Deadline: **Fri 13 Aug 2021 2359 h**
Format: **Demo (10 min) and Written Report (MS Word)**
Type: **Individual**
Weightage: **30%**

Overview

You may use the AWS Educate Classroom environment for this lab. The AWS Educate Classroom enables you to have a persistent environment, subject to a credit limit of $50. You are to manage your spending (for example shutdown EC2 instances when not necessary), so that you do not exceed the limit. Note that if you exceed the limit, you will not be able to continue with the project in the AWS Educate Classroom.

Scenario

You are an Infrastructure Engineer in your company. Your company currently runs a small data center and is looking to migrate part of the infrastructure to the cloud. Your manager has given you the following requirements in preparation for the migration to the AWS cloud.

Task 1 - Basic Setup

1. Create a linux EC2 instance on AWS
2. Install httpd and mariadb on the linux EC2 instance.
3. Start the webserver and database server on the EC2 instance
4. Perform any necessary configurations on AWS so that the services can be accessed according to the following requirements:
   a. The EC2 instance can be accessed via an SSH client
   b. The web server can be accessed from anywhere on the internet
   c. The database server can only be accessed from within the EC2 instance
5. Demonstrate the access meet the requirements of (4)

Task 1 Hints
1. When starting EC2 instances in AWS Academy or AWS Educate, you will only be able to use AMIs found under Quick Start. The AMIs does not include CentOS, so you will need to use Redhat linux for your project (e.g. Red Hat Enterprise Linux 8 (HVM), SSD Volume Type)
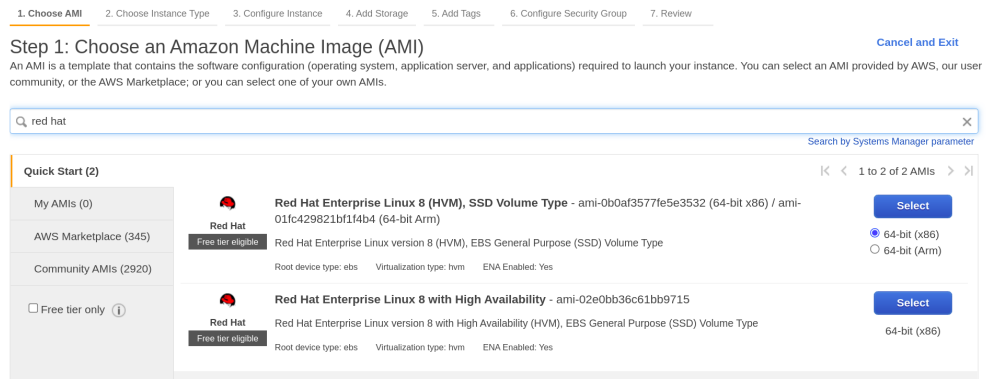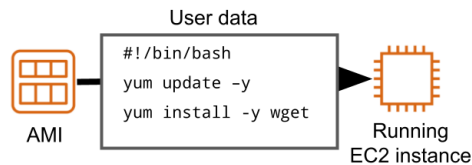
2. You can make use of the user data script to automate software installation or service startups. Refer to module 6 notes.

3. Connect to your Linux instance (link) -
https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/AccessingInstances.html

The company web server is running a software called "Wordpress". The engineer who was maintaining the web server has left the company. The manager requires that you take over this role and perform the tasks listed in task 2.

Note that there is minimal documentation left behind by the engineer. However, your manager provides the following link to get you started on Wordpress.

