CLOUD COMPUTING

TASK 10.1P

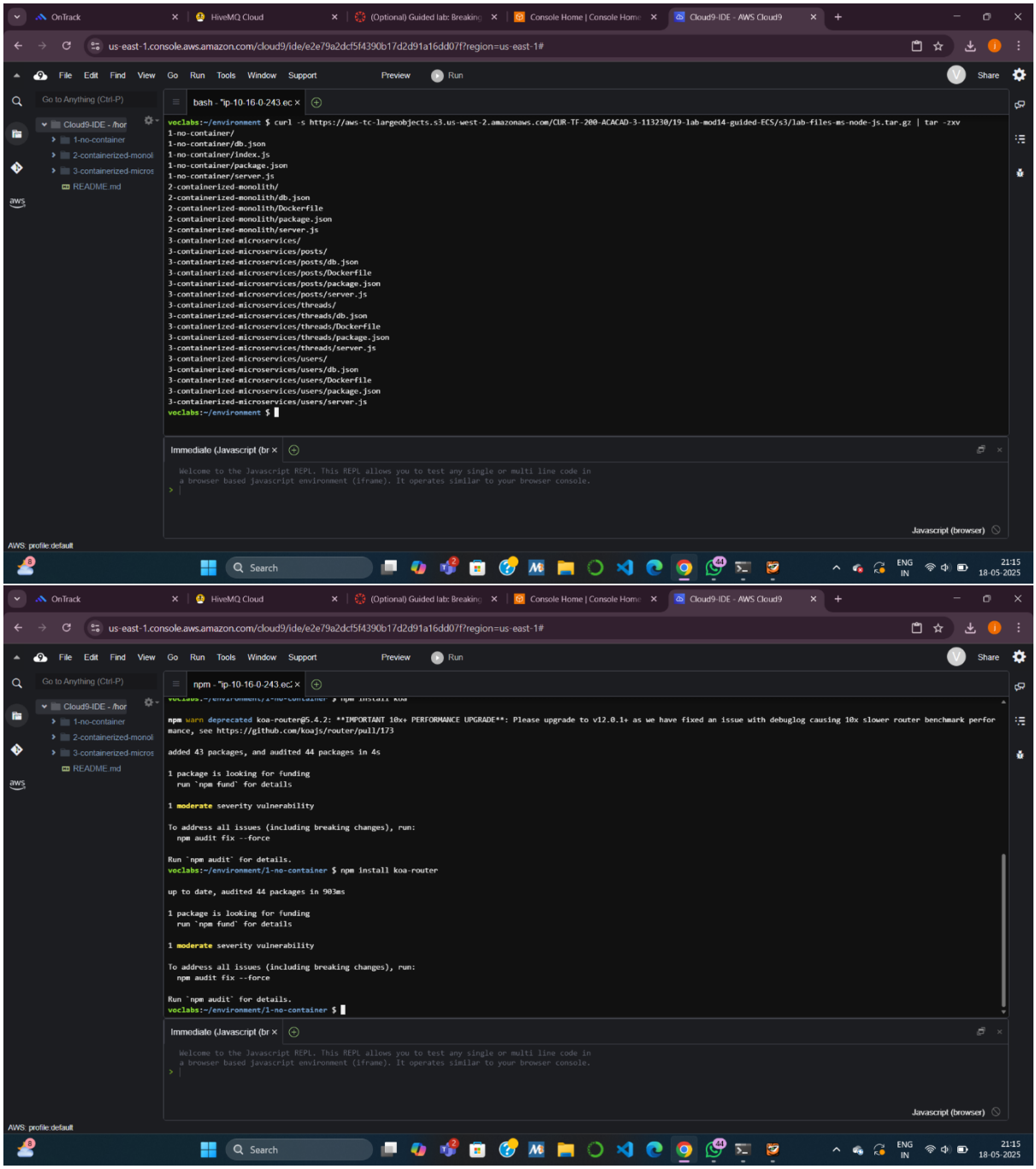
Breaking a Monolithic Node.js Application into Microservices

Task 1: Preparing the Development Environment

Objective: Get your workspace ready in the AWS Cloud9 IDE.

Subtasks:

- Open Cloud9 using the provided URL.
- Use curl to download a tar file containing 3 versions of the app:
    1. **1-no-container**: monolithic app (runs locally).
    2. **2-containerized-monolith**: same app made ready for Docker.
    3. **3-containerized-microservices**: refactored into microservices.
- Keep this IDE open for the entire lab.



Task 2: Running the Application on a Basic Node.js Server

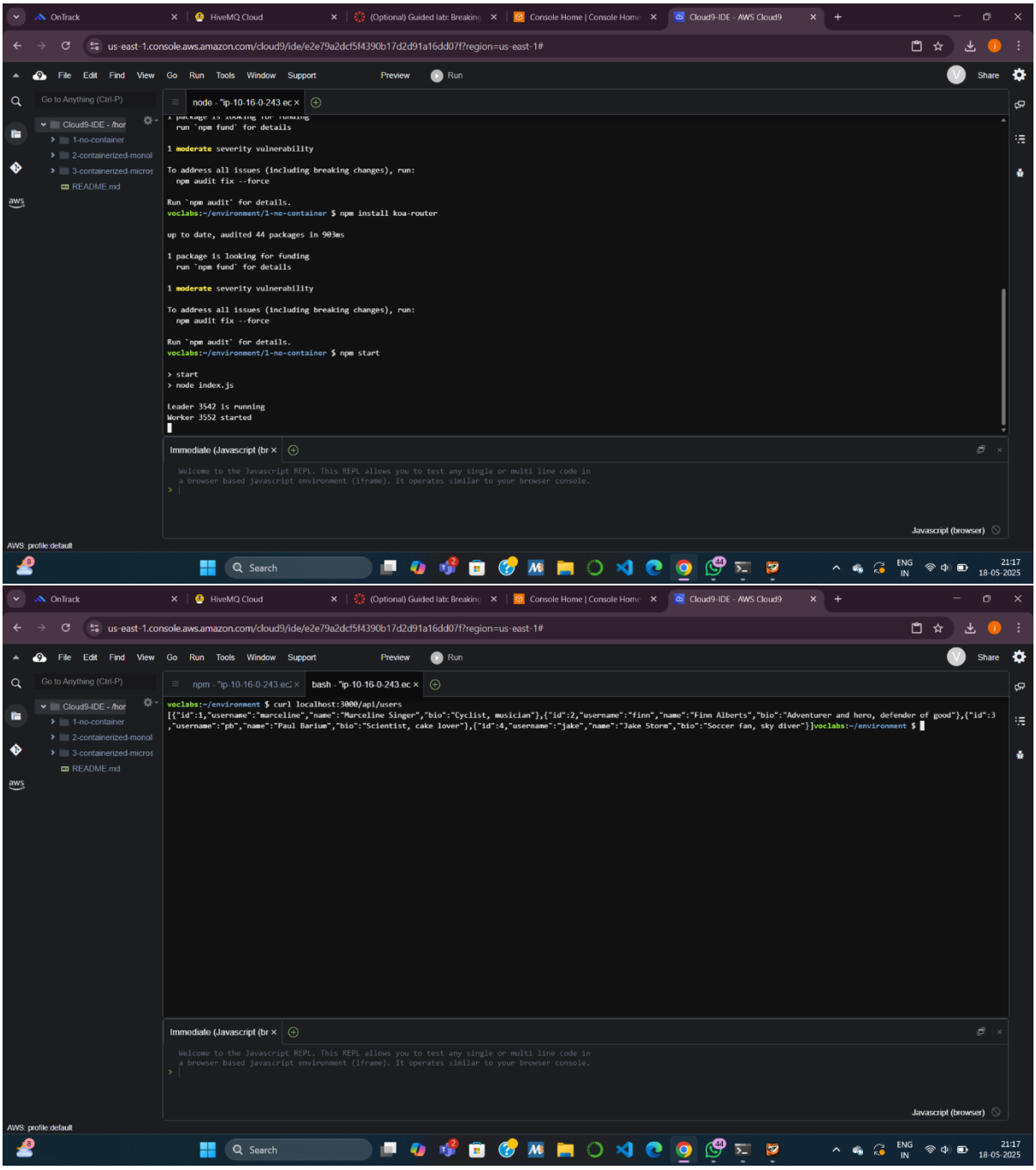
Objective: Understand and run the **monolithic** version without Docker.

Subtasks:

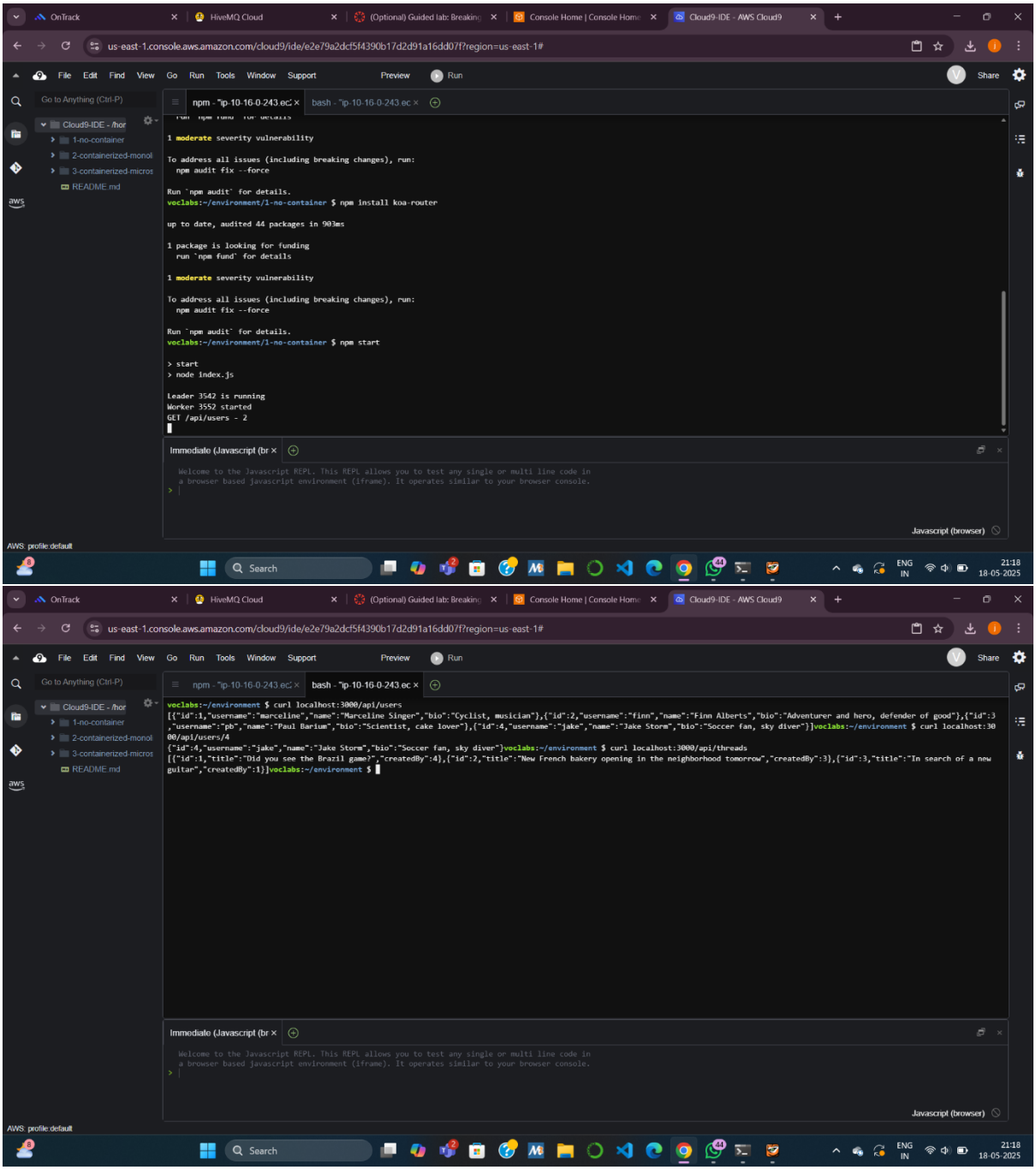
- **2.1 Install dependencies**: Install koa and koa-router with npm.
- **2.2 Review code**:
    - index.js: sets up cluster mode (1 leader, 1 worker per CPU core).
    - server.js: contains all REST APIs (users, threads, posts).

- db.json: mock database of users, threads, and posts.

- **2.3 Run and test app**:
  - Run using npm start.
  - Use curl to call APIs like /api/users, /api/threads.
  - Observe logs to understand request flow and timing.
  - Stop the server using Ctrl+C.

- 

-



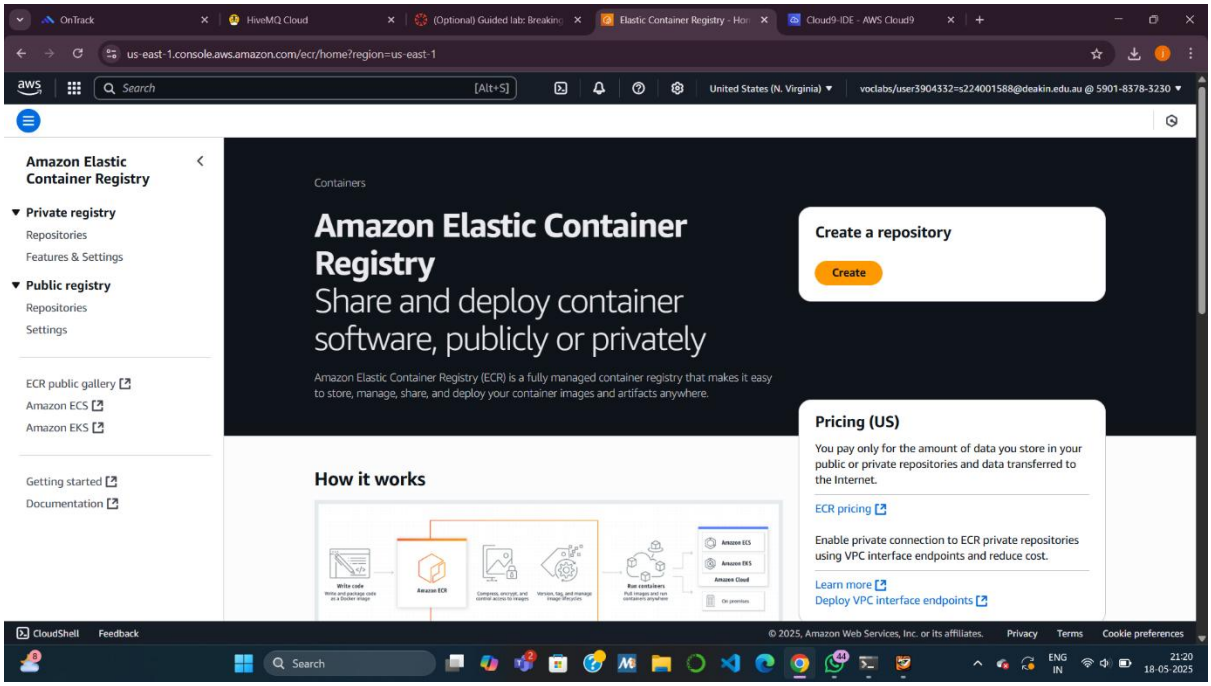
Task 3: Containerizing the Monolith for Amazon ECS

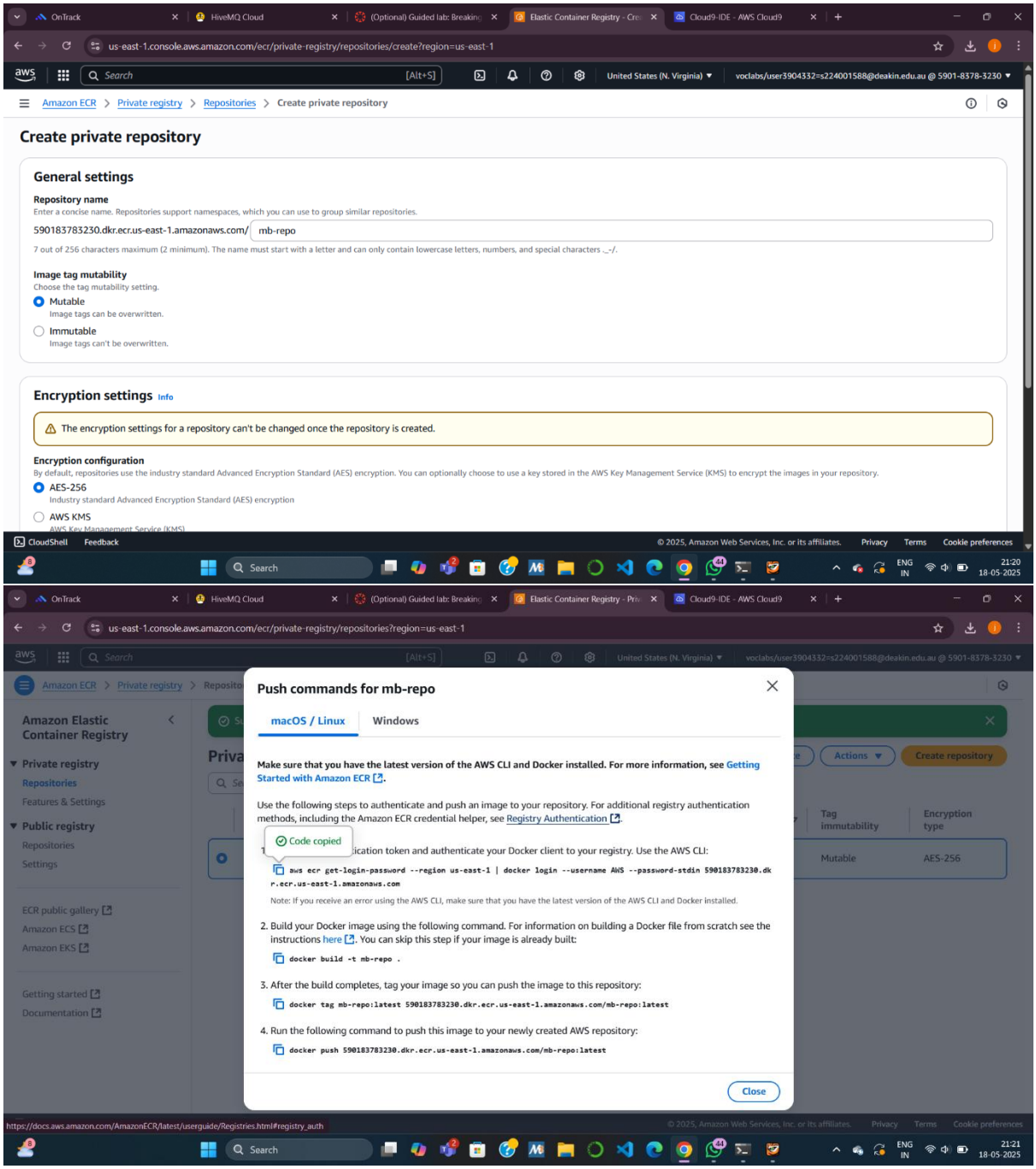
Objective: Prepare and push the **monolithic app** to Docker and ECR.

Subtasks:

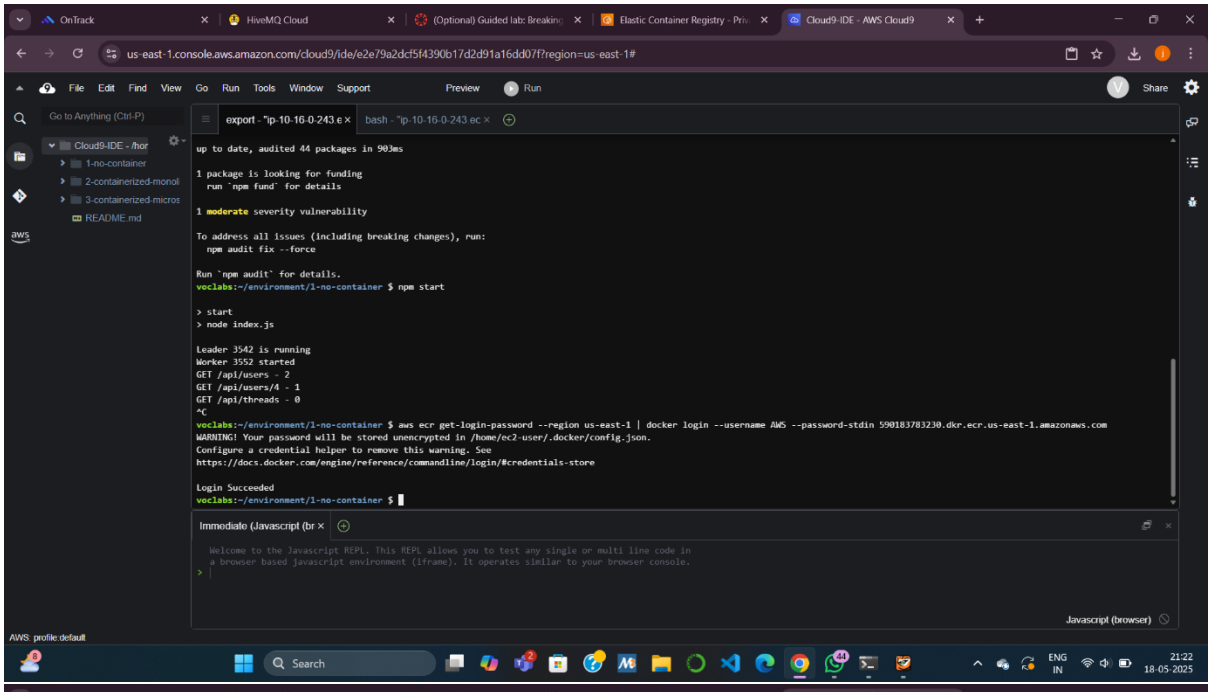
- **3.1 Modify the app**:
  - Remove cluster logic (no index.js).
  - Use server.js as the main app file.
  - Add a Dockerfile to define image instructions.

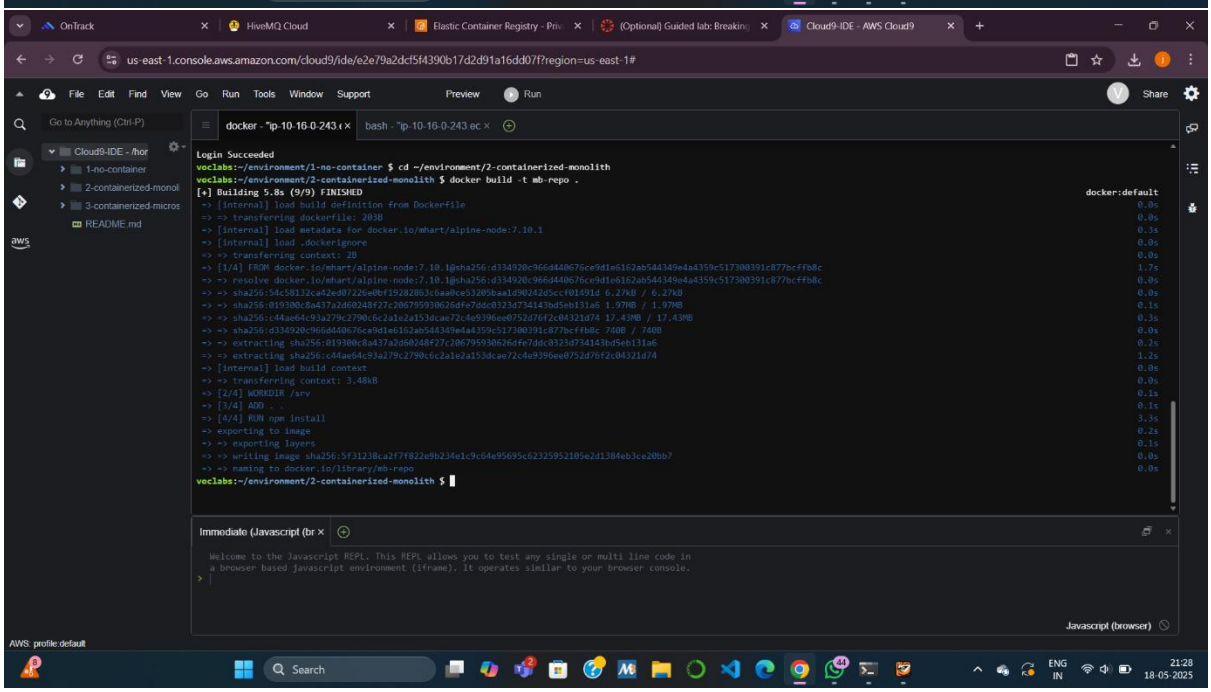
- **3.2 Create ECR Repository**:
    - Go to **Amazon ECR** → Create **mb-repo** (private).
- **3.3 Build & Push Docker Image**:
    - Authenticate Docker to AWS.
    - Run docker build -t mb-repo .
    - Tag the image with repository URI.
    - Push to ECR with docker push.

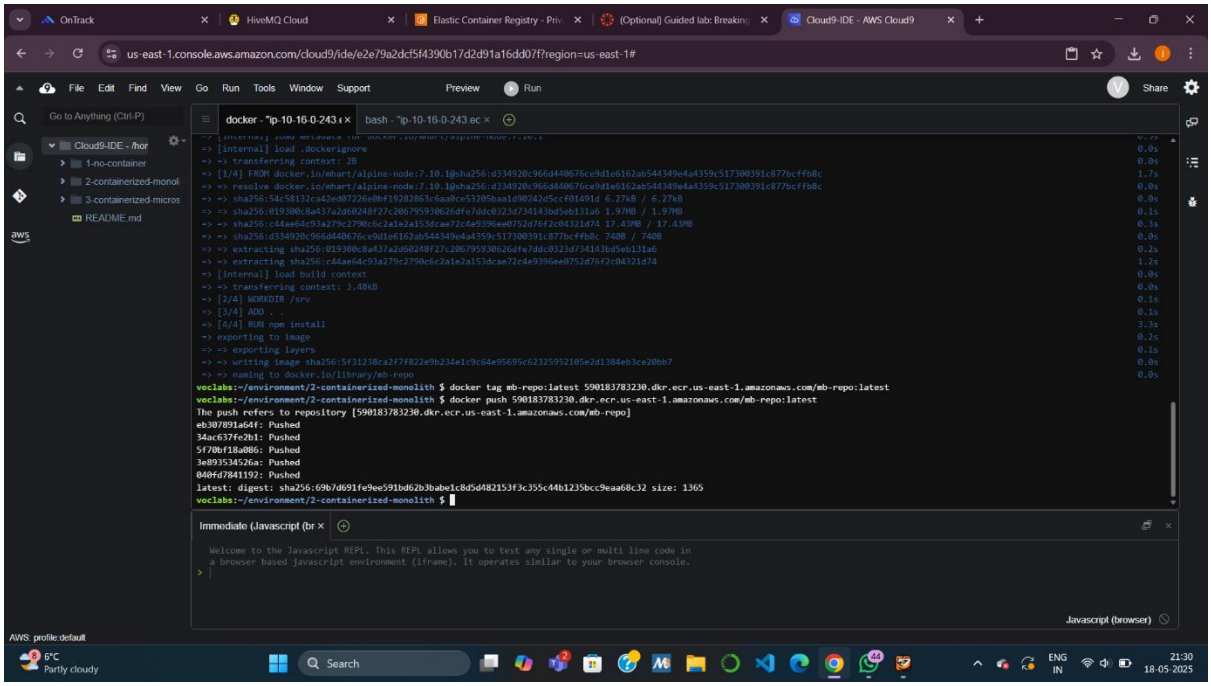


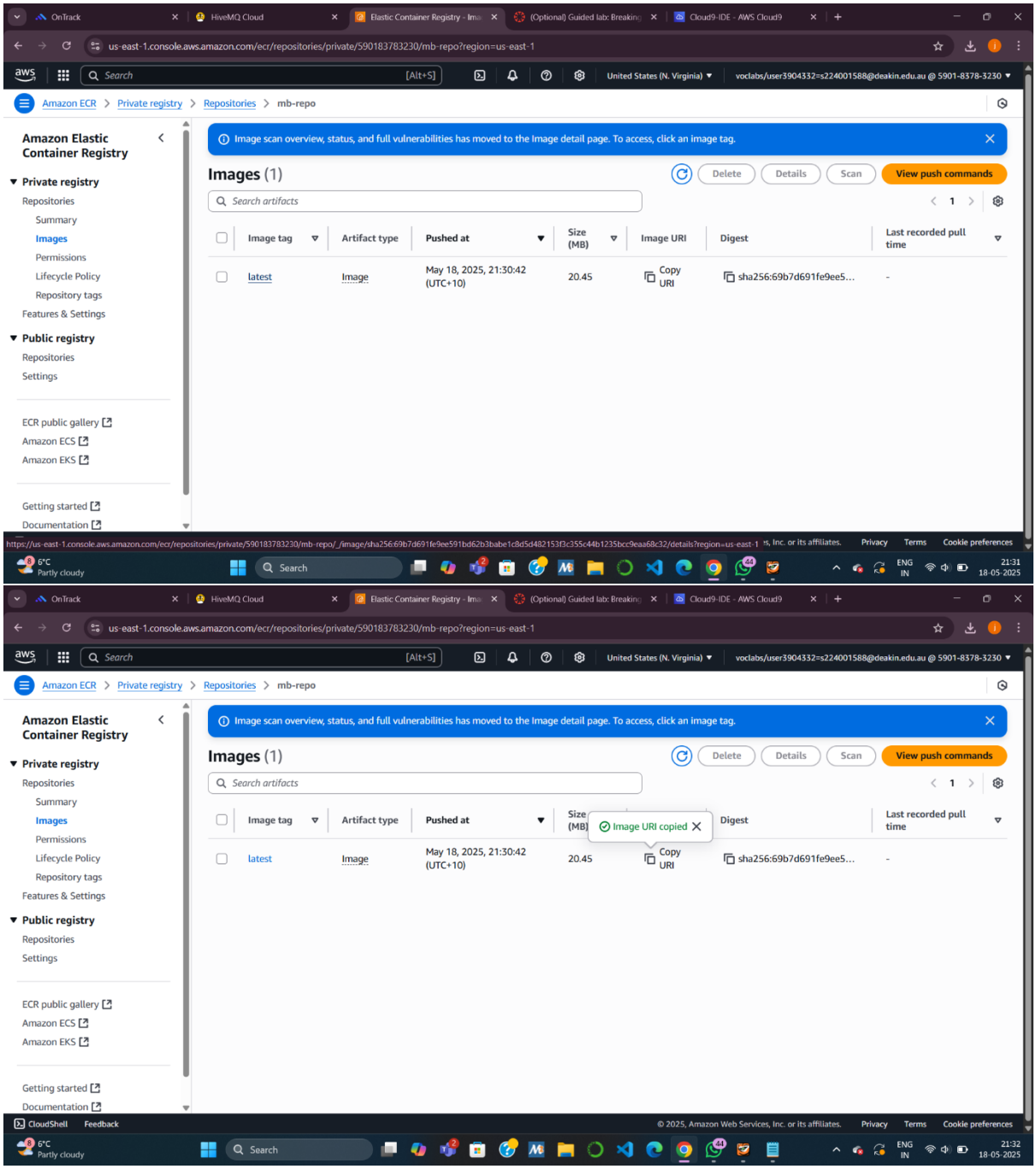

us-east-1.console.aws.amazon.com/ecr/private-registry/repositories/create?region=us-east-1
Amazon ECR > Private registry > Repositories > Create private repository
Create private repository
General settings
Repository name
Enter a concise name. Repositories support namespaces, which you can use to group similar repositories.
590183783230.dkr.ecr.us-east-1.amazonaws.com/
mb-repo
7 out of 256 characters maximum (2 minimum). The name must start with a letter and can only contain lowercase letters, numbers, and special characters ._-/.
Image tag mutability
Choose the tag mutability setting.
Mutable
Image tags can be overwritten.
Immutable
Image tags can't be overwritten.
Encryption settings Info
The encryption settings for a repository can't be changed once the repository is created.
Encryption configuration
By default, repositories use the industry standard Advanced Encryption Standard (AES) encryption. You can optionally choose to use a key stored in the AWS Key Management Service (KMS) to encrypt the images in your repository.
AES-256
Industry standard Advanced Encryption Standard (AES) encryption
AWS KMS
CloudShell
Feedback
© 2025, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences

us-east-1.console.aws.amazon.com/ecr/private-registry/repositories?region=us-east-1
Amazon Elastic Container Registry
Private registry
Repositories
Features & Settings
Public registry
Repositories
Settings
ECR public gallery
Amazon ECS
Amazon EKS
Getting started
Documentation
Actions
Create repository
Tag immutability
Encryption type
Mutable
AES-256
Push commands for mb-repo
macOS / Linux
Windows
Make sure that you have the latest version of the AWS CLI and Docker installed. For more information, see Getting Started with Amazon ECR.
Use the following steps to authenticate and push an image to your repository. For additional registry authentication methods, including the Amazon ECR credential helper, see Registry Authentication.
Code copied
aws ecr get-login-password --region us-east-1 | docker login --username AWS --password-stdin 590183783230.dkr.ecr.us-east-1.amazonaws.com
Note: If you receive an error using the AWS CLI, make sure that you have the latest version of the AWS CLI and Docker installed.
2. Build your Docker image using the following command. For information on building a Docker file from scratch see the instructions here. You can skip this step if your image is already built:
docker build -t mb-repo .
3. After the build completes, tag your image so you can push the image to this repository:
docker tag mb-repo:latest 590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-repo:latest
4. Run the following command to push this image to your newly created AWS repository:
docker push 590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-repo:latest
Close
https://docs.aws.amazon.com/AmazonECR/latest/userguide/Registries.html#registry_auth


