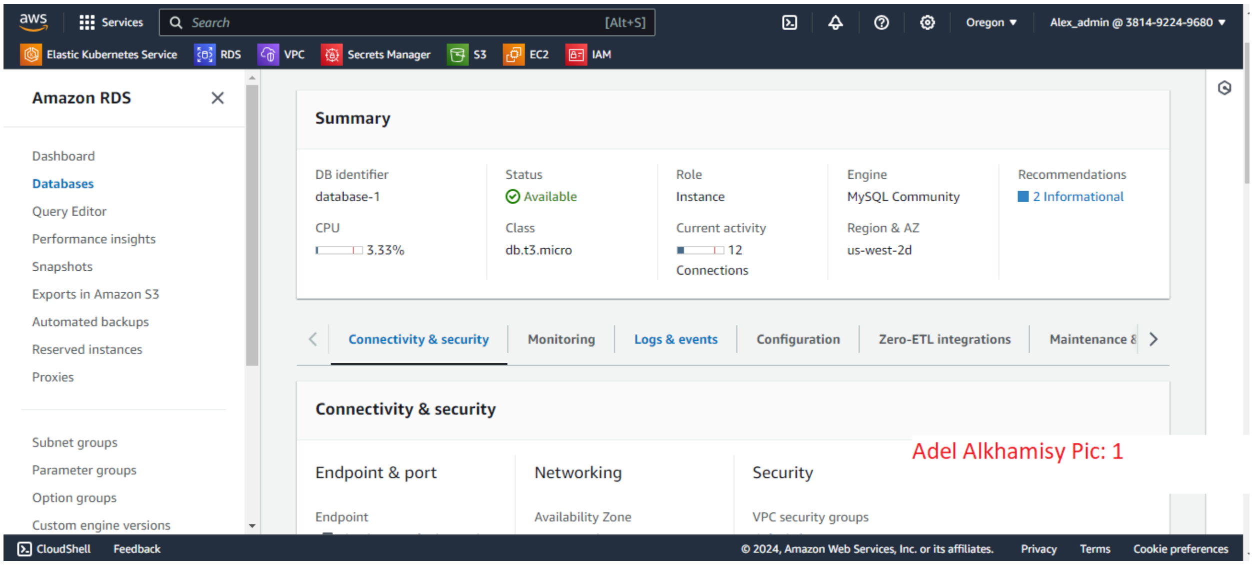
Jenkinsfile for CI/CD Pipeline with EKS Deployment for Spring Boot App

1: Create MySQL RDS in US West (Oregon)us-west-2 region



Summary

DB identifier	Status	Role	Engine	Recommendations
database-1	✓ Available	Instance	MySQL Community	2 Informational
CPU	Class	Current activity	Region & AZ	
3.33%	db.t3.micro	12 Connections	us-west-2d	

Connectivity & security

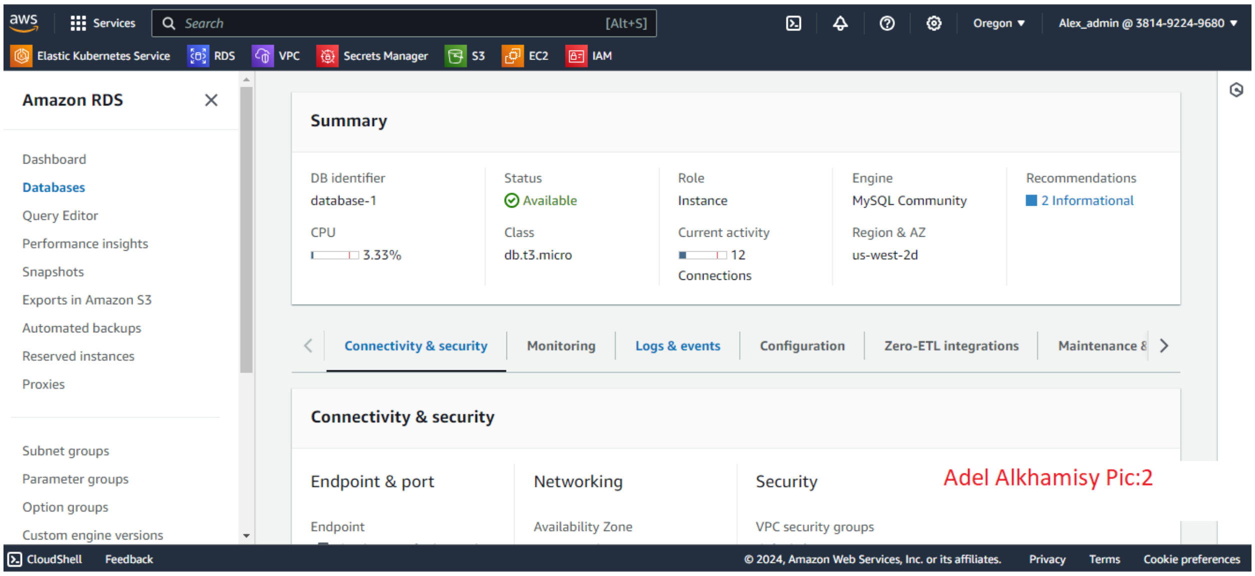
Endpoint & port — Endpoint

Networking — Availability Zone

Security — VPC security groups

Adel Alkhamisy Pic: 1

2: MySQL RDS configuration



Summary

DB identifier	Status	Role	Engine	Recommendations
database-1	✓ Available	Instance	MySQL Community	2 Informational
CPU	Class	Current activity	Region & AZ	
3.33%	db.t3.micro	12 Connections	us-west-2d	

