

Deploying OpenTelemetry Application in AWS EKS

ENPM818N Cloud Computing - Group 9 Final Project

Team Members:

- Bolla Sai Saketh
- Fahad Shaker
- Shiv Ramolia
- Swaraj M Rao



Docker Phase Overview (Drive Link of Video : [Link](#))

The screenshot displays the AWS Management Console interface for an EC2 instance. The browser address bar shows the URL: `us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#InstanceDetails:instanceId=i-0822778582f91dd9d`. The console header includes the AWS logo, a search bar with 'securityLAKE', and navigation icons. The left sidebar shows the 'EC2' menu with options like Dashboard, EC2 Global View, Events, Instances, Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Capacity Reservations, Images, AMIs, AMI Catalog, Elastic Block Store, Volumes, Snapshots, Lifecycle Manager, and Network & Security. The main content area is titled 'Instance summary for i-0822778582f91dd9d (OpenTelemetryEC2-docker)' and includes buttons for 'Connect', 'Instance state', and 'Actions'. The instance details are organized into columns: Instance ID (i-0822778582f91dd9d), IPv6 address (-), Hostname type (IP name: ip-10-0-1-140.ec2.internal), Answer private resource DNS name (-), Auto-assigned IP address (98.80.190.11 [Public IP]), IAM Role (Docker-otel-EC2Role-O5c2079v2b0G), IMDSv2 (Optional, with a warning that EC2 recommends setting IMDSv2 to required), Operator (-), Public IPv4 address (98.80.190.11 | open address), Instance state (Running), Private IP DNS name (IPv4 only) (ip-10-0-1-140.ec2.internal), Instance type (t3.large), VPC ID (vpc-03093c501dc969e3d (OpenTelemetryVPC)), Subnet ID (subnet-047f9aa0e60291bd3 (OpenTelemetryPublicSubnet)), Instance ARN (arn:aws:ec2:us-east-1:944362433564:instance/i-0822778582f91dd9d), Private IPv4 addresses (10.0.1.140), Public IPv4 DNS (ec2-98-80-190-11.compute-1.amazonaws.com | open address), Elastic IP addresses (-), AWS Compute Optimizer finding (Opt-in to AWS Compute Optimizer for recommendations. | Learn more), Auto Scaling Group name (-), and Managed (false). Below the summary, there are tabs for Details, Status and alarms, Monitoring, Security, Networking, Storage, and Tags. The 'Security' tab is active, showing 'Security details' with IAM Role (Docker-otel-EC2Role-O5c2079v2b0G), Owner ID (944362433564), and Launch time (Sat May 17 2025 21:36:03 GMT+0400 (Eastern Daylight Time)). The footer includes 'CloudShell', 'Feedback', and copyright information for Amazon Web Services, Inc. or its affiliates, along with links for Privacy, Terms, and Cookie preferences.

CloudFormation x SecurityGroups x Instance details x EC2 Instances x Final Project x Otel Demo x OpenTelemetry x Locust x Jaeger UI x Flagd Console x +

us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#InstanceDetails:instanceId=i-0822778582f91dd9d

aws securityLAKE

EC2 > Instances > i-0822778582f91dd9d

EC2

Dashboard

EC2 Global View

Events

▼ Instances

Instances

Instance Types

Launch Templates

Spot Requests

Savings Plans

Reserved Instances

Dedicated Hosts

Capacity Reservations

▼ Images

AMIs

AMI Catalog

▼ Elastic Block Store

Volumes

Snapshots

Lifecycle Manager

▼ Network & Security

Security Groups

Security IDs

Instance summary for i-0822778582f91dd9d (OpenTelemetryEC2-docker) info

Updated 5 minutes ago

Connect Instance state Actions

Instance ID

i-0822778582f91dd9d

IPv6 address

-

Hostname type

IP name: ip-10-0-1-140.ec2.internal

Answer private resource DNS name

-

Auto-assigned IP address

98.80.190.11 [Public IP]

IAM Role

Docker-otel-EC2Role-O5c2079v2b0G

IMDSv2

Optional

⚠ EC2 recommends setting IMDSv2 to required | Learn more

Operator

-

Public IPv4 address

98.80.190.11 | open address

Instance state

Running

Private IP DNS name (IPv4 only)

ip-10-0-1-140.ec2.internal

Instance type

t3.large

VPC ID

vpc-03093c501dc969e3d (OpenTelemetryVPC)

Subnet ID

subnet-047f9aa0e60291bd3 (OpenTelemetryPublicSubnet)

Instance ARN

arn:aws:ec2:us-east-1:944362433564:instance/i-0822778582f91dd9d

Private IPv4 addresses

10.0.1.140

Public IPv4 DNS

ec2-98-80-190-11.compute-1.amazonaws.com | open address

Elastic IP addresses

-

AWS Compute Optimizer finding

Opt-in to AWS Compute Optimizer for recommendations. | Learn more

Auto Scaling Group name

-

Managed

false

Details Status and alarms Monitoring Security Networking Storage Tags

▼ Security details

IAM Role

Docker-otel-EC2Role-O5c2079v2b0G

Owner ID

944362433564

Launch time

Sat May 17 2025 21:36:03 GMT+0400 (Eastern Daylight Time)

CloudShell Feedback

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Kubernetes Phase Overview (Drive Link of Video : [Link](#))

The image displays a terminal window on the left and an AWS Management Console window on the right, illustrating the setup of an EKS cluster.