OnTrack
HiveMQ Cloud
(Optional) Guided lab: Breaking
Elastic Container Registry - Priv
Cloud9-IDE - AWS Cloud9
us-east-1.console.aws.amazon.com/cloud9/ide/e2e79a2dcf5f4390b17d2d91a16dd07f?region=us-east-1#
File Edit Find View Go Run Tools Window Support Preview Run Share
Go to Anything (Ctrl-P)
Cloud9-IDE - /hor
1-no-container
2-containerized-monol
3-containerized-micros
README.md
export - "ip-10-16-0-243.e
bash - "ip-10-16-0-243.ec
up to date, audited 44 packages in 903ms
1 package is looking for funding
run `npm fund` for details
1 moderate severity vulnerability
To address all issues (including breaking changes), run:
npm audit fix --force
Run `npm audit` for details.
veclabs:~/environment/1-no-container $ npm start
> start
> node index.js
Leader 3542 is running
Worker 3552 started
GET /api/users - 2
GET /api/users/4 - 1
GET /api/threads - 0
^C
veclabs:~/environment/1-no-container $ aws ecr get-login-password --region us-east-1 | docker login --username AWS --password-stdin 590183703230.dkr.ecr.us-east-1.amazonaws.com
WARNING! Your password will be stored unencrypted in /home/ec2-user/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store
Login Succeeded
veclabs:~/environment/1-no-container $
Immediate (Javascript (br
Welcome to the Javascript REPL. This REPL allows you to test any single or multi line code in
a browser based javascript environment (iframe). It operates similar to your browser console.
Javascript (browser)
AWS: profile:default
Search
ENG
IN
21:22
18-05-2025


OnTrack
HiveMQ Cloud
Elastic Container Registry - Priv
(Optional) Guided lab: Breaking
Cloud9-IDE - AWS Cloud9
us-east-1.console.aws.amazon.com/cloud9/ide/e2e79a2dcf5f4390b17d2d91a16dd07f?region=us-east-1#
File Edit Find View Go Run Tools Window Support Preview Run Share
Go to Anything (Ctrl-P)
Cloud9-IDE - /hor
1-no-container
2-containerized-monol
3-containerized-micros
README.md
docker - "ip-10-16-0-243.e
bash - "ip-10-16-0-243.ec
Login Succeeded
veclabs:~/environment/1-no-container $ cd ~/environment/2-containerized-monolith
veclabs:~/environment/2-containerized-monolith $ docker build -t mb-repo .
[+] Building 5.8s (9/9) FINISHED
docker:default
=> [internal] load build definition from Dockerfile 0.0s
=> => transferring dockerfile: 203B 0.0s
=> [internal] load metadata for docker.io/mhart/alpine-node:7.10.1 0.3s
=> [internal] load .dockerignore 0.0s
=> => transferring context: 2B 0.0s
=> [1/4] FROM docker.io/mhart/alpine-node:7.10.1@sha256:d334920c966d440676ce9d1e6162ab544349e4a4359c517300391c877bcffb8c 1.7s
=> => resolve docker.io/mhart/alpine-node:7.10.1@sha256:d334920c966d440676ce9d1e6162ab544349e4a4359c517300391c877bcffb8c 0.0s
=> => sha256:54c58132ca42ed07226e0bf1928286 3c6aa0ce53205baa1d90242d5ccf01491d 6.27kB / 6.27kB 0.0s
=> => sha256:019300c8a437a2d60248f27c2067595930626dfe7ddc0323d734143bd5eb131a6 1.97MB / 1.97MB 0.1s
=> => sha256:c44a664c93a279c2790c6c2a1e2a153dcae72c4e9396ee0752d76f2c04321d74 17.43MB / 17.43MB 0.3s
=> => sha256:d334920c966d440676ce9d1e6162ab544349e4a4359c517300391c877bcffb8c 740B / 740B 0.0s
=> => extracting sha256:019300c8a437a2d60248f27c2067595930626dfe7ddc0323d734143bd5eb131a6 0.2s
=> => extracting sha256:c44a664c93a279c2790c6c2a1e2a153dcae72c4e9396ee0752d76f2c04321d74 1.2s
=> [internal] load build context 0.0s
=> => transferring context: 3.48kB 0.0s
=> [2/4] WORKDIR /srv 0.1s
=> [3/4] ADD . . 0.1s
=> [4/4] RUN npm install 3.3s
=> exporting to image 0.2s
=> => exporting layers 0.1s
=> => writing image sha256:5f31238ca2f7f822e9b234e1c9c64e95695c62325952105e2d1384eb3ce20bb7 0.0s
=> => naming to docker.io/library/mb-repo 0.0s
veclabs:~/environment/2-containerized-monolith $
Immediate (Javascript (br
Welcome to the Javascript REPL. This REPL allows you to test any single or multi line code in
a browser based javascript environment (iframe). It operates similar to your browser console.
Javascript (browser)
AWS: profile:default
Search
ENG
IN
21:28
18-05-2025


OnTrack
HiveMQ Cloud
Elastic Container Registry - Priv
(Optional) Guided lab: Breaking
Cloud9-IDE - AWS Cloud9
us-east-1.console.aws.amazon.com/cloud9/ide/e2e79a2dcf5f4390b17d2d91a16dd07f?region=us-east-1#
File Edit Find View Go Run Tools Window Support
Preview
Run
Share
Go to Anything (Ctrl-P)
Cloud9-IDE - /hor
1-no-container
2-containerized-monol
3-containerized-micros
README.md
docker - "ip-10-16-0-243 (
bash - "ip-10-16-0-243.ec
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [1/4] FROM docker.io/mhart/alpine-node:7.10.1@sha256:d334920c966d440676ce9d1e6162ab544349e4a4359c517300391c877bcffb8c
=> => resolve docker.io/mhart/alpine-node:7.10.1@sha256:d334920c966d440676ce9d1e6162ab544349e4a4359c517300391c877bcffb8c
=> => sha256:54c58132ca42ed07226e0bf19282863c6aa0ce53205baa1d90242d5ccf01491d 6.27kB / 6.27kB
=> => sha256:019300c8a437a2d60248f27c206795930626dfe7ddc0323d734143bd5eb131a6 1.97MB / 1.97MB
=> => sha256:c44ae64c93a279c2790c6c2a1e2a153dcae72c4e9396ee0752d76f2c04321d74 17.43MB / 17.43MB
=> => sha256:d334920c966d440676ce9d1e6162ab544349e4a4359c517300391c877bcffb8c 740B / 740B
=> => extracting sha256:019300c8a437a2d60248f27c206795930626dfe7ddc0323d734143bd5eb131a6
=> => extracting sha256:c44ae64c93a279c2790c6c2a1e2a153dcae72c4e9396ee0752d76f2c04321d74
=> [internal] load build context
=> => transferring context: 3.48kB
=> [2/4] WORKDIR /srv
=> [3/4] ADD . .
=> [4/4] RUN npm install
=> exporting to image
=> => exporting layers
=> => writing image sha256:5f31238ca2f7f822e9b234e1c9c64e95695c62325952105e2d1384eb3ce20bb7
=> => naming to docker.io/library/mb-repo
veclabs:~/environment/2-containerized-monolith $ docker tag mb-repo:latest 590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-repo:latest
veclabs:~/environment/2-containerized-monolith $ docker push 590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-repo:latest
The push refers to repository [590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-repo]
eb307891a64f: Pushed
34ac637fe2b1: Pushed
5f70bf18a086: Pushed
3e893534526a: Pushed
040fd7841192: Pushed
latest: digest: sha256:69b7d691fe9ee591bd62b3babe1c8d5d482153f3c355c44b1235bcc9eaa68c32 size: 1365
veclabs:~/environment/2-containerized-monolith $
Immediate (Javascript (br
Welcome to the Javascript REPL. This REPL allows you to test any single or multi line code in
a browser based javascript environment (iframe). It operates similar to your browser console.
Javascript (browser)
AWS: profile:default
6°C
Partly cloudy
Search
ENG
IN
21:30
18-05-2025



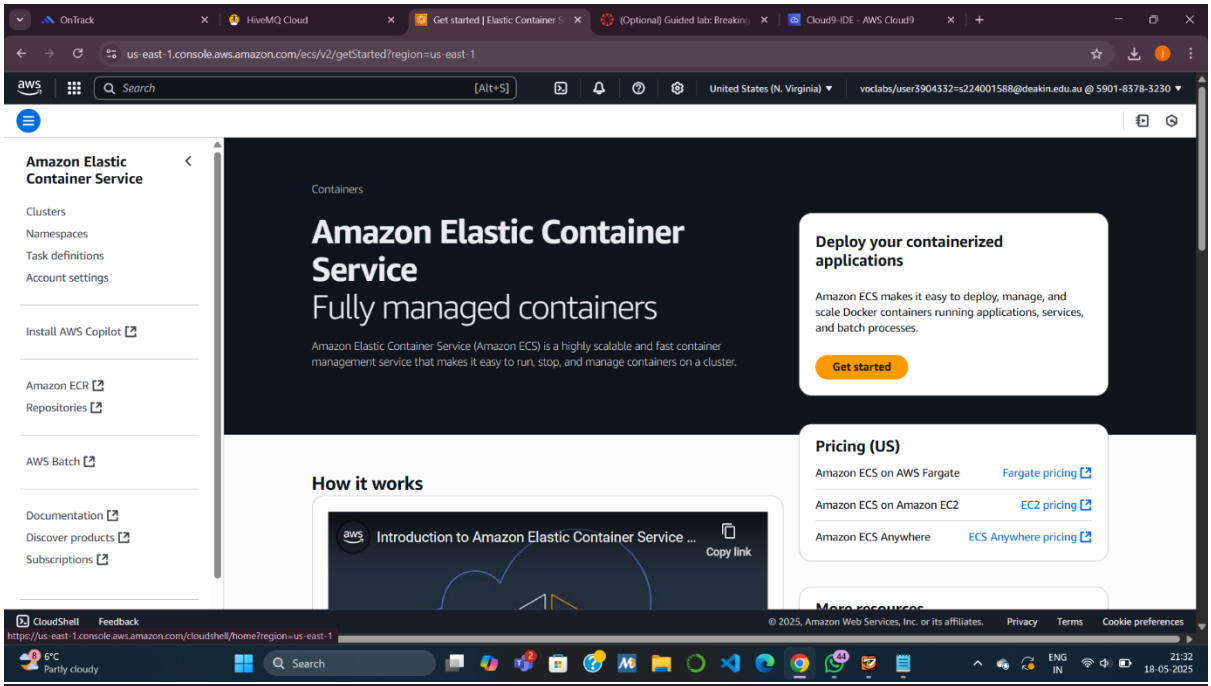
Task 4: Deploying the Monolith to Amazon ECS

Objective: Deploy the containerized monolith on ECS with EC2 and a Load Balancer.

Subtasks:

- **4.1 Create ECS Cluster**:
    - Use **EC2 launch type**, 2 instances, t2.medium, public subnets.
- **4.2 Create Task Definition**:
    - Name: mb-task.

    - Container: mb-container, image from ECR, port 3000.
- **4.3 Deploy as ECS Service**:
    - Create service: mb-ecs-service.
    - Attach it to a **new Application Load Balancer (ALB)**.
- **4.4 Test API**:
    - Use Load Balancer DNS to test endpoints like:
        - /api
        - /api/users
        - /api/posts/in-thread/2


us-east-1.console.aws.amazon.com/ecs/v2/getStarted?region=us-east-1
Amazon Elastic Container Service
Clusters
Namespaces
Task definitions
Account settings
Install AWS Copilot
Amazon ECR
Repositories
AWS Batch
Documentation
Discover products
Subscriptions
Containers
Amazon Elastic Container Service
Fully managed containers
Amazon Elastic Container Service (Amazon ECS) is a highly scalable and fast container management service that makes it easy to run, stop, and manage containers on a cluster.
Deploy your containerized applications
Amazon ECS makes it easy to deploy, manage, and scale Docker containers running applications, services, and batch processes.
Get started
Pricing (US)
Amazon ECS on AWS Fargate
Fargate pricing
Amazon ECS on Amazon EC2
EC2 pricing
Amazon ECS Anywhere
ECS Anywhere pricing
How it works
Introduction to Amazon Elastic Container Service ...
Copy link
CloudShell
Feedback
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Privacy
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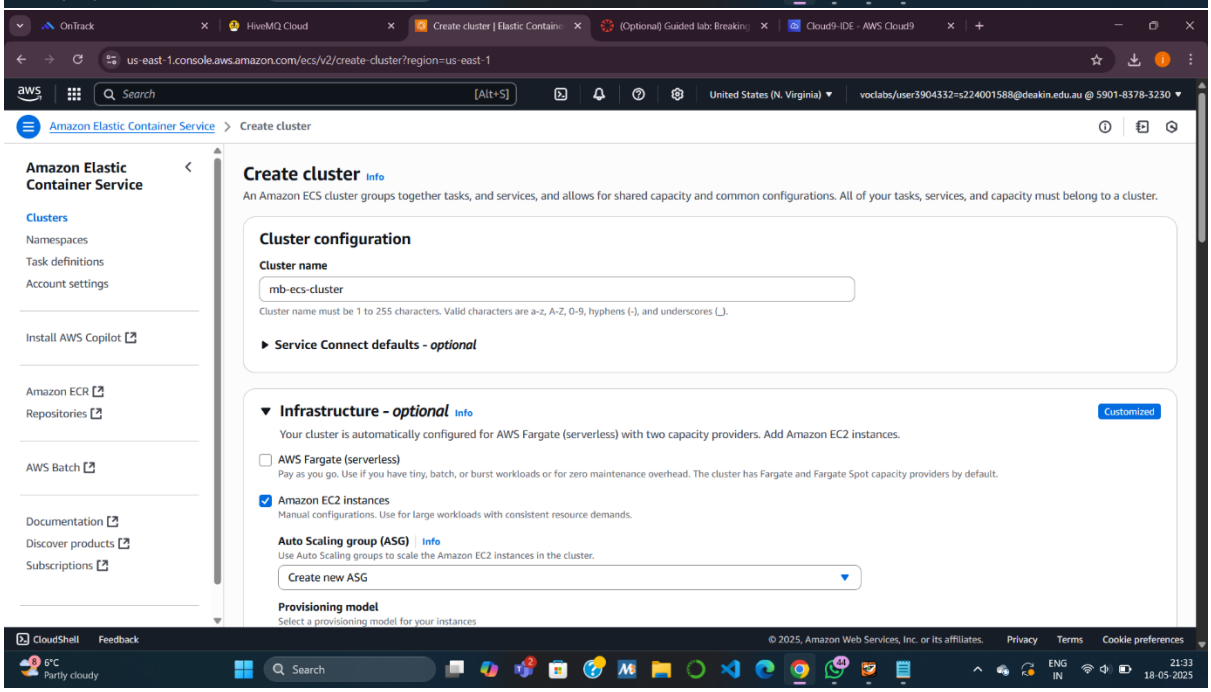
us-east-1.console.aws.amazon.com/ecs/v2/create-cluster?region=us-east-1
Amazon Elastic Container Service
Create cluster
Amazon Elastic Container Service
Clusters
Namespaces
Task definitions
Account settings
Install AWS Copilot
Amazon ECR
Repositories
AWS Batch
Documentation
Discover products
Subscriptions
Create cluster Info
An Amazon ECS cluster groups together tasks, and services, and allows for shared capacity and common configurations. All of your tasks, services, and capacity must belong to a cluster.
Cluster configuration
Cluster name
mb-ecs-cluster
Cluster name must be 1 to 255 characters. Valid characters are a-z, A-Z, 0-9, hyphens (-), and underscores (_).
Service Connect defaults - optional
Infrastructure - optional Info
Customized
Your cluster is automatically configured for AWS Fargate (serverless) with two capacity providers. Add Amazon EC2 instances.
AWS Fargate (serverless)
Pay as you go. Use if you have tiny, batch, or burst workloads or for zero maintenance overhead. The cluster has Fargate and Fargate Spot capacity providers by default.
Amazon EC2 instances
Manual configurations. Use for large workloads with consistent resource demands.
Auto Scaling group (ASG) Info
Use Auto Scaling groups to scale the Amazon EC2 instances in the cluster.
Create new ASG
Provisioning model
Select a provisioning model for your instances
CloudShell
Feedback
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Privacy
Terms
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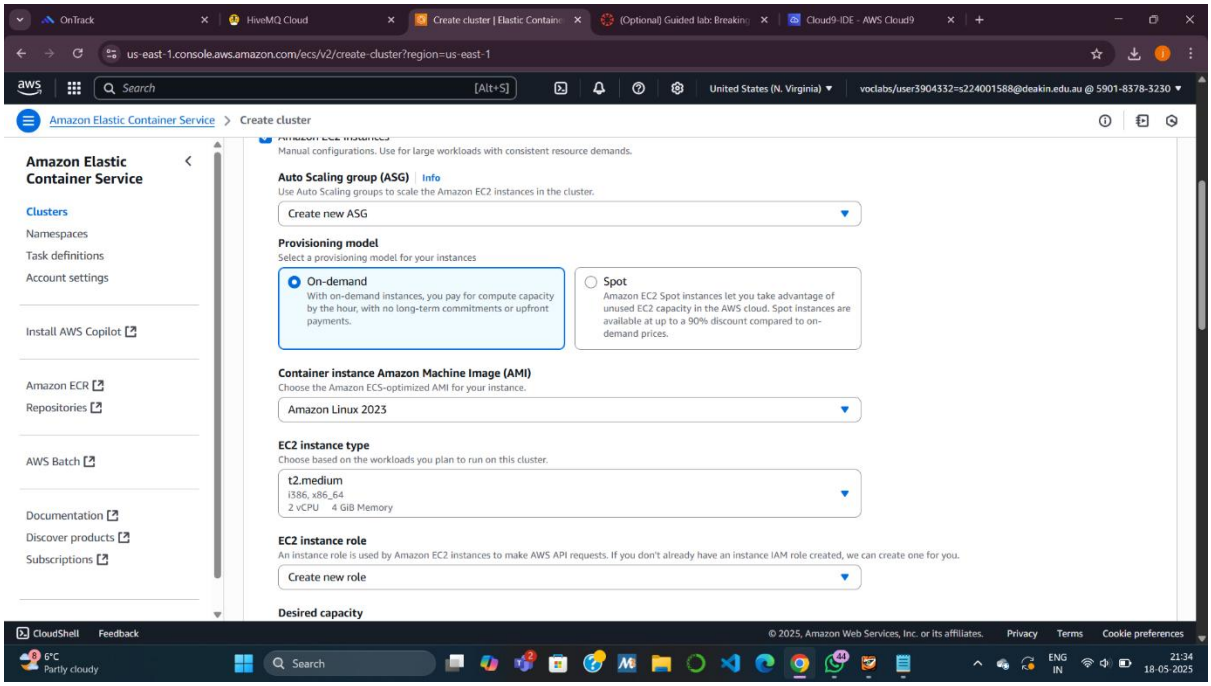
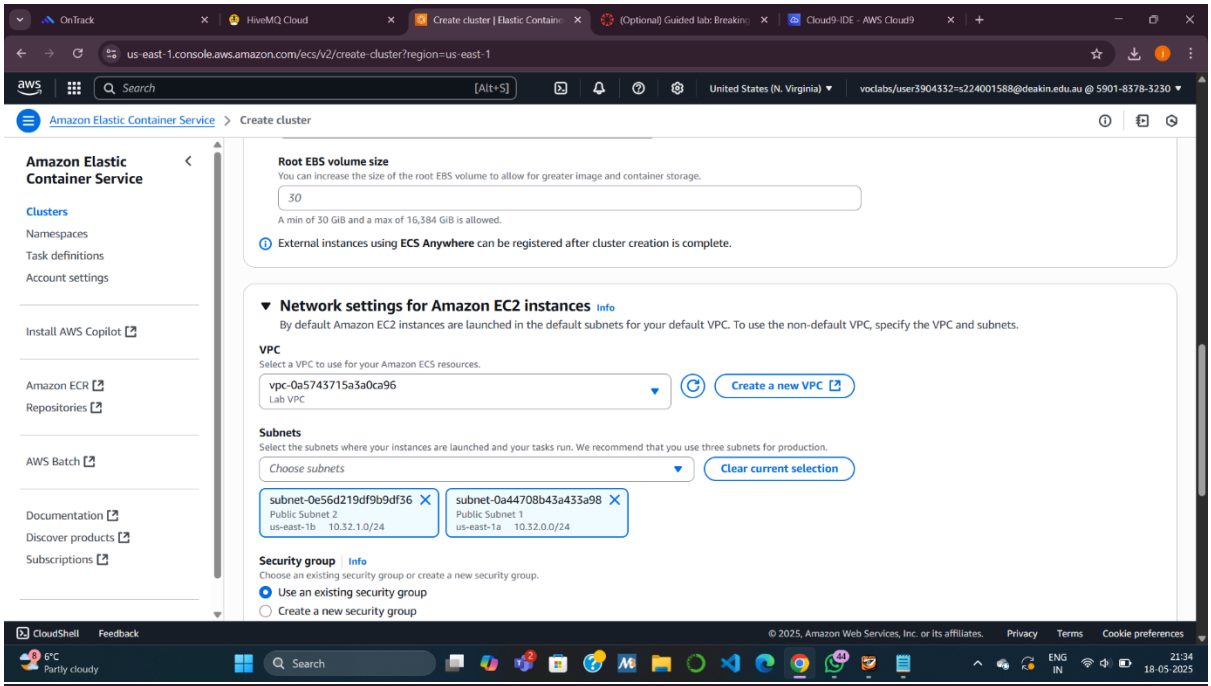
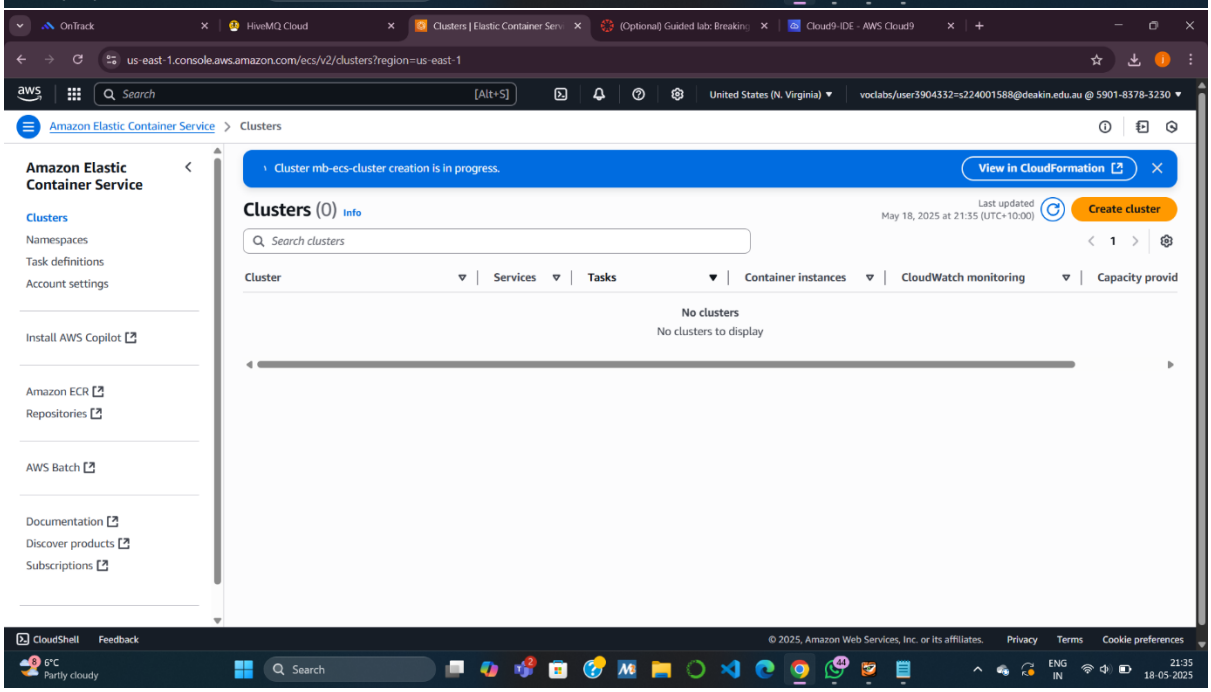
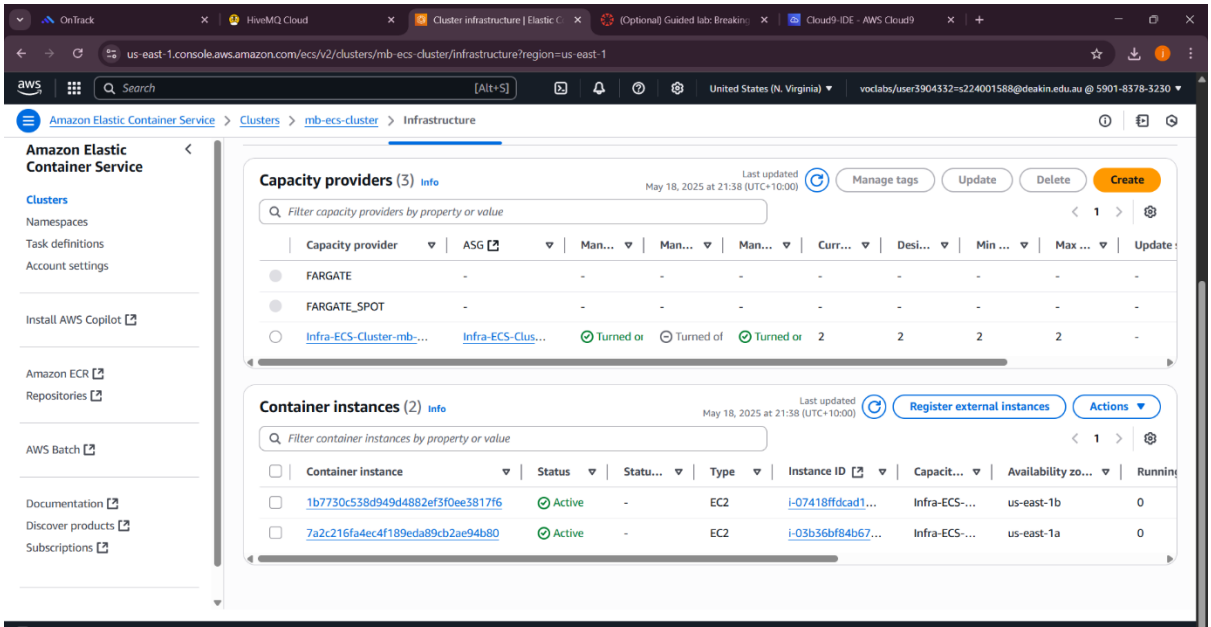

OnTrack
HiveMQ Cloud
Create cluster | Elastic Containe
(Optional) Guided lab: Breaking
Cloud9-IDE - AWS Cloud9
us-east-1.console.aws.amazon.com/ecs/v2/create-cluster?region=us-east-1
Search
[Alt+S]
United States (N. Virginia)
voclabs/user3904332=s224001588@deakin.edu.au @ 5901-8378-3230
Amazon Elastic Container Service
Create cluster
Amazon Elastic Container Service
Clusters
Namespaces
Task definitions
Account settings
Install AWS Copilot
Amazon ECR
Repositories
AWS Batch
Documentation
Discover products
Subscriptions
Manual configurations. Use for large workloads with consistent resource demands.
Auto Scaling group (ASG) Info
Use Auto Scaling groups to scale the Amazon EC2 instances in the cluster.
Create new ASG
Provisioning model
Select a provisioning model for your instances
On-demand
With on-demand instances, you pay for compute capacity by the hour, with no long-term commitments or upfront payments.
Spot
Amazon EC2 Spot instances let you take advantage of unused EC2 capacity in the AWS cloud. Spot instances are available at up to a 90% discount compared to on-demand prices.
Container instance Amazon Machine Image (AMI)
Choose the Amazon ECS-optimized AMI for your instance.
Amazon Linux 2023
EC2 instance type
Choose based on the workloads you plan to run on this cluster.
t2.medium
i386, x86_64
2 vCPU 4 GiB Memory
EC2 instance role
An instance role is used by Amazon EC2 instances to make AWS API requests. If you don't already have an instance IAM role created, we can create one for you.
Create new role
Desired capacity
CloudShell
Feedback
© 2025, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences
6°C
Partly cloudy
Search
ENG
IN
21:34
18-05-2025


OnTrack
HiveMQ Cloud
Create cluster | Elastic Containe
(Optional) Guided lab: Breaking
Cloud9-IDE - AWS Cloud9
us-east-1.console.aws.amazon.com/ecs/v2/create-cluster?region=us-east-1
Search [Alt+S]
United States (N. Virginia)
voclabs/user3904332=s224001588@deakin.edu.au @ 5901-8378-3230
Amazon Elastic Container Service
Create cluster
Amazon Elastic Container Service
Clusters
Namespaces
Task definitions
Account settings
Install AWS Copilot
Amazon ECR
Repositories
AWS Batch
Documentation
Discover products
Subscriptions
Root EBS volume size
You can increase the size of the root EBS volume to allow for greater image and container storage.
30
A min of 30 GiB and a max of 16,384 GiB is allowed.
External instances using ECS Anywhere can be registered after cluster creation is complete.
Network settings for Amazon EC2 instances Info
By default Amazon EC2 instances are launched in the default subnets for your default VPC. To use the non-default VPC, specify the VPC and subnets.
VPC
Select a VPC to use for your Amazon ECS resources.
vpc-0a5743715a3a0ca96
Lab VPC
Create a new VPC
Subnets
Select the subnets where your instances are launched and your tasks run. We recommend that you use three subnets for production.
Choose subnets
Clear current selection
subnet-0e56d219df9b9df36
Public Subnet 2
us-east-1b 10.32.1.0/24
subnet-0a44708b43a433a98
Public Subnet 1
us-east-1a 10.32.0.0/24
Security group Info
Choose an existing security group or create a new security group.
Use an existing security group
Create a new security group
CloudShell
Feedback
© 2025, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences
6°C
Partly cloudy
Search
ENG
IN
21:34
18-05-2025


OnTrack
HiveMQ Cloud
Clusters | Elastic Container Serv
(Optional) Guided lab: Breaking
Cloud9-IDE - AWS Cloud9
us-east-1.console.aws.amazon.com/ecs/v2/clusters?region=us-east-1
Search [Alt+S]
United States (N. Virginia)
voclabs/user3904332=s224001588@deakin.edu.au @ 5901-8378-3230
Amazon Elastic Container Service
Clusters
Amazon Elastic Container Service
Clusters
Namespaces
Task definitions
Account settings
Install AWS Copilot
Amazon ECR
Repositories
AWS Batch
Documentation
Discover products
Subscriptions
Cluster mb-ecs-cluster creation is in progress.
View in CloudFormation
Clusters (0) Info
Last updated
May 18, 2025 at 21:35 (UTC+10:00)
Create cluster
Search clusters
1
Cluster
Services
Tasks
Container instances
CloudWatch monitoring
Capacity provid
No clusters
No clusters to display
CloudShell
Feedback
© 2025, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences
6°C
Partly cloudy
Search
ENG
IN
21:35
18-05-2025