Connectivity & security

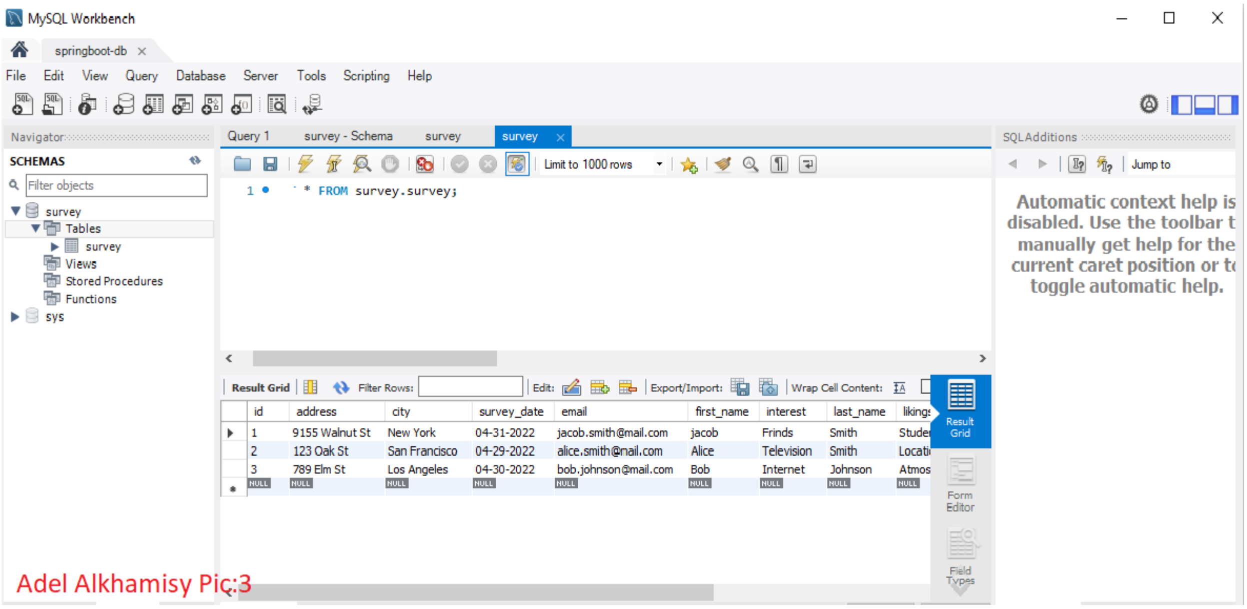
Endpoint & port — Endpoint

Networking — Availability Zone

Security — VPC security groups

Adel Alkhamisy Pic:2

3: MySQL Workbench



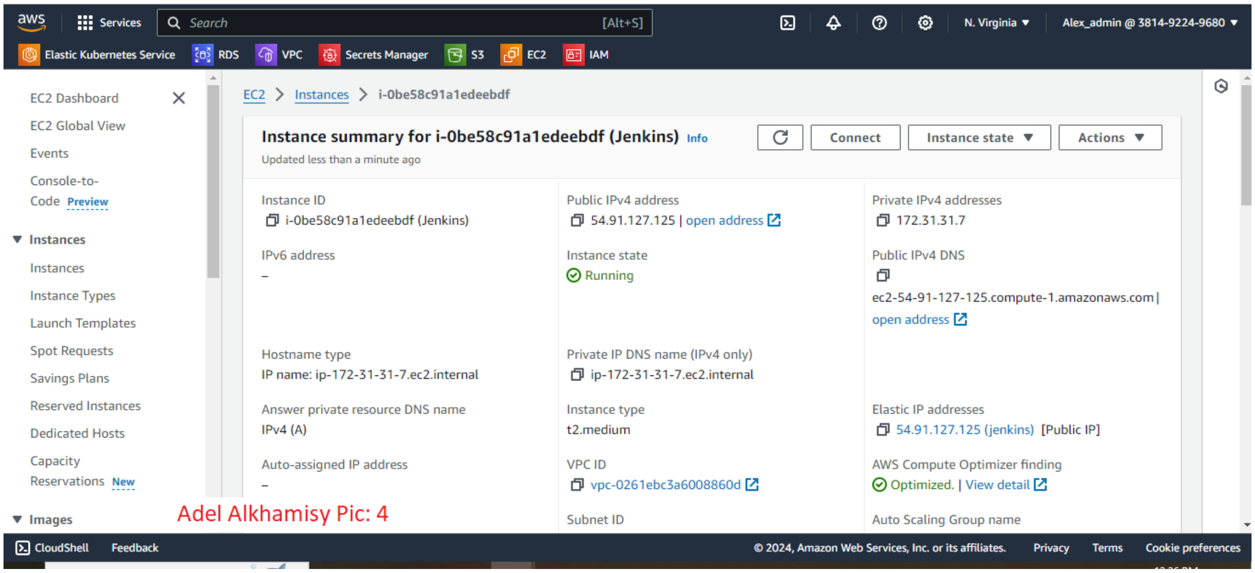
```
1 ●   * FROM survey.survey;
```

Automatic context help is disabled. Use the toolbar t manually get help for the current caret position or t toggle automatic help.

id	address	city	survey_date	email	first_name	interest	last_name	likings
1	9155 Walnut St	New York	04-31-2022	jacob.smith@mail.com	jacob	Frinds	Smith	Studer
2	123 Oak St	San Francisco	04-29-2022	alice.smith@nail.com	Alice	Television	Smith	Locati
3	789 Elm St	Los Angeles	04-30-2022	bob.johnson@mail.com	Bob	Internet	Johnson	Atmos
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Adel Alkhamisy Pic:3

4: Create ec2 instance to install Jenkins, docker and maven. In us-east-1 with configuration: 2 vCPU, 4 GB RAM, 20 GB EBS volume



Instance summary for i-0be58c91a1edeebdf (Jenkins)

Updated less than a minute ago

Instance ID: i-0be58c91a1edeebdf (Jenkins)

Public IPv4 address: 54.91.127.125 | open address

Private IPv4 addresses: 172.31.31.7

IPv6 address: –

Instance state: Running

Public IPv4 DNS: ec2-54-91-127-125.compute-1.amazonaws.com | open address

Hostname type: IP name: ip-172-31-31-7.ec2.internal

Private IP DNS name (IPv4 only): ip-172-31-31-7.ec2.internal

Answer private resource DNS name: IPv4 (A)

Instance type: t2.medium

Elastic IP addresses: 54.91.127.125 (jenkins) [Public IP]

Auto-assigned IP address: –

VPC ID: vpc-0261ebc3a6008860d

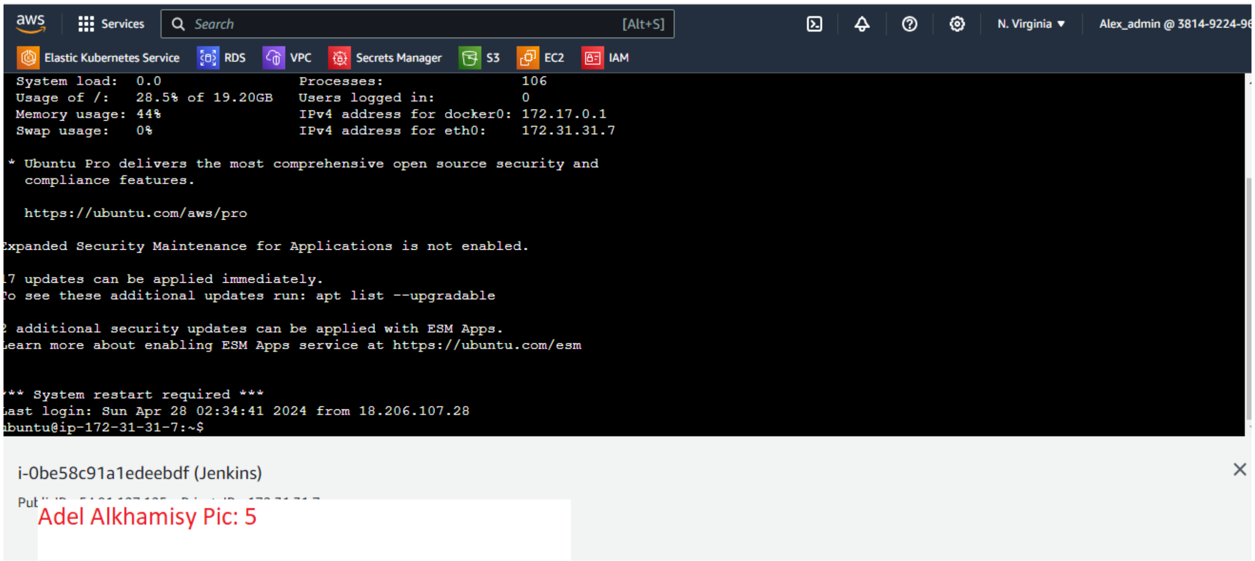
AWS Compute Optimizer finding: Optimized. | View detail

