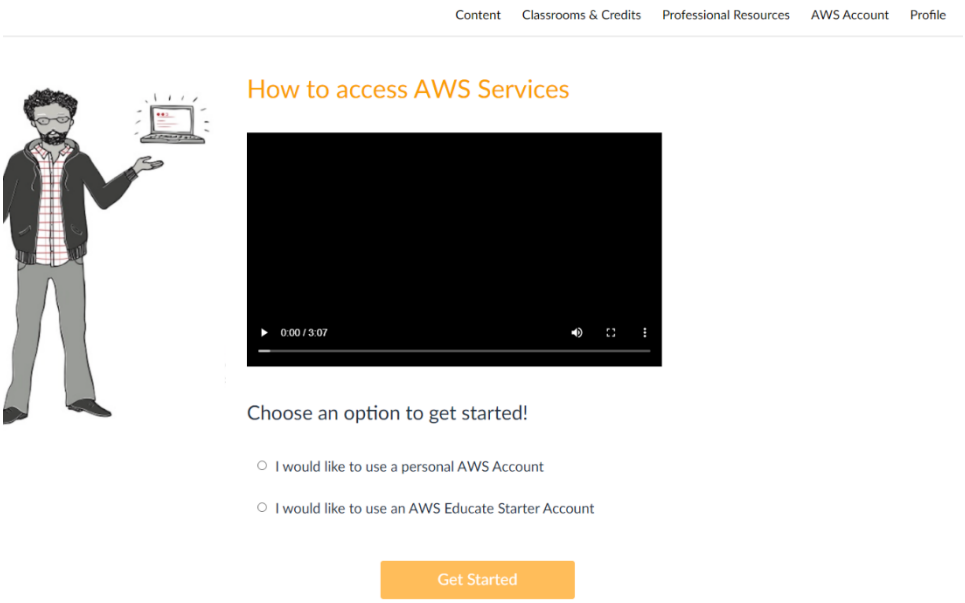
Introduction

- This guide is applicable to all students on the Network and Information Security Module (NISM). It describes how to set up a target website that can be used as the target of security scans and to allow students to potentially compromise and exploit it. With this in mind, it is important that students do NOT include any personally identifiable information or commonly used passwords on the site.
- On the module students will be assigned to a team/group to carry out the assignment – each team will also create a target site following the instructions in this guide. This target site will be used by one of the other teams to carry out their exercises. It is recommended that the assignment of sites be reciprocal, that is that a pair of teams test each other's target site. **A word of warning: these instructions utilise the 'free tier' provision of AWS. Hence, it is NOT recommended to leave the web sites running all day every day as this will result in all your free credits being consumed prematurely**. It is recommended that teams agree 'test periods' when web sites will be up and running and available for testing.
- This guide will cover:
    - how to set up a free AWS account,
    - how to set up security groups and keys,
    - how to obtain and upload the demo application,
    - how to modify security groups for optimum testing,
    - how to check and assign Elastic IP addresses,
    - how to check access, and
    - how to review, monitor and backup the application using the EB console.

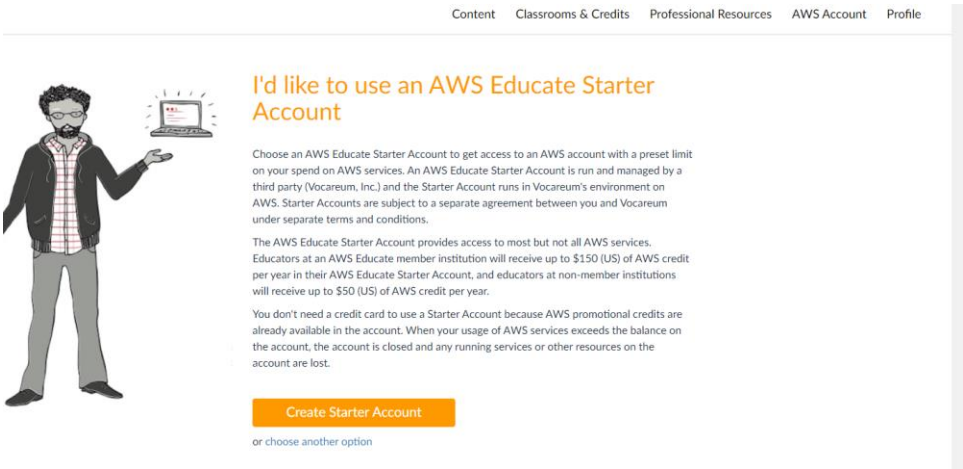
Sign up for AWS Educate

This first section will describe how to sign up for a free AWS Educate account using your **Essex University email account.**

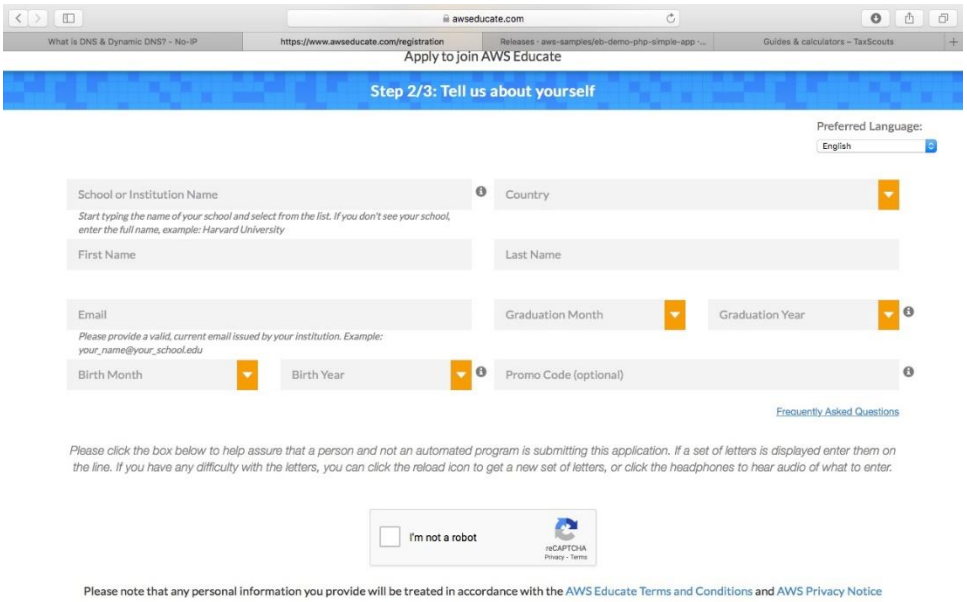


1. Go to the AWS Educate account at https://aws.amazon.com/education/awseducate/

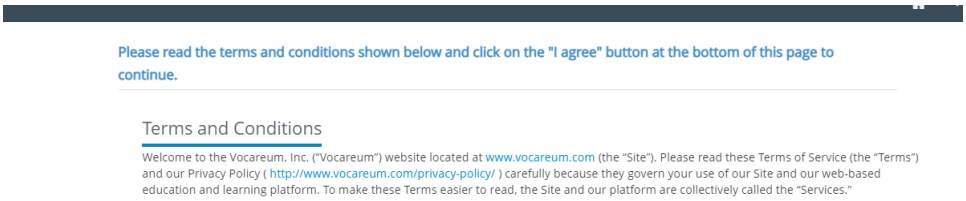
2. Choose the I would like to use an AWS Educate button
3. Click the Get Started button shown above.
4. On the first screen displayed, click on the Create Starter Account button - as shown below.



