

Laboratory Goals / Objectives

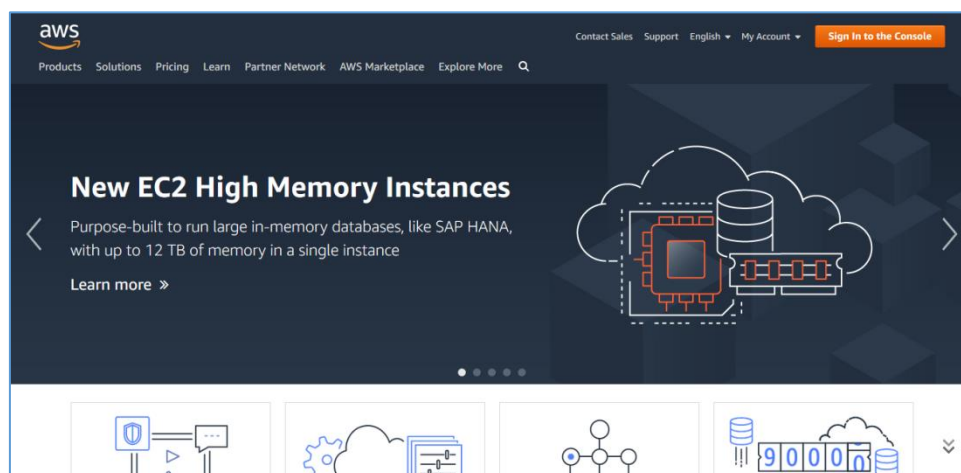
Upon completion of this lab, the students should be aware of available cloud platforms providers with advantages and disadvantages of each option. In addition, students will practise how they can host and interact with a web server hosted in the cloud.

Introduction

Cloud Computing is the delivery of on-demand computing resources (computer power, database storage, applications as well as other IT resources) over the Internet. This is achieved by using a network of remote servers hosted by data centres. The types of services include Infrastructure as a Service (IaaS), Platform as a Service (PaaS) and Software as a Service (SaaS). Developers can benefit from pay-as-you-use feature where the price is calculated depending on the amount of resources used. In practice, there are four main cloud providers:

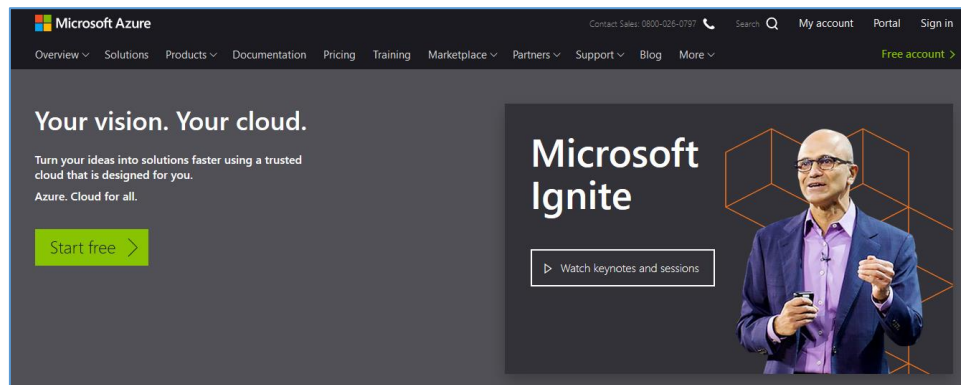
AWS

A comprehensive, evolving cloud-computing platform provided by Amazon. It offers the ability to create IaaS, PaaS, and SaaS services. Link: <https://aws.amazon.com/>



Windows Azure

It is Microsoft's public cloud computing platform that provides a range of cloud services through a global network of Microsoft managed data centres. Link: <https://azure.microsoft.com/en-us/>



Google Cloud

It is the suite of public cloud computing services offered by Google. It runs on the same infrastructure Google uses for end-user products such as Google Search. Google cloud provides a range of hosted services to compute, storage and application development that run on Google hardware. Link: <https://cloud.google.com/>



IBM Cloud

Cloud computing services offered by IBM that provides the ability of creating PaaS, SaaS, and IaaS services. With IBM Cloud IaaS, you can deploy and access virtualized IT resources such as compute power, storage and networking over the internet. For compute, this platform helps you to choose between bare-metal or virtual servers. Link: <https://www.ibm.com/uk-en/cloud>.

