

CC de data pipeline :

Question 1)

La région Stockholm sur AWS -> eu-north-1

Terraform plan :

```
$ terraform plan

Terraform used the selected providers to generate the following execution
plan. Resource actions are indicated with the following symbols:
  + create

Terraform will perform the following actions:

# aws_instance.ec2_vm will be created
+ resource "aws_instance" "ec2_vm" {
  + ami                        = "ami-02384a901b5df8024"
  + arn                       = (known after apply)
  + associate_public_ip_address = (known after apply)
  + availability_zone          = (known after apply)
  + cpu_core_count             = (known after apply)
  + cpu_threads_per_core       = (known after apply)
  + disable_api_termination    = (known after apply)
  + ebs_optimized              = (known after apply)
  + get_password_data          = false
  + host_id                   = (known after apply)
  + id                         = (known after apply)
  + instance_initiated_shutdown_behavior = (known after apply)
  + instance_state             = (known after apply)
  + instance_type              = "t3.micro"
  + ipv6_address_count         = (known after apply)
  + ipv6_addresses             = (known after apply)
  + key_name                   = "prisca-cli0-key"
  + monitoring                 = (known after apply)
  + outpost_arn               = (known after apply)
  + password_data              = (known after apply)
  + placement_group            = (known after apply)
  + placement_partition_number = (known after apply)
  + primary_network_interface_id = (known after apply)
  + private_dns                = (known after apply)
  + private_ip                 = (known after apply)
  + public_dns                 = (known after apply)
  + public_ip                  = (known after apply)
  + secondary_private_ips      = (known after apply)
  + security_groups            = (known after apply)
  + source_dest_check          = true
  + subnet_id                  = (known after apply)
  + tags                       = {
    + "Name" = "Etudiant"
    + "Owner" = "prisca.cli0@etu.u-pec.fr"
  }
  + tags_all                   = {
    + "Name" = "Etudiant"
    + "Owner" = "prisca.cli0@etu.u-pec.fr"
  }
  + tenancy                    = (known after apply)
  + user_data                  = (known after apply)
  + user_data_base64          = (known after apply)
  + vpc_security_group_ids    = (known after apply)

  + capacity_reservation_specification {
```

```

+ capacity_reservation_specification {
+   + capacity_reservation_preference = (known after apply)

    + capacity_reservation_target {
        + capacity_reservation_id = (known after apply)
    }
}

+ ebs_block_device {
+   + delete_on_termination = (known after apply)
+   + device_name           = (known after apply)
+   + encrypted             = (known after apply)
+   + iops                  = (known after apply)
+   + kms_key_id            = (known after apply)
+   + snapshot_id           = (known after apply)
+   + tags                  = (known after apply)
+   + throughput            = (known after apply)
+   + volume_id             = (known after apply)
+   + volume_size           = (known after apply)
+   + volume_type           = (known after apply)
}

+ enclave_options {
+   + enabled = (known after apply)
}

+ ephemeral_block_device {
+   + device_name = (known after apply)
+   + no_device   = (known after apply)
+   + virtual_name = (known after apply)
}

+ metadata_options {
+   + http_endpoint           = (known after apply)
+   + http_put_response_hop_limit = (known after apply)
+   + http_tokens             = (known after apply)
+   + instance_metadata_tags   = (known after apply)
}

+ network_interface {
+   + delete_on_termination = (known after apply)
+   + device_index          = (known after apply)
+   + network_interface_id  = (known after apply)
}

+ root_block_device {
+   + delete_on_termination = (known after apply)
+   + device_name           = (known after apply)
+   + encrypted             = (known after apply)
+   + iops                  = (known after apply)
+   + kms_key_id            = (known after apply)
+   + tags                  = (known after apply)
+   + throughput            = (known after apply)
+   + volume_id             = (known after apply)
+   + volume_size           = (known after apply)
+   + volume_type           = (known after apply)
}

