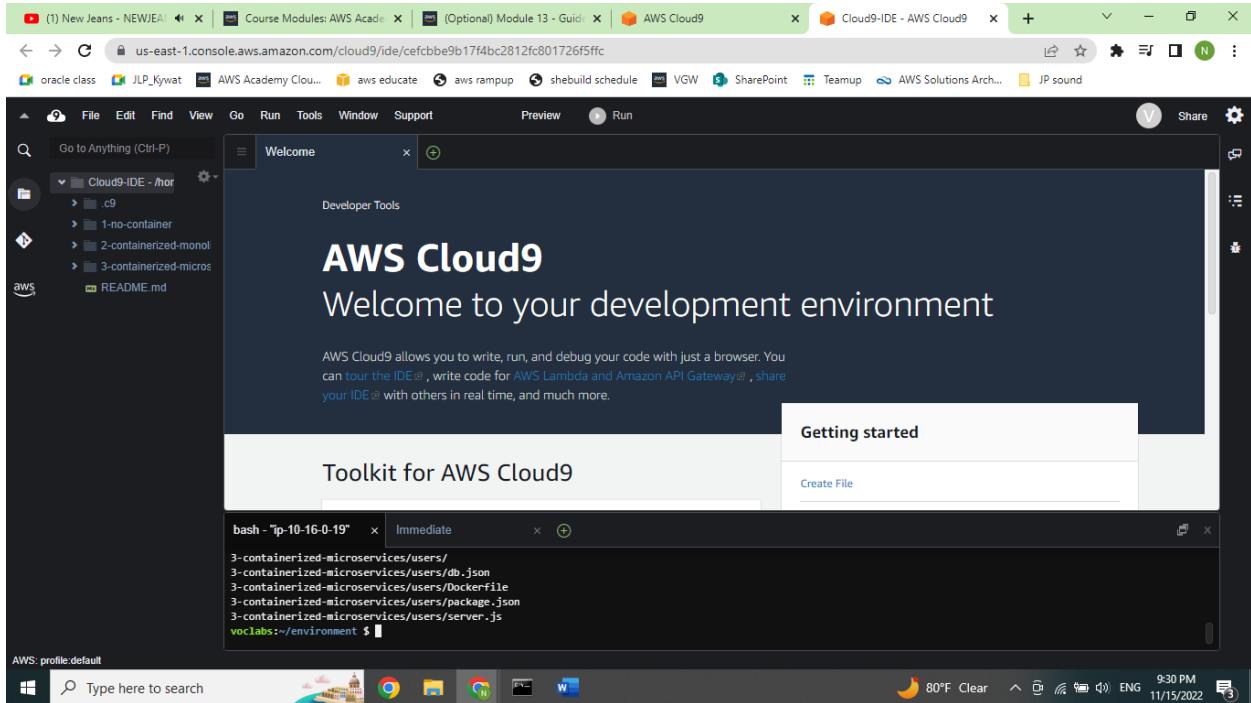
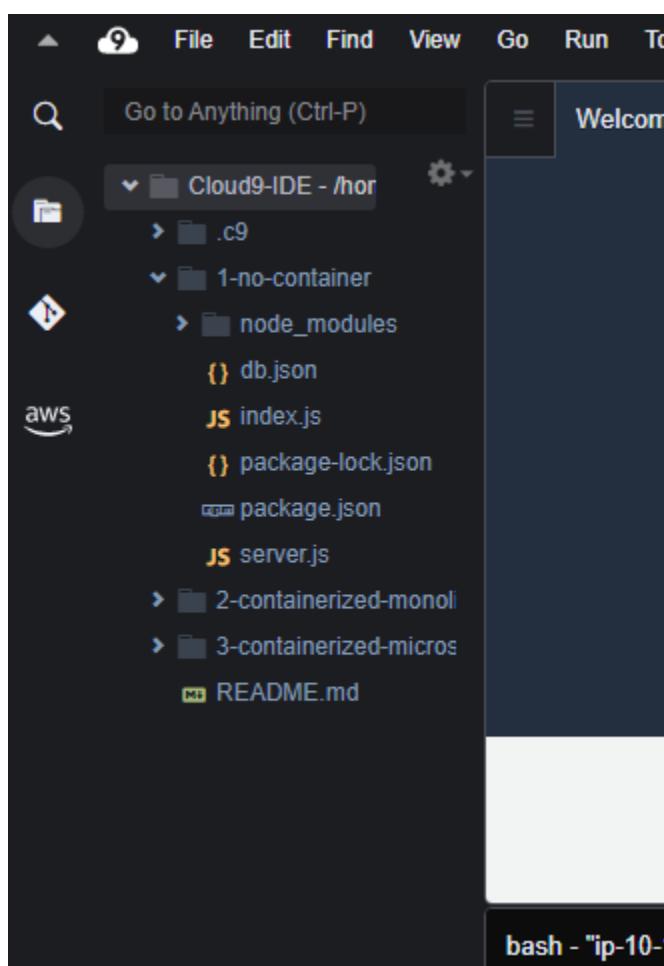
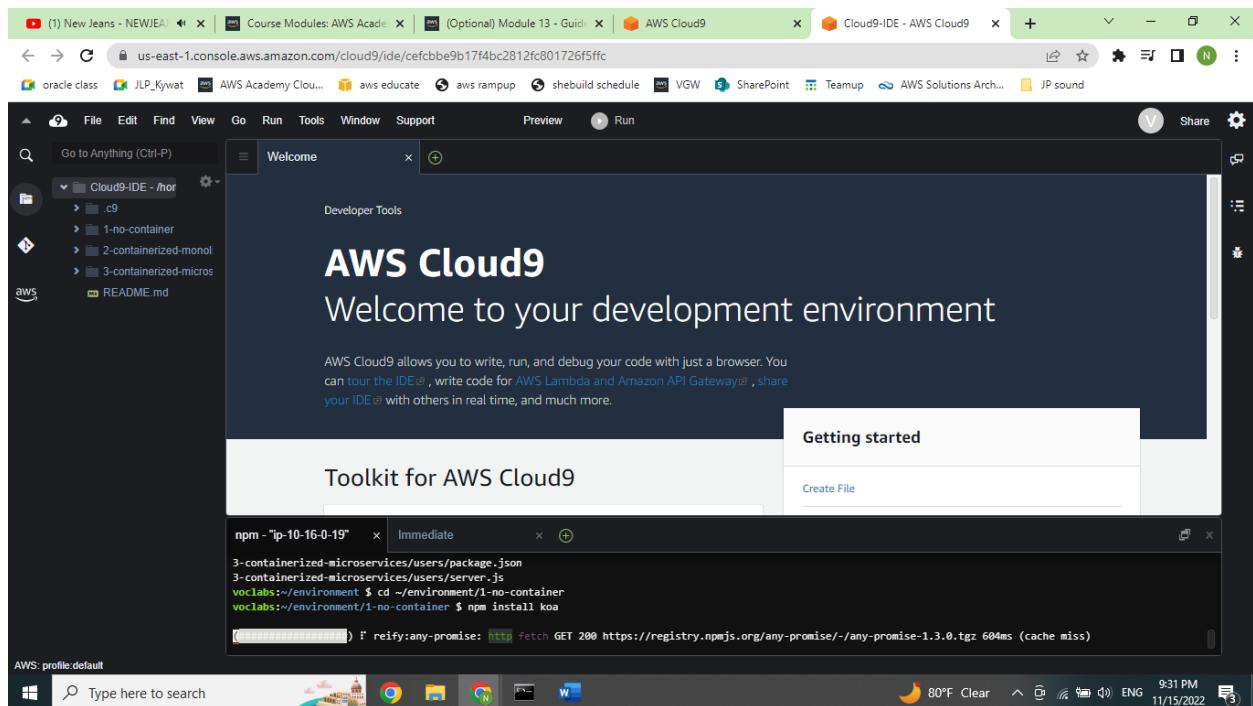


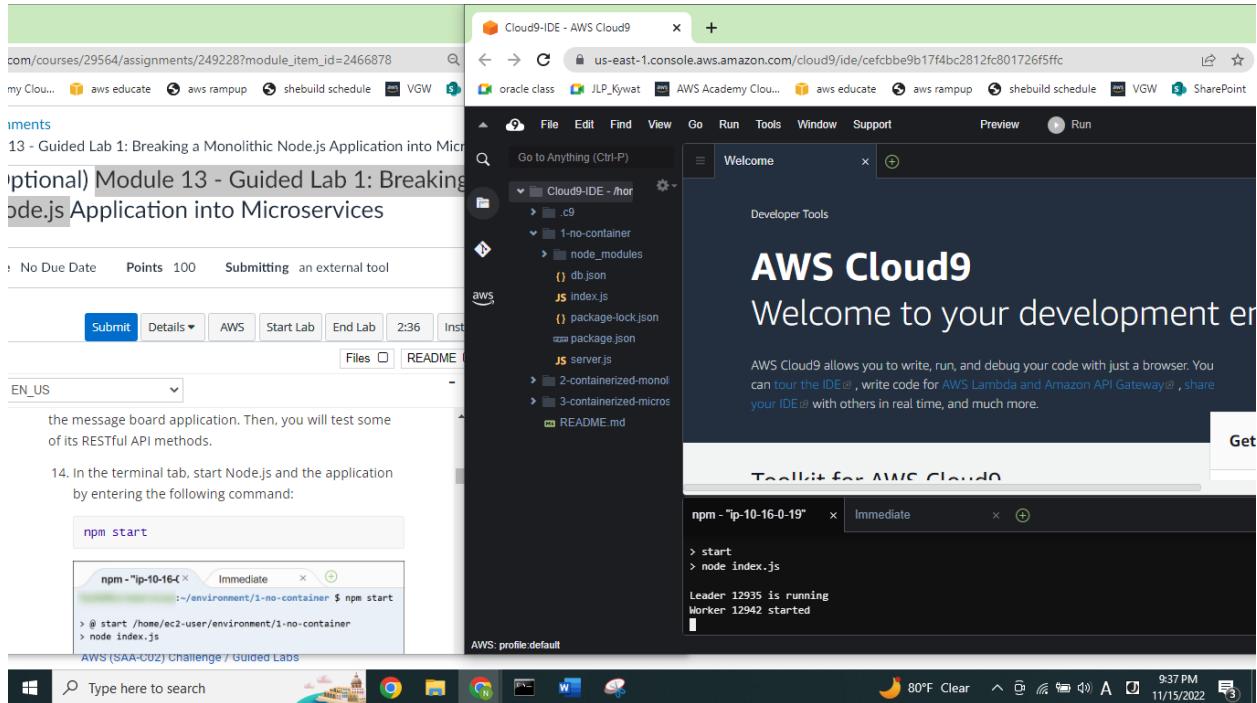
Module 13 Guided Lab - Implementing a Serverless Architecture with AWS Lambda