Terminal Output (Left):

```
ubuntu@ip-10-0-1-110:~/opentelemetry-demo$ eksctl create cluster \
--name otel-demo-cluster-1 \
--region us-east-1 \
--nodegroup-name worker-nodes-1 \
--node-type t3.xlarge \
--nodes 2 \
--nodes-min 2 \
--nodes-max 2 \
--managed
2025-05-18 19:00:10 [I] eksctl version 0.207.0
2025-05-18 19:00:10 [I] using region us-east-1
2025-05-18 19:00:12 [I] setting availability zones to [us-east-1a us-east-1b]
2025-05-18 19:00:12 [I] subnets for us-east-1a - public:192.168.0.0/19 private:192.168.64.0/19
2025-05-18 19:00:12 [I] subnets for us-east-1b - public:192.168.32.0/19 private:192.168.96.0/19
2025-05-18 19:00:12 [I] nodegroup "worker-nodes-1" will use "" [AmazonLinux2/1.32]
2025-05-18 19:00:12 [I] using Kubernetes version 1.32
2025-05-18 19:00:12 [I] creating EKS cluster "otel-demo-cluster-1" in "us-east-1" region with managed nodes
2025-05-18 19:00:12 [I] will create 2 separate CloudFormation stacks for cluster itself and the initial managed nodegroup
2025-05-18 19:00:12 [I] if you encounter any issues, check CloudFormation console or try 'eksctl utils describe-stacks --region=us-east-1 --cluster=otel-demo-cluster-1'
2025-05-18 19:00:12 [I] Kubernetes API endpoint access will use default of {publicAccess=true, privateAccess=false} for cluster "otel-demo-cluster-1" in "us-east-1"
2025-05-18 19:00:12 [I] CloudWatch logging will not be enabled for cluster "otel-demo-cluster-1" in "us-east-1"
2025-05-18 19:00:12 [I] you can enable it with 'eksctl utils update-cluster-logging --enable-types={SPECIFY-YOUR-LOG-TYPES-HERE (e.g. all)} --region=us-east-1 --cluster=otel-demo-cluster-1'
2025-05-18 19:00:12 [I] default addons vpc-cni, kube-proxy, coredns, metrics-server were not specified, will install them as EKS addons
2025-05-18 19:00:12 [I]
2 sequential tasks: [ create cluster control plane "otel-demo-cluster-1",
2 sequential sub-tasks: {
2 sequential sub-tasks: {
1 task: { create addons },
wait for control plane to become ready,
create managed nodegroup "worker-nodes-1",
}
```

AWS Management Console (Right):

The console shows the 'Instance summary' for the EKS cluster 'otel-kubernetes-eks' in the 'us-east-1' region. The instance is named 'otel-kubernetes-eks' and is running on a 't3.xlarge' instance type. The instance is associated with the 'otel-kubernetes-eks' VPC and the 'otel-kubernetes-eks' subnet. The instance is running on the 'AmazonLinux2' AMI.

Instance Summary Details:

- Instance ID:** i-0b80c012b45359b2a
- Public IPv4 address:** 44.215.69.95
- Private IPv4 address:** 10.0.1.110
- Instance state:** Running
- Hostname type:** IP name: ip-10-0-1-110.ec2.internal
- Answer private resource DNS name:** -
- Auto-assigned IP address:** 44.215.69.95 (Public IP)
- IAM Role:** EKSClientAdminRole
- IMDSv2:** Required
- Operator:** -
- Subnet ID:** subnet-0c0f460c0e119d19d (otel-kubernetes-eks)
- Instance ARN:** arn:aws:ec2:us-east-1:944362435564:instance/i-0b80c012b45359b2a
- Managed:** false

Instance Details:

- AMI ID:** ami-015ee56c2b35f098a
- AMI name:** otel-heim-image-v2
- Stop protection:** Disabled
- Instance auto-recovery:** Default
- AMI Launch Index:** 0
- Monitoring:** disabled
- Allowed ingress:** -
- Launch time:** Sun May 18 2025 14:57:33 GMT-04:00 (Eastern Daylight Time) (33 minutes)
- Lifecycle:** normal
- Key pair assigned at launch:** -
- Platform details:** Linux/UNIX
- Termination protection:** Disabled
- AMI location:** 944362435564/otel-heim-image-v2
- Stop-hibernate behavior:** Disabled
- State transition reason:** -

Helm Phase Overview (Drive Link of Video : [Link](#))

