

# Cotiss Honest FeedBack Web-server

This document describes the architecture of an Honest FeedBack Web hosting service for Cotiss.

This document explains the steps taken using AWS in setting up the web-server in the most efficient and reliable way for the given use case.

**Demonstration:** [https://www.youtube.com/watch?v=\\_5aA6WEqaE](https://www.youtube.com/watch?v=_5aA6WEqaE)

## Outline:

[Webpage - Final Outcome](#)

[Creating an IAM user](#)

[Setting up MFA for the root user](#)

[Setting up Billing Alerts for more than 1 NZD](#)

[Setting up the AWS Command Line Interface](#)

[Deploying an EC2 instance](#)

[Hosting a static website](#)

[Creating a Amazon Machine Image](#)

[Setting up Launch Configurations](#)

[Creating an Auto Scaling group](#)

[Creating a launch template](#)

[Attach Load balancer](#)

[Creating an IAM Role](#)

[Installing PHP & Composer](#)

[Coding to read DB using PHP](#)

[Coding to write to DB using PHP](#)

[How much would this cost a month?](#)

[How would you scale this architecture?](#)

[How would the costs change as a result?](#)

[Technical Support Contact Information](#)

## Introduction:

This document is for Cotiss' employers to see how I have used AWS to provide an Honest feedback web service for customers to leave feedback anonymously. It is assumed that the viewer has knowledge of AWS and basic coding principles. Readers should be able to understand how to set up this web service using AWS to provide an anonymous feedback system that utilises the benefits of cloud computing.

# Webpage - Final Outcome:

Not secure | 34.229.200.49/readData.php

VUW BB My Drive Gmail Tools for students Mail Outlook Wozber LinkedIn GitHub SOT Nuku VUW payments Remix IDE

Test

Submit

Test

1

**Honest Feedback**

testing

Submit

testing

2

DynamoDB > Items > Cotiss-Honest-Feedback-DB

Tables (1)

Any table tag

Find tables by table name

Cotiss-Honest-Feedback-DB

Scan/Query items

Completed Read capacity units consumed: 0.5

Items returned (1)

message

Test

Autopreview View table details

Actions Create item

Feedback Looking for language selection? Find it in the new Unified Settings.

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3

<sup>1</sup> Web page without any CSS

<sup>2</sup> Web page with CSS

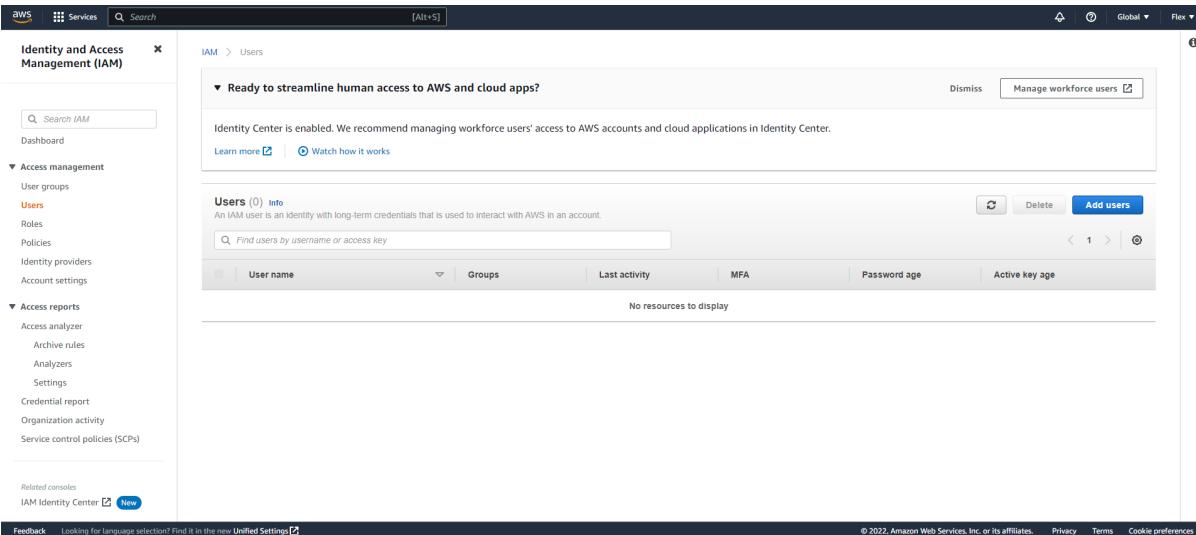
<sup>3</sup> Item in the dynamoDB table

# Creating an IAM user:

The benefit of creating an IAM user for the project is that we can assign permissions to each individual IAM user that restricts the IAM users authority to use certain AWS services. This is useful if you have different people in an organisation that are responsible for different things. In this case we only have 1 IAM user so we can give it full administrator access.

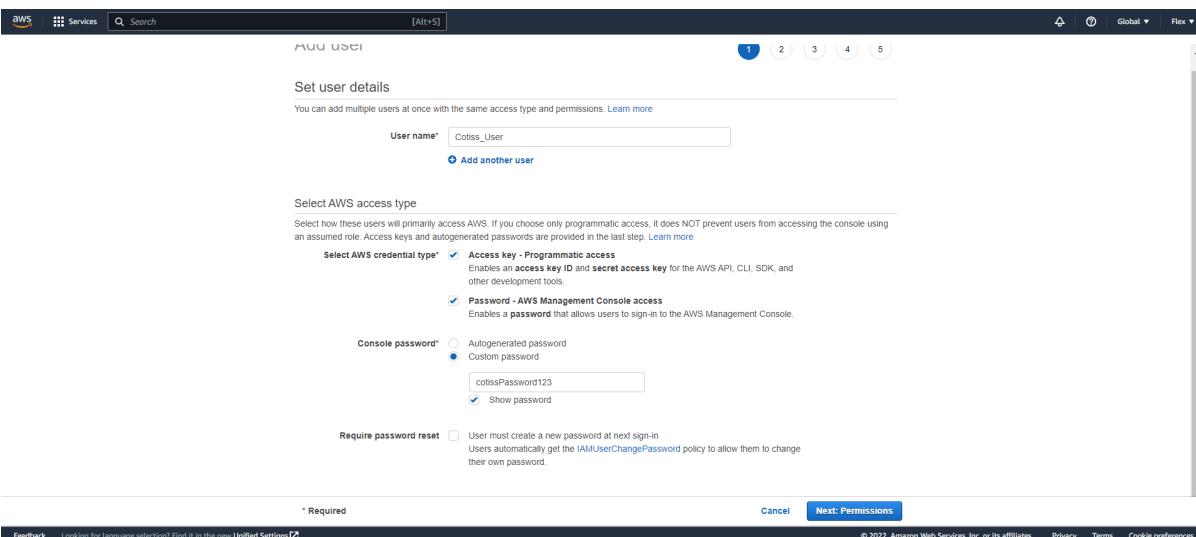
## Steps:

1. Type in “IAM” in the AWS search bar
2. Click on Add a new User
3. Enter a name
4. Grant Administrator access
5. Create user
6. Save details



The screenshot shows the AWS Identity and Access Management (IAM) service. On the left, there's a navigation sidebar with options like Dashboard, Access management (Users, Roles, Policies), Access reports (Access analyzer, Archive rules, Analyzers, Settings), and Related consoles (IAM Identity Center). The main content area is titled "Ready to streamline human access to AWS and cloud apps?" It says "Identity Center is enabled. We recommend managing workforce users' access to AWS accounts and cloud applications in Identity Center." Below this, there's a section for "Users (0) Info" with a note: "An IAM user is an identity with long-term credentials that is used to interact with AWS in an account." A search bar and a table header with columns "User name", "Groups", "Last activity", "MFA", "Password age", and "Active key age" are shown. The table body says "No resources to display". At the bottom, there are links for Feedback, Unified Settings, and copyright information: "© 2022, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences".

4



This screenshot shows the "Set user details" step of the "Add user" wizard. It has a progress bar at the top with steps 1 through 5. The "User name" field is filled with "Cotiss\_User". Below it is a link to "Add another user". The "Select AWS access type" section asks how users will primarily access AWS, noting that it does not prevent console access. It lists two options: "Access key - Programmatic access" (selected) and "Password - AWS Management Console access". The "Console password" field contains "cotisspassword123" with the "Show password" checkbox checked. The "Require password reset" checkbox is unchecked. At the bottom, there are "Cancel" and "Next: Permissions" buttons, along with a note about the IAMUserChangePassword policy. The footer includes links for Feedback, Unified Settings, and copyright information: "© 2022, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences".

<sup>4</sup> Currently no IAM users are present under the account

<sup>5</sup> Setting up the IAM user

The screenshot shows the 'Add user' wizard in the AWS IAM console, specifically Step 4: Set permissions. The 'Attach existing policies directly' tab is selected. A list of 805 policies is displayed, with 'AdministratorAccess' checked. Other visible policies include 'AdministratorAccess-Amplify', 'AdministratorAccess-AWSelasticBeanstalk', 'AlexaForBusinessDeviceSetup', 'AlexaForBusinessFullAccess', 'AlexaForBusinessGatewayExecution', 'AlexaForBusinessLeaseDelegatedAccessPolicy', 'AlexaForBusinessPolyDelegatedAccessPolicy', 'AlexaForBusinessReadOnlyAccess', 'AmazonAPIGatewayAdministrator', and 'AmazonAPIGatewayInvokeFullAccess'. The interface includes a search bar, filter dropdown, and pagination controls.

6

The screenshot shows the 'Add user' wizard in the AWS IAM console, specifically Step 5: Review. It displays the user details and the permissions summary. The user details section shows the user name 'Cottis\_User', AWS access type 'Programmatic access and AWS Management Console access', console password type 'Custom', and require password reset 'No'. The permissions boundary is set to 'Permissions boundary is not set'. The permissions summary shows that the 'AdministratorAccess' managed policy will be attached to the user. There are no tags added. The interface includes a 'Create user' button at the bottom right.

7

<sup>6</sup> Granting permissions for the IAM user  
<sup>7</sup> Review the IAM user details

The screenshot shows the AWS Management Console with the IAM service selected. A success message box is open, stating: "You successfully created the users shown below. You can view and download user security credentials. You can also email users instructions for signing in to the AWS Management Console. This is the last time these credentials will be available to download. However, you can create new credentials at any time." Below the message is a "Download .csv" button. A table lists one user: Cotiss\_User, with columns for User, Access key ID, Secret access key, and Email login instructions. The Access key ID is AKIAS6OQ6VN2WXOK6DV3. The Secret access key is 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. The Email login instructions link is https://202838551413.signin.aws.amazon.com/console. There are navigation links at the top right: 1, 2, 3, 4, 5, Close, Feedback, © 2022, Amazon Web Services, Inc. or its affiliates., Privacy, Terms, and Cookie preferences.

8

	A	B	C	D	E	F	G	H	I	J
1	User name	Password	Access key ID	Secret access key	Console login link					
2	Cotiss_User		AKIAS6OQ6VN2WXOK6DV3	nPhtlAlcfFng4JfrP7k0/maWz4ROPDftMvvTA6nF	https://202838551413.signin.aws.amazon.com/console					
3										

9

<sup>8</sup> Create the IAM user  
<sup>9</sup> Downloaded CSV credentials

# Setting up MFA for the root user:

MFA is an extra layer of security because it requires the user to not only enter the correct login credentials but also input a unique authentication code that is always changing. This is especially important for the root user since the root user has full administrator access.

## Steps:

1. Go to security credentials
2. Activate MFA
3. Download Google Authentication on Android device
4. Scan QR code and follow instructions
5. Make sure all access keys are disabled
6. Give IAM users access to billing information

The screenshot shows the AWS Identity and Access Management (IAM) console. The left sidebar navigation includes 'Identity and Access Management (IAM)', 'Dashboard', 'Access management' (with 'User groups', 'Users', 'Roles', 'Policies', 'Identity providers', 'Account settings'), 'Access reports' (with 'Access analyzer', 'Archive rules', 'Analyzers', 'Settings'), 'Credential report', 'Organization activity', and 'Service control policies (SCPs)'. A search bar at the bottom left says 'Search IAM'. The main content area is titled 'Your Security Credentials' and contains sections for 'Password', 'Multi-factor authentication (MFA)' (which is expanded), 'Access keys (access key ID and secret access key)', 'CloudFront key pairs', 'X.509 certificate', and 'Account identifiers'. A blue button labeled 'Activate MFA' is visible under the MFA section. The top right corner shows the account ID: 202838551413, and the right sidebar lists 'Account', 'Organization', 'Service Quotas', 'Billing Dashboard', 'Security credentials' (which is highlighted in orange), and 'Settings'. A 'Sign out' button is at the bottom right of the sidebar.

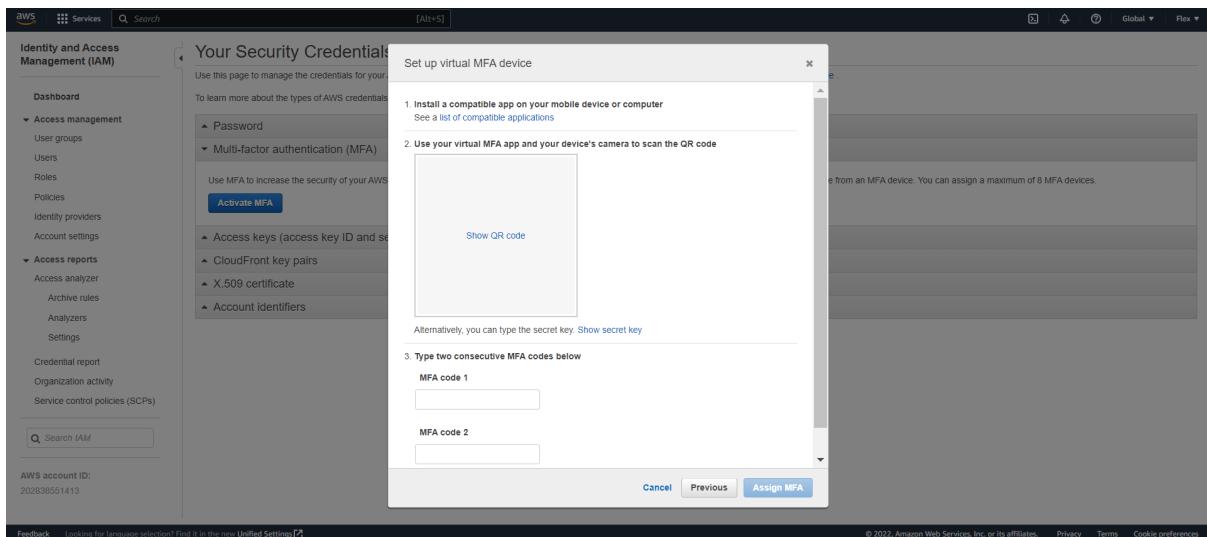
10

The screenshot shows the 'Manage MFA device' dialog box overlying the IAM Security Credentials page. The dialog box has a title 'Manage MFA device'. It contains a 'Name\*' field with the value 'Cotiss\_MFA-Device', a note about character limits, and a note about choosing a type of MFA device. Three options are listed: 'Virtual MFA device' (selected), 'Security key', and 'Other hardware MFA device'. Below these options is a note about supported MFA devices. At the bottom of the dialog box are 'Cancel' and 'Continue' buttons. The background of the IAM page is dimmed.