```

```

+ kms_key_id      = (known after apply)
+ tags            = (known after apply)
+ throughput      = (known after apply)
+ volume_id       = (known after apply)
+ volume_size     = (known after apply)
+ volume_type     = (known after apply)
}
}

# aws_key_pair.mykey will be created
+ resource "aws_key_pair" "mykey" {
+   arn              = (known after apply)
+   fingerprint     = (known after apply)
+   id              = (known after apply)
+   key_name         = "prisca-clio-key"
+   key_name_prefix = (known after apply)
+   key_pair_id      = (known after apply)
+   public_key       = "ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQDp1iJ685uh0wg6Z
CJ3+1qWxhNScb/CjMdxXcZ8yWbnJTUmI901fC3E7dsBN8Rb+CBASKV29DX601U6v+1AUSiD0aGoB7S8
pDdYnHRSWw+OdcCq72HV5Iy2pmqKlw0t8xuFDNxAHlPh/1txHGQF1LFCCjZf6cmCm7sxFYea51K6bV7a
WA4qHQDkOSAN9DtoHMTTeUKP0tTJGx+QgUfxl8KTPXg2NBWr2xsQu7WrYv3W5EACpPYXQyZxhxDy/VQp
qtNQ+kzeY01Qu7tqhbNdyer9m5LWlwwHDiUH9n6sswtqjXhtWjXMYLRTLg7H/XGs7xhX8DCQYjJze3M
Ssf/86T Prisca@LAPTOP-9KJ7VP6F"
+   tags_all        = (known after apply)
}

# aws_security_group.default will be created
+ resource "aws_security_group" "default" {
+   arn              = (known after apply)
+   description      = "Managed by Terraform"
+   egress            = [
+     {
+       + cidr_blocks = [
+         + "0.0.0.0/0",
+       ]
+       + description = ""
+       + from_port   = 0
+       + ipv6_cidr_blocks = []
+       + prefix_list_ids = []
+       + protocol     = "-1"
+       + security_groups = []
+       + self          = false
+       + to_port      = 0
+     },
+   ]
+   id              = (known after apply)
+   ingress          = [
+     {
+       + cidr_blocks = [
+         + "0.0.0.0/0",
+       ]
+       + description = ""
+       + from_port   = 22
+       + ipv6_cidr_blocks = []
+       + prefix_list_ids = []
+       + protocol     = "tcp"
+       + security_groups = []
+       + self          = false

```

```

+ description      = ""
+ from_port        = 0
+ ipv6_cidr_blocks = []
+ prefix_list_ids  = []
+ protocol         = "-1"
+ security_groups  = []
+ self             = false
+ to_port          = 0
},
]
+ id               = (known after apply)
+ ingress          = [
+ {
+   + cidr_blocks = [
+     + "0.0.0.0/0",
+   ]
+   + description = ""
+   + from_port   = 22
+   + ipv6_cidr_blocks = []
+   + prefix_list_ids = []
+   + protocol     = "tcp"
+   + security_groups = []
+   + self         = false
+   + to_port      = 22
+ },
+ {
+   + cidr_blocks = [
+     + "0.0.0.0/0",
+   ]
+   + description = ""
+   + from_port   = 80
+   + ipv6_cidr_blocks = []
+   + prefix_list_ids = []
+   + protocol     = "tcp"
+   + security_groups = []
+   + self         = false
+   + to_port      = 80
+ },
+ ]
+ name               = (known after apply)
+ name_prefix        = (known after apply)
+ owner_id           = (known after apply)
+ revoke_rules_on_delete = false
+ tags_all           = (known after apply)
+ vpc_id             = (known after apply)
}

```

Plan: 3 to add, 0 to change, 0 to destroy.

Note: You didn't use the -out option to save this plan, so Terraform can't guarantee to take exactly these actions if you run "terraform apply" now.