OnTrack
HiveMQ Cloud
Cluster infrastructure | Elastic C
(Optional) Guided lab: Breaking
Cloud9-IDE - AWS Cloud9
us-east-1.console.aws.amazon.com/ecs/v2/clusters/mb-ecs-cluster/infrastructure?region=us-east-1
Search [Alt+S]
United States (N. Virginia)
voclabs/user3904332=s224001588@deakin.edu.au @ 5901-8378-3230
Amazon Elastic Container Service > Clusters > mb-ecs-cluster > Infrastructure
Amazon Elastic Container Service
Clusters
Namespaces
Task definitions
Account settings
Install AWS Copilot
Amazon ECR
Repositories
AWS Batch
Documentation
Discover products
Subscriptions
Capacity providers (3) Info
Last updated May 18, 2025 at 21:38 (UTC+10:00)
Manage tags
Update
Delete
Create
Filter capacity providers by property or value
Capacity provider
ASG
FARGATE
FARGATE_SPOT
Infra-ECS-Cluster-mb-...
Infra-ECS-Clus...
Turned on
Turned off
Container instances (2) Info
Last updated May 18, 2025 at 21:38 (UTC+10:00)
Register external instances
Actions
Filter container instances by property or value
Container instance
Status
Type
Instance ID
Capacit...
Availability zo...
1b7730c538d949d4882ef3f0ee3817f6
Active
EC2
i-07418ffdcad1...
Infra-ECS-...
us-east-1b
7a2c216fa4ec4f189eda89cb2ae94b80
i-03b36bf84b67...
us-east-1a
CloudShell
Feedback
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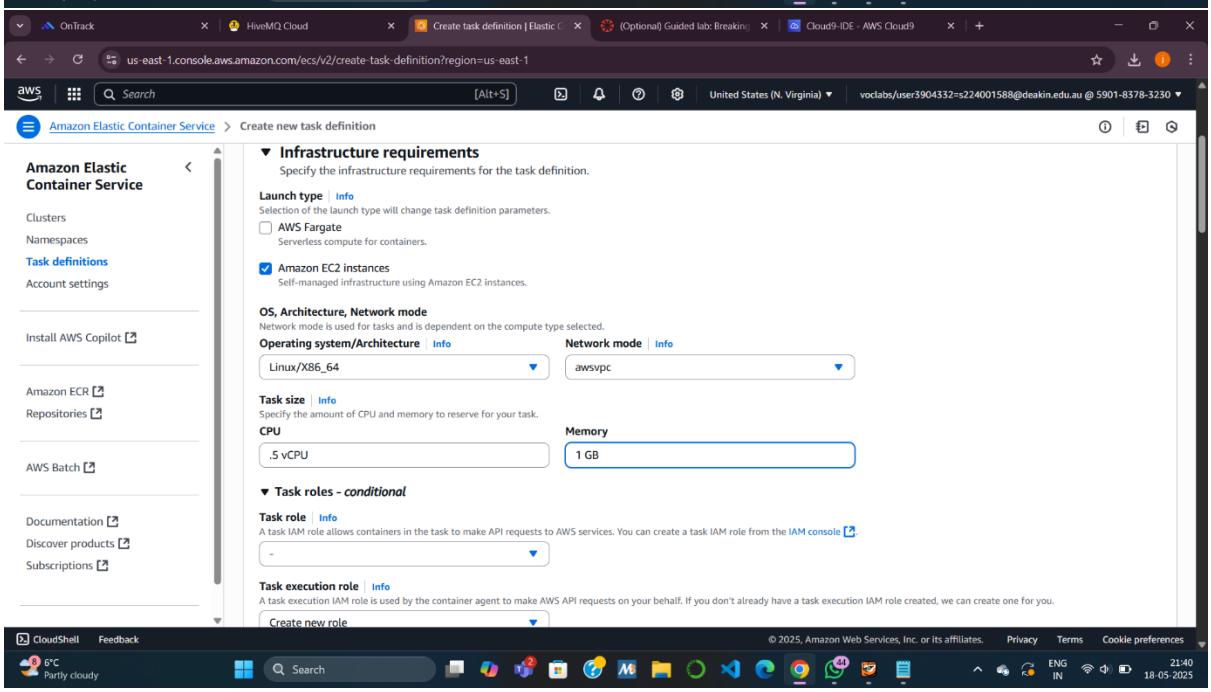
Cookie preferences
6°C
Partly cloudy
ENG
IN
21:38
18-05-2025


OnTrack
HiveMQ Cloud
Create task definition | Elastic C
(Optional) Guided lab: Breaking
Cloud9-IDE - AWS Cloud9
us-east-1.console.aws.amazon.com/ecs/v2/create-task-definition?region=us-east-1
Search [Alt+S]
United States (N. Virginia)
voclabs/user3904332=s224001588@deakin.edu.au @ 5901-8378-3230
Amazon Elastic Container Service > Create new task definition
Amazon Elastic Container Service
Clusters
Namespaces
Task definitions
Account settings
Install AWS Copilot
Amazon ECR
Repositories
AWS Batch
Documentation
Discover products
Subscriptions
Infrastructure requirements
Specify the infrastructure requirements for the task definition.
Launch type Info
Selection of the launch type will change task definition parameters.
AWS Fargate
Serverless compute for containers.
Amazon EC2 instances
Self-managed infrastructure using Amazon EC2 instances.
OS, Architecture, Network mode
Network mode is used for tasks and is dependent on the compute type selected.
Operating system/Architecture Info
Linux/X86_64
Network mode Info
awsvpc
Task size Info
Specify the amount of CPU and memory to reserve for your task.
CPU
.5 vCPU
Memory
1 GB
Task roles - conditional
Task role Info
A task IAM role allows containers in the task to make API requests to AWS services. You can create a task IAM role from the IAM console
Task execution role Info
A task execution IAM role is used by the container agent to make AWS API requests on your behalf. If you don't already have a task execution IAM role created, we can create one for you.
Create new role
CloudShell
Feedback
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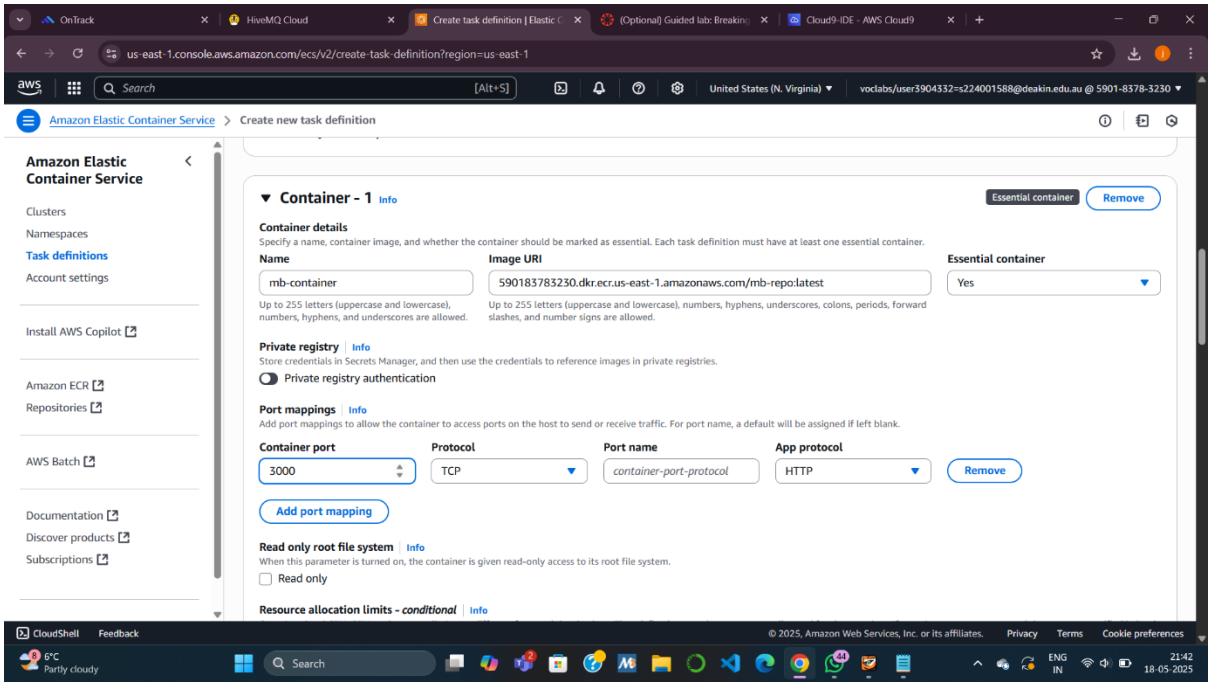
Partly cloudy
ENG
IN
21:40
18-05-2025


OnTrack
HiveMQ Cloud
Create task definition | Elastic C
(Optional) Guided lab: Breaking
Cloud9-IDE - AWS Cloud9
us-east-1.console.aws.amazon.com/ecs/v2/create-task-definition?region=us-east-1
Search
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United States (N. Virginia)
voclabs/user3904332=s224001588@deakin.edu.au @ 5901-8378-3230
Amazon Elastic Container Service
Create new task definition
Amazon Elastic Container Service
Clusters
Namespaces
Task definitions
Account settings
Install AWS Copilot
Amazon ECR
Repositories
AWS Batch
Documentation
Discover products
Subscriptions
Container - 1 Info
Essential container
Remove
Container details
Specify a name, container image, and whether the container should be marked as essential. Each task definition must have at least one essential container.
Name
mb-container
Up to 255 letters (uppercase and lowercase), numbers, hyphens, and underscores are allowed.
Image URI
590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-repo:latest
Up to 255 letters (uppercase and lowercase), numbers, hyphens, underscores, colons, periods, forward slashes, and number signs are allowed.
Essential container
Yes
Private registry Info
Store credentials in Secrets Manager, and then use the credentials to reference images in private registries.
Private registry authentication
Port mappings Info
Add port mappings to allow the container to access ports on the host to send or receive traffic. For port name, a default will be assigned if left blank.
Container port
3000
Protocol
TCP
Port name
container-port-protocol
App protocol
HTTP
Remove
Add port mapping
Read only root file system Info
When this parameter is turned on, the container is given read-only access to its root file system.
Read only
Resource allocation limits - conditional Info
CloudShell
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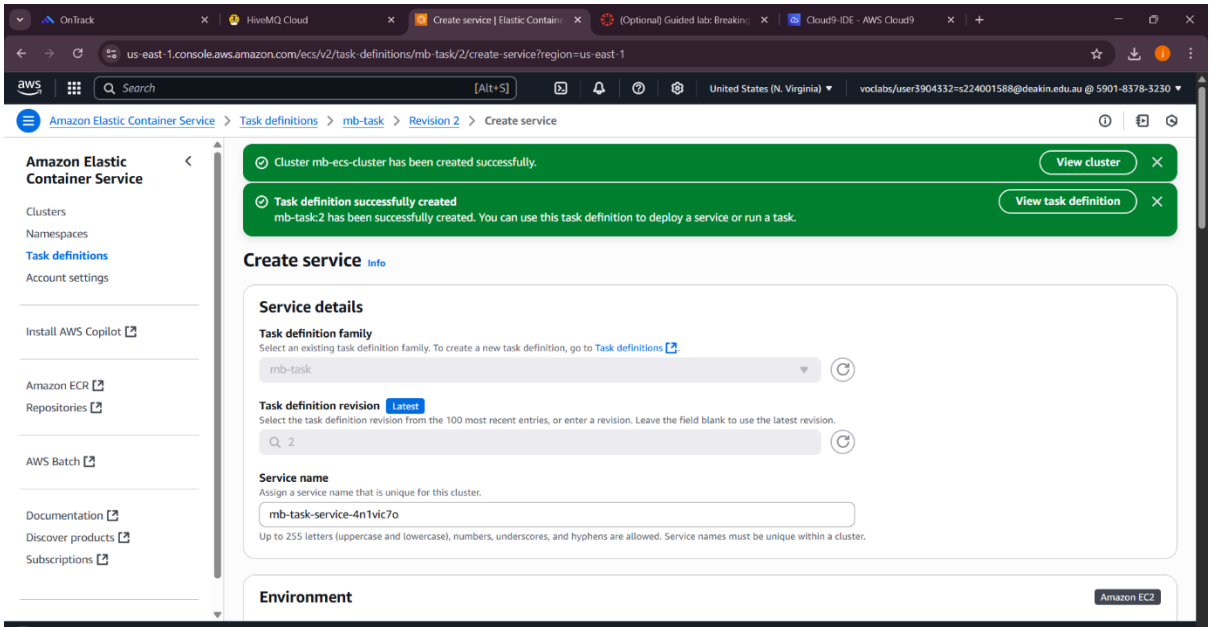
Cookie preferences
6°C
Partly cloudy
Search
ENG
IN
21:42
18-05-2025


Amazon Elastic Container Service
Clusters
Namespaces
Task definitions
Account settings
Install AWS Copilot
Amazon ECR
Repositories
AWS Batch
Documentation
Discover products
Subscriptions
Amazon Elastic Container Service > Task definitions > mb-task > Revision 2 > Create service
Cluster mb-ecs-cluster has been created successfully.
View cluster
Task definition successfully created
mb-task:2 has been successfully created. You can use this task definition to deploy a service or run a task.
View task definition
Create service Info
Service details
Task definition family
Select an existing task definition family. To create a new task definition, go to Task definitions.
mb-task
Task definition revision Latest
Select the task definition revision from the 100 most recent entries, or enter a revision. Leave the field blank to use the latest revision.
2
Service name
Assign a service name that is unique for this cluster.
mb-task-service-4n1vic7o
Up to 255 letters (uppercase and lowercase), numbers, underscores, and hyphens are allowed. Service names must be unique within a cluster.
Environment
Amazon EC2
CloudShell
Feedback
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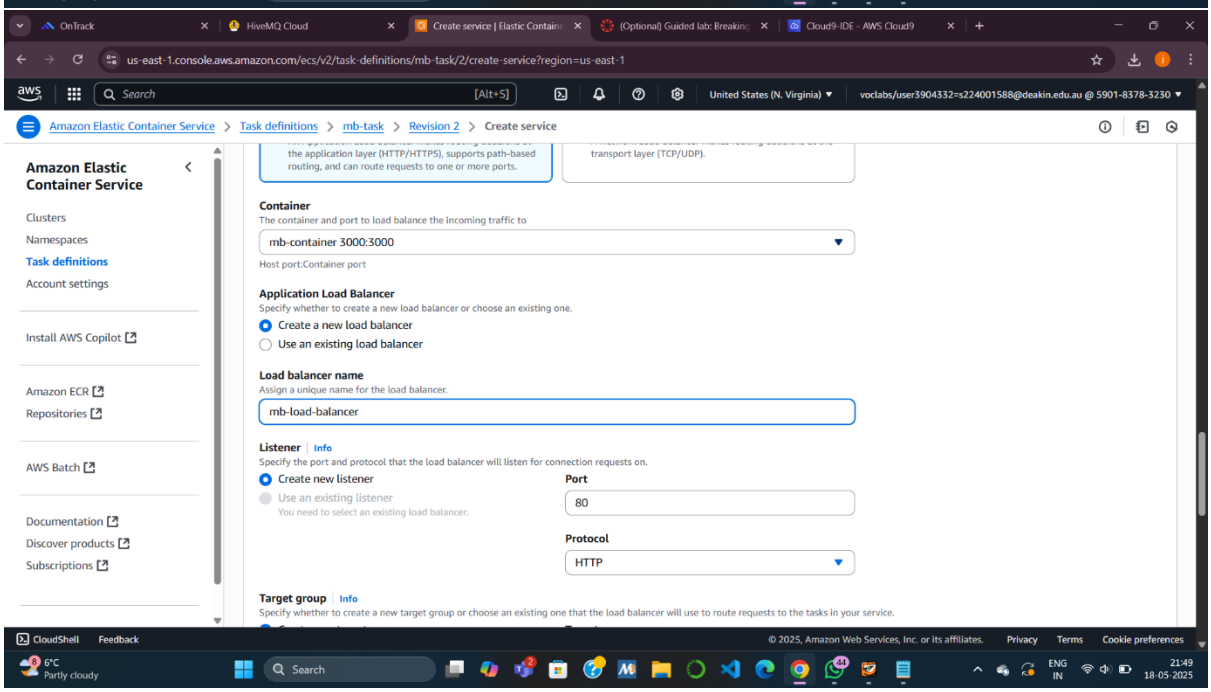
Amazon Elastic Container Service
Clusters
Namespaces
Task definitions
Account settings
Install AWS Copilot
Amazon ECR
Repositories
AWS Batch
Documentation
Discover products
Subscriptions
Amazon Elastic Container Service > Task definitions > mb-task > Revision 2 > Create service
the application layer (HTTP/HTTPS), supports path-based routing, and can route requests to one or more ports.
transport layer (TCP/UDP).
Container
The container and port to load balance the incoming traffic to
mb-container 3000:3000
Host port:Container port
Application Load Balancer
Specify whether to create a new load balancer or choose an existing one.
Create a new load balancer
Use an existing load balancer
Load balancer name
Assign a unique name for the load balancer.
mb-load-balancer
Listener Info
Specify the port and protocol that the load balancer will listen for connection requests on.
Create new listener
Use an existing listener
You need to select an existing load balancer.
Port
80
Protocol
HTTP
Target group Info
Specify whether to create a new target group or choose an existing one that the load balancer will use to route requests to the tasks in your service.
CloudShell
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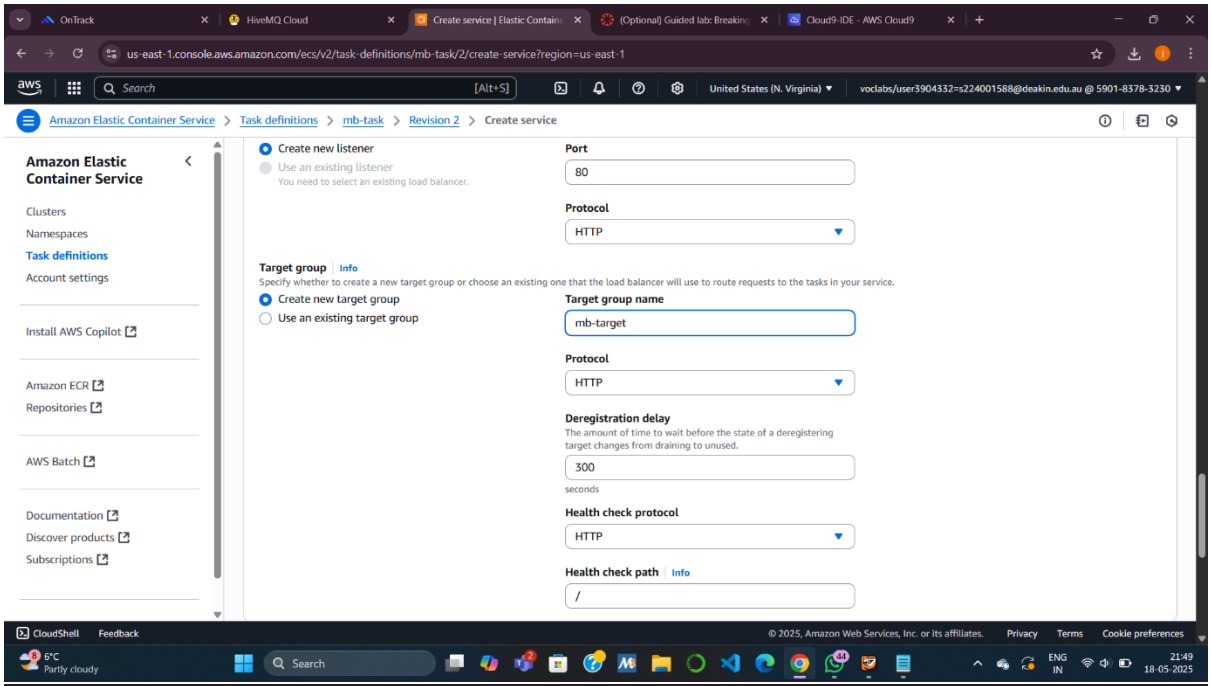
us-east-1.console.aws.amazon.com/ecs/v2/task-definitions/mb-task/2/create-service?region=us-east-1
Amazon Elastic Container Service > Task definitions > mb-task > Revision 2 > Create service
Amazon Elastic Container Service
Clusters
Namespaces
Task definitions
Account settings
Install AWS Copilot
Amazon ECR
Repositories
AWS Batch
Documentation
Discover products
Subscriptions
Create new listener
Use an existing listener
You need to select an existing load balancer.
Port
80
Protocol
HTTP
Target group Info
Specify whether to create a new target group or choose an existing one that the load balancer will use to route requests to the tasks in your service.
Create new target group
Use an existing target group
Target group name
mb-target
Protocol
HTTP
Deregistration delay
The amount of time to wait before the state of a deregistering target changes from draining to unused.
300
seconds
Health check protocol
HTTP
Health check path Info
/
CloudShell
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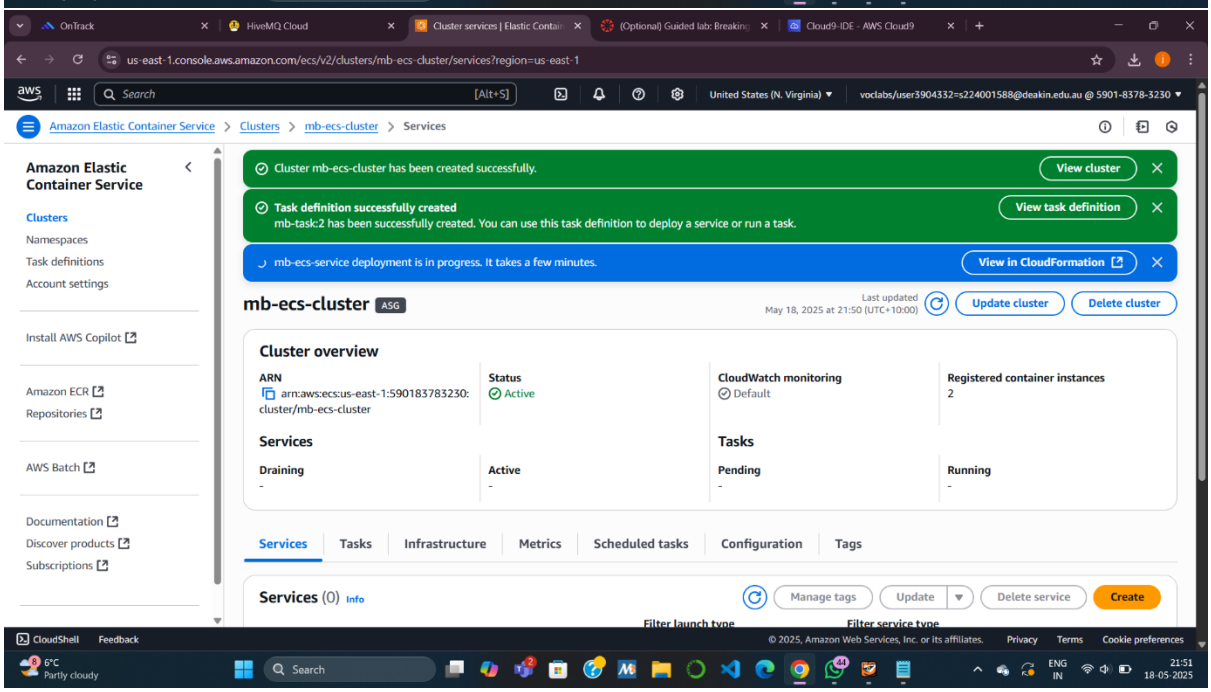
us-east-1.console.aws.amazon.com/ecs/v2/clusters/mb-ecs-cluster/services?region=us-east-1
Amazon Elastic Container Service > Clusters > mb-ecs-cluster > Services
Amazon Elastic Container Service
Clusters
Namespaces
Task definitions
Account settings
Install AWS Copilot
Amazon ECR
Repositories
AWS Batch
Documentation
Discover products
Subscriptions
Cluster mb-ecs-cluster has been created successfully.
View cluster
Task definition successfully created
mb-task:2 has been successfully created. You can use this task definition to deploy a service or run a task.
View task definition
mb-ecs-service deployment is in progress. It takes a few minutes.
View in CloudFormation
mb-ecs-cluster
ASG
Last updated
May 18, 2025 at 21:50 (UTC+10:00)
Update cluster
Delete cluster
Cluster overview
ARN
arn:aws:ecs:us-east-1:590183783230:cluster/mb-ecs-cluster
Status
Active
CloudWatch monitoring
Default
Registered container instances
2
Services
Draining
-
Active
-
Tasks
Pending
-
Running
-
Services
Tasks
Infrastructure
Metrics
Scheduled tasks
Configuration
Tags
Services (0) Info
Manage tags
Update
Delete service
Create
Filter launch type
Filter service type
CloudShell
Feedback
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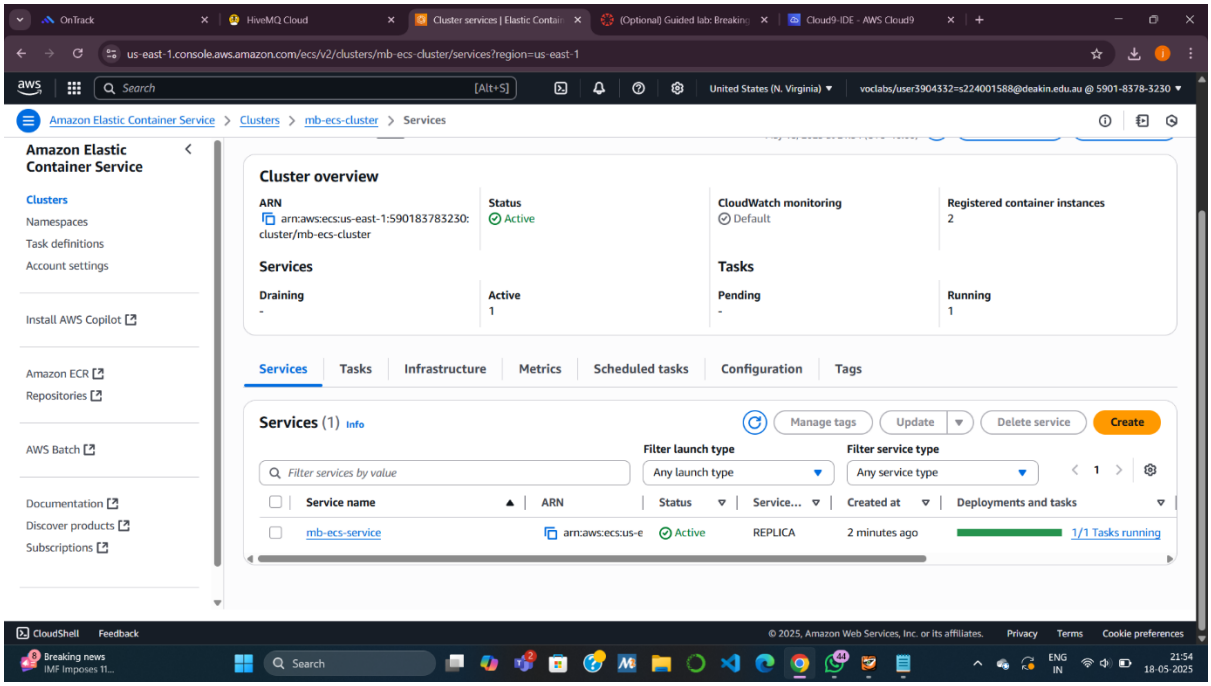
OnTrack
HiveMQ Cloud
Cluster services | Elastic Contai
(Optional) Guided lab: Breaking
Cloud9-IDE - AWS Cloud9
us-east-1.console.aws.amazon.com/ecs/v2/clusters/mb-ecs-cluster/services?region=us-east-1
Search
[Alt+S]
United States (N. Virginia)
voclabs/user3904332=s224001588@deakin.edu.au @ 5901-8378-3230
Amazon Elastic Container Service
Clusters
mb-ecs-cluster
Services
Amazon Elastic Container Service
Clusters
Namespaces
Task definitions
Account settings
Install AWS Copilot
Amazon ECR
Repositories
AWS Batch
Documentation
Discover products
Subscriptions
Cluster overview
ARN
arn:aws:ecs:us-east-1:590183783230:cluster/mb-ecs-cluster
Status
Active
CloudWatch monitoring
Default
Registered container instances
2
Services
Draining
-
Active
1
Tasks
Pending
-
Running
1
Services
Tasks
Infrastructure
Metrics
Scheduled tasks
Configuration
Tags
Services (1) Info
Manage tags
Update
Delete service
Create
Filter services by value
Filter launch type
Any launch type
Filter service type
Any service type
1
Service name
ARN
Status
Service...
Created at
Deployments and tasks
mb-ecs-service
arn:aws:ecs:us-e
Active
REPLICA
2 minutes ago
1/1 Tasks running
CloudShell
Feedback
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Privacy
Terms
Cookie preferences
Breaking news
IMF Imposes 11...
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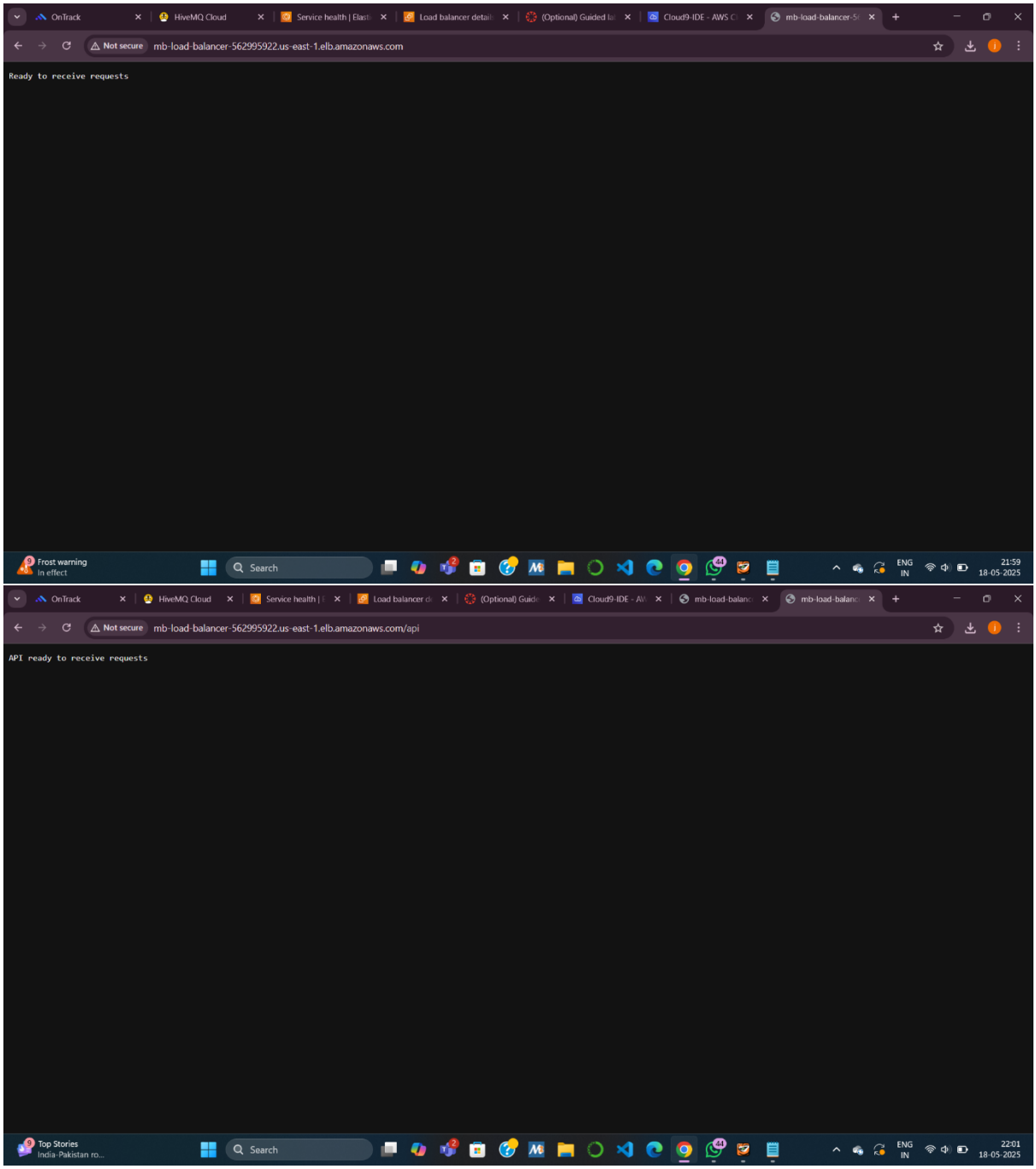
21:54
18-05-2025