Installation

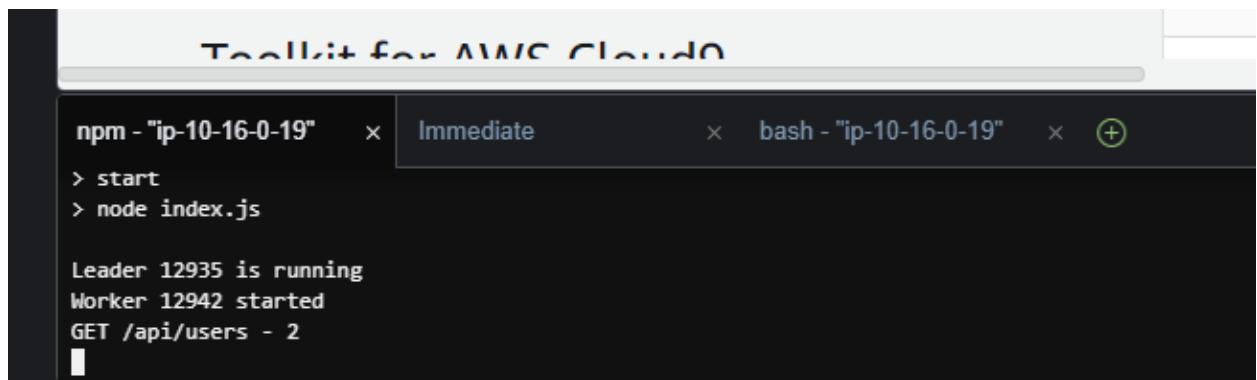


Running



Open new terminal

```
curl localhost:3000/api/users
```



Get

Toolkit for AWS Cloud9

npm - "ip-10-16-0-19" x Immediate x bash - "ip-10-16-0-19" x +

```
voclabs:~/environment $ curl localhost:3000/api/users
[{"id":1,"username":"marceline","name":"Marceline Singer","bio":"Cyclist, musician"}, {"id":2,"name":"Finn Alberts","bio":"Adventurer and hero, defender of good"}, {"id":3,"username":"pb", "ium","bio":"Scientist, cake lover"}, {"id":4,"username":"jake","name":"Jake Storm","bio":"Socce"}]voclabs:~/environment $
```

curl localhost:3000/api/users/4

npm - "ip-10-16-0-19" x Immediate x bash - "ip-10-16-0-19" x +

```
voclabs:~/environment $ curl localhost:3000/api/users
[{"id":1,"username":"marceline","name":"Marceline Singer","bio":"Cyclist, musician"}, {"id":2,"name":"Finn Alberts","bio":"Adventurer and hero, defender of good"}, {"id":3,"username":"pb", "ium","bio":"Scientist, cake lover"}, {"id":4,"username":"jake","name":"Jake Storm","bio":"Socce"}]voclabs:~/environment $ curl localhost:3000/api/users/4
{"id":4,"username":"jake","name":"Jake Storm","bio":"Soccer fan, sky diver"}voclabs:~/environment $
```

npm - "ip-10-16-0-19" x Immediate x bash - "ip-10-16-0-19" x +

```
voclabs:~/environment $ curl localhost:3000/api/users
[{"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"}]voclabs:~/environment $ curl localhost:3000/api/users/4
voclabs:~/environment $ curl localhost:3000/api/thread
[{"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}]voclabs:~/environment $
```

npm - "ip-10-16-0-19" x Immediate x bash - "ip-10-16-0-19" x +

```
""}]voclabs:~/environment $ curl localhost:3000/api/users/4
voclabs:~/environment $ curl localhost:3000/api/thread
[{"id":1,"title":"Did you see the Brazil game?", "createdBy":4}, {"id":2,"title":"New French ba he neighborhood tomorrow", "createdBy":3}, {"id":3,"title":"In search of a new guitar", "createdBy":1}]voclabs:~/environment $ curl localhost:3000/api/posts/in-thread/1
[{"thread":1,"text":"That last goal was awesome!", "user":4}, {"thread":1,"text":"Yes, the way .. What talent!", "user":2}]voclabs:~/environment $
```

A screenshot of a terminal window titled "npm - "ip-10-16-0-19"" with three tabs. The active tab shows logs from a Node.js application. The logs indicate the Leader worker has started and a Worker has started. It also shows several GET requests to /api/users, /api/users/4, /api/threads, and /api/posts/in-thread/1, all returning 2, 1, 0, and 0 respectively. The terminal window has a dark background and light-colored text.

```
Leader 12935 is running
Worker 12942 started
GET /api/users - 2
GET /api/users/4 - 1
GET /api/threads - 0
GET /api/posts/in-thread/1 - 0
```

Stop the server

A screenshot of a terminal window titled "npm - "ip-10-16-0-19"" with three tabs. The active tab shows logs from a Node.js application. The logs indicate a Worker has started and several GET requests to /api/users, /api/users/4, /api/threads, and /api/posts/in-thread/1, all returning 2, 1, 0, and 0 respectively. The terminal then receives a ^C signal, which is shown as "vclabs:~/environment/1-no-container \$". The terminal window has a dark background and light-colored text.

```
Worker 12942 started
GET /api/users - 2
GET /api/users/4 - 1
GET /api/threads - 0
GET /api/posts/in-thread/1 - 0
^C
vclabs:~/environment/1-no-container $
```

Open package.json

The screenshot shows the Cloud9 IDE interface with the package.json file open in the editor. The file contains the following code:

```
1 {  
2   "dependencies": {  
3     "koa": "^1.2.5",  
4     "koa-router": "^5.4.0"  
5   },  
6   "scripts": {  
7     "start": "node server.js"  
8   }  
9 }  
10 |
```

The screenshot shows the Cloud9 IDE interface with the Dockerfile open in the editor. The file contains the following code:

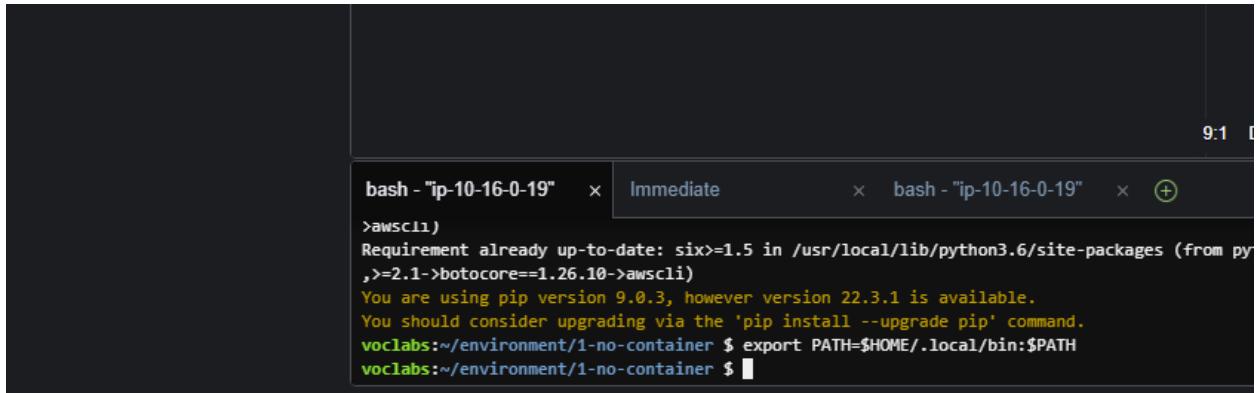
```
1 FROM mhart/alpine-node:7.10.1  
2 WORKDIR /srv  
3 ADD . .  
4 RUN npm install  
5 EXPOSE 3000  
6 CMD ["node", "server.js"]  
7 |  
8 |
```

The screenshot shows a split-screen view. On the left, a guided lab assignment titled "Optional) Module 13 - Guided Lab 1: Breaking a Monolithic Node.js Application into Microservices" is displayed. It includes steps 25 through 29, which involve creating an ECR repository. On the right, the AWS ECR console is open, showing the "Create repository" wizard. The repository name "mb-repo" is entered in the "Repository name" field. The "Private" visibility setting is selected.

The screenshot shows the AWS ECR console after a successful repository creation. A green success message "Successfully created repository mb-repo" is visible. The "Private" tab is selected, showing one private repository named "mb-repo". The repository details table includes columns for Repository name, URI, and Created at.

The screenshot shows a terminal window with the following commands entered:

```
pip3 install awscli --upgrade --user
export PATH=$HOME/.local/bin:$PATH
```



A screenshot of a terminal window titled "bash - "ip-10-16-0-19"" with the tab "Immediate" selected. The terminal shows the following output:

```
>awscli)
Requirement already up-to-date: six>=1.5 in /usr/local/lib/python3.6/site-packages (from py
,>=2.1->botocore==1.26.10->awscli)
You are using pip version 9.0.3, however version 22.3.1 is available.
You should consider upgrading via the 'pip install --upgrade pip' command.
voclabs:~/environment/1-no-container $ export PATH=$HOME/.local/bin:$PATH
voclabs:~/environment/1-no-container $
```

Successfully created repository mb-repo

View push commands X

Amazon ECR > Repositories

Private Public

com/courses/29564/assignments/249228?module_item_id=2466878

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Comments 13 - Guided Lab 1: Breaking a Monolithic Node.js Application into Microservices

(optional) Module 13 - Guided Lab 1: Breaking a Monolithic Node.js Application into Microservices

No Due Date Points 100 Submitting an external tool

Submit Details AWS Start Lab End Lab 2:21 Instructions Grades Actions

Files README Terminal Source bash

EN_US

ddd_v1_w_mhp_1506790@runweb671

then copy the command to the clipboard by choosing the **Copy** icon.

The command looks like the following example:

```
$ aws ecr get-login-password --region us-east-1 | docker login --username AWS --password-stdin 01234567890.dkr.ecr.us-east-1.amazonaws.com/mb-repo
```

33. Switch to the AWS Cloud9 IDE browser tab.

34. In the **left terminal tab**, paste the copied command and run it by pressing ENTER:

Elastic Container Registry x +

e.aws.amazon.com/ecr/repositories?region=us-east-1

WS Academy Clou... aws educate aws rampup shebuild schedule VGW SharePoint

Instructions for mb-repo

Windows

I have the latest version of the AWS CLI and Docker installed. For more information, see [Getting on ECR](#).