Capture d'écran du tableau de bord AWS montrant la VM démarrée et son « tag » :

Instances (1) Informations							
<input type="text" value="Find instance by attribute or tag (case-sensitive)"/> Se connecter État de l'instance ▼ Actions ▼ Lancer des instances ▼							
État de l'instance = running X Effacer les filtres							
<input type="checkbox"/>	Name ▼	ID d'instance	État de l'insta... ▼	Type d'insta... ▼	Contrôle des st...	Statut d'alar...	DNS IPv4 public
<input type="checkbox"/>	Etudiant	i-0a57776bd126ef516	En cours d'exé...	t3.micro	Initialisation en co	Aucune al...	ec2-13-49-221-1

<p>ID d'instance i-0a57776bd126ef516 (Etudiant)</p> <p>Adresse IPv6 -</p> <p>Type de nom d'hôte Nom de l'adresse IP: ip-172-31-7-101.eu-north-1.compute.internal</p> <p>Réponse à un nom DNS de ressource privée -</p> <p>Adresse IP attribuée automatiquement 13.49.221.142 [IP publique]</p> <p>Rôle IAM -</p>	<p>Adresse IPv4 publique 13.49.221.142 adresse ouverte</p> <p>État de l'instance En cours d'exécution</p> <p>Nom DNS de l'IP privé (IPv4 uniquement) ip-172-31-7-101.eu-north-1.compute.internal</p> <p>Type d'instance t3.micro</p> <p>ID de VPC vpc-0c49c1b9d633f16e8</p> <p>ID de sous-réseau subnet-005f81ee19052419f</p>	<p>Adresses IPv4 privées 172.31.7.101</p> <p>DNS IPv4 public ec2-13-49-221-142.eu-north-1.compute.amazonaws.com adresse ouverte</p> <p>Adresses IP élastiques -</p> <p>Recherche d'AWS Compute Optimizer Inscrivez-vous à AWS Compute Optimizer pour obtenir des recommandations. En savoir plus</p> <p>Nom du groupe Auto Scaling -</p>			
<p>Détails</p> <p>Sécurité</p> <p>Mise en réseau</p> <p>Stockage</p> <p>Vérifications de statut</p> <p>Surveillance</p> <p>Balises</p>	<p>▼ Détails de l'instance Informations</p> <table> <tr> <td> <p>Plateforme Red Hat (dédié)</p> <p>Informations sur la plateforme Red Hat Enterprise Linux</p> </td><td> <p>ID AMI ami-02384a901b5df8024</p> <p>Nom de l'AMI RHEL-9.1.0_HVM-20221101-x86_64-2-Hourly2-GP2</p> </td><td> <p>Surveillance désactivé</p> <p>Protection de la résiliation Désactivé</p> </td></tr> </table>		<p>Plateforme Red Hat (dédié)</p> <p>Informations sur la plateforme Red Hat Enterprise Linux</p>	<p>ID AMI ami-02384a901b5df8024</p> <p>Nom de l'AMI RHEL-9.1.0_HVM-20221101-x86_64-2-Hourly2-GP2</p>	<p>Surveillance désactivé</p> <p>Protection de la résiliation Désactivé</p>
<p>Plateforme Red Hat (dédié)</p> <p>Informations sur la plateforme Red Hat Enterprise Linux</p>	<p>ID AMI ami-02384a901b5df8024</p> <p>Nom de l'AMI RHEL-9.1.0_HVM-20221101-x86_64-2-Hourly2-GP2</p>	<p>Surveillance désactivé</p> <p>Protection de la résiliation Désactivé</p>			

Question 2)

Se connecter :

ssh -i "prisca-clio-key.pem" [ec2-user@ec2-13-49-221-142.eu-north-1.compute.amazonaws.com](https://ec2-13-49-221-142.eu-north-1.compute.amazonaws.com)