OnTrack
HiveMQ Cloud
Service health | Elast
Load balancer detail
(Optional) Guided la
Cloud9-IDE - AWS C
mb-load-balancer-5
Not secure
mb-load-balancer-562995922.us-east-1.elb.amazonaws.com
Ready to receive requests
Frost warning
In effect
Search
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21:59
18-05-2025
OnTrack
HiveMQ Cloud
Service health |
Load balancer d
(Optional) Guide
Cloud9-IDE - AW
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mb-load-balanc
Not secure
mb-load-balancer-562995922.us-east-1.elb.amazonaws.com/api
API ready to receive requests
Top Stories
India-Pakistan ro...
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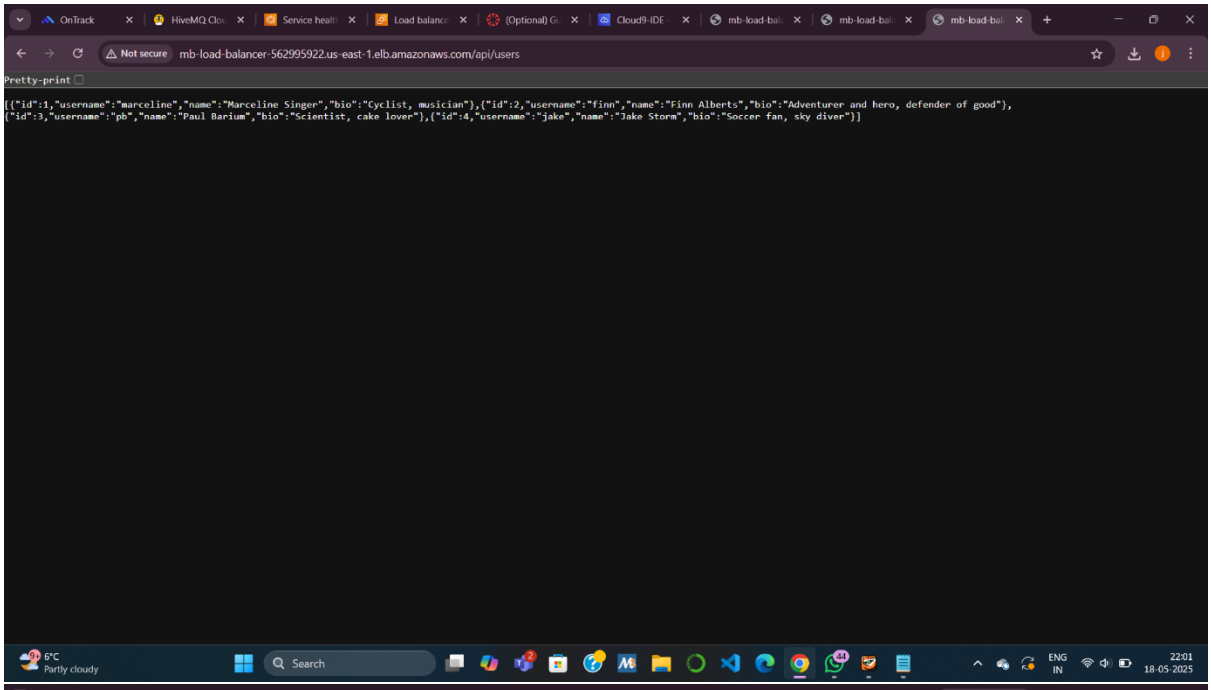
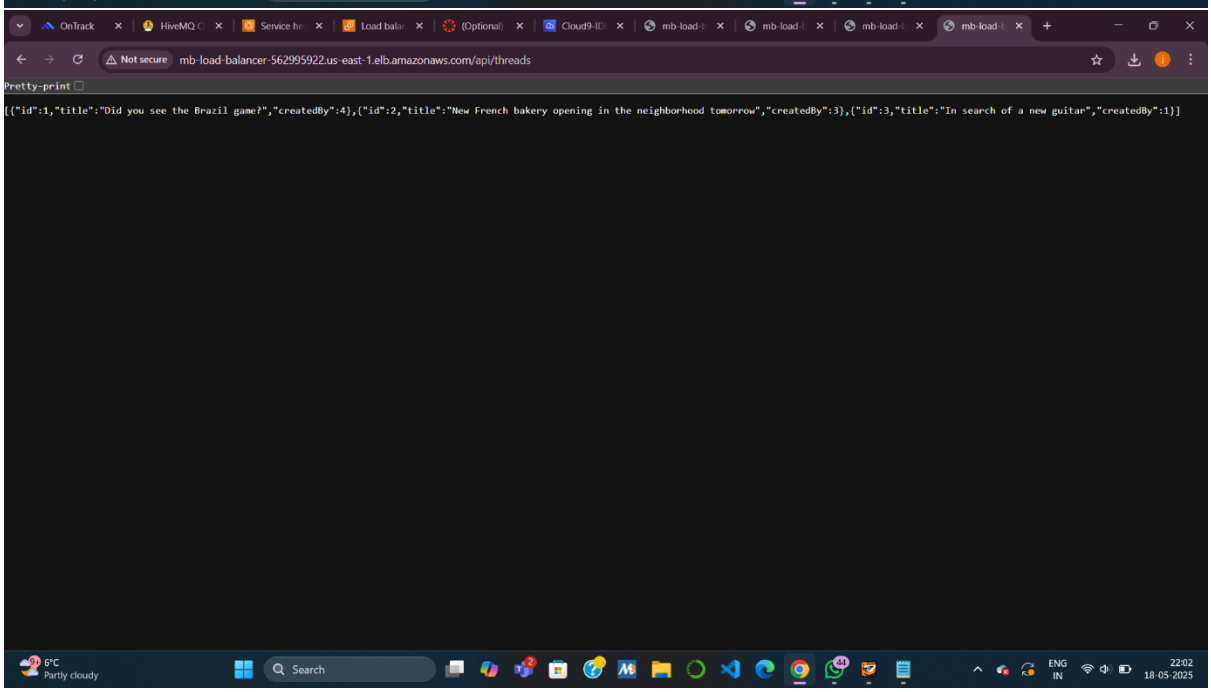
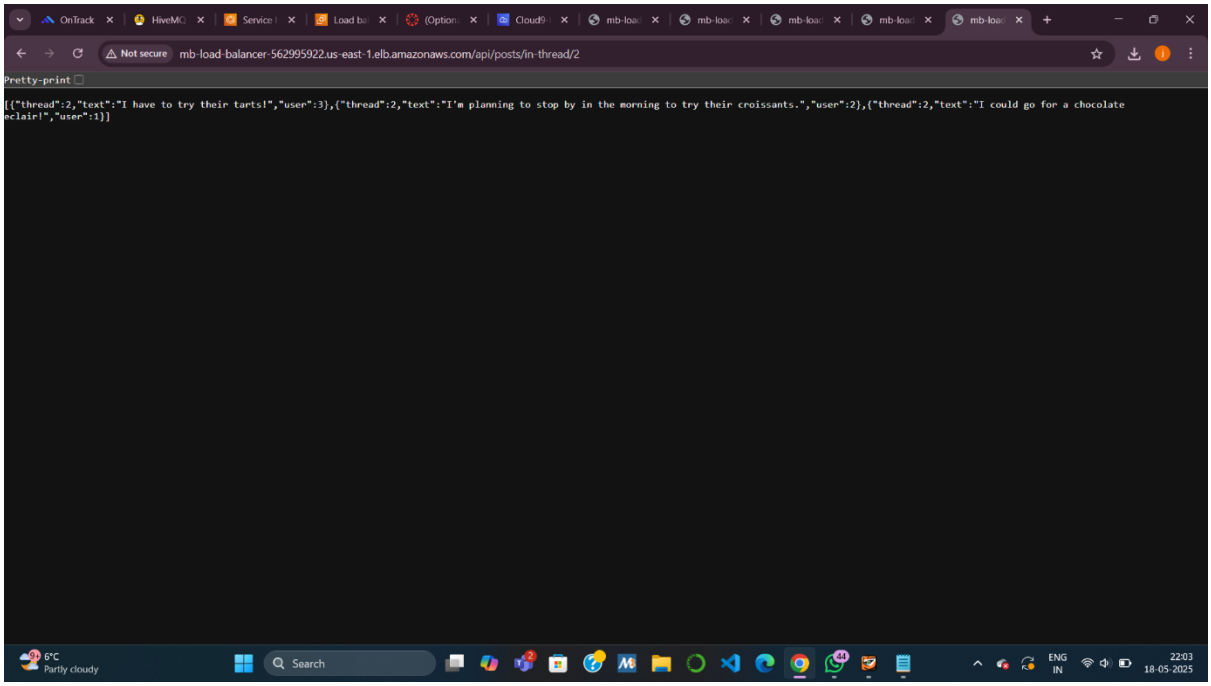
ENG
IN
22:01
18-05-2025


Not secure
mb-load-balancer-562995922.us-east-1.elb.amazonaws.com/api/users
Pretty-print
[{"id":1,"username":"marceline","name":"Marceline Singer","bio":"Cyclist, musician"},{"id":2,"username":"finn","name":"Finn Alberts","bio":"Adventurer and hero, defender of good"},
{"id":3,"username":"pb","name":"Paul Barium","bio":"Scientist, cake lover"},{"id":4,"username":"jake","name":"Jake Storm","bio":"Soccer fan, sky diver"}]
6°C
Partly cloudy
Search
ENG
IN
22:01
18-05-2025


Not secure
mb-load-balancer-562995922.us-east-1.elb.amazonaws.com/api/threads
Pretty-print
[{"id":1,"title":"Did you see the Brazil game?","createdBy":4},{"id":2,"title":"New French bakery opening in the neighborhood tomorrow","createdBy":3},{"id":3,"title":"In search of a new guitar","createdBy":1}]
6°C
Partly cloudy
Search
ENG
IN
22:02
18-05-2025

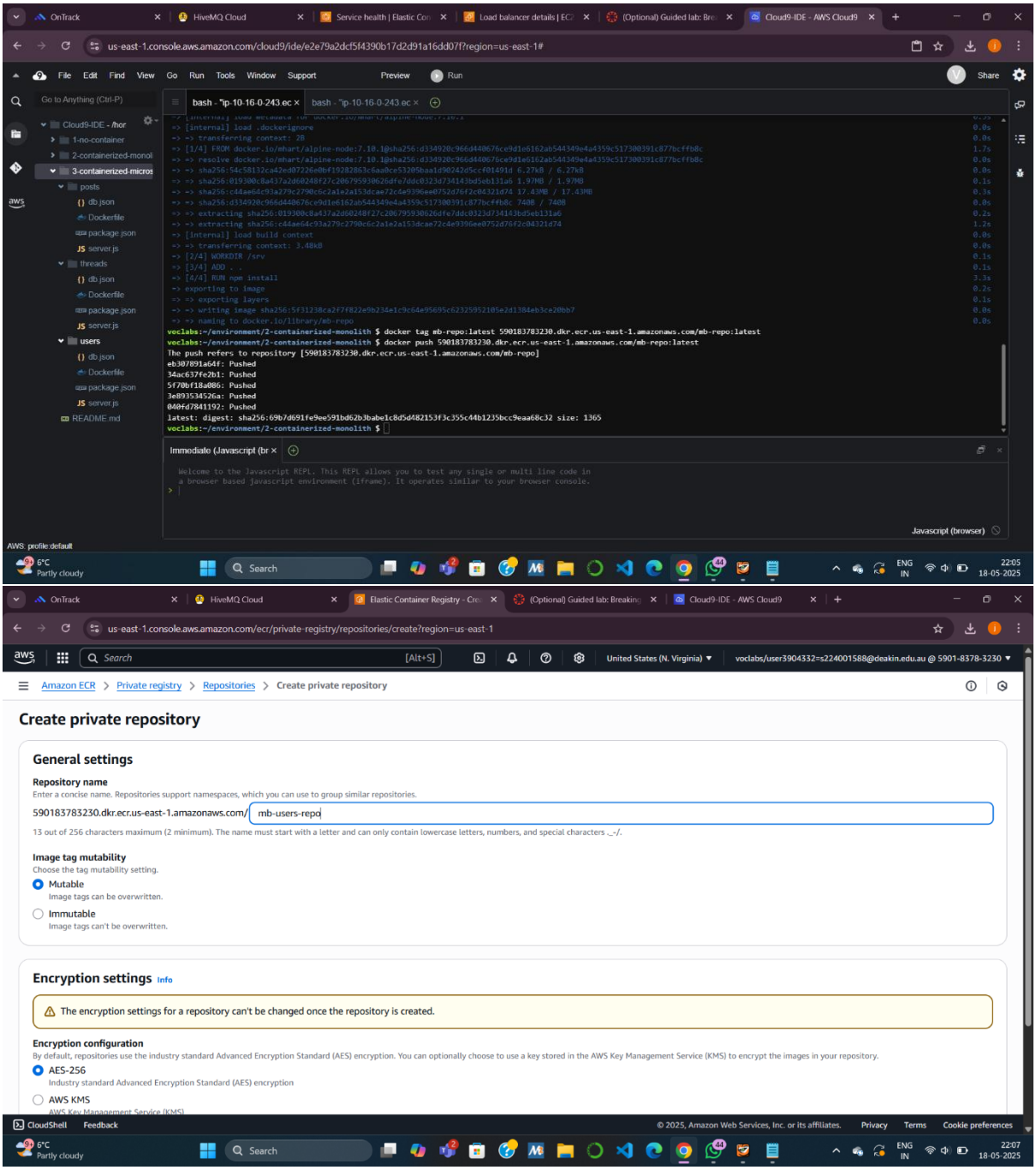


Task 5: Refactoring the Monolith

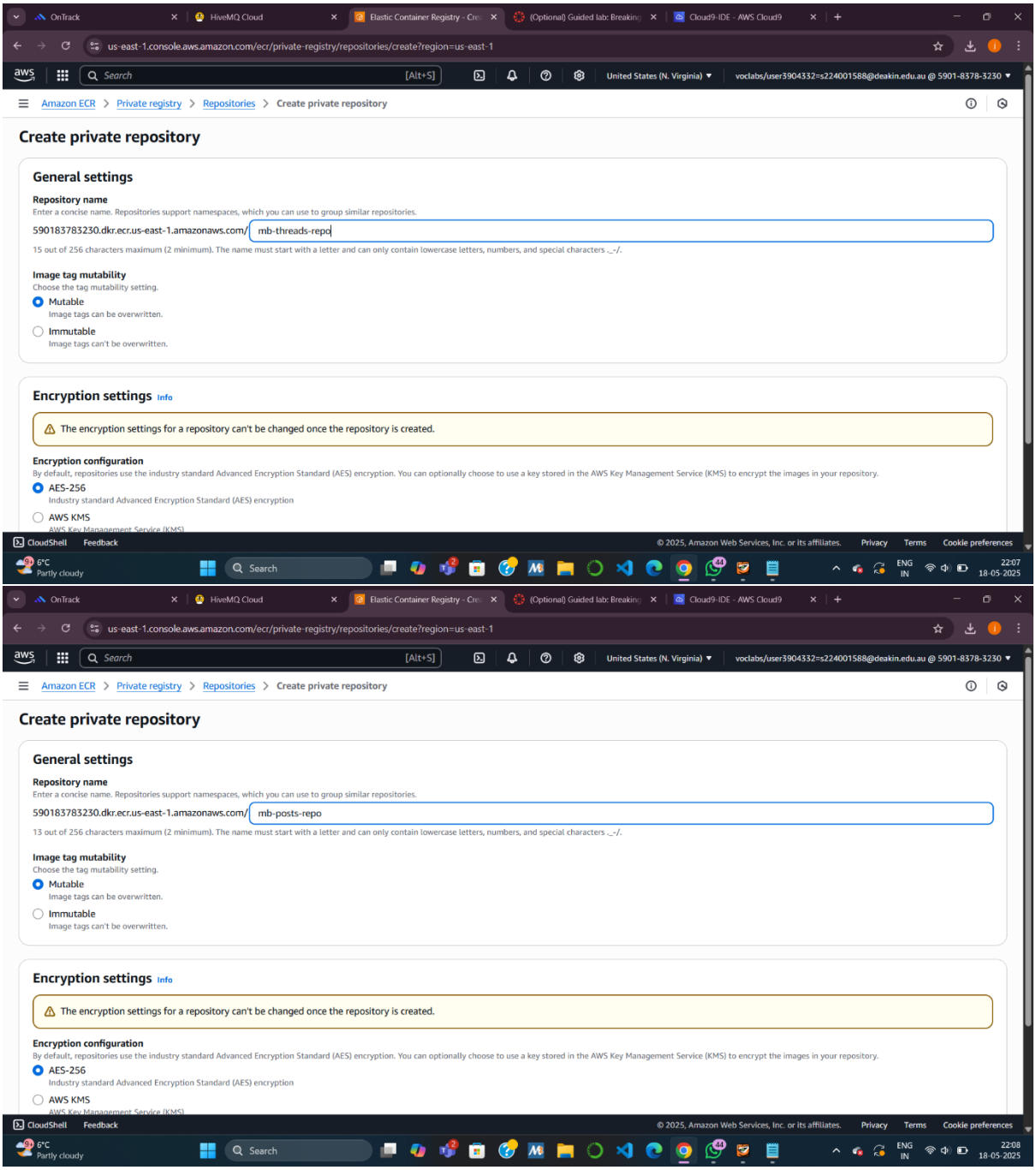
Objective: Break the monolith into **3 separate microservices**.

Subtasks:

- **5.1 Review Refactored App**:
  - Each microservice has its own folder: users, threads, posts.
  - server.js in each folder contains only relevant endpoints.
- **5.2 Create Repositories**:
  - ECR repos: mb-users-repo, mb-threads-repo, mb-posts-repo.
- **5.3 Build & Push Images**:
  - For each service:
    - cd into folder.
    - Run build → tag → push using ECR-provided commands.
    - Verify upload and save image URIs.


OnTrack
HiveMQ Cloud
Service health | Elastic Con
Load balancer details | EC2
(Optional) Guided lab: Bre
Cloud9-IDE - AWS Cloud9
us-east-1.console.aws.amazon.com/cloud9/ide/e2e79a2dcf5f4390b17d2d91a16dd07f?region=us-east-1#
File Edit Find View Go Run Tools Window Support
Preview
Run
Share
Go to Anything (Ctrl-P)
Cloud9-IDE - /hor
1-no-container
2-containerized-monol
3-containerized-micros
posts
db.json
Dockerfile
package.json
server.js
threads
db.json
Dockerfile
package.json
server.js
users
db.json
Dockerfile
package.json
server.js
README.md
bash - "ip-10-16-0-243.ec
bash - "ip-10-16-0-243.ec
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [1/4] FROM docker.io/mhart/alpine-node:7.10.1@sha256:d334920c966d440676ce9d1e6162ab544349e4a4359c517300391c877bcffb8c
=> => resolve docker.io/mhart/alpine-node:7.10.1@sha256:d334920c966d440676ce9d1e6162ab544349e4a4359c517300391c877bcffb8c
=> => sha256:54c58132ca42ed07226e0bf19282863c6aa0ce5305baa1d90242d5ccf01491d 6.27kB / 6.27kB
=> => sha256:019300c8a437a2d60248f27c206795930626dfe7ddc0323d734143bd5eb131a6 1.97MB / 1.97MB
=> => sha256:c44ae64c93a279c2790c6c2a1e2a153dcae72c4e9396ee0752d76f2c04321d74 17.43MB / 17.43MB
=> => sha256:d334920c966d440676ce9d1e6162ab544349e4a4359c517300391c877bcffb8c 740B / 740B
=> => extracting sha256:019300c8a437a2d60248f27c206795930626dfe7ddc0323d734143bd5eb131a6
=> => extracting sha256:c44ae64c93a279c2790c6c2a1e2a153dcae72c4e9396ee0752d76f2c04321d74
=> [internal] load build context
=> => transferring context: 3.48kB
=> [2/4] WORKDIR /srv
=> [3/4] ADD . .
=> [4/4] RUN npm install
=> exporting to image
=> => exporting layers
=> => writing image sha256:5f31238ca2f7f822e8b234e1c9c64e95695c62325952105e2d1384eb3ce20bb7
=> => naming to docker.io/library/mb-repo
voclabs:~/environment/2-containerized-monolith $ docker tag mb-repo:latest 590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-repo:latest
voclabs:~/environment/2-containerized-monolith $ docker push 590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-repo:latest
The push refers to repository [590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-repo]
eb307891a64f: Pushed
34ac637fe2b1: Pushed
5f70bf18a086: Pushed
3e893534526a: Pushed
040fd7841192: Pushed
latest: digest: sha256:69b7d691fe9ee591bd62b3babe1c8d5d482153f3c355c44b1235bcc9eaa68c32 size: 1365
voclabs:~/environment/2-containerized-monolith $
Immediate (Javascript (br
Welcome to the Javascript REPL. This REPL allows you to test any single or multi line code in
a browser based javascript environment (iframe). It operates similar to your browser console.
Javascript (browser)
AWS: profile:default
6°C
Partly cloudy
Search
ENG
IN
22:05
18-05-2025

OnTrack
HiveMQ Cloud
Elastic Container Registry - Cre
(Optional) Guided lab: Breaking
Cloud9-IDE - AWS Cloud9
us-east-1.console.aws.amazon.com/ecr/private-registry/repositories/create?region=us-east-1
Search
[Alt+S]
United States (N. Virginia)
voclabs/user3904332=s224001588@deakin.edu.au @ 5901-8378-3230
Amazon ECR
Private registry
Repositories
Create private repository
Create private repository
General settings
Repository name
Enter a concise name. Repositories support namespaces, which you can use to group similar repositories.
590183783230.dkr.ecr.us-east-1.amazonaws.com/
mb-users-repo
13 out of 256 characters maximum (2 minimum). The name must start with a letter and can only contain lowercase letters, numbers, and special characters ._-/.
Image tag mutability
Choose the tag mutability setting.
Mutable
Image tags can be overwritten.
Immutable
Image tags can't be overwritten.
Encryption settings
Info
The encryption settings for a repository can't be changed once the repository is created.
Encryption configuration
By default, repositories use the industry standard Advanced Encryption Standard (AES) encryption. You can optionally choose to use a key stored in the AWS Key Management Service (KMS) to encrypt the images in your repository.
AES-256
Industry standard Advanced Encryption Standard (AES) encryption
AWS KMS
AWS Key Management Service (KMS)
CloudShell
Feedback
© 2025, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences
6°C
Partly cloudy
Search
ENG
IN
22:07
18-05-2025


OnTrack
HiveMQ Cloud
Elastic Container Registry - Cre
(Optional) Guided lab: Breaking
Cloud9-IDE - AWS Cloud9
us-east-1.console.aws.amazon.com/ecr/private-registry/repositories/create?region=us-east-1
Search
[Alt+S]
United States (N. Virginia)
voclabs/user3904332=s224001588@deakin.edu.au @ 5901-8378-3230
Amazon ECR
Private registry
Repositories
Create private repository
Create private repository
General settings
Repository name
Enter a concise name. Repositories support namespaces, which you can use to group similar repositories.
590183783230.dkr.ecr.us-east-1.amazonaws.com/
mb-threads-repo
15 out of 256 characters maximum (2 minimum). The name must start with a letter and can only contain lowercase letters, numbers, and special characters ._-/.
Image tag mutability
Choose the tag mutability setting.
Mutable
Image tags can be overwritten.
Immutable
Image tags can't be overwritten.
Encryption settings
Info
The encryption settings for a repository can't be changed once the repository is created.
Encryption configuration
By default, repositories use the industry standard Advanced Encryption Standard (AES) encryption. You can optionally choose to use a key stored in the AWS Key Management Service (KMS) to encrypt the images in your repository.
AES-256
Industry standard Advanced Encryption Standard (AES) encryption
AWS KMS
CloudShell
Feedback
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Privacy
Terms
Cookie preferences
6°C
Partly cloudy
Search
ENG
IN
22:07
18-05-2025

OnTrack
HiveMQ Cloud
Elastic Container Registry - Cre
(Optional) Guided lab: Breaking
Cloud9-IDE - AWS Cloud9
us-east-1.console.aws.amazon.com/ecr/private-registry/repositories/create?region=us-east-1
Search
[Alt+S]
United States (N. Virginia)
voclabs/user3904332=s224001588@deakin.edu.au @ 5901-8378-3230
Amazon ECR
Private registry
Repositories
Create private repository
Create private repository
General settings
Repository name
Enter a concise name. Repositories support namespaces, which you can use to group similar repositories.
590183783230.dkr.ecr.us-east-1.amazonaws.com/
mb-posts-repo
13 out of 256 characters maximum (2 minimum). The name must start with a letter and can only contain lowercase letters, numbers, and special characters ._-/.
Image tag mutability
Choose the tag mutability setting.
Mutable
Image tags can be overwritten.
Immutable
Image tags can't be overwritten.
Encryption settings
Info
The encryption settings for a repository can't be changed once the repository is created.
Encryption configuration
By default, repositories use the industry standard Advanced Encryption Standard (AES) encryption. You can optionally choose to use a key stored in the AWS Key Management Service (KMS) to encrypt the images in your repository.
AES-256
Industry standard Advanced Encryption Standard (AES) encryption
AWS KMS
CloudShell
Feedback
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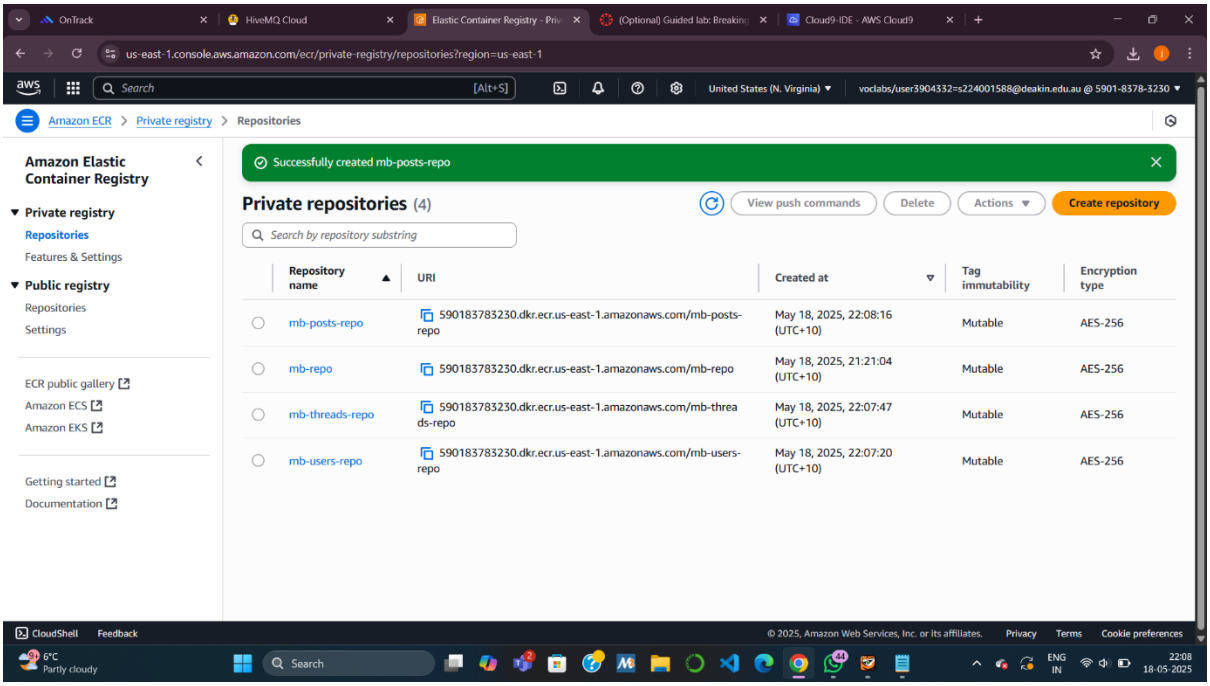
Privacy
Terms
Cookie preferences
6°C
Partly cloudy
Search
ENG
IN
22:08
18-05-2025


