

# Experiment 01 - Cloud Computing

December 7, 2022

## Aim

Creation of an EC2 instance and hosting a static web page by binding an Elastic IP with remote SSH Service

## Theory

The experiment performed is the most rudimentary approach towards any cloud service. In this experiment hosting of a virtual machine by provided by cloud provider is done. The provider used is **Amazon Web Services** where the service of instance is known as **Elastic Cloud Computing** often abbreviated as **EC2**. The experiment is successful execution of an EC2 and is used to host a static webpage using **apache server** by connecting it through **PuTTY** (*SSH service for Windows*) service. The result should suffice the every step of execution in a seamless manner.

## Results

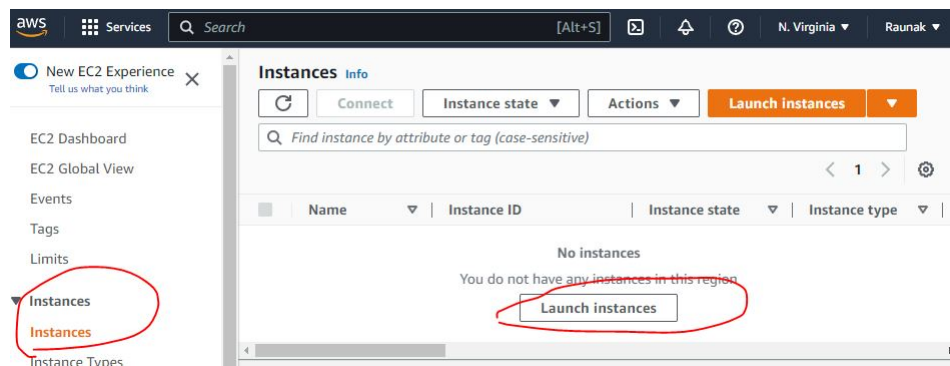


Figure 1: Dashboard for Instance Services offered by AWS

**Name and tags** [Info](#)

Name  
 [Add additional tags](#)

▼ **Application and OS Images (Amazon Machine Image)** [Info](#)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. Search or Browse for AMIs if you don't see what you are looking for below

**Quick Start**

Amazon Linux macOS **Ubuntu** Windows Red Hat S

aws Mac ubuntu Microsoft Red Hat

Amazon Machine Image (AMI)

Ubuntu Server 22.04 LTS (HVM), SSD Volume Type  
ami-0574da719dca65348 (64-bit (x86)) / ami-0e2b332e63c56bcb5 (64-bit (Arm))  
Virtualization: hvm ENA enabled: true Root device type: ebs [Free tier eligible](#)

Description

Canonical, Ubuntu, 22.04 LTS, amd64 jammy image build on 2022-12-01

Architecture AMI ID

64-bit (x86) ami-0574da719dca65348 [Verified provider](#)

Figure 2: Naming and selecting an Instance. The instance used is Ubuntu Machine

▼ **Instance type** [Info](#)

Instance type

t2.micro [Free tier eligible](#)

Family: t2 1 vCPU 1 GiB Memory  
On-Demand Linux pricing: 0.0116 USD per Hour  
On-Demand Windows pricing: 0.0162 USD per Hour

[Compare instance types](#)

Figure 3: The type of Instance used is a free tier eligible which is t2.micro machine

Create key pair

Key pairs allow you to connect to your instance securely.

Enter the name of the key pair below. When prompted, store the private key in a secure and accessible location on your computer. **You will need it later to connect to your instance.** [Learn more](#)

Key pair name

genericKeyPair

The name can include up to 255 ASCII characters. It can't include leading or trailing spaces.

Key pair type

☒ RSA

RSA encrypted private and public key pair

☐ ED25519

ED25519 encrypted private and public key pair (Not supported for Windows instances)

Private key file format

☐ .pem

For use with OpenSSH

☒ .ppk

For use with PuTTY

Cancel

Create key pair

Figure 4: Creation of key pair for connecting the instance using SSH tools

Services

Search

[Alt+S]

N. Virginia

Raunak

Key pair (login)

You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair before you launch the instance.