Subnet ID

Auto Scaling Group name

Adel Alkhamisy Pic: 4

5: Ec2 console connect



```
 System load:  0.0                Processes:             106
 Usage of /:   28.5% of 19.20GB   Users logged in:       0
 Memory usage: 44%                IPv4 address for docker0: 172.17.0.1
 Swap usage:   0%                 IPv4 address for eth0:    172.31.31.7

 * Ubuntu Pro delivers the most comprehensive open source security and
   compliance features.

   https://ubuntu.com/aws/pro

xpanded Security Maintenance for Applications is not enabled.

7 updates can be applied immediately.
o see these additional updates run: apt list --upgradable

 additional security updates can be applied with ESM Apps.
earn more about enabling ESM Apps service at https://ubuntu.com/esm


** System restart required ***
ast login: Sun Apr 28 02:34:41 2024 from 18.206.107.28
buntu@ip-172-31-31-7:~$
```

i-0be58c91a1edeebdf (Jenkins)

Adel Alkhamisy Pic: 5

6. ECR to manage docker images

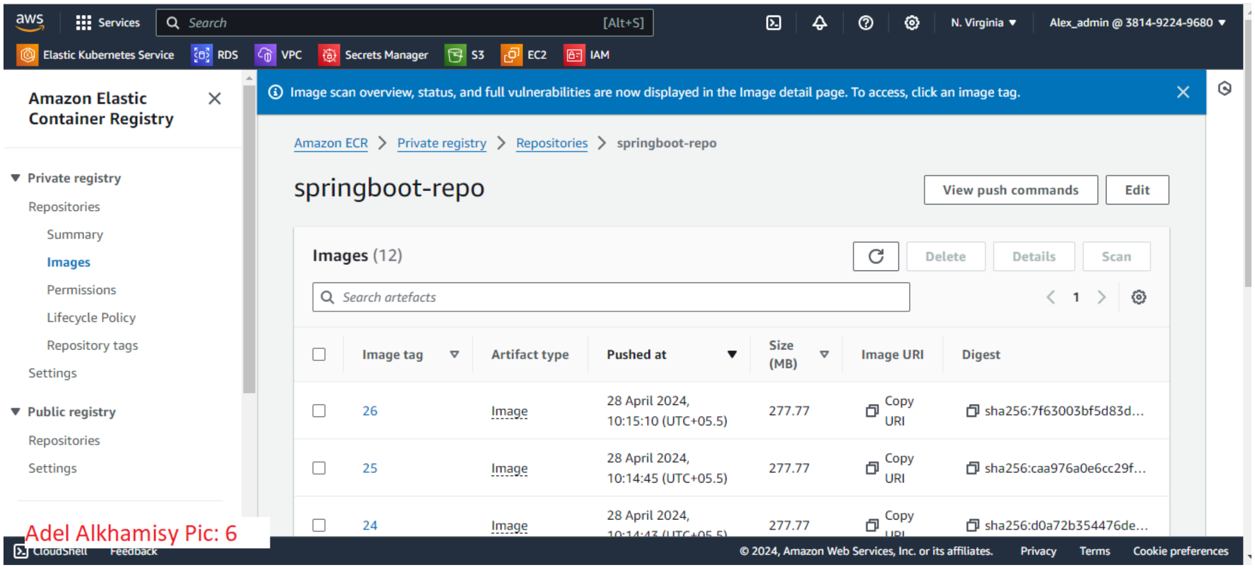


Image scan overview, status, and full vulnerabilities are now displayed in the Image detail page. To access, click an image tag.

Amazon ECR > Private registry > Repositories > springboot-repo

springboot-repo

Images (12)

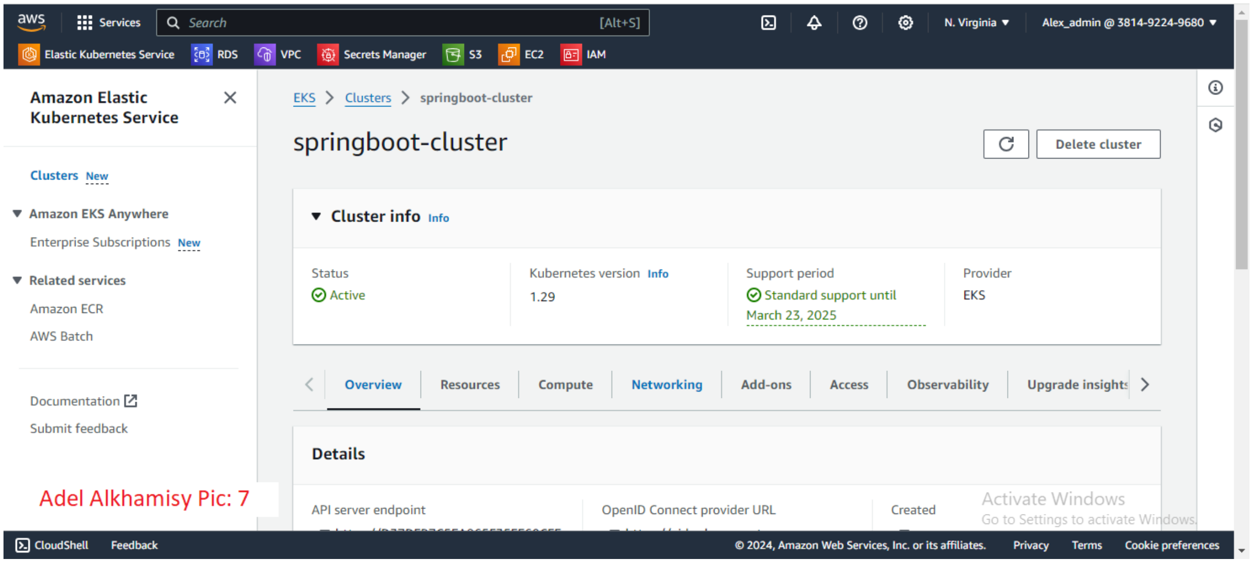
□	Image tag	Artifact type	Pushed at	Size (MB)	Image URI	Digest
□	26	Image	28 April 2024, 10:15:10 (UTC+05.5)	277.77	Copy URI	sha256:7f63003bf5d83d...
□	25	Image	28 April 2024, 10:14:45 (UTC+05.5)	277.77	Copy URI	sha256:caa976a0e6cc29f...
□	24	Image	28 April 2024, 10:14:43 (UTC+05.5)	277.77	Copy URI	sha256:d0a72b354476de...

© 2024, Amazon Web Services, Inc. or its affiliates.