Task 2 - Wordpress Setup

1. Setup wordpress in the EC2 linux instance created in Task 1.
2. Try customising the website such as:
    a. Adding your name to the website (eg. created by: abc)
    b. Changing the themes

The manager also heard that there are many possibilities with the adoption of a Cloud Architecture. He knows that you have AWS cloud knowledge during your time at Ngee Ann Polytechnic School of Engineering. He therefore ask you to:

Task 3 - Enhancements

1. Evaluate ways to:
    a. Improve fault tolerance
    b. Handle changes in demand automatically
    c. Reduce the administrative tasks such as database setup, patching and backups
2. Explore other possible enhancements

Note that you need to implement and demonstrate what you proposed in Task 3. You are not restricted to what you have learnt in class, but you are expected to demonstrate and explain any enhancements you proposed.

You showed your setup and enhancements to your manager. After hearing your proposal, he wants you to present and demonstrate to your Director. This is your chance to impress!

Task 4 - Presentation / Demo

1. Your Director will see you either during the week of 26 Jul or 2 Aug. Prepare a live demonstration to your Director.
2. You may use google slides or Microsoft powerpoint during your live demo. On your demo day, focus on the following:
    a. Demo
    b. Enhancements -- what and why
    c. Difficulties encountered -- and how you overcame
    d. Reflection -- (example only) any new insights gained, any new understanding of how cloud systems work and the benefits, etc

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Your manager also requires that you submit a report on your project.

Task 5 - Report

1. **Submit a report by the deadline stated at the beginning of this document**
2. **The slides which you used during your demonstration are optional**
3. You may use the following to guide your report
    a. Introduction -- what is Wordpress
    b. Installation -- the screenshots of your installation
    c. Topology of your AWS setups -- pre and post enhancements
    d. Installation Guide -- explaining how you set up
    e. Difficulties encountered -- and how you overcame
    f. Enhancements -- what and why

g. Reflection -- (example only) any new insights gained, any new understanding of how cloud systems work and the benefits, etc
h. Any other relevant topics

Queries on Project / Module

Please post any queries on the project to your lecturer via your Discussion channels such as MS Teams.

Resources

Technical Report Format -
https://writing.colostate.edu/guides/page.cfm?pageid=1594&guideid=88
Wordpress - https://wordpress.org/
How to install WordPress on RHEL 8 / CentOS 8 Linux -
https://linuxconfig.org/install-wordpress-on-redhat-8
AWS Documentation - https://docs.aws.amazon.com/
Connect to your Linux instance -
https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/AccessingInstances.html
AWS Architecture Icons - https://aws.amazon.com/architecture/icons/

Rubric:

Criteria	Weight	Exemplary (A)	Accomplished (B)	Developing (C)	Beginning (D - F)
Task 1 - Basic setup	30%	All items completed	One of the sub-tasks is incomplete	Some of the sub-tasks are incomplete	Most of the sub-tasks are incomplete
Task 2 - Wordpress setup	20%	Wordpress installed and all customizations demonstrated	Wordpress installed but some customizations are incomplete	Wordpress installed but not working properly	Wordpress not installed
Task 3 - Enhancements	20%	Enhancements fully addressed the company's AND implemented fully.	Enhancements partially addressed the requirements OR not implemented fully.	Enhancements partially addressed the requirements AND not implemented fully.	Enhancements do not address requirements.
Task 4 - Presentation / Demo	15%	Well prepared and rehearsed Excellent delivery techniques - Poise, posture - Eye contact - Voice projection Compelling presentation Speaker appears to be confident	Prepared but can do better with more rehearsals Satisfactory delivery techniques - Poise, posture - Eye contact - Voice projection Interesting presentation Speaker appears to be comfortable	Not prepared / absent for the presentation Unsatisfactory delivery techniques - Poise, posture - Eye contact - Voice projection Presentation hard to understand Speaker appears to be uncomfortable	
Task 5 - Report	15%	Good Organization No spelling / grammatical errors Good diagrams / references	Fairly good organization 1-2 spelling / grammatical errors Fairly good diagrams / references	Some organization Few spelling / grammatical errors Few diagrams / references	Poorly organized Numerous errors No diagrams / references

* The School of Engineering Policy mandates that any report more than 7 days late will be awarded 0