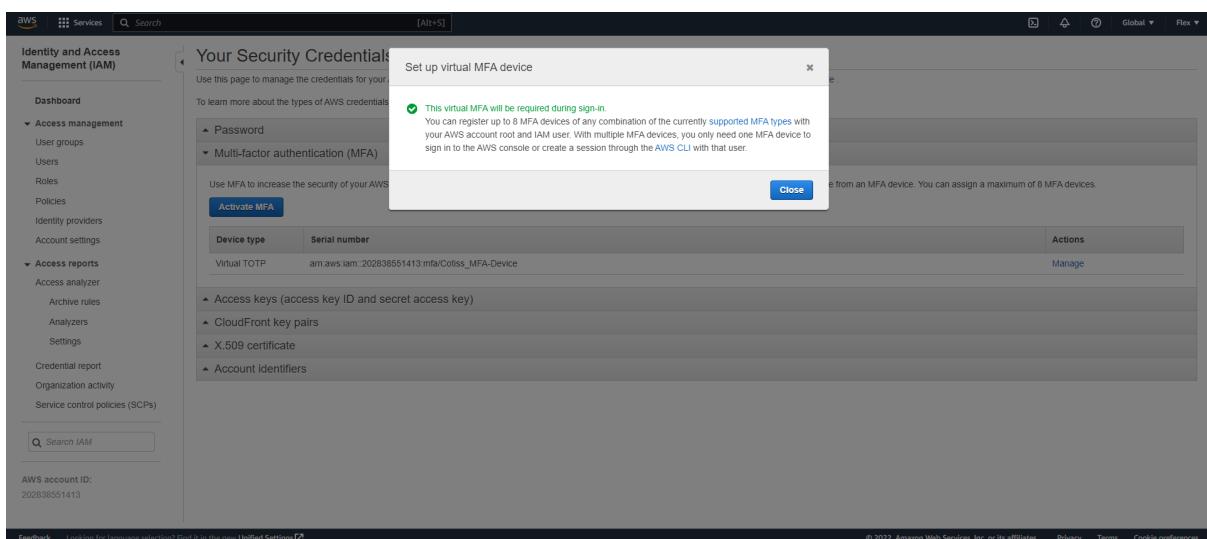
11

<sup>10</sup> Find security credentials for the root user

<sup>11</sup> Activate Multi Factor Authentication



12



13

<sup>12</sup> Scan the QR code

<sup>13</sup> Complete set up for MFA

**14**

**IAM User and Role Access to Billing Information**

Use the **Activate IAM Access** setting to allow IAM users and roles access to pages of the Billing and Cost Management console. This setting alone doesn't grant IAM users and roles the necessary permissions for these console pages. In addition to activating IAM access, you must also attach the required IAM policies to those users or roles. For more information, see [Granting access to your billing information and tools](#).

If this setting is deactivated, then IAM users and roles in this account can't access the Billing and Cost Management console pages, even if they have administrator access or the required IAM policies.

The **Activate IAM Access** setting does not control access to:

- The console pages for AWS Cost Anomaly Detection, Savings Plans overview, Savings Plans inventory, Purchase Savings Plans, and Savings Plan cart
- The Cost Management view in the AWS Console Mobile Application
- The Billing and Cost Management SDK APIs (AWS Cost Explorer, AWS Budgets, and AWS Cost and Usage Report APIs)
- The Customer Carbon Footprint Tool on the Cost & Usage Reports console page

**IAM user/role access to billing information is deactivated.**

**14**

**IAM User and Role Access to Billing Information**

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- The Customer Carbon Footprint Tool on the Cost & Usage Reports console page

**Activate IAM Access**

**Update** **Cancel**

**15**

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<sup>14</sup> View account details  
<sup>15</sup> Tick activate IAM access

# Setting up Billing Alerts for more than 1 NZD:

We want to be able to monitor our usage of AWS services so we won't be charged more than expected. In order to do so we need to create a billing alert so if we overspend beyond the threshold, a given set of emails will receive a notification of the over usage of the services.

## Steps:

1. Create a custom budget
2. Give the alert a name
3. Set the amount
4. Make sure all resources are monitored
5. Select the option "Any amount equal to or greater than"
6. Add the alert

The screenshot shows the AWS Billing Console interface. The left sidebar has a 'Services' dropdown set to 'Billing'. Under 'Budgets', 'Budgets' is selected, showing 'Budgets (0) info'. A search bar says 'Find a budget' and a button says 'Show all budgets'. On the right, there's a 'Create budget' button. Below is a table with columns: Name, Thresholds, Budget, Amount used, Forecasted amount, Current vs. budgeted, and Forecasted vs. budgeted. A note says 'No budgets' and 'No budgets to display.' The URL at the bottom is https://us-east-1.console.aws.amazon.com/console/home?region=us-east-1.

16

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<sup>16</sup> View our budgets

Billing Console > Budgets > Create budget

Step 1  
Choose budget type

Budget setup

Use a template (simplified)  
Use the recommended configurations. You can change some configuration options after the budget is created.

Customize (advanced)  
Customize a budget to set parameters specific to your use case. You can customize the time period, the start month, and specific accounts.

Budget types

Cost budget - Recommended  
Monitor your costs against a specified dollar amount and receive alerts when your user-defined thresholds are met. Using cost budgets, the budgeted amount you set represents your expected cloud spend. For example, you can set a cost budget for a business unit and then add additional parameters such as the associated member accounts.

Usage budget  
Monitor your usage of one or more specified usage types or usage type groups and receive alerts when your user-defined thresholds are met. Using usage budgets, the budgeted amount represents your expected usage. For example, you can use a usage budget to monitor the usage of certain services such as Amazon EC2 and Amazon S3.

Savings Plans budget  
Track the utilization or coverage associated with your Savings Plans and receive alerts when your percentage drops below a threshold you define. Setting a coverage target lets you see how much of your instance usage is covered by Savings Plans, while setting a utilization target lets you see if your Savings Plans are unused or underutilized.

17

Billing Console > Budgets > Create budget

Step 1  
Choose budget type

Step 2  
Set your budget

Step 3  
Configure alerts

Step 4 - Optional  
Attach actions

Step 5  
Review

How to set up your budget

Step 1: Enter your budget details  
Define the budget name.

Step 2: Set budget amount  
Select the period and whether you would like to have a fixed budget or to specify a budget plan, then enter your budget amount.

Step 3: Scope your budget - optional  
Add dimensions of data to narrow on a set of cost information. For example, you could select a number of AWS services to track as part of this budget.

Details

Budget name  
Provide a descriptive name for this budget.  
Cotiss\_Budget\_Alert  
Names must be between 1-100 characters.

Set budget amount

18

<sup>17</sup> Select a customised budget

<sup>18</sup> Filling in details for our budget

**Cotis\_Budget\_Alert**

Names must be between 1-100 characters.

### Set budget amount

Period  
Daily budgets do not support enabling forecasted alerts, or daily budget planning.  
Monthly

Budget renewal type  
 Recurring budget  
Recurring budgets renew on the first day of every monthly billing period.  
 Expiring budget  
Expiring monthly budgets stop renewing at the end of the selected expiration month.

Start month  
Dec ▾ 2022 ▾

Budgeting method [Info](#)  
 Fixed  
Create a budget that tracks against a single monthly budgeted amount.

Enter your budgeted amount (\$)  
Last month's cost: \$109.04  
1.00

**Budget scope [Info](#)**  
Add filtering and use advanced options to narrow the set of cost information tracked as part of this budget

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19

**Alert #1** [Remove](#)

### Set alert threshold

Threshold When should this alert be triggered? Trigger How should this alert be triggered?  
0.5 % of budgeted amount Actual

Summary: When your actual cost is greater than 0.50% (\$0.01) of your **budgeted amount** (\$1.00), the alert threshold will be exceeded.

### Notification preferences

Select one or more notification preferences to receive alerts.

Email recipients Specify the email recipients you want to notify when the threshold has exceeded.  
felixng2003@gmail.com, hjiangui15@gmail.com

Maximum number of email recipients is 10.

► [Amazon SNS Alerts - Optional](#) [Info](#)  
► [Amazon Chatbot Alerts - Optional](#)

[+ Add alert threshold](#)

Cancel [Previous](#) [Next](#)

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20

<sup>19</sup> Setting our budget amount

<sup>20</sup> Setting up the alerts for when our budget is reached

Name: Cotiss\_Budget\_Alert

Start date: Dec 2022

Budget amount: \$1.00

Period: Monthly

End date: -

► Additional budget parameters

Step 3: Configure alerts

Alerts

Alert #1

Threshold: 0.5% of budgeted amount

Threshold measured against: Actual costs

Step 4: Attach actions - optional

Actions

You have no budgets actions

Cancel Previous Create budget

21

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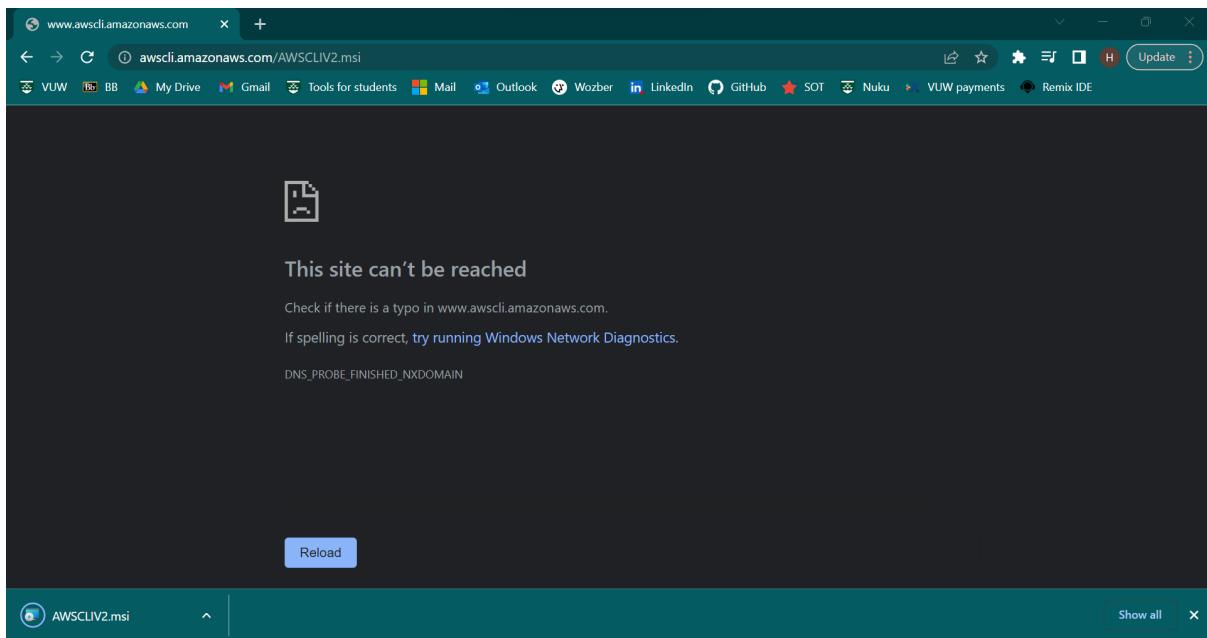
<sup>21</sup> Reviewing the details and creating our budget

# Setting up the AWS Command Line Interface:

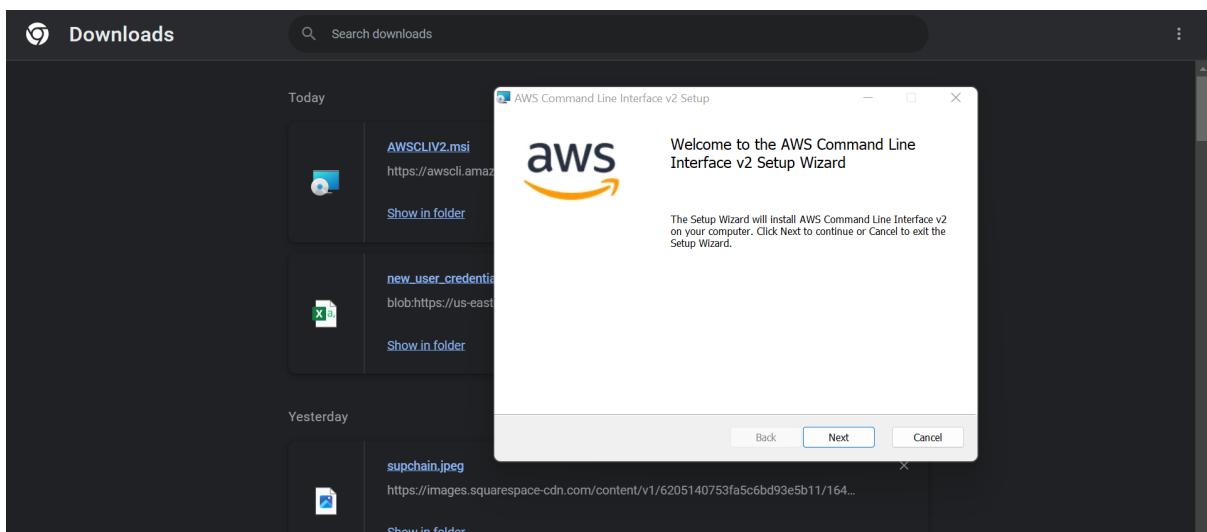
We want to be able to configure and manage our AWS services from a quick and simple command line. With this tool we can download and configure files in our AWS services such as EC2 instances.

## Steps:

1. Download the installer for AWS CLI
2. Run the installer and follow instructions
3. Create an Access key for the IAM user
4. Provide the 4 pieces of information to set up the CLI for the IAM user



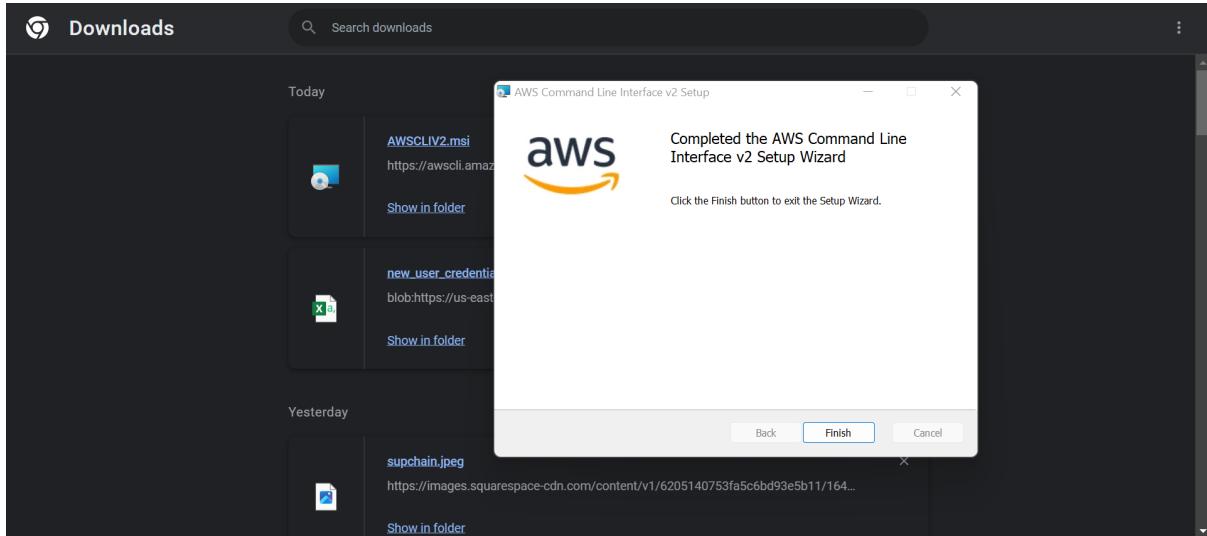
22



23

<sup>22</sup> Downloading the installer for AWS CLI

<sup>23</sup> Run the installer



24

The screenshot shows the AWS IAM User Management console. On the left, the navigation menu includes "Identity and Access Management (IAM)" and "Users" (selected). The main area shows a user named "Cotiss\_User" with a summary card. The "Security credentials" tab is selected, showing "Sign-in credentials" (Console sign-in link), "Console password" (Enabled), and "Signing certificates" (None). Below this, the "Multi-factor authentication (MFA)" section indicates "No MFA assigned". The "Access keys" section is also visible.