Adel Alkhamisy Pic: 6

7. Create EKS to deploy springboot app

Configuration: Two node, Instance type for both: t3.small, region: us-east-1



springboot-cluster

Cluster info Info

Status: Active

Kubernetes version Info: 1.29

Support period: Standard support until March 23, 2025

Provider: EKS

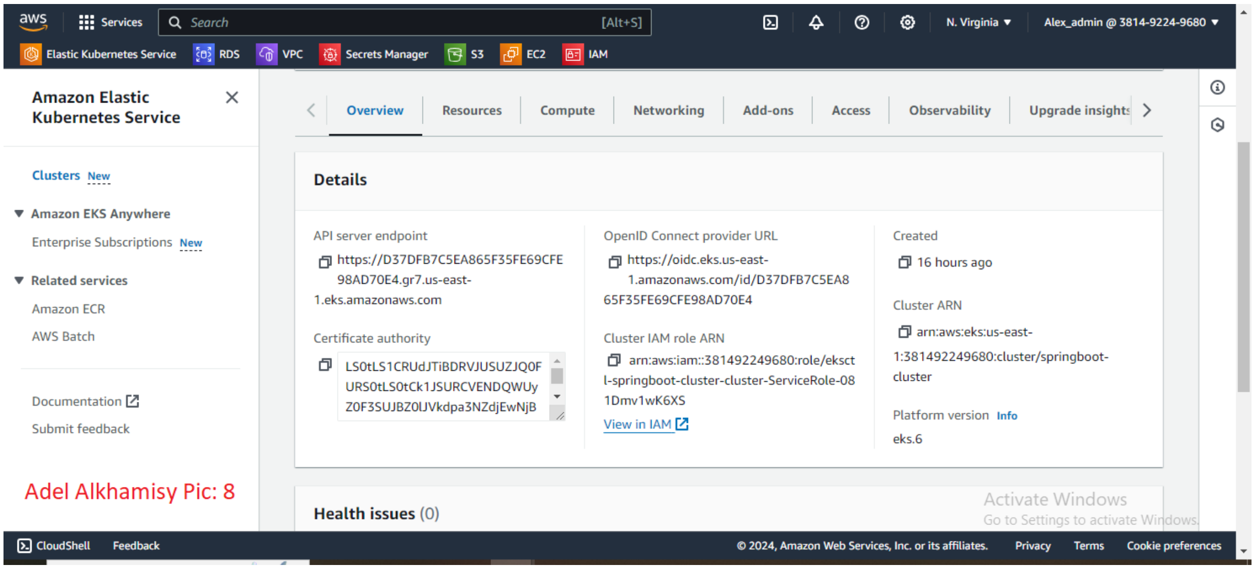
Details

API server endpoint

OpenID Connect provider URL

Created

Adel Alkhamisy Pic: 7



Details

API server endpoint: https://D37DFB7C5EA865F35FE69CFE98AD70E4.gr7.us-east-1.eks.amazonaws.com

Certificate authority: LS0tLS1CRUdJTiBDRVJUSUZJQ0FURS0tLS0tCk1JSURCVENDQWUyZ0F3SUJBZ0lJVkdpa3NZdjEwNjB

OpenID Connect provider URL: https://oidc.eks.us-east-1.amazonaws.com/id/D37DFB7C5EA865F35FE69CFE98AD70E4

Cluster IAM role ARN: arn:aws:iam::381492249680:role/eksctl-springboot-cluster-cluster-ServiceRole-081Dmv1wK6XS

View in IAM

Created: 16 hours ago

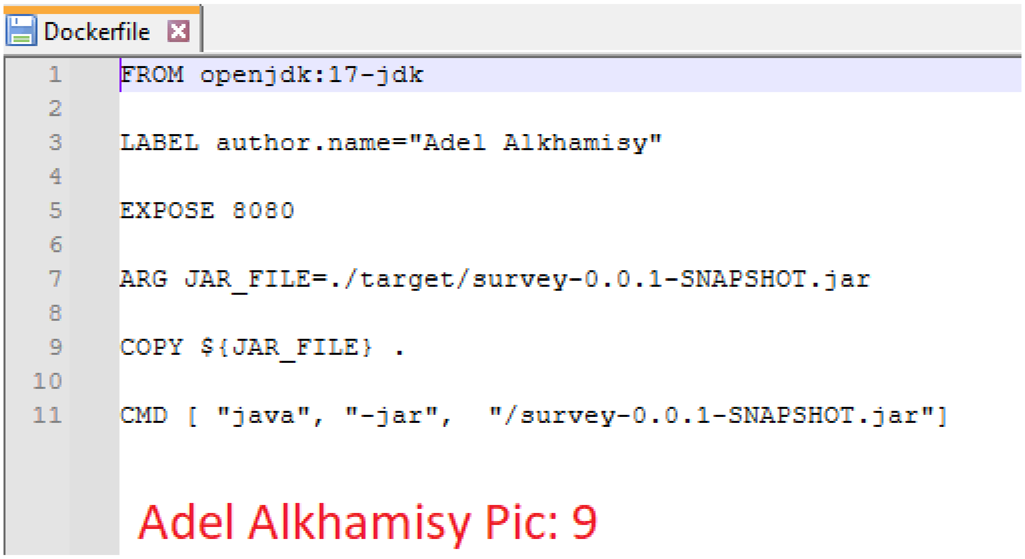
Cluster ARN: arn:aws:eks:us-east-1:381492249680:cluster/springboot-cluster

Platform version Info: eks.6

Health issues (0)

Adel Alkhamisy Pic: 8

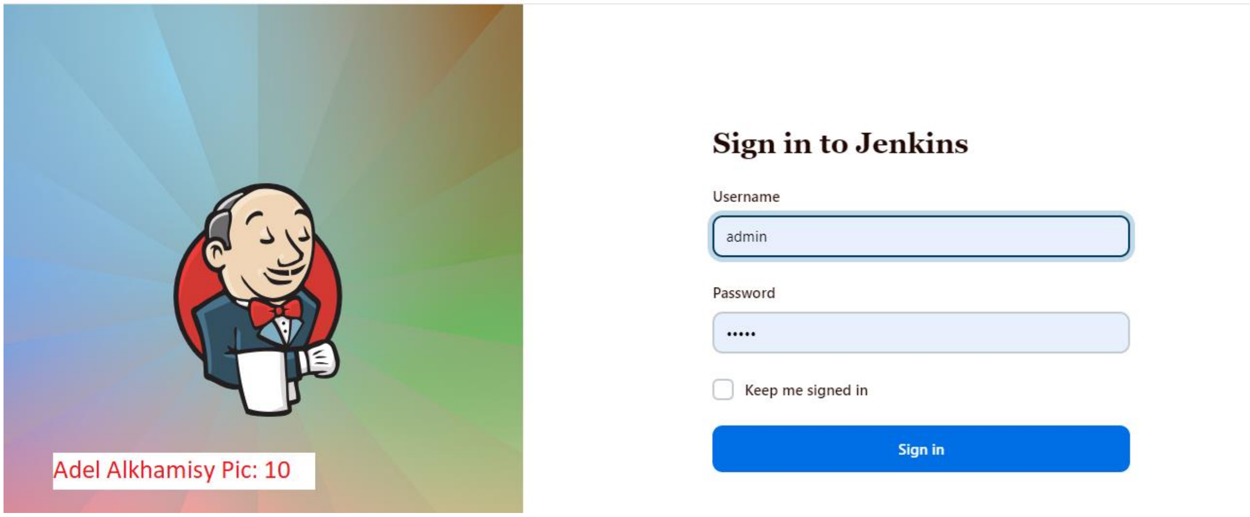
8. Create Dockerfile to build image



```
FROM openjdk:17-jdk

LABEL author.name="Adel Alkhamisy"

EXPOSE 8080

ARG JAR_FILE=./target/survey-0.0.1-SNAPSHOT.jar

COPY ${JAR_FILE} .

CMD [ "java", "-jar",  "/survey-0.0.1-SNAPSHOT.jar"]
```