Helm Phase Overview

```
ubuntu@ip-10-0-1-222:~$ helm repo add open-telemetry https://open-telemetry.github.io/opentelemetry-helm-charts
"open-telemetry" already exists with the same configuration, skipping
```

```
ubuntu@ip-10-0-1-222:~$ helm search repo open-telemetry
NAME                                CHART VERSION  APP VERSION  DESCRIPTION
open-telemetry/opentelemetry-collector 0.122.5        0.123.1      OpenTelemetry Collector Helm chart for Kubernetes
open-telemetry/opentelemetry-demo      0.37.1         2.6.2        opentelemetry demo helm chart
open-telemetry/opentelemetry-cbpf      0.1.6          v0.10.2      OpenTelemetry eBPF Helm chart for Kubernetes
open-telemetry/opentelemetry-kube-stack 0.5.2          0.120.0      OpenTelemetry Quickstart chart for Kubernetes. ...
open-telemetry/opentelemetry-operator  0.88.6         0.124.0      OpenTelemetry Operator Helm chart for Kubernetes
ubuntu@ip-10-0-1-222:~$
```

```
ubuntu@ip-10-0-1-222:~$ helm repo update
Hang tight while we grab the latest from your chart repositories...
...Successfully got an update from the "open-telemetry" chart repository
Update Complete. ✨Happy Helming!✨
ubuntu@ip-10-0-1-222:~$ |
```

```
ubuntu@ip-10-0-1-222:~$ kubectl create namespace otel-demo-helm
namespace/otel-demo-helm created
ubuntu@ip-10-0-1-222:~$ |
```

Alerting Service and Notifications Overview (Drive Link of Video : [Link](#))

The screenshot displays the AWS Management Console for an EC2 instance in the us-east-1 region. The instance ID is i-04624206c20fdd072. The console is organized into a sidebar on the left, a main content area with tabs, and a details section at the bottom.

Left Sidebar:

- EC2
 - Dashboard
 - EC2 Global View
 - Events
- Instances
 - Instances
 - Instance Types
 - Launch Templates
 - Spot Requests
 - Savings Plans
 - Reserved Instances
 - Dedicated Hosts
 - Capacity Reservations
- Images
 - AMIs
 - AMI Catalog
- Elastic Block Store
 - Volumes
 - Snapshots
 - Lifecycle Manager

Main Content Area (Instance Details for i-04624206c20fdd072):

- IAM Role:** [EKSClntAdminRole](#)
- IMDSv2:** Required
- Operator:** -
- Subnet ID:** [subnet-0e49fe469cd6e119d](#) (otel-demo-public-subnet-1)
- Instance ARN:** [arn:aws:ec2:us-east-1:944362433564:instance/i-04624206c20fdd072](#)
- Auto Scaling Group name:** -
- Managed:** false

Tabs: Details (selected), Status and alarms, Monitoring, Security, Networking, Storage, Tags

▼ Instance details

- AMI ID:** [ami-030f28bf3a8d703af](#)
- AMI name:** [ec2-helm-otel-demo](#)
- Stop protection:** Disabled
- Instance auto-recovery:** Default
- AMI Launch index:** 0
- Monitoring:** disabled
- Allowed image:** -
- Launch time:** [Sun May 18 2025 11:38:11 GMT-0400 \(Eastern Daylight Time\)](#) (about 8 hours)
- Lifecycle:** normal
- Key pair assigned at launch:** [ec2-docker](#)
- Platform details:** [Linux/UNIX](#)
- Termination protection:** Disabled
- AMI location:** [944362433564/ec2-helm-otel-demo](#)
- Stop-hibernate behavior:** Disabled
- State transition reason:** -

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CI/CD Integration Overview (Drive Link of Video : [Link](#))

The screenshot displays a web browser window with multiple tabs open, including 'Instances | EC2 | us-e...', 'Final Project: Deployi...', 'OpenTelemetry-Appli...', 'CI/CD using Docker C...', 'Your Packages', 'testing rollback - sake...', and 'Group9_FinalProject...'. The active tab shows the GitHub repository 'sakethbolla / OpenTelemetry-Application-Deployment-in-EKS'. The file path is '.github / workflows / ci-cd-frontend.yml'. The file content is displayed in a code editor with the following YAML structure:

```
1 name: CI/CD using Docker Compose and Helm
2
3 on:
4   push:
5     branches:
6       - main
7   workflow_dispatch:
8     inputs:
9       run_tests:
10        description: 'Run Helm and Smoke Tests manually'
11        required: false
12        default: 'false'
13
14 # env:
15 #   EKS_CLUSTER: otel-demo-cluster
16 #   REGION: us-east-1
17 #   NAMESPACE: otel-demo-ci-cd
18 #   REPO_BASE: ghcr.io/${{ github.repository_owner }}/otel-demo
19 #   COMPOSE_FILE: docker-compose.yml
20
```

The left sidebar shows the repository structure with folders like '.github/workflows', 'CloudFormationTemplates', 'helm-chart', 'templates', 'internal', 'kubernetes', 'modified_yaml/kuber_custom', and 'pb'. The file 'ci-cd-frontend.yml' is selected under the '.github/workflows' folder.

Thank You