Steps to authenticate and push an image to your repository. For additional registry authentication or the Amazon ECR credential helper, see [Registry Authentication](#).

authentication token and authenticate your Docker client to your registry.

```
$ aws ecr get-login-password --region us-east-1 | docker login --username AWS --password-stdin 698384538129.dkr.ecr.us-east-1.amazonaws.com
```

If an error using the AWS CLI, make sure that you have the latest version of the AWS CLI and Docker installed.

builder image using the following command. For information on building a Docker file from instructions here. You can skip this step if your image is already built:

```
$ docker build -t mb-repo .
```

Once completed, tag your image so you can push the image to this repository:

```
$ docker tag mb-repo:latest 698384538129.dkr.ecr.us-east-1.amazonaws.com/mb-repo:latest
```

Windows Taskbar

Type here to search

79°F Clear 9:52 PM 11/15/2022

bash - "ip-10-16-0-19" x Immediate x bash - "ip-10-16-0-19" x +

```
,>=2.1->botocore==1.26.10->awscli)
You are using pip version 9.0.3, however version 22.3.1 is available.
You should consider upgrading via the 'pip install --upgrade pip' command.
voclabs:~/environment/1-no-container $ export PATH=$HOME/.local/bin:$PATH
voclabs:~/environment/1-no-container $ aws ecr get-login-password --region us-east-1 | docker
AWS --password-stdin 698384538129.dkr.ecr.us-east-1.amazonaws.com
```

Change cd

```
bash - "ip-10-16-0-19"  x  Immediate      x  bash - "ip-10-16-0-19"  x  +  
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  
voclabs:~/environment/1-no-container $ cd ~/environment/2-containerized-monolith  
voclabs:~/environment/2-containerized-monolith $
```

docker build -t mb-repo .

```
9:1  
  
docker - "ip-10-16-0-19"  x  Immediate      x  bash - "ip-10-16-0-19"  x  +  
Removing intermediate container 24/ecbbcc013  
--> 4383dedfa3a5  
Step 3/6 : ADD . .  
--> 11cc632c0af6  
Step 4/6 : RUN npm install  
--> Running in 91b1185ca433  
  
9:1 Doc  
  
docker - "ip-10-16-0-19"  x  Immediate      x  bash - "ip-10-16-0-19"  x  +  
Step 6/6 : CMD ["node", "server.js"]  
--> Running in cc3b3a5c9c5b  
Removing intermediate container cc3b3a5c9c5b  
--> 668bcc5bca96  
Successfully built 668bcc5bca96  
Successfully tagged mb-repo:latest  
voclabs:~/environment/2-containerized-monolith $
```

docker tag mb-repo:latest 698384538129.dkr.ecr.us-east-1.amazonaws.com/mb-repo:latest

docker push 698384538129.dkr.ecr.us-east-1.amazonaws.com/mb-repo:latest

JS server.js

3-containerized-microservices

README.md

AWS Cloud9 allows you to write, run, and debug your code with just a browser. You can tour the IDE, write code for AWS Lambda and Amazon API Gateway, share your IDE with others in real time, and much more.

Get

Toolkit for AWS Cloud9

docker - "ip-10-16-0-19" x Immediate x bash - "ip-10-16-0-19" x +

```
The push refers to repository [698384538129.dkr.ecr.us-east-1.amazonaws.com/mb-repo]
1c1d2caaae8c: Pushed
470d354b663a: Pushed
3e893534526a: Pushed
040fd7841192: Pushed
latest: digest: sha256:a716aa7e6c156d6c45587e6340458adc2d210561ad4c3d4562faa363ca2bbc41 size: vclabs:~/environment/2-containerized-monolith $
```

Cloud9-IDE - AWS Cloud9 x Elastic Container Registry x Facebook x | (3) NewJeans (뉴진스) - Hypo x | +

us-east-1.console.aws.amazon.com/ecr/repositories/private/698384538129/mb-repo?region=us-east-1

oracle class JLP_Kyawt AWS Academy Clou... aws educate aws rampup shebuild schedule VGW SharePoint Teamup AWS Solutions Arch... JP sound

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Amazon Elastic Container Registry

Private registry Public registry Repositories Summary Images Permissions Lifecycle Policy Repository tags

Getting started Documentation Public gallery

Amazon ECR > Repositories > mb-repo

mb-repo

View push commands Edit

Images (1)

Find images

	Image tag	Artifact type	Pushed at	Size (MB)	Image URI	Digest	Scan status	Vuln
<input type="checkbox"/>	latest	Image	November 15, 2022, 22:01:00 (UTC+06:5)	20.46	Copy URI	sha256:a716aa7e6c156d6c45587e6340458adc2d210561ad4c3d4562faa363ca2bbc41...	-	-

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Cloud9-IDE - AWS Cloud Services

Amazon ECS

Facebook

(3) NewJeans

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Amazon Elastic Container Service

New ECS Experience Tell us what you think

Amazon ECS Clusters Task Definitions Account Settings Amazon EKS Clusters Amazon ECR Repositories AWS Marketplace Discover software Subscriptions

EN_US

Elastic Container Service.

53. In the navigation pane, choose **Amazon ECS > Clusters**.

54. In the **Clusters** page, choose **Create Cluster**.

55. In the **Select cluster template** page, select the **EC2 Linux + Networking** card.

56. Choose **Next step**.

57. In the **Configure cluster** wizard, configure the following settings.

- Cluster name: mb-ecs-cluster

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13 - Guided Lab 1: Breaking a Monolithic Node.js Application into Microservices

optional) Module 13 - Guided Lab 1: Breaking a Monolithic Node.js Application into Microservices

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Submit Details AWS Start Lab End Lab

EN_US

53. In the navigation pane, choose **Amazon ECS > Clusters**.
 54. In the **Clusters** page, choose **Create Cluster**.
 55. In the **Select cluster template** page, select the **Linux + Networking** card.
 56. Choose **Next step**.
 57. In the **Configure cluster** wizard, configure the following settings.

- **Cluster name:** mb-ecs-cluster

Cloud9-IDE - AWS Cloud X Amazon ECS X Facebook X | (3) Newjeans (유진) X +

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Create Cluster

Step 1: Select cluster template

Step 2: Configure cluster

Select cluster template

The following cluster templates are available to simplify cluster creation. Additional configuration and integrations can be added later.

Networking only ⓘ

Resources to be created:

- Cluster
- VPC (optional)
- Subnets (optional)

ⓘ For use with either AWS Fargate (Windows/Linux) or with External instance capacity.

EC2 Linux + Networking ⓘ

Resources to be created:

- Cluster
- VPC
- Subnets

Auto Scaling group with Linux AMI

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55. In the **Select cluster template** page, select the **Linux + Networking** card.
 56. Choose **Next step**.
 57. In the **Configure cluster** wizard, configure the following settings.

- **Cluster name:** mb-ecs-cluster
- **Provisioning Model:** On-Demand Instance
- **EC2 instance type:** t2.micro
- **Number of instances:** 2
- **VPC:** Create a new VPC
- **CIDR blocks:** 10.22.0.0/16

Cloud9-IDE - AWS Cloud X Amazon ECS X Facebook X | (3) Newjeans (유진) X +

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Create Cluster

Step 1: Select cluster template

Step 2: Configure cluster

Configure cluster

Cluster name* mb-ecs-cluster ⓘ

Create an empty cluster

Instance configuration

Provisioning Model **On-Demand Instance**

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

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The screenshot shows the AWS Cloud9 IDE interface. The top navigation bar includes tabs for 'Cloud9-IDE - AWS Cloud9' and 'Amazon ECS'. Below the tabs, there's a search bar and a list of recent links. The main content area displays a wizard for creating a new AWS Cloud9 instance, specifically for the 'clusters/create/new' step. It asks for a VPC configuration, with fields for 'CIDR block' (10.32.0.0/16), 'Subnet 1' (10.32.0.0/24), and 'Subnet 2' (10.32.1.0/24). A link to 'Add more subnets.' is visible.

Networking

Configure the VPC for your container instances to use. A VPC is an isolated portion of the AWS cloud populated by AWS objects, such as Amazon EC2 instances. You can choose an existing VPC, or create a new one with this wizard.

VPC [Create a new VPC](#)

CIDR block ⓘ

Subnet 1 ⓘ

Subnet 2 ⓘ

[+ Add more subnets.](#)

This screenshot is identical to the one above, showing the 'clusters/create/new' step of the AWS Cloud9 instance creation wizard. The configuration for the VPC is the same: CIDR block 10.32.0.0/16, Subnet 1 10.32.0.0/24, and Subnet 2 10.32.1.0/24. The 'Add more subnets.' link is also present.

[Back](#) [View Cluster](#)

ECS status - 2 of 3 complete mb-ecs-cluster



ECS cluster

ECS Cluster mb-ecs-cluster successfully created



ECS Instance IAM Policy

IAM Policy for the role ecsInstanceRole successfully attached



CloudFormation Stack

Creating CloudFormation stack resources

Cluster Resources

Loading...

This screenshot is identical to the ones above, showing the 'clusters/create/new' step of the AWS Cloud9 instance creation wizard. The configuration for the VPC is the same: CIDR block 10.32.0.0/16, Subnet 1 10.32.0.0/24, and Subnet 2 10.32.1.0/24. The 'Add more subnets.' link is also present.

Screenshot of a browser window showing the AWS Cloud9 IDE, Amazon ECS, Facebook, and NewJeans tabs. The AWS Cloud9 tab shows a successful creation of an ECS cluster named 'mb-ecs-cluster'. The ECS status page indicates 3 of 3 tasks are complete. Below this, the Cluster Resources section lists instance type (t2.micro), desired number of instances (2), key pair, ECS AMI ID (ami-0fe77b349d804e9e6), VPC (vpc-061a379b133814ef), and Subnet 1 (subnet-08188d22b5a04edfb).

The screenshot also shows a guided lab titled 'Module 13 - Guided Lab 1: Breaking a Monolithic Node.js Application into Microservices' in the Cloud9 IDE. Step 60, 'Choose View Cluster.', is completed, and step 61, 'Choose the ECS Instances tab.', is in progress.

The main ECS cluster details page for 'mb-ecs-cluster' is shown, featuring tabs for Services, Tasks, ECS Instances, Metrics, Scheduled Tasks, Tags, and Capacity Providers. The ECS Instances tab is currently selected, showing 2 registered container instances, all in the Fargate state.

View cluster

The resources that the wizard creates are listed in the **Cluster Resources** section.

60. Choose **View Cluster**.

The details page for the *mb-ecs-cluster* opens. The **Status** field shows a value of **ACTIVE**.

61. Choose the **ECS Instances** tab.

The two EC2 instances for the cluster (which the wizard created) are listed.

Note: It might take a few minutes for the two EC2 instances to show in the list. If you do not see both instances, refresh the page.

62. Choose the **Tasks** tab.

No tasks are deployed to the cluster yet. You will create one next.