Adel Alkhamisy Pic: 9

9. Configure Jenkins to build pipeline



Adel Alkhamisy Pic: 10

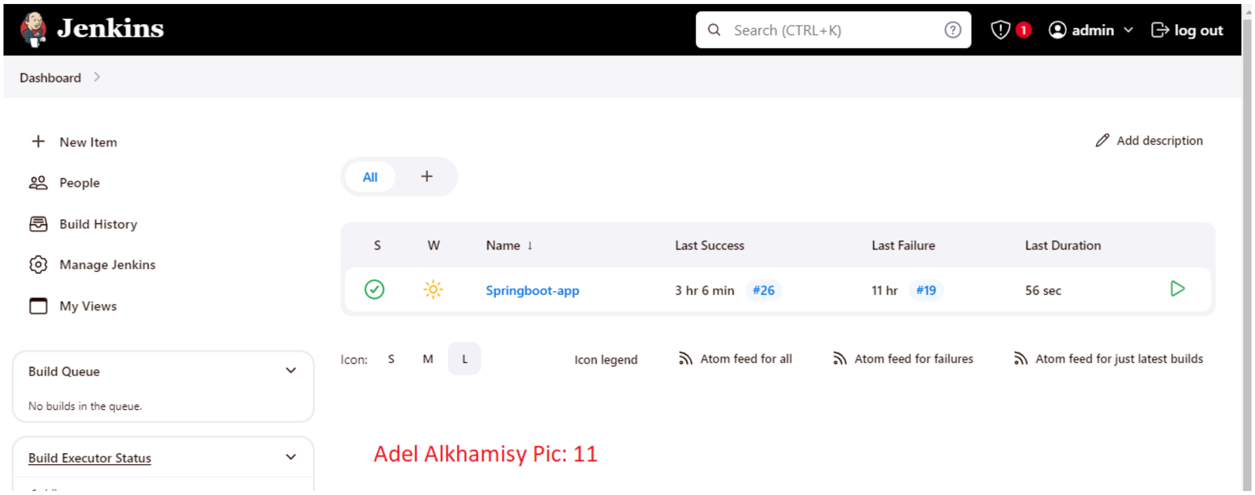
Sign in to Jenkins

Username: admin

Password: •••••

□ Keep me signed in

10. Jenkins dashboard



S	W	Name ↓	Last Success	Last Failure	Last Duration	
✓	☼	Springboot-app	3 hr 6 min #26	11 hr #19	56 sec	▷

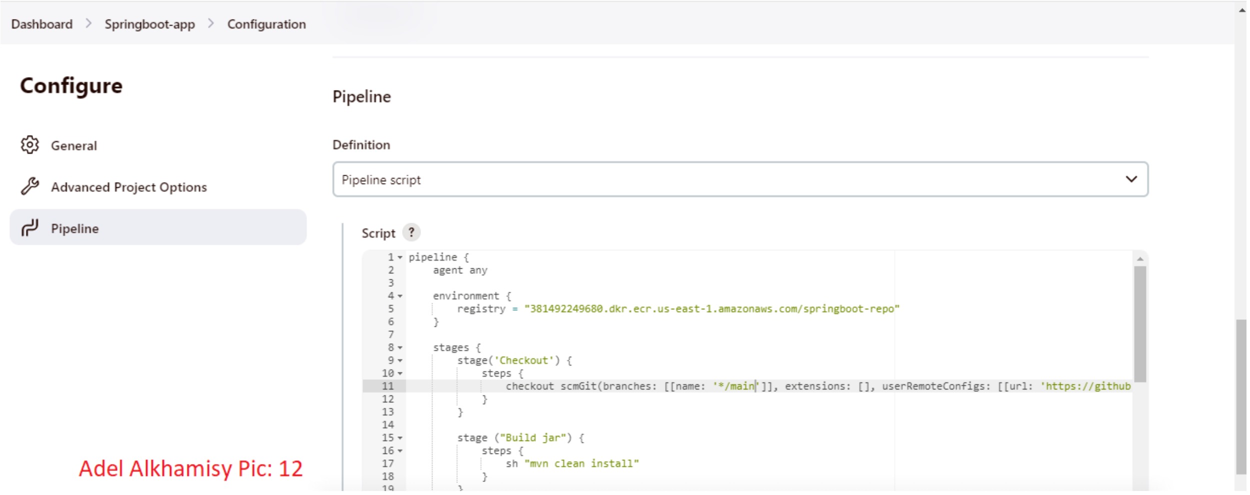
Build Queue

No builds in the queue.

Build Executor Status

Adel Alkhamisy Pic: 11

11. Jenkins project configuration. Complete Jenkins file is in GitHub repository



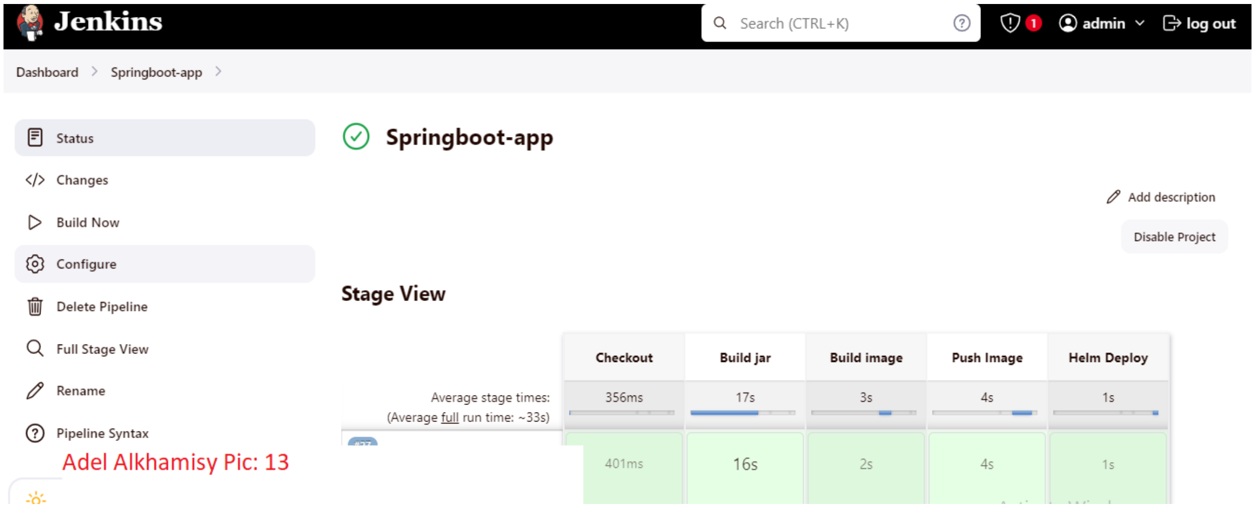
Definition: Pipeline script

Script

```
pipeline {
    agent any

    environment {
        registry = "381492249680.dkr.ecr.us-east-1.amazonaws.com/springboot-repo"
    }

    stages {
        stage('Checkout') {
            steps {
                checkout scmGit(branches: [[name: '*/main']], extensions: [], userRemoteConfigs: [[url: 'https://github
            }
        }

        stage ("Build jar") {
            steps {
                sh "mvn clean install"
            }
        }
```

