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Лабораторна робота №2
з дисципліни «Проектування розподілених систем»
за темою «Розгортання веб-порталу ввикористовуючи підхід PaaS»

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Тема: Розгортання веб-порталу ввикористовуючи підхід PaaS.

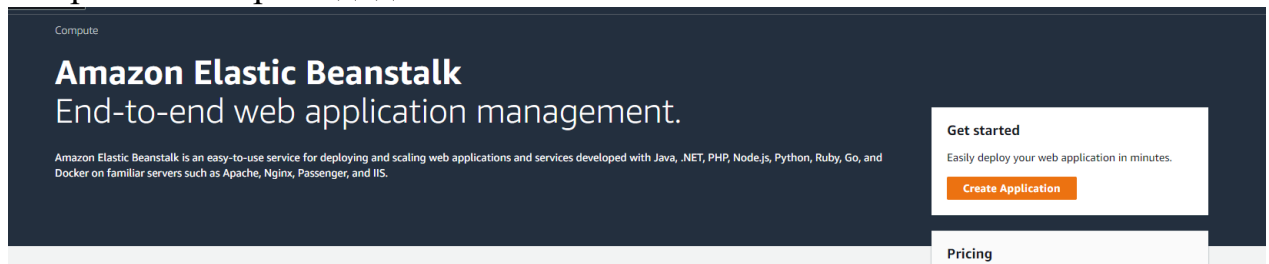
Завдання:

- Застосунок має бути розгорнутий як Azure App Service, Digital Ocean App Platform або AWS Elastic Beanstalk.

Хід роботи

Репозиторій: <https://github.com/JokerFunny/PRZ>.

1. Перейдемо до головної сторінки «Amazon Elastic Beanstalk» (у обраному регіоні): <https://eu-central-1.console.aws.amazon.com/elasticbeanstalk/home?region=eu-central-1#/welcome>
2. Оберемо «Створити доданок»:



3. Встановимо відповідні налаштування (назву, тег, платформу та як буде завантажено код):

Application information

Application name

Up to 100 Unicode characters, not including forward slash (/).

Application tags

Apply up to 50 tags. You can use tags to group and filter your resources. A tag is a key-value pair. The key must be unique within the resource and is case-sensitive. [Learn more](#)

Key	Value	
<input type="text" value="purpose"/>	<input type="text" value="labs"/>	<button>Remove tag</button>
<input type="text"/>	<input type="text"/>	<button>Remove tag</button>

Add tag

49 remaining

Platform

Platform

Platform branch

Platform version

Application code

☐ Sample application
Get started right away with sample code.

☒ Upload your code
Upload a source bundle from your computer or copy one from Amazon S3.

4. Перейдемо до списку усіх доданків, перевіримо що наш живий і виконується:

Elastic Beanstalk > Environments

All environments

Filter results matching the display values

Environment name	Health	Application name	Date created	Last modified	URL	Running versions	Platform	Platform state	Tier name
<input type="radio"/> Lab2beanstalk-env	OK	lab-2-beanstalk	2022-12-25 19:31:24 UTC+0200	2022-12-25 19:44:24 UTC+0200	Lab2beanstalk-env:eba-efyhrpqp.eu-central-1.elasticbeanstalk.com	Sample Application-2	.NET Core running on 64bit Amazon Linux 2	Supported	WebServer

5. Обравши його, переходимо до конфігурації (нам необхідно створити базу даних):

eu-central-1.console.aws.amazon.com/elasticbeanstalk/home?region=eu-central-1#/environment/dashboard?applicationName=lab-2-

aws Services Search [Alt+S]