Task 4.2: Creating a task definition for the application container image

A task definition is a list of configuration settings for how to run a Docker container on Amazon ECS. It tells Amazon ECS what command to run, what port to expose, and what environment variables to use.

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Discover software Subscriptions

Draining service count 0 Fargate, 0 EC2, 0 External

Services Tasks ECS Instances Metrics Scheduled Tasks Tags Capacity Providers

An Amazon ECS instance is either an External instance registered using ECS Anywhere or an Amazon EC2 instance. To register an External instance, choose Register External Instances and follow the steps. Learn More To register an Amazon EC2 instance, you can use the Amazon EC2 console. Learn More

Register External Instances Actions Last updated on November 15, 2022 10:09:18 PM (0m 0s)

Status: ALL ACTIVE DRAINING 1-2

Filter by attributes (click or press down arrow to view filter options)

Container Instance	ECS Instance ...	Availability Zon...	External Instan...	Agent Con...
3dda34f947c74341a9d9df...	I-0baad787b55...	us-east-1b	false	true
af7ce89257dc4f1bb0053a1...	I-07085ba14f53...	i-0baad787b5501ec1	false	true

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https://us-east-1.console.aws.amazon.com/ec2/v2/home?reg... 10:09 PM 11/15/2022

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Clusters Amazon ECR Repositories AWS Marketplace Discover software Subscriptions

Registered container instances 2

Pending tasks count 0 Fargate, 0 EC2, 0 External

Running tasks count 0 Fargate, 0 EC2, 0 External

Active service count 0 Fargate, 0 EC2, 0 External

Draining service count 0 Fargate, 0 EC2, 0 External

Services Tasks ECS Instances Metrics Scheduled Tasks Tags Capacity Providers

Run new Task Stop Stop All Actions Last updated on November 15, 2022 10:09:48 PM (0m 0s)

Desired task status: Running Stopped

Filter in this page Launch type ALL

Task	Task d...	Contai...	Last st...	Desire...	Started...	Started...	Group ...
No results							

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https://us-east-1.console.aws.amazon.com/ecs/home?region=us-east-1#/clusters/mb-ecs-cluster/tasks 10:09 PM 11/15/2022

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Guided Lab 1: Breaking a Monolithic Node.js Application
optional] Module 13 - Guided Lab 1: Break a Monolithic Node.js Application into Microservices

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IS

- What container image to run
- How much CPU and memory the container needs
- What ports the container listens to traffic on

In this subtask, you will create a task definition for the container image of the message board application.

63. In the navigation pane of the **Amazon ECS** console browser tab, choose **Task Definitions**.

64. Choose **Create new Task Definition**.

65. In the **Select launch type compatibility** page, choose the **EC2** card.

Type here to search

Cloud9-IDE - AWS Cloud9 Amazon ECS Facebook | (3) NewJeans (뉴진스) - Hyp... +

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Step 2: Configure task and container definitions

Create new Task Definition

Step 1: Select launch type compatibility

Step 2: Configure task and container definitions

Select launch type compatibility

Select which launch type you want your task definition to be compatible with based on where you want to launch your task.

FARGATE

Price based on task size
Requires network mode awsvpc
AWS-managed infrastructure, no Amazon EC2 instances to manage

EC2

Price based on resource usage
Multiple network modes available
Self-managed infrastructure using Amazon EC2 instances

EXTERNAL

Price based on instance-hours and additional charges for other AWS services used
Self-managed on-premise infrastructure with ECS Anywhere

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courses/29564/assignments/249228?module_item_id=2466878

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ts Guided Lab 1: Breaking a Monolithic Node.js Application

Module 13 - Guided Lab 1: Breaking a Monolithic Node.js Application into Microservices

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JS 68. Scroll down to **Container Definitions** and choose **Add container**.
The **Add container** window opens.
69. Configure the following settings.

- o **Container name:** mb-container
- o **Image:** Paste the **Image URI** of the application container image, which you copied to a text editor in a previous step.
- o **Memory Limits:** Select **Hard limit** and enter 256 (This setting defines the maximum amount of memory that the container is allowed to use.)

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JS 68. Scroll down to **Container Definitions** and choose **Add container**.
The **Add container** window opens.
69. Configure the following settings.

- o **Container name:** mb-container
- o **Image:** Paste the **Image URI** of the application container image, which you copied to a text editor in a previous step.
- o **Memory Limits:** Select **Hard limit** and enter 256 (This setting defines the maximum amount of memory that the container is allowed to use.)
- o **Port mappings > Container port:** 3000 (This setting specifies the port where the container receives requests. You do not need to enter a value in **Host port**.)

Cloud9-IDE - AWS Cloud9 Amazon ECS Facebook YouTube

us-east-1.console.aws.amazon.com/ecs/home?region=us-east-1#/taskDefinitions/create

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Container name: mb-container

Image: Paste the Image URI of the application container image, which you copied to a text editor in a previous step.

Memory Limits: Select Hard limit and enter 256 (This setting defines the maximum amount of memory that the container is allowed to use.)

Port mappings > Container port: 3000 (This setting specifies the port where the container receives requests. You do not need to enter a value in Host port.)

Task memory (MiB): 256 shared of 256 MiB total

Container definitions:

Container ...	Image	Hard/Soft ...	CPU Unit...	GPU	Inference ...	Essential ...
mb-co...	698384538...	256/-				true

Elastic Inference: Elastic Inference provides cost efficient hardware acceleration for Amazon ECS tasks. Learn more

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The screenshot shows two browser windows side-by-side. The left window is the Cloud9 IDE showing a Node.js assignment titled "Module 13 - Guided Lab 1: Breaking a Monolithic Node.js Application into Microservices". It includes a code editor with some JavaScript code and a terminal window. The right window is the AWS ECS console, specifically the Task Definitions page. A success message "Created Task Definition successfully" is displayed. The task definition name is "mb-task:1". The "Task definition name" field is set to "mb-task". The "Task role" is listed as "None". The navigation bar at the top of the ECS console shows "Cloud9-IDE - AWS Cloud9" and "Amazon ECS".

This screenshot shows the same setup as the previous one, but the right-hand window has switched to the EC2 Management console. The navigation pane on the left lists services like Snapshots, Lifecycle Manager, Network & Security, Load Balancing, and Auto Scaling. Under Load Balancing, the "Load Balancers" section is selected, showing a "Target Groups" sub-section with a "New" button. The main content area displays a search bar and a table with columns for Name, DNS name, State, and VPC ID. A message at the bottom says "Select a load balancer". The EC2 Management console header includes "Cloud9-IDE - AWS Cloud9", "Amazon ECS", and "EC2 Management". The status bar at the bottom of the screen shows the date and time as 11/15/2022 and 10:15 PM.

ts
Guided Lab 1: Breaking a Monolithic Node.js Application into Microservices

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IS SERVICES, and then select Compute > EC2.

73. In the navigation pane, scroll down and select **Load Balancers**.

74. Choose **Create Load Balancer**.
The **Select load balancer type** page opens.

75. In the **Application Load Balancer** card, choose **Create**.
The Application Load Balancer creation wizard opens.

76. In **Step 1: Configure Load Balancer**, configure the following settings.

Type here to search

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IS

76. In **Step 1: Configure Load Balancer**, configure the following settings.

- o **Name:** mb-load-balancer
- o Scroll to the **Availability Zones** section and enter these settings.
 - **VPC:** Select the *Amazon ECS cluster VPC ID*. This ID is similar to *vpc-nnnnnnnnnn (10.32.0.0/16)*
 - **Availability Zones:** Select both Availability Zones.

Type here to search

Cloud9-IDE - AW... Amazon ECS Load balancers Facebook YouTube (3) NewJean

oracle class JLP_Kywat AWS Academy Clou... aws educate aws rampup shebuild schedule VGW SharePoint Teamup N. Virgin vclabs/user221147=Nwe_Nwe_Htay_Win @ 6983-8

EC2 > Load balancers > Create Application Load Balancer

Create Application Load Balancer Info

The Application Load Balancer distributes incoming HTTP and HTTPS traffic across multiple targets such as Amazon EC2 instances, microservices, and containers, based on request attributes. When the load balancer receives a connection request, it evaluates the listener rules in priority order to determine which rule to apply, and if applicable, it selects a target from the target group for the rule action.

► How Elastic Load balancing works

Basic configuration

Load balancer name
Name must be unique within your AWS account and cannot be changed after the load balancer is created.
mb-load-balancer
A maximum of 32 alphanumeric characters including hyphens are allowed, but the name must not begin or end with a hyphen.

Scheme Info
Scheme cannot be changed after the load balancer is created.

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EC2 > Load balancers > Create Application Load Balancer

Create Application Load Balancer Info

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► How Elastic Load balancing works

Basic configuration

Load balancer name
Name must be unique within your AWS account and cannot be changed after the load balancer is created.
mb-load-balancer
A maximum of 32 alphanumeric characters including hyphens are allowed, but the name must not begin or end with a hyphen.

Scheme Info
Scheme cannot be changed after the load balancer is created.

Internet-facing
An internet-facing load balancer routes requests from clients over the internet to targets. Requires a public subnet. Learn more ?

Internal
An internal load balancer routes requests from clients to targets using private IP addresses.

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Module 13 - Guided Lab 1: Breaking a Monolithic Node.js Application into Microservices

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Submit Details AWS Start Lab End Lab 1:56

Files README

IS

76. In Step 1: Configure Load Balancer, configure the following settings.

- Name: mb-load-balancer
- Scroll to the Availability Zones section and enter these settings.
 - VPC: Select the Amazon ECS cluster VPC ID. This ID is similar to `vpn-nnnnnnnnnn` (`10.32.0.0/16`)
 - Availability Zones: Select both Availability Zones.

Cloud9-IDE - AW | Amazon ECS | Load balancers | Facebook | YouTube | NewJean | +

us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateALBWizard:

Services Search [Alt+S]

Network mapping Info

The load balancer routes traffic to targets in the selected subnets, and in accordance with your IP address settings.

VPC Info

Select the virtual private cloud (VPC) for your targets. Only VPCs with an internet gateway are enabled for selection. The selected VPC cannot be changed after the load balancer is created. To confirm the VPC for your targets, view your target groups [\[?\]](#).

vpc-061a379b133814efa
IPv4: 10.32.0.0/16

C

Mappings Info

Select at least one Availability Zone and one subnet per zone. The load balancer routes traffic to targets in these Availability Zones only. Availability Zones that are not supported by the load balancer or the VPC are not available for selection.

us-east-1a

us-east-1b

Security groups Info

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79. In Step 3: Configure Security Groups, configure these settings.

- Assign a security group: Select an existing security group
- Security Group ID:
 - Clear default.
 - Select EC2ContainerService-mb-ecs-cluster-EcsSecurityGroup. (This is the security group of your ECS cluster.)