25

<sup>24</sup> Finish the installer

<sup>25</sup> Select the security credentials of our IAM user

Use access keys to make programmatic calls to AWS from the AWS CLI, Tools for PowerShell, AWS SDKs, or direct AWS API calls. You can have a maximum of two access keys (active or inactive) at a time.

**Create access key**

**Warning**  
Never post your secret access key on public platforms, such as GitHub. This can compromise your account security.

**Success**  
This is the **only** time that the secret access keys can be viewed or downloaded. You cannot recover them later. However, you can create new access keys at any time.

**Access key ID**  
AKIAS6OQ6VN23T575RPM

**Secret access key**  
\*\*\*\*\* Show

**Download .CSV file**

**SSH key ID**  
AKIAS6OQ6VN23T575RPM

**HTTPS Git credentials for AWS CodeCommit**  
Generate a user name and password  
**Generate credentials**

**Credentials for Amazon Keypaces (for Apache Cassandra)**  
Generate a user name and password you can use to authenticate to Amazon Keypaces. You can generate and store up to 2 sets of credentials for Amazon Keypaces. [Learn more](#)

**Generate credentials**

No credentials have been generated.

Feedback Looking for language selected? Find it in the new Unified Settings [?](#)

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26

	A	B	C	D	E	F
1	Access key ID	Secret access key				
2						
3						

27

```

C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.22000.1219]
(c) Microsoft Corporation. All rights reserved.

C:\Users\User1>aws --version
aws-cli/2.9.4 Python/3.9.11 Windows/10 exe/AMD64 prompt/off

C:\Users\User1>aws configure
AWS Access Key ID [*****]: *****[REDACTED]
AWS Secret Access Key [*****]: *****[REDACTED]
default region name [us-east-1]: us-east-1
default output format [json]: json

C:\Users\User1>aws iam list-users
{
    "Users": [
        {
            "Path": "/",
            "UserName": "Cotiss_User",
            "UserId": "AIDAS6OQ6VN23T575RPM",
            "Arn": "arn:aws:iam::202838551413:user/Cotiss_User",
            "CreateDate": "2022-12-07T00:25:45+00:00",
            "PasswordLastUsed": "2022-12-07T00:56:27+00:00"
        }
    ]
}

C:\Users\User1>

```

28

<sup>26</sup> Create access keys for the IAM user

<sup>27</sup> Download the CSV for the access keys

<sup>28</sup> Test the access keys in AWS CLI

# Deploying an EC2 instance:

We use an EC2 instance to host our virtual web-server, this allows us to configure security, networking, and storage as well as enabling elastic provisioning to handle spikes in requirements.

## Steps:

1. Click “Launch an Instance”
2. Enter a name for the instance
3. Select Amazon Linux AMI
4. Create a key pair
5. Select “t2.micro” for instance type
6. Click “Launch instance”

The screenshot shows the 'Launch an instance' wizard in the AWS Management Console. The 'Summary' step is displayed, showing the following configuration:

- Number of instances:** 1
- Software Image (AMI):** Amazon Linux 2 Kernel 5.10 AMI (ami-090db0967f052e63)
- Virtual server type (instance type):** t2.micro
- Firewall (security group):** New security group
- Storage (volumes):** 1 volume(s) - 8 GiB

A callout box highlights the 'Free tier' information: "In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable). Instance usage on free tier AMIs per month: 30 GiB of EBS storage, 2 million I/O, 1 GB of snapshots, and 100 GiB of bandwidth to the internet."

At the bottom right of the summary step is a large orange 'Launch Instance' button.

29

The screenshot shows the 'Create key pair' dialog box overlaid on the main EC2 instance creation form. The dialog box contains the following fields:

- Key pair name:** Honest-FeedBack-KeyPair
- Key pair type:** RSA (selected)
- Private key file format:** pem (selected)

At the bottom right of the dialog box is an orange 'Create key pair' button.

30

<sup>29</sup> Setting up an EC2 instance

<sup>30</sup> Creating a key pair for this instance

31

32

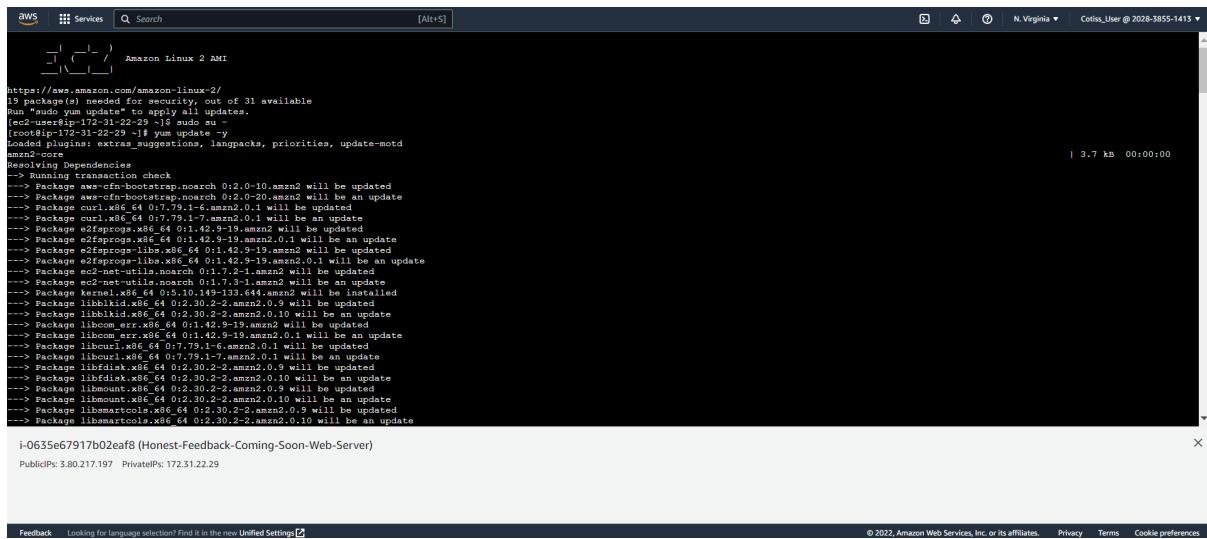
<sup>31</sup> Download the keypair  
<sup>32</sup> Launch instance

# Hosting a static website:

A static website is a fully constructed page using HTML and CSS as well as Javascript. This process requires a lot of configuration.

## Steps:

1. Connect to the EC2 instance
2. Login as root user: `sudo su -`
3. Run an update: `yum update -y`
4. Install httpd: `yum install -y httpd`
5. View the status of httpd: `systemctl status httpd`
6. Create a folder called “temp”: `mkdir temp`
7. Enter that folder: `cd temp/`
8. Download the code
9. Unzip the file
10. Move all files to the html folder: `mv * /var/www/html/`
11. Enter the html folder: `cd /var/www/html/`
12. Edit the inbound rules of our EC2 instance security group
13. Add rules to allow HTTP and HTTPS connection from anywhere
14. Enable httpd: `systemctl enable httpd`
15. Start httpd: `systemctl start httpd`



The screenshot shows a terminal window titled "Services" with a search bar and an "Alt+S" keybinding. The session is connected to an "Amazon Linux 2 AMI" instance. The terminal output shows the execution of a `yum update -y` command. The update process lists 19 packages needed for security, including `curl.x86_64`, `httpd.x86_64`, and various `amzn2` packages. The update is completed successfully with a size of 3.7 kB and a duration of 00:00:00. The session ID is i-0635e67917b02eaf8, and the IP address is 58.217.197. Public and private IPs are also listed as 58.217.197 and 172.31.22.249 respectively. The bottom of the screen includes standard AWS footer links for Feedback, Unified Settings, Copyright notice, Privacy, Terms, and Cookie preferences.

<sup>33</sup> Run the update

```

aws Services Search [Alt+S] N. Virginia ▾ Cotiss_User @ 2028-3855-1413 ▾
Verifying : httpd-2.4.54-1.amzn2.x86_64
Verifying : mailcap-2.1.41-2.amzn2.noarch
Verifying : generic-logos-httpd-18.0.0-4.amzn2.noarch
Verifying : httpd-filesystem-2.4.54-1.amzn2.noarch
Verifying : apr-1.7.0-9.amzn2.x86_64

Installed:
httpd.x86_64 0:2.4.54-1.amzn2
Dependency Installed:
apr.x86_64 0:1.7.0-9.amzn2      apr-util.x86_64 0:1.6.1-5.amzn2.0.2  apr-util-bdb.x86_64 0:1.6.1-5.amzn2.0.2  generic-logos-httpd.noarch 0:18.0.0-4.amzn2  httpd-filesystem.noarch 0:2.4.54-1.amzn2

[Complete]
[root@ip-172-31-22-29 ~]# systemctl status httpd
● httpd.service - The Apache HTTP Server
  Loaded: loaded (/usr/lib/systemd/system/httpd.service; disabled; vendor preset: disabled)
    Active: inactive (dead)
      Docs: manhttpd.service(8)
[root@ip-172-31-22-29 ~]# cd temp/
[root@ip-172-31-22-29 ~]# curl -O https://www.free-css.com/assets/files/free-css-templates/download/page203/potoub.zip
2022-12-08 03:23:11 - [https://www.free-css.com/assets/files/free-css-templates/download/page203/potoub.zip]
Resolving www.free-css.com... 217.160.0.242, 2001:8d8:1:00f:0:0:0:28f
Connecting to www.free-css.com (www.free-css.com)|217.160.0.242|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 4162984 (4.0M) [application/zip]
Saving to: 'potoub.zip'

100%[=====] 4,162,984 4.00MB/s in 1.0s

2022-12-08 03:23:13 (4.00 MB/s) - 'potoub.zip' saved [4162984/4162984]

[root@ip-172-31-22-29 temp]# ls -lxt
total 406K
-rw-r--r-- 1 root root 4162984 Aug 17 2021 potoub.zip
[root@ip-172-31-22-29 temp]# 

i-0635e67917b02ef8 (Honest-Feedback-Coming-Soon-Web-Server)
PublicIP: 3.80.217.197 PrivateIP: 172.31.22.29

```

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34

```

aws Services Search [Alt+S] N. Virginia ▾ Cotiss_User @ 2028-3855-1413 ▾
[root@ip-172-31-22-29 temp]# unzip potoub.zip
Archive: potoub.zip
  creating: potoub/html/
  creating: potoub/html/css/
  inflating: potoub/html/css/_DS_Store
  inflating: potoub/html/css/animate.min.css
  inflating: potoub/html/css/bootstrap.min.css
  inflating: potoub/html/css/bootstrap-grid.css.map
  inflating: potoub/html/css/bootstrap-grid.min.css
  inflating: potoub/html/css/bootstrap-grid.min.css.map
  inflating: potoub/html/css/bootstrap-reboot.css
  inflating: potoub/html/css/bootstrap-reboot.map
  inflating: potoub/html/css/bootstrap-reboot.min.css
  inflating: potoub/html/css/bootstrap-reboot.min.css.map
  inflating: potoub/html/css/bootstrap.css
  inflating: potoub/html/css/bootstrap.min.css
  inflating: potoub/html/css/bootstrap.min.css.map
  inflating: potoub/html/css/default-skin.css
  inflating: potoub/html/css/iconfont/iconfont-min.css
  inflating: potoub/html/css/jquery-ui.css
  inflating: potoub/html/css/jquery.fancybox.min.css
  inflating: potoub/html/css/jquery.mCustomScrollbar.min.css
  inflating: potoub/html/css/nice-select.css
  inflating: potoub/html/css/normalize.css
  inflating: potoub/html/css/owl.carousel.min.css
  inflating: potoub/html/css/owl.theme.default.min.css
  inflating: potoub/html/css/slick.css
  inflating: potoub/html/css/style.css
  requesting: potoub/html/fonts/
  inflating: potoub/html/fonts/Fontawesome-webfont.eot
  inflating: potoub/html/fonts/Fontawesome-webfont.svg
  inflating: potoub/html/fonts/Fontawesome-webfont.ttf
  inflating: potoub/html/fonts/Fontawesome-webfont.woff
  inflating: potoub/html/fonts/Fontawesome-webfont.woff2

i-0635e67917b02ef8 (Honest-Feedback-Coming-Soon-Web-Server)
PublicIP: 3.80.217.197 PrivateIP: 172.31.22.29

```

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35

<sup>34</sup> Create a repository  
<sup>35</sup> Unzip source code for the website

```

[Alt+S] Services Search [N. Virginia] Cotiss_User @ 2028-3855-1413 ▾
infating: potoub.html/j/revolution/js/extensions/revolution.extension.carousel.min.js
infating: potoub.html/j/revolution/js/extensions/revolution.extension.kenburn.min.js
infating: potoub.html/j/revolution/js/extensions/revolution.extension.layeranimation.min.js
infating: potoub.html/j/revolution/js/extensions/revolution.extension.migration.min.js
infating: potoub.html/j/revolution/js/extensions/revolution.extension.parallax.min.js
infating: potoub.html/j/revolution/js/extensions/revolution.extension.video.min.js
infating: potoub.html/j/revolution/jquery.themepunch.revolution.min.js
infating: potoub.html/j/revolution/jquery.themepunch.tools.min.js
infating: potoub.html/j/slider.setting.js
[root@ip-172-31-22-29 temp]# ls -lrt
ls: cannot access .lrt: No such file or directory
[root@ip-172-31-22-29 temp]# ls -lrt
total 4068
drwxr-xr-x 7 root root 84 Dec 20 2019 potoub-html
-rw-r--r-- 1 root root 41526 Aug 17 2019 potoub.zip
[root@ip-172-31-22-29 temp]# rm -rf potoub.html
[root@ip-172-31-22-29 potoub-html]# ls -lrt
total 36
drwxr-xr-x 2 root root 6 Aug 22 2019 icon
-rw-r--r-- 1 root root 20486 Dec 20 2019 index.html
drwxr-xr-x 3 root root 4096 Dec 20 2019 ja
drwxr-xr-x 2 root root 251 Dec 20 2019 images
drwxr-xr-x 2 root root 4096 Dec 20 2019 fonts
drwxr-xr-x 2 root root 4096 Dec 20 2019 css
[root@ip-172-31-22-29 potoub-html]# mv * /var/www/html/
[root@ip-172-31-22-29 potoub-html]# cd /var/www/html/
[root@ip-172-31-22-29 html]# ls -lrt
total 36
drwxr-xr-x 2 root root 6 Aug 22 2019 icon
-rw-r--r-- 1 root root 20486 Dec 20 2019 index.html
drwxr-xr-x 3 root root 4096 Dec 20 2019 ja
drwxr-xr-x 2 root root 251 Dec 20 2019 images
drwxr-xr-x 2 root root 4096 Dec 20 2019 fonts
drwxr-xr-x 2 root root 4096 Dec 20 2019 css
[root@ip-172-31-22-29 html]# []

