

TP AWS

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BTC 26.1



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CONFIGURATION VPC

Nous commençons par créer notre VPC.

EC2

VPC > Your VPCs > Create VPC

Create VPC

Info

A VPC is an isolated portion of the AWS Cloud populated by AWS objects, such as Amazon EC2 instances.

VPC settings

Resources to create

Info

Create only the VPC resource or the VPC and other networking resources.

☒ VPC only

☐ VPC and more

Name tag - optional

Creates a tag with a key of 'Name' and a value that you specify.

amine-ezechiel-vpc

IPv4 CIDR block

Info

☒ IPv4 CIDR manual input

☐ IPAM-allocated IPv4 CIDR block

IPv4 CIDR

10.0.0.0/16

CIDR block size must be between /16 and /28.

Pour l'instant nos VPC est vide

Resource map

Info

VPC

Show details

Your AWS virtual network

amine-ezechiel-vpc

Subnets (0)

Subnets within this VPC

Route tables (1)

Route network traffic to resources

rtb-07421287fbf278d40

Sous-Réseaux

On crée alors nos sous réseaux en sachant qu'on aura 3 sous réseaux pour chaque instance. On choisit le CIDR block du VPC et en respectant les plages réseaux.

Subnet settings

Specify the CIDR blocks and Availability Zone for the subnet.

Subnet 1 of 1

Subnet name

Create a tag with a key of 'Name' and a value that you specify.

amine-ezechi-el-public-subnet

The name can be up to 256 characters long.

Availability Zone [Info](#)

Choose the zone in which your subnet will reside, or let Amazon choose one for you.

No preference

IPv4 VPC CIDR block [Info](#)

Choose the VPC's IPv4 CIDR block for the subnet. The subnet's IPv4 CIDR must lie within this block.

10.0.0/16

IPv4 subnet CIDR block

10.0.1.0/24

256 IPs

< > ^ v

▼ Tags - optional

Table de routage

Nous aurons ensuite besoin de nos deux tables de routages, une pour la publique et une pour la privée qu'on associe au VPC.

Edit routes

Destination	Target	Status
10.0.0.0/16	local	✓ Active
<input type="text" value="0.0.0.0/0"/>	<input type="text" value="local"/>	
	Internet Gateway	-
	<input type="text" value="igw-"/>	
	Use: "igw-"	
	igw-09bb9c8ba7c9a1074 (amine-ezechiel-gateway)	

[Add route](#)

Route table settings

Name - optional

Create a tag with a key of 'Name' and a value that you specify.

amine-ezechiel-public-rt

VPC

The VPC to use for this route table.

vpc-0f31a58cb58c4d5cc (amine-ezechiel-vpc)

Tags

A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs.

Key

Value - optional

[Remove](#)

[Add new tag](#)

You can add 49 more tags.

[Cancel](#)

[Create route table](#)

On edit ensuite les routes

Route tables (1/6) Info						Last updated 2 minutes ago	Actions	Create route ta
<input type="text" value="Find resources by attribute or tag"/>								
<input type="checkbox"/>	Name	Route table ID	Explicit subnet associ...	Edge associatio				
<input type="checkbox"/>	mino-cours-public-rt	rtb-0038bd383a4e61640	subnet-0ce8a0ff01c4dc9...	-				
<input type="checkbox"/>	mino-cours-private-rt	rtb-03f78d9fc36aa2dc9	subnet-040fe3afbe0058c...	-				
<input type="checkbox"/>	-	rtb-0ee5d71b1fb6e9508	-	-				
<input type="checkbox"/>	-	rtb-07421287fbf278d40	-	-				
<input checked="" type="checkbox"/>	amine-ezechiel-public-rt	rtb-0c074ba15e99f746a	-	-			<div>View details Set main route table Edit subnet associations Edit edge associations Edit route propagation Edit routes Manage tags Delete route table</div>	
<input type="checkbox"/>	amine-ezechiel-private-rt	rtb-025aecc3dbed4e70e	-	-				

On associe nos tables de routages pour qu'ils soient connecté à notre vpc.