sudo yum install -y python

sudo yum install -y pip

sudo pip install boto3

```
[ec2-user@ip-172-31-7-101 ~]$ ls
stock.py
[ec2-user@ip-172-31-7-101 ~]$ cat stock.py
import datetime
import json
import random
import boto3

STREAM_NAME = "input-stream"
REGION = "us-east-1"

def get_data():
    return {
        'event_time': datetime.datetime.now().isoformat(),
        'ticker': random.choice(["BTC", "ETH", "BNB", "XRP", "DOGE", "PRCL"]),
        'price': round(random.random() * 100, 2)}

def generate(stream_name, kinesis_client):
    while True:
        data = get_data()
        print(data)
        #kinesis_client.put_record(StreamName=stream_name, Data=json.dumps(data), PartitionKey="partitionkey")

if __name__ == '__main__':
    generate(STREAM_NAME, boto3.client('kinesis', region_name=REGION))
[ec2-user@ip-172-31-7-101 ~]$
```

```

ec2-user@ip-172-31-7-101:~
[ 'event_time': '2022-12-06T15:44:43.152154', 'ticker': 'XRP', 'price': 24.71}
[ 'event_time': '2022-12-06T15:44:43.152171', 'ticker': 'BNB', 'price': 93.08}
[ 'event_time': '2022-12-06T15:44:43.152186', 'ticker': 'ETH', 'price': 23.62}
[ 'event_time': '2022-12-06T15:44:43.152200', 'ticker': 'DOGE', 'price': 19.06}
[ 'event_time': '2022-12-06T15:44:43.152215', 'ticker': 'BTC', 'price': 92.64}
[ 'event_time': '2022-12-06T15:44:43.152230', 'ticker': 'ETH', 'price': 16.47}
[ 'event_time': '2022-12-06T15:44:43.152245', 'ticker': 'BNB', 'price': 54.48}
[ 'event_time': '2022-12-06T15:44:43.152259', 'ticker': 'ETH', 'price': 90.85}
[ 'event_time': '2022-12-06T15:44:43.152274', 'ticker': 'ETH', 'price': 31.46}
[ 'event_time': '2022-12-06T15:44:43.152289', 'ticker': 'DOGE', 'price': 79.19}
[ 'event_time': '2022-12-06T15:44:43.152304', 'ticker': 'DOGE', 'price': 43.17}
[ 'event_time': '2022-12-06T15:44:43.152318', 'ticker': 'BTC', 'price': 78.15}
[ 'event_time': '2022-12-06T15:44:43.152333', 'ticker': 'DOGE', 'price': 27.95}
[ 'event_time': '2022-12-06T15:44:43.152348', 'ticker': 'BNB', 'price': 89.05}
[ 'event_time': '2022-12-06T15:44:43.152363', 'ticker': 'ETH', 'price': 73.51}
[ 'event_time': '2022-12-06T15:44:43.152378', 'ticker': 'XRP', 'price': 12.46}
[ 'event_time': '2022-12-06T15:44:43.152392', 'ticker': 'DOGE', 'price': 18.63}
[ 'event_time': '2022-12-06T15:44:43.152407', 'ticker': 'DOGE', 'price': 3.02}
[ 'event_time': '2022-12-06T15:44:43.152422', 'ticker': 'ETH', 'price': 38.94}
[ 'event_time': '2022-12-06T15:44:43.152436', 'ticker': 'BNB', 'price': 81.4}
[ 'event_time': '2022-12-06T15:44:43.152451', 'ticker': 'ETH', 'price': 50.82}
[ 'event_time': '2022-12-06T15:44:43.152466', 'ticker': 'XRP', 'price': 14.99}
[ 'event_time': '2022-12-06T15:44:43.152481', 'ticker': 'BNB', 'price': 5.53}
[ 'event_time': '2022-12-06T15:44:43.152495', 'ticker': 'BNB', 'price': 32.62}
[ 'event_time': '2022-12-06T15:44:43.152510', 'ticker': 'PRCL', 'price': 25.84}
[ 'event_time': '2022-12-06T15:44:43.152525', 'ticker': 'PRCL', 'price': 51.85}
[ 'event_time': '2022-12-06T15:44:43.152540', 'ticker': 'ETH', 'price': 71.67}
[ 'event_time': '2022-12-06T15:44:43.152554', 'ticker': 'BNB', 'price': 67.31}
[ 'event_time': '2022-12-06T15:44:43.152569', 'ticker': 'PRCL', 'price': 95.7}
[ 'event_time': '2022-12-06T15:44:43.152584', 'ticker': 'BAC

```

Question 3)

Amazon Kinesis > Flux de données > Créer un flux de données

Créer un flux de données [Info](#)

Configuration des flux de données

Nom du flux de données

Les caractères autorisés sont les lettres majuscules et minuscules, les chiffres, les traits de soulignement, les tirets et les points.

Flux de données prisca-clio-stock-input-stream créé avec succès.