OnTrack
HiveMQ Cloud
Elastic Container Registry - Priv
(Optional) Guided lab: Breaking
Cloud9-IDE - AWS Cloud9
us-east-1.console.aws.amazon.com/ecr/private-registry/repositories?region=us-east-1
Search
[Alt+S]
United States (N. Virginia)
voclabs/user3904332=s224001588@deakin.edu.au @ 5901-8378-3230
Amazon ECR
Private registry
Repositories
Amazon Elastic Container Registry
Private registry
Repositories
Features & Settings
Public registry
Repositories
Settings
ECR public gallery
Amazon ECS
Amazon EKS
Getting started
Documentation
Successfully created mb-posts-repo
Private repositories (4)
View push commands
Delete
Actions
Create repository
Search by repository substring
Repository name
URI
Created at
Tag immutability
Encryption type
mb-posts-repo
590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-posts-repo
May 18, 2025, 22:08:16 (UTC+10)
Mutable
AES-256
mb-repo
590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-repo
May 18, 2025, 21:21:04 (UTC+10)
Mutable
AES-256
mb-threads-repo
590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-threads-repo
May 18, 2025, 22:07:47 (UTC+10)
Mutable
AES-256
mb-users-repo
590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-users-repo
May 18, 2025, 22:07:20 (UTC+10)
Mutable
AES-256
CloudShell
Feedback
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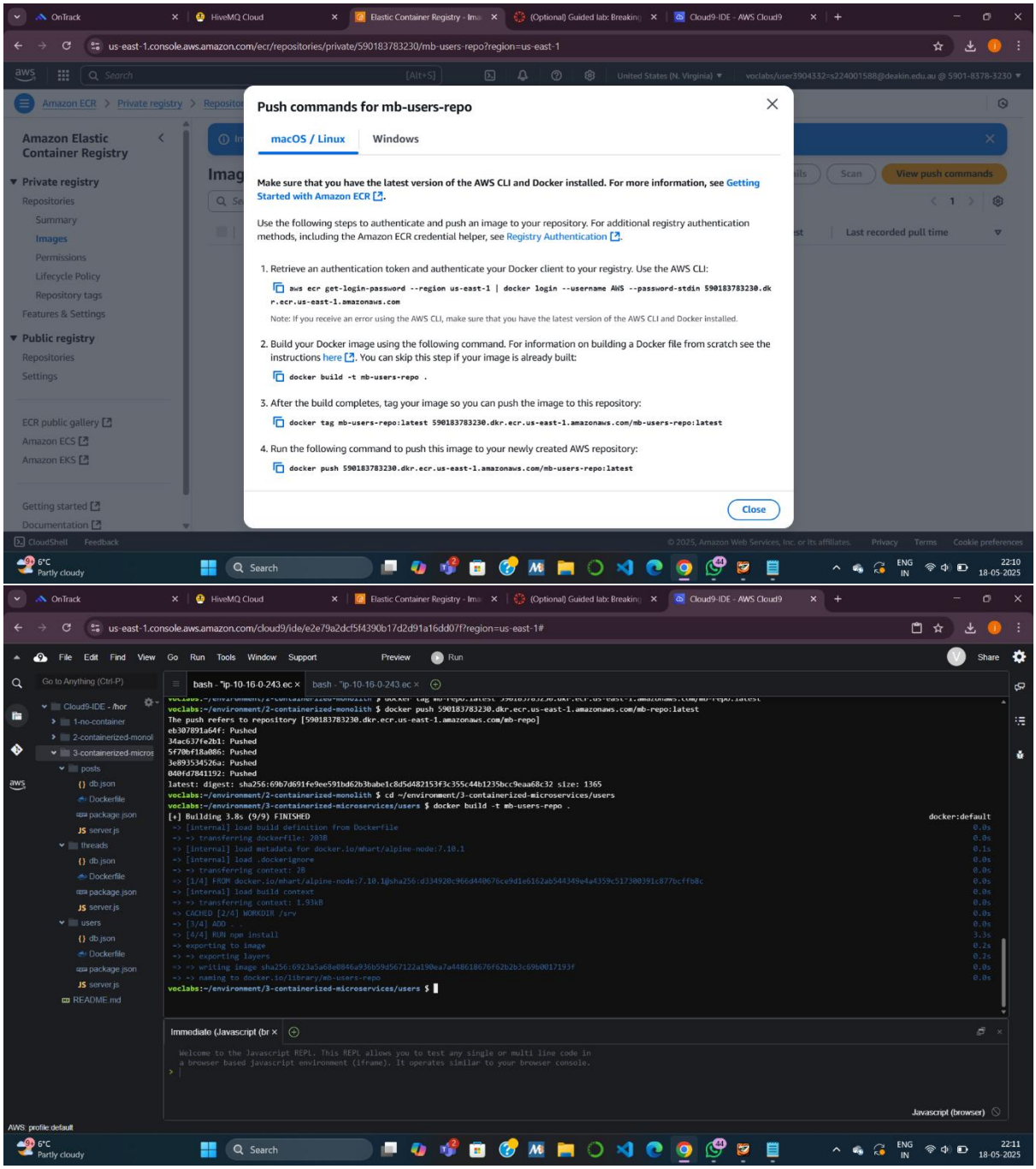
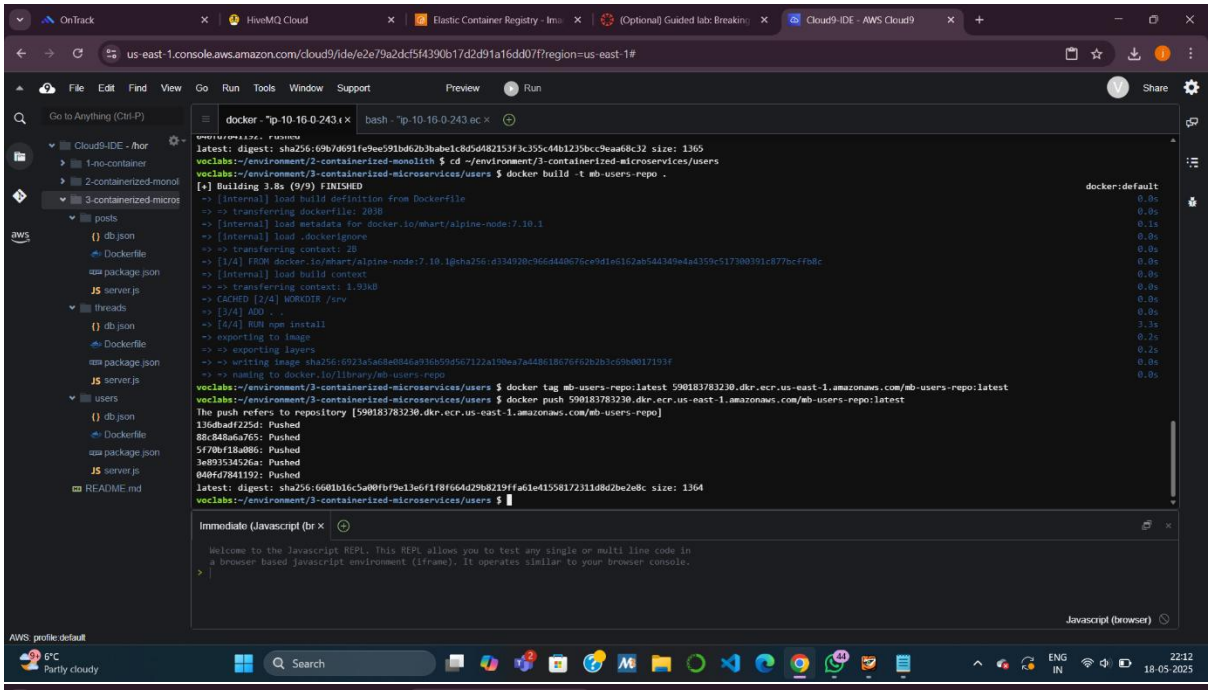
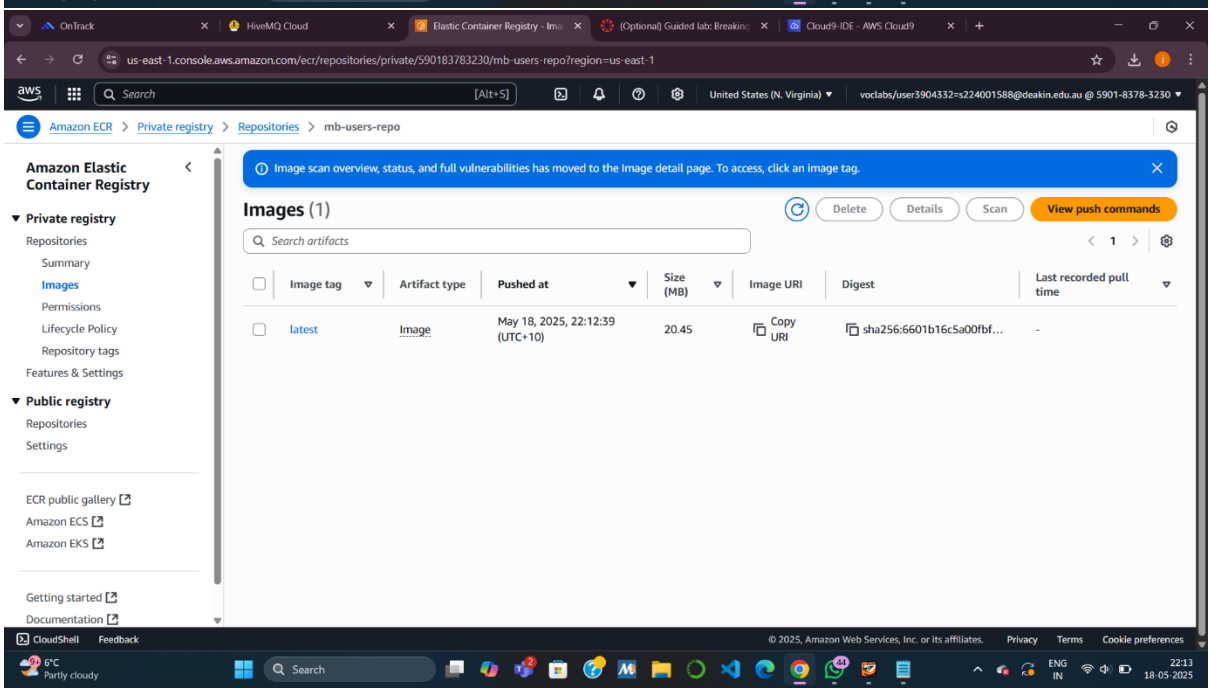
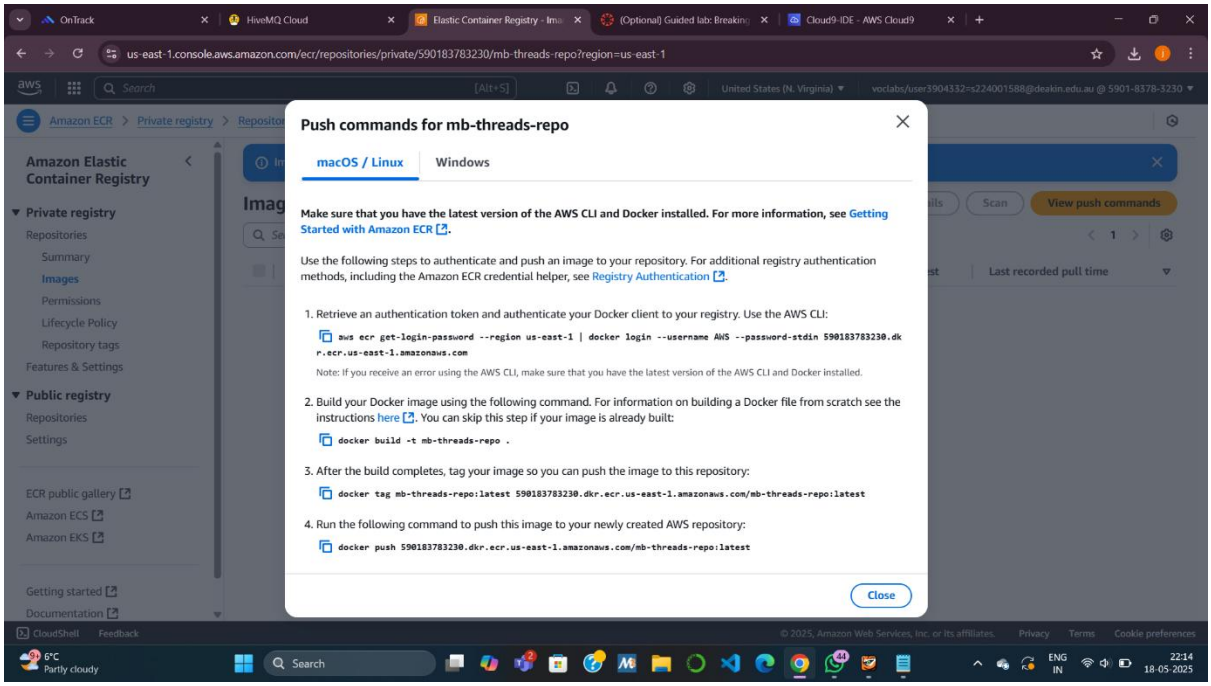
Cookie preferences
6°C
Partly cloudy
Search
ENG
IN
22:08
18-05-2025

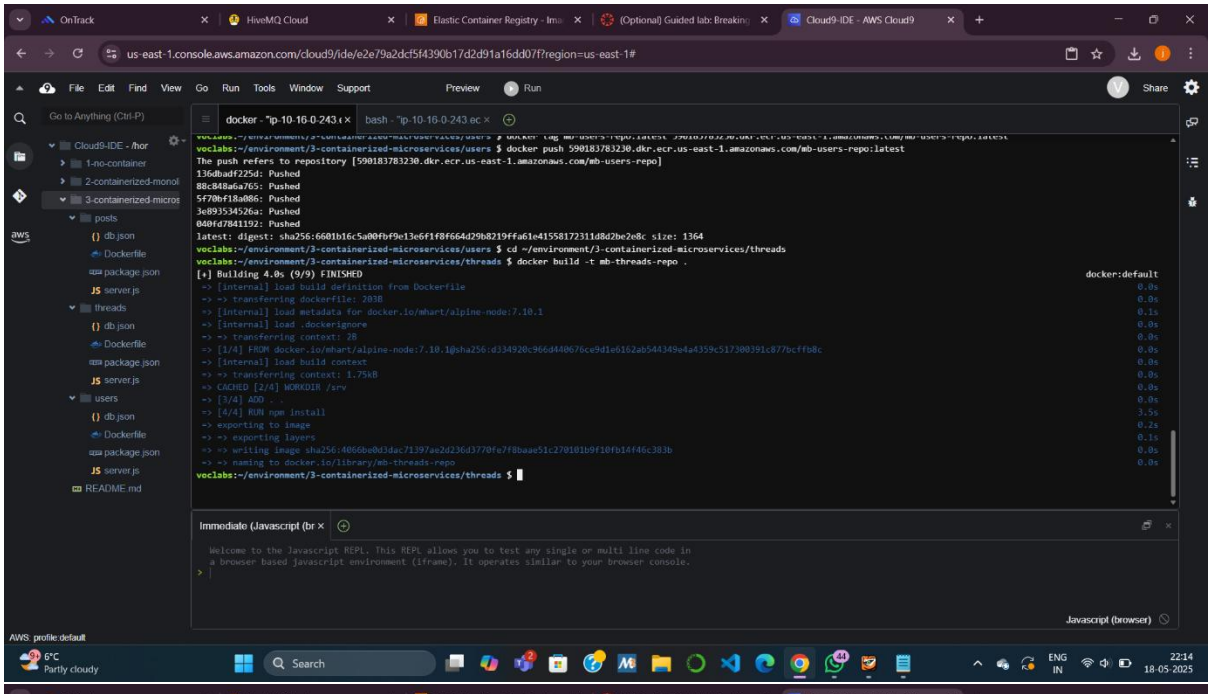

Push commands for mb-users-repo
macOS / Linux
Windows
Make sure that you have the latest version of the AWS CLI and Docker installed. For more information, see Getting Started with Amazon ECR.
Use the following steps to authenticate and push an image to your repository. For additional registry authentication methods, including the Amazon ECR credential helper, see Registry Authentication.
1. Retrieve an authentication token and authenticate your Docker client to your registry. Use the AWS CLI:
aws ecr get-login-password --region us-east-1 | docker login --username AWS --password-stdin 590183783230.dkr.ecr.us-east-1.amazonaws.com
Note: If you receive an error using the AWS CLI, make sure that you have the latest version of the AWS CLI and Docker installed.
2. Build your Docker image using the following command. For information on building a Docker file from scratch see the instructions here. You can skip this step if your image is already built:
docker build -t mb-users-repo .
3. After the build completes, tag your image so you can push the image to this repository:
docker tag mb-users-repo:latest 590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-users-repo:latest
4. Run the following command to push this image to your newly created AWS repository:
docker push 590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-users-repo:latest
Close

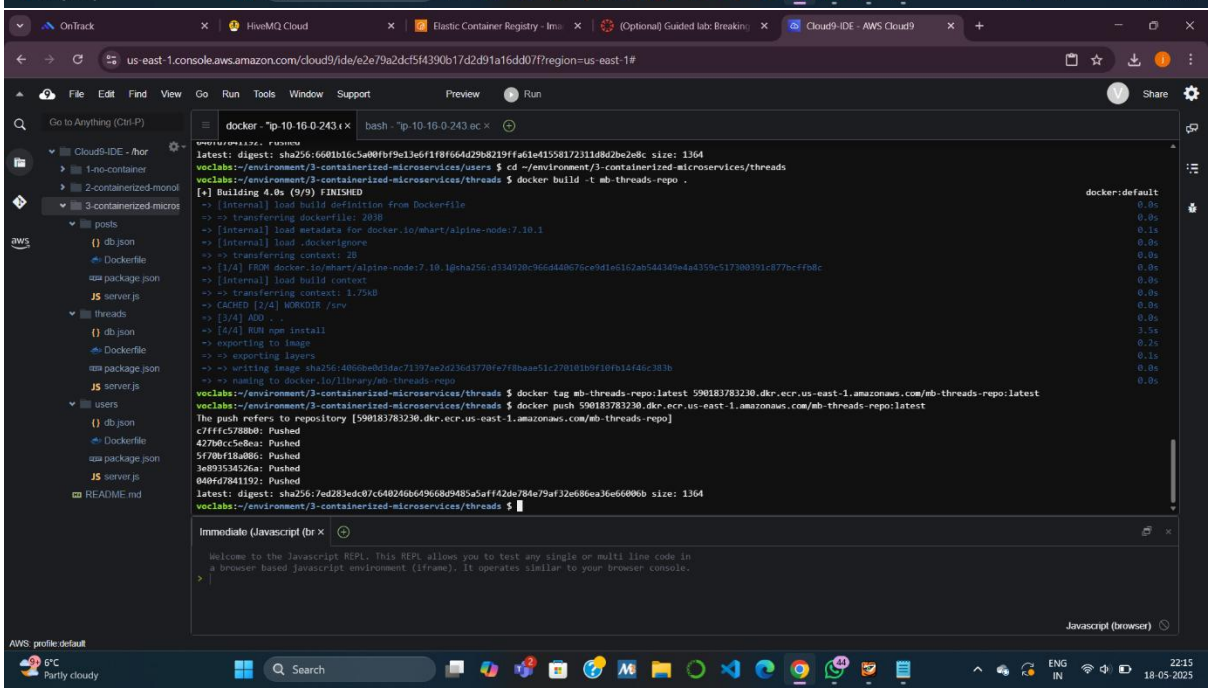
voclabs:~/environment/2-containerized-monolith $ docker push 590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-repo:latest
The push refers to repository [590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-repo]
eb307891a64f: Pushed
34ac637fe2b1: Pushed
5f70bf18a086: Pushed
3e893534526a: Pushed
040fd7841192: Pushed
latest: digest: sha256:69b7d691fe9ee591bd62b3babe1c8d5d482153f3c355c44b1235bcc9eaa68c32 size: 1365
voclabs:~/environment/2-containerized-monolith $ cd ~/environment/3-containerized-microservices/users
voclabs:~/environment/3-containerized-microservices/users $ docker build -t mb-users-repo .
[+] Building 3.8s (9/9) FINISHED
voclabs:~/environment/3-containerized-microservices/users $

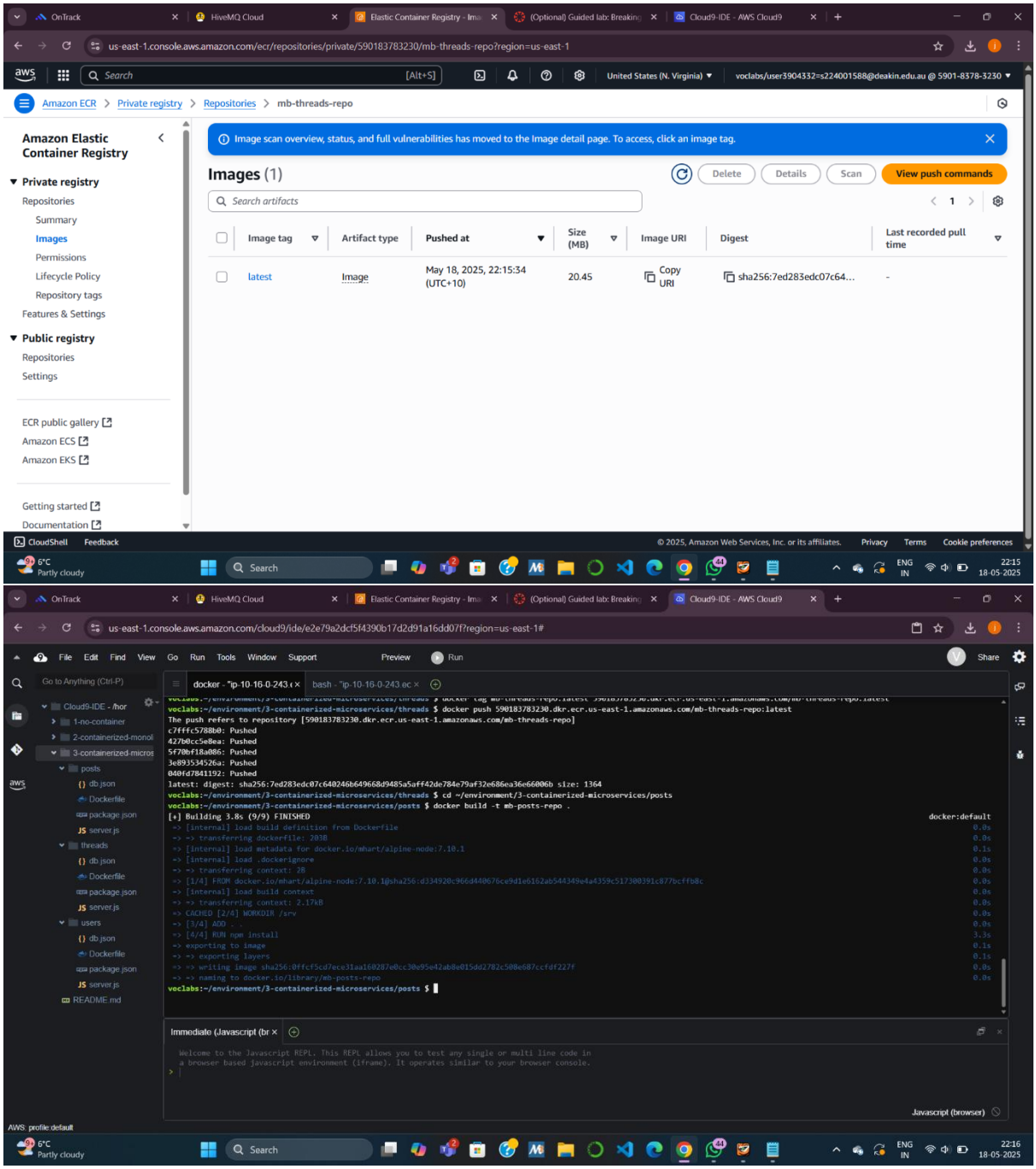

latest: digest: sha256:69b7d691fe9ee591bd62b3babe1c8d5d482153f3c355c44b1235bcc9eaa68c32 size: 1365
voclabs:~/environment/2-containerized-monolith $ cd ~/environment/3-containerized-microservices/users
voclabs:~/environment/3-containerized-microservices/users $ docker build -t mb-users-repo .
[+] Building 3.8s (9/9) FINISHED
docker:default
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 203B
=> [internal] load metadata for docker.io/mhart/alpine-node:7.10.1
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [1/4] FROM docker.io/mhart/alpine-node:7.10.1@sha256:d334920c966d440676ce9d1e6162ab544349e4a4359c517300391c877bcffb8c
=> [internal] load build context
=> => transferring context: 1.93kB
=> CACHED [2/4] WORKDIR /srv
=> [3/4] ADD . .
=> [4/4] RUN npm install
=> exporting to image
=> => exporting layers
=> => writing image sha256:6923a5a68e0846a936b59d567122a190ea7a448618676f62b2b3c69b0017193f
=> => naming to docker.io/library/mb-users-repo
voclabs:~/environment/3-containerized-microservices/users $ docker tag mb-users-repo:latest 590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-users-repo:latest
voclabs:~/environment/3-containerized-microservices/users $ docker push 590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-users-repo:latest
The push refers to repository [590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-users-repo]
136dbadf225d: Pushed
88c848a6a765: Pushed
5f70bf18a086: Pushed
3e893534526a: Pushed
040fd7841192: Pushed
latest: digest: sha256:6601b16c5a00fbf9e13e6f1f8f664d29b8219ffa61e41558172311d8d2be2e8c size: 1364
voclabs:~/environment/3-containerized-microservices/users $
Immediate (Javascript (br
Welcome to the Javascript REPL. This REPL allows you to test any single or multi line code in
a browser based javascript environment (iframe). It operates similar to your browser console.
Javascript (browser)
AWS: profile:default


Amazon ECR > Private registry > Repositories > mb-users-repo
Amazon Elastic Container Registry
Private registry
Repositories
Summary
Images
Permissions
Lifecycle Policy
Repository tags
Features & Settings
Public registry
Repositories
Settings
ECR public gallery
Amazon ECS
Amazon EKS
Getting started
Documentation
Image scan overview, status, and full vulnerabilities has moved to the Image detail page. To access, click an image tag.
Images (1)
Delete
Details
Scan
View push commands
Search artifacts
Image tag
Artifact type
Pushed at
Size (MB)
Image URI
Digest
Last recorded pull time
latest
Image
May 18, 2025, 22:12:39 (UTC+10)
20.45
Copy URI
sha256:6601b16c5a00fbf...
-
CloudShell
Feedback
© 2025, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences

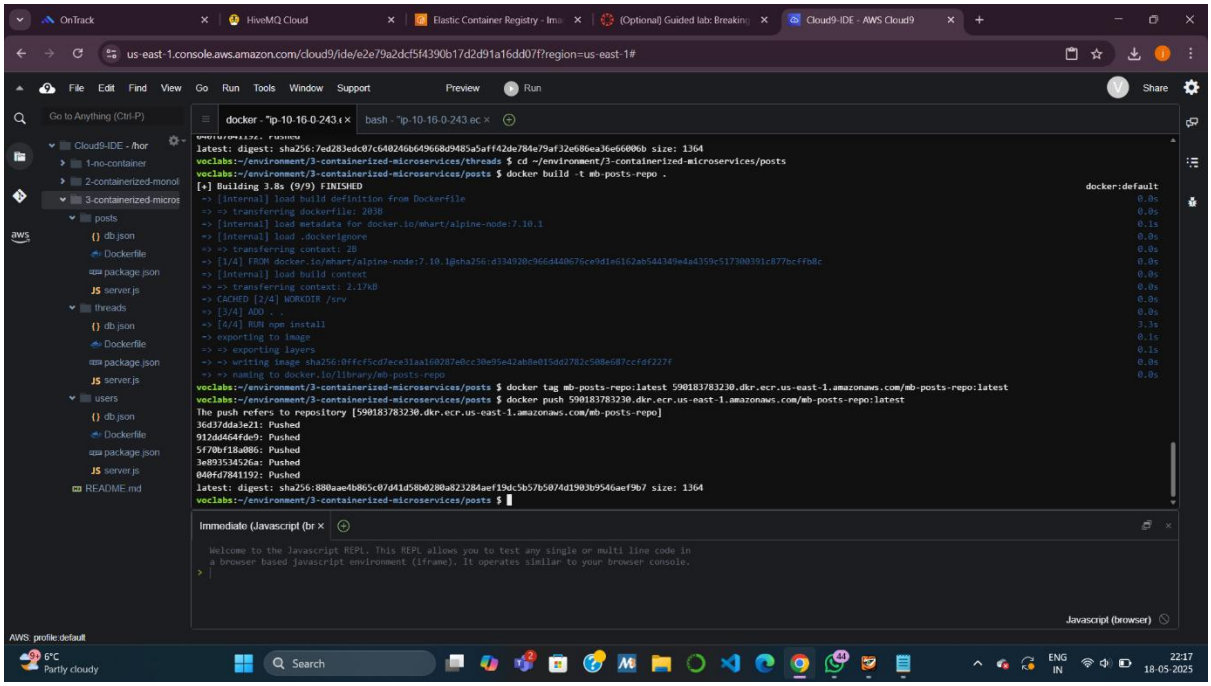

Push commands for mb-threads-repo
macOS / Linux
Windows
Make sure that you have the latest version of the AWS CLI and Docker installed. For more information, see Getting Started with Amazon ECR.
Use the following steps to authenticate and push an image to your repository. For additional registry authentication methods, including the Amazon ECR credential helper, see Registry Authentication.
1. Retrieve an authentication token and authenticate your Docker client to your registry. Use the AWS CLI:
aws ecr get-login-password --region us-east-1 | docker login --username AWS --password-stdin 590183783230.dkr.ecr.us-east-1.amazonaws.com
Note: If you receive an error using the AWS CLI, make sure that you have the latest version of the AWS CLI and Docker installed.
2. Build your Docker image using the following command. For information on building a Docker file from scratch see the instructions here. You can skip this step if your image is already built:
docker build -t mb-threads-repo .
3. After the build completes, tag your image so you can push the image to this repository:
docker tag mb-threads-repo:latest 590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-threads-repo:latest
4. Run the following command to push this image to your newly created AWS repository:
docker push 590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-threads-repo:latest
Close


OnTrack
HiveMQ Cloud
Elastic Container Registry - Ima
(Optional) Guided lab: Breaking
Cloud9-IDE - AWS Cloud9
us-east-1.console.aws.amazon.com/cloud9/ide/e2e79a2dcf5f4390b17d2d91a16dd07f?region=us-east-1#
File Edit Find View Go Run Tools Window Support
Preview
Run
Share
Go to Anything (Ctrl-P)
Cloud9-IDE - /hor
1-no-container
2-containerized-monol
3-containerized-micros
posts
db.json
Dockerfile
package.json
server.js
threads
db.json
Dockerfile
package.json
server.js
users
db.json
Dockerfile
package.json
server.js
README.md
docker - "ip-10-16-0-243.e
bash - "ip-10-16-0-243.ec
voclabs:~/environment/3-containerized-microservices/users $ docker push 590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-users-repo:latest
The push refers to repository [590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-users-repo]
136dbadf225d: Pushed
88c848a6a765: Pushed
5f70bf18a086: Pushed
3e893534526a: Pushed
040fd7841192: Pushed
latest: digest: sha256:6601b16c5a00fbf9e13e6f1f8f664d29b8219ffa61e41558172311d8d2be2e8c size: 1364
voclabs:~/environment/3-containerized-microservices/users $ cd ~/environment/3-containerized-microservices/threads
voclabs:~/environment/3-containerized-microservices/threads $ docker build -t mb-threads-repo .
[+] Building 4.0s (9/9) FINISHED
docker:default
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 203B
=> [internal] load metadata for docker.io/mhart/alpine-node:7.10.1
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [1/4] FROM docker.io/mhart/alpine-node:7.10.1@sha256:d334920c966d440676ce9d1e6162ab544349e4a4359c517300391c877bcffb8c
=> [internal] load build context
=> => transferring context: 1.75kB
=> CACHED [2/4] WORKDIR /srv
=> [3/4] ADD . .
=> [4/4] RUN npm install
=> exporting to image
=> => exporting layers
=> => writing image sha256:4066be0d3dac71397ae2d236d3770fe7f8baae51c270101b9f10fb14f46c383b
=> => naming to docker.io/library/mb-threads-repo
voclabs:~/environment/3-containerized-microservices/threads $
Immediate (Javascript (br
Welcome to the Javascript REPL. This REPL allows you to test any single or multi line code in
a browser based javascript environment (iframe). It operates similar to your browser console.
Javascript (browser)
AWS: profile:default
6°C
Partly cloudy
Search
ENG
IN
22:14
18-05-2025


OnTrack
HiveMQ Cloud
Elastic Container Registry - Ima
(Optional) Guided lab: Breaking
Cloud9-IDE - AWS Cloud9
us-east-1.console.aws.amazon.com/cloud9/ide/e2e79a2dcf5f4390b17d2d91a16dd07f?region=us-east-1#
File Edit Find View Go Run Tools Window Support
Preview
Run
Share
Go to Anything (Ctrl-P)
Cloud9-IDE - /hor
1-no-container
2-containerized-monol
3-containerized-micros
posts
db.json
Dockerfile
package.json
server.js
threads
db.json
Dockerfile
package.json
server.js
users
db.json
Dockerfile
package.json
server.js
README.md
docker - "ip-10-16-0-243.e
bash - "ip-10-16-0-243.ec
latest: digest: sha256:6601b16c5a00fbf9e13e6f1f8f664d29b8219ffa61e41558172311d8d2be2e8c size: 1364
voclabs:~/environment/3-containerized-microservices/users $ cd ~/environment/3-containerized-microservices/threads
voclabs:~/environment/3-containerized-microservices/threads $ docker build -t mb-threads-repo .
[+] Building 4.0s (9/9) FINISHED
docker:default
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 203B
=> [internal] load metadata for docker.io/mhart/alpine-node:7.10.1
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [1/4] FROM docker.io/mhart/alpine-node:7.10.1@sha256:d334920c966d440676ce9d1e6162ab544349e4a4359c517300391c877bcffb8c
=> [internal] load build context
=> => transferring context: 1.75kB
=> CACHED [2/4] WORKDIR /srv
=> [3/4] ADD . .
=> [4/4] RUN npm install
=> exporting to image
=> => exporting layers
=> => writing image sha256:4066be0d3dac71397ae2d236d3770fe7f8baae51c270101b9f10fb14f46c383b
=> => naming to docker.io/library/mb-threads-repo
voclabs:~/environment/3-containerized-microservices/threads $ docker tag mb-threads-repo:latest 590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-threads-repo:latest
voclabs:~/environment/3-containerized-microservices/threads $ docker push 590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-threads-repo:latest
The push refers to repository [590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-threads-repo]
c7fffc5788b0: Pushed
427b0cc5e8ea: Pushed
5f70bf18a086: Pushed
3e893534526a: Pushed
040fd7841192: Pushed
latest: digest: sha256:7ed283edc07c640246b649668d9485a5aff42de784e79af32e686ea36e66006b size: 1364
voclabs:~/environment/3-containerized-microservices/threads $
Immediate (Javascript (br
Welcome to the Javascript REPL. This REPL allows you to test any single or multi line code in
a browser based javascript environment (iframe). It operates similar to your browser console.
Javascript (browser)
AWS: profile:default
6°C
Partly cloudy
Search
ENG
IN
22:15
18-05-2025


us-east-1.console.aws.amazon.com/ecr/repositories/private/590183783230/mb-threads-repo?region=us-east-1
Amazon ECR > Private registry > Repositories > mb-threads-repo
Amazon Elastic Container Registry
Private registry
Repositories
Summary
Images
Permissions
Lifecycle Policy
Repository tags
Features & Settings
Public registry
Repositories
Settings
ECR public gallery
Amazon ECS
Amazon EKS
Getting started
Documentation
Image scan overview, status, and full vulnerabilities has moved to the Image detail page. To access, click an image tag.
Images (1)
Delete
Details
Scan
View push commands
Search artifacts
Image tag
Artifact type
Pushed at
Size (MB)
Image URI
Digest
Last recorded pull time
latest
Image
May 18, 2025, 22:15:34 (UTC+10)
20.45
Copy URI
sha256:7ed283edc07c64...
-
CloudShell
Feedback
© 2025, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences

us-east-1.console.aws.amazon.com/cloud9/ide/e2e79a2dcf5f4390b17d2d91a16dd07f?region=us-east-1#
docker - "ip-10-16-0-243.e
bash - "ip-10-16-0-243.ec
voclabs:~/environment/3-containerized-microservices/threads $ docker push 590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-threads-repo:latest
The push refers to repository [590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-threads-repo]
c7fffc5788b0: Pushed
427b0cc5e8ea: Pushed
5f70bf18a086: Pushed
3e893534526a: Pushed
040fd7841192: Pushed
latest: digest: sha256:7ed283edc07c640246b649668d9485a5aff42de784e79af32e686ea36e66006b size: 1364
voclabs:~/environment/3-containerized-microservices/threads $ cd ~/environment/3-containerized-microservices/posts
voclabs:~/environment/3-containerized-microservices/posts $ docker build -t mb-posts-repo .
[+] Building 3.8s (9/9) FINISHED
voclabs:~/environment/3-containerized-microservices/posts $
Immediate (Javascript (br
Welcome to the Javascript REPL. This REPL allows you to test any single or multi line code in a browser based javascript environment (iframe). It operates similar to your browser console.
Javascript (browser)
AWS: profile:default