```

i-0635e67917b02eaf8 (Honest-Feedback-Coming-Soon-Web-Server)  
PublicIPs: 3.80.217.197 PrivateIPs: 172.31.22.29

36

**EC2 > Security Groups > sg-084a8cf469b234c79 - launch-wizard-3**

Details	
Security group name	sg-084a8cf469b234c79
Owner	202838551413
Description	launch-wizard-3 created 2022-12-08T03:04:09.208Z
VPC ID	vpc-076558e00d38608b7
Inbound rules count	1 Permission entry
Outbound rules count	1 Permission entry

**Inbound rules (1/1)**

Name	Security group rule...	IP version	Type	Protocol	Port range	Source	Description
-	sgr-0d097fabfa1c127e	IPv4	SSH	TCP	22	0.0.0.0/0	-

Run Reachability Analyzer

37

<sup>36</sup> List the source files

<sup>37</sup> Go to the security group of the EC2 instance

Inbound rules

Security group rule ID	Type	Protocol	Port range	Source	Description - optional
sgr-0db097fabfa1c127e	SSH	TCP	22	Custom	0.0.0.0/0
-	HTTP	TCP	80	Anywhere	web port
-	HTTPS	TCP	443	Anywhere	web port

Add rule

Cancel Preview changes Save rules

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38

```

drwxr-xr-x 2 root root 4096 Dec 20 2019 css
[root@ip-172-31-22-29 potcup-html]# mv * /var/www/html/
[root@ip-172-31-22-29 potcup-html]# cd /var/www/html/
[root@ip-172-31-22-29 html]# ls -lrt
total 36
drwxr-xr-x 2 root root 6 Aug 22 2019 icon
-rw-r--r-- 1 root root 20486 Dec 20 2019 index.html
drwxr-xr-x 2 root root 4096 Dec 20 2019 js
drwxr-xr-x 2 root root 251 Dec 20 2019 images
drwxr-xr-x 2 root root 4096 Dec 20 2019 fonts
drwxr-xr-x 2 root root 4096 Dec 20 2019 css
[root@ip-172-31-22-29 html]# systemctl status httpd
● httpd.service - Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; disabled; vendor preset: disabled)
     Active: inactive (dead)
       Docs: manhttpd.service(8)
[root@ip-172-31-22-29 httpd]# systemctl enable httpd
Created symlink from /etc/systemd/system/multi-user.target.wants/httpd.service to /usr/lib/systemd/system/httpd.service.
[root@ip-172-31-22-29 html]# systemctl start httpd
[root@ip-172-31-22-29 html]# systemctl status httpd
● httpd.service - Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; enabled; vendor preset: disabled)
     Active: active (running) since Thu 2022-12-08 03:38:14 UTC; 24s ago
       Docs: manhttpd.service(8)
Main PID: 10230 (httpd)
   Status: "Total requests: 0; Idle/Busy workers 100/0; Requests/sec: 0; Bytes served/sec: 0 B/sec"
   CGroup: /system.slice/httpd.service
           ├─10223 /usr/sbin/httpd -DFOREGROUND
           ├─10226 /usr/sbin/httpd -DFOREGROUND
           ├─10227 /usr/sbin/httpd -DFOREGROUND
           ├─10228 /usr/sbin/httpd -DFOREGROUND
           ├─10229 /usr/sbin/httpd -DFOREGROUND
           └─10230 /usr/sbin/httpd -DFOREGROUND

Dec 08 03:38:14 ip-172-31-22-29.ec2.internal systemd[1]: Starting The Apache HTTP Server...
Dec 08 03:38:14 ip-172-31-22-29.ec2.internal systemd[1]: Started The Apache HTTP Server.
[root@ip-172-31-22-29 html]#

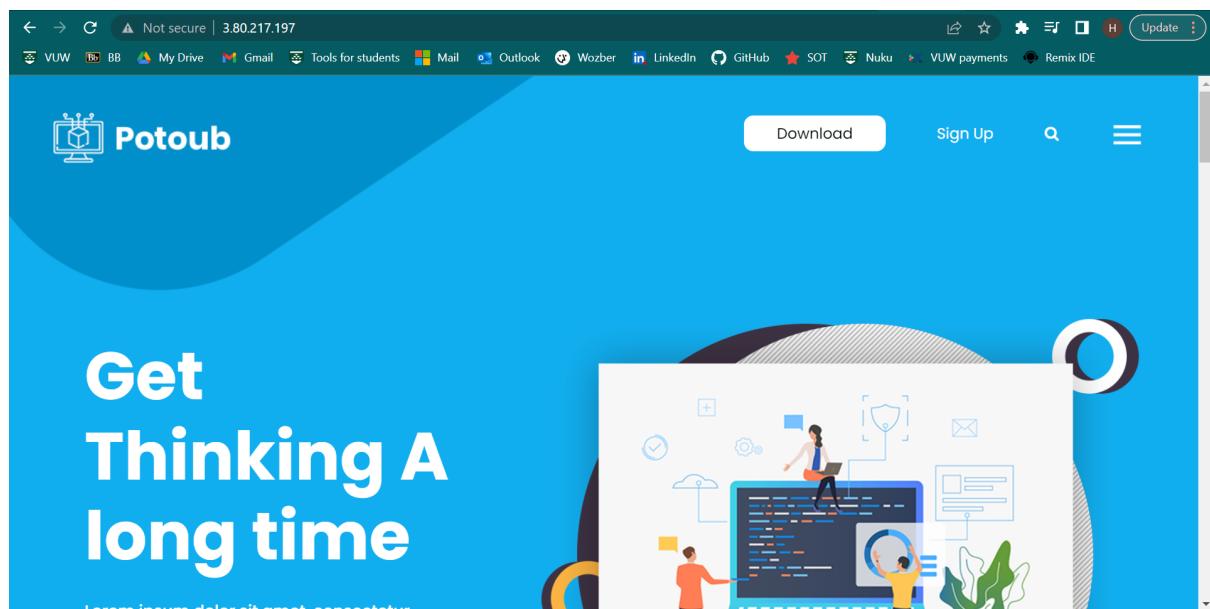
```

i-0635e67917b02eaf (Honest-Feedback-Coming-Soon-Web-Server)  
PublicIPs: 3.80.217.197 PrivateIPs: 172.31.22.29

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39

<sup>38</sup> Add HTTP and HTTPS inbound rules  
<sup>39</sup> Enable HTTP for the EC2 instance



40

---

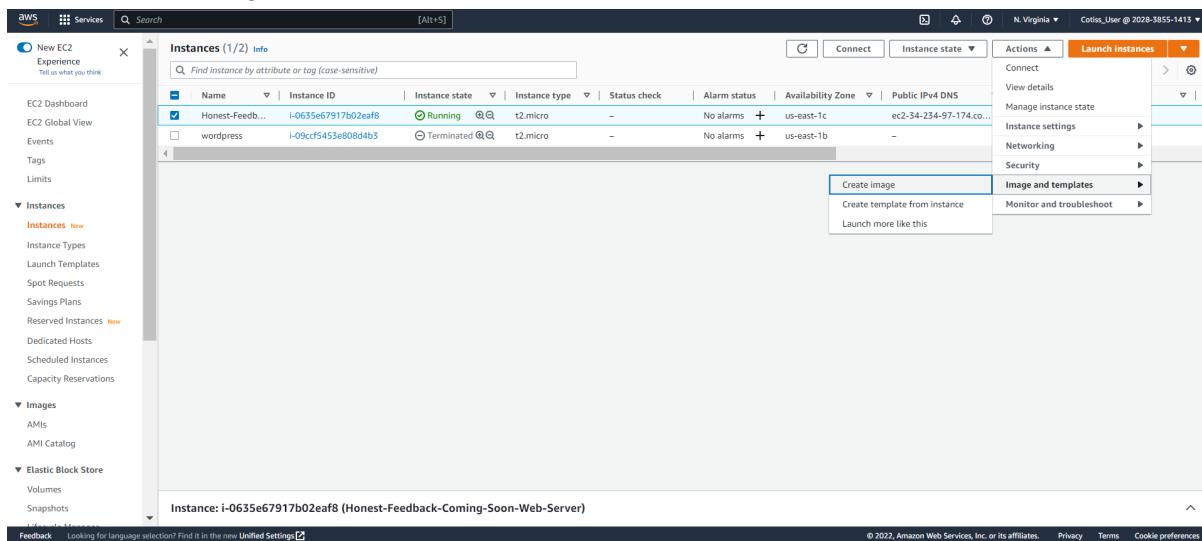
<sup>40</sup> Viewing the website on the instance

# Creating a Amazon Machine Image:

AMIs are an image that provides the information that's required to launch an EC2 instance. This allows us to launch multiple EC2 instances using a single AMI saving us from redoing the same configuration for every instance.

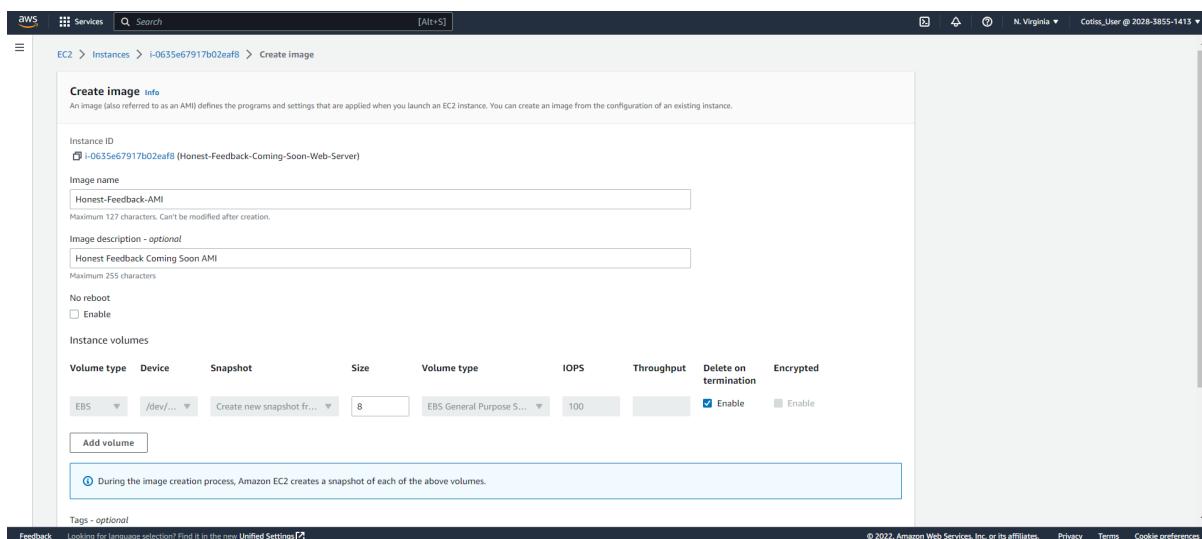
## Steps:

1. Select the instance
2. Click "Create Image"
3. Enter a name
4. Create Image



The screenshot shows the AWS Management Console with the EC2 service selected. The left sidebar shows navigation options like EC2 Dashboard, EC2 Global View, Events, Tags, and various Instance and Image-related sections. The main pane displays a table of instances. The first instance, 'Honest-Feedback...', is currently running. The second instance, 'wordpress', has already terminated. In the top right corner of the instance table, there is a 'Actions' dropdown menu. Within this menu, the 'Create image' option is highlighted with a blue background and white text. Other options in the menu include 'Connect', 'Instance state', 'View details', 'Manage instance state', 'Instance settings', 'Networking', 'Security', 'Image and templates', and 'Monitor and troubleshoot'.

41



This screenshot shows the 'Create image info' step of the EC2 Create Image wizard. At the top, it says 'Create image info' and provides a brief description of what an AMI is. Below that, the 'Instance ID' is listed as 'i-0635e67917b02eaf8 (Honest-Feedback-Coming-Soon-Web-Server)'. The 'Image name' field contains 'Honest-Feedback-AMI'. The 'Image description - optional' field contains 'Honest Feedback Coming Soon AMI'. Under 'Instance volumes', there is one EBS volume listed with a size of 8 GiB, an IOPS of 100, and throughput of 100 MiB/s. The 'Delete on termination' checkbox is checked. There is also an 'Add volume' button. A note at the bottom states: 'During the image creation process, Amazon EC2 creates a snapshot of each of the above volumes.' The bottom of the screen shows the standard AWS footer with links for Feedback, Copyright, Privacy, Terms, and Cookie preferences.

42

<sup>41</sup> Create AMI image

<sup>42</sup> Configure AMI image

Screenshot of the AWS EC2 Amazon Machine Images (AMIs) page.

**Amazon Machine Images (AMIs) (1/8) Info**

Owned by me | Find AMI by attribute or tag

Name	AMI ID	AMI name	Source	Owner	Visibility	Status	Creation date
-	ami-011cacb533ac5521	AwsBackup_ami-026b2f793b9ea3f...	202838551413/AwsBackup_ami-026b2f7...	202838551413	Private	Available	2022/11/17 20:14 GMT
wordpress	ami-027277cc606b03f0a	AwsBackup_ami-09ccf5453e080d4...	202838551413/AwsBackup_ami-09ccf545...	202838551413	Private	Available	2022/11/22 20:21 GMT
wordpress	ami-0e7e435e9baa19abe	AwsBackup_ami-09ccf5453e080d4...	202838551413/AwsBackup_ami-09ccf545...	202838551413	Private	Available	2022/11/23 20:20 GMT
wordpress	ami-060109969d328336b	AwsBackup_ami-09ccf5453e080d4...	202838551413/AwsBackup_ami-09ccf545...	202838551413	Private	Available	2022/11/20 20:22 GMT
wordpress	ami-0faea42246dedc2440	AwsBackup_ami-09ccf5453e080d4...	202838551413/AwsBackup_ami-09ccf545...	202838551413	Private	Available	2022/11/21 20:27 GMT
-	ami-05adff13add2b19585	AwsBackup_ami-026b2f793b9ea3f...	202838551413/AwsBackup_ami-026b2f7...	202838551413	Private	Available	2022/11/19 20:14 GMT
-	ami-009f807027bbx3841	AwsBackup_ami-026b2f793b9ea3f...	202838551413/AwsBackup_ami-026b2f7...	202838551413	Private	Available	2022/11/18 20:11 GMT
<input checked="" type="checkbox"/>	ami-025e9739794a2d8e1	Honest-Feedback-AMI	202838551413/Honest-Feedback-AMI	202838551413	Private	Available	2022/11/08 17:00 GMT

**AMI ID: ami-025e9739794a2d8e1**

**Details** | Permissions | Storage | Tags

AMI ID ami-025e9739794a2d8e1	Image type machine	Platform details Linux/UNIX	Root device type EBS
AMI name Honest-Feedback-AMI	Owner account ID 202838551413	Architecture x86_64	Usage operation RunInstances
Default device name /dev/sda1	Status Enabled	Additional Details	

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43

43 Select AMI image

# Setting up Launch Configurations:

Launch configurations are used as an instance configuration template for Auto Scaling groups to launch EC2 instances.

## Steps:

1. Click “Create launch configuration”
2. Give it a name
3. Select our AMI
4. Select our security group
5. Select out key pair
6. Create the launch configuration

The screenshot shows the AWS CloudWatch Metrics console. At the top, there's a search bar and a dropdown menu for 'Region' set to 'N. Virginia'. Below the search bar, there's a 'Metrics Insights' button. The main area displays a table with columns: Metric Name, Namespace, Dimensions, and Last Value. There are two rows of data: one for 'AWS/CloudWatch Metrics' and another for 'AWS/Amazon CloudWatch Metrics Insights'.