Elastic Beanstalk

- Environments
- Applications
- Change history


lab-2-beanstalk

- Application versions
- Saved configurations

Lab2beanstalk-env


- Go to environment 
- Configuration
- Logs
- Health
- Monitoring
- Alarms

Lab2beanstalk-env

Lab2beanstalk-env.eba-efyhrzpz.eu-central-1.elasticbeanstalk.com 

Application name: lab-2-beanstalk

Health












Ok

Causes

Recent events

Configurations

Cancel Review changes

Category	Options	Actions
Software	Log streaming: disabled Proxy server: nginx Rotate logs: disabled X-Ray daemon: disabled	
Instances	EC2 security groups: aws-elasticbeanstalk-ec2-role IMDSv1: disabled IOPS: container default Monitoring interval: 5 minute Root volume type: container default Size: container default Throughput: container default	
Capacity	AMI ID: ami-028dca7e02b59462 Capacity rebalancing: disabled Environment type: single instance Instance types: t2.micro, t2.small Scaling cooldown: 360 seconds Time-based Scaling	
Load balancer	This configuration does not contain a load balancer.	
Rolling updates and deployments	Command timeout: 600 Deployment policy: All at once Health threshold: OK Ignore health check: disabled Rolling updates: disabled	
Security	EC2 key pair: -- IAM instance profile: aws-elasticbeanstalk-ec2-role Service role: arn:aws:iam::517864397577:role/aws-elasticbeanstalk-service-role	
Monitoring	CloudWatch Custom Metrics-Environment: CloudWatch Custom Metrics-Instance: Health event log streaming: disabled Ignore HTTP 4xx: disabled Ignore load balancer 4xx: disabled System: Enhanced	
Managed updates	Instance replacement: disabled Managed updates: enabled Update level: Minor and patch Weekly update window: Mon 12:00	
Notifications	Email: --	
Network	This environment is not part of a VPC.	
Database		

6. Так як наш доданок використовує PostgreSQL, створимо відповідну БД:

Elastic Beanstalk

Environments

Applications


Change history

lab-2-beanstalk

Application versions

Saved configurations

Lab2beanstalk-env

Go to environment 

Configuration

Logs

Health

Monitoring

Alarms

Managed updates

Events

Tags

Recent environments

Lab2beanstalk-env

Restore a snapshot - optional

Restore an existing snapshot from a previously used database.

Snapshot

None

Database settings

Choose an engine and instance type for your environment's database.

Engine

postgres

Engine version

13.7

Instance class

db.t4g.micro

Storage

Choose a number between 5 GB and 1024 GB.

5

Username

pgadmin

Password

Availability

Low (one AZ)

Database deletion policy

This policy applies when you delete a database or terminate the environment coupled to it.

☐ Create snapshot

Elastic Beanstalk saves a snapshot of the database and then deletes it. You can restore a database from a snapshot when you add a DB to an Elastic Beanstalk environment or when you create a standalone database. You might incur charges for storing database snapshots.

☐ Retain

The deleted database will remain available and operational external to Elastic Beanstalk.

☒ Delete

Elastic Beanstalk terminates the database. The database will no longer be available.

Cancel Continue Apply

7. Після якогось часу, перевіряємо що БД успішно створено:

Elastic Beanstalk

X

Environments

Applications

Change History

▼ lab-2-beanstalk

Application versions

Saved configurations

▼ Lab2beanstalk-env

Go to environment

Configuration

Logs

Health

Monitoring

Alarms

Managed updates

Events

Tags

▼ Recent environments

Lab2beanstalk-env

Q Search for an option name or value

Category	Options	Actions
Software	Log streaming: disabled Proxy server: nginx Rotate logs: disabled X-Ray daemon: disabled	<div>Edit</div>
Instances	EC2 security groups: awseb-e-xfmsnmgs7-stack-AWSEBSecurityGroup-1M7MBAE8KFO IMDSv1: disabled IOPS: container default Monitoring interval: 5 minute Root volume type: container default Size: container default Throughput: container default	<div>Edit</div>
Capacity	AMI ID: ami-028dca7ed2b6594d2 Capacity rebalancing: disabled Environment type: single instance Instance types: t2.micro,t2.small Scaling cooldown: 360 seconds Time-based Scaling	<div>Edit</div>
Load balancer	This configuration does not contain a load balancer.	
Rolling updates and deployments	Command timeout: 600 Deployment policy: All at once Healthy threshold: Ok Ignore health check: disabled Rolling updates: disabled	<div>Edit</div>
Security	EC2 key pair: -- IAM instance profile: aws-elasticbeanstalk-ec2-role Service role: arn:aws:iam::317864397577:role/aws-elasticbeanstalk-service-role	<div>Edit</div>
Monitoring	CloudWatch Custom Metrics-Environment: CloudWatch Custom Metrics-Instance: Health event log streaming: disabled Ignore HTTP 4xx: disabled Ignore load balancer 4xx: disabled System: Enhanced	<div>Edit</div>
Managed updates	Instance replacement: disabled Managed updates: enabled Update level: Minor and patch Weekly update window: Mon:12:00	<div>Edit</div>
Notifications	Email: --	<div>Edit</div>
Network	This environment is not part of a VPC. Endpoint: awseb-e-xfmsnmgs7-stack-awsebrdsdatabase-t4oh4x5pgbf3.c5mp5qdgroug.eu-central-1.rds.amazonaws.com:5432	
Database	Availability: Low (one AZ) Engine: postgres Instance class: db.t4g.micro Retention: Delete Storage: 10 Username: pgadmin	<div>Edit</div>

8. Переходимо до Amazon RDS для налаштування доступу до БД (щоб була можливість під'єднатися з локального енва):

RDS > Databases > awseb-e-xfmsnmgs7-stack-awsebrdsdatabase-t4oh4x5pgbf3			
awseb-e-xfmsnmgs7-stack-awsebrdsdatabase-t4oh4x5pgbf3			
Summary			
DB identifier awseb-e-xfmsnmgs7-stack-awsebrdsdatabase-t4oh4x5pgbf3	CPU 3.80%	Status Available	Class db.t4g.micro
Role Instance	Current activity 1 Connections	Engine PostgreSQL	Region & AZ eu-central-1-c
Connectivity & security Monitoring Logs & events Configuration Maintenance & backups Tags			
Connectivity & security			
Endpoint & port Endpoint awseb-e-xfmsnmgs7-stack-awsebrdsdatabase-t4oh4x5pgbf3.c5mp5qdgroug.eu-central-1.rds.amazonaws.com Port 5432	Networking Availability Zone eu-central-1-c VPC vpc-05b5b4786229a5f4e Subnet group default Subnets subnet-05a7de6be08409803 subnet-07a1b0ff3bf19dbu6 subnet-06640d5708673bf8b Network type IPv4	Security VPC security groups awseb-e-xfmsnmgs7-stack-AWSEBRDSDBSecurityGroup-AZDSXAD0YRLC (sg-0f6b73313bcd113b) Active Publicly accessible Yes Certificate authority info rds-ca-2019 Certificate authority date August 22, 2024, 20:08 (UTC+03:00)	

9. Йдемо до «VPC security groups» за посиланням, налаштуємо «Inbound rules» на весь IPv4 трафік:

The screenshot shows the AWS IAM console with the 'Lab2beanstalk-env' security group selected. The 'Inbound rules' tab is active, showing a single rule that allows all traffic from 0.0.0.0/0. The 'Run Reachability Analyzer' button is visible at the top right of the rules section.

10. Після п-ої кількості налаштувань додатку, перевіряємо що усе працює:

The top screenshot displays the 'Application versions' for the 'lab-2-beanstalk' application. It lists several versions of the 'jotter-api' application, including 'jotter-api-v1.3', 'jotter-api-v1.2', 'jotter-api-v1.1', and 'jotter-api-v1'. The bottom screenshot shows the 'Application environments' for the same application, listing the 'Lab2beanstalk-env' environment with a 'jotter-api-v1.3' running version.

Додаток живий і працює, базу створено:

The screenshot shows the AWS CloudFormation console with the 'Servers (1)' section expanded. The 'test' stack is selected, and the 'Databases (4)' section is expanded, showing 'ebdb', 'jotter', 'postgres', and 'rdsadmin'. The 'jotter' database is highlighted with a red circle.