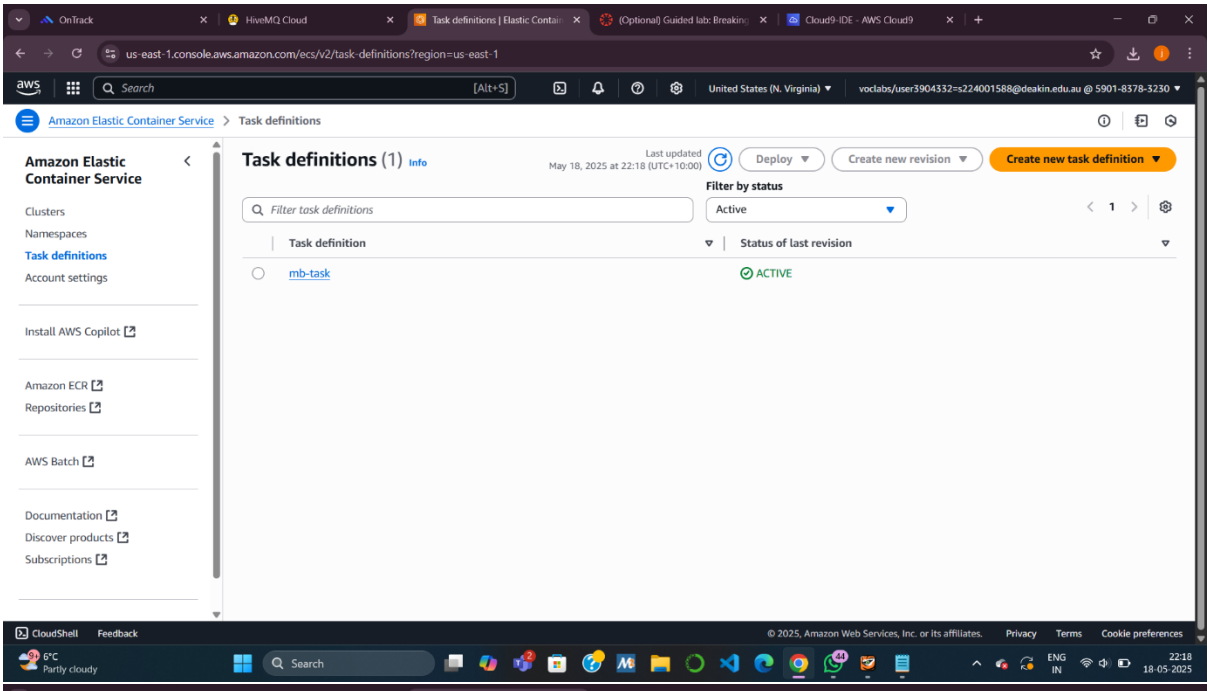
Task 6: Deploying the Containerized Microservices

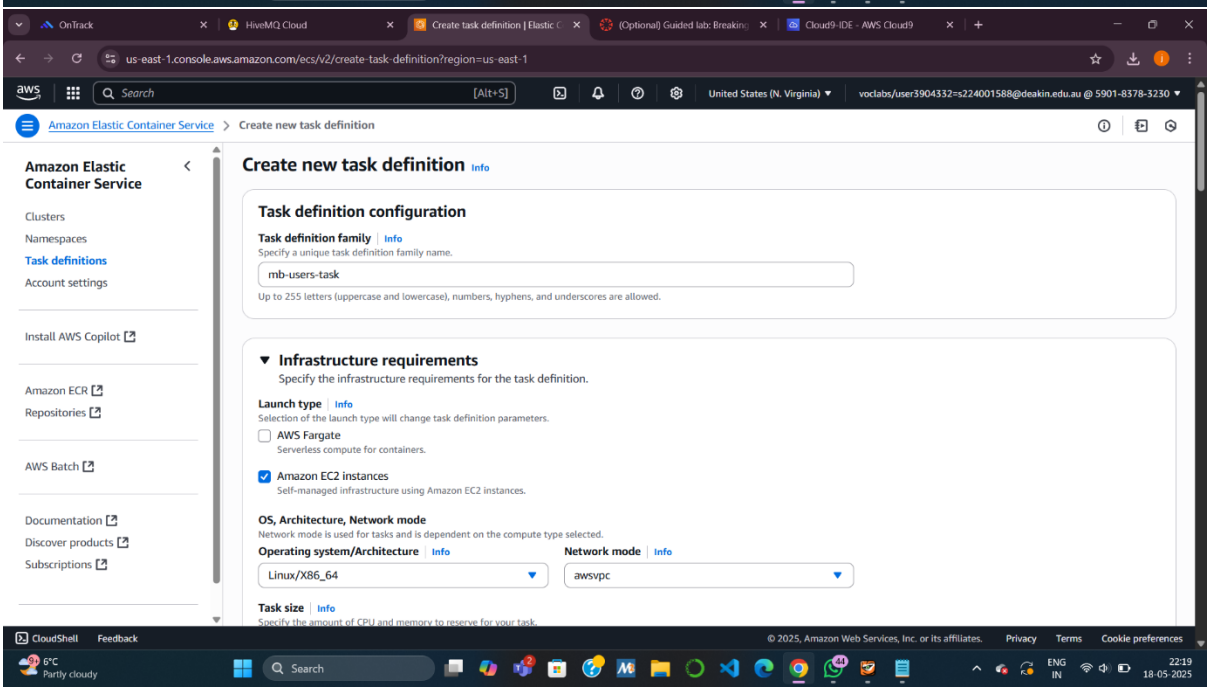
Objective: Deploy all 3 microservices to ECS, each routed by ALB using path patterns.

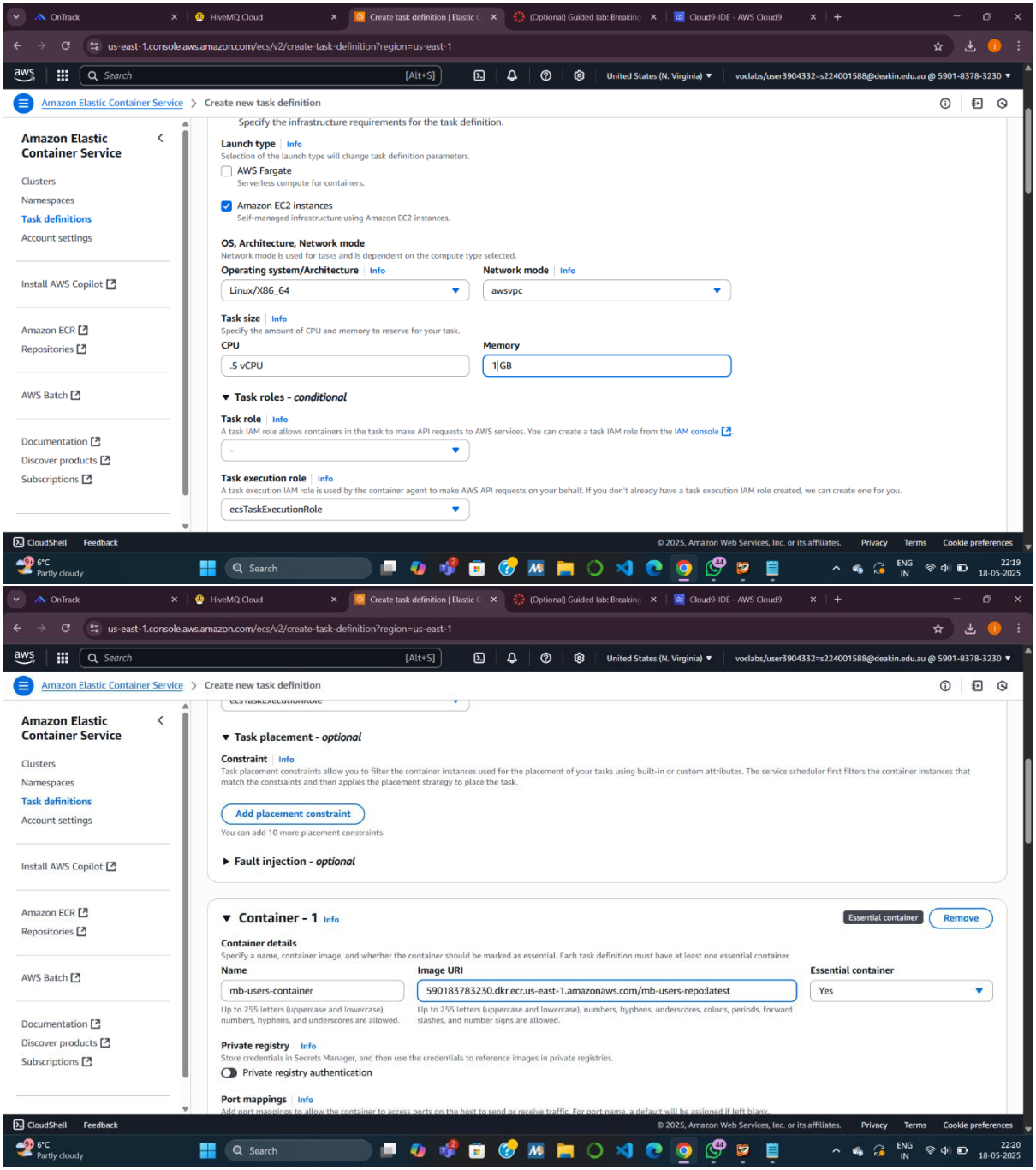
Subtasks:

- **6.1 Create Task Definitions**:
  - Create one task definition for each service:
    - mb-users-task, mb-threads-task, mb-posts-task.
- **6.2 Deploy Services**:
  - For each service:
    - Launch with EC2.
    - Connect to **existing Load Balancer (mb-load-balancer)**.
    - Define target group and path:
      - /api/users* → mb-users-target
      - /api/posts* → mb-posts-target
      - /api/threads* → mb-threads-target
  - Update ALB's **default rule** to show "Invalid request" message.
  - Stop the **old monolithic service** (mb-ecs-service) by setting task count to 0.
- **6.3 Test Deployment**:
  - Test via Load Balancer DNS:

- /api → users service
- /api/users/2, /api/threads, /api/posts/in-thread/2
- Invalid URL like /xxx returns error message






Amazon Elastic Container Service > Create new task definition
Specify the infrastructure requirements for the task definition.
Launch type | Info
Selection of the launch type will change task definition parameters.
AWS Fargate
Serverless compute for containers.
Amazon EC2 instances
Self-managed infrastructure using Amazon EC2 instances.
OS, Architecture, Network mode
Network mode is used for tasks and is dependent on the compute type selected.
Operating system/Architecture | Info
Linux/X86_64
Network mode | Info
awsvpc
Task size | Info
Specify the amount of CPU and memory to reserve for your task.
CPU
.5 vCPU
Memory
1 GB
Task roles - conditional
Task role | Info
A task IAM role allows containers in the task to make API requests to AWS services. You can create a task IAM role from the IAM console
Task execution role | Info
A task execution IAM role is used by the container agent to make AWS API requests on your behalf. If you don't already have a task execution IAM role created, we can create one for you.
ecsTaskExecutionRole
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Task placement - optional
Constraint | Info
Task placement constraints allow you to filter the container instances used for the placement of your tasks using built-in or custom attributes. The service scheduler first filters the container instances that match the constraints and then applies the placement strategy to place the task.
Add placement constraint
You can add 10 more placement constraints.
Fault injection - optional
Container - 1 | Info
Essential container
Remove
Container details
Specify a name, container image, and whether the container should be marked as essential. Each task definition must have at least one essential container.
Name
mb-users-container
Up to 255 letters (uppercase and lowercase), numbers, hyphens, and underscores are allowed.
Image URI
590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-users-repo:latest
Up to 255 letters (uppercase and lowercase), numbers, hyphens, underscores, colons, periods, forward slashes, and number signs are allowed.
Essential container
Yes
Private registry | Info
Store credentials in Secrets Manager, and then use the credentials to reference images in private registries.
Private registry authentication
Port mappings | Info
Add port mappings to allow the container to access ports on the host to send or receive traffic. For port name, a default will be assigned if left blank.
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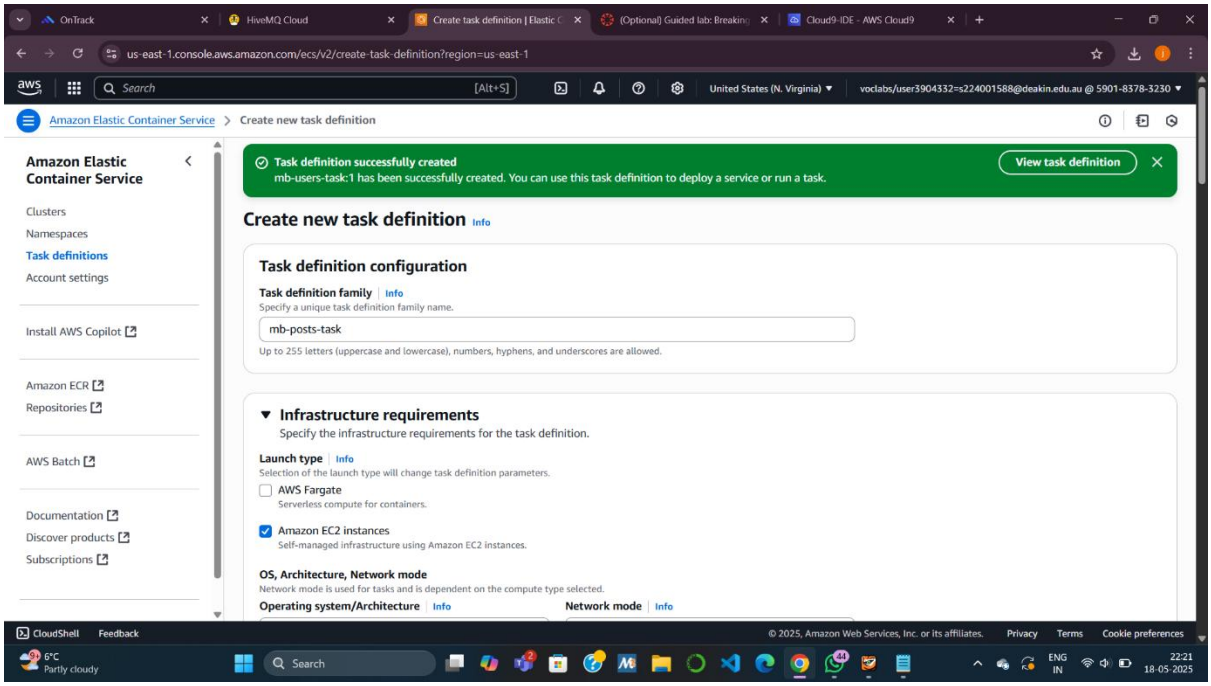
OnTrack
HiveMQ Cloud
Create task definition | Elastic C
(Optional) Guided lab: Breakin
Cloud9-IDE - AWS Cloud9
us-east-1.console.aws.amazon.com/ecs/v2/create-task-definition?region=us-east-1
Search
[Alt+S]
United States (N. Virginia)
voclabs/user3904332=s224001588@deakin.edu.au @ 5901-8378-3230
Amazon Elastic Container Service
Create new task definition
Amazon Elastic Container Service
Clusters
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Task definition successfully created
mb-users-task:1 has been successfully created. You can use this task definition to deploy a service or run a task.
View task definition
Create new task definition Info
Task definition configuration
Task definition family Info
Specify a unique task definition family name.
mb-posts-task
Up to 255 letters (uppercase and lowercase), numbers, hyphens, and underscores are allowed.
Infrastructure requirements
Specify the infrastructure requirements for the task definition.
Launch type Info
Selection of the launch type will change task definition parameters.
AWS Fargate
Serverless compute for containers.
Amazon EC2 instances
Self-managed infrastructure using Amazon EC2 instances.
OS, Architecture, Network mode
Network mode is used for tasks and is dependent on the compute type selected.
Operating system/Architecture Info
Network mode Info
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6°C
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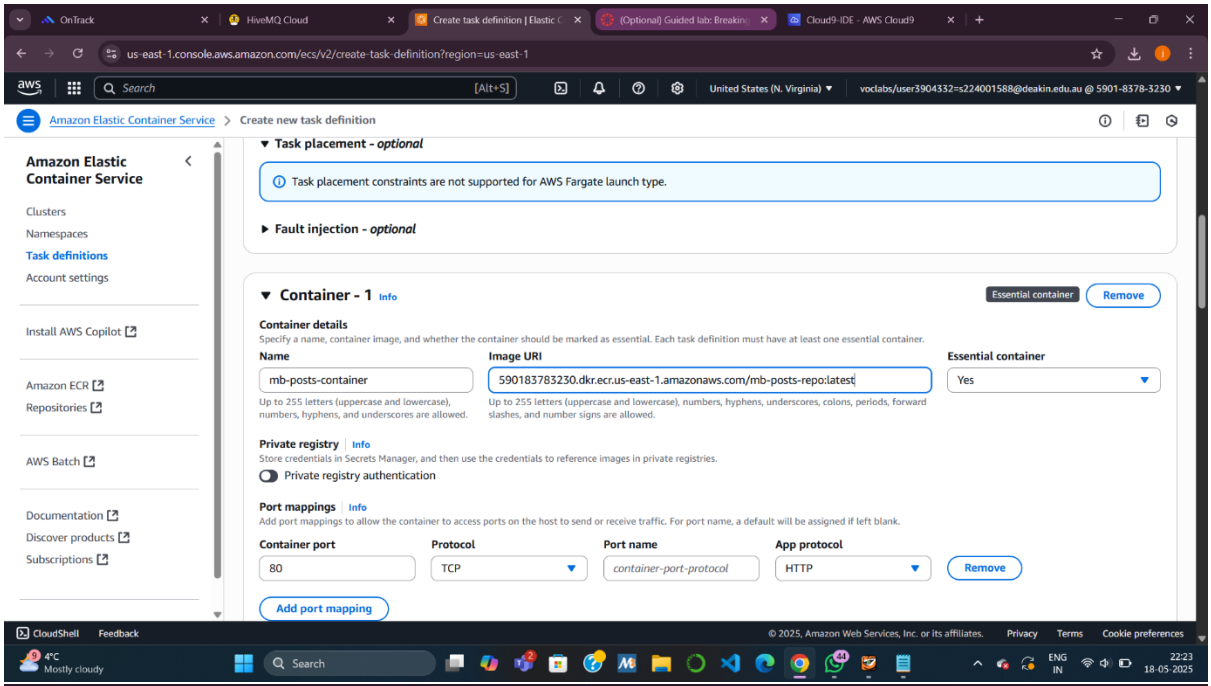
18-05-2025