5. The screen below is then displayed:



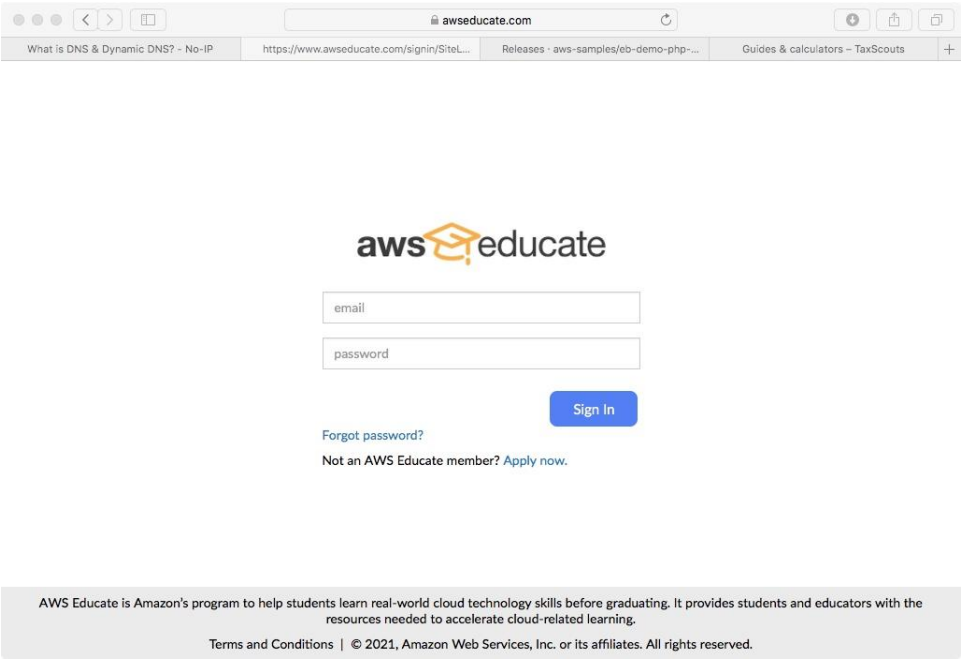
6. Complete **all** the boxes with your details using your Essex University details - **specify the 'University of Essex' as the institution and use your Essex email address**. Click on the "I'm not a robot" captcha and then click on the *Next* button
7. On the next page, read and agree to the end user agreement and then click submit.



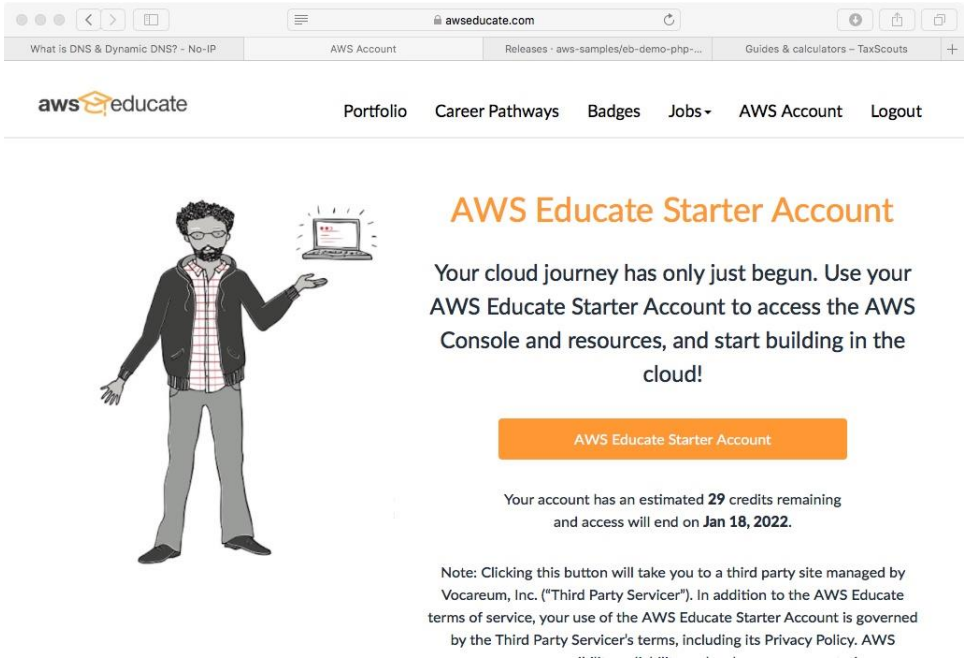
8. The web site will then send you an email. Click on the link to confirm your email address and activate your AWS Educate account.

Log in via the AWS Educate page

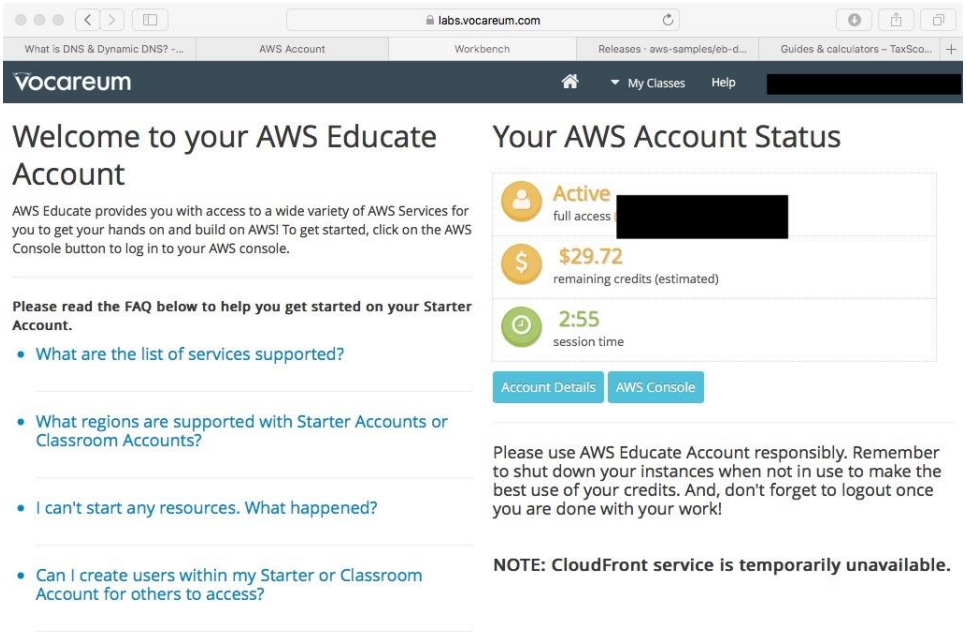
1. You will receive an email confirming your AWS Educate application has been approved. You will then have to set up a password for your account.
2. The email link will take you directly to the AWS Educate login page, but generally you can access your account from the main url: https://aws.amazon.com/education/awseducate/
3. This time click on the sign into AWS Educate link (below the main button)
4. The screen below is displayed:



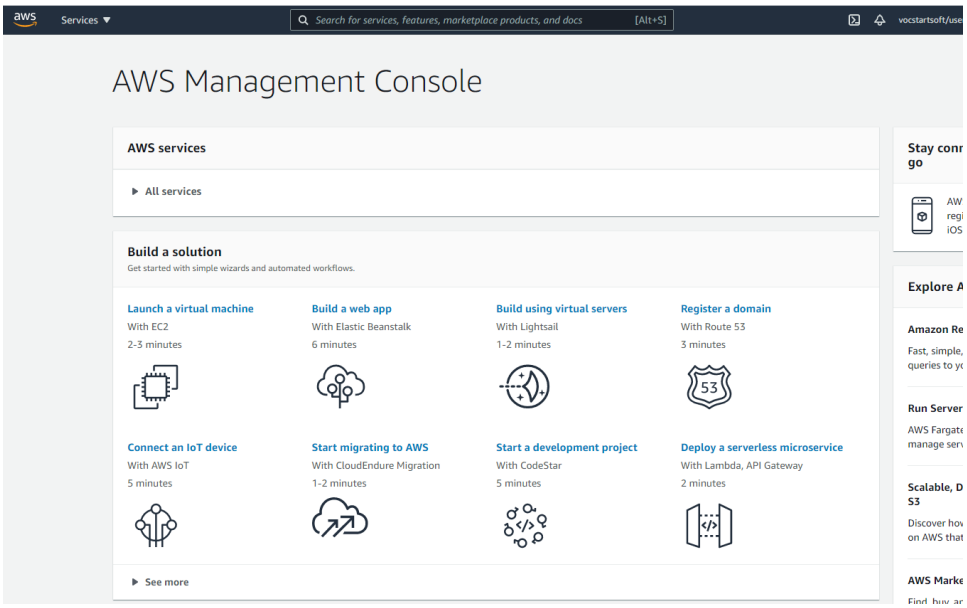
5. Enter your university email and your password.
6. The next screen displayed provides access to a number of AWS courses, allows you to upload your CV/create a portfolio and look for jobs related to AWS
7. On the menu bar at the top of the screen, click on the AWS account option, the screen below is displayed or you will be asked to choose an account – please choose the AWS Educate Starter Account:



8. Click on the button named AWS Educate starter account, the screen below is displayed:



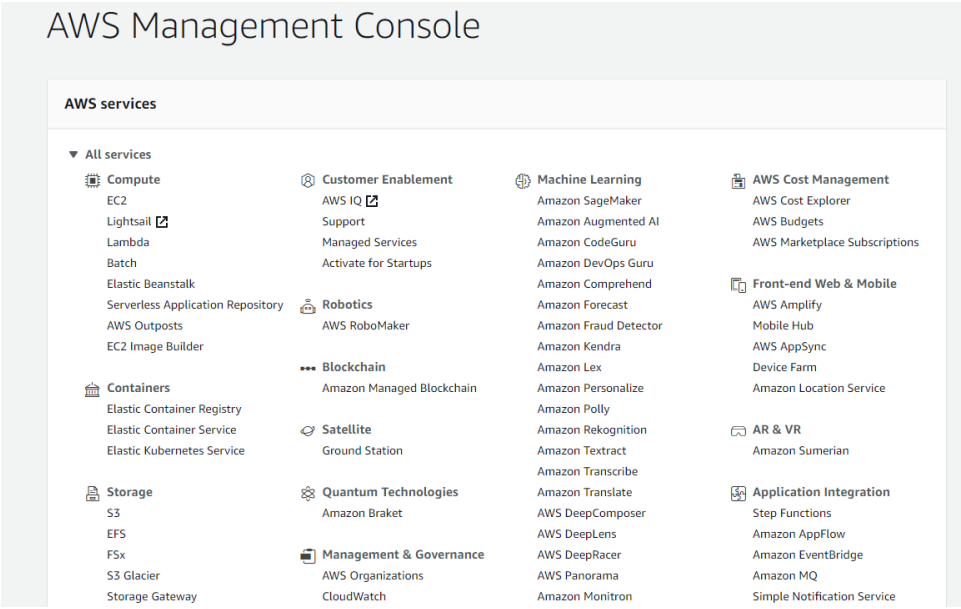
9. Click on the ***AWS console*** button to access the main account screen, shown below:



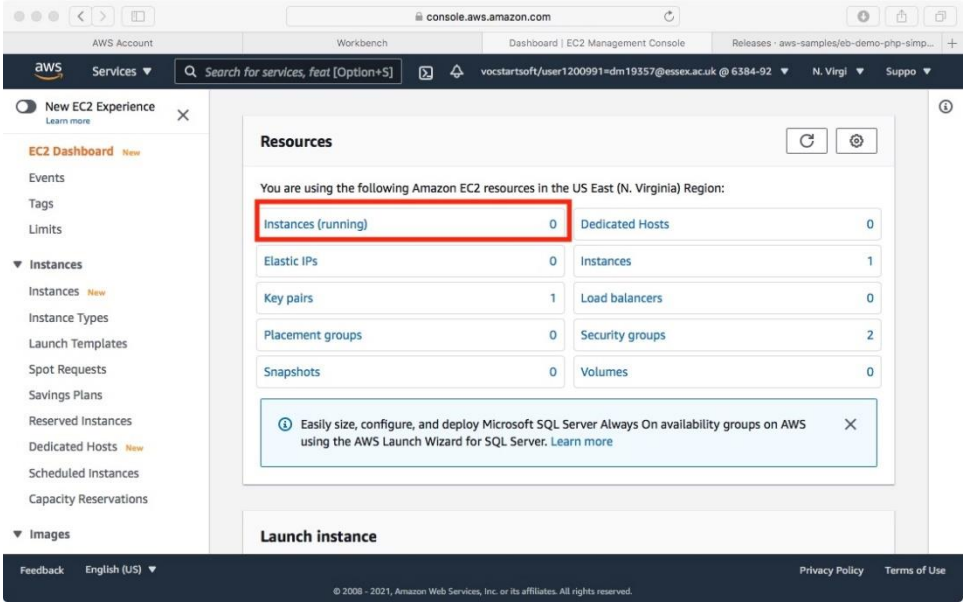
10. From this screen, there are a couple of housekeeping tasks that need to be done, which will be covered in the next section.

Initial Set Up

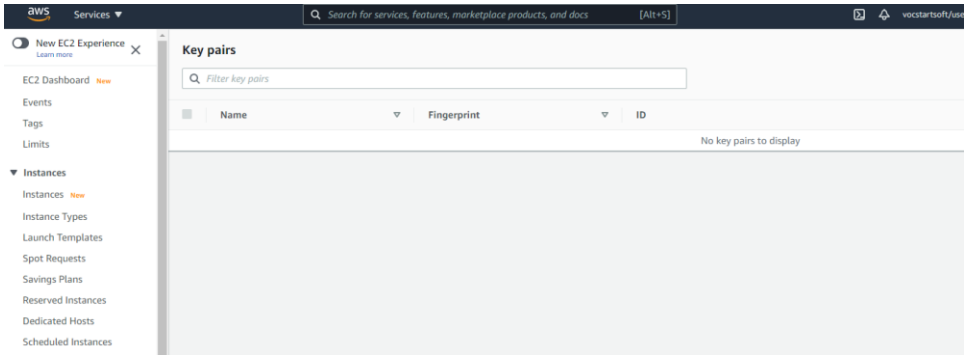
1. The first task is to set up keys for remote, secure access. Select the ***EC2*** option from the drop-down menu on AWS Services, and the screen below is displayed:



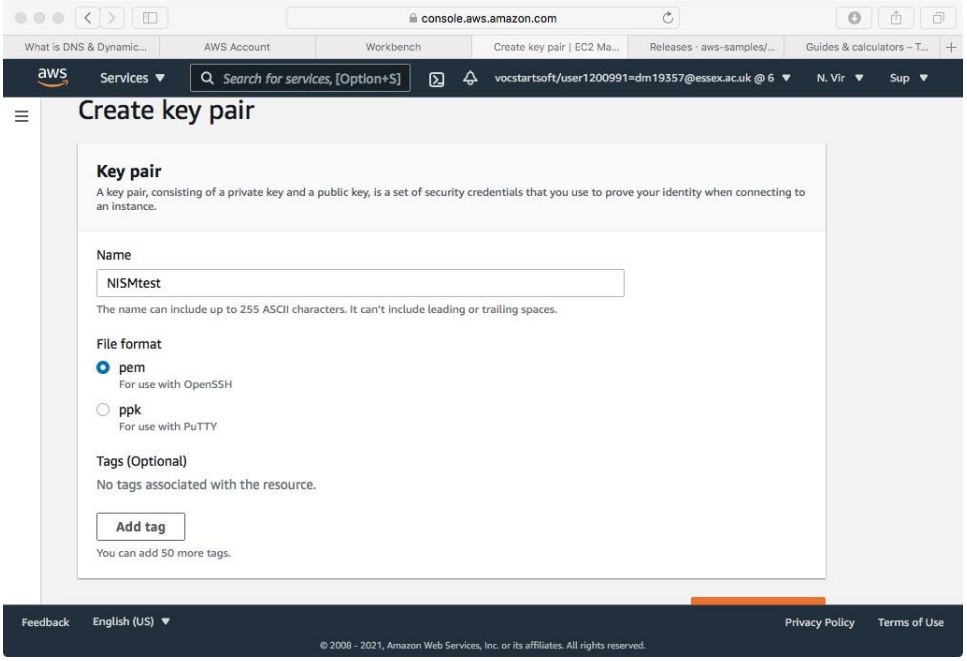
2. Initially the numbers should be “0” next to all the options. This is a crucial screen that you should refer to regularly as it tells you how many resources you have and, **most importantly**, how many are actually running (the ***Instances running*** button).



3. To set up your secure access keys, click on the ***Key pairs*** button and the screen below is displayed:



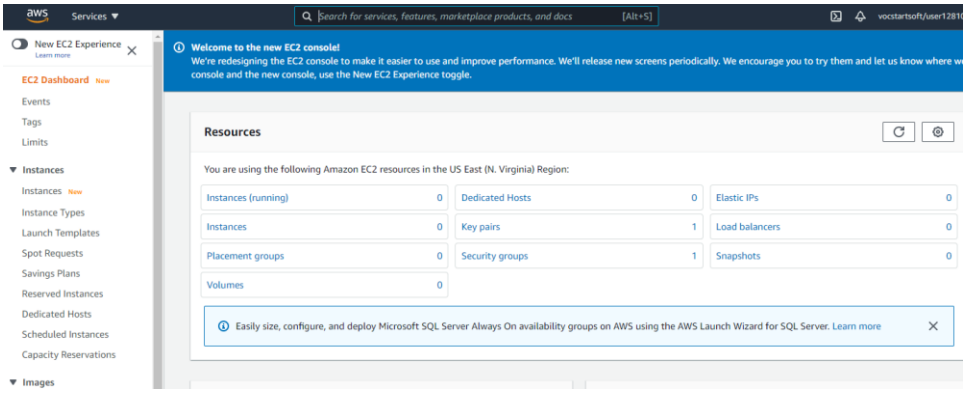
4. Click on the ***Create key pair*** button in the top right corner, the screen below is displayed:



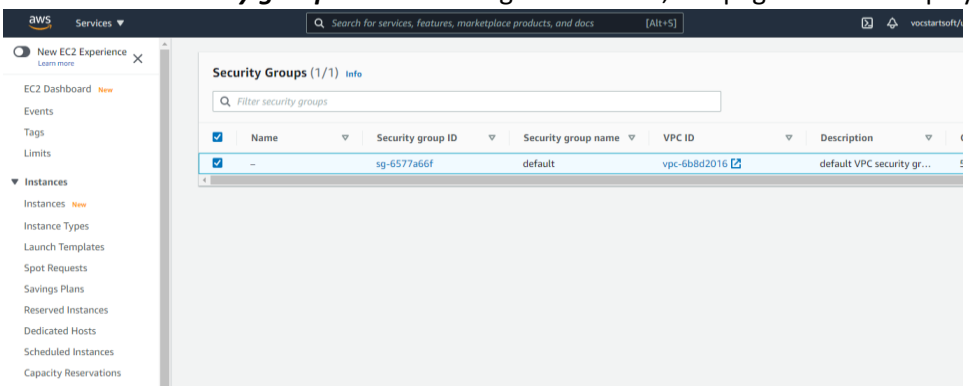
5. Name your key pair `NISMtest` and select the file format. If you are going to use a Unix/ MacOS machine to access the cloud, choose `PEM`. If you are going to use a Windows machine, then chose `PPK`. It will also give you the option to download your keys. If it does this, make sure to save them somewhere safe.

Create a security group

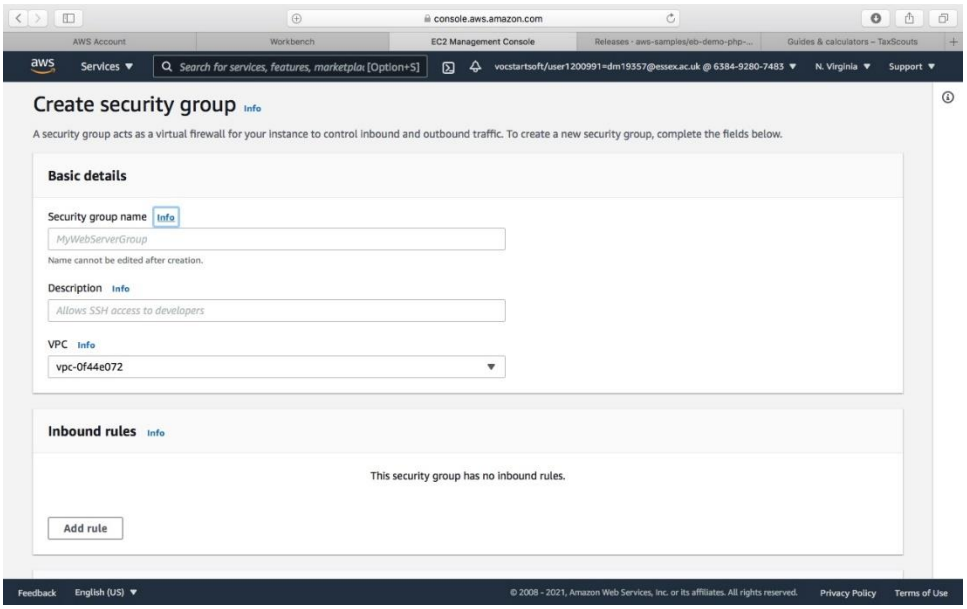
1. Return to the EC2 dashboard (there is a link in the left-hand column). The dashboard screen (shown below) should be displayed:



2. Click on the ***Security groups*** link on the right-hand side, the page below is displayed:

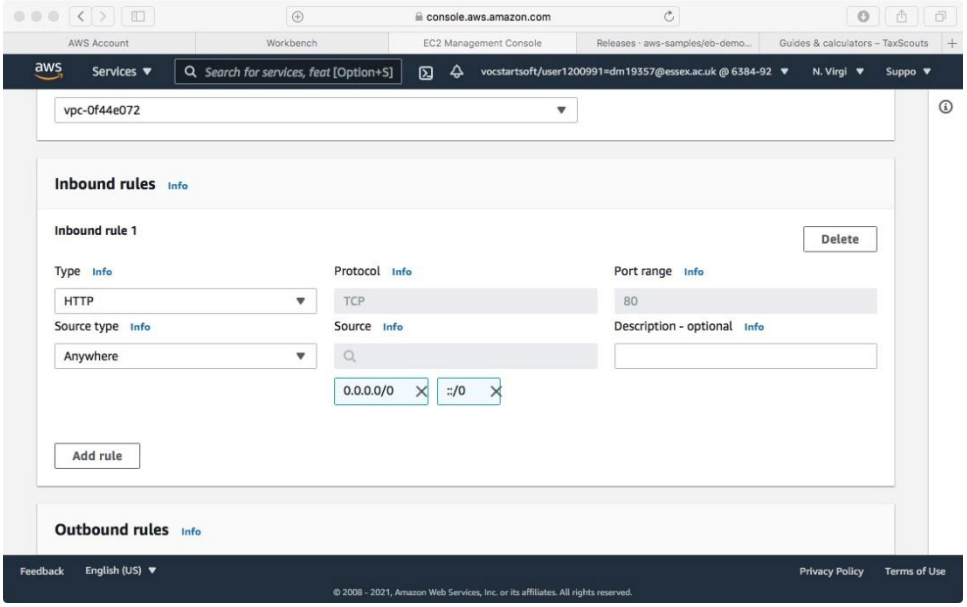


3. Click on the ***Create Security Group*** button (top right corner) - the screen below will be displayed:

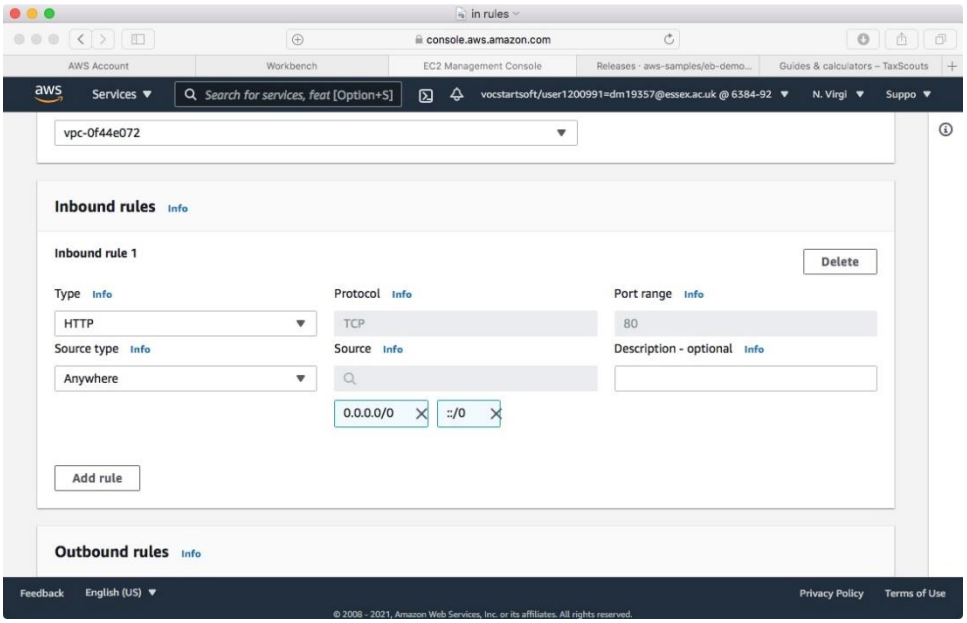


4. In the security group name box enter 'Main' and the description should be 'Allows HTTP, HTTPS and SSH access'. No other changes are needed in this section.
5. Then click on the ***Add rule*** button (you may need to scroll down to access it).