11. Перевіряємо працездатність (<http://lab2beanstalk-env.eba-efyhrpzp.eu-central-1.elasticbeanstalk.com/>):


```
{
  "Email": "test@gmail.com",
  "Name": "TestUser",
  "Password": "Test12345678"
}
```

б. Отримання інформації про користувача:

Request Settings

URL:

☆ http://lab2beanstalk-env.eba-efyhrpzb.eu-central-1.elasticbeanstalk.com/user
GET

Payload:

application/json

Custom Headers

Headers:
Content-Type: application/json
Add Selected Header
Add New Header

Header Name	Header Value	Actions
Authorization	Bearer eyJhbGciOiJodHRwOi8vd3d3LnczLm9yZy8yMDAxLzA0L3htbGRzaWctbW9yZSNoZWJlXNoYTI1NiIsInR5cCI6IkpXVCJ9.eyJodHRwOi8vc2NoZW1hcy54bWxzb2FwLm9yZy93cy8yMDAxLzA1L2lkZW50aXR5L2NsYWltcy9uYW1laWRibnRpZmllciI6IiRlc3Rvc2VylwiiaHR0cDovL3NjaGVtYXMuG1sc29hcC5vcmevd3MvMjAwNS8wNS9pZGVudGI0eS9jbGFpbXMvbmFtZSI6IjA2ZmQwNGQ0LWZkYjgtNDljNS1hOGU0LTlhYzg1ZTgzYTRkMSIsImV4cCI6MTY3MjA4NjkzNywiawXNzIjoiSm90dGVyIiwiaXVkJoiU29tZSBhdWRpZW5jZSJ9.2DIHfSAO7B_5dxfbtTuawbrRkZbIcuO3nehWGfy_ZP8	✖ 📋

The above header(s) will be added to the next request.

Authentication

Send Request

Response

Request URL: http://lab2beanstalk-env.eba-efyhrpzb.eu-central-1.elasticbeanstalk.com/user
Request Method: GET
Response Time: 0.09 seconds
Response Status: 200 - OK

200

Response Body
Response Body (RAW)
Response Headers
Request Details

```
{
  "error": null,
  "isSuccessful": true,
  "responseResult": {
    "id": "06fd04d4-fdb8-49c5-a8e4-9ac85e83a4d1",
    "name": "TestUser",
    "email": "test@gmail.com"
  }
}
```

http://lab2beanstalk-env.eba-efyhrpzb.eu-central-1.elasticbeanstalk.com/user

Authorization = Bearer

eyJhbGciOiJodHRwOi8vd3d3LnczLm9yZy8yMDAxLzA0L3htbGRzaWctbW9yZSNoZWJlXNoYTI1NiIsInR5cCI6IkpXVCJ9.eyJodHRwOi8vc2NoZW1hcy54bWxzb2FwLm9yZy93cy8yMDAxLzA1L2lkZW50aXR5L2NsYWltcy9uYW1laWRibnRpZmllciI6IiRlc3Rvc2VylwiiaHR0cDovL3NjaGVtYXMuG1sc29hcC5vcmevd3MvMjAwNS8wNS9pZGVudGI0eS9jbGFpbXMvbmFtZSI6IjA2ZmQwNGQ0LWZkYjgtNDljNS1hOGU0LTlhYzg1ZTgzYTRkMSIsImV4cCI6MTY3MjA4NjkzNywiawXNzIjoiSm90dGVyIiwiaXVkJoiU29tZSBhdWRpZW5jZSJ9.2DIHfSAO7B_5dxfbtTuawbrRkZbIcuO3nehWGfy_ZP8

с. Створення нової категорії нотатків:

Request Settings

URL:

☆

http://lab2beanstalk-env.eba-efyhrpzp.eu-central-1.elasticbeanstalk.com/Categories

POST ▾

Payload:

```
{
  "Name": "TestCategory"
}
```

Custom Headers

Headers:

Authorization: Bearer eyJhbGciOiJIodHRwOi8vd3d3LnczLm9yZy8yMDAxLzA0L3htbGRzaWc=

Add Selected Header

Add New Header

Header Name	Header Value	Actions
Authorization	Bearer eyJhbGciOiJIodHRwOi8vd3d3LnczLm9yZy8yMDAxLzA0L3htbGRzaWctbW9yZSNoZWVjLXN0eTY1NiIsInR5cCI6IkpXVCJ9.ejYodHRWOI8vc2NoZWV1hcy54bWxzb2FwLm9yZy93cy8yMDA1LzA1L2lkZW50aXR5L2NsYWltcy9uYW1laWRlbnpRpZmlcll6IlRlc3Rvc2VylliwiaHR0cDovLzNjaGVtYXMueG1sc29hcC5vcmcvd3MvMjAwNS8wNS9pZGVudGl0eS9jbGFpbXBvbmlFZSJi6lA2ZmQwNGQ0LWZkYgttNDljNS1hOGU0LTlhYzg1ZTgzYTdkMSlwiV4cCl6MTY3MjA4NjkzNywiaXNzIjoISm90dGVyIiwiaXYkiOjU2tZSBhdWRpRW5jZSJ9.2DiHfSA07B_5dxftbTuawbrRkZblcuO3nehWGfy_ZP8	<div><div></div><div></div></div>

The above header(s) will be added to the next request.

The above header(s) will be added to the next request.

Authentication

Send Request

Response

Request URL: <http://lab2beanstalk-env.eba-efyhrpzp.eu-central-1.elasticbeanstalk.com/Categories>

Request Method: POST

Response Time: 0.418 seconds

Response Status: 200 - OK

200

Response Body

Response Body (RAW)

Response Headers

Request Details

```
{
  "error": null,
  "isSuccessful": true,
  "responseResult": {
    "id": "1fddb23e-fb40-44a9-b269-76bab33ec23e",
    "name": "TestCategory",
    "isLocked": false
  }
}
```

<http://lab2beanstalk-env.eba-efyhrpzp.eu-central-1.elasticbeanstalk.com/Categories>

```
{
  "Name": "TestCategory"
}
```

Authorization = Bearer

eyJhbGciOiJodHRwOi8vd3d3LnczLm9yZy8yMDAxLzA0L3htbGRzaWctbW9yZSNOblWFjLXNoYTI1NiIsInR5cCI6IkpXVCJ9.eyJodHRwOi8vc2NoZW1hcy54bWxzb2FwLm9yZy93cy8yMDAxLzA0L2lkZW50aXR5L2NsYWltcy9uYW1laWRlbnRpZmllciI6IiRlc3Rvc2VyIiwiaHR0cDovL3NjaGVtYXNueG1sc29hcC5vcmevd3MvMjAwNS8wNS9pZGVudGl0eS9jbGFpbXMvbmFtZSI6IjA2ZmQwNGQ0LWZkYjgtNDljNS1hOGU0LTlhYzg1ZTgzYTRkMSIsImV4cCI6MTYzMTMjA4NjZkNywiawXNzIjoiaSm90dGVyIiwiaXVkljoiaU29tZSBhdWRpZW5jZSJ9.2DiHfSAO7B_5dxfbtTuawbrRkZbIcuO3nehWGfy_ZP8

d. Перевірка, що категорію створено:

Request Settings

URL: GET

Payload:

Custom Headers

Headers: Add Selected Header Add New Header

Header Name	Header Value	Actions
Authorization	Bearer eyJhbGciOiJodHRwOi8vd3d3LnczLm9yZy8yMDAxLzA0L3htbGRzaWctbW9yZSNoZWJlXNoYTI1NiIsInR5cCI6IkpXVCJ9.eyJodHRwOi8vc2NoZW1hcy54bWxzb2FwLm9yZy93cy8yMDAxLzA1L2lkZW50aXR5L2NsYWltcy9uYW1laWRibnRpbmllci6iIHRlc3Rvc2VyIiwiaHR0cDovL3NjaGVtYXMuG1sc29hcC5vcmevd3MvMjAwNS8wNS9pZGVudGl0eS9jbGFpbXMvbmFtZSI6IjA2ZmQwNGQ0LWZkYjgtNDljNS1hOGU0LTlhYzg1ZTgzYTRkMSIsImV4cCI6MTY3MjA4NjZkNywiXNzIjoiaSm90dGVyIiwiaXVkiOiU29tZSBhdWRpZW5jZSJ9.2DiHfSAO7B_5dxfbtTuawbrRkZbIcuO3nehWGfy_ZP8	

The above header(s) will be added to the next request.