80. Choose Next: Configure Routing.

81. In Step 4: Configure Routing, configure the following

Cloud9-IDE - AW | Amazon ECS | Load balancers | Facebook | YouTube | NewJean | +

us-east-1.console.aws.amazon.com/ec2/home?region=us-east-1#CreateALBWizard:

Services Search [Alt+S]

Security groups Info

A security group is a set of firewall rules that control the traffic to your load balancer.

Security groups

Select up to 5 security groups

Create new security group [\[?\]](#)

EC2ContainerService-mb-ecs-cluster-EcsSecurityGroup-F9LPOUPRDQR X

VPC: vpc-061a379b133814efa sg-033d191f06c4da5d8

Listeners and routing Info

A listener is a process that checks for connection requests using the port and protocol you configure. The rules that you define for a listener determine how the load balancer routes requests to its registered targets.

▼ Listener HTTP:80 Remove

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81. In Step 4: Configure Routing, configure the following

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File README

JS Number of load balancers target group

- Protocol and Port: Leave these setting at their default values of HTTP and 80. The application expects to be accessed through RESTful HTTP requests.
- Expand Advanced health check settings and enter the following settings.
 - Healthy threshold:** 2 (This setting tells the load balancer that the target is considered healthy if it receives two consecutive successful health checks from it.)

Type here to search

Cloud9-IDE | Amazon EC | Load balanc... | Target group | Facebook | YouTube | New | +

oracle class | JLP_Kyat | AWS Academy Cloud... | aws educate | aws rampup | shebuild schedule | VGW | SharePoint | Teamup

aws Services Search [Alt+S]

EC2 > Target groups > Create target group

Step 1 Specify group details

Step 2 Register targets

Specify group details

Your load balancer routes requests to the targets in a target group and performs health checks on the targets.

Basic configuration

Settings in this section cannot be changed after the target group is created.

Choose a target type

Instances

- Supports load balancing to instances within a specific VPC.
- Facilitates the use of Amazon EC2 Auto Scaling to manage and scale your EC2 capacity.

IP addresses

- Supports load balancing to VPC and on-premises resources.
- Facilitates routing to multiple IP addresses and network interfaces on the same instance.
- Offers flexibility with microservice based architectures, simplifying inter-application communication.
- Supports IPv6 targets, enabling end-to-end IPv6 communication, and IPv4-to-IPv6 NAT.

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Waiting for us-east-1.prod.pranalytics.console.aws.a2z.com...

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File README

JS Number of load balancers target group

- load balancer that the target is considered healthy if it receives two consecutive successful health checks from it.)
- Interval:** 6 (This setting increases the frequency of health checks to once every 6 seconds.)

82. Choose **Next: Register Targets**.

83. You can skip **Step 5: Register Targets** because we will register an **ECS service** as a target in a later step. Choose **Next: Review**.

84. In the **Review** page, make sure that the settings are correct and click **Create target group**.

Type here to search

Cloud9-IDE | Amazon EC | Load balanc... | Target group | Facebook | YouTube | New | +

oracle class | JLP_Kyat | AWS Academy Cloud... | aws educate | aws rampup | shebuild schedule | VGW | SharePoint | Teamup

aws Services Search [Alt+S]

EC2 > Target groups > Create target group

Step 1 Specify group details

Step 2 Register targets

Specify group details

Your load balancer routes requests to the targets in a target group and performs health checks on the targets.

Basic configuration

Settings in this section cannot be changed after the target group is created.

Choose a target type

Traffic port

Override

Healthy threshold

The number of consecutive health checks successes required before considering an unhealthy target healthy.

2

2-10

Unhealthy threshold

The number of consecutive health check failures required before considering a target unhealthy.

2

2-10

Timeout

The amount of time, in seconds, during which no response means a failed health check.

5

Seconds

2-120

Interval

The approximate amount of time between health checks of an individual target.

6

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Waiting for us-east-1.prod.pranalytics.console.aws.a2z.com...

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This screenshot shows a browser window with multiple tabs open, illustrating the process of creating a target group in AWS.

The top tab is "Cloud9-IDE". Below it, the "Services" tab is active, showing the "Target groups" section. The "Register targets" sub-section is visible, with a table listing two ECS instances as targets:

	Instance ID	Name	State	Security groups	Zone
<input type="checkbox"/>	i-07085ba14f538a7a5	ECS Instance - EC2ContainerService-mbeecs-cluster	running	EC2ContainerService-mbeecs-cluster-EcsSecurityGroup-F9LPOUPRDRQ	us-east-1a
<input type="checkbox"/>	i-0baad787b55010ec1	ECS Instance - EC2ContainerService-mbeecs-cluster	running	EC2ContainerService-mbeecs-cluster-EcsSecurityGroup-F9LPOUPRDRQ	us-east-1b

The status bar at the bottom indicates "0 selected".

The bottom section shows the "Review targets" step of the target group creation wizard. It displays a table with one row:

Targets (0)		Remove all pending
All	<input type="text" value="80"/> 1-65535 (separate multiple ports with commas)	Include as pending below

The status bar at the bottom indicates "0 pending".

Screenshot of the AWS Cloud9 IDE - AWS CLI terminal showing the creation of an Application Load Balancer (ALB). The terminal output shows the command being run:

```
aws elbv2 create-load-balancer --name mb-load-balancer --subnets subnet-01234567890abcdef --security-groups sg-01234567890abcdef --Listeners ListenerHTTP80 --Protocol HTTP --Port 80 --DefaultAction ForwardTo targetgroup:mb-load-balancer-target-group
```

The screenshot also shows the AWS Services dashboard and the AWS Lambda function configuration page.

Listeners and routing

A listener is a process that checks for connection requests using the port and protocol you configure. The rules that you define for a listener determine how the load balancer routes requests to its registered targets.

Listener HTTP:80

Protocol	Port	Default action	Info
HTTP	: 80	Forward to targetgroup:mb-load-balancer-target-group	Target type: Instance, IPv4

Listener tags - optional

Consider adding tags to your listener. Tags enable you to categorize your AWS resources so you can more easily manage them.

Add listener tag

You can add up to 50 more tags.

Add listener

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Windows Taskbar: Type here to search, 78°F Clear, 10:23 PM, 11/15/2022

Successfully created load balancer: mb-load-balancer

Note: It might take a few minutes for your load balancer to be fully set up and ready to route traffic. Targets will also take a few minutes to complete the registration process and pass initial health checks.

EC2 > Load balancers > mb-load-balancer > Create Application Load Balancer

Create Application Load Balancer

Suggested next steps

- Review, customize, or enable attributes for your load balancer and listeners using the Description and Listeners tabs within mb-load-balancer.
- Discover other services that you can integrate with your load balancer. Visit the Integrated services tab within mb-load-balancer.

View load balancer

To complete the load balancer configuration, you must modify its security group to open the ports that internal communication between the load balancer and the instances in the ECS cluster.

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Screenshot of the AWS EC2 Security Groups page showing a specific security group configuration.

Details:

- Security group name:** sg-033d191f06c4da5d8
- Description:** ECS Allowed Ports
- VPC ID:** vpc-061a379b133814ef
- Owner:** 698384538129
- Inbound rules count:** 1 Permission entry
- Outbound rules count:** 1 Permission entry

Inbound rules:

Protocol	Port range	Source	Description
HTTP	80	Custom 0.0.0.0/0	
Custom TCP	31000 -	Custom sg-033d191f06c4da5d8	

Screenshot of the AWS EC2 Inbound Rules editor.

Inbound rules:

Security group rule ID	Type	Protocol	Port range	Source	Description - optional
sgr-0d99d30e21b7fba62	HTTP	TCP	80	Custom 0.0.0.0/0	
-	Custom TCP	TCP	31000 -	Custom sg-033d191f06c4da5d8	

Buttons: Add rule, Cancel, Preview changes, Save rules.

You can now check network connectivity with Reachability Analyzer

[Run Reachability Analyzer](#)

Inbound rules (2)

Security group rule...	IP version	Type	Protocol	Port range
sgr-0d99d30e21b7fba62	IPv4	HTTP	TCP	80
sgr-0e35bcddcd557ef03	-	Custom TCP	TCP	31000 - 61000

[Filter security group rules](#)

[Edit inbound rules](#)

[Cloud9...](#) [Amazon...](#) [EC2 Man...](#) [EC2 Man...](#) [Target g...](#) [\(1\) Face...](#) [YouTube...](#) [AWS Academy...](#) [aws educate...](#) [aws rampup...](#) [shebuild schedule...](#) [VGW...](#) [SharePoint...](#) [Teamup...](#)

[aws](#) [Services](#) [Search](#) [Alt+S] [Actions](#)

N. Virgi... vodlabs/user2211147=Nwe_Nwe_Htay_Win@6983-845

Task Definitions

Task definitions specify the container information for your application, such as how many containers are part of your task, the resources they will use, how they are linked together, and which host ports they will use. [Learn more](#)

[Create new Task Definition](#) [Create new revision](#) [Actions](#)

Last updated on November 15, 2022 10:30:20 PM (0m ago)

Status: [ACTIVE](#) [INACTIVE](#)

Filter in this page < 1-1 > Page size 50

Task Definition	Latest revision status
Task Definition	ACTIVE
mb-task	ACTIVE

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https://us-east-1.console.aws.amazon.com/ecs/home?region...

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Module 13 - Guided Lab 1: Breaking a Monolithic Node.js Application into Microservices

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IS

96. In the navigation pane, choose **Task Definition**.

97. In the **Task Definition** list, choose the **mb-task**. A page opens with the available revisions of the definition.

98. Select **mb-task:1** and choose **Actions > Create Service**.

99. In **Step 1: Configure service**, configure these settings.

- Launch type: EC2 (You are running the containerized application directly on a cluster.)

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Task Definitions mb-task 1

Task Definition: mb-task:1

View detailed information for your task definition. To modify the task definition, you need to create a new revision and then make the required changes to the task definition.

Create new revision Actions

Builder JSON Tags

Task defi... Task role None

Optional IAM role that tasks can use to make API requests to authorized AWS services. Create an Amazon Elastic Container Service Task Role in the IAM Console.

Run Task Create Service Update Service Deregister

Task role None

Launch type FARGATE EC2 EXTERNAL

Switch to capacity provider strategy

Task Definition Family mb-task Revision 1 Cluster mb-ecs-cluster Service name mb-ecs-service

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d Lab 1: Breaking a Monolithic Node.js Application into Microservices

I) Module 13 - Guided Lab 1: Breaking a Monolithic Application into Microservices

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Submit Details AWS Start Lab End Lab 1:42 Instructions Grades Actions

Files README Terminal Source

Number of tasks: (By default, to take full advantage of the cluster, you would enter a higher number, depending on the request load that you expect. However, to keep things simple in this exercise, you specify that you want to launch and maintain one task on the cluster at all times.)