Edit route table association [Info](#)

Subnet route table settings

Subnet ID

subnet-023210feca5e5eb3c

Route table ID

rtb-0c074ba15e99f746a (amine-ezechiel-public-rt)

Routes (2)

Filter routes

< 1 > ⚙

Destination	Target
10.0.0.0/16	local
0.0.0.0/0	igw-09bb9c8ba7c9a1074

Cancel Save

Une fois cela connecter on connecte nos sous réseaux à nos tables de routages.

<input checked="" type="checkbox"/>	amine-ezechiel-public-subnet	subnet-023210feca5e5eb3c	Available	vpc-0f31a58cb58c4d5cc amin...	Off
<input type="checkbox"/>	amine-ezechiel-private-subnet	subnet-0d750d5c1e7a45163	Available	vpc-0f31a58cb58c4d5cc amin...	Off
<input type="checkbox"/>	amine-ezechiel-private2-subnet	subnet-0d5d7ee60da79c7c3	Available	vpc-0f31a58cb58c4d5cc amin...	Off

subnet-023210feca5e5eb3c / amine-ezechiel-public-subnet

Details | Flow logs | **Route table** | Network ACL | CIDR reservations | Sharing | Tags

Route table: rtb-07421287fbf278d40

[Edit route table association](#)

Routes (1)

Filter routes

< 1 > ⚙

Destination	Target
10.0.0.0/16	local

Route tables (1/6) [Info](#)

Last updated
2 minutes ago

[Actions](#)

[Create route ta](#)

Find resources by attribute or tag

	Name	Route table ID	Explicit subnet associ...	Edge associati...
<input type="checkbox"/>	mino-cours-public-rt	rtb-0038bd383a4e61640	subnet-0ce8a0ff01c4dc9...	-
<input type="checkbox"/>	mino-cours-private-rt	rtb-03f78d9fc36aa2dc9	subnet-040fe3afbe0058c...	-
<input type="checkbox"/>	-	rtb-0ee5d71b1fb6e9508	-	-
<input type="checkbox"/>	-	rtb-07421287fbf278d40	-	-
<input checked="" type="checkbox"/>	amine-ezechiel-public-rt	rtb-0c074ba15e99f746a	-	-
<input type="checkbox"/>	amine-ezechiel-private-rt	rtb-025aecc3dbed4e70e	-	-

View details

Set main route table

Edit subnet associations

Edit edge associations

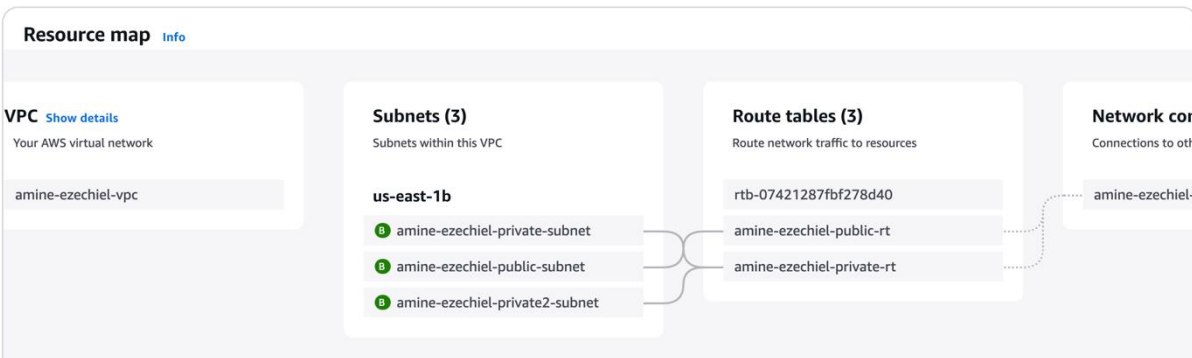
Edit route propagation

Edit routes

Manage tags

Delete route table

On voit ensuite nos différents sous réseaux et nos différentes tables de routages.