44

The screenshot shows the AWS CloudWatch Metrics console. At the top, there's a search bar and a dropdown menu for 'Region' set to 'N. Virginia'. Below the search bar, there's a 'Metrics Insights' button. The main area displays a table with columns: Metric Name, Namespace, Dimensions, and Last Value. There are two rows of data: one for 'AWS/CloudWatch Metrics' and another for 'AWS/Amazon CloudWatch Metrics Insights'.

45

<sup>44</sup> Select Launch configurations  
<sup>45</sup> Set up a Launch configuration

Description  
AutoScaling-Security-Group-1 (2022-12-08T06:39:41.755Z)

Rules

Type	Protocol	Port range	Source type	Source
SSH	TCP	22	Anywhere	0.0.0.0/0

+ Add new rule

⚠ Rules with source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only.

Key pair (login) [Info](#)

Key pair options  
Choose an existing key pair

Existing key pair  
Honest-FeedBack-KeyPair

I acknowledge that I have access to the selected private key file (Honest-FeedBack-KeyPair.pem), and that without this file, I won't be able to log into my instance.

Create launch configuration

46

Recommendation to not use launch configurations  
Amazon EC2 Auto Scaling no longer adds support for new EC2 features to launch configurations and will stop supporting new EC2 instances types after December 31, 2022. We recommend that customers using launch configurations migrate to launch templates. For more information, see the documentation [here](#).

Successfully created launch configuration: Honest-Feedback-Launch-Config

Name	AMI ID	Instance type	Spot price	Creation time
Honest-Feedbac...	ami-025e973979...	t2.micro	-	Thu Dec 08 2022 19:47:01 GMT+1300 (New Zealand Daylight Time)

Launch configuration:Honest-Feedback-Launch-Config

Details

47

- 
- <sup>46</sup> Create a Launch configuration  
<sup>47</sup> View the Launch configuration

# Creating an Auto Scaling group:

Auto Scaling groups monitor our web-server and elastically provisioned capacity to maintain a steady performance at the lowest possible cost. This deeply favours scenarios whereby traffic to the web server fluctuates.

Steps:

1. Click “Create AutoScaling group”
2. Select the launch configuration
3. Select 2 availability zones
4. Launch the auto scaling group

This screenshot shows the first step of creating an Auto Scaling group. The left sidebar lists steps 1 through 7. Step 1 is selected and titled "Choose launch template or configuration". It contains a sub-section for "Auto Scaling group name" where "Auto-Scaling-Group-Honest-Feedback" is entered. A note at the bottom of this section advises against using launch configurations and recommends migrating to launch templates. Step 2, "Choose instance launch options", is visible below it. The top navigation bar shows "EC2 > Auto Scaling groups > Create Auto Scaling group".

48

This screenshot shows the second step of creating an Auto Scaling group. The left sidebar lists steps 1 through 7. Step 2 is selected and titled "Choose instance launch options". It includes sections for "Network" (VPC selected as "vpc-076558e00038608b7") and "Availability Zones and subnets" (two subnets selected: "us-east-1a | subnet-0464b25bf41e3a66" and "us-east-1b | subnet-0417e588071b757a5"). The bottom of the screen shows navigation buttons: "Cancel", "Previous", "Skip to review", and "Next". The top navigation bar shows "EC2 > Auto Scaling groups > Create Auto Scaling group".

49

<sup>48</sup> Set up an auto scaling group  
<sup>49</sup> Select the availability zones

Step 1  
Choose launch template or configuration

Step 2  
Choose instance launch options

Step 3 (optional)  
Configure advanced options

Step 4 (optional)  
Configure group size and scaling policies

Step 5 (optional)  
Add notifications

Step 6 (optional)  
Add tags

Step 7  
Review

**Review** [Info](#)

**Step 1: Choose launch template or configuration**

**Group details**

Auto Scaling group name  
Auto-Scaling-Group-Honest-Feedback

Launch configuration  
Honest-Feedback-Launch-Config

**Step 2: Choose instance launch options**

**Network**

VPC  
vpc-076558e00d38608b7

Availability Zone Subnet

us-east-1a	subnet-04b4b25bbf41e3a66	172.31.0.0/20
us-east-1b	subnet-0417e588071b737a5	172.31.80.0/20

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50

We have launched a new allocation strategy, 'Price capacity optimized', that optimizes for both the lowest price and available capacity for the number of Spot Instances that are launching. For more information, see [Allocation strategies](#).

Auto-Scaling-Group-Honest-Feedback created successfully

**Auto Scaling groups (1) [Info](#)**

Name	Launch template/configuration	Instances	Status	Desired capacity	Min	Max	Availability Zones
Auto-Scaling-Group-Honest-Feedback	Honest-Feedback-Launch-Config	0	Updating capacity...	1	1	1	us-east-1a, us-east-1b

0 Auto Scaling groups selected

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51

<sup>50</sup> Review the details

<sup>51</sup> Finish creation of auto scaling group

# Creating a launch template:

EC2 launch templates are just like launch configurations, they contain all the launch parameters so that we don't have to set them ourselves. The benefit of using a launch template over launch configurations for an auto scaling group is that the launch template has version control so changes we make to the template create a new version and we can revert back to a version we once had.

## Steps:

1. Click "Create Launch Template"
2. Give it a name
3. Select the Honest Feedback AMI
4. Select the same configurations as the launch configurations
5. Create the launch template
6. Set the auto scaling group Desired, Maximum, Minimum parameters to 2
7. Switch from launch configurations to launch template
8. Check that 2 instances are created

The screenshot shows the 'Create launch template' wizard in the AWS Management Console. The 'Summary' step is displayed, showing the configuration details for the new launch template. The 'Software Image (AMI)' section lists 'Amazon Linux 2 Kernel 5.10 AMI...' with a 'read more' link. The 'Virtual server type (instance type)' dropdown is set to '-'. The 'Firewall (security group)' dropdown is set to '-'. The 'Storage (volumes)' section shows '1 volume(s) - 8 GiB'. A tooltip for the storage volume indicates it's a 'Free tier: In your first year includes 750 hours of t2.micro (or t3.micro in the Regions in which t2.micro is unavailable) instance usage on free tier AMIs per month, 30 GiB of EBS storage, 2 million I/Os, 1 GB of snapshots, and 100 GB of bandwidth to the internet.' The 'Create launch template' button is visible at the bottom right of the summary panel.

52

The screenshot shows the 'Create launch template' wizard in the AWS Management Console. The success message 'Successfully created Honest-Feedback-Launch-Template (lt-0d5034224bb9a3c6c)' is displayed. Below the message, there is an 'Actions log' section and a 'Next steps' section. The 'Next steps' section contains links for 'Launch an instance', 'Create an Auto Scaling group from your template', 'Create an Auto Scaling group from your template' (repeated), and 'Create Spot Fleet'. At the bottom right of the 'Next steps' section is a 'View launch templates' button.

<sup>52</sup> Create a launch template

EC2 > Auto Scaling groups > Auto-Scaling-Group-Honest-Feedback

**Auto-Scaling-Group-Honest-Feedback**

Details Activity Automatic scaling Instance management Monitoring Instance refresh

**Group details**

Desired capacity: 1  
Minimum capacity: 1  
Maximum capacity: 1

**Group size**

Specify the size of the Auto Scaling group by changing the desired capacity. You can also specify minimum and maximum capacity limits. Your desired capacity must be within the limit range.

Desired capacity: 2  
Minimum capacity: 2  
Maximum capacity: 2

**Launch configuration**

Launch configuration: Honest-Feedback-Launch-Config

Instance type: t2.micro  
Key pair name: Honest-Feedback-KeyPair

Storage (volumes): /dev/xvda

**Update**

Cancel

arni-025e9739794a2d8e1  
sg-0e9c022f5b6bf96f4

Create time: Thu Dec 08 2022 19:47:01 GMT+1300 (New Zealand Daylight Time)

https://us-east-1.console.aws.amazon.com/console/home?region=us-east-1

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53

EC2 > Auto Scaling groups > Group-Honest-Feedback

**Group details**

Desired capacity: 1  
Minimum capacity: 1  
Maximum capacity: 1

**Launch configuration**

Launch configuration: Honest-Feedback-Launch-Config

AMID: ami-025e9739794a2d8e1  
Security groups: sg-0e9c022f5b6bf96f4

Instance type: t2.micro  
Key pair name: Honest-Feedback-KeyPair

Storage (volumes): /dev/xvda

**Network**

Availability Zones: us-east-1a, us-east-1b  
Subnet ID: subnet-0417e588071b737a5, subnet-04b4b25bbf41e3a66

**Load balancing**

Load balancer target groups: -  
Classic Load Balancers: -

**Health checks**

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54

<sup>53</sup> Set group size for auto scaling group  
<sup>54</sup> Edit launch configuration

55

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<sup>55</sup> Switch to launch template

<sup>56</sup> Update auto scaling group

The screenshot shows the AWS EC2 Instances page. The left sidebar includes links for New EC2 Experience, EC2 Dashboard, EC2 Global View, Events, Tags, Limits, Instances (with sub-links for Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Scheduled Instances, Capacity Reservations), Images (AMIs, AMI Catalog), and Elastic Block Store (Volumes, Snapshots). The main content area displays a table titled 'Instances (3) Info' with columns: Name, Instance ID, Instance state, Instance type, Status check, Alarm status, Availability Zone, Public IPv4 DNS, Public IPv4 IP, Elastic IP, and If. Three instances are listed:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Public IPv4 IP	Elastic IP	If
Honest-Feedb...	i-0635e67917b02eaf8	Stopped	t2.micro	-	No alarms	us-east-1c	-	-	-	-
-	i-0a799cff8a61ca58	Running	t2.micro	2/2 checks passed	No alarms	us-east-1b	ec2-44-211-38-215.co...	44.211.38.215	-	-
-	i-06e0370d613b95eaf	Running	t2.micro	2/2 checks passed	No alarms	us-east-1a	ec2-3-231-148-69.com...	3.231.148.69	-	-

A modal window titled 'Select an instance' is open at the bottom, listing the three instances: 'Honest-Feedb...', 'i-0a799cff8a61ca58', and 'i-06e0370d613b95eaf'. The footer contains links for Feedback, Unified Settings, Privacy, Terms, and Cookie preferences.

57

<sup>57</sup> Test Auto scaling group is working as intended

# Attach Load balancer:

Load balancers distribute the incoming traffic between multiple targets, in this case we have 2 targets in our target group so the traffic is balanced between those 2 EC2 instances. Both these instances are in separate availability zones so when one fails the other instance is still running. This makes our web server highly available. The load balancer is the first point of contact for our clients.

## Steps:

1. Click “Create load balancer”
2. Select Application Load Balancer
3. Give it a name
4. Select Internet facing
5. Select 2 availability zones under mapping
6. Select our security group
7. Add a listener on port 80
8. Create a target group
9. Select instances
10. Give it a name
11. Add the target group to the load balancer
12. Select our target group
13. Click “Register Targets”
14. Add our 2 instances to our targets
15. Now we create our load balancer
16. Test if we can connect to all our instances

The screenshot shows the AWS Management Console with the URL [https://console.aws.amazon.com/vpc/home?#loadBalancers:createLoadBalancer](#). The top navigation bar includes 'Services', 'Search', and 'N. Virginia'. The main content area is titled 'Select load balancer type' and contains three cards:

- Application Load Balancer**: Shows a diagram of a client connecting to an ALB, which then routes traffic to Lambda functions or EC2 instances via HTTP and HTTPS. Description: Choose an Application Load Balancer when you need a flexible feature set for your applications with HTTP and HTTPS traffic. Operating at the request level, Application Load Balancers provide advanced routing and traffic management features.
- Network Load Balancer**: Shows a diagram of a client connecting to an NLB, which then routes traffic to VPCs or VPCe via TCP, UDP, and TLS. Description: Choose a Network Load Balancer when you need ultra-high performance, TLS offloading at scale, centralized certificate deployment, support for UDP, and static IP addresses for your applications. Operating at the transport layer, Network Load Balancers provide low-latency and high-throughput traffic management.
- Gateway Load Balancer**: Shows a diagram of a client connecting to a GWLB, which then routes traffic to third-party virtual appliances via TCP, UDP, and TLS. Description: Choose a Gateway Load Balancer when you need to deploy and manage a fleet of third-party virtual appliances that support GENEVE. These appliances enable you to improve security, compliance, and policy controls.

58

<sup>58</sup> Select an application load balancer

**Create Application Load Balancer** info

The Application Load Balancer distributes incoming HTTP and HTTPS traffic across multiple targets such as Amazon EC2 instances, microservices, and containers, based on request attributes. When the load balancer receives a connection request, it evaluates the listener rules in priority order to determine which rule to apply, and if applicable, it selects a target from the target group for the rule action.

▶ How Elastic Load balancing works

**Basic configuration**

Load balancer name  
Name must be unique within your AWS account and cannot be changed after the load balancer is created.

Scheme info  
Scheme cannot be changed after the load balancer is created.

Internet-facing  
An internet-facing load balancer routes requests from clients over the Internet to targets. Requires a public subnet. [Learn more](#)

Internal  
An internal load balancer routes requests from clients to targets using private IP addresses.

IP address type info  
Select the type of IP addresses that your subnets use.

IPv4  
Recommended for internal load balancers.

Dualstack  
Includes IPv4 and IPv6 addresses.

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59

**Network mapping** info

The load balancer routes traffic to targets in the selected subnets, and in accordance with your IP address settings.

VPC info  
Select the virtual private cloud (VPC) for your targets. Only VPCs with an internet gateway are enabled for selection. The selected VPC cannot be changed after the load balancer is created. To confirm the VPC for your targets, view your target groups.

-  [vpc-076558e00d38a0b7](#)  
IPv4: 172.31.0.0/16

Mappings info  
Select at least two Availability Zones and one subnet per zone. The load balancer routes traffic to targets in these Availability Zones only. Availability Zones that are not supported by the load balancer or the VPC are not available for selection.

**us-east-1a (use1-az1)**

Subnet

IPv4 settings  
Assigned by AWS

**us-east-1b (use1-az2)**

Subnet

IPv4 settings  
Assigned by AWS

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60

<sup>59</sup> Create the application load balancer

<sup>60</sup> Select the subnets

Step 2 Register targets

**Basic configuration**  
Settings in this section cannot be changed after the target group is created.

**Choose a target type**

- Instances
  - Supports load balancing to instances within a specific VPC.
  - Facilitates the use of [Amazon EC2 Auto Scaling](#) to manage and scale your EC2 capacity.
- IP addresses
  - Supports load balancing to VPC and on-premises resources.
  - Facilitates routing to multiple IP addresses and network interfaces on the same instance.
  - Offers flexibility with microservice based architectures, simplifying inter-application communication.
  - Supports IPv6 targets, enabling end-to-end IPv6 communication, and IPv4-to-IPv6 NAT.
- Lambda function
  - Facilitates routing to a single Lambda function.
  - Accessible to Application Load Balancers only.
- Application Load Balancer
  - Offers the flexibility for a Network Load Balancer to accept and route TCP requests within a specific VPC.
  - Facilitates using static IP addresses and PrivateLink with an Application Load Balancer.

**Target group name**

A maximum of 32 alphanumeric characters including hyphens are allowed, but the name must not begin or end with a hyphen.