6. The screen below will be displayed:

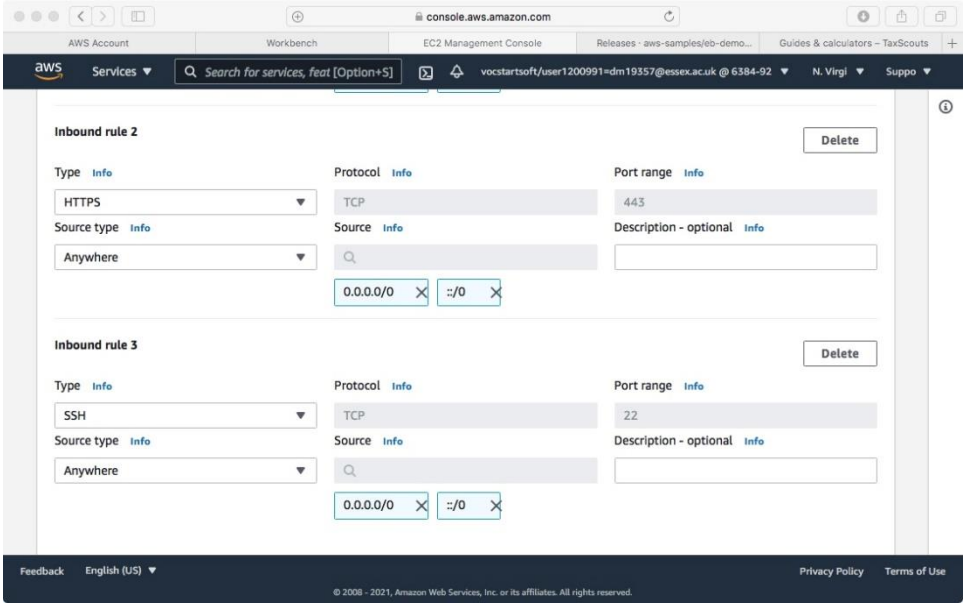


7. In the type dropdown choose ‘HTTP’, it will fill in `TCP` and `80` automatically.
8. Choose source type from the pulldown menu, and select ‘Anywhere’ (as shown) - it will automatically insert the source address/ mask.
9. Click Add Rule and the screen below is shown:

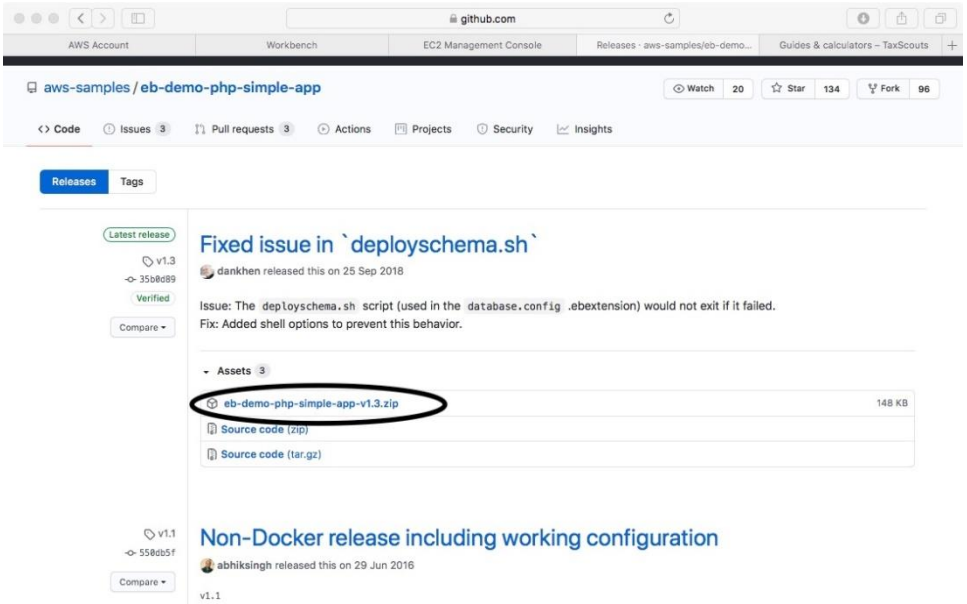


10. Repeat for rule 2, but use HTTPS instead of HTTP.
11. For Rule 3, chose SSH.

12. The two new rules should look as in the screenshot below:

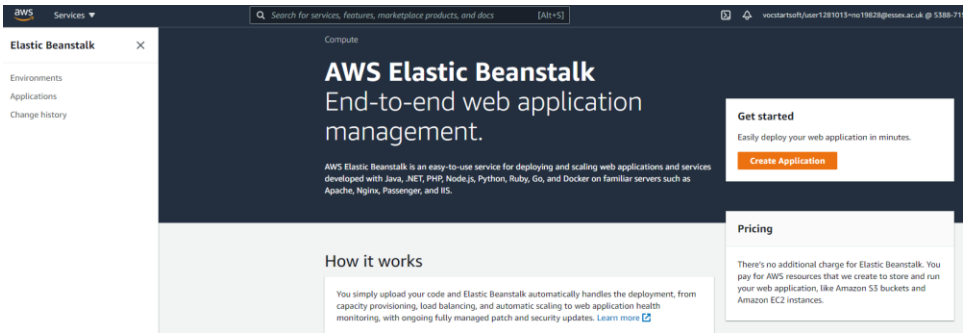


13. Click ***Create Security Group*** (you may need to scroll down to find the button).
14. Now you are ready to start creating your application.
15. First, download the demo app from https://github.com/aws-samples/eb-demo-php-simple-app/releases (At the time of writing the latest version was v1.3 as shown below):

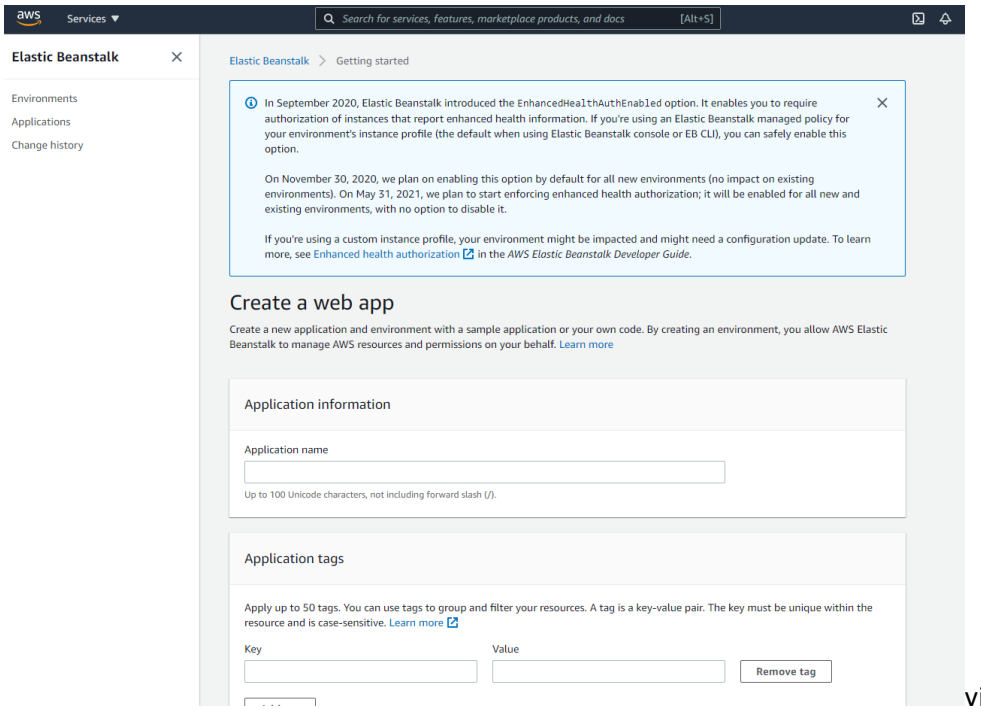


Create the Application in Elastic Beanstalk

1. In the AWS console (from the dropdown menu on the ***Services*** button, top left-hand corner), choose the Elastic Beanstalk option.



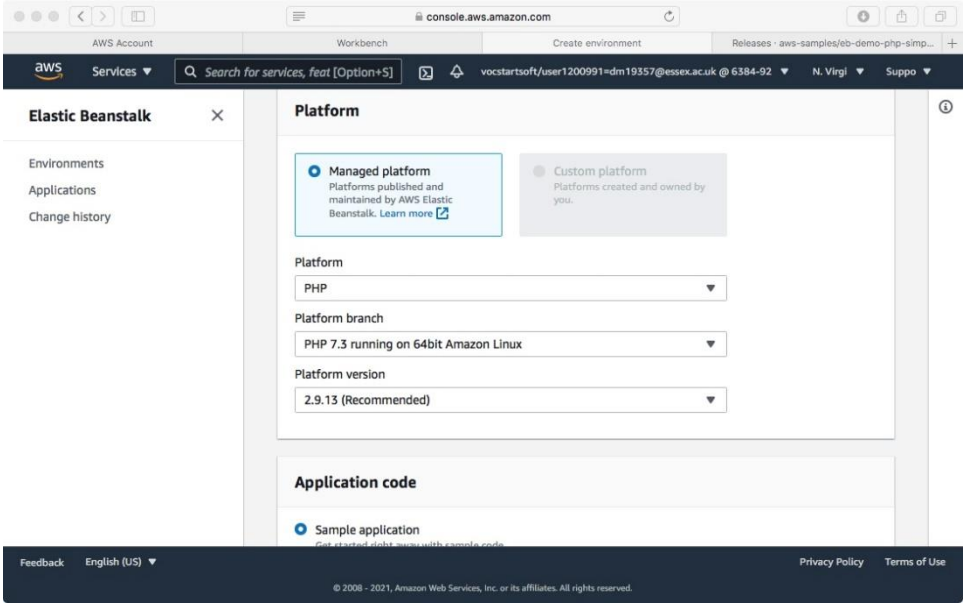
2. Click on the Create Application button shown above.