Amazon Kinesis > Flux de données > prisca-clio-stock-input-stream

prisca-clio-stock-input-stream [Info](#) Supprimer

Résumé du flux de données

Statut 🟢 Actif	Mode de capacité À la demande	ARN arn:aws:kinesis:eu-north-1:797644540006:stream/prisca-clio-stock-input-stream	Heure de création 06 décembre 2022 à 16:37 UTC+1
	Période de rétention des données 1 jour		

Applications | Surveillance | Configuration | Visionneuse de données | Diffusion améliorée (0)

Question 4)

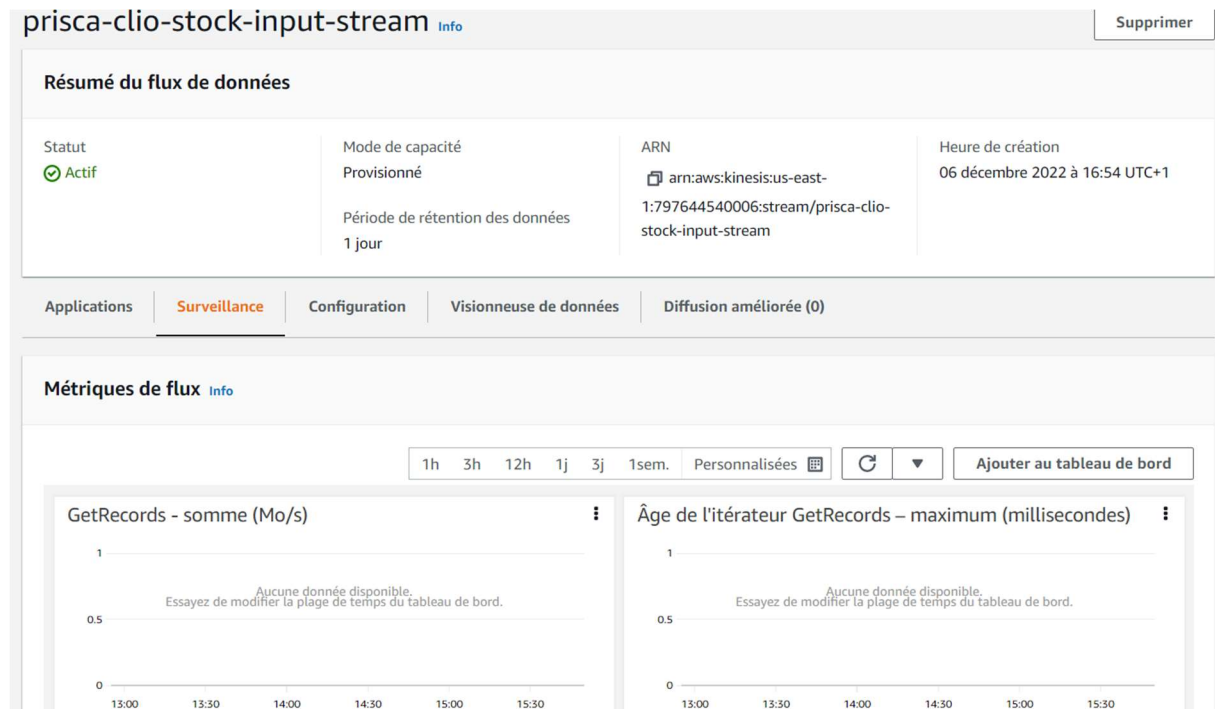
- 1) Supprimer le data stream

`aws kinesis delete-stream --stream-name prisca-clio-stock-input-stream`

- 2) Créer un data stream

`aws kinesis create-stream --stream-name prisca-clio-stock-input-stream --shard-count 1`

```
C:\Users\Prisca>aws kinesis create-stream --stream-name prisca-clio-stock-input-stream --shard-count 1
C:\Users\Prisca>
```



Question 5)

- 1) Modification du code python

```
[ec2-user@ip-172-31-7-101 ~]$ cat stock.py
import datetime
import json
import random
import boto3

STREAM_NAME = "prisca-clio-stock-input-stream"
REGION = "us-east-1"

def get_data():
    return {
        'event_time': datetime.datetime.now().isoformat(),
        'ticker': random.choice(["BTC", "ETH", "BNB", "XRP", "DOGE", "PRCL"]),
        'price': round(random.random() * 100, 2)}

def generate(stream_name, kinesis_client):
    while True:
        data = get_data()
        print(data)
        #kinesis_client.put_record(StreamName=stream_name, Data=json.dumps(data), PartitionKey="partitionkey")

if __name__ == '__main__':
    generate(STREAM_NAME, boto3.client('kinesis', region_name=REGION))
```