Adel Alkhamisy Pic: 12

12. Jenkins build pipeline



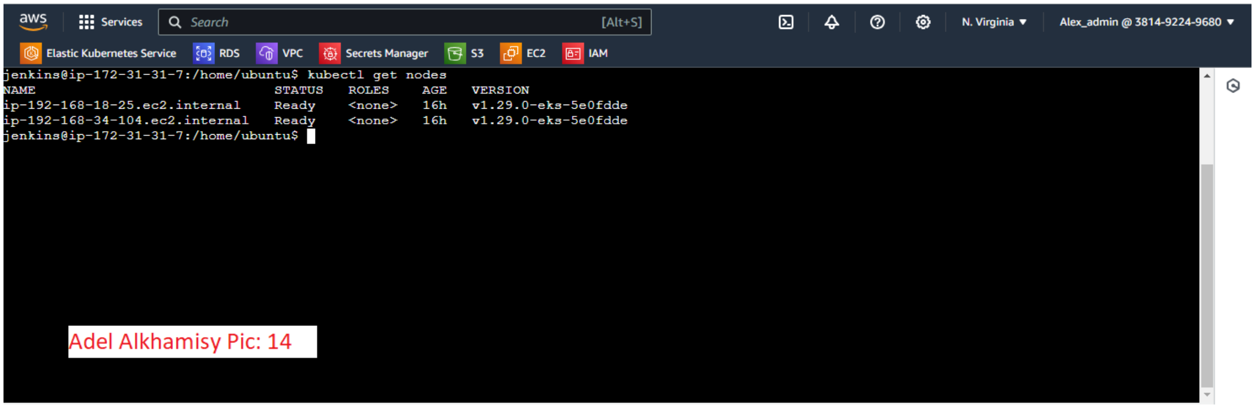
Springboot-app

Stage View

	Checkout	Build jar	Build image	Push Image	Helm Deploy
Average stage times: (Average full run time: ~33s)	356ms	17s	3s	4s	1s
	401ms	16s	2s	4s	1s

Adel Alkhamisy Pic: 13

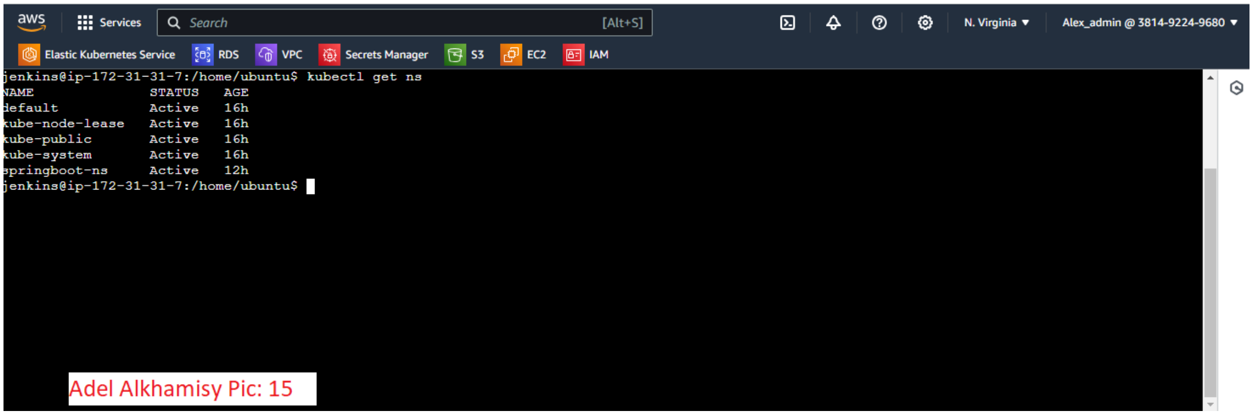
13. List of nodes



```
jenkins@ip-172-31-31-7:/home/ubuntu$ kubectl get nodes
NAME                             STATUS   ROLES    AGE   VERSION
ip-192-168-18-25.ec2.internal    Ready    <none>   16h   v1.29.0-eks-5e0fdde
ip-192-168-34-104.ec2.internal   Ready    <none>   16h   v1.29.0-eks-5e0fdde
jenkins@ip-172-31-31-7:/home/ubuntu$
```

Adel Alkhamisy Pic: 14

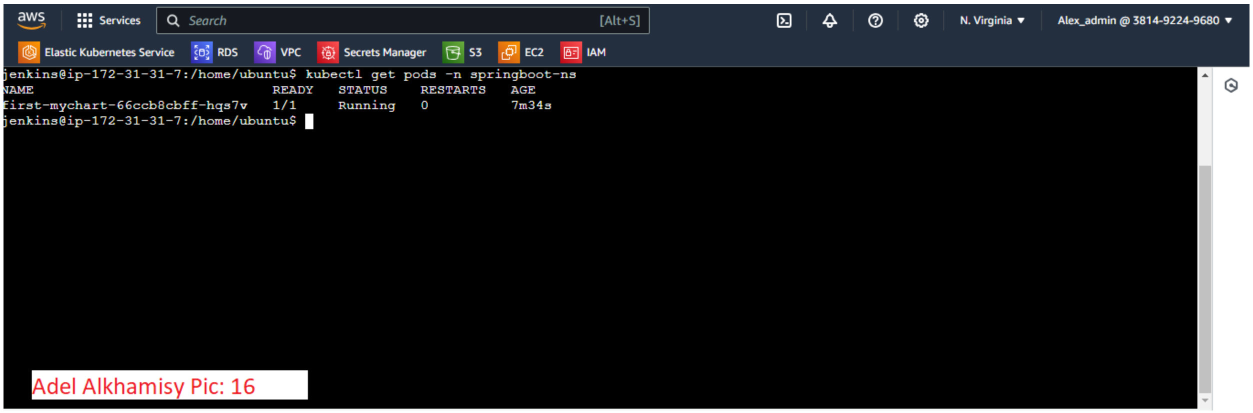
14. List of namespaces



```
jenkins@ip-172-31-31-7:/home/ubuntu$ kubectl get ns
NAME                 STATUS   AGE
default              Active   16h
kube-node-lease      Active   16h
kube-public          Active   16h
kube-system          Active   16h
springboot-ns        Active   12h
jenkins@ip-172-31-31-7:/home/ubuntu$
```

Adel Alkhamisy Pic: 15

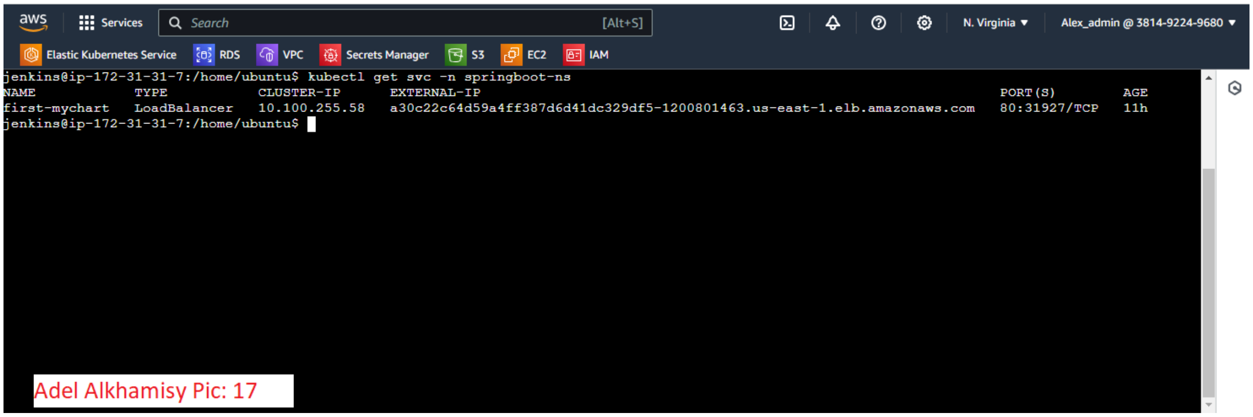
15. Kubernetes pod



```
jenkins@ip-172-31-31-7:/home/ubuntu$ kubectl get pods -n springboot-ns
NAME                           READY   STATUS    RESTARTS   AGE
first-mychart-66ccb8cbff-hqs7v   1/1     Running   0          7m34s
jenkins@ip-172-31-31-7:/home/ubuntu$ 
```

