**BN232 Advanced Network programming**

**Week 10 Laboratory**

**Laboratory Activity:**

**Getting Started with AWS – Launch Your First EC2 Instance**

End of laboratory class, submit the file on Moodle at least 10 minutes before the end of laboratory class.

Click on “[AWS Academy Cloud Foundations [115283]](https://awsacademy.instructure.com/courses/115283)”. Then click on Introduction to Amazon EC2. Then, accept the terms and conditions and continue with the lab.

In this task, you will launch an Amazon EC2 instance with *termination protection* and *stop protection*. Termination protection prevents you from accidentally terminating the EC2 instance and stop protection prevents you from accidentally stopping the EC2 instance. You will also specify a User Data script when you launch the instance that will deploy a simple web server.

1. In the **AWS Management Console** choose **Services**, choose **Compute** and then choose **EC2**.

**Note**: Verify that your EC2 console is currently managing resources in the **N. Virginia** (us-east-1) region. You can verify this by looking at the drop down menu at the top of the screen, to the left of your username. If it does not already indicate N. Virginia, choose the N. Virginia region from the region menu before proceeding to the next step.

1. Choose the **Launch instance** menu and select **Launch instance**.

**Step 1: Name and tags**

1. Give the instance the name Web Server.

The Name you give this instance will be stored as a tag. Tags enable you to categorize your AWS resources in different ways, for example, by purpose, owner, or environment. This is useful when you have many resources of the same type — you can quickly identify a specific resource based on the tags you have assigned to it. Each tag consists of a Key and a Value, both of which you define. You can define multiple tags to associate with the instance if you want to.

In this case, the tag that will be created will consist of a *key* called Name with a *value* of Web Server

**Step 2: Application and OS Images (Amazon Machine Image)**

1. In the list of available *Quick Start* AMIs, keep the default **Amazon Linux** AMI selected.
2. Also keep the default **Amazon Linux 2023 AMI** selected.

An **Amazon Machine Image (AMI)** provides the information required to launch an instance, which is a virtual server in the cloud. An AMI includes:

* + A template for the root volume for the instance (for example, an operating system or an application server with applications)
  + Launch permissions that control which AWS accounts can use the AMI to launch instances
  + A block device mapping that specifies the volumes to attach to the instance when it is launched

The **Quick Start** list contains the most commonly-used AMIs. You can also create your own AMI or select an AMI from the AWS Marketplace, an online store where you can sell or buy software that runs on AWS.

**Step 3: Instance type**

1. In the *Instance type* panel, keep the default **t2.micro** selected.

Amazon EC2 provides a wide selection of *instance types* optimized to fit different use cases. Instance types comprise varying combinations of CPU, memory, storage, and networking capacity and give you the flexibility to choose the appropriate mix of resources for your applications. Each instance type includes one or more *instance sizes*, allowing you to scale your resources to the requirements of your target workload.

The t2.micro instance type has 1 virtual CPU and 1 GiB of memory.

**Note**: You may be restricted from using other instance types in this lab.

**Step 4: Key pair (login)**

1. For **Key pair name - *required***, choose **vockey**.

Amazon EC2 uses public–key cryptography to encrypt and decrypt login information. To ensure you will be able to log in to the guest OS of the instance you create, you identify an existing key pair or create a new key pair when launching the instance. Amazon EC2 then installs the key on the guest OS when the instance is launched. That way, when you attempt to login to the instance and you provide the private key, you will be authorized to connect to the instance.

**Note**: In this lab you will not actually use the key pair you have specified to log into your instance.

**Step 5: Network settings**

1. Next to Network settings, choose **Edit**.
2. For **VPC**, select **Lab VPC**.

The Lab VPC was created using an AWS CloudFormation template during the setup process of your lab. This VPC includes two public subnets in two different Availability Zones.

**Note**: Keep the default subnet **PublicSubnet1**. This is the subnet in which the instance will run. Notice also that by default, the instance will be assigned a public IP address.

1. Under **Firewall (security groups)**, choose **Create security group** and configure:
   * **Security group name:** Web Server security group
   * **Description:** Security group for my web server

A *security group* acts as a virtual firewall that controls the traffic for one or more instances. When you launch an instance, you associate one or more security groups with the instance. You add *rules* to each security group that allow traffic to or from its associated instances. You can modify the rules for a security group at any time; the new rules are automatically applied to all instances that are associated with the security group.

* + Under **Inbound security group rules**, notice that one rule exists. **Remove** this rule.

**Step 6: Configure storage**

1. In the *Configure storage* section, keep the default settings.

Amazon EC2 stores data on a network-attached virtual disk called *Elastic Block Store*.

You will launch the Amazon EC2 instance using a default 8 GiB disk volume. This will be your root volume (also known as a 'boot' volume).

**Step 7: Advanced details**

1. Expand **Advanced details**.
2. For **Termination protection**, select **Enable**.

When an Amazon EC2 instance is no longer required, it can be *terminated*, which means that the instance is deleted and its resources are released. A terminated instance cannot be accessed again and the data that was on it cannot be recovered. If you want to prevent the instance from being accidentally terminated, you can enable *termination protection* for the instance, which prevents it from being terminated as long as this setting remains enabled.

1. Scroll to the bottom of the page and then copy and paste the code shown below into the **User data** box:

#!/bin/bash

dnf install -y httpd

systemctl enable httpd

systemctl start httpd

echo '<html><h1>Hello From Your Web Server!</h1></html>' > /var/www/html/index.html

When you launch an instance, you can pass *user data* to the instance that can be used to perform automated installation and configuration tasks after the instance starts.

Your instance is running Amazon Linux 2023. The *shell script* you have specified will run as the *root* guest OS user when the instance starts. The script will:

* + Install an Apache web server (httpd)
  + Configure the web server to automatically start on boot
  + Run the Web server once it has finished installing
  + Create a simple web page

**Step 8: Launch the instance**

1. At the bottom of the **Summary** panel choose **Launch instance**

You will see a Success message.

1. Choose **View all instances**
   * In the Instances list, select **Web Server**.
   * Review the information displayed in the **Details** tab. It includes information about the instance type, security settings and network settings.

The instance is assigned a *Public IPv4 DNS* that you can use to contact the instance from the Internet.

To view more information, drag the window divider upwards.

At first, the instance will appear in a *Pending* state, which means it is being launched. It will then change to *Initializing*, and finally to *Running*.

1. Wait for your instance to display the following:
   * **Instance State:** *Running*
   * **Status Checks:** *2/2 checks passed*

**Congratulations!** You have successfully launched your first Amazon EC2 instance.

**References**

[1] Amazon Web Services, AWS Academy Cloud Foundations Labs, AWS Academy. [Online]. Available: <https://awsacademy.com>.