

Source provider GitHub	Primary repository SelmiNazeeb/FinalProject-Devops	Artifacts upload location -	Service role arn:aws:iam::390403857216:role/service-role/codebuild-terraform-build-service-role
Public builds Disabled			

Build history Batch history Project details Build triggers Metrics Debug sessions

Build history Stop build View artifacts View logs Delete builds Retry build Debug build

	Build run	Status	Build number	Source version	Submitter	Duration	Completed
<input type="checkbox"/>	terraform-build:e843e6de-8558-4b41-80b0-595f8f7acb80	✔ Succeeded	43	c5c9cbe868531e a361b2b2a840f6 2df68996e6c1	GitHub- Hookshot/fb6e1 5e	38 seconds	12 hours ago

Dynamo DB table and S3 bucket for storing terraform tf state storage of code build of infrastructure

Dynamo DB

DynamoDB > Explore items > terraform-lock-table

DynamoDB

- Dashboard
- Tables
- Explore items**
- PartiQL editor
- Backups
- Exports to S3
- Imports from S3
- Integrations [New](#)
- Reserved capacity
- Settings

DAX

- Clusters
- Subnet groups
- Parameter groups
- Events

Tables (1)

- Any tag key
- Any tag value
-
- [terraform-lock-table](#)

terraform-lock-table Autopreview View table details

Scan or query items

- ☒ Scan ☐ Query
- Select a table or index: Table - terraform-lock-table
- Select attribute projection: All attributes
- Filters - optional
- Run Reset

✔ Completed - Items returned: 1 - Items scanned: 1 - Efficiency: 100% - RCUs consumed: 2

Table: terraform-lock-table - Items returned (1) Actions Create item

Scan started on June 24, 2025, 00:02:50

LockID (String)	Digest
selmicapstones3/terr...	b0dba6e44719e3886ff8fb1dd33e67c

S3 bucket

selmicapstones3 [Info](#)

[Objects](#) [Metadata](#) [Properties](#) [Permissions](#) [Metrics](#) [Management](#) [Access Points](#)

Objects (1)



[Copy S3 URI](#)

[Copy URL](#)

[Download](#)

[Open](#)

[Delete](#)

[Actions](#)

[Create folder](#)

[Upload](#)

Objects are the fundamental entities stored in Amazon S3. You can use [Amazon S3 inventory](#) to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. [Learn more](#)

☐ Show versions

< 1 > [Settings](#)

<input type="checkbox"/>	Name	Type	Last modified	Size
<input type="checkbox"/>	terraform.tfstate	tfstate	June 23, 2025, 11:55:56 (UTC+05:30)	134.8 KB

Outputs

Outputs:

```
eks_cluster_endpoint = "https://7627E37233A3CF883ECD615F9D063276.gr7.us-east-2.eks.amazonaws.com"
eks_cluster_security_group_id = "sg-020b2b5f3047cfc66"
rds_endpoint = "task-db-postgres.czus4mukos81.us-east-2.rds.amazonaws.com:5432"
vpc_id = "vpc-02b566a9f4f50daec"
```

Resources created

RDS

Databases (1)

☒ Group resources



[Modify](#)

[Actions](#)

[Create database](#)

< 1 > [Settings](#)

<input type="checkbox"/>	DB identifier	Status	Role	Engine	Region ...	Size
<input type="radio"/>	task-db-postgres	Available	Instance	PostgreSQL	us-east-1c	db.t3.micro

EKS cluster

three-tier-eks-cluster



[Delete cluster](#)

[Upgrade version](#)

[Monitor cluster](#)

Warning Your cluster's Kubernetes version (1.28) will reach the end of extended support on November 26, 2025. If you don't upgrade your cluster to a later version before that date, it will be automatically upgraded to Kubernetes version 1.29.

[Upgrade now](#)

Cluster info [Info](#)

Status
Active

Kubernetes version [Info](#)
1.28

Support period
Extended support until November 26, 2025

Provider
EKS

Cluster health

0

Upgrade insights

6

Node health issues

0

[Overview](#) [Resources](#) [Compute](#) [Networking](#) [Add-ons](#) [Access](#) [Observability](#) [Update history](#) [Tags](#)

Access configuration

[Manage access](#)

Authentication mode
EKS API and ConfigMap

IAM access entries (4) [Info](#)

[View details](#)

[Edit](#)

[Delete](#)

[Create access entry](#)

< 1 >

Permission to user to access EKS cluster

Select EKS cluster -> Access -> Add access entry -> give user arn -> next -> add "AmazonEKSClusterAdminPolicy" -> save

TASK 4:

DEPLOYING APPLICATION ON THE INFRASTRUCTURE CREATED BY TERRAFORM

Permissions needed

- pipeline role – Access entry in EKS cluster

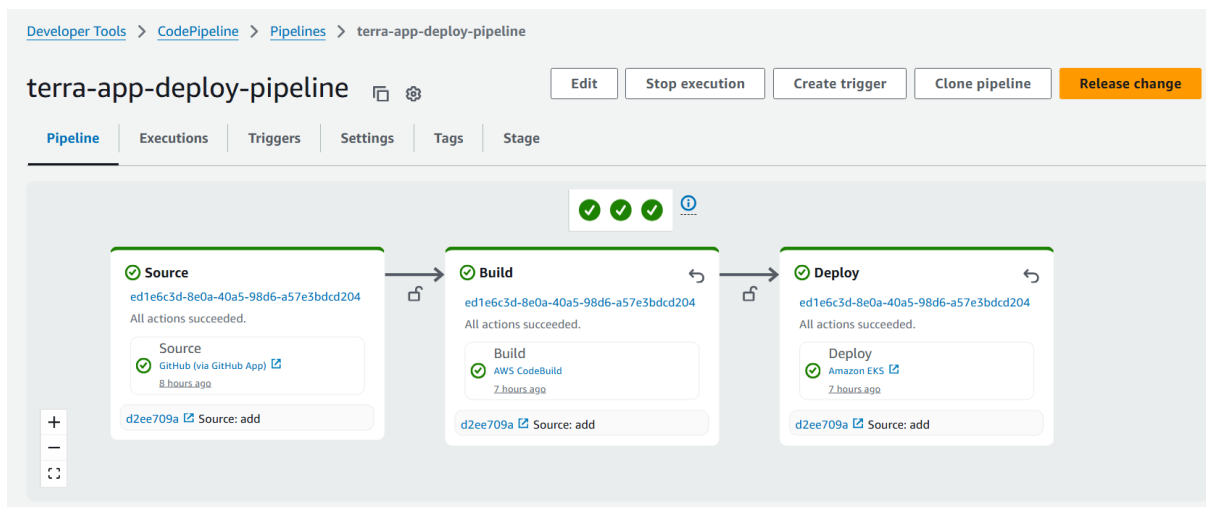
Select EKS cluster -> Access -> Add access entry -> give pipeline role arn -> next -> add “AmazonEKSClusterAdminPolicy” -> save

IAM access entries (4) Info

Find access entry by property filtering					
IAM principal ARN	Type	Username	Group names	Access policies	
arn:aws:iam::390403857216:role/service-role/AWSCodePipelineServiceRole-us-east-1-buildpipelineeksRDS	Standard	arn:aws:sts::390403857216:assumed-role/AWSCodePipelineServiceRole-us-east-1-buildpipelineeksRDS/{{SessionName}}	-	AmazonEKSClusterAdminPolicy	

- Code build role - [AmazonEC2ContainerRegistryPowerUser](#)

Success pipeline of application deployment



>>> Now all containers, pods, deployment and services are running

Load Balancer created for the application

Load balancers (1)						
Elastic Load Balancing scales your load balancer capacity automatically in response to changes in incoming traffic.						
Filter load balancers						
<input type="checkbox"/>	Name	DNS name	State	VPC ID	Availability Zones	Type
<input type="checkbox"/>	ae42791e1b72140ccb6...	ae42791e1b72140ccb6d58...	Active	vpc-02b566a9f4f50daec	2 Availability Zones	network

ae42791e1b72140ccb6d586e27168a6b

Details

Load balancer type

Network

Scheme

Internet-facing

Status

Active

Hosted zone

ZLMOA37VPKANP

VPC

[vpc-02b566a9f4f50daec](#)

Availability Zones

[subnet-08dd5ceaf6d6578809](#) us-east-2b (use2-az2)
 [subnet-052ebb6f8c08320a7](#) us-east-2a (use2-az1)

Load balancer IP address type

IPv4

Date created

June 23, 2025, 15:41 (UTC+05:30)

Load balancer ARN

arn:aws:elasticloadbalancing:us-east-2:390403857216:loadbalancer/net/ae42791e1b72140ccb6d586e27168a6b/64186227eb34f237

DNS name info

ae42791e1b72140ccb6d586e27168a6b-64186227eb34f237.elb.us-east-2.amazonaws.com (A Record)

Listeners

Network mapping

Resource map

Security

Monitoring

Integrations

Attributes

Capacity

Tags

Listeners (1)

A listener checks for connection requests using the protocol and port that you configure. Traffic received by a Network Load Balancer listener is forwarded to the selected target group.