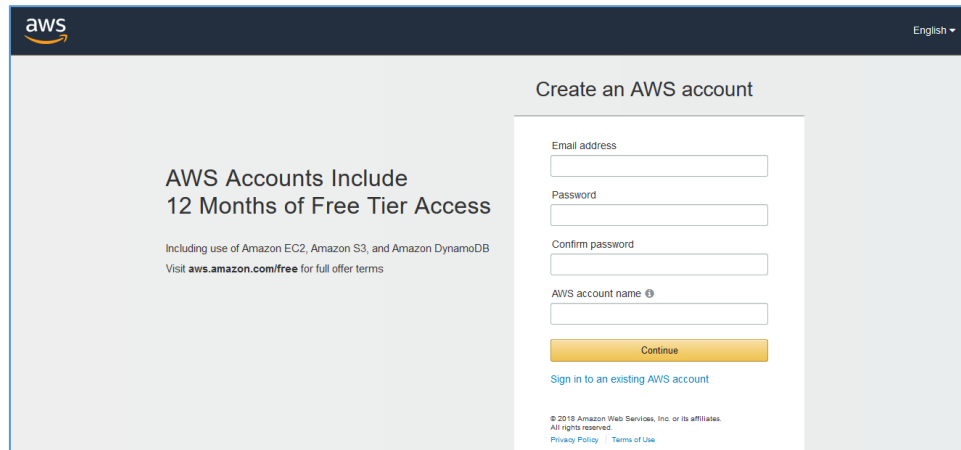
Hosting a web server on AWS

We will use AWS for the lab work.

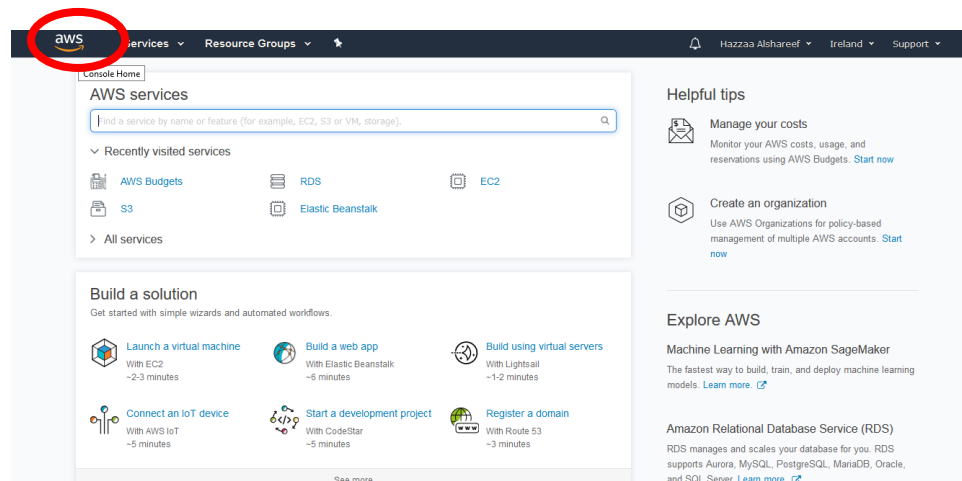
First, head to the following link and create a new personal account

<https://portal.aws.amazon.com/billing/signup#/start>

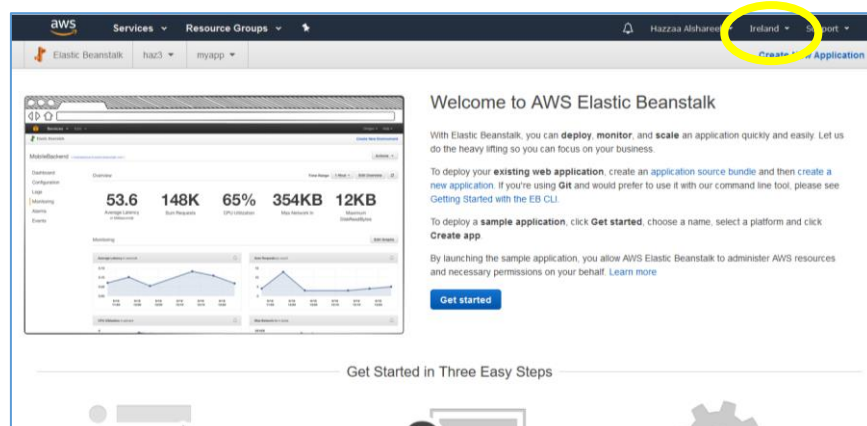
To complete the account creation you have to provide valid card details. Do not worry they will not charge you unless you exceeded the AWS Free Tier Limits. However, it is recommended to use a prepaid credit card (i.e. [3 money](#) card)



Once you finished, click on AWS icon on the top right to get the following page:



Next, let start creating a web server. Click on **Elastic Beanstalk** to get the following page:



NB: make sure that your service is located at Ireland servers. See the yellow circle!