EC2

Dashboard
EC2 Global View
Events
Instances
Instances

Instances (2) Info

Last updated less than a minute ago

Connect

Instance state

Actions

Launch instances

Find Instance by attribute or tag (case-sensitive)

All states

<input type="checkbox"/>	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	
<input type="checkbox"/>	mino-cours-ba...	i-005c6f3bd7790e720	Running	t2.micro	2/2 checks passed	View alarms	us-east-1f	-
<input type="checkbox"/>	mino-cours-cri...	i-009b952b7002526a7	Running	t2.micro	2/2 checks passed	View alarms	us-east-1f	-

Génération de la paire de Clé

On crée une clef RSA qui permettra de se connecter en ssh de manière sécuriser avec un format .pem

Create key pair

Key pair name

Key pairs allow you to connect to your instance securely.

amine-ezechiel-key

The name can include up to 255 ASCII characters. It can't include leading or trailing spaces.

Key pair type

☒ RSA
RSA encrypted private and public key pair

☐ ED25519
ED25519 encrypted private and public key pair

Private key file format

☒ .pem
For use with OpenSSH

☐ .ppk
For use with PuTTY

⚠

When prompted, store the private key in a secure and accessible location on your computer. **You will need it later to connect to your instance.** [Learn more](#)

Cancel

Create key pair

✓

Success
 Successfully initiated launch of instance (i-0251a7414479daa2c)

► Launch log

On donne les services voulus pour l'instance. Ssh pour la connexion et http pour la connexion au reverse proxy.

Inbound Security Group Rules

▼ Security group rule 1 (TCP, 22, 0.0.0.0/0)

Remove

Type | Info

ssh

Protocol | Info

TCP

Port range | Info

22

Source type | Info

Anywhere

Source | Info

Q Add CIDR, prefix list or security group

0.0.0.0/0 X

Description - optional | Info

e.g. SSH for admin desktop

▼ Security group rule 2 (TCP, 80)

Remove

Type | Info

HTTP

Protocol | Info

TCP

Port range | Info

80

Source type | Info

Custom

Source | Info

Q Add CIDR, prefix list or security group

Description - optional | Info

e.g. SSH for admin desktop

On choisit ensuite le bon sous réseaux crée et le bon VPC pour lier l'instance et les configurations faites précédemment.

▼ Network settings Info

VPC - required | Info

vpc-0f31a58cb58c4d5cc (amine-ezechieel-vpc)
10.0.0.0/16



Subnet | Info

subnet-0d750d5c1e7a45163 amine-ezechieel-private-subnet
VPC: vpc-0f31a58cb58c4d5cc Owner: 716961978438 Availability Zone: us-east-1b
Zone type: Availability Zone IP addresses available: 251 CIDR: 10.0.2.0/24



Create new subnet

Auto-assign public IP | Info

Disable

Firewall (security groups) | Info

A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.

Create security group

Select existing security group

Security group name - required

amine-ezechieel-private-sg

This security group will be added to all network interfaces. The name can't be edited after the security group is created. Max length is 255 characters. Valid characters: a-z, A-Z, 0-9, spaces, and ., -, /, !, @, #, *, &, '[]\$*

Description - required | Info

amine-ezechieel-private-sg created 2025-02-28T09:44:41.957Z

Voici le script qui permet d'avoir le service apache directement à l'installation de la machine

```
yum install -y
yum install -y httpd
systemctl start httpd
systemctl enable httpd
echo "<h1> Serveur Web 1<h1>" > /var/www/html/index.html
```

On va donner une IP publique à l'instance publique

Instances (1/5) Info

Last updated 2 minutes ago

Connect Instance state Actions Launch instances

Find Instance by attribute or tag (case-sensitive)

