

## Sujet d'épreuves de la 48<sup>e</sup> Compétition Nationale des Métiers

# MÉTIER N°53

# CLOUD COMPUTING

Jour 3

Soumis par :

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# DEPLOYING A SCALABLE AND SECURE API INFRASTRUCTURE ON AWS WITH ECS, LOAD BALANCING, AND CDN

DUREE TOTALE DE L'ÉPREUVE	4 heures
DIFFUSION DU SUJET	C3 <i>Découvert le jour de la compétition</i>

**Grading :** The grading for this part is 31,5 points.

You have the right to the Internet but no AI, whether in a code editor or online or in any other form. Should you be caught using this technology, the sub-section in question will be retrieved and the comment "AI cheats" with a grade of 0 will be awarded. If you're caught a second time, you'll be eliminated from the day's event or even from the competition.

If you're really stuck, or need a break, just raise your hand.

To complete this project, you have access to an AWS account. To demonstrate your ability to properly use this cloud provider, we require that you follow all best practices defined in the Well-Architected Framework.

## CONTEXT

As part of securing data and ensuring traceability of information, your company needs to transform sensitive strings into cryptographically secure values using hash functions. This allows for storing the information without exposing raw data, while ensuring its uniqueness.

## GOAL

Based on the information provided, your task is to design and deploy the necessary infrastructure to support the company's API. Your work will be assessed on how well it follows the project instructions and applies AWS best practices.

# DIAGRAM

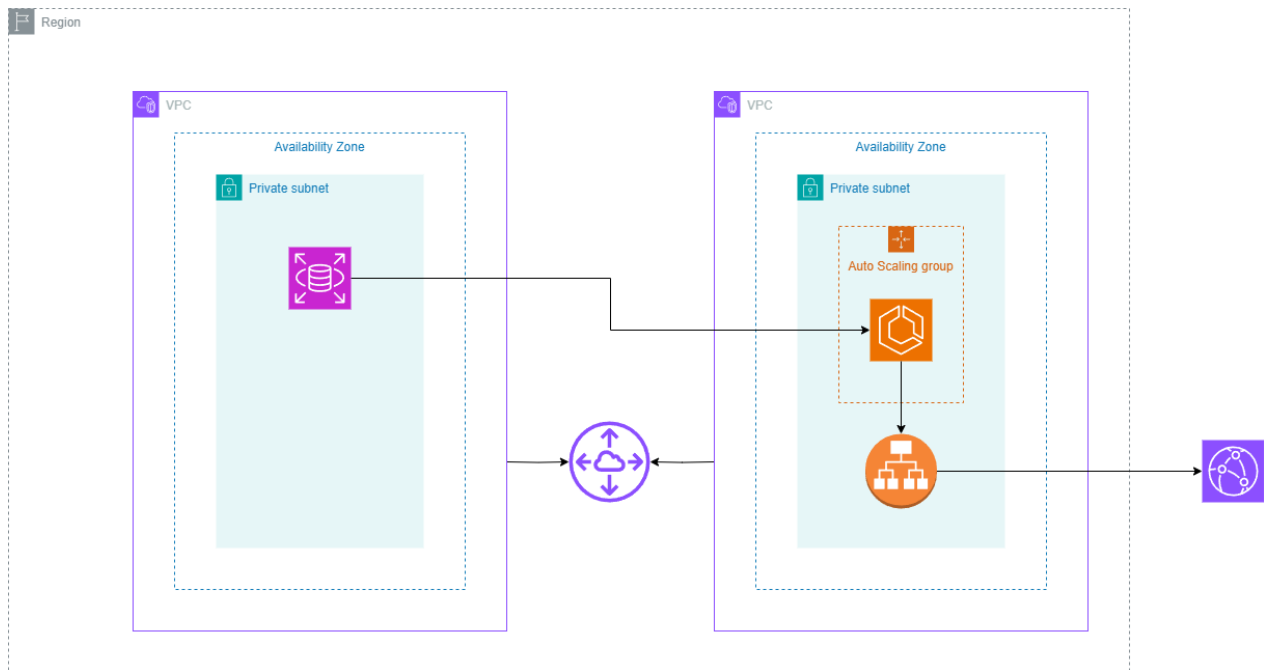


Figure 1 Non-detailed diagram

# TECHNICAL DETAILS

## Container

To run your company's API, a binary has been compiled on a Debian Bookworm image. Deploy this binary using ECS (Elastic Container Service) from an image that you will build for this purpose.

Description	Valeur
Cluster name and/or tag name	app-cluster
Task name and/or tag name	app-task
Service name and/or tag name	app-service
Launch type	Fargate
Max capacity	3
Min capacity	1
Auto scaling policy	CPU

## Registry

Your container image must be stored in a private registry on the AWS account provided by your company.

Description	Valeur
Repositories name and/or tag name	app_repository

## Database

The API relies on a MariaDB database to log the most recent requests made. You may choose any service you prefer to deploy this database. The database schema will be initialized by the binary, so there is no need to perform reverse engineering to define it.

Description	Valeur
Database name and/or tag name	app_data
Engine	MariaDB
Version	11.4.5
Instance class	db.t3.micro
Allocated storage	10 Gb
Username	Admin

## Load balancer

The binary provides an API using the HTTP protocol. Deploy a load balancer to distribute traffic across your containers. Choose and deploy the service you believe best meets this requirement.

Description	Valeur
Load balancer name and/or tag name	app-lb

## Network

For this infrastructure, you need to deploy two VPCs:

- VPC A for the database,
- VPC B for your containers.

Since other services located in different VPCs within the company may need to access the database, choose the method of VPC interconnection wisely.

Description	Valeur
VPC name and/or tag name	app_vpc_a
VPC CIDR	10.0.0.0/16
Subnet1 name and/or tag name	subnet_a1
Subnet1 CIDR	10.0.1.0/24
Subnet2 name and/or tag name	subnet_a2
Subnet2 CIDR	10.0.2.0/24
Subnet3 name and/or tag name	subnet_a3
Subnet3 CIDR	10.0.3.0/24
Route table name and/or tag name	app_route_a

Table 1 VPC A

Description	Valeur
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VPC name and/or tag name	app_vpc_b
VPC CIDR	10.1.0.0/16
Subnet1 name and/or tag name	subnet_b1
Subnet1 CIDR	10.1.1.0/24
Subnet2 name and/or tag name	subnet_b2
Subnet2 CIDR	10.1.2.0/24
Subnet3 name and/or tag name	subnet_b3
Subnet3 CIDR	10.1.3.0/24
Route table name and/or tag name	app_route_b

Table 2 VPC B

## CDN

To distribute your API across the USA and Europe, use a CDN (Content Delivery Network). Deploy the service you believe best meets this requirement.