**Protocol**  **Port**

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61

**Successfully created target group: Honest-Feedback-Target-Group**

**EC2 > Target groups**

**Target groups (1) Info**

Name	ARN	Port	Protocol	Target type	Load balancer	VPC ID
Honest-Feedback-Target-Group	arn:aws:elasticloadbalancin...	80	HTTP	Instance	None associated	vpc-076558e00d38608b7

**0 target groups selected**

Select a target group above.

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62

---

<sup>61</sup> Create a target group  
<sup>62</sup> Finish creating target group

**Listener HTTP:80**

Protocol: HTTP Port: 80 Default action: Info  
Forward to: Honest-Feedback-Target-Group Target type: Instance, IPv4

**Listener tags - optional**  
Consider adding tags to your listener. Tags enable you to categorize your AWS resources so you can more easily manage them.

**Add listener tag**  
You can add up to 50 more tags.

**Add listener**

**Add-on services - optional**  
Additional AWS services can be integrated with this load balancer at launch. You can also add these and other services after your load balancer is created by reviewing the "Integrated Services" tab for the selected load balancer.

**AWS Global Accelerator info**  
 Create an accelerator to get static IP addresses and improve the performance and availability of your applications. Additional charges apply.

**Tags - optional**  
Consider adding tags to your load balancer. Tags enable you to categorize your AWS resources so you can more easily manage them. The 'Key' is required, but 'Value' is optional. For example, you can have Key = production-webserver, or Key = webserver, and Value = production.

<https://us-east-1.console.aws.amazon.com/console/home?region=us-east-1>

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63

**Honest-Feedback-Target-Group**

**Details**  
arn:aws:elasticloadbalancing:us-east-1:1202838551413:targetgroup/Honest-Feedback-Target-Group/c669a85c661566cb

Target type	Protocol : Port	Protocol version	VPC
Instance	HTTP: 80	HTTP1	vpc-076558e00d38608b7
IP address type	Load balancer		
IPv4	None associated		

Total targets	Healthy	Unhealthy	Unused	Initial	Draining
0	0	0	0	0	0

**Targets** | Monitoring | Health checks | Attributes | Tags

**Registered targets (0)**

No registered targets

**Targets** | Deregister | Register targets

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64

<sup>63</sup> Select target group

<sup>64</sup> View target group

**Targets (2)**

Remove	Health status	Instance ID	Name	Port	State	Security groups	Zone	IPv4 address	Subnet ID
unused	i-0a799cff8a61ca58	80	running	AutoScaling-Security-Group-Honest-Feedback	us-east-1b	44.211.38.215	subnet-0417e588071b737a5		
unused	i-06e0370d613b95eaf	80	running	AutoScaling-Security-Group-Honest-Feedback	us-east-1a	3.231.148.69	subnet-04b4b25bbf41e5a66		

**Feedback** Looking for language selection? Find it in the new [Unified Settings](#).

**65**

**EC2 > Load balancers > Honest-Feedback-Load-Balancer > Create Application Load Balance**

**Create Application Load Balancer**

**Suggested next steps**

- Review, customize, or enable attributes for your load balancer and listeners using the **Description** and **Listeners** tabs within **Honest-Feedback-Load-Balancer**.
- Discover other services that you can integrate with your load balancer. Visit the **Integrated services** tab within **Honest-Feedback-Load-Balancer**.

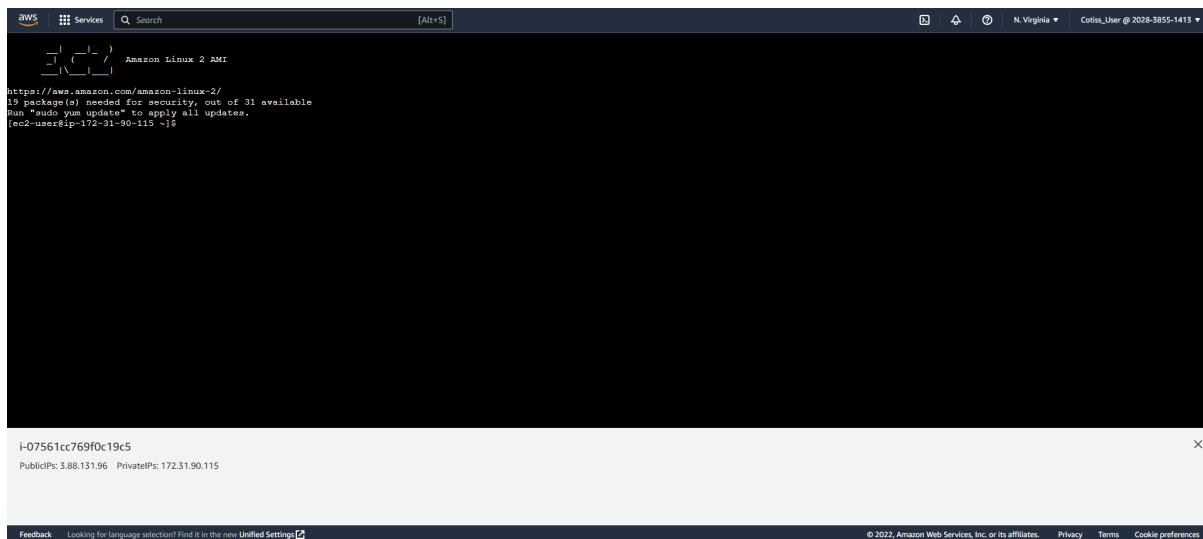
**View load balancer**

**Feedback** Looking for language selection? Find it in the new [Unified Settings](#).

**66**

<sup>65</sup> Register targets

<sup>66</sup> Finally create the application load balancer



67

---

<sup>67</sup> Connect to the instances created by auto scaler

# Creating an IAM Role:

Identity and Access Management (IAM) role is used to assign permissions for an application or identities to perform a certain action in AWS services. IAM roles manage who has access to a specific AWS resource. In this case we are granting permissions for our EC2 instance to access dynamoDB.

## Steps:

1. Click “create role”
2. Select EC2
3. Select Amazon DynamoDB Full Access
4. Give it a name
5. Create the role

The screenshot shows the AWS IAM Roles page. The left sidebar includes sections for User groups, Policies, Identity providers, Account settings, Access reports, and Service control policies (SCPs). The main content area displays a table of existing roles, each with a checkbox, role name, trusted entity, and last activity. The table lists 14 roles, all associated with the 'forecast' AWS service.

68

The screenshot shows the 'Create role' wizard, Step 1: Select trusted entity. It includes a sidebar with steps: Step 1 (Select trusted entity), Step 2 (Add permissions), and Step 3 (Name, review, and create). The main content area shows a 'Trusted entity type' section with five options: AWS service (selected), AWS account, Web identity, SAML 2.0 federation, and Custom trust policy. Below this is a 'Use case' section with options: EC2 (selected), Lambda, and Common use cases. A dropdown menu allows choosing a service to view use cases.

69

<sup>68</sup> View IAM roles

<sup>69</sup> Configure a new IAM role

The screenshot shows the 'Add permissions' step of the IAM role creation wizard. It displays a list of pre-defined policies under 'Permissions policies'. One policy, 'AmazonDynamoDBFullAccess', is selected and highlighted. Other visible policies include 'AWSLambdaDynamoDBExecutionRole', 'AmazonDynamoDBReadOnlyAccess', and 'AWSLambdaInvocation-DynamoDB'. A search bar at the top right allows filtering by policy name. Below the list, there's a section for setting a 'permissions boundary' which is currently optional.

70

The screenshot shows the 'Name, review, and create' step of the IAM role creation wizard. It includes fields for 'Role name' (set to 'DynamoDB-Access-Honest\_Feedback') and 'Description' (set to 'Allows EC2 instances to call AWS services on your behalf'). Below these, the 'Step 1: Select trusted entities' section shows a JSON policy document:

```

1 - [
2 -   {
3 -     "Version": "2012-10-17",
4 -     "Statement": [
5 -       {
6 -         "Effect": "Allow",
7 -         "Action": [
8 -           "sts:AssumeRole"
9 -         ],
10        "Principal": [
11          "ServiceRole"
12        ]
13      }
14    ]
15  }
16]

```

71

<sup>70</sup> Add permissions to the role

<sup>71</sup> Review the details

The screenshot shows the AWS Identity and Access Management (IAM) service interface. In the top navigation bar, there are tabs for 'Services' and 'IAM'. Below the navigation, a blue banner displays the message: 'New! Securely access AWS services from your data center with IAM Roles Anywhere. Learn more.' The main content area is titled 'Roles (45) Info' and includes a search bar with the query 'Honest' and a result count of '1 match'. A table lists one role: 'DynamoDB-Access-Honest\_Feedback' under the 'Role name' column, with 'AWS Service: ec2' listed under 'Trusted entities'. To the right of the table are buttons for 'Delete' and 'Create role'. Below this section, there's a 'Roles Anywhere' section with three options: 'Access AWS from your non AWS workloads' (with an icon of two servers), 'X.509 Standard' (with an icon of a certificate), and 'Temporary credentials' (with an icon of a key and lock). At the bottom of the page, there are links for 'Feedback', 'Related consoles', and 'IAM Identity Center [New]'. The footer contains copyright information: '© 2022, Amazon Web Services, Inc. or its affiliates.' and links for 'Privacy', 'Terms', and 'Cookie preferences'.

72

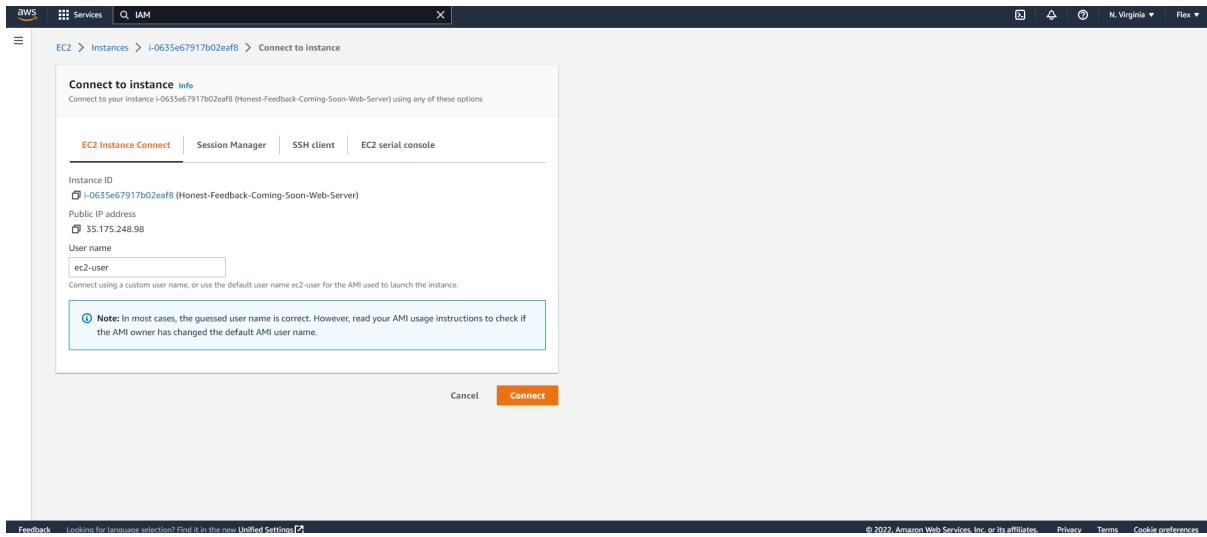
<sup>72</sup> Finish creating the IAM role

# Installing PHP & Composer:

PHP (Hypertext Preprocessor) is used to develop dynamic and interactive websites, in our case we want the user to be able to input data and submit it to the database and then display the information back out to the GUI. We are going to use PHP to interact with the DynamoDB database. Installing a composer into the EC2 instance is an important step because the composer is a dependency manager for PHP. The vendor file is used to run the PHP scripts automatically.

## Steps:

1. Connect to our EC2 instance
2. Login as root user: `sudo su -`
3. Install PHP: `yum install httpd php git -y`
4. Start httpd: `service httpd start`
5. List all services: `chkconfig httpd on`
6. Enter html folder: `cd /var/www/html`
7. Connect dynamoDB to PHP
8. `/bin/dd if=/dev/zero of=/var/swap.1 bs=1M count=1024`
9. `/sbin/mkswap /var/swap.1`
10. `/sbin/swapon /var/swap.1`
11. Install composer
12. `php -r "copy('https://getcomposer.org/installer', 'composer-setup.php');"`
13. `php -r "if (hash_file('sha384', 'composer-setup.php') === 'e0012edf3e80b6978849f5eff0d4b4e4c79ff1609dd1e613307e16318854d24ae64f26d17af3ef0bf7cfb710ca74755a') { echo 'Installer verified'; } else { echo 'Installer corrupt'; unlink('composer-setup.php'); } echo PHP_EOL;"`
14. `php composer-setup.php`
15. `php -r "unlink('composer-setup.php');"`
16. `sudo mv composer.phar /usr/local/bin/composer`
17. Check if composer is installed: `composer`
18. `php -d memory_limit=-1 composer.phar require aws/aws-sdk-php`
19. Make sure we have a composer.phar and vendor file
20. Now we want to restart httpd: `systemctl restart httpd`
21. Modify the IAM role of our EC2 instance
22. Add our IAM role
23. Copy the public IP address and add a slash then the name of the PHP file



73

74

<sup>73</sup> Connect to our EC2 instance

## 74 Install PHP

75

```

AWS Services Search [Alt+S] N. Virginia Flex ▾
Installing : git-core-doc-2.38.1-1.amzn2.0.noarch
Installing : libperl-Error-0.17020-2.amzn2.noarch
Installing : perl-TermReadKey-2.30-20.amzn2.0.x86_64
Installing : perl-URI-1.38-1.amzn2.0.noarch
Installing : libzip010-compat-0.10.1-9.amzn2.0.5.x86_64
Installing : php-common-5.4.16-46.amzn2.0.2.x86_64
Installing : php-cgi-5.4.16-46.amzn2.0.1.x86_64
Installing : php-cgi-5.4.16-46.amzn2.0.1.noarch
Verifying : libzip010-compat-0.10.1-9.amzn2.0.5.x86_64
Verifying : perl-TermReadKey-2.30-20.amzn2.0.x86_64
Verifying : git-core-doc-2.38.1-1.amzn2.0.1.noarch
Verifying : libzip010-compat-0.10.1-9.amzn2.0.5.x86_64
Verifying : git-2.38.1-1.amzn2.0.1.x86_64
Verifying : php-5.4.16-46.amzn2.0.2.x86_64
Verifying : git-core-2.38.1-1.amzn2.0.1.x86_64
Verifying : perl-URI-1.38-1.amzn2.0.2.noarch
Verifying : perl-Git-1.38.1-1.amzn2.0.1.noarch
Verifying : php-common-5.4.16-46.amzn2.0.2.x86_64

Installed:
git.x86_64 0:2.38.1-1.amzn2.0.1

Dependency Installed:
git-core.x86_64 0:2.38.1-1.amzn2.0.1      git-core-doc.noarch 0:2.38.1-1.amzn2.0.1  librip010-compat.x86_64 0:0.10.1-9.amzn2.0.5  perl-Error.noarch 1:0.17020-2.amzn2  perl-git.noarch 0:2.38.1-1.amzn2.0.1

Complete!
[root@ip-172-31-22-29 ~]# service httpd start
Redirecting to /bin/systemctl start httpd.service
[root@ip-172-31-22-29 ~]# chkconfig httpd on
Note: Forwarding request to 'systemctl enable httpd.service'.
[root@ip-172-31-22-29 ~]# nano </var/www/html/test.php
[root@ip-172-31-22-29 ~]# ls
css fonts icons images index.html js test.php
[root@ip-172-31-22-29 ~]# 

i-0635e67917b02eaf8 (Honest-Feedback-Coming-Soon-Web-Server)
PublicIPs: 35.175.248.98 PrivateIPs: 172.31.22.29