Exécution :

```

_make_request
    return self._endpoint.make_request(operation_model, request_dict)
    File "/usr/local/lib/python3.9/site-packages/botocore/endpoint.py", line 119,
in make_request
    return self._send_request(request_dict, operation_model)
    File "/usr/local/lib/python3.9/site-packages/botocore/endpoint.py", line 198,
in _send_request
    request = self.create_request(request_dict, operation_model)
    File "/usr/local/lib/python3.9/site-packages/botocore/endpoint.py", line 134,
in create_request
    self._event_emitter.emit(
    File "/usr/local/lib/python3.9/site-packages/botocore/hooks.py", line 412, in
emit
    return self._emitter.emit(aliased_event_name, **kwargs)
    File "/usr/local/lib/python3.9/site-packages/botocore/hooks.py", line 256, in
emit
    return self._emit(event_name, kwargs)
    File "/usr/local/lib/python3.9/site-packages/botocore/hooks.py", line 239, in
_emit
    response = handler(**kwargs)
    File "/usr/local/lib/python3.9/site-packages/botocore/signers.py", line 105,
in handler
    return self.sign(operation_name, request)
    File "/usr/local/lib/python3.9/site-packages/botocore/signers.py", line 189,
in sign
    auth.add_auth(request)
    File "/usr/local/lib/python3.9/site-packages/botocore/auth.py", line 418, in
add_auth
    raise NoCredentialsError()
botocore.exceptions.NoCredentialsError: Unable to locate credentials
[ec2-user@ip-172-31-7-101 ~]$

```

2)

Il faut pouvoir ajouter des credential

3)

Pour résoudre le problème :

/

Suppression des ressources :

Pour supprimer le data stream on fait comme pour la question précédente et pour supprimer la vm on fait terraform destroy

Question 6)

Cf page suivante


```
$ terraform plan
```

Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:

+ create

Terraform will perform the following actions:

```
# aws_kinesis_stream.test_stream will be created
+ resource "aws_kinesis_stream" "test_stream" {
  + arn                        = (known after apply)
  + encryption_type          = "NONE"
  + enforce_consumer_deletion = false
  + id                        = (known after apply)
  + name                      = "prisca-clio-stock-input-stream"
  + retention_period          = 24
  + shard_count               = 1
  + tags                      = {
    + "Name" = "Etudiant"
    + "Owner" = "prisca.clio@etu.u-pec.fr"
  }
  + tags_all                  = {
    + "Name" = "Etudiant"
    + "Owner" = "prisca.clio@etu.u-pec.fr"
  }
  + stream_mode_details {
    + stream_mode = (known after apply)
  }
}
```

Plan: 1 to add, 0 to change, 0 to destroy.

Note: You didn't use the -out option to save this plan, so Terraform can't guarantee to take exactly these actions if you run "terraform apply" now.

Do you want to perform these actions?

Terraform will perform the actions described above.

Only 'yes' will be accepted to approve.

Enter a value: yes

aws_kinesis_stream.test_stream: Creating...


aws_kinesis_stream.test_stream: Still creating... [10s elapsed]

aws_kinesis_stream.test_stream: Still creating... [20s elapsed]

aws_kinesis_stream.test_stream: Creation complete after 23s [id=arn:aws:kinesis:eu-north-1:797644540006:stream/prisca-clio-stock-input-stream]

Apply complete! Resources: 1 added, 0 changed, 0 destroyed.

Prisca@LAPTOP-9KJ7VP6F MINGW64 ~/Documents/EPISEN SI ING3/SEMESTRE 1/Pipeline traintement_cloud/CC/terraform

<input type="checkbox"/>	prisca-clio-stock-input-stream	 Actif	Provisionné	1	1 jour	Désactivé	0
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Question 7)

Je n'ai pas eu le temps de finir cette question