< 1 >

⚙️

<input type="checkbox"/>	Protocol:Port	Default action	ARN	Security policy	Default SSL/TLS certificate	ALPN policy	Tags
<input type="checkbox"/>	TCP:80	Forward to target group <ul style="list-style-type: none"> k8s-tasks-frontend-c16bab7844 	ARN	Not applicable	Not applicable	None	2 tags

In Browser – paste load balancer arn **(Application is working)**

Frontend of Task management APP – Adding a new task (task2 – give title and description -> add task)

TaskFlow Dashboard

Organize Your Workflow

Add New Task

Task deleted successfully!

Task Title

task2

Task Description

terraform deploy success

+ ADD TASK

Your Tasks (1)

task

new

✎

🗑

Added task and stored in Database

TaskFlow Dashboard

Organize Your Workflow

Add New Task

Task added successfully!

Task Title

Task Description

+ ADD TASK

Your Tasks (2)

task2

terraform deploy success

✎

🗑

hello

added route53

✎

🗑

TASK 5 :

ROUTE 53 FOR FAILURE ROUTING

Domain Name : selmithreetier.com

Registered domains Info				Download billing report	Transfer in	Register domains
<input type="text" value="Search domains by name"/>				< 1 > ⚙		
Domain name	Expiration date	Auto-renew	Transfer lock			
selmithreetier.com	June 23, 2026	On	Off			

Creating a failure routing A record to public hosted zone

- Set primary load balancer as LB in region1 and secondary as LB in region2
- If primary load balancer fails routes the traffic to secondary load balancer

selmithreetier.com

Hosted zone details[Edit hosted zone](#)

Records (4)

DNSSEC signingHosted zone tags (0)

Records (1/4) [Info](#)

[Delete record](#)[Import zone file](#)[Create record](#)

Automatic mode is the current search behavior optimized for best filter results. [To change modes go to settings.](#)

TypeRouting p...Alias

	Record ...	Type	Routin...	Differ...	Alias	Value/Route traffic to	TTL (s)
<input type="checkbox"/>	selmithre...	NS	Simple	-	No	ns-1447.awsdns-52.org. ns-717.awsdns-25.net. ns-216.awsdns-27.com. ns-1827.awsdns-36.co.uk.	17280
<input type="checkbox"/>	selmithre...	SOA	Simple	-	No	ns-1447.awsdns-52.org. aws...	900
<input checked="" type="checkbox"/>	app.selmi...	A	Failover	Primary	Yes	acac655f892824cb58fe8359...	-
<input type="checkbox"/>	app.selmi...	A	Failover	Secondary	Yes	ae42791e1b72140ccb6d586...	-

Record details[Edit record](#)

Record name
[app.selmithreetier.com](#)

Record type
A

Value
[acac655f892824cb58fe835909f65563-e574172a6ac64731.elb.us-east-1.amazonaws.com.](#)

Alias
Yes

TTL (seconds)
-

Routing policy
Failover

Failover record type

Browse – “app.selmithreetier.com”

Frontend of Task management APP – Adding a new task (task3 – give title and description -> add task)

TaskFlow DashboardOrganize Your Workflow

Add New Task

Task deleted successfully!

Task Title

task3

Task Description



Route 53 added successfully

+ ADD TASK

Your Tasks (1)

task2

terraform deploy success



Added task and stored in Database

TaskFlow Dashboard

Organize Your Workflow

Add New Task

✔ Task added successfully!

Task Title



Task Description

+ ADD TASK

Your Tasks (2)



task3

Route 53 added succesfully



task2

terraform deploy success



Deleted one stored value

TaskFlow Dashboard

Organize Your Workflow

Add New Task

✔ Task deleted successfully!

Task Title



Task Description

+ ADD TASK

Your Tasks (1)