Adel Alkhamisy Pic: 16

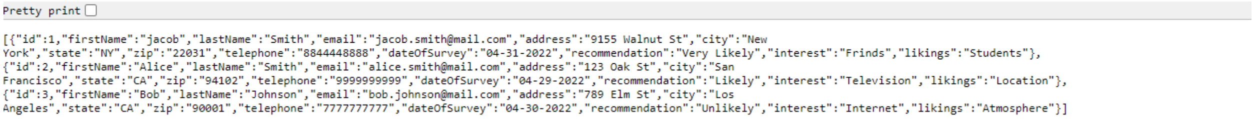
16. Kubernetes service



```
jenkins@ip-172-31-31-7:/home/ubuntu$ kubectl get svc -n springboot-ns
NAME            TYPE           CLUSTER-IP      EXTERNAL-IP                                                               PORT(S)        AGE
first-mychart   LoadBalancer   10.100.255.58   a30c22c64d59a4ff387d6d41dc329df5-1200801463.us-east-1.elb.amazonaws.com   80:31927/TCP   11h
jenkins@ip-172-31-31-7:/home/ubuntu$ 
```

Adel Alkhamisy Pic: 17

17. Output

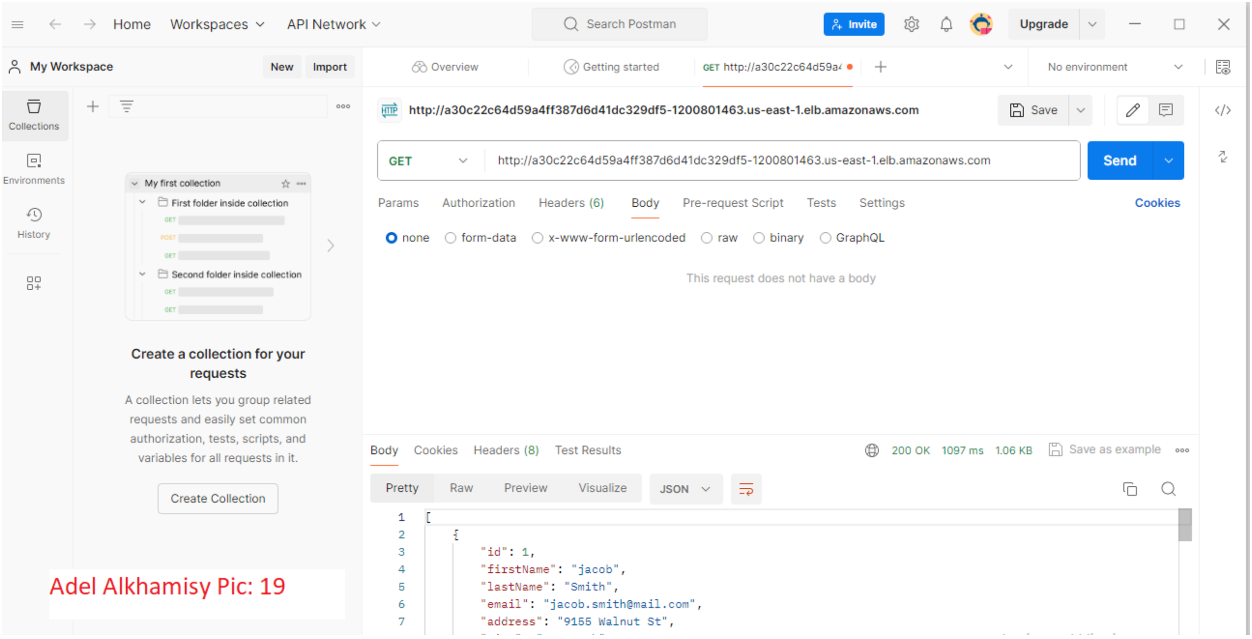


Pretty print □

```
[{"id":1,"firstName":"jacob","lastName":"Smith","email":"jacob.smith@mail.com","address":"9155 Walnut St","city":"New
York","state":"NY","zip":"22031","telephone":"8844448888","dateOfSurvey":"04-31-2022","recommendation":"Very Likely","interest":"Frinds","likings":"Students"},
{"id":2,"firstName":"Alice","lastName":"Smith","email":"alice.smith@mail.com","address":"123 Oak St","city":"San
Francisco","state":"CA","zip":"94102","telephone":"9999999999","dateOfSurvey":"04-29-2022","recommendation":"Likely","interest":"Television","likings":"Location"},
{"id":3,"firstName":"Bob","lastName":"Johnson","email":"bob.johnson@mail.com","address":"789 Elm St","city":"Los
Angeles","state":"CA","zip":"90001","telephone":"7777777777","dateOfSurvey":"04-30-2022","recommendation":"Unlikely","interest":"Internet","likings":"Atmosphere"}]
```

Adel Alkhamisy Pic: 18

18. GET method



Create a collection for your requests

A collection lets you group related requests and easily set common authorization, tests, scripts, and variables for all requests in it.

Create Collection

Adel Alkhamisy Pic: 19

GET http://a30c22c64d59a4ff387d6d41dc329df5-1200801463.us-east-1.elb.amazonaws.com

Params | Authorization | Headers (6) | Body | Pre-request Script | Tests | Settings | Cookies

● none ○ form-data ○ x-www-form-urlencoded ○ raw ○ binary ○ GraphQL

This request does not have a body

Body | Cookies | Headers (8) | Test Results — 200 OK 1097 ms 1.06 KB Save as example