All states

Name	Instance ID	Instance state	Instance type	Status check
amine-ezechiel...	i-0251a7414479daa2c	Running	t2.micro	2/2 checks passed
amine-ezechiel...	i-0f80b19bc9dfaf11a	Running		
amine-ezechiel...	i-058357e21e1e63be0	Running		
mino-cours-ba...	i-005c6f3bd7790e720	Running		
mino-cours-cri...	i-009b952b7002526a7	Running		

i-0251a7414479daa2c (amine-ezechiel-public-instance)

Details Status and alarms Monitoring Security

Attach network interface
Detach network interface
Connect RDS database
Disaster recovery for your instances
Change source/destination check
Disassociate Elastic IP address
Manage IP addresses
Manage ENA Express
Manage bandwidth

Pour cela nous allons donner une IP elastic a l'instance

Elastic IP addresses (2)

Find resources by attribute or tag

Name	Allocated IPv4 address	Type	Allocation ID	Reverse DNS record
-	18.215.21.208	Public IP	eipalloc-0b89ac9cf2dfbf20	-
-	52.6.56.128	Public IP	eipalloc-093389e1eb62bfc90	-

Elastic IP addresses (1/1)

Find resources by attribute or tag

Public IPv4 address: 3.88.121.205

Clear filters


Name	Allocated IPv4 address	Type	Allocation ID	Reverse DNS record
-	3.88.121.205	Public IP	eipalloc-C	

View details
Release Elastic IP addresses
Associate Elastic IP address
Disassociate Elastic IP address
Update reverse DNS
Enable transfers
Disable transfers
Accept transfers



On choisit la bonne IP privée et la bonne instance.


Elastic IP address: 3.88.121.205

Resource type
Choose the type of resource with which to associate the Elastic IP address.
☒ Instance
☐ Network interface

 If you associate an Elastic IP address with an instance that already has an Elastic IP address associated, the previously associated Elastic IP address will be disassociated, but the address will still be allocated to your account. [Learn more](#)

If no private IP address is specified, the Elastic IP address will be associated with the primary private IP address.

Instance
  

Private IP address
The private IP address with which to associate the Elastic IP address.
 

Reassociation
Specify whether the Elastic IP address can be reassociated with a different resource if it already associated with a resource.
☐ Allow this Elastic IP address to be reassociated

Cancel

Associate

On peut se connecter en ssh à l'instance publique via la clef privées

```

-> ~ sudo ssh ec2-user@3.88.121.205 -i .ssh/Mino\ Key\ EC2.pem
Password:
The authenticity of host '3.88.121.205 (3.88.121.205)' can't be established.
ED25519 key fingerprint is SHA256:gRLVSCri4TLW3eiAP9nF2FtZvtNjUP3MySxCanij7ck.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '3.88.121.205' (ED25519) to the list of known hosts.

      #_
    ~\_ #####_      Amazon Linux 2023
  ~ ~ \_ #####\
  ~ ~   \###|
  ~ ~    \#/  ---   https://aws.amazon.com/linux/amazon-linux-2023
  ~ ~      V~' ' ->
    ~ ~ ~
      ~ ~ . _ .
        _/ _/ _/
      _/m/'
[ec2-user@ip-10-0-1-231 ~]$