Authentication

Send Request

Response

Request URL: http://lab2beanstalk-env.eba-efyhrpzp.eu-central-1.elasticbeanstalk.com/Categories
Request Method: GET
Response Time: 0.05 seconds
Response Status: 200 - OK

200

Response Body

Response Body (RAW) Response Headers Request Details

```
{
  "error": null,
  "isSuccessful": true,
  "responseResult": {
    "categories": [
      {
        "id": "1fddb23e-fb40-44a9-b269-76bab33ec23e",
        "name": "TestCategory",
        "isLocked": false
      }
    ]
  }
}
```

http://lab2beanstalk-env.eba-efyhrpzp.eu-central-1.elasticbeanstalk.com/Categories

Authorization = Bearer

eyJhbGciOiJodHRwOi8vd3d3LnczLm9yZy8yMDAxLzA0L3htbGRzaWctbW9yZSNoZWJlXNoYTI1NiIsInR5cCI6IkpXVCJ9.eyJodHRwOi8vc2NoZW1hcy54bWxzb2FwLm9yZy93cy8yMDAxLzA1L2lkZW50aXR5L2NsYWltcy9uYW1laWRibnRpbmllci6iIHRlc3Rvc2VyIiwiaHR0cDovL3NjaGVtYXMuG1sc29hcC5vcmevd3MvMjAwNS8wNS9pZGVudGl0eS9jbGFpbXMvbmFtZSI6IjA2ZmQwNGQ0LWZkYjgtNDljNS1hOGU0LTlhYzg1ZTgzYTRkMSIsImV4cCI6MTY3MjA4NjZkNywiXNzIjoiaSm90dGVyIiwiaXVkiOiU29tZSBhdWRpZW5jZSJ9.2DiHfSAO7B_5dxfbtTuawbrRkZbIcuO3nehWGfy_ZP8

Додаток працює!

Також API доступний через swagger: <http://lab2beanstalk-env.eba-efyhrpzp.eu-central-1.elasticbeanstalk.com/swagger/index.html>

\wedge

Request body application/json

Execute

Clear

Responses

```
curl -X 'POST' \
  'http://lab2beanstalk-env.eba-efyhrpiz.eu-central-1.elasticbeanstalk.com/login' \
  -H 'accept: text/plain' \
  -H 'content-type: application/json' \
  -d '{
    "email": "test@gmail.com",
    "password": "test12345678"
  }'
```

Request URL

<http://lab2beanstalk-env.eba-efyhrzp-eu-central-1.elasticbeanstalk.com/login>

Server response

Code	Details
------	---------

[illegible]

```
Response headers
access-control-allow-origin: *
connection: keep-alive
content-type: application/json; charset=utf-8
date: Mon, 26 Dec 2022 14:00:50 GMT
server: nginx/1.22.0
transfer-encoding: chunked
```

Responses

Code	Description	Links
------	-------------	-------

200 No links

Для використання токену наверху сторінки кнопка Authorize:

Available authorizations

Bearer (apiKey)

JWT Authorization header using the Bearer scheme.

Enter 'Bearer' [space] and then your token in the text input below.

Example: 'Bearer 12345abcdef'

Name: Authorization

In: header

Value:

Bearer eyJhbGciOiJodHRwO

AuthorizeClose

[illegible]

Висновок:

В результаті виконання лабораторної роботи було розгорнуто .NET застосунок на AWS Elastic Beanstalk (code part) + Amazon RDS (PostgreSQL) + swagger для зручного перегляду API.