Amazon Elastic Container Service
Create new task definition
Task placement - optional
Task placement constraints are not supported for AWS Fargate launch type.
Fault injection - optional
Container - 1 Info
Essential container
Remove
Container details
Specify a name, container image, and whether the container should be marked as essential. Each task definition must have at least one essential container.
Name
mb-posts-container
Image URI
590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-posts-repo:latest
Essential container
Yes
Private registry Info
Store credentials in Secrets Manager, and then use the credentials to reference images in private registries.
Private registry authentication
Port mappings Info
Add port mappings to allow the container to access ports on the host to send or receive traffic. For port name, a default will be assigned if left blank.
Container port
80
Protocol
TCP
Port name
container-port-protocol
App protocol
HTTP
Remove
Add port mapping
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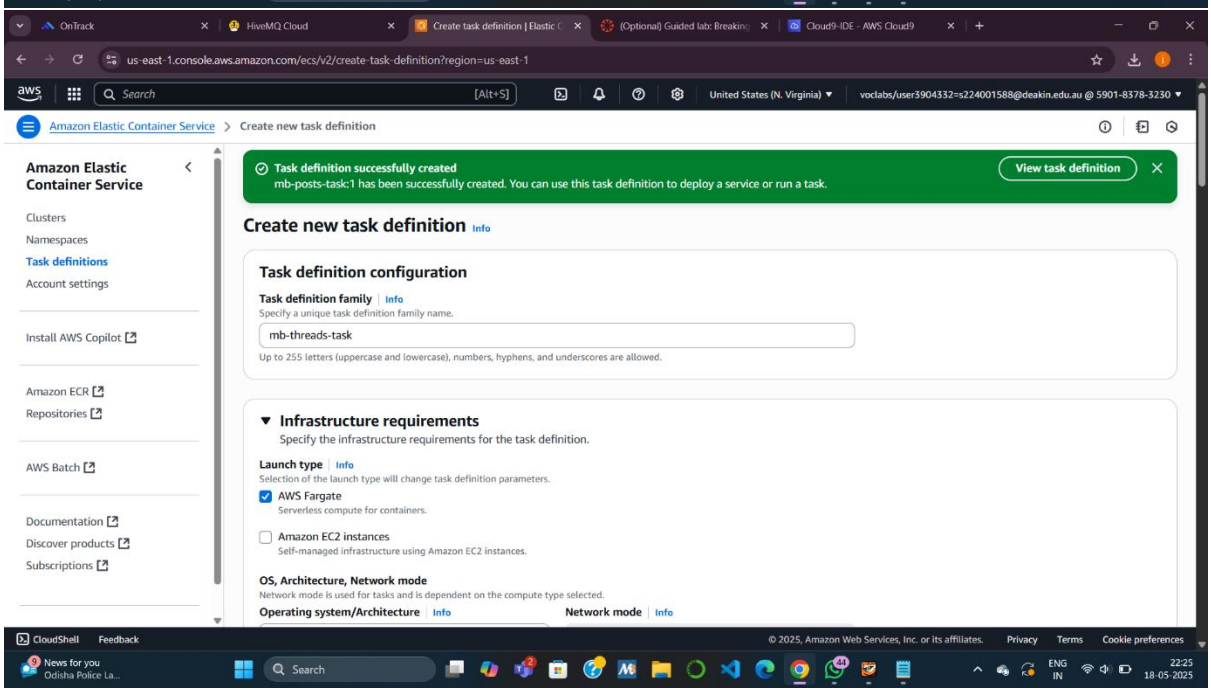
Task definition successfully created
mb-posts-task:1 has been successfully created. You can use this task definition to deploy a service or run a task.
View task definition
Create new task definition Info
Task definition configuration
Task definition family Info
Specify a unique task definition family name.
mb-threads-task
Up to 255 letters (uppercase and lowercase), numbers, hyphens, and underscores are allowed.
Infrastructure requirements
Specify the infrastructure requirements for the task definition.
Launch type Info
Selection of the launch type will change task definition parameters.
AWS Fargate
Serverless compute for containers.
Amazon EC2 instances
Self-managed infrastructure using Amazon EC2 instances.
OS, Architecture, Network mode
Network mode is used for tasks and is dependent on the compute type selected.
Operating system/Architecture Info
Network mode Info
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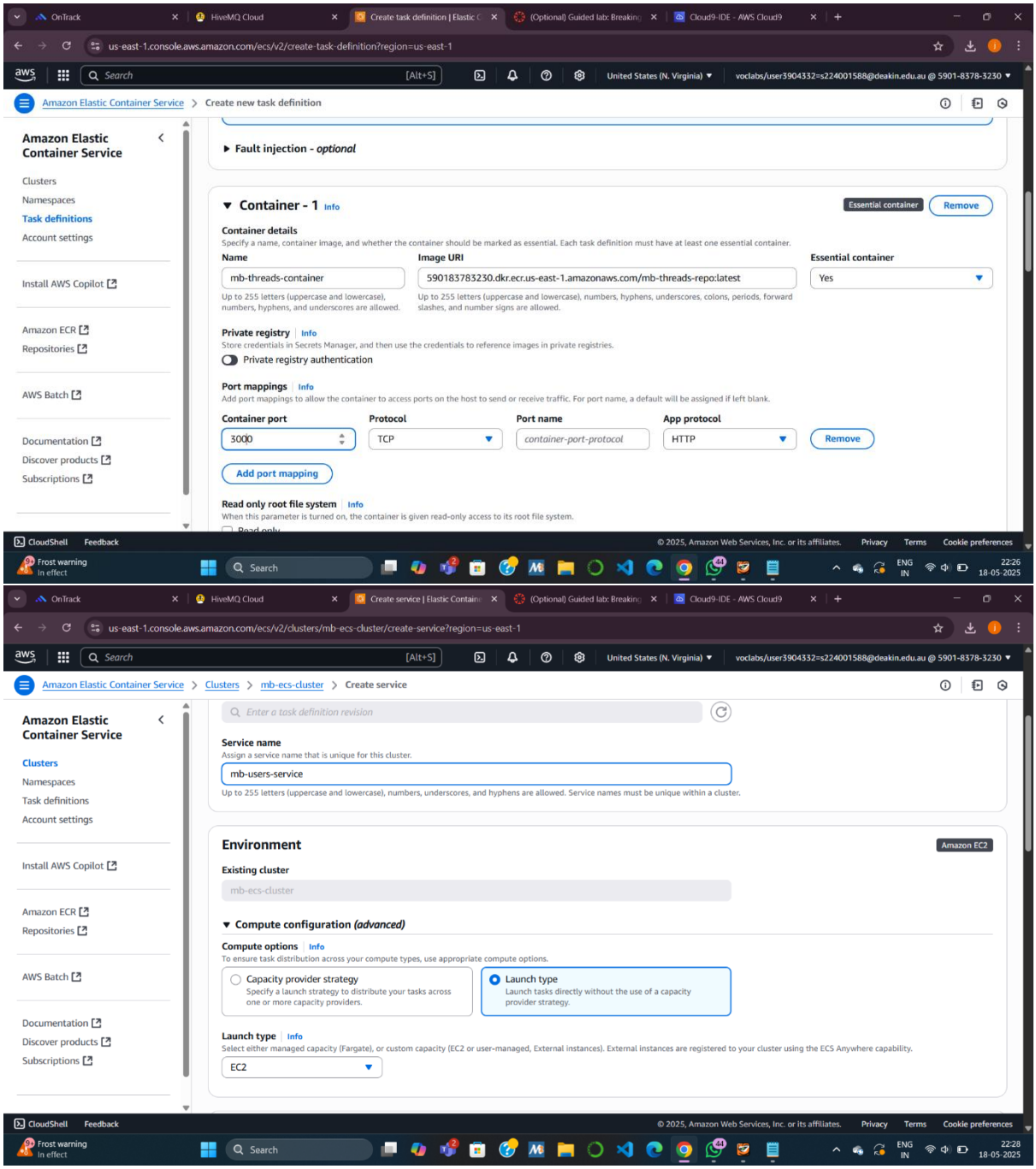
Amazon Elastic Container Service
Create new task definition
Fault injection - optional
Container - 1 Info
Essential container
Remove
Container details
Specify a name, container image, and whether the container should be marked as essential. Each task definition must have at least one essential container.
Name
mb-threads-container
Image URI
590183783230.dkr.ecr.us-east-1.amazonaws.com/mb-threads-repo:latest
Essential container
Yes
Private registry Info
Store credentials in Secrets Manager, and then use the credentials to reference images in private registries.
Private registry authentication
Port mappings Info
Add port mappings to allow the container to access ports on the host to send or receive traffic. For port name, a default will be assigned if left blank.
Container port
3000
Protocol
TCP
Port name
container-port-protocol
App protocol
HTTP
Remove
Add port mapping
Read only root file system Info
When this parameter is turned on, the container is given read-only access to its root file system.
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Amazon Elastic Container Service
Clusters
mb-ecs-cluster
Create service
Service name
Assign a service name that is unique for this cluster.
mb-users-service
Up to 255 letters (uppercase and lowercase), numbers, underscores, and hyphens are allowed. Service names must be unique within a cluster.
Environment
Amazon EC2
Existing cluster
mb-ecs-cluster
Compute configuration (advanced)
Compute options Info
To ensure task distribution across your compute types, use appropriate compute options.
Capacity provider strategy
Specify a launch strategy to distribute your tasks across one or more capacity providers.
Launch type
Launch tasks directly without the use of a capacity provider strategy.
Launch type Info
Select either managed capacity (Fargate), or custom capacity (EC2 or user-managed, External instances). External instances are registered to your cluster using the ECS Anywhere capability.
EC2
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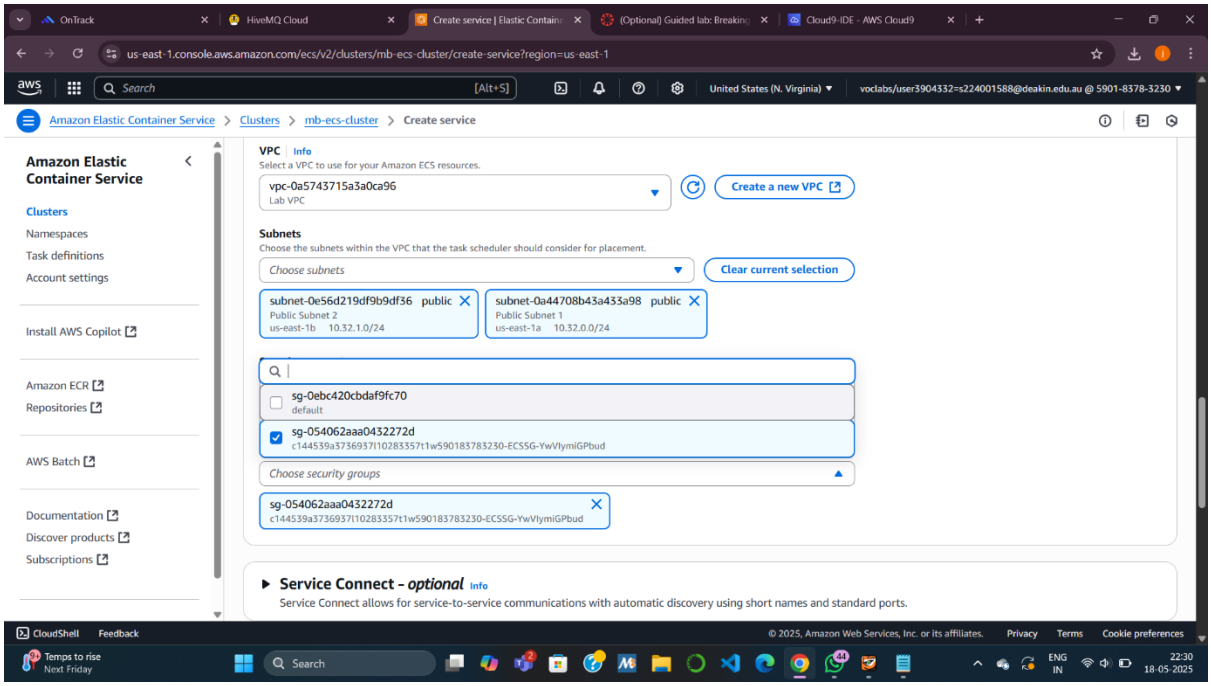
OnTrack
HiveMQ Cloud
Create service | Elastic Contain
(Optional) Guided lab: Breaking
Cloud9-IDE - AWS Cloud9
us-east-1.console.aws.amazon.com/ecs/v2/clusters/mb-ecs-cluster/create-service?region=us-east-1
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United States (N. Virginia)
voclabs/user3904332=s224001588@deakin.edu.au @ 5901-8378-3230
Amazon Elastic Container Service > Clusters > mb-ecs-cluster > Create service
Amazon Elastic Container Service
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VPC Info
Select a VPC to use for your Amazon ECS resources.
vpc-0a5743715a3a0ca96
Lab VPC
Create a new VPC
Subnets
Choose the subnets within the VPC that the task scheduler should consider for placement.
Choose subnets
Clear current selection
subnet-0e56d219df9b9df36 public
Public Subnet 2
us-east-1b 10.32.1.0/24
subnet-0a44708b43a433a98 public
Public Subnet 1
us-east-1a 10.32.0.0/24
sg-0ebc420cbdaf9fc70
default
sg-054062aaa0432272d
c144539a3736937l10283357t1w590183783230-ECSSG-YwVIymiGPbud
Choose security groups
sg-054062aaa0432272d
c144539a3736937l10283357t1w590183783230-ECSSG-YwVIymiGPbud
Service Connect - optional Info
Service Connect allows for service-to-service communications with automatic discovery using short names and standard ports.
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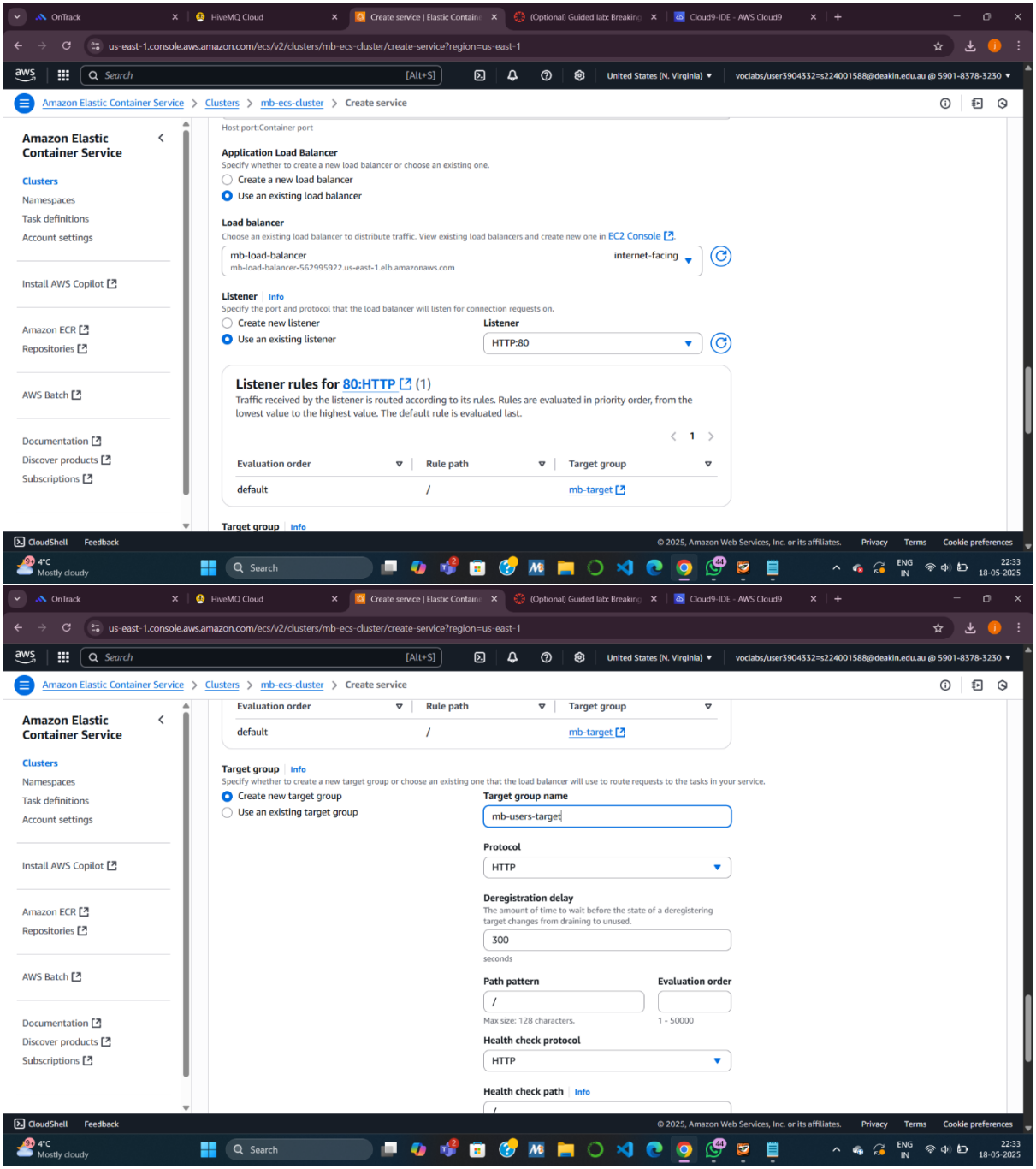
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Task definitions
Account settings
Install AWS Copilot
Amazon ECR
Repositories
AWS Batch
Documentation
Discover products
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Amazon Elastic Container Service > Clusters > mb-ecs-cluster > Create service
Host port:Container port
Application Load Balancer
Specify whether to create a new load balancer or choose an existing one.
Create a new load balancer
Use an existing load balancer
Load balancer
Choose an existing load balancer to distribute traffic. View existing load balancers and create new one in EC2 Console
mb-load-balancer
mb-load-balancer-562995922.us-east-1.elb.amazonaws.com
internet-facing
Listener | Info
Specify the port and protocol that the load balancer will listen for connection requests on.
Create new listener
Use an existing listener
Listener
HTTP:80
Listener rules for 80:HTTP (1)
Traffic received by the listener is routed according to its rules. Rules are evaluated in priority order, from the lowest value to the highest value. The default rule is evaluated last.
Evaluation order
Rule path
Target group
default
/
mb-target
Target group | Info
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Task definitions
Account settings
Install AWS Copilot
Amazon ECR
Repositories
AWS Batch
Documentation
Discover products
Subscriptions
Amazon Elastic Container Service > Clusters > mb-ecs-cluster > Create service
Evaluation order
Rule path
Target group
default
/
mb-target
Target group | Info
Specify whether to create a new target group or choose an existing one that the load balancer will use to route requests to the tasks in your service.
Create new target group
Use an existing target group
Target group name
mb-users-target
Protocol
HTTP
Deregistration delay
The amount of time to wait before the state of a deregistering target changes from draining to unused.
300
seconds
Path pattern
/
Max size: 128 characters.
Evaluation order
1 - 50000
Health check protocol
HTTP
Health check path | Info
/
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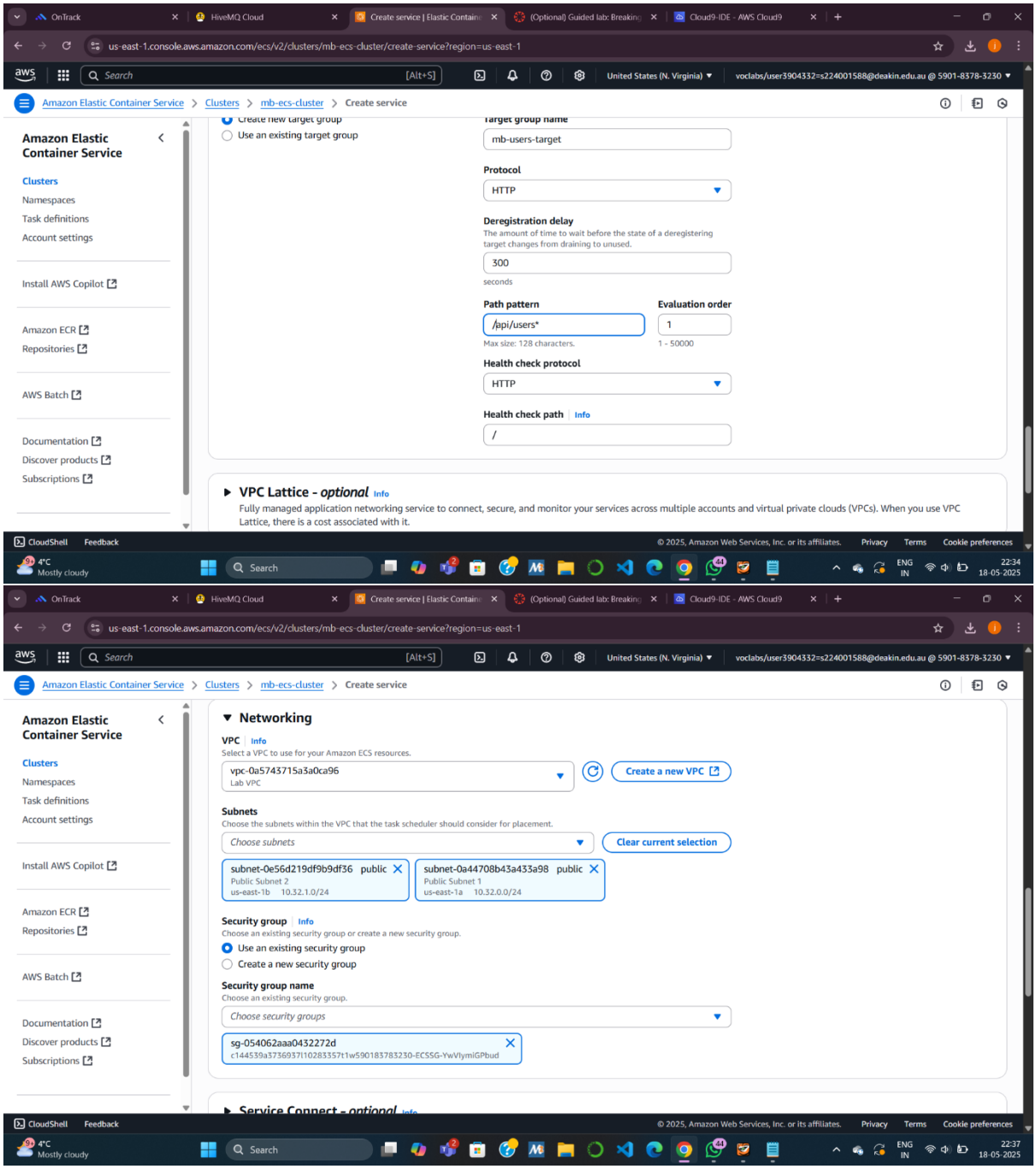
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Amazon ECR
Repositories
AWS Batch
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Amazon Elastic Container Service > Clusters > mb-ecs-cluster > Create service
Use an existing target group
mb-users-target
Protocol
HTTP
Deregistration delay
The amount of time to wait before the state of a deregistering target changes from draining to unused.
300
seconds
Path pattern
/api/users*
Max size: 128 characters.
Evaluation order
1
1 - 50000
Health check protocol
HTTP
Health check path
Info
/
VPC Lattice - optional
Info
Fully managed application networking service to connect, secure, and monitor your services across multiple accounts and virtual private clouds (VPCs). When you use VPC Lattice, there is a cost associated with it.
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Amazon Elastic Container Service > Clusters > mb-ecs-cluster > Create service
Networking
VPC
Info
Select a VPC to use for your Amazon ECS resources.
vpc-0a5743715a3a0ca96
Lab VPC
Create a new VPC
Subnets
Choose the subnets within the VPC that the task scheduler should consider for placement.
Choose subnets
Clear current selection
subnet-0e56d219df9b9df36 public
Public Subnet 2
us-east-1b 10.32.1.0/24
subnet-0a44708b43a433a98 public
Public Subnet 1
us-east-1a 10.32.0.0/24
Security group
Info
Choose an existing security group or create a new security group.
Use an existing security group
Create a new security group
Security group name
Choose an existing security group.
Choose security groups
sg-054062aaa0432272d
c144539a3736937l10283357t1w590183783230-EC5SG-YwVlymiGPbud
Service Connect - optional
Info
CloudShell
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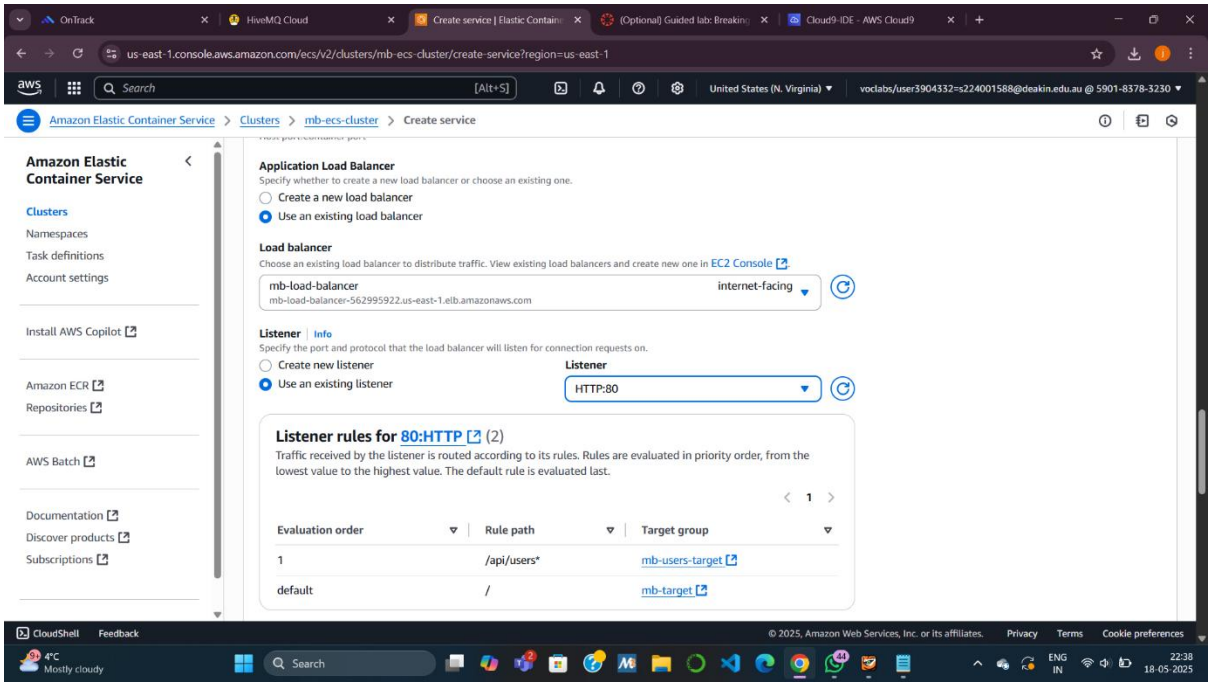
OnTrack
HiveMQ Cloud
Create service | Elastic Contain
(Optional) Guided lab: Breakin
Cloud9-IDE - AWS Cloud9
us-east-1.console.aws.amazon.com/ecs/v2/clusters/mb-ecs-cluster/create-service?region=us-east-1
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mb-ecs-cluster
Create service
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Application Load Balancer
Specify whether to create a new load balancer or choose an existing one.
Create a new load balancer
Use an existing load balancer
Load balancer
Choose an existing load balancer to distribute traffic. View existing load balancers and create new one in EC2 Console.
mb-load-balancer
mb-load-balancer-562995922.us-east-1.elb.amazonaws.com
internet-facing
Listener Info
Specify the port and protocol that the load balancer will listen for connection requests on.
Create new listener
Use an existing listener
Listener
HTTP:80
Listener rules for 80:HTTP (2)
Traffic received by the listener is routed according to its rules. Rules are evaluated in priority order, from the lowest value to the highest value. The default rule is evaluated last.
1
Evaluation order
Rule path
Target group
1
/api/users*
mb-users-target
default
/
mb-target
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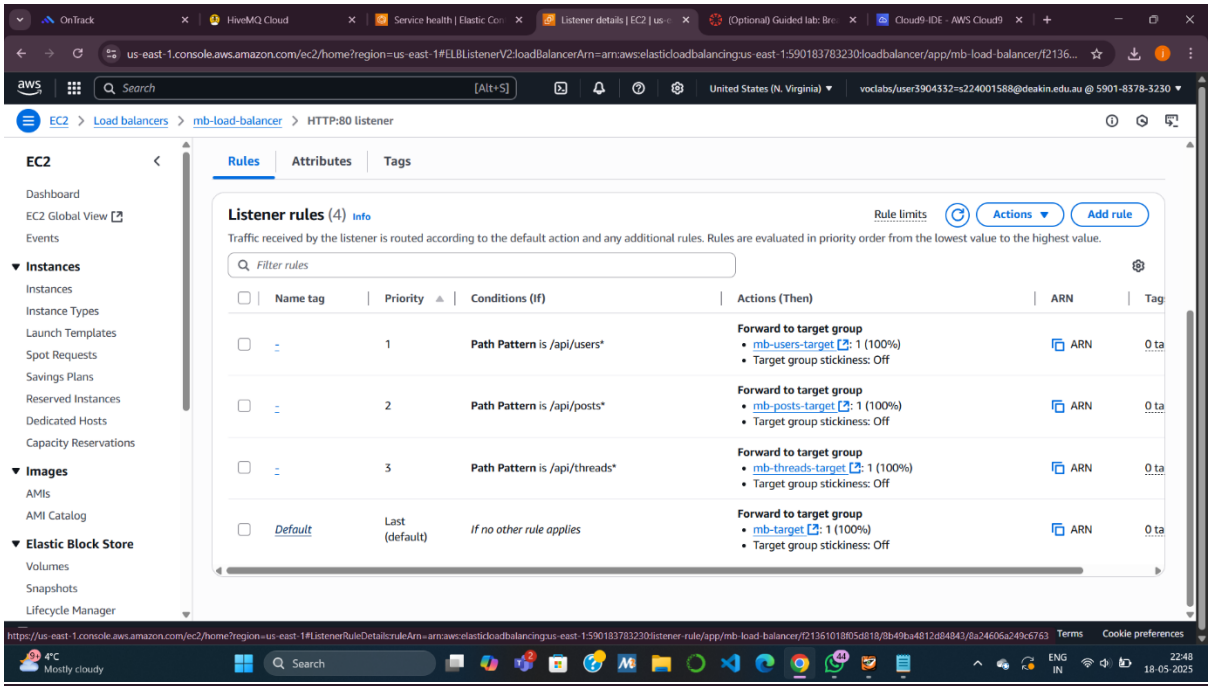
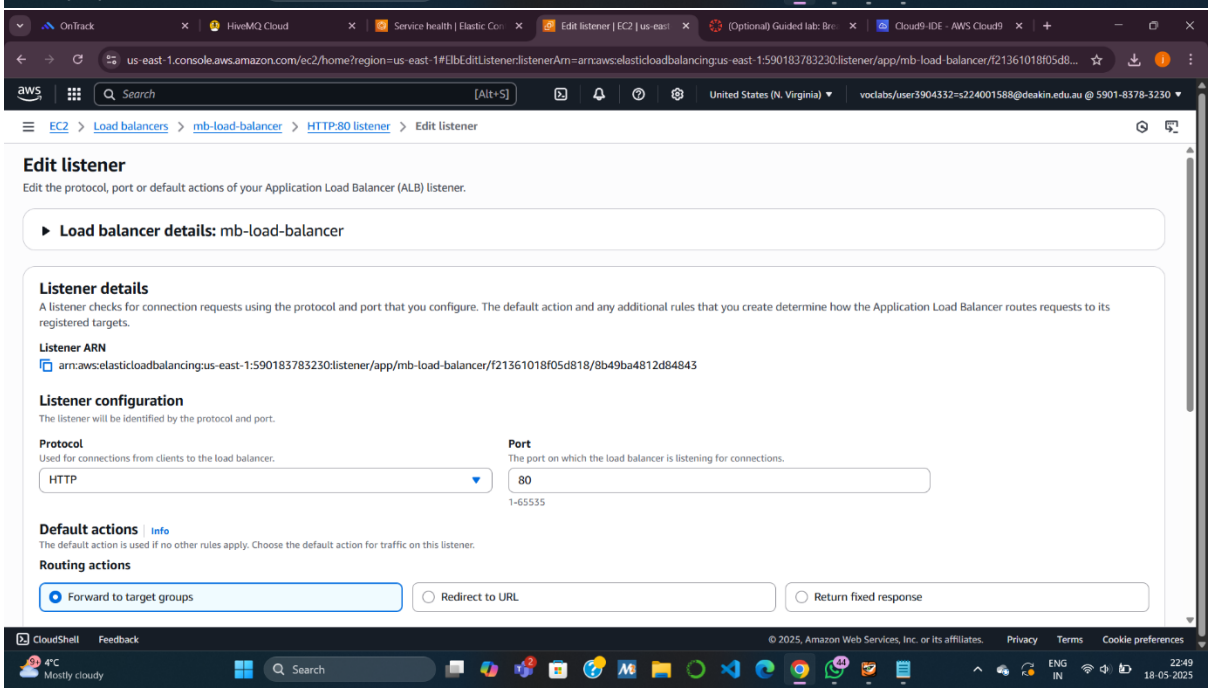
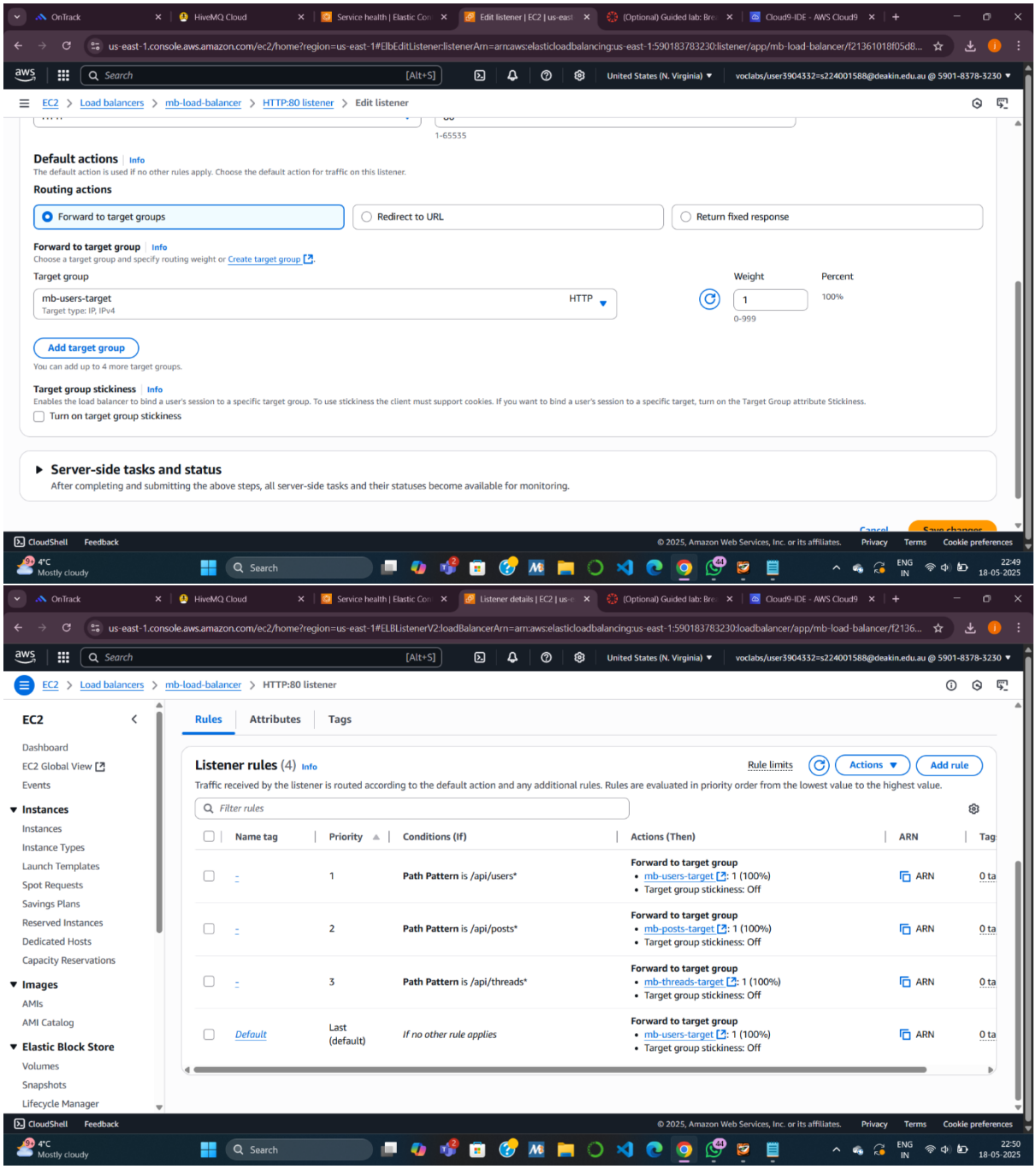

EC2 > Load balancers > mb-load-balancer > HTTP:80 listener
Rules
Attributes
Tags
Listener rules (4) Info
Rule limits
Actions
Add rule
Traffic received by the listener is routed according to the default action and any additional rules. Rules are evaluated in priority order from the lowest value to the highest value.
Filter rules
Name tag
Priority
Conditions (If)
Actions (Then)
ARN
Tag
1
Path Pattern is /api/users*
Forward to target group
mb-users-target: 1 (100%)
Target group stickiness: Off
2
Path Pattern is /api/posts*
Forward to target group
mb-posts-target: 1 (100%)
Target group stickiness: Off
3
Path Pattern is /api/threads*
Forward to target group
mb-threads-target: 1 (100%)
Target group stickiness: Off
Default
Last (default)
If no other rule applies
Forward to target group
mb-target: 1 (100%)
Target group stickiness: Off


EC2 > Load balancers > mb-load-balancer > HTTP:80 listener > Edit listener
Edit listener
Edit the protocol, port or default actions of your Application Load Balancer (ALB) listener.
Load balancer details: mb-load-balancer
Listener details
A listener checks for connection requests using the protocol and port that you configure. The default action and any additional rules that you create determine how the Application Load Balancer routes requests to its registered targets.
Listener ARN
arn:aws:elasticloadbalancing:us-east-1:590183783230:listener/app/mb-load-balancer/f21361018f05d818/8b49ba4812d84843
Listener configuration
The listener will be identified by the protocol and port.
Protocol
Used for connections from clients to the load balancer.
HTTP
Port
The port on which the load balancer is listening for connections.
80
1-65535
Default actions Info
The default action is used if no other rules apply. Choose the default action for traffic on this listener.
Routing actions
Forward to target groups
Redirect to URL
Return fixed response


EC2 > Load balancers > mb-load-balancer > HTTP:80 listener > Edit listener
1-65535
Default actions | Info
The default action is used if no other rules apply. Choose the default action for traffic on this listener.
Routing actions
Forward to target groups
Redirect to URL
Return fixed response
Forward to target group | Info
Choose a target group and specify routing weight or Create target group.
Target group
mb-users-target
Target type: IP, IPv4
HTTP
Weight
Percent
1
100%
0-999
Add target group
You can add up to 4 more target groups.
Target group stickiness | Info
Enables the load balancer to bind a user's session to a specific target group. To use stickiness the client must support cookies. If you want to bind a user's session to a specific target, turn on the Target Group attribute Stickiness.
Turn on target group stickiness
Server-side tasks and status
After completing and submitting the above steps, all server-side tasks and their statuses become available for monitoring.
Cancel
Save changes
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EC2 > Load balancers > mb-load-balancer > HTTP:80 listener
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EC2 Global View
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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
Rules
Attributes
Tags
Listener rules (4) Info
Rule limits
Actions
Add rule
Traffic received by the listener is routed according to the default action and any additional rules. Rules are evaluated in priority order from the lowest value to the highest value.
Filter rules
Name tag
Priority
Conditions (If)
Actions (Then)
ARN
Tag
- 1 Path Pattern is /api/users* Forward to target group • mb-users-target: 1 (100%) • Target group stickiness: Off ARN 0 ta
- 2 Path Pattern is /api/posts* Forward to target group • mb-posts-target: 1 (100%) • Target group stickiness: Off ARN 0 ta
- 3 Path Pattern is /api/threads* Forward to target group • mb-threads-target: 1 (100%) • Target group stickiness: Off ARN 0 ta
Default Last (default) If no other rule applies Forward to target group • mb-users-target: 1 (100%) • Target group stickiness: Off ARN 0 ta
CloudShell
Feedback
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Privacy
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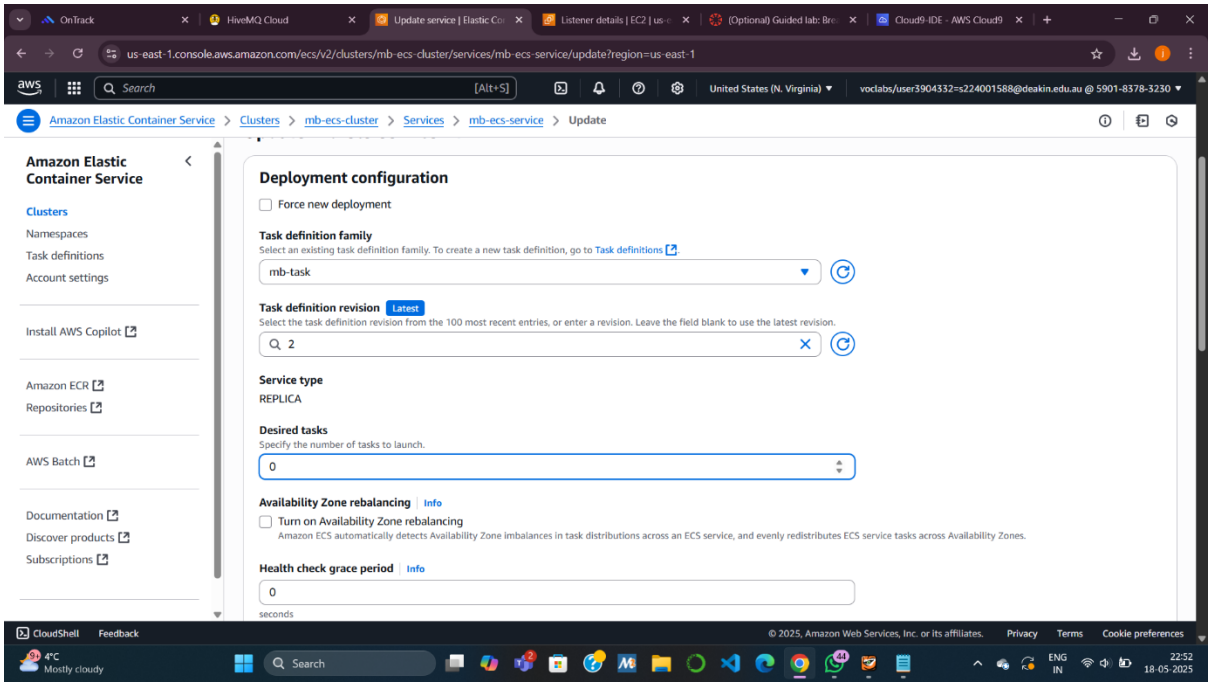
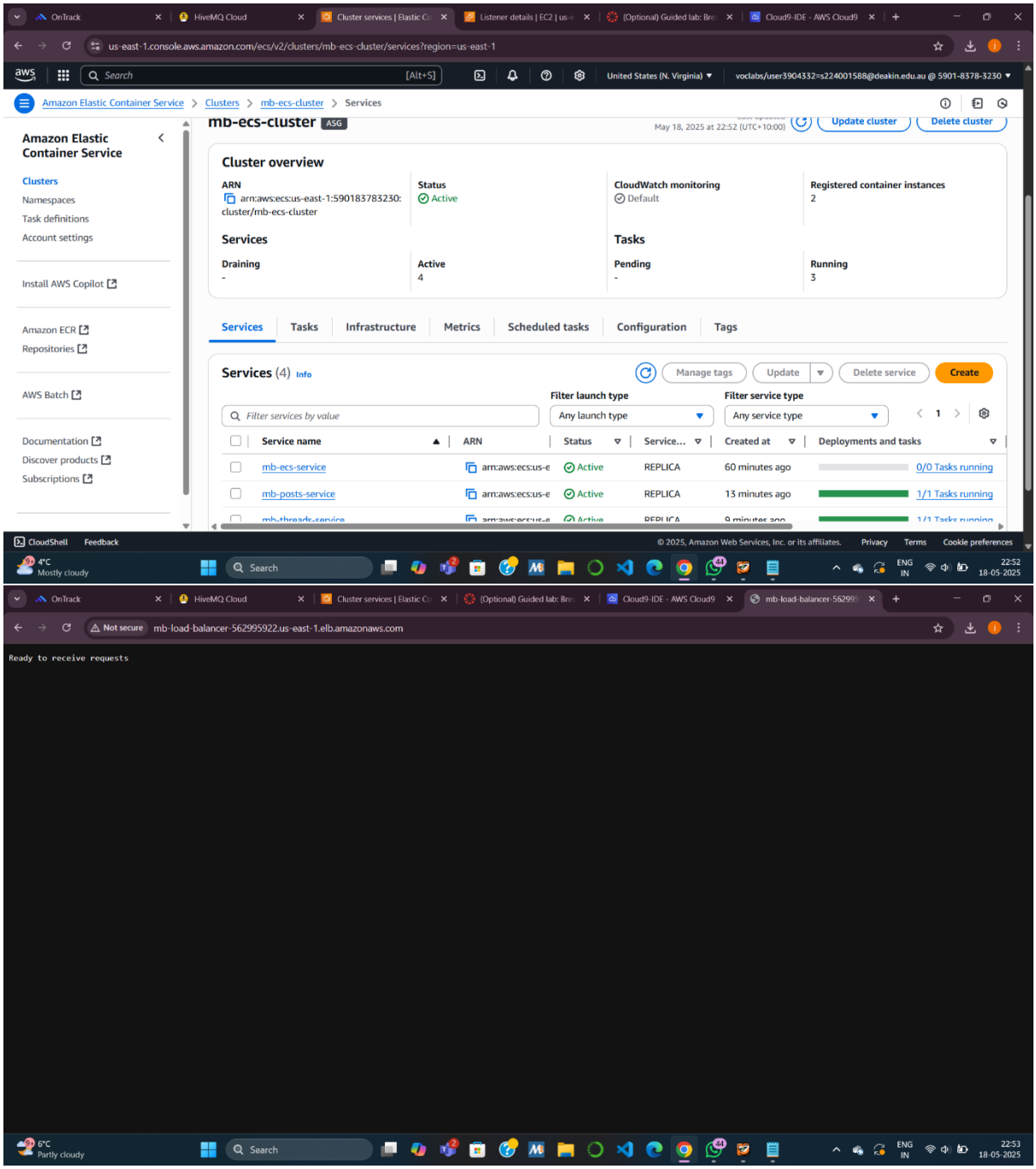