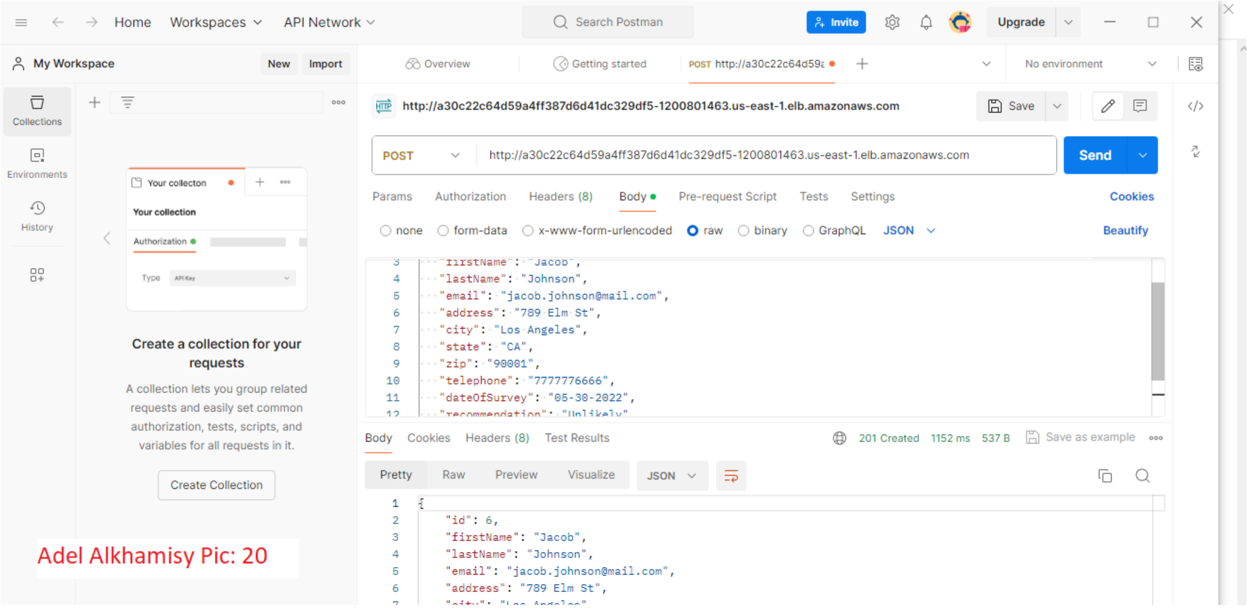
Pretty | Raw | Preview | Visualize | JSON

```
[
    {
        "id": 1,
        "firstName": "jacob",
        "lastName": "Smith",
        "email": "jacob.smith@mail.com",
        "address": "9155 Walnut St",
```

Output:

```
[
    {
        "id": 1,
        "firstName": "jacob",
        "lastName": "Smith",
        "email": "jacob.smith@mail.com",
        "address": "9155 Walnut St",
        "city": "New York",
        "state": "NY",
        "zip": "22031",
        "telephone": "8844448888",
        "dateOfSurvey": "04-31-2022",
        "recommendation": "Very Likely",
        "interest": "Frinds",
        "likings": "Students"
    },
    {
        "id": 2,
        "firstName": "Alice",
        "lastName": "Smith",
        "email": "alice.smith@mail.com",
        "address": "123 Oak St",
        "city": "San Francisco",
        "state": "CA",
        "zip": "94102",
        "telephone": "9999999999",
        "dateOfSurvey": "04-29-2022",
        "recommendation": "Likely",
        "interest": "Television",
        "likings": "Location"
    },
    {
        "id": 3,
        "firstName": "Bob",
        "lastName": "Johnson",
        "email": "bob.johnson@mail.com",
        "address": "789 Elm St",
        "city": "Los Angeles",
        "state": "CA",
        "zip": "90001",
        "telephone": "7777777777",
        "dateOfSurvey": "04-30-2022",
        "recommendation": "Unlikely",
        "interest": "Internet",
        "likings": "Atmosphere"
    }
]
```

19. POST method



Create a collection for your requests

A collection lets you group related requests and easily set common authorization, tests, scripts, and variables for all requests in it.

POST http://a30c22c64d59a4ff387d6d41dc329df5-1200801463.us-east-1.elb.amazonaws.com

Body: ○ none ○ form-data ○ x-www-form-urlencoded ● raw ○ binary ○ GraphQL JSON

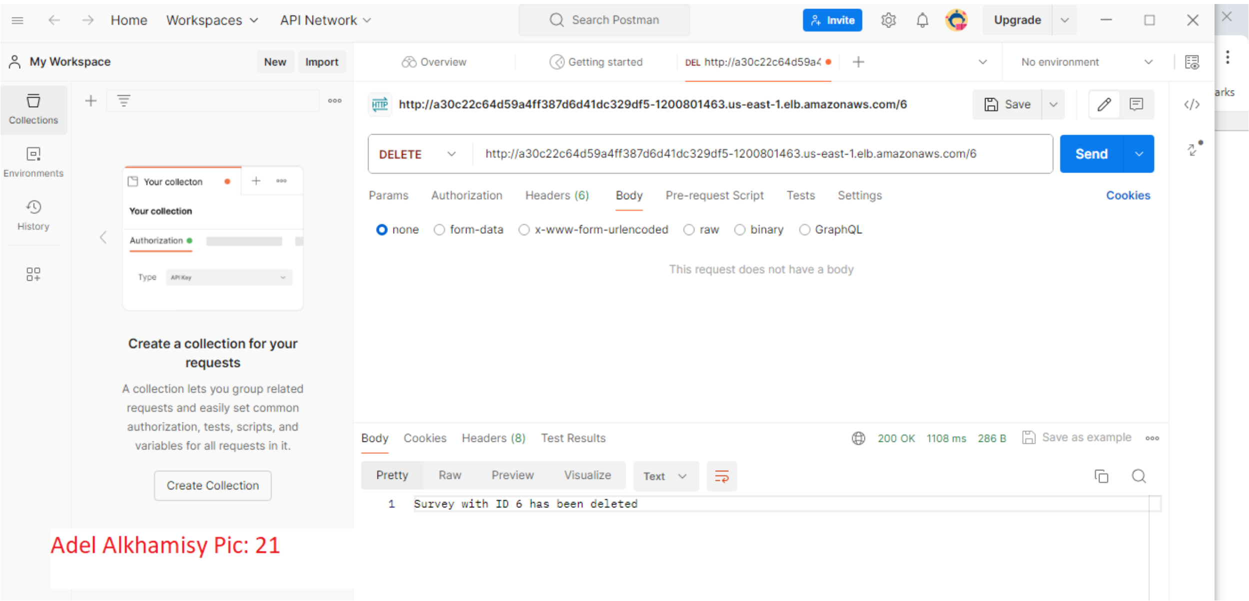
```
    "firstName": "Jacob",
    "lastName": "Johnson",
    "email": "jacob.johnson@mail.com",
    "address": "789 Elm St",
    "city": "Los Angeles",
    "state": "CA",
    "zip": "90001",
    "telephone": "7777776666",
    "dateOfSurvey": "05-30-2022",
    "recommendation": "Unlikely"
```

201 Created 1152 ms 537 B

```
{
    "id": 6,
    "firstName": "Jacob",
    "lastName": "Johnson",
    "email": "jacob.johnson@mail.com",
    "address": "789 Elm St",
    "city": "Los Angeles"
```

Adel Alkhamisy Pic: 20

20. DELETE method



http://a30c22c64d59a4ff387d6d41dc329df5-1200801463.us-east-1.elb.amazonaws.com/6

DELETE http://a30c22c64d59a4ff387d6d41dc329df5-1200801463.us-east-1.elb.amazonaws.com/6

Body: ● none ○ form-data ○ x-www-form-urlencoded ○ raw ○ binary ○ GraphQL

This request does not have a body

Create a collection for your requests

A collection lets you group related requests and easily set common authorization, tests, scripts, and variables for all requests in it.

200 OK 1108 ms 286 B

```
Survey with ID 6 has been deleted
```

Adel Alkhamisy Pic: 21

Video URL:

https://www.loom.com/share/09b3f2fd8a9343afa4eaf0ce93c78a9c?sid=29f0f74d-8b25-4418-b0a8-e731154a1168