Key pair name - required

genericKeyPair

Create new key pair

Network settings

Network

vpc-055b0f13119b0e718

Subnet

No preference (Default subnet in any availability zone)

Auto-assign public IP

Enable

Firewall (security groups)

Create security group

Select existing security group

We'll create a new security group called "launch-wizard-1" with the following rules:

☒ Allow SSH traffic from

Helps you connect to your instance

Anywhere

0.0.0.0/0

☒ Allow HTTPS traffic from the internet

To set up an endpoint, for example when creating a web server

☒ Allow HTTP traffic from the internet

To set up an endpoint, for example when creating a web server

Rules with source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only.

Figure 5: Enabling the HTTP traffic for hosting pages

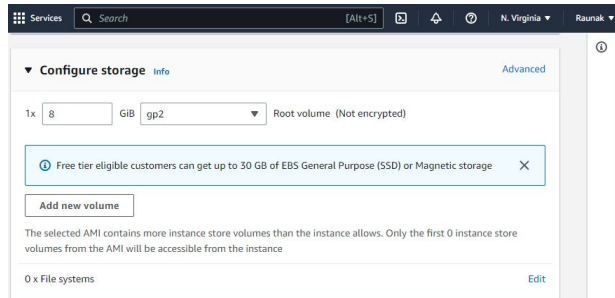


Figure 6: Configuring the basic level storage

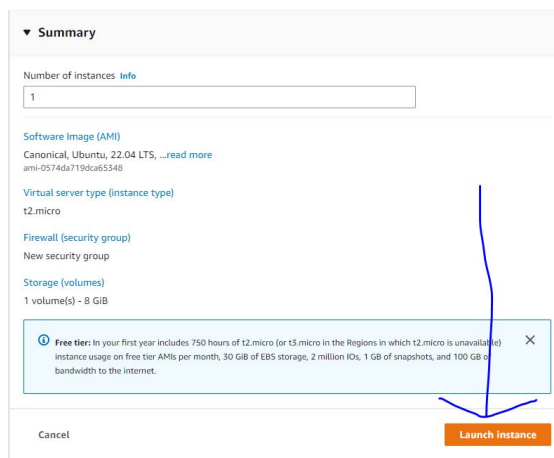


Figure 7: Launching the instance which creates it

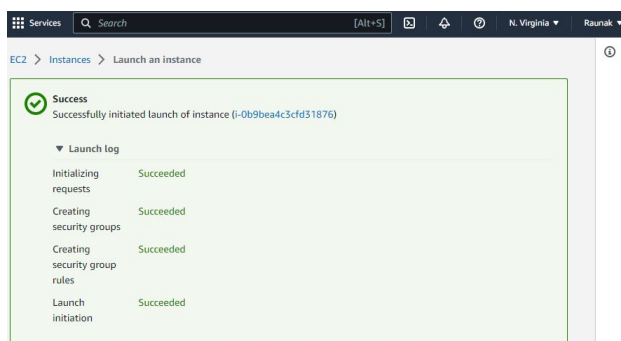


Figure 8: Successful process of Instance creation

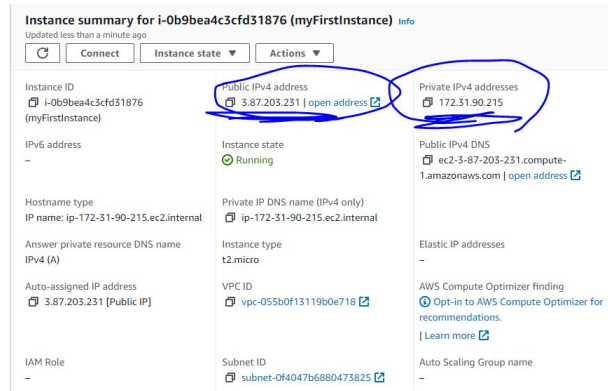


Figure 9: The public and private IP addresses of EC2

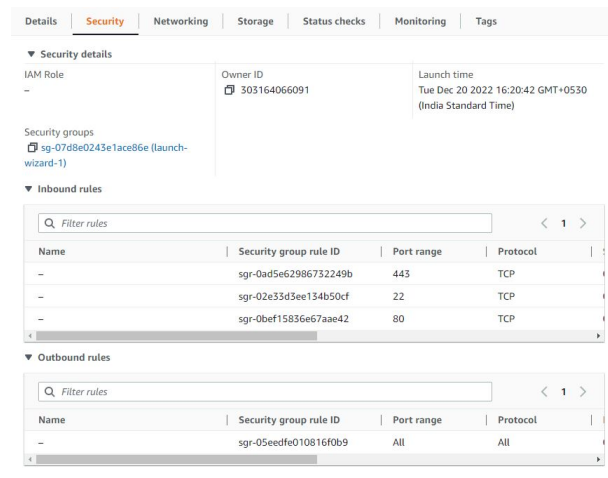


Figure 10: Checking the security groups of the web ports

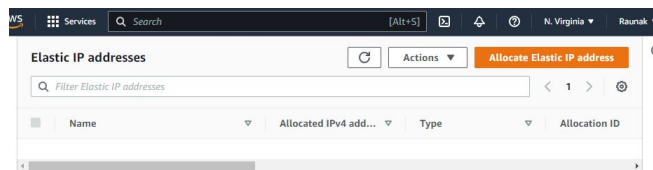


Figure 11: Elastic IP Dashboard

Allocate Elastic IP address [info](#)

**Elastic IP address settings** [info](#)

Network Border Group [info](#)

us-east-1

Public IPv4 address pool

☒ Amazon's pool of IPv4 addresses

☐ Public IPv4 address that you bring to your AWS account (option disabled because no pools found) [Learn more](#)

☐ Customer owned pool of IPv4 addresses (option disabled because no customer owned pools found) [Learn more](#)

Global static IP addresses

AWS Global Accelerator can provide global static IP addresses that are announced worldwide using anycast from AWS edge locations. This can help improve the availability and latency for your user traffic by using the Amazon global network. [Learn more](#)