```

On a donc installer haProxy sur l'admin

```
Installing:
haproxy                x86_64                2.8.3-1.amzn2023.0.1                amazonlinux                2.4 M

Transaction Summary
=====
Install 1 Package

Total download size: 2.4 M
Installed size: 7.6 M
Downloading Packages:
haproxy-2.8.3-1.amzn2023.0.1.x86_64.rpm                21 MB/s | 2.4 MB                00:00
-----
Total                16 MB/s | 2.4 MB                00:00
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing           :                                1/1
  Running scriptlet: haproxy-2.8.3-1.amzn2023.0.1.x86_64 1/1
  Installing         : haproxy-2.8.3-1.amzn2023.0.1.x86_64 1/1
  Running scriptlet: haproxy-2.8.3-1.amzn2023.0.1.x86_64 1/1
  Verifying          : haproxy-2.8.3-1.amzn2023.0.1.x86_64 1/1

Installed:
haproxy-2.8.3-1.amzn2023.0.1.x86_64

Complete!
[ec2-user@ip-10-0-1-231 ~]$
```

```
[ec2-user@ip-10-0-1-231 ~]$ sudo nano /etc/haproxy/haproxy.cfg
[ec2-user@ip-10-0-1-231 ~]$ sudo systemctl restart haproxy
[ec2-user@ip-10-0-1-231 ~]$ sudo systemctl enable haproxy
Created symlink /etc/systemd/system/multi-user.target.wants/haproxy.service → /usr/lib/systemd/system/haproxy.service.
[ec2-user@ip-10-0-1-231 ~]$ sudo systemctl status haproxy
● haproxy.service - HAProxy Load Balancer
   Loaded: loaded (/usr/lib/systemd/system/haproxy.service; enabled; preset: disabled)
   Active: active (running) since Fri 2025-02-28 10:17:53 UTC; 36s ago
     Main PID: 26917 (haproxy)
        Status: "Ready."
         Tasks: 2 (limit: 1111)
        Memory: 5.9M
           CPU: 31ms
        CGroup: /system.slice/haproxy.service
                └─26917 /usr/sbin/haproxy -Ws -f /etc/haproxy/haproxy.cfg -f /etc/haproxy/conf.d -p /run/haproxy.pid
                  └─26919 /usr/sbin/haproxy -Ws -f /etc/haproxy/haproxy.cfg -f /etc/haproxy/conf.d -p /run/haproxy.pid

Feb 28 10:17:53 ip-10-0-1-231.ec2.internal systemd[1]: Starting haproxy.service - HAProxy Load Balancer...
Feb 28 10:17:53 ip-10-0-1-231.ec2.internal haproxy[26917]: [NOTICE] (26917) : haproxy version is 2.8.3-86e043a
Feb 28 10:17:53 ip-10-0-1-231.ec2.internal haproxy[26917]: [NOTICE] (26917) : path to executable is /usr/sbin/haproxy
Feb 28 10:17:53 ip-10-0-1-231.ec2.internal haproxy[26917]: [ALERT] (26917) : config : parsing [/etc/haproxy/haproxy.cfg]
Feb 28 10:17:53 ip-10-0-1-231.ec2.internal haproxy[26917]: [NOTICE] (26917) : New worker (26919) forked
Feb 28 10:17:53 ip-10-0-1-231.ec2.internal systemd[1]: Started haproxy.service - HAProxy Load Balancer.
Feb 28 10:17:53 ip-10-0-1-231.ec2.internal haproxy[26917]: [NOTICE] (26917) : Loading success.
Feb 28 10:17:53 ip-10-0-1-231.ec2.internal haproxy[26919]: [WARNING] (26919) : Server web_servers/web1 is DOWN, reason:
Feb 28 10:17:53 ip-10-0-1-231.ec2.internal haproxy[26919]: [WARNING] (26919) : Server web_servers/web2 is DOWN, reason:
Feb 28 10:17:54 ip-10-0-1-231.ec2.internal haproxy[26919]: [ALERT] (26919) : backend 'web_servers' has no server avail
```

Voici le fichier de configuration haproxy pour que le load balancing est lieu avec les ip de nos serveurs

```
global
    log /dev/log local0
    log /dev/log local1 notice
    chroot /var/lib/haproxy
    stats socket /var/lib/haproxy/stats mode 660 level admin
    stats timeout 30s
    user haproxy
    group haproxy
    daemon

defaults
    log global
    mode http
    option httplog
    option dontlognull
    timeout connect 5000ms
    timeout client 50000ms
    timeout server 50000ms

frontend http_front
    bind *:80
    default_backend web_servers

backend web_servers
    balance roundrobin
    server web1 10.0.2.198:80 check
    server web2 10.0.3.33:80 check
```