```

75

```

AWS Services Search [Alt+S] N. Virginia Flex ▾
To initialize a project, please create a composer.json file. See https://getcomposer.org/basic-usage
[root@ip-172-31-22-29 ~]# ls
php composer.phar
[root@ip-172-31-22-29 ~]# cd html
[root@ip-172-31-22-29 ~]# No such file or directory
[root@ip-172-31-22-29 ~]# cd /var/www/html
[root@ip-172-31-22-29 ~]# sudo curl -sS https://getcomposer.org/installer | sudo php
all settings correct for using Composer
Downloading...
Composer (version 2.2.18) successfully installed to: /var/www/html/composer.phar
Use it: php composer.phar

[root@ip-172-31-22-29 ~]# sudo mv composer.phar /usr/local/bin/composer
[root@ip-172-31-22-29 ~]# ln -s /usr/local/bin/composer /usr/bin/composer
ln: failed to create symbolic link '/usr/bin/composer': File exists
[root@ip-172-31-22-29 ~]# sudo composer install
Composer could not find a composer.json file in /var/www/html
To initialize a project, please create a composer.json file. See https://getcomposer.org/basic-usage
[root@ip-172-31-22-29 ~]# php -r "copy('https://getcomposer.org/installer', 'composer-setup.php');"
[root@ip-172-31-22-29 ~]# php -r "if (hash_file('sha384', 'composer-setup.php') === '55ce33d7678c5a61108589f1f3dd8b3c52d62cd01d4ba75c0ee0459970c2200a51f492d557530c71c15d8dba01eae') { echo 'Installer verified'; } else { echo 'Installer corrupt'; unlink('composer-setup.php'); } echo PHP_EOL;"
Installer verified
[root@ip-172-31-22-29 ~]# php composer-setup.php
all settings correct for using Composer
downloading...
Composer (version 2.2.18) successfully installed to: /var/www/html/composer.phar
Use it: php composer.phar

[root@ip-172-31-22-29 ~]# php -r "unlink('composer-setup.php');"
[root@ip-172-31-22-29 ~]# sudo mv composer.phar /usr/local/bin/composer
[root@ip-172-31-22-29 ~]# ls
css fonts icons images index.html js test.php
[root@ip-172-31-22-29 ~]# 

i-0635e67917b02eaf8 (Honest-Feedback-Coming-Soon-Web-Server)
PublicIPs: 35.175.248.98 PrivateIPs: 172.31.22.29

```

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76

<sup>75</sup> Create PHP file  
<sup>76</sup> Install Composer

```

AWS Services Search [Alt+S] N. Virginia Flex ▾
-Bash: cd: vendor: No such file or directory
[root@ip-172-31-22-29 html]# composer
Composer version 2.2.18 2022-08-20 11:33:38

Usage:
  command [options] [arguments]

Options:
  -h, --help           Display this help message
  -q, --quiet          Do not output any message
  --version           Display this application version
  --ansi              Print ANSI escape codes
  --no-ansi            Disable ANSI output
  --n, --no-interaction  Do not ask any interactive question
  --profile            Display timing and memory usage information
  --no-profile          Remove profile output
  --no-scripts          Skips the execution of all scripts defined in composer.json file.
  -d, --working-dir WORKING-DIR  If specified, use the given directory as working directory.
  --no-cache            Prevent use of the cache
  -vvv, --verbose       Increase the verbosity of messages: 1 for normal output, 2 for more verbose output and 3 for debug

Available commands:
  about      Shows a short information about Composer.
  archive    Creates an archive of the current package.
  browser   Opens the package's repository URL in your browser.
  clear     Clears composer's internal package cache.
  check-platform-reqs  Check that platform requirements are satisfied.
  clear-cache  Clears composer's internal package cache.
  config     Clears composer's internal package cache.
  config:options Sets config options.
  create-project Creates new project from a package into given directory.

i-0635e67917b02eaf8 (Honest-Feedback-Coming-Soon-Web-Server)
PublicIP: 35.175.248.98 PrivateIP: 172.31.22.29

```

77

```

AWS Services Search [Alt+S] N. Virginia Flex ▾
ed'; ) else [ echo 'Installer corrupt'; unlink("composer-setup.php"); ] echo PHP_EOL"
Installer verified
[root@ip-172-31-22-29 html]# php composer-setup.php
All packages are up to date
Downloading..

Composer (version 2.2.18) successfully installed to: /var/www/html/composer.phar
Use this phar file to run Composer.

[root@ip-172-31-22-29 html]# ls
composer.phar composer-setup.php create_table.php css fonts icon images index.html js test.php
[root@ip-172-31-22-29 html]# composer.phar composer-setup.php --allow-root composer.phar require aws/aws-sdk-php
Using version ^2.0 for aws/aws-sdk-php
/composer.json has been created
Running composer update aws/aws-sdk-php
Loading composer repositories with package information
Updating dependencies
Lock file operations: 3 installs, 0 updates, 0 removals
  - Installing aws/aws-sdk-php (v2.0.31)
  - Locking guzzle/guzzle (v3.9.3)
  - Locking symfony/event-dispatcher (v2.8.52)
Writing lock file
Installing dependencies from lock file (including require-dev)
Package operations: 3 installs, 0 updates, 0 removals
  - Downloading symfony/event-dispatcher (v2.8.52)
  - Downloading guzzle/guzzle (v3.9.3)
  - Downloading aws/aws-sdk-php (v2.0.31)
  - Installing guzzle/guzzle (v3.9.3): Extracting archive
  - Installing guzzle/guzzle (v3.9.3): Extracting archive
  - Installing aws/aws-sdk-php (v2.0.31): Extracting archive
  package suggestions were added by new dependencies, use composer suggest to see details.
Generating autoload files
[composer.phar was abandoned, you should now be using it's replacement composer instead]
[root@ip-172-31-22-29 html]# ls
composer.json composer.lock composer.phar composer-setup.php create_table.php css fonts icon images index.html js test.php vendor
[root@ip-172-31-22-29 html]# 

i-0635e67917b02eaf8 (Honest-Feedback-Coming-Soon-Web-Server)
PublicIP: 35.175.248.98 PrivateIP: 172.31.22.29

```

78

<sup>77</sup> Check if Composer is installed

<sup>78</sup> List all files in directory to check for vendor file



# Coding to read DB using PHP:

readData.php uses html to display a form that the user uses to input their feedback and submit it to the database. The PHP section retrieves the table that we stated and it gets the Items in that table and the values inside that Item as feedback then that gets echo to be displayed on the webpage. When feedback is submitted, the writeData.php file is run by action.

## Steps:

1. Connect to the EC2 instance
2. Sign into root user: `sudo su -`
3. Enter the html folder: `cd /var/www/html`
4. Create a new PHP file: `nano readData.php`
5. Paste the code
6. Save the file

The screenshot shows a terminal window within the AWS CloudShell interface. The terminal output is as follows:

```
Last login: Fri Dec 9 07:10:16 2022 from ec2-18-206-107-28.compute-1.amazonaws.com
[Alt+S] | 
[Amazon Linux 2 AMI]
https://aws.amazon.com/amazon-linux-2/
2 package(s) needed for security, out of 2 available
Run 'sudo yum update' to apply all updates.
[ec2-18-206-107-28.compute-1.amazonaws.com]:~# sudo apt-get update
[ec2-18-206-107-28.compute-1.amazonaws.com]:~# 
[ec2-18-206-107-28.compute-1.amazonaws.com]:~# nano readData.php
[ec2-18-206-107-28.compute-1.amazonaws.com]:~# 
```

Below the terminal, the AWS CloudShell status bar shows:

i-0635e67917b02eaf8 (Honest-Feedback-Coming-Soon-Web-Server)  
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Feedback Looking for language selection? Find it in the new Unified Settings. © 2022, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

---

<sup>81</sup> Create a PHP file in directory

readData.php

```

1  <!DOCTYPE html>
2  <html>
3  <head>
4      <title></title>
5  </head>
6  <body>
7      <form action="writeData.php" method="post">
8          <input type="text" input="message" placeholder="Feedback" name="message">
9          <br>
10         <button type="submit" name="submit">Submit</button>
11     </form>
12     <?php
13         require 'vendor/autoload.php';
14
15         use Aws\DynamoDb\DynamoDbClient;
16
17         $client = DynamoDbClient::factory(array(
18             'region' => 'us-east-1',
19             'version' => 'latest'
20         ));
21
22         $tableName = 'Cotiss-Honest-Feedback-DB';
23
24         $response = $client->scan(array(
25             'TableName' => $tableName
26         ));
27
28         $items = $response->get('Items');
29
30         $feedback = $items[array_rand($items)];
31
32         echo '<p>' . $feedback['message'][0] . '</p>';
33     -?>
34     </body>
35     </html>

```

Services

readData.php

```

GNU nano 2.9.8
<!DOCTYPE html>
<html>
<head>
    <title></title>
</head>
<body>
<form action="writeData.php" method="post">
    <input type="text" input="message" placeholder="Feedback" name="message">
    <br>
    <button type="submit" name="submit">Submit</button>
</form>
<?php
require 'vendor/autoload.php';
use Aws\DynamoDb\DynamoDbClient;
$client = DynamoDbClient::factory(array(
    'region' => 'us-east-1',
    'version' => 'latest'
));
$tableName = 'Cotiss-Honest-Feedback-DB';
$response = $client->scan(array(
    'TableName' => $tableName
));
$items = $response->get('Items');
$feedback = $items[array_rand($items)];
echo '<p>' . $feedback['message'][0] . '</p>';
-?>

```

File Edit View Insert Cell Help

Get Help Write Out Where Is Cut Text Justify Our Pos Undo Mark Text To Bracket Previous Back Prev Word

Exit Read File Replace Undo Text Go to Spell Go to Line Redo Copy Text Whereis Next Next Forward Next Word

i-0635e67917bd02ef8 (Honest-Feedback-Coming-Soon-Web-Server)

Public IP: 34.229.200.49 Private IP: 172.31.22.29

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82

<sup>82</sup> Copy the code into the file and save it

```
readDataFinal.php
<!DOCTYPE html>
<html>
<head>
    <title></title>
    <style>

        div form {
            width: 100%;
            display: flex;
            flex-direction: column;
            justify-content: center;
        }

        div form * {
            margin: 0.5rem 0;
        }

        div form label {
            font-size: 1.2rem;
            margin-bottom: 0;
        }

    </style>
</head>
<body>
<div style="position:left;margin:0px;">
    <div
        style="opacity:1;position:absolute;left:0px;top:-30px;width:100%;height:140px;background-color:#2B2D42">

        <center>
            <h1
                style="color:#05ca86;font-size:4rem;margin-top:-0.5rem;font-family:sans-serif;">Honest
                Feedback</h1>
        </center>
    </div>

    <div style="margin:10rem auto;width:20%;margin-top:10rem;">
        <form action="writeDataFinal.php" method="post">
            <textarea style="height:10rem;font-family:sans-serif;" placeholder="insert your
            feedback here" name="message"></textarea>
            <br>
            <button style="margin:3px;height:3rem;background-color:#05ca86;border:1px
            solid #05ca86;border-radius:4px;color:white;font-size:2rem;cursor:pointer;" type="submit"
            name="submit">Submit</button>
        </form>
    </div>
</body>
```

```
</div>
<?php
require 'vendor/autoload.php';

use Aws\DynamoDb\DynamoDbClient;

$client = DynamoDbClient::factory(array(
    'region' => 'us-east-1',
    'version' => 'latest'
));

$tableName = 'Cotiss-Honest-Feedback-DB';

$response = $client->scan(array(
    'TableName' => $tableName
));

$items = $response->get('Items');

$feedback = $items[array_rand($items)];

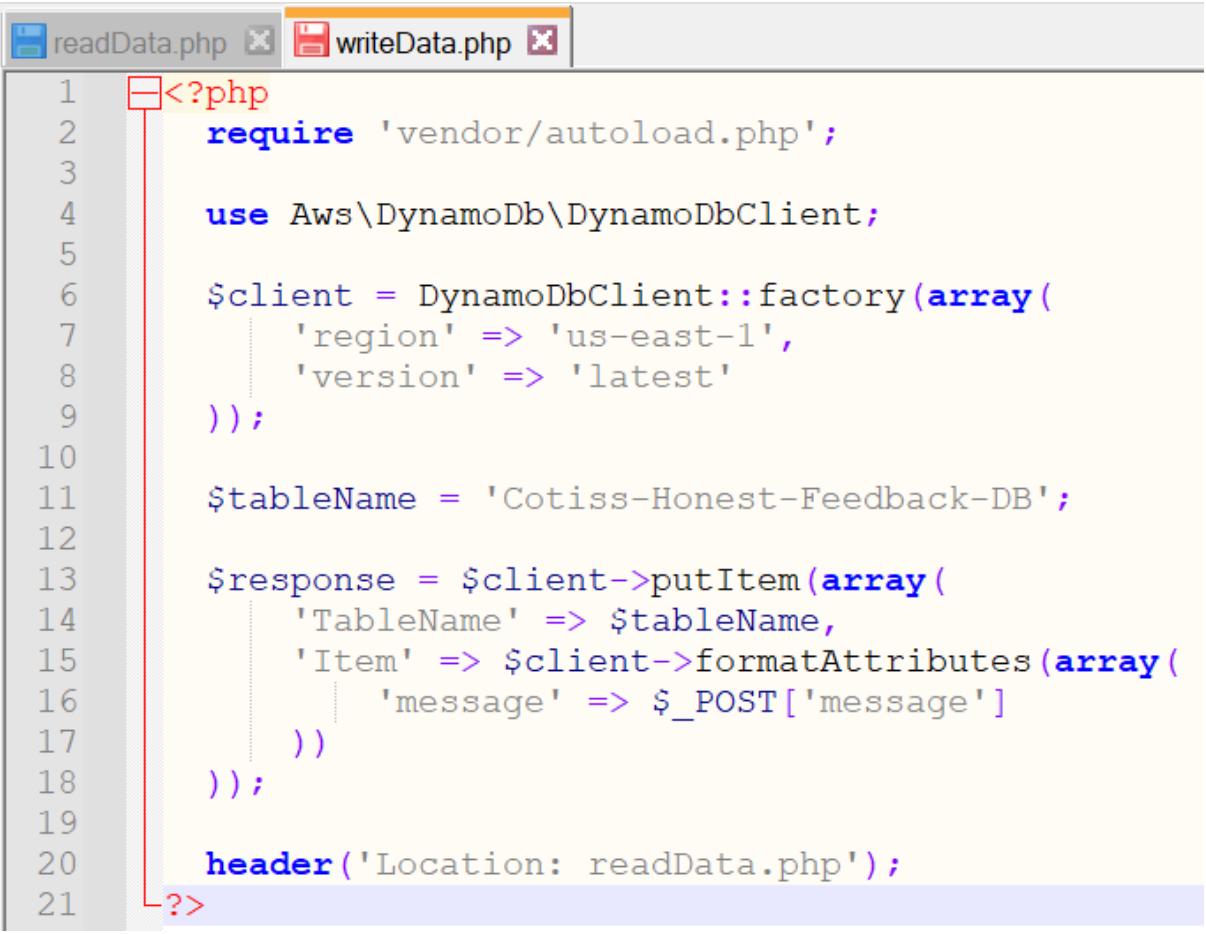
echo '<p>' . $feedback['message']['S'] . '</p>';
?>
</body>
</html>
```