Choose **Next step**.

n Step 2: Configure network. configure the following settings.

- Load balancer type: Application Load Balancer** (You want the tasks in your service to be load balanced by the *mb-load-balancer* that you set up earlier)

Service IAM role: Create new role

Load balancer name: mb-load-balancer

Launch Terminal

Task Definition Family: **mb-task**, Revision: **1**

Cluster: **mb-ecs-cluster**

Service name: **mb-ecs-service**

Service type*: **REPLICA**

Number of tasks: **1**

Minimum healthy percent: **100**

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Create Service

Step 1: Configure service

Step 2: Configure network

Step 3: Set Auto Scaling (optional)

Step 4: Review

Configure network

VPC and security groups

VPC and security groups are configurable when your task definition uses the `awsvpc` network mode.

Health check grace period

If your service's tasks take a while to start and respond to ELB health checks, you can specify a health check grace period of up to 2,147,483,647 seconds during which the ECS service scheduler will ignore ELB health check status. This grace period can prevent the ECS service scheduler from marking tasks as unhealthy and stopping them before they have time to come up. This is only valid if your service is configured to use a load balancer.

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launch and maintain one task on the cluster at all times.)

Choose Next step.

n Step 2: Configure network, configure the following settings.

- o Load balancer type: Application Load Balancer (You want the tasks in your service to be load balanced by the *mb-load-balancer* that you set up earlier)
- o Service IAM role: Create new role
- o Load balancer name: *mb-load-balancer*

Load balancing

An Elastic Load Balancing load balancer distributes incoming traffic across the tasks running in your service. Choose an existing load balancer, or create a new one in the [Amazon EC2 console](#).

Load balancer type*

Application Load Balancer Allows containers to use dynamic host port mapping (multiple tasks allowed per container instance). Multiple services can use the same listener port on a single load balancer with rule-based routing and paths.

Network Load Balancer A Network Load Balancer functions at the fourth layer of the Open Systems Interconnection (OSI) model. After the load balancer receives a request, it selects a target from the target group for the default rule using a flow hash routing algorithm.

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I) Module 13 - Guided Lab 1: Breaking a Monolithic Node.js Application into Microservices

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populated with the correct container information that is associated with the task definition. Choose Add to load balancer. (This setting will associate the container with one of the load balancer's listeners.)

- o Production listener port: 80:HTTP (This setting associates the container with the load balancer listener for HTTP traffic on port 80)
- o Target group name: *mb-load-balancer-target-group*

Choose Next step.

n Step 2: Set Auto Scaling (optional) choose Next

Service IAM role Create new role

Load balancer name *mb-load-balancer*

Container to load balance

mb-container : 3000 Remove

Production listener port* 80:HTTP

Production listener protocol* HTTP

Target group name *mb-load-balancer-target-group*

Target group protocol HTTP

Target type instance

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Guided Lab 1: Breaking a Monolithic Node.js Application into Microservices

Module 13 - Guided Lab 1: Breaking a Monolithic Node.js Application into Microservices

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automatic scaling.

104. In the **Review** page, make sure that the settings are correct and choose **Create Service**.
The **Launch Status** page opens, and shows the tasks that the wizard performs.

105. Wait until all tasks display check marks, which indicates that they are complete.

Launch Status

ECS Service status - 1 of 3 completed

Create Load Balancer

IAM Role: <create_new>

✓ IAM Service role created
IAM Service role created. Waiting to attach policy. View: arn:aws:iam::698384538129:role/ecsServiceRole

IAM Policy

IAM Service policy

Create Service

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Guided Lab 1: Breaking a Monolithic Node.js Application into Microservices

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automatic scaling.

104. In the **Review** page, make sure that the settings are correct and choose **Create Service**.
The **Launch Status** page opens, and shows the tasks that the wizard performs.

105. Wait until all tasks display check marks, which indicates that they are complete.

Launch Status

ECS Service status - 3 of 3 completed

Create Load Balancer

IAM Role: <create_new>

✓ IAM Service role created
IAM Service role created. Waiting to attach policy. View: arn:aws:iam::698384538129:role/ecsServiceRole

IAM Policy

✓ IAM Service policy attached
IAM Service policy attached to the role. arn:aws:iam::698384538129:role/ecsServiceRole. View policy: AmazonEC2ContainerServiceRole

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The screenshot shows a dual-browser setup. The left browser window displays the AWS Cloud9 interface for a guided lab titled "Guided Lab 1: Breaking a Monolithic Node.js Application into Microservices". The right browser window shows the AWS Management Console with the following details:

Service type: REPLICA
Launch type: EC2
Service role: ecsServiceRole
Created By: am:aws:iam::698384538129:role/voclabs

The "Tasks" tab is selected, showing one task in the "Running" state:

Task	Task Definition	Last Status	Desired Status	Group	Launch type
68fad00b53664...	mb-task:1	RUNNING	RUNNING	service:mb-ecs...	EC2

The status bar at the bottom indicates "Last updated on November 15, 2022 10:34:30 PM (0m ago)".

The bottom part of the screenshot shows the Windows taskbar with various pinned icons and the system clock indicating "10:34 PM 11/15/2022".

Copy DNS name

Ready to receive requests

Module 13 - Guided Lab 1: Breaking a Monolithic Node.js Application into Microservices

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Submit Details AWS Start Lab End Lab 1:37

Files README

name and choose the **Copy** icon.

- Paste the DNS name value into a text editor, and label it Load Balancer DNS Name. You will use this value multiple times in later steps.
- Open a new browser tab, paste the DNS name into the address bar, and press ENTER.

mb-load-balancer-1895913077.us-east-1.elb.amazonaws.com

Ready to receive requests

With /api

API ready to receive requests

mb-load-balancer-1895913077.us-east-1.elb.amazonaws.com/api

mb-load-balancer-1895913077.us-east-1.elb.amazonaws.com/api/users

```
[{"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"}]
```

Cloud | Amaz | EC2 M | EC2 M | Target | (1) Fail | mb-ld | +

Not secure | mb-load-balancer-1895913077.us-east-1.elb.amazonaws.com/api/users/1

oracle class JLP_Kywat AWS Academy Clou... aws educate aws rampup shebuild schedule VGW SharePoint Teamu

```
{"id":1,"username":"marceline","name":"Marceline Singer","bio":"Cyclist, musician"}
```

Cloud | Amaz | EC2 M | EC2 M | Target | (1) Fail | mb-ld | +

Not secure | mb-load-balancer-1895913077.us-east-1.elb.amazonaws.com/api/threads

oracle class JLP_Kywat AWS Academy Clou... aws educate aws rampup shebuild schedule VGW SharePoint Teamu

```
[{"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}]
```

Cloud | Amaz | EC2 M | EC2 M | Target | (1) Fail | mb-ld | +

Not secure | mb-load-balancer-1895913077.us-east-1.elb.amazonaws.com/api/posts/in-thread/2

oracle class JLP_Kywat AWS Academy Clou... aws educate aws rampup shebuild schedule VGW SharePoint Teamu

```
[{"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}]
```

Cloud9 IDE

package.json
server.js

aws 3-containerized-micro

posts
db.json
Dockerfile
package.json
server.js

threads
db.json
Dockerfile
package.json
server.js

users
db.json
Dockerfile
package.json
server.js

AWS Cloud9 allows you to code in your favorite IDE, write code in your IDE with others, and...

Toolkit for AWS

The AWS Toolkit for AWS CodeCommit makes it easy to access and integrate with AWS services.

bash - "ip-10-16-0-19" x lmn

```
The push refers to repository l...
```

vocab:~/environment/2-contain...

The screenshot shows a browser window with two tabs open. The left tab is a guided lab assignment titled "13 - Guided Lab 1: Breaking a Monolithic Node.js Application" with a due date of November 15, 2022. The right tab is the "Amazon Elastic Container Registry" console under the "Private" tab, showing a single repository named "mb-repo".

Guided Lab 1: Breaking a Monolithic Node.js Application

13 - Guided Lab 1: Breaking a Monolithic Node.js Application

Optional) Module 13 - Guided Lab 1: Breaking a Monolithic Node.js Application into Microservices

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EN_US

125. To open the Amazon ECR console, go to the **AWS Management Console** browser tab, choose **Services**, and then select **Containers > Elastic Container Registry**.

126. Choose **Create repository**.

127. In **Repository name**, enter **mb-users-repo**.

128. Choose **Create repository**. A message is displayed at the top of the page indicating that the repository was successfully created.

129. Repeat the previous steps to create two repositories for the other two microservices with the following names:

- mb-posts-repo
- mb-threads-repo

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create three repositories

The screenshot shows the "Amazon Elastic Container Registry" console under the "Private" tab, displaying four repositories: "mb-posts-repo", "mb-repo", "mb-threads-repo", and "mb-users-repo".

Repository name	URI	Created at	Tag immutability	Scan frequency	Encryption type	Pull through cache
mb-posts-repo	698384538129.dkr.ecr.us-east-1.amazonaws.com/mb-posts-repo	November 15, 2022, 22:42:16 (UTC+06:5)	Disabled	Manual	AES-256	Inactive
mb-repo	698384538129.dkr.ecr.us-east-1.amazonaws.com/mb-repo	November 15, 2022, 21:50:27 (UTC+06:5)	Disabled	Manual	AES-256	Inactive
mb-threads-repo	698384538129.dkr.ecr.us-east-1.amazonaws.com/mb-threads-repo	November 15, 2022, 22:42:07 (UTC+06:5)	Disabled	Manual	AES-256	Inactive
mb-users-repo	698384538129.dkr.ecr.us-east-1.amazonaws.com/mb-users-repo	November 15, 2022, 22:41:53 (UTC+06:5)	Disabled	Manual	AES-256	Inactive

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cd ~/environment/3-containerized-microservices/users

The terminal window shows the following Docker push commands:

```

package.json
JS server.js
users
  db.json
  Dockerfile
package.json
JS server.js

profile:default
bash - "ip-10-16-0-19" x Immediate x bash - "ip-10-16-0-19" x + 
1c1d2caaae8c: Pushed
470d354b663a: Pushed
3e893534526a: Pushed
040fd7841192: Pushed
latest: digest: sha256:a716aa7e6c156d6c45587e6340458adc2d210561ad4c3d4562faa363ca2bbc41 size: 1159
voclabs:~/environment/2-containerized-monolith $ cd ~/environment/3-containerized-microservices/users
voclabs:~/environment/3-containerized-microservices/users $

```

The AWS ECR interface shows the 'mb-users-repo' repository with the following details:

- Images (0)
- Find images
- Image tag
- Artifact type
- Pushed at
- Size (MB)
- Image URI
- Digest

No images are displayed.

docker build -t mb-users-repo .

docker tag mb-users-repo:latest 698384538129.dkr.ecr.us-east-1.amazonaws.com/mb-users-repo:latest

docker push 698384538129.dkr.ecr.us-east-1.amazonaws.com/mb-users-repo:latest

The terminal window shows the successful push of the Docker image:

```

package.json
JS server.js
users
  db.json
  Dockerfile
package.json
JS server.js

profile:default
bash - "ip-10-16-0-19" x Immediate x bash - "ip-10-16-0-19" x + 
The push refers to repository [698384538129.dkr.ecr.us-east-1.amazonaws.com/mb-users-repo]
f77329390f7c: Pushed
3de37bbf22d5: Pushed
3e893534526a: Pushed
040fd7841192: Pushed
latest: digest: sha256:f43a867484381d183df69bc7d331925bc8fe72f3f56fe6fb136195f5e794c53 size: 1158
voclabs:~/environment/3-containerized-microservices/users $

```

The screenshot shows the AWS Cloud9 IDE interface. The top navigation bar includes tabs for Cloud9-ID, Amazon ECR, EC2 Manager, Elastic Container Registry, EC2 Manager, Target groups, Facebook, YouTube, mb-load-test, and others. The main content area displays the AWS Lambda function configuration for 'mb-load-test'. The function is triggered by an S3 event from the 'mb-users-repo' bucket. The code editor shows the Lambda function code.