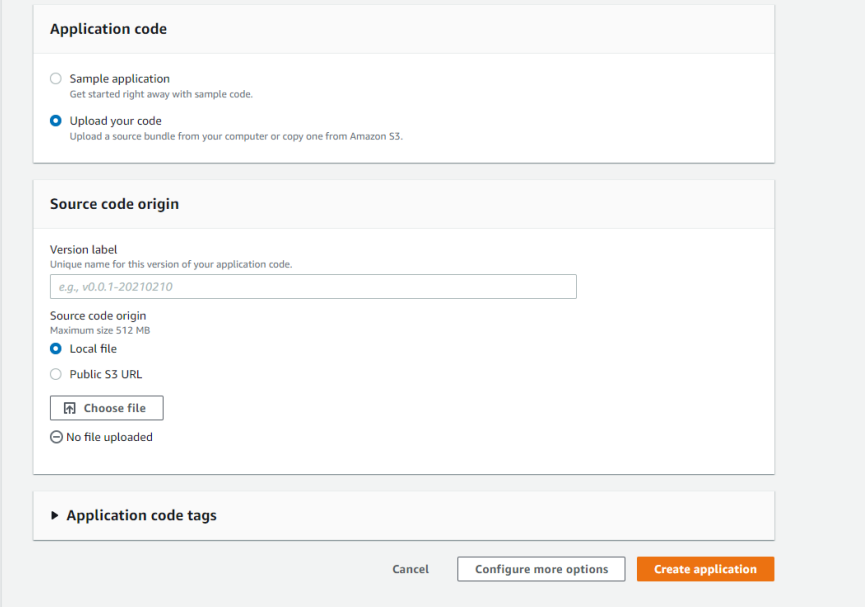
vi:

3. In the application name box type ‘NISMPHP’ and press enter.
4. Scroll down and check that the environment name box says ‘Nismphp-env’ (it should have entered that automatically).
5. Scroll down to the platform box, ensure that the ‘Managed Platform’ box is selected.
6. From the platform dropdown choose PHP – leave the version as default. Ensure you are running PHP 7.3 on 64 bit Amazon Linux (NOT Linux 2).

7. Your screen should now be as shown below:

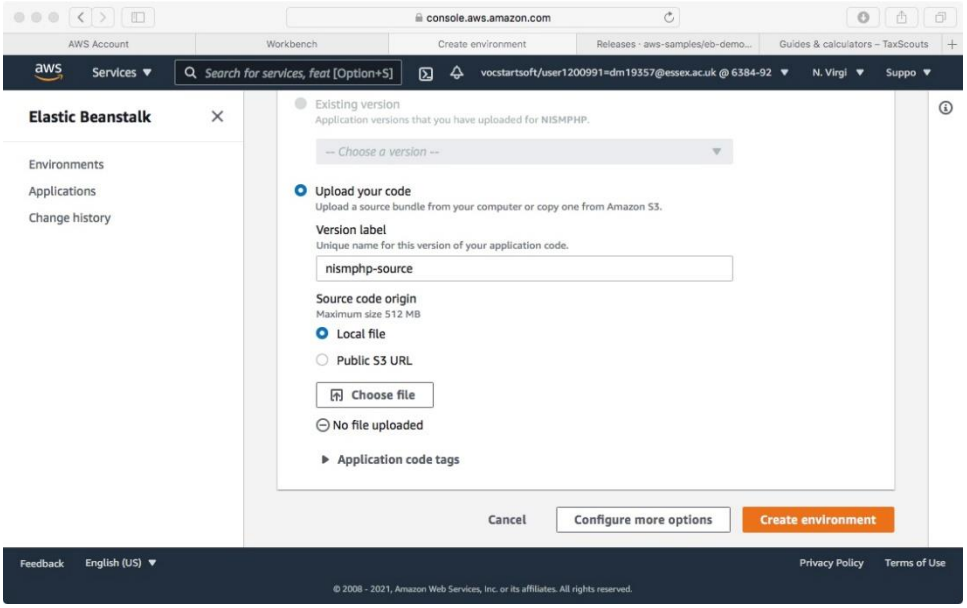


8. The next section is where you upload the demo code.

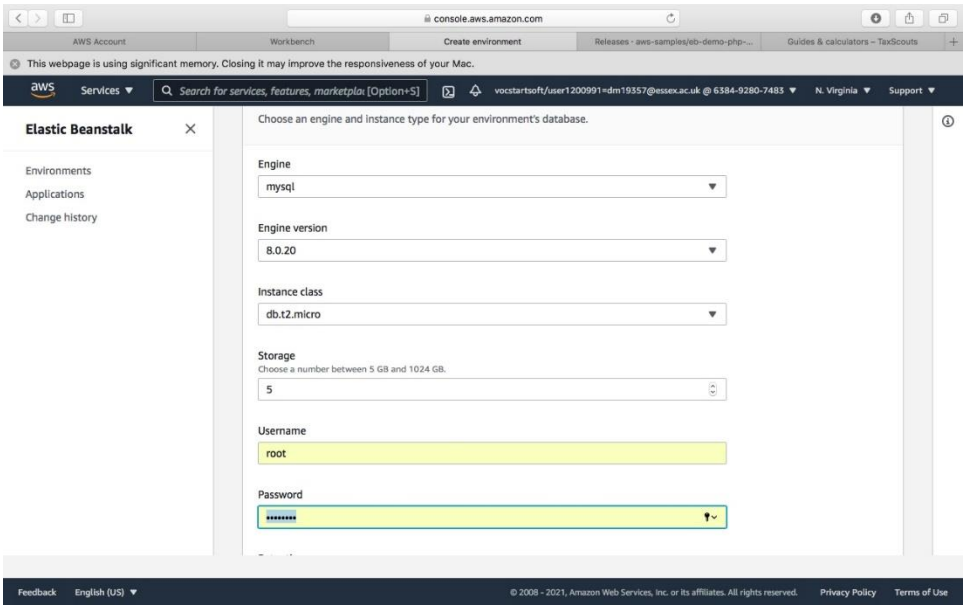


9. Click on upload your code, it should populate the version label automatically.

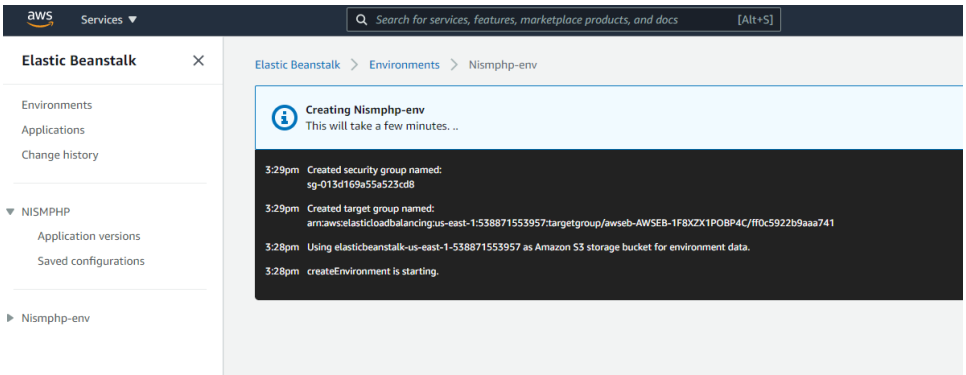
10. Under source code origin make sure that local file is selected then click choose file as shown in the screenshot below:



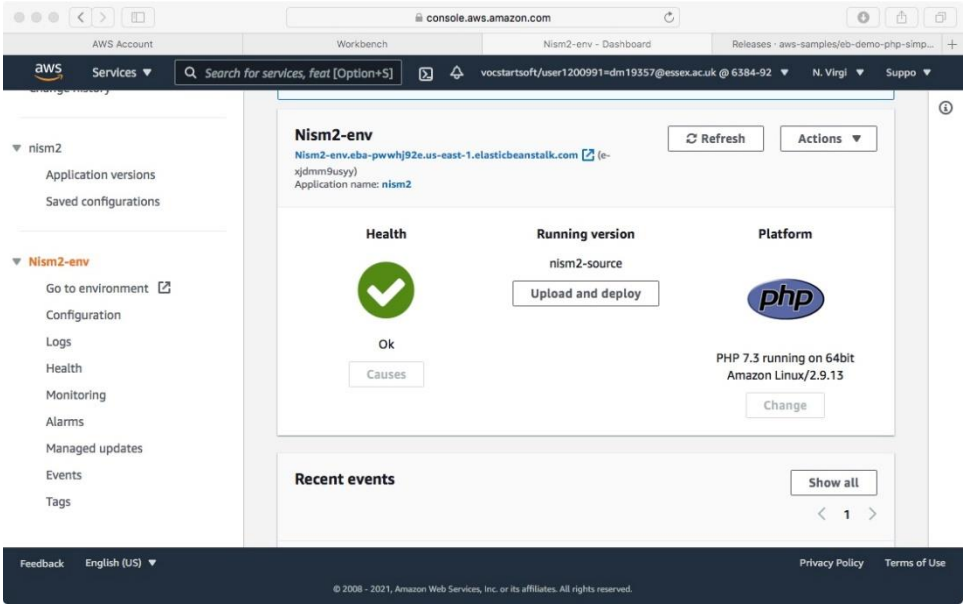
11. From the file dialogue, select the demo app you downloaded previously and click choose.
12. Click on ***Configure more option (before Creating the app)***, on the screen displayed select *Database* and click *Edit* (you may need to scroll down to find the database option).
13. Confirm the default options of *mysql*, the version and instance as shown below:



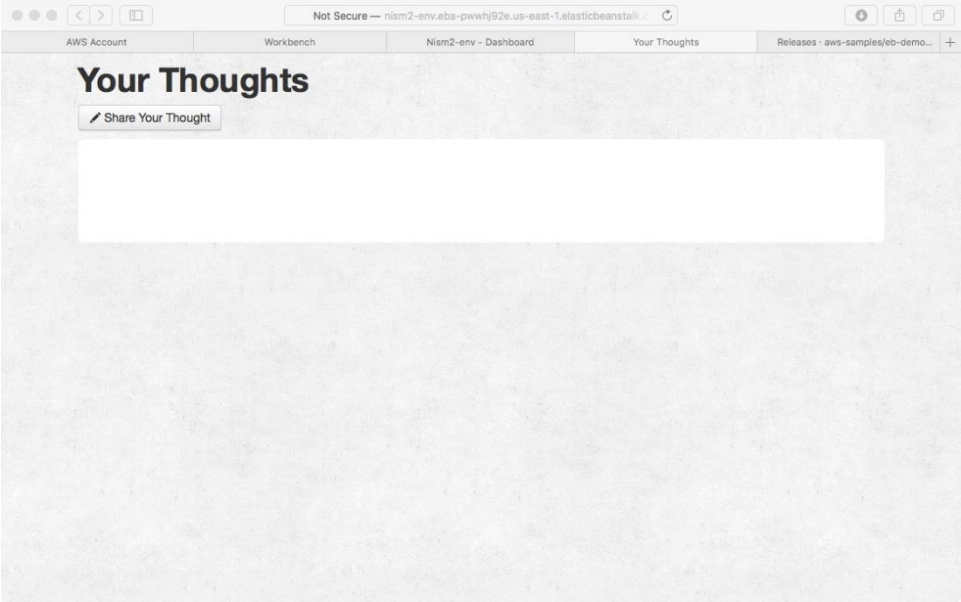
14. In the highlighted boxes enter root and enter a password, minimum length is 8 characters.
15. Scroll down and click save.
16. On the previous screen click ***Create Environment***.



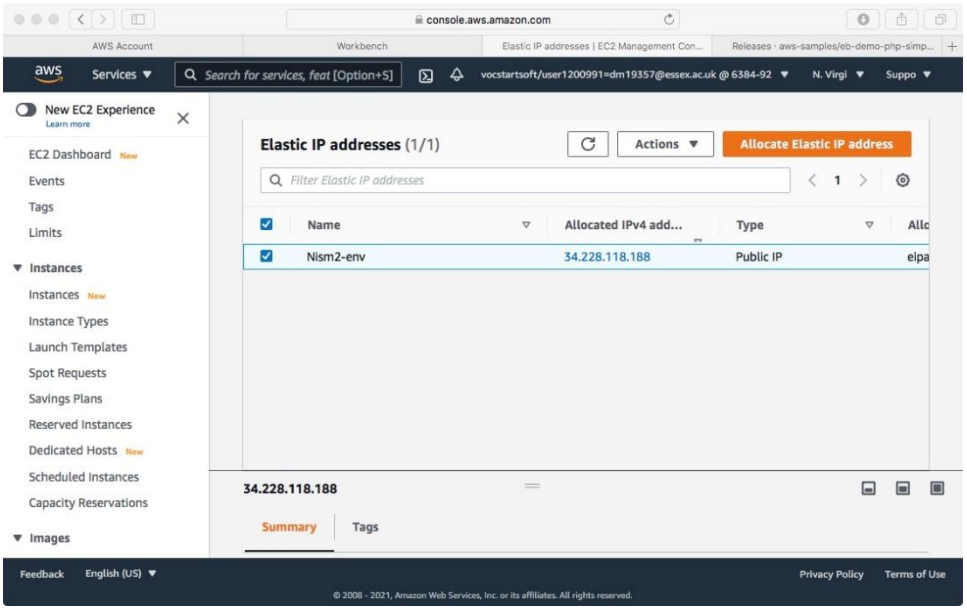
17. AWS will now create and upload the application for you – this will take several minutes. A typical update screen is shown above. You can monitor progress from the EB Console page – a screenshot of the runnning version is given below:



18. In the screenshot above the environment is called Nism2-env, and below the name is a link that launches the website. Click on the link and the web app is displayed – as shown below:

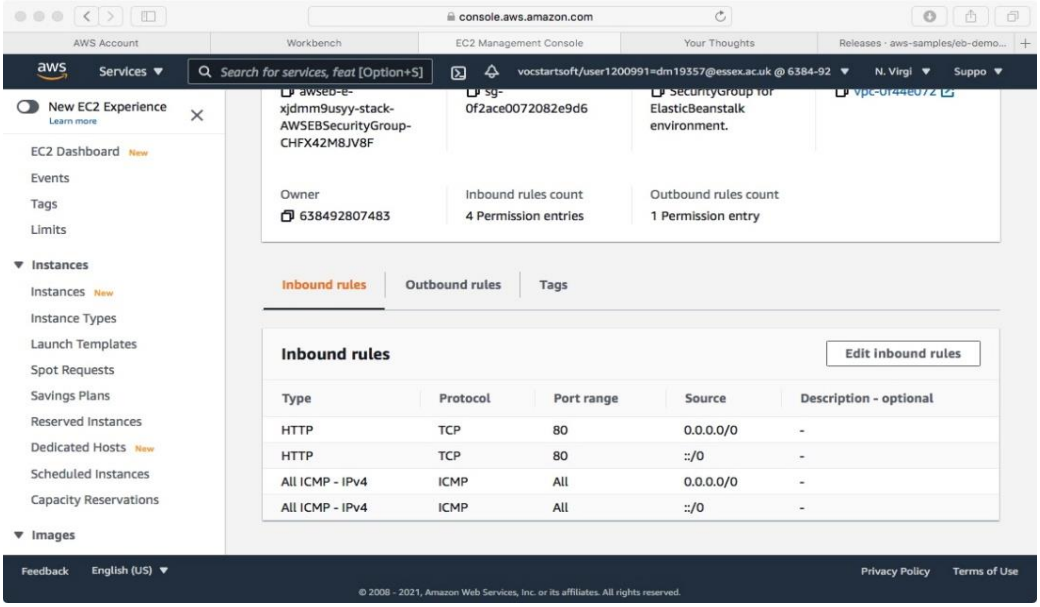


19. Assuming that this screen is displayed you can add a comment (thought) and a name – both will be written to the database running in the background.
20. The IP address (known as Elastic IP or EIP in AWS terminology) can be found from the EIP page (go back to the EC Console page and click on the ***Elastic IP*** link).
21. The screen below is displayed:

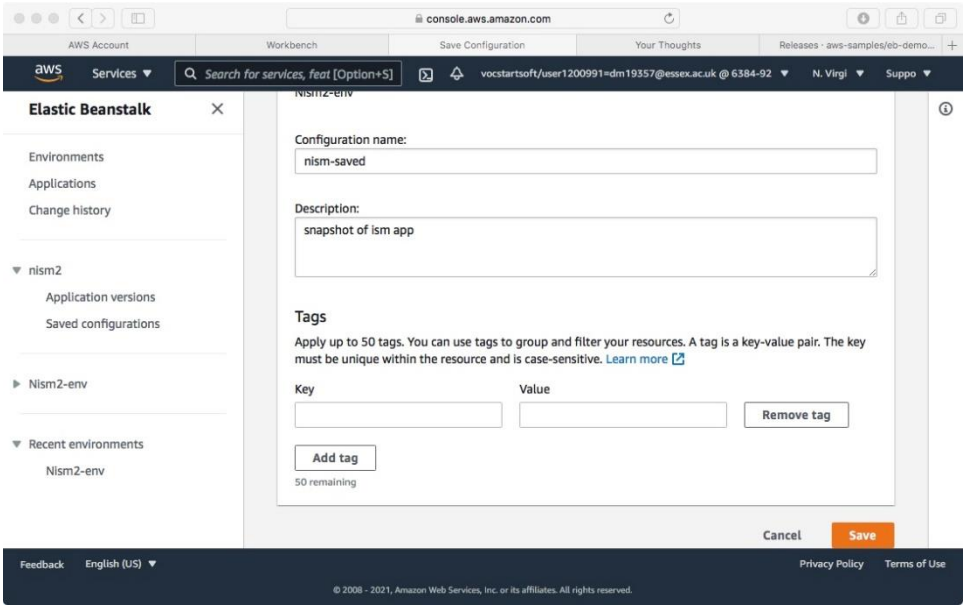


22. The IP is shown next to the environment name. In this example, it is **34.228.118.188**
23. Note the IP address may change every time the environment is restarted. So, be sure to check the page above and let the other group members know the new address.
24. You should also change the security group to allow ICMP access to the website. Use the instructions provided previously to add a new rule to the `Main` group you created earlier; it

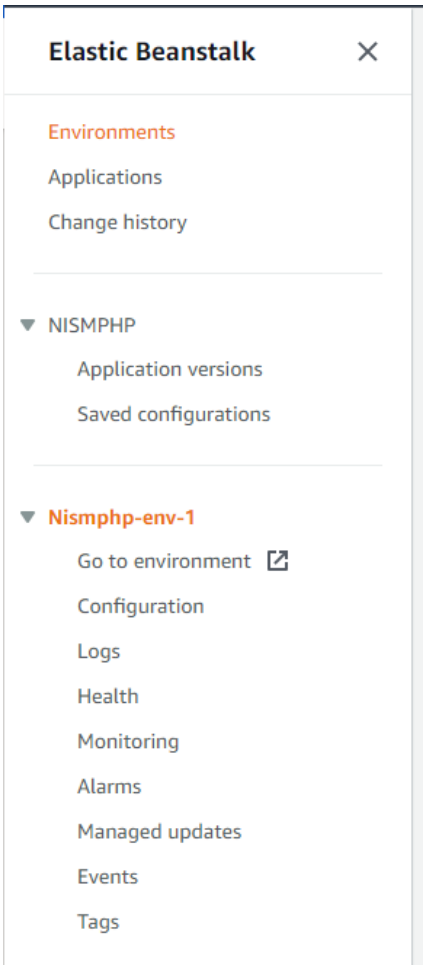
should look like the screenshot below:



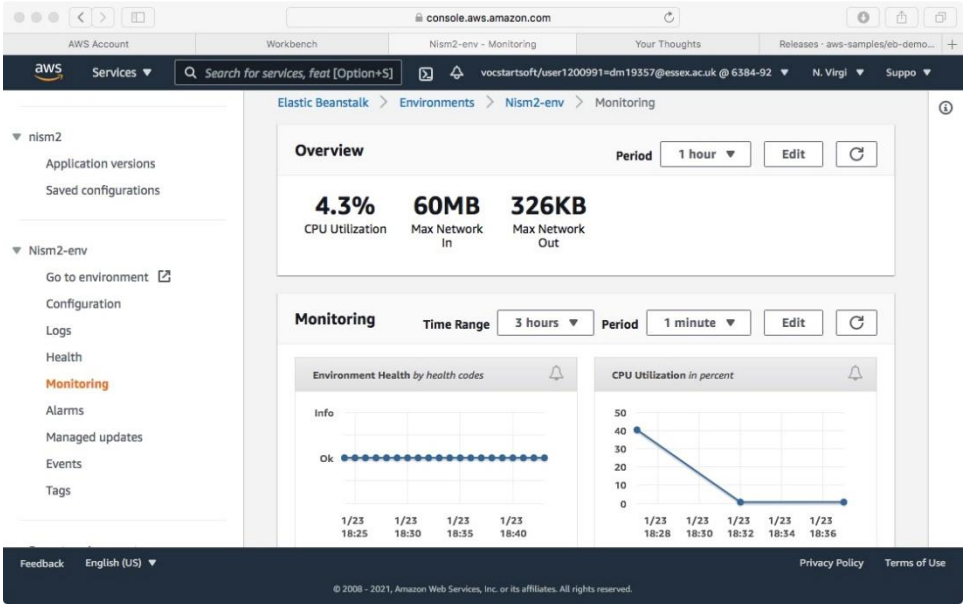
25. You should also save the current configuration to make restoring the application easier when required.
26. Access the Elastic Beanstalk (EB) console again and click on the Environment you have created. Then click Actions and ***save configuration.*** The screen below will then be displayed:



27. In the configuration name box enter nism-saved. Add a description such as 'snapshot of the app'. Then click save.
28. This will make it easier to restore the application later, when required.
29. The EB-console also lets you check the configuration. Go back to the Environments list and click on your environment for this set of options to come up:

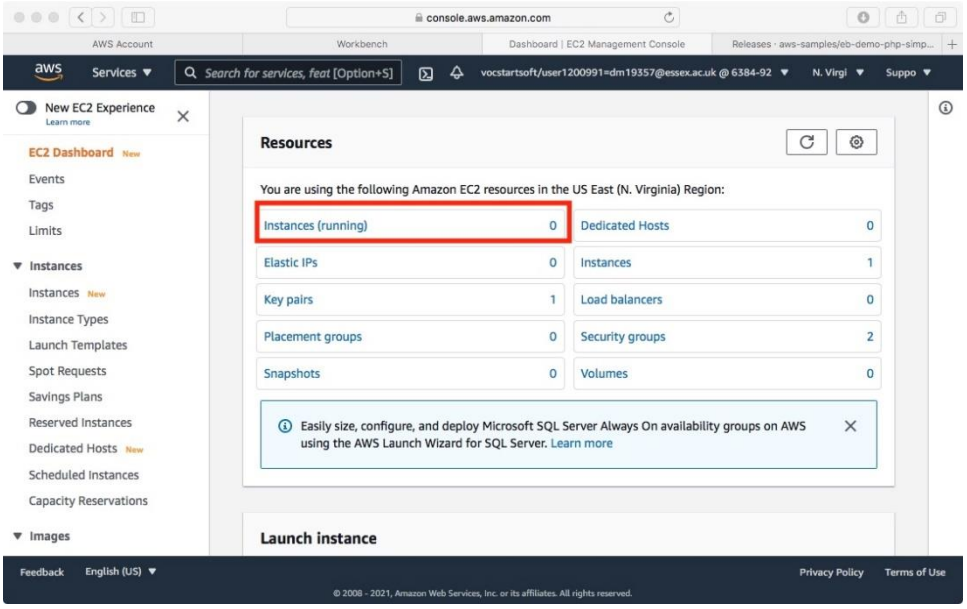


30. The screenshot below shows the monitor screen which displays useful data about the application operation:



Housekeeping

1. The AWS free tier provides 750 hours per month of EC2 instances, among other resources. Therefore, if we leave the app running all the time, we will soon consume all our free credits. We recommend that the groups liaise and schedule sessions when the web app can be left running so that scans and exploits can be tested.
2. Applications can be quickly restored from the saved configuration you created previously.
3. From the EB-Console, click on environments, select your environment and click on the actions pull down.
4. From the actions menu, choose ***load configuration***.
5. Click on the configuration you saved (it should be called nism-saved if you followed instructions).
6. Click on load and it will reload your saved configuration.
7. Remember to terminate your environment when the agreed test period has completed to save your credits.
8. From the environments screen, click on your running environment, click on the actions menu and choose 'terminate environment'.
9. After the EB-console informs you that the environment has terminated, check the EC console to ensure you have no running instances. It should look like the screenshot below:



10. Finally, during these instructions, I have made a few common (and hopefully fairly obvious) security *faux pas* that you should be able to pick up, and you should include them in your **individual** e-portfolio.