On a peut donc se connecter aux instances privées en envoyant la clef dans l'instance publique

```
[ec2-user@ip-10-0-1-231 .ssh]$ sudo ssh ec2-user@10.0.2.198 -i ~/.ssh/Minoclef
#_
~\#####_ Amazon Linux 2023
~~\#####\
~~\###|
~~\#/ https://aws.amazon.com/linux/amazon-linux-2023
~~V~' '->
~~~~
~~._.-/_/
~/m/'
```

[ec2-user@ip-10-0-2-198 ~]\$ █

Nous avons un problème de connexion avec nos instances privées car elle n'était pas connectée un NAT Gateway pour accéder à internet et exécuter le script.

NAT gateways (1) [Info](#)

Q

Find resources by attribute or tag

<

1

>

Name

▼

NAT gateway ID

▼

Connectivity...

▼

State

▼

State message

▼

Primary public I...

▼

Pri

▼

amine-ezechieel-nat

[nat-02421cea582f37590](#)

Public

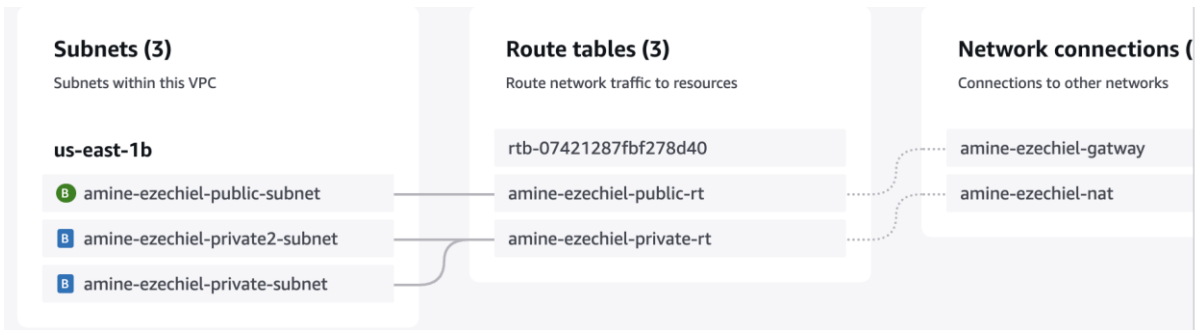
Pending

-

-

-

10.



Le fichier index.html n'était pas créé dans les serveurs donc on l'a créé et personnalisé avec un numéro de serveur

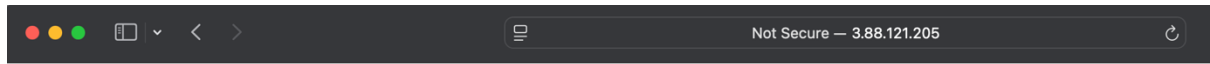
```
[ec2-user@ip-10-0-3-33 ~]$ sudo touch /var/www/html/index.html
[ec2-user@ip-10-0-3-33 ~]$ sudo nano /var/www/html/index.html
```

```
GNU nano 5.8 /var/www/html/index.html
<h1>Server2<h2>
```

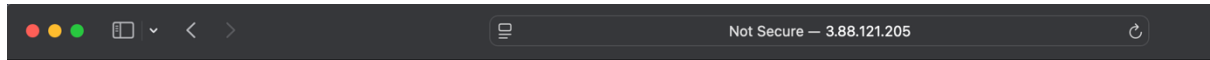
```
[ec2-user@ip-10-0-3-33 ~]$ yum update -y
Error: This command has to be run with superuser privileges (under the root user
on most systems).
[ec2-user@ip-10-0-3-33 ~]$ sudo yum update -y
Amazon Linux 2023 repository          40 MB/s | 32 MB      00:00
Amazon Linux 2023 Kernel Livepatch repository 110 kB/s | 14 kB     00:00
Dependencies resolved.
Nothing to do.
Complete!
[ec2-user@ip-10-0-3-33 ~]$ sudo yum install httpd -y
Last metadata expiration check: 0:00:13 ago on Fri Feb 28 11:21:50 2025.
Dependencies resolved.
```

Test

On a bien les deux seveurs quand on refresh la page



Server1



Server2