Now you got image

The screenshot shows the AWS Cloud9 IDE interface. The top navigation bar includes tabs for Cloud9-ID, Amazon ECR, EC2 Manager, Elastic Container Registry, EC2 Manager, Target groups, Facebook, YouTube, mb-load-test, and others. The main content area displays the AWS Lambda function configuration for 'mb-load-test'. The function is triggered by an S3 event from the 'mb-users-repo' bucket. The code editor shows the Lambda function code.

```
cd ~/environment/3-containerized-microservices/thread
```

The screenshot shows a browser window with multiple tabs open. On the left, a tab for a guided lab titled "3 - Guided Lab 1: Breaking a Monolithic Node.js Application into Microservices" is visible. On the right, the AWS ECR console shows the repository "mb-threads-repo". The "Images" tab is selected, showing a table with one row:

Image tag	Artifact type	Pushed at	Size (MB)	Image URI	Digest
latest	Image	November 15, 2022, 22:48:41 (UTC+06:5)	20.46	Copy URI	sha256:d6a48ad96d2792...

Now in mb-thread-repo

The screenshot shows the same AWS ECR console as before, but now the table in the "Images" section shows one row, indicating the image has been successfully pushed:

Image tag	Artifact type	Pushed at	Size (MB)	Image URI	Digest
latest	Image	November 15, 2022, 22:48:41 (UTC+06:5)	20.46	Copy URI	sha256:d6a48ad96d2792...

```
cd ~/environment/3-containerized-microservices/posts
```

CloudWatch Logs | Amazon CloudWatch Metrics | EC2 | Elastic Container Registry | EC2 | Tarantula | Facebook | YouTube | mb-post | +

CloudWatch Metrics | Oracle Class | JLP_Kyaw | AWS Academy CloudWatch Metrics | AWS Educate | AWS Rampup | SheBuild Schedule | VGW | SharePoint | Teamup

N. Virgin | vclabs/user2211147=Nwe_Nwe_Htay_Win @ 6983-8453-4211

Amazon Elastic Container Registry

Amazon ECR > Repositories > mb-posts-repo

mb-posts-repo

No Due Date Points 100

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EN_US

cd ~/environment/3-cloud-native-microservices/posts

172. Switch to the Amazon ECR tab.

173. In the navigation pane, click on the **Repositories** link.

174. In the **Repositories** list, select the **mb-posts-repo**.

175. Choose **View push commands** from the Actions menu.

The **Push commands** window opens.

First, you will build the Docker image.

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Images (0)

Find images

Image tag Artifact type Pushed at Size (MB) Image URI Digest

No images

No images to display

CloudWatch Logs | Amazon CloudWatch Metrics | EC2 | Elastic Container Registry | EC2 | Tarantula | Facebook | YouTube | mb-post | +

CloudWatch Metrics | Oracle Class | JLP_Kyaw | AWS Academy CloudWatch Metrics | AWS Educate | AWS Rampup | SheBuild Schedule | VGW | SharePoint | Teamup

N. Virgin | vclabs/user2211147=Nwe_Nwe_Htay_Win @ 6983-8453-4211

Amazon Elastic Container Registry

Amazon ECR > Repositories > mb-posts-repo

mb-posts-repo

No Due Date Points 100

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187. Switch to the Amazon ECR tab.

188. Close the **Push commands** window.

189. Choose the **Refresh** icon.

In the **Images** list, you should see the image that you pushed, with the **latest** tag.

190. Record the Image URI. In the **Image URI** of the **latest** version.

191. Paste the value in a text editor. You will use this value in the next step.

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Images (1)

Find images

Image tag Artifact type Pushed at Size (MB) Image URI Digest

latest Image November 15, 2022, 22:50:25 (UTC+06:5) 20.46 Copy URI

om/courses/29564/assignments/249228?module_item_id=2466878
y Clou... aws educate aws rampup shebuild schedule

ments

.3 - Guided Lab 1: Breaking a Monolithic Node.js Application

**(optional) Module 13 - Guided Lab 1: Bre
ide.js Application into Microservices**

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 EN_US Files

You will start by creating the task definition for the user microservice container.

192. In the navigation pane of the **Amazon ECR** console, choose **Task definitions**, and then choose **Create new Task Definition**.

Note: You may need to expand the menu in the navigation pane to find **Task Definitions**.

193. In **Step 2: Select launch type compatibility** page, select the **EC2** card.

194. Choose **Next step**.

The screenshot shows a Windows desktop environment with several open browser tabs. The active tab is on the AWS CloudWatch console, specifically the 'taskDefinitions/create' page for the 'us-east-1' region. The dialog box is titled 'Add container' and contains fields for a 'Container definition'. It includes sections for 'Standard' configuration, where the 'Container name' is set to 'mb-users-container' and the 'Image' field contains the URI '698384538129.dkr.ecr.us-east-1.amazonaws.com/mb-users-repo:latest'. There are also options for 'Private repository authentication' and 'Memory Limits (MiB)' set to 'Hard limit' with a value of '256'. A note at the bottom states 'Define hard and/or soft memory limits in MiB for your task'. At the bottom right of the dialog are 'Required' and 'Cancel' buttons.

195 In Step 2: Configure task and container definitions

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78°F Clear 10:52 PM 11/15/2022

Type here to search

reses/29564/assignments/249228?module_item_id=2466878

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nal] Module 13 - Guided Lab 1: Breaking a Monolithic Node.js Application into Microservices

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Files README

page these settings.

Container name: mb-users-container

Image: Paste the *Users Image URI* that you copied to a text editor in a previous step.

Memory Limits: Make sure that *Hard limit* is selected, and enter 256. (This defines the maximum amount of memory that the container is allowed to use.)

Port mappings > Container port: 3000 (This specifies the port on which the container receives requests.)

Choose Add

Feedback Looking for language selection? Find it in the top right corner of the page.

Add container

Container definitions

Add container

Container ... Image

Elastic Inference

Elastic Inference provides

Elastic Inference acceleration

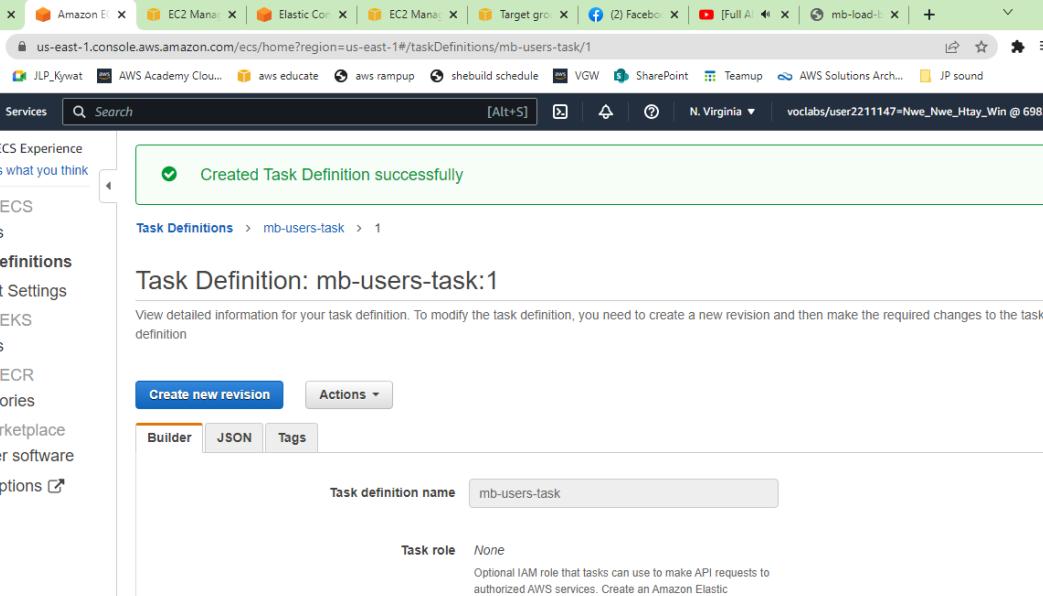
+

Constraint

Task placement constraints define the attributes. The service scheduler uses these to place the task.

Required

Cancel



The screenshot shows the AWS Cloud9 IDE interface. At the top, there's a search bar and a navigation bar with links like 'Feedback', 'Unified Settings', 'Privacy', 'Terms', and 'Cookie preferences'. The main content area displays a success message: 'Created Task Definition successfully' with a green checkmark icon. Below this, the URL in the address bar is 'us-east-1.console.aws.amazon.com/ecs/home?region=us-east-1#/taskDefinitions/mb-users-task/1'. The browser tab title is 'mb-load-l'. The AWS Services navigation bar includes links for Cloud9-ID, Amazon ECR, EC2 Manager, Elastic Container Registry, EC2 Manager, Target groups, Facebook, YouTube, mb-load-l, oracle class, JLP_Kyawt, AWS Academy Cloud, aws educate, aws rampup, shebuild schedule, VGW, SharePoint, Teamup, AWS Solutions Arch., JP sound, and N. Virginia. On the left, a sidebar for 'Amazon ECS' shows 'Clusters' and 'Task Definitions' (which is currently selected). Under 'Task Definitions', there are links for 'Account Settings', 'Amazon EKS', 'Clusters', 'Amazon ECR', 'Repositories', 'AWS Marketplace', 'Discover software', and 'Subscriptions'. The main content area shows the 'Task Definition: mb-users-task:1' page, which includes a 'Create new revision' button, an 'Actions' dropdown, and tabs for 'Builder' (which is selected), 'JSON', and 'Tags'. The 'Task definition name' is set to 'mb-users-task'. The 'Task role' is listed as 'None' with a note about optional IAM roles for API requests. The bottom of the screen has a footer with 'Feedback', 'Unified Settings', 'Privacy', 'Terms', and 'Cookie preferences'.

