

Deploying Web site of a small-scale Fashion Retailer

Business Case Scenario

A small-scale fashion retailer plans to have their presence on the web by starting their own web site. Currently they have a set of static web pages which they want to deploy on their web site. Followed by this they would like to add more functionality and make their web site interactive with a database backend to store data of their apparels and other merchandise.

Attached is the sample content that they would like to see on their web site to begin with.

They have decided to use a cloud platform for their web site and selected AWS as their choice. They also have got a domain name *pgcpb8.ml* allocated for their web site.

Problem Statement

You have to decide on the infrastructure that should be used for this web site then get it up and running with the given sample content. The web site is expected to have high-availability and handle large number of visits with reasonable response time even when the load increases.

You need to determine and implement:

- a) Environment i.e. EC2 instance or S3 on which the content is to be hosted
- b) Address other non-functional requirements such as scaling up with increasing visitor load mentioned above
- c) Make sure that when *pgcpb8.ml* or *www.pgcp.ml* is given on a browser it brings up these sample web pages.

List of Resources and References

1. LMS Videos on:
 - EC2 Instance, Web server deployment
 - Load balancers and Auto scaling
 - Route 53 and DNS services
2. Webinar sessions on the above topics
3. <https://my.freenom.com/> and <http://www.dot.tk> for more information on the domain name mentioned above and to manage the DNS list.

Implementation Guide

Steps Involved:

Below are the steps to be followed. Details of each task listed in these steps are also given.

Under EC2 Service

1. Launch an Ubuntu EC2 Instance with Apache2 web server installed
 - Go to EC2 Service on AWS Console.
 - On left navigation pane click on Instances under Instances dropdown. And click on Launch Instance button at the top.
 - Now right pane of the page Search for Ubuntu and select the free tier eligible Ubuntu Server 18.04 LTS.
 - In Step 3. Configuration Details, under Advanced Details give the following shell commands to install Apache 2 web server

```
#!/bin/bash

sudo apt-get update

sudo apt-get install apache2 -y
```
 - Proceed to next steps on the page. On Step 6 Configure Security Group make sure you select Add Rule and select HTTP in the Type and Custom 0.0.0.0/0, :::/0 in Source. If you have an existing security group with this rule added with these specified you can use existing security group.
 - You can now review and launch the instance.
 - Once the instance comes up you can copy the DNS name or the IP address. Enter it in a browser window and ensure that the Apache web server's default page comes up.
 - Now you need to transfer the web pages provided in the zip file to this EC2 instance. You can use WinSCP or Filezilla for this if you are using a laptop with Windows OS. You need to use the same PPK file which is used to login with Putty or any SSH tool to the EC2 instance. Then you can drag and drop the files.
 - On Mac OS you can use sftp command for file transfer. You need to use the same PEM file that is used for ssh command for this. After connecting to your EC2 instance with sftp you can use the command put to transfer the files to the EC2 instance.
 - For file transfer you can unzip the files on your laptop and transfer them to the EC2 instance. Alternatively you can use unzip command on the EC2 instance to unzip them.

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- The files contain an HTML file and a directory with CSS and JavaScript files. You need to copy them to Apache2 web server's html directory using the commands below.

```
sudo cp open_close.html /var/www/html/index.html
```

```
sudo cp open_close -R /var/www/html/
```

- Now on a new browser tab or window enter the DNS name or IP address of the EC2 instance. You should see the new web pages with its images.
- Now you are ready to take the image of this instance.

2. Create an image (AMI) of the above instance

- You can by selecting the EC2 instance, Clicking on Actions button on top and then selecting Image → Create Image
- Give a name to this AMI image and make a note of this name for later use.

3. Create an Application Load Balancer

- On the left pane further down select Load Balancers
- Click on the button Create Load Balancer button on top. From the page that appears click on Create button under Application Load Balancer
- In the next page give a name for the Load Balancer. Make sure you select multiple availability zones.
- In Configure Security Group select the radio button Create New Security Group. Give a name like my-load-balancer and make a note of this name for later use. In the Type select HTTP protocol, and go to next step.
- In Configure Routing step, create a Target Group by giving a name of your choice. In the next step do not register any target instances. Proceed to Review step and complete creating the Load Balancer.
- After it is completely created Copy the DNS name of the Load Balancer in a notepad for later use.

4. Create a Launch Configuration

- On the left pane scroll down and Select Launch Configuration under Auto Scaling
- Now on the right pane click on the button Create Launch Configuration at the top.
- Click on My AMIs and select the AMI you created in the previous step.
- Proceed to next steps. In the step Configure Security Group, choose the radio button option Create a New Security Group. Give a name for the group.

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- And in Type dropdown select HTTP; in Source field dropdown select Custom IP and in the text box enter the Security Group name of Load Balancer you noted down earlier.
- Now Review and Create the Launch Configuration.
- This specifies that the instances will be launched from the AMI image and the traffic coming into to them will be only from the Load Balancer, which is what we require.

5. Create an Auto Scaling Group

- In the last task of the above step you will see an option Create Auto Scaling Group using this Configuration. You can select it.
- (Alternatively on left navigation pane select the option Auto Scaling Group and click on the button Create Auto Scaling Group on top of the page that appears.)
- Give a name for the group. Enter 2 for group size. Choose the multiple subnets which you had selected in the previous step.
- Under Advanced Details – Select the checkbox Load Balancing. For the field Target Groups select the target group you created in the earlier steps; For Health Check Type choose ELB radio button.
- In Configure Scaling Policies select the radio button Keep this group at its initial size.
- Now proceed to further steps and review and launch the Auto Scaling Group.
- You will notice that two instances of EC2 get created.
- Once it is completely done, you can enter the DNS name of the Load Balancer on a browser's address bar. You should see the web pages coming up.

Under Route53 Service

1. Create a Hosted Zone with the given domain name
2. From the record set created select NS type record and copy the name server values and paste them in a notepad for later use
3. In the same hosted zone - Click on Create Record Set and create alias records – one with domain name and one more with www.<domain name>

Note: In Alias Target for both the above alias records select the Load Balancer which you had created in the previous step. And click on Create button.

Registering Domain Name with the provider

1. You can check for available domain name at <http://www.dot.tk/>

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Note: www.dot.tk is a non-secure site. So clicking on some links can result in opening a pop up or new tab on your browser. Close the new tabs/pop-up as they may carry irrelevant ads and some maybe potentially damaging. Though most of the time they will be ads.

2. Once you select a domain name like pgcpb8.ml or something similar, checkout ensuring that it is coming at 0 dollars.
3. Login with your gmail id as it takes you to the web site <https://freenom.com>
4. On Freenom web site complete the process of registering the domain name you selected above.

If you do not find the domain name you selected in the previous step then select Services option in the top menu on Freenom web page, and then select Register New Domain. Enter the domain name you selected and click on Check Availability.

After this is done you can complete the process of registering the domain name.

5. You can now select on Services → My Domains option from the top menu and then click on Manage Domain option that appears against your domain name towards the right.
6. Then select Management Tools → Name Servers
7. On the following page select Use Custom Name Servers and enter the name servers that you have noted down from Route 53 Service.
8. Click on the Change Name Servers button at the bottom.

Now your domain name will be propagated to the DNS servers. You can now open a browser window or tab and in the address bar enter the domain name you selected and registered. The web page should show up on your browser.

If you have added a second alias record in Route 53 for www.<your domain name> then you can use it as the web address (URL) as well. And it will bring up your web pages.