# Coding to write to DB using PHP:

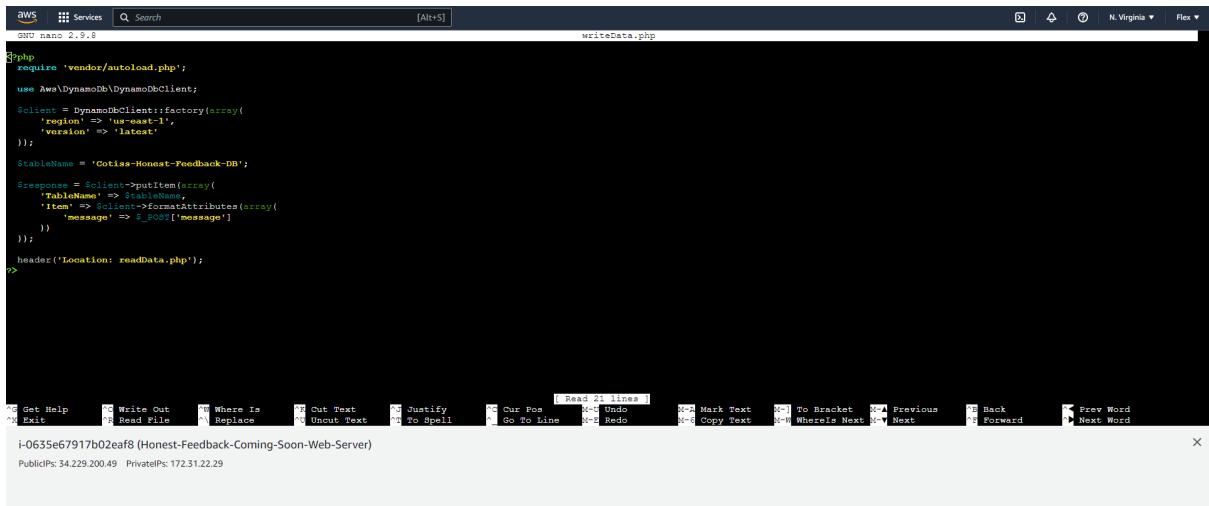
writeData.php creates a client with the factory method. We then enable adding items to the database by using the putItem() method and we state the table name, primary key, and the message we want to add as the response. Then we assign the header to being the readData.php

## Steps:

1. Create a new PHP file: *nano readData.php*
2. Paste the code
3. Save the file
4. View files: *ls*
5. Create dynamoDB database
6. Run the scripts
7. Check DB for Items



```
1 <?php
2     require 'vendor/autoload.php';
3
4     use Aws\DynamoDb\DynamoDbClient;
5
6     $client = DynamoDbClient::factory(array(
7         'region' => 'us-east-1',
8         'version' => 'latest'
9     ));
10
11    $tableName = 'Cotiss-Honest-Feedback-DB';
12
13    $response = $client->putItem(array(
14        'TableName' => $tableName,
15        'Item' => $client->formatAttributes(array(
16            'message' => $_POST['message']
17        ))
18    ));
19
20    header('Location: readData.php');
21 ?>
```



```

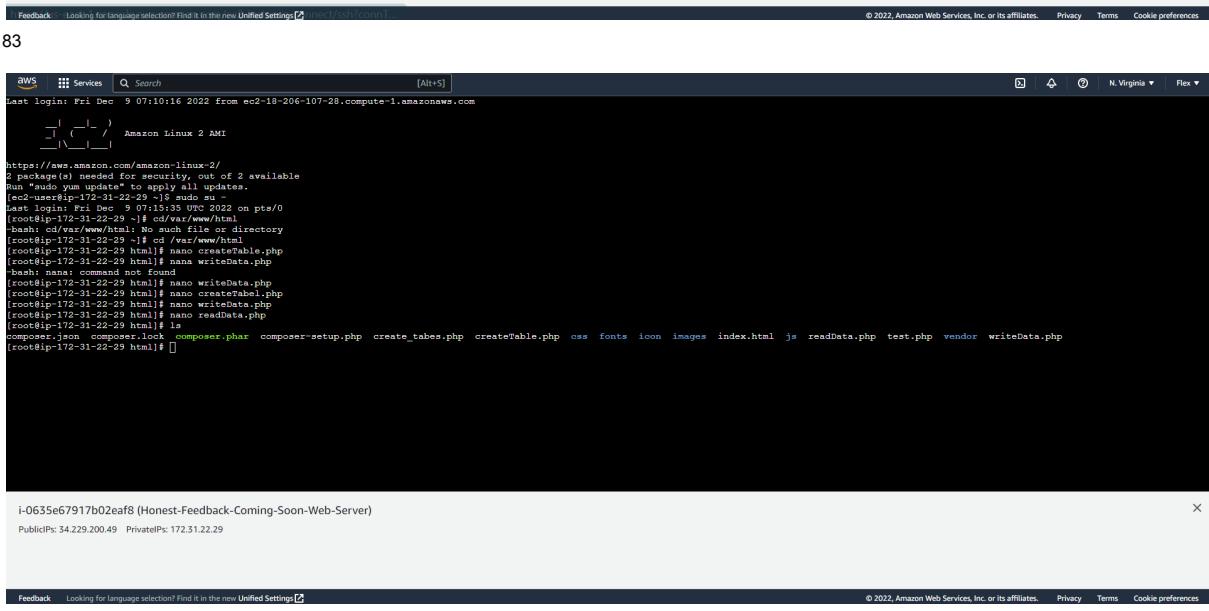
AWS Services Search [Alt+S] N. Virginia Flex ▾
[SN3] name 2.9.9 writeData.php
[php
require 'vendor/autoload.php';
use Aws\DynamoDb\DynamoDbClient;
$client = DynamoDbClient::factory([
    'region' => 'us-east-1',
    'version' => 'latest'
]);
$TableName = 'Cotiss-Honest-Feedback-DB';
$response = $client->putItem([
    'TableName' => $TableName,
    'Item' => $client->formatAttributes([
        'message' => $_POST['message']
    ])
]);
header('Location: readData.php');
>>

```

Get Help Write Out Where Is Cut Text Justify Cur Pos Read 21 lines Undo Mask Text To Bracket Previous Back Prev Word  
X Exit Read File Replace Uncut Text To Spell Go To Line Redo Copy Text Where's Next Next Forward Next Word

i-0635e67917b02eaf8 (Honest-Feedback-Coming-Soon-Web-Server)  
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```

AWS Services Search [Alt+S] N. Virginia Flex ▾
Last login: Fri Dec 9 07:10:16 2022 from ec2-18-206-107-28.compute-1.amazonaws.com
[ec2-user@ip-172-31-22-29 ~]$ sudo su -
[ec2-user@ip-172-31-22-29 ~]$ cd /var/www/html
[ec2-user@ip-172-31-22-29 ~]$ nano createTable.php
[ec2-user@ip-172-31-22-29 ~]$ nano writeData.php
[ec2-user@ip-172-31-22-29 ~]$ nano readData.php
[ec2-user@ip-172-31-22-29 ~]$ ls
composer.json composer.lock composer.phar composer-setup.php create_table.php css fonts icon images index.html js readData.php test.php vendor writeData.php
[ec2-user@ip-172-31-22-29 ~]$ [ ]

```

i-0635e67917b02eaf8 (Honest-Feedback-Coming-Soon-Web-Server)  
PublicIPs: 34.229.200.49 PrivateIPs: 172.31.22.29

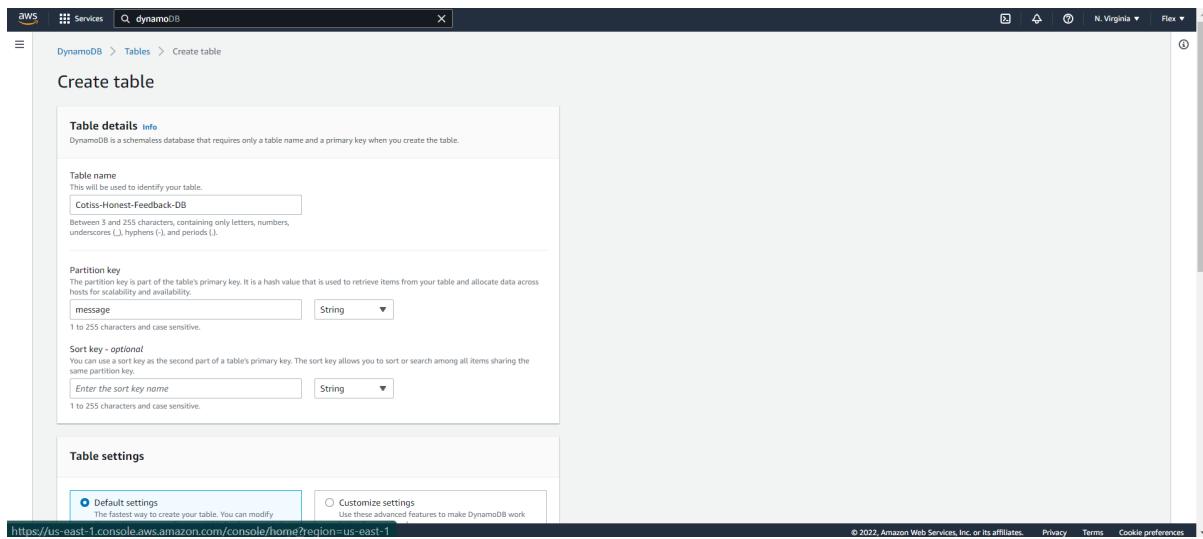
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83

84

<sup>83</sup> Copy the next set of code into a new file like in the previous step

<sup>84</sup> List all files to check if both have been created successfully



85

## writeDataFinal.php

```
<?php
require 'vendor/autoload.php';

use Aws\DynamoDb\DynamoDbClient;

$client = DynamoDbClient::factory(array(
    'region' => 'us-east-1',
    'version' => 'latest'
));

$tableName = 'Cotiss-Honest-Feedback-DB';

$response = $client->putItem(array(
    'TableName' => $tableName,
    'Item' => $client->formatAttributes(array(
        'message' => $_POST['message']
    ))
));
header('Location: readDataFinal.php');
?>
```

---

<sup>85</sup> Create a DynamoDB table

# How much would this cost a month?:

## Chargeable services:

1. Load Balancer
2. EC2 Instance
3. DynamoDB Table

## Non-chargeable services:

1. Auto Scaler
2. IAM user
3. Billing Alerts
4. CLI
5. AMI
6. Launch Configurations
7. Launch Template
8. IAM Role
9. PHP & Composer

Total Monthly Cost:  $8.26(x2) + 22.27 + 28.64 = 67.43 \text{ USD}$

=> 105.46 NZD

The screenshot shows the AWS Pricing Calculator interface. At the top, it displays "My Estimate" and "Edit". Below this, the "Estimate summary" section shows the following details:

Upfront cost	Monthly cost	Total 12 months cost
0.00 USD	8.26 USD	<b>99.12 USD</b> Includes upfront cost

To the right, there is a "Getting Started with AWS" sidebar with "Contact Sales" and "Sign in to the Console" buttons. Below the summary, the "My Estimate" table lists one item:

Service Name	Upfront cost	Monthly cost	Description	Region	Config Summary
Amazon EC2	0.00 USD	8.26 USD	-	US East (N. Virginia)	Operating syste...

At the bottom of the page, there are links for "Privacy", "Site terms", "Cookie preferences", and a copyright notice: "© 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved."

86

<sup>86</sup> Cost from using Amazon EC2

aws pricing calculator

AWS Pricing Calculator > My Estimate

My Estimate [Edit](#)

**Estimate summary [Info](#)**

Upfront cost 0.00 USD	Monthly cost 22.27 USD	Total 12 months cost <b>267.24 USD</b> Includes upfront cost
--------------------------	---------------------------	--

**Getting Started with AWS**

[Contact Sales](#) [Sign in to the Console](#)

**My Estimate**

<input type="checkbox"/> Service Name	▲	Upfront cost	▼	Monthly cost	▼	Description	▼	Region	▼	Config Summary	▼
<input type="checkbox"/> Elastic Load Balancing	<a href="#">Edit</a>	0.00 USD		22.27 USD		-		US East (N. Virginia)		Number of Appli...	

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87

aws pricing calculator

AWS Pricing Calculator > My Estimate

My Estimate [Edit](#)

**Estimate summary [Info](#)**

Upfront cost 180.00 USD	Monthly cost 28.64 USD	Total 12 months cost <b>523.68 USD</b> Includes upfront cost
----------------------------	---------------------------	--

**Getting Started with AWS**

[Contact Sales](#) [Sign in to the Console](#)

**My Estimate**

<input type="checkbox"/> Service Name	▲	Upfront cost	▼	Monthly cost	▼	Description	▼	Region	▼	Config Summary	▼
<input type="checkbox"/> Amazon DynamoDB	<a href="#">Edit</a>	180.00 USD		28.64 USD		-		US East (N. Virginia)		Table class (Stan...	

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88

<sup>87</sup> Cost from using Elastic load balancing  
<sup>88</sup> Cost from using DynamoDB

# How would you scale this architecture?:

## **Availability Scaling:**

If we want the server to be more available we can change the parameters in the auto scaler. Say we want 3 instances in 3 different availability zones then we would add another availability zone and then change the Desired, Maximum, and Minimum parameters all to 3.

## **Load balancer Scaling:**

If we wanted to load balance between more instances we would add more instances to our target group so traffic would be balanced among more instances.

## **EC2 Instances Scaling:**

If we wanted to change the parameters of our EC2 instances we can just change the launch template which the auto scaling group uses. This will cause the new instances created to have the new desired parameters.

## **DynamoDB Tables Scaling:**

If we want to scale our database we need to attach it to an auto scaler and set the minimum and maximum levels of read and write capacity for our dynamoDB table. We will also need to set the target utilisation percentage which defines the ratio of consumed capacity compared to provisioned capacity.

# How would the costs change as a result?:

## **Availability Cost:**

By increasing the amount in the auto scaling group parameters more EC2 instances will be running to increase the availability of the web-server. Each EC2 instance is 8.26 USD so each incremental increase in the number of available instances will increase the monthly cost by that amount.

## **Load balancer Cost:**

The higher the traffic of clients to the web-server the more connections are made to the EC2 instances there will be and the more interested those clients are the longer the connection time to the instance will be. This means that the cost of the load balancer largely depends on the client's willingness and passion to leave anonymous feedback. Currently the processed GB per hour is 1 costing us 22.27 USD a month.

## **EC2 Instances Cost:**

For this web-server I have selected a t2.micro instance type with 1GB of memory, 1 CPU. I have also provisioned 2GB of storage. It is unlikely that storage would be increased as most of the data is stored in the dynamoDB table. The average cost for t2.micro instance is \$9.50 USD per month. A t2.small is \$19.00 USD indicating that prices are exponential as size increases.

## **DynamoDB Tables Cost:**

One dynamoDB table charges \$0.25 USD per GB a month. I have provisioned the table to have 10GB so we are looking at \$2.50 USD per GB a month. If we wish to add more storage we would add \$0.25 USD to the current amount. Write operations cost \$1.25 per million requests. Read operations cost \$0.25 per million requests so the provisioned amount of storage is the most influential cost of using dynamoDB tables.

# Technical Support Contact Information:

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Phone: 022 042 6304