Screenshot of the AWS ECS Task Definitions page.

Task Definitions

Task definitions specify the container information for your application, such as how many containers are part of your task, what resources they will use, how they are linked together, and which host ports they will use. [Learn more](#)

Create new Task Definition [Create new revision](#) [Actions](#) Last updated on November 15, 2022 10:57:56 PM (0m ago)

Status: [ACTIVE](#) [INACTIVE](#)

Task Definition	Latest revision status
mb-posts-task	ACTIVE
mb-task	ACTIVE
mb-threads-task	ACTIVE
mb-users-task	ACTIVE

Screenshot of the EC2 Target Groups page.

Target groups (1) Info

Search or filter target groups

Name	ARN	Port	Protocol
mb-load-balancer-target-group	arn:aws:elasticloadbalancing:us-east-1:698384538129:targetgroup/mb-load-balancer-target-group/698384538129	80	HTTP

0 target groups selected

Select a target group above.

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Guided Lab 1: Breaking a Monolithic Node.js Application into Microservices

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JS

211. Choose Next.

212. In Step 2: Register targets, choose Create target group.

A window opens with a message that the target group was successfully created.

213. Close the message window.

The `mb-lb-users-target-group` appears in the target group list.

Successfully created target group: mb-lb-users-target-group

EC2 > Target groups

Target groups (2) Info

Name	ARN	Port	Protocol
<code>mb-lb-users-target-group</code>	<code>arn:aws:elasticloadbalancing:us-east-1:6983-8453-1#mb-lb-users-target-group</code>	80	HTTP
<code>mb-load-balancer-target-group</code>	<code>arn:aws:elasticloadbalancing:us-east-1:6983-8453-1#mb-load-balancer-target-group</code>	80	HTTP

0 target groups selected

Successfully created target group: mb-lb-posts-target-group

EC2 > Target groups

Target groups (4) Info

Name	ARN	Port	Protocol	Target type
<code>mb-lb-posts-target-group</code>	<code>arn:aws:elasticloadbalancing:us-east-1:6983-8453-1#mb-lb-posts-target-group</code>	80	HTTP	Instance
<code>mb-lb-threads-target-group</code>	<code>arn:aws:elasticloadbalancing:us-east-1:6983-8453-1#mb-lb-threads-target-group</code>	80	HTTP	Instance
<code>mb-lb-users-target-group</code>	<code>arn:aws:elasticloadbalancing:us-east-1:6983-8453-1#mb-lb-users-target-group</code>	80	HTTP	Instance
<code>mb-load-balancer-target-group</code>	<code>arn:aws:elasticloadbalancing:us-east-1:6983-8453-1#mb-load-balancer-target-group</code>	80	HTTP	Instance

0 target groups selected

Screenshot of a browser window showing the AWS Lambda console and the AWS CloudWatch Metrics dashboard.

The top browser tab shows the AWS Lambda console with the URL <https://us-east-1.console.aws.amazon.com/lambda/home?region=us-east-1#Functions>. The page displays a list of Lambda functions, including "HelloWorld" and "HelloWorld2".

The bottom browser tab shows the AWS CloudWatch Metrics dashboard with the URL <https://us-east-1.console.aws.amazon.com/cloudwatchmetrics/home?region=us-east-1>. The dashboard displays metrics for various AWS services, including Lambda, CloudWatch Logs, and CloudWatch Metrics.

Screenshot of the AWS CloudWatch Metrics console showing the creation of a new CloudWatch Metrics rule.

The rule configuration is as follows:

- Rule Name:** mb-load-balancer | HTTP:80
- Condition:** Path is /api/users*
- Action:** Forward to target group mb-lb-users-target-group: 1 (100%)
- Group-level stickiness:** Off

The rule is listed under the "HTTP 80: default action" section, which is marked as "This rule cannot be moved or deleted".

Feedback message: New rule was created successfully.

Rule limits for condition values, wildcards, and total rules.

Insert Rule

Feedback message: Rule was successfully created.

Rule 2 configuration:

- Condition:** Path is /api/threads*
- Action:** Forward to target group mb-lb-threads-target-group: 1 (100%)
- Group-level stickiness:** Off

Rule 3 configuration:

- Condition:** Path is /api/posts*
- Action:** Forward to target group mb-lb-posts-target-group: 1 (100%)
- Group-level stickiness:** Off

Rule 4 configuration:

- Condition:** Path is / OR /api
- Action:** Forward to target group mb-lb-users-target-group: 1 (100%)
- Group-level stickiness:** Off

Last rule (HTTP 80: default action):

- Condition:** Requests otherwise not routed
- Action:** Forward to target group mb-lb-balancer-target-group: 1 (100%)
- Group-level stickiness:** Off

Feedback message: Rule was successfully created.

courses/29564/assignments/249228?module_item_id=24668

aws educate aws rampup shebuild schedule

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38. Scroll to the last rule and choose the **Edit Rule** (pencil icon).

39. In the rules editor, configure these settings.

- Then:** Delete the existing *Forward* to action by choosing the **Delete** (trashcan) icon.
- Add action:** *Return fixed response*
- Response code:** 200
- Response body:** `invalid request`

The rules editor should look like this example:

IF (all match)

✓ Requests otherwise not routed

THEN

1. Return fixed response...

Response code (2xx,4xx,5xx)
200

Content-Type (optional)
text/plain

Response body (optional)
Invalid request

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courses/29564/assignments/249228?module_item_id=24668

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US

Creating an ECS service for *Users*

You will now create an ECS service for the *Users* microservice task definition.

242. In the **Amazon EC2 console** browser tab, choose **Services**, and then select **Containers > Elastic Container Service**.

243. In the clusters list, choose **mb-ecs-cluster**.

244. In the **Services** tab, open the Create Service wizard by choosing **Create**.

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aws Services Search [Alt+S]

Amazon EKS Clusters

Amazon ECR Repositories

AWS Marketplace Discover software Subscriptions

View list card

mb-ecs-cluster > CloudWatch monitoring Default Monitoring

FARGATE

0 Services 0 Running tasks 0 Pending tasks

EC2

1 Services 1 Running tasks 0 Pending tasks

0.01% CPUUtilization	0.66% MemoryUtilization
2 EC2 container instances	

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11:12 PM 11/15/2022

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Creating an ECS service for **Users**

You will now create an ECS service for the **Users** microservice task definition.

242. In the **Amazon EC2 console** browser tab, choose **Services**, and then select **Containers > Elastic Container Service**.

243. In the clusters list, choose **mb-ecs-cluster**.

244. In the **Services** tab, open the Create Service wizard by choosing **Create**.

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Amazon EKS Clusters Amazon ECR Repositories AWS Marketplace Discover software Subscriptions

Status ACTIVE

Registered container instances 2

Pending tasks count 0 Fargate, 0 EC2, 0 External

Running tasks count 0 Fargate, 1 EC2, 0 External

Active service count 0 Fargate, 1 EC2, 0 External

Draining service count 0 Fargate, 0 EC2, 0 External

Services Tasks ECS Instances Metrics Scheduled Tasks Tags Capacity Providers

Create Update Delete Actions Last updated on November 15, 2022 11:12:26 PM (0m)

Filter in this page Launch type ALL Service type ALL

Service Name	Status	Service Type	Task Definition	Desired Count	Running Count	Last Checkpoint
mb-ecs-service	ACTIVE	REPLICATING	mb-task-definition	1	1	EC2

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US

Creating an ECS service for **Threads**

Next, you will create an ECS service for the **Threads** microservice task definition.

!53. After a few moments, choose the **Refresh** button. The task's **Last status** should show a value of **RUNNING**.

Creating an ECS service for **Threads**

The details page for **mb-users-ecs-service** opens. The **Tasks** tab shows that there is now one task running in the container.

!53. After a few moments, choose the **Refresh** button. The task's **Last status** should show a value of **RUNNING**.

Launch Status

ECS Service status - 2 of 2 completed

Create Load Balancer

IAM Policy

- IAM Service policy attached** IAM Service policy attached to the role: arn:aws:iam::698384538129:role/ecsServiceRole. View policy: [AmazonEC2ContainerServiceRole](#)

Create Service

Create service: mb-users-ecs-service

Service created Service created. Tasks will start momentarily. View: [mb-users-ecs-service](#)

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Type here to search

The screenshot shows the AWS ECS console interface. On the left, a sidebar lists services like Amazon EKS, Clusters, Amazon ECR, Repositories, AWS Marketplace, Discover software, and Subscriptions. The main area displays the status of the 'mb-ecs-cluster'. It shows 2 registered container instances, all in an ACTIVE state. Task counts are as follows: Pending tasks (0 Fargate, 0 EC2, 0 External), Running tasks (0 Fargate, 4 EC2, 0 External), Active service count (0 Fargate, 4 EC2, 0 External), and Training service count (0 Fargate, 0 EC2, 0 External). Below this, a table lists four services: 'mb-posts-ecs-service', 'mb-ecs-service', 'mb-threads-ecs-service', and 'mb-users-ecs-service', each in an ACTIVE state with 1 desired task and 1 running task, running on EC2.

Service Name	Status	Service ...	Task Def...	Desired ...	Running...	Launch ...	Platform...
mb-posts-ecs-service	ACTIVE	REPLICA	mb-posts...	1	1	EC2	--
mb-ecs-service	ACTIVE	REPLICA	mb-task:1	1	1	EC2	--
mb-threads-ecs-service	ACTIVE	REPLICA	mb-threa...	1	1	EC2	--
mb-users-ecs-service	ACTIVE	REPLICA	mb-users...	1	1	EC2	--

The screenshot shows the AWS CloudFront console with the URL <https://us-east-1.console.aws.amazon.com/cloudfront/v2/home?region=us-east-1#ELBRules:type=app;loadBalancerName=mb-load-balancer;loadBalancerId=b8fef716f1ab...>. The page displays a single rule named "HTTP 80: default action" which routes requests to the "mb-load-balancer-target-group". The rule condition is "Requests otherwise not routed". The "Forward to" section shows a target group named "mb-load-balancer-target-group" with a weight of 100%. Group-level stickiness is set to "Off".

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