Now, click on Get started and do the following:

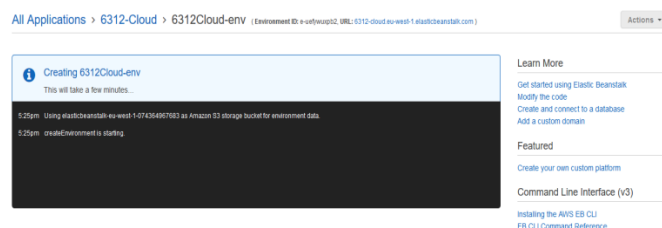
The first screenshot shows the 'Select environment tier' dialog. It has two options: 'Web server environment' (selected) and 'Worker environment'. The 'Web server environment' option is highlighted with a blue border and a yellow circle around the 'Select' button.

The second screenshot shows the 'Create a web server environment' page. It has fields for 'Application name' (6312-Cloud), 'Environment name' (6312Cloud-env), 'Domain' (6312-cloud), and 'Description'. The 'Domain' field has a green checkmark and the text '6312-cloud.eu-west-1.elasticbeanstalk.com is available'. There is a 'Check availability' button.

The third screenshot shows the 'Base configuration' page. It has sections for 'Platform' (Preconfigured platform, Tomcat) and 'Application code' (Sample application, Existing version, Upload your code). The 'Sample application' option is selected.

- Select a Web server environment.
 - Chose a name for your application
 - Pick up a domain name and check if it is available.
 - Select your web server platform.
- In this practice, we will select **Tomcat**.
- Keep the application code on **Sample application** option.
 - Click on **Create environment**.

Wait until the new environment is created for you. Once done, the following page will be shown →

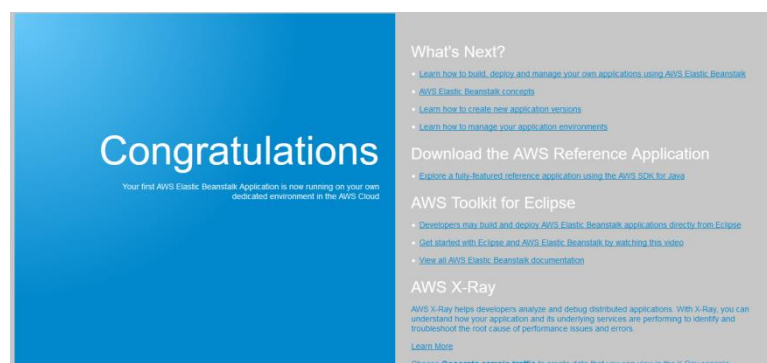


The screenshot shows the AWS Elastic Beanstalk console. The breadcrumb navigation at the top reads: **All Applications** > **6312-Cloud** > **6312Cloud-env**. A red box labeled '1' highlights the environment ID and URL: (Environment ID: e-uefywuxpb2, URL: 6312-cloud.eu-west-1.elasticbeanstalk.com). The left sidebar contains navigation links: Dashboard, Configuration, Logs, Health, Monitoring, Alarms, Managed Updates, Events, and Tags. The main content area has three sections: 1. **Overview** (labeled '2') showing a green checkmark for Health (Ok), the Running Version (Sample Application), and Configuration (Tomcat 8.5 with Java 8 running on 64bit Amazon Linux/3.0.4). 2. **Recent Events** (labeled '3') showing a table of events.

Time	Type	Details
2018-09-28 17:29:01 UTC+0300	INFO	Environment health has transitioned from Pending to Ok. Initialization completed 15 seconds ago and took 3 minutes.
2018-09-28 17:28:55 UTC+0300	INFO	Successfully launched environment: 6312Cloud-env
2018-09-28 17:28:55 UTC+0300	INFO	Application available at 6312-cloud.eu-west-1.elasticbeanstalk.com.

Congratulation your environment has been created successfully. Now let's understand what we have here:

- 1- Your environment ID or a URL to the index page of this web server. If you click on this link you should get the following page 😊

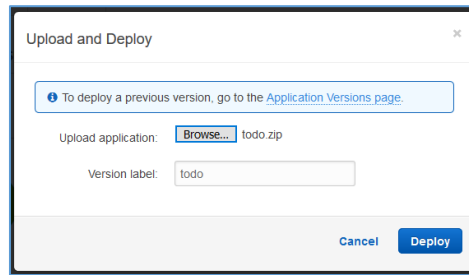


- 2- The overview that include the status of your environment, the running application version, and the configuration of this environment.
- 3- Logs or events: here you can track the changes on your environment.

Uploading a web application

You can create an application using HTML5 and then upload that application on the cloud.

Click on **Upload and Deploy** button then navigate to your zip file.



Now if you click on the environment URL, you should see the index page of your web app.

Resources

https://docs.aws.amazon.com/index.html#lang/en_us

https://docs.aws.amazon.com/elasticbeanstalk/latest/dg/RelatedResources.html?icmpid=docs_elasticbeanstalk_console

Task

This lab task is to create an AWS cloud instance and then upload and run a web application.

You need to submit by the deadline the following:

- (1) A **zip file** of your code and
- (2) **Screenshots** of the created app showing all the above interactions.