OnTrack
HiveMQ Cloud
Update service | Elastic Co
Listener details | EC2 | us-e
(Optional) Guided lab: Bre
Cloud9-IDE - AWS Cloud9
us-east-1.console.aws.amazon.com/ecs/v2/clusters/mb-ecs-cluster/services/mb-ecs-service/update?region=us-east-1
Search
[Alt+S]
United States (N. Virginia)
voclabs/user3904332=s224001588@deakin.edu.au @ 5901-8378-3230
Amazon Elastic Container Service
Clusters
mb-ecs-cluster
Services
mb-ecs-service
Update
Amazon Elastic Container Service
Clusters
Namespaces
Task definitions
Account settings
Install AWS Copilot
Amazon ECR
Repositories
AWS Batch
Documentation
Discover products
Subscriptions
Deployment configuration
Force new deployment
Task definition family
Select an existing task definition family. To create a new task definition, go to Task definitions.
mb-task
Task definition revision
Latest
Select the task definition revision from the 100 most recent entries, or enter a revision. Leave the field blank to use the latest revision.
2
Service type
REPLICA
Desired tasks
Specify the number of tasks to launch.
0
Availability Zone rebalancing
Info
Turn on Availability Zone rebalancing
Amazon ECS automatically detects Availability Zone imbalances in task distributions across an ECS service, and evenly redistributes ECS service tasks across Availability Zones.
Health check grace period
Info
0
seconds
CloudShell
Feedback
© 2025, Amazon Web Services, Inc. or its affiliates.
Privacy
Terms
Cookie preferences
4°C
Mostly cloudy
Search
ENG
IN
22:52
18-05-2025


us-east-1.console.aws.amazon.com/ecs/v2/clusters/mb-ecs-cluster/services?region=us-east-1
Amazon Elastic Container Service > Clusters > mb-ecs-cluster > Services
mb-ecs-cluster
ASG
May 18, 2025 at 22:52 (UTC+10:00)
Update cluster
Delete cluster
Amazon Elastic Container Service
Clusters
Namespaces
Task definitions
Account settings
Install AWS Copilot
Amazon ECR
Repositories
AWS Batch
Documentation
Discover products
Subscriptions
Cluster overview
ARN
arn:aws:ecs:us-east-1:590183783230:cluster/mb-ecs-cluster
Status
Active
CloudWatch monitoring
Default
Registered container instances
2
Services
Draining
-
Active
4
Tasks
Pending
-
Running
3
Services
Tasks
Infrastructure
Metrics
Scheduled tasks
Configuration
Tags
Services (4) Info
Manage tags
Update
Delete service
Create
Filter services by value
Filter launch type
Any launch type
Filter service type
Any service type
Service name
ARN
Status
Service...
Created at
Deployments and tasks
mb-ecs-service
Active
REPLICA
60 minutes ago
0/0 Tasks running
mb-posts-service
Active
REPLICA
13 minutes ago
1/1 Tasks running
CloudShell
Feedback
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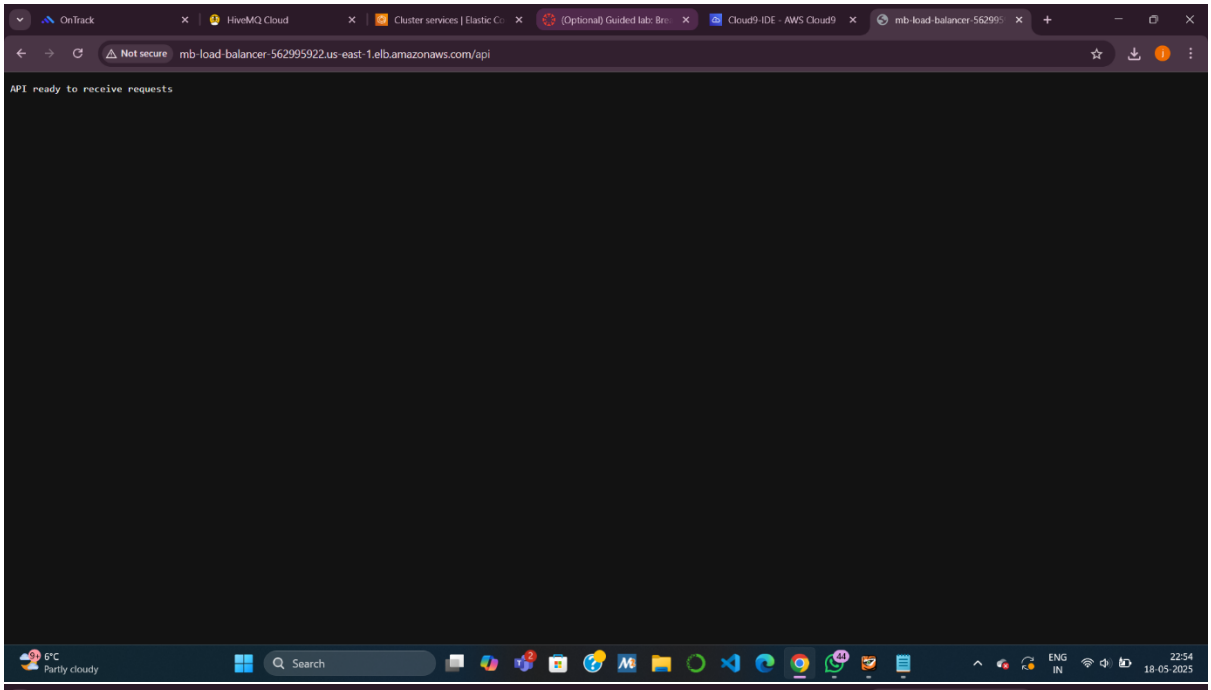
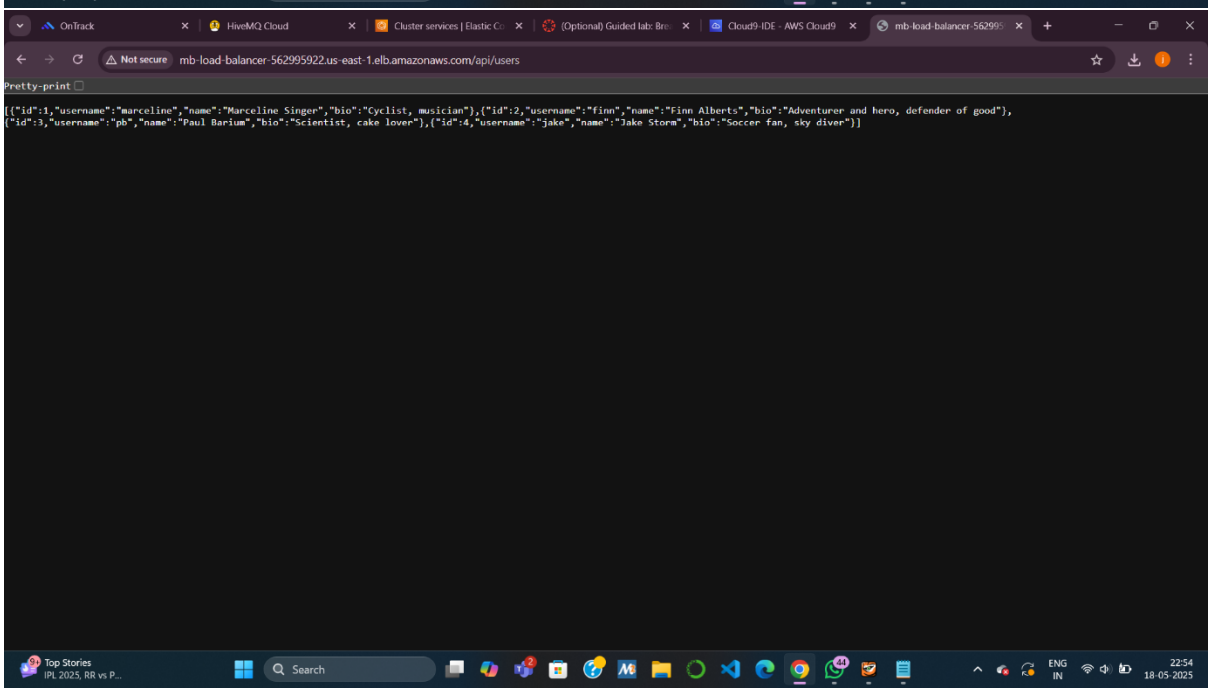
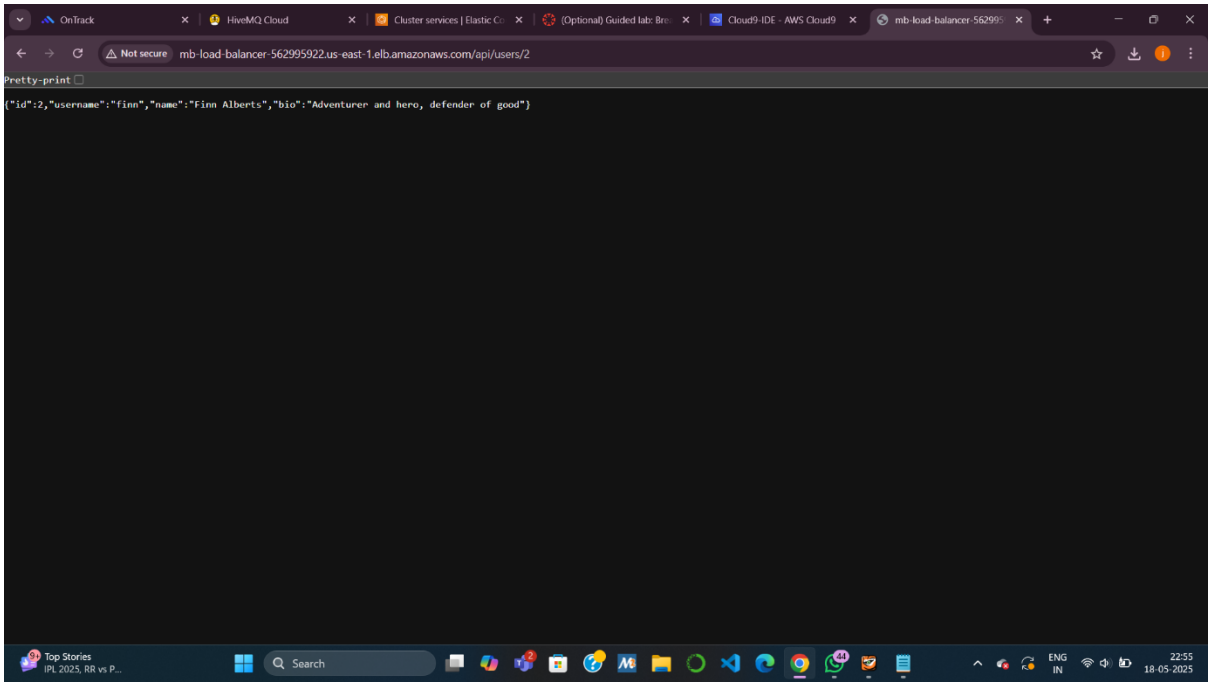
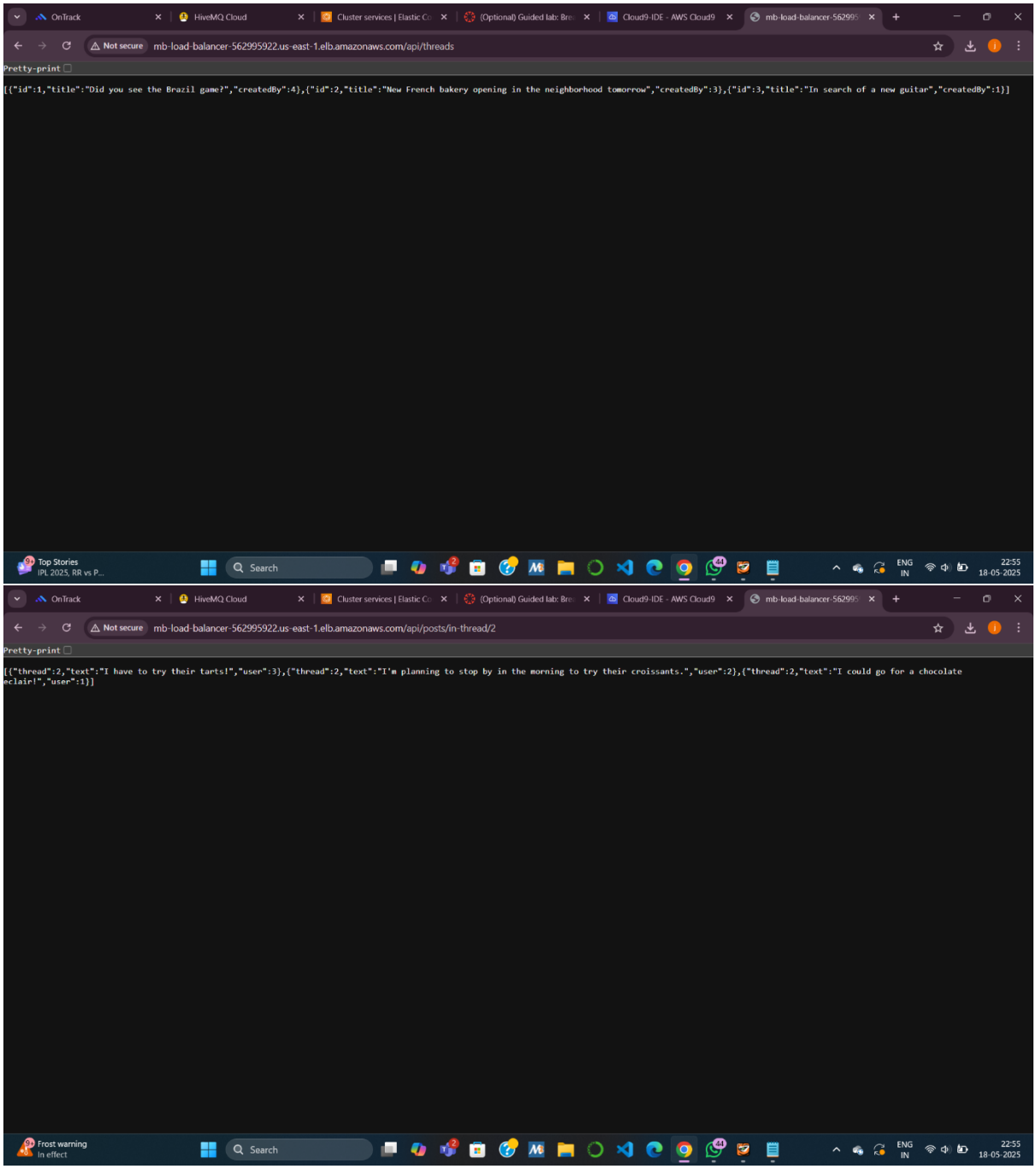
Terms
Cookie preferences
4°C
Mostly cloudy
Search
ENG
IN
22:52
18-05-2025

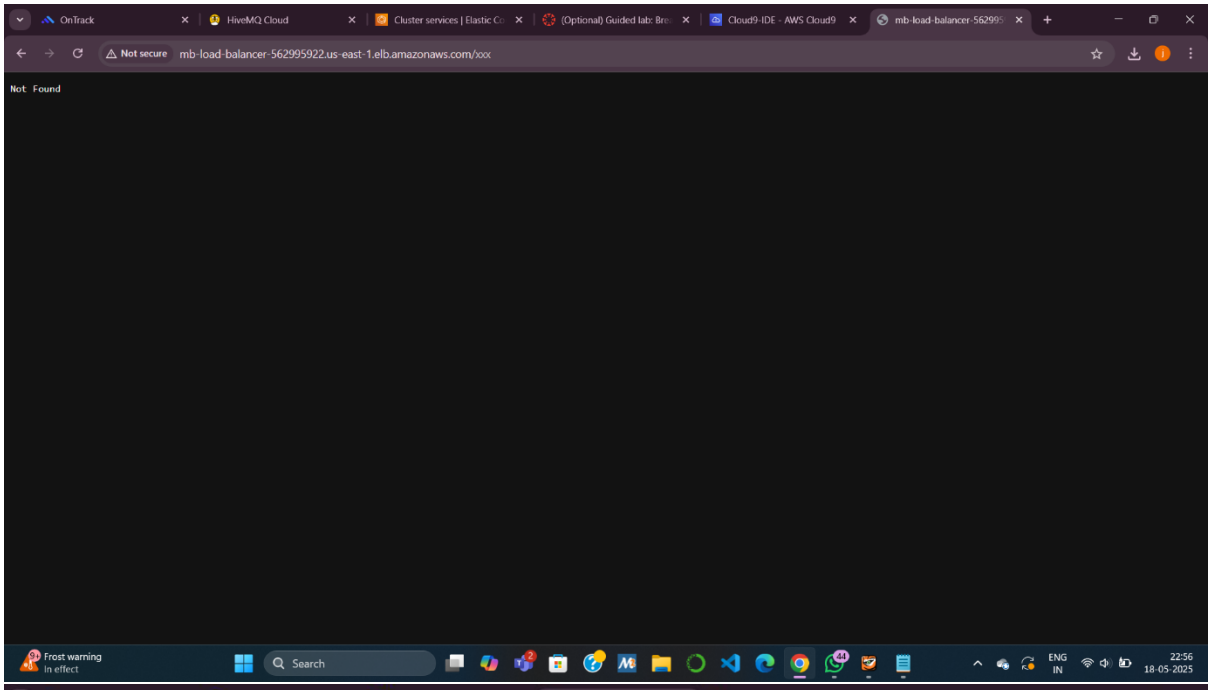
Not secure
mb-load-balancer-562995922.us-east-1.elb.amazonaws.com
Ready to receive requests
6°C
Partly cloudy
Search
ENG
IN
22:53
18-05-2025

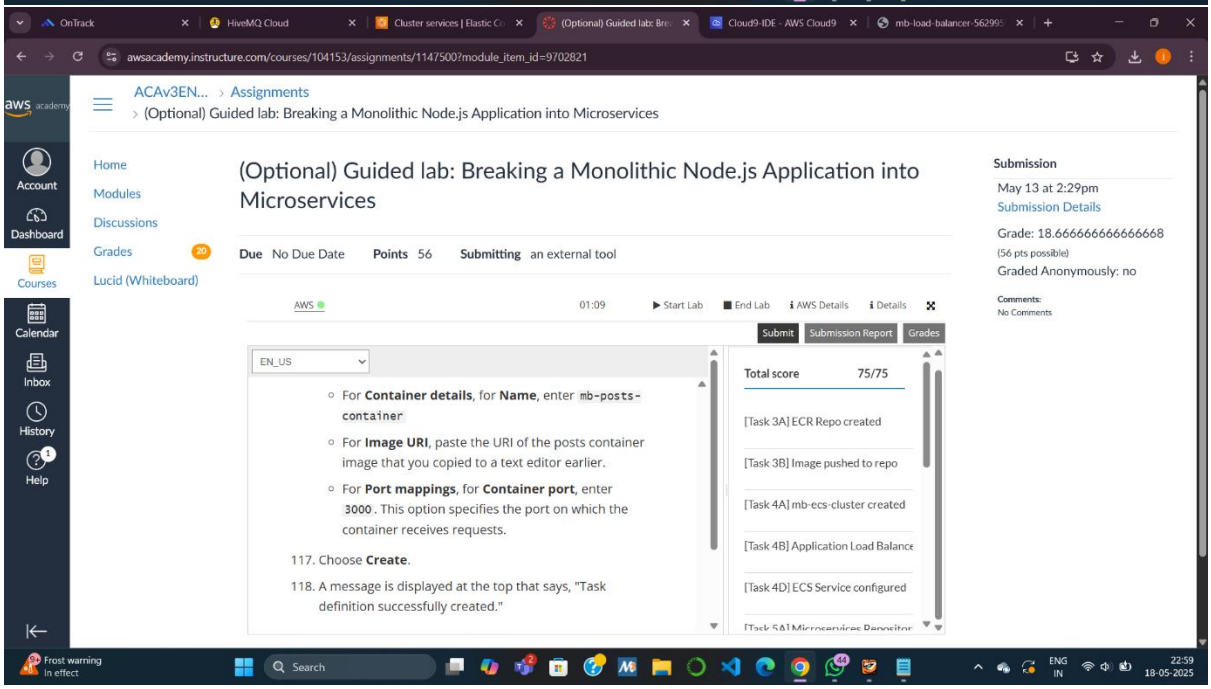

OnTrack
HiveMQ Cloud
Cluster services | Elastic Co
(Optional) Guided lab: Bre
Cloud9-IDE - AWS Cloud9
mb-load-balancer-562995
Not secure
mb-load-balancer-562995922.us-east-1.elb.amazonaws.com/api
API ready to receive requests
6°C
Partly cloudy
Search
ENG
IN
22:54
18-05-2025

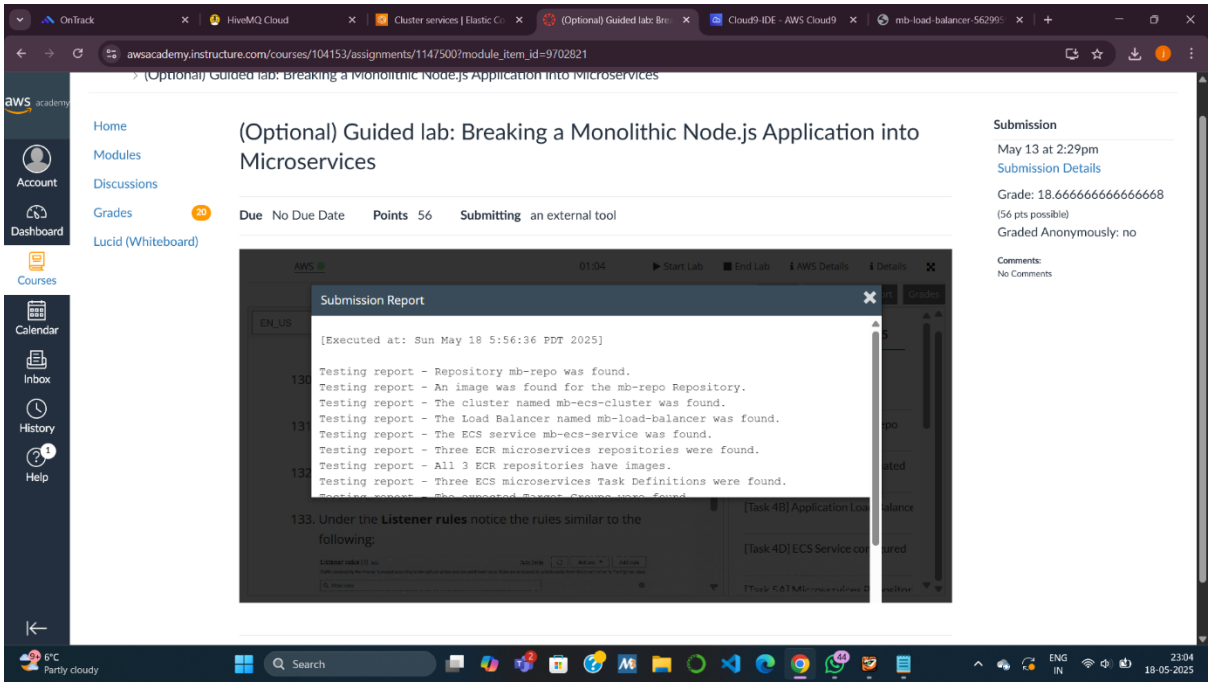

OnTrack
HiveMQ Cloud
Cluster services | Elastic Co
(Optional) Guided lab: Bre
Cloud9-IDE - AWS Cloud9
mb-load-balancer-562995
Not secure
mb-load-balancer-562995922.us-east-1.elb.amazonaws.com/api/users
Pretty-print
[{"id":1,"username":"marceline","name":"Marceline Singer","bio":"Cyclist, musician"},{"id":2,"username":"finn","name":"Finn Alberts","bio":"Adventurer and hero, defender of good"},
{"id":3,"username":"pb","name":"Paul Barium","bio":"Scientist, cake lover"},{"id":4,"username":"jake","name":"Jake Storm","bio":"Soccer fan, sky diver"}]
Top Stories
IPL 2025, RR vs P...
Search
ENG
IN
22:54
18-05-2025


OnTrack
HiveMQ Cloud
Cluster services | Elastic Co
(Optional) Guided lab: Bre
Cloud9-IDE - AWS Cloud9
mb-load-balancer-562995
Not secure
mb-load-balancer-562995922.us-east-1.elb.amazonaws.com/api/users/2
Pretty-print
{"id":2,"username":"finn","name":"Finn Alberts","bio":"Adventurer and hero, defender of good"}
Top Stories
IPL 2025, RR vs P...
Search
ENG
IN
22:55
18-05-2025


OnTrack
HiveMQ Cloud
Cluster services | Elastic Co
(Optional) Guided lab: Bre
Cloud9-IDE - AWS Cloud9
mb-load-balancer-562995
Not secure
mb-load-balancer-562995922.us-east-1.elb.amazonaws.com/api/threads
Pretty-print
[{"id":1,"title":"Did you see the Brazil game?","createdBy":4},{"id":2,"title":"New French bakery opening in the neighborhood tomorrow","createdBy":3},{"id":3,"title":"In search of a new guitar","createdBy":1}]
Top Stories
IPL 2025, RR vs P...
Search
ENG
IN
22:55
18-05-2025
OnTrack
HiveMQ Cloud
Cluster services | Elastic Co
(Optional) Guided lab: Bre
Cloud9-IDE - AWS Cloud9
mb-load-balancer-562995
Not secure
mb-load-balancer-562995922.us-east-1.elb.amazonaws.com/api/posts/in-thread/2
Pretty-print
[{"thread":2,"text":"I have to try their tarts!","user":3},{"thread":2,"text":"I'm planning to stop by in the morning to try their croissants.","user":2},{"thread":2,"text":"I could go for a chocolate eclair!","user":1}]
Frost warning
In effect
Search
ENG
IN
22:55
18-05-2025


OnTrack
HiveMQ Cloud
Cluster services | Elastic Co
(Optional) Guided lab: Bre
Cloud9-IDE - AWS Cloud9
mb-load-balancer-562995
Not secure
mb-load-balancer-562995922.us-east-1.elb.amazonaws.com/xxx
Not Found
Frost warning
In effect
Search
ENG
IN
22:56
18-05-2025


OnTrack
HiveMQ Cloud
Cluster services | Elastic Co
(Optional) Guided lab: Bre
Cloud9-IDE - AWS Cloud9
mb-load-balancer-562995
awsacademy.instructure.com/courses/104153/assignments/1147500?module_item_id=9702821
aws academy
Account
Dashboard
Courses
Calendar
Inbox
History
Help
ACAv3EN... › Assignments
› (Optional) Guided lab: Breaking a Monolithic Node.js Application into Microservices
Home
Modules
Discussions
Grades 20
Lucid (Whiteboard)
(Optional) Guided lab: Breaking a Monolithic Node.js Application into Microservices
Due No Due Date Points 56 Submitting an external tool
AWS
01:09
Start Lab
End Lab
AWS Details
Details
Submit
Submission Report
Grades
EN_US
For Container details, for Name, enter mb-posts-container
For Image URI, paste the URI of the posts container image that you copied to a text editor earlier.
For Port mappings, for Container port, enter 3000. This option specifies the port on which the container receives requests.
117. Choose Create.
118. A message is displayed at the top that says, "Task definition successfully created."
Total score 75/75
[Task 3A] ECR Repo created
[Task 3B] Image pushed to repo
[Task 4A] mb-ecs-cluster created
[Task 4B] Application Load Balance
[Task 4D] ECS Service configured
Submission
May 13 at 2:29pm
Submission Details
Grade: 18.666666666666668
(56 pts possible)
Graded Anonymously: no
Comments:
No Comments
Frost warning
In effect
Search
ENG
IN
22:59
18-05-2025



1. What is the difference between a monolithic and microservices architecture?

- **Monolithic Architecture**:
    - All application components (e.g., user handling, threads, posts) are packaged into a **single unit**.
    - Deployed as one service — if one component fails, it can affect the whole app.
    - Difficult to **scale** or **update individual parts** without affecting others.
- **Microservices Architecture**:
    - Application is broken into **independent services**, each responsible for one function (e.g., a separate service for users, posts, and threads).
    - Each service is **deployed, scaled, and updated independently**.
    - Easier to maintain and allows for faster innovation.

2. What is a container and how does it differ from virtual machines (VMs)?

- **Container**:
    - A lightweight, portable unit that packages **app code and its dependencies**.
    - Shares the **host OS kernel** but runs in isolated environments.
    - Starts quickly and uses fewer system resources.
    - Common tool: **Docker**
- **Virtual Machine (VM)**:

- Emulates a **full operating system** (OS) with its own kernel.
- Requires a **hypervisor** and is **heavier and slower** to start.
- More resource-intensive than containers.

3. What is the command used to build an image for Docker?

docker build -t <image-name> .

Example from lab:

docker build -t mb-users-repo .

- -t specifies the tag (image name).
- . indicates to use the current directory as the build context (where the Dockerfile is located).

Knowledge check