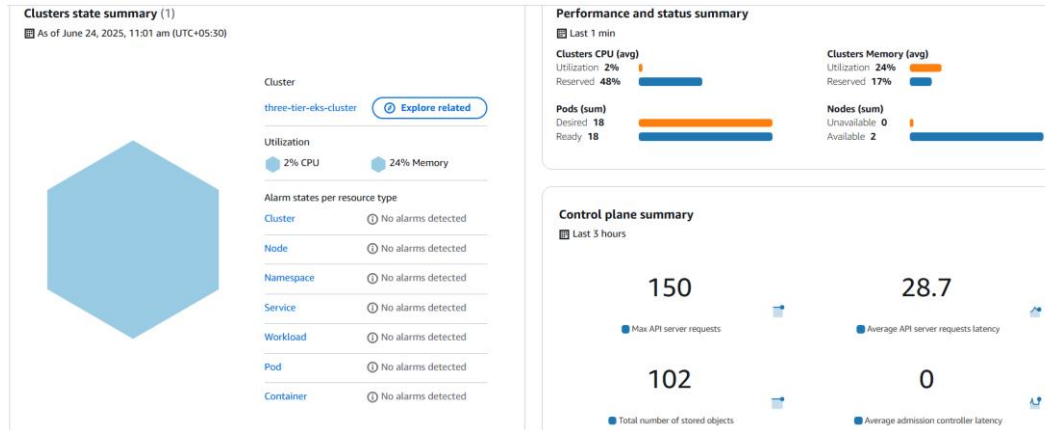
task3

Route 53 added succesfully

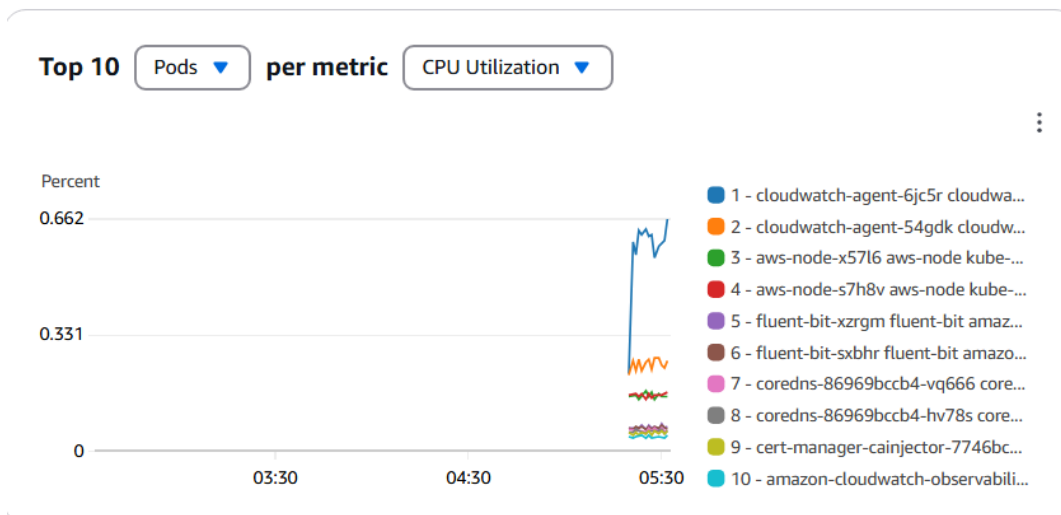


TASK 6:

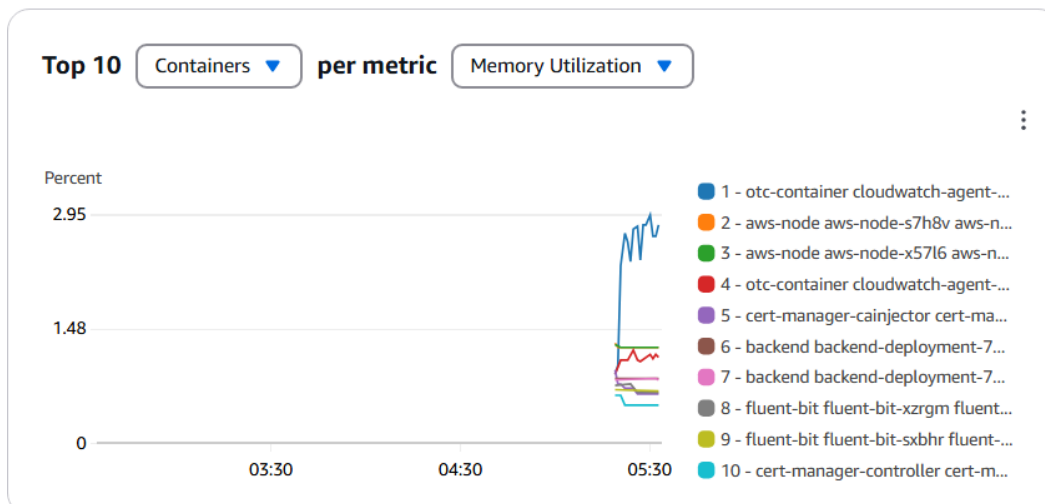
CLOUD WATCH – MONITORING EKS CLUSTER THROUGH CLOUD WATCH



Pod cpu utilization monitoring



Container memory utilization monitoring



nodes memory utilization monitoring