[Create accelerator](#)

**Tags - optional**

A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs.

No tags associated with the resource.

[Add new tag](#)

You can add up to 50 more tags

[Cancel](#) [Allocate](#)

Figure 12: Creating an Elastic IP with default settings

Services Search [Alt+S] N. Virginia Raunak

**Elastic IP address allocated successfully.**  
Elastic IP address 52.200.193.133

[Associate this Elastic IP address](#)

**Elastic IP addresses (1/1)**

Filter Elastic IP addresses

Public IPv4 address: 52.200.193.133

[Clear filters](#)

<input checked="" type="checkbox"/>	Name	Allocated IPv4 address	Type	Allocation ID
<input checked="" type="checkbox"/>	-	52.200.193.133	Public IP	eipalloc-0be823f1

[Allocate Elastic IP address](#)

Figure 13: Successful creation of Elastic IP and can be further allocated to a resource such as an running instance

**Elastic IP address: 52.200.193.133**

**Resource type**  
Choose the type of resource with which to associate the Elastic IP address.

☒ Instance

☐ Network interface

**Warning**  
If you associate an Elastic IP address to an instance that already has an Elastic IP address associated, this previously associated Elastic IP address will be disassociated but still allocated to your account. [Learn more](#)

**Instance**

i-0b9be4c3fd3187d

**Private IP address**  
The private IP address with which to associate the Elastic IP address.

[Choose a private IP address](#)

**Reassociation**  
Specify whether the Elastic IP address can be reassigned with a different resource if it already associated with a resource.

☐ Allow this Elastic IP address to be reassigned

[Cancel](#) [Associate](#)

Figure 14: Selecting the recently created instance and allocating the elastic IP to it

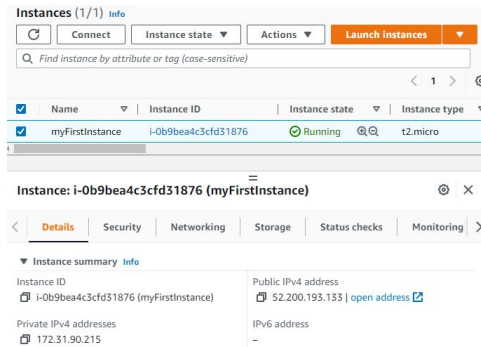


Figure 15: Changes the IP to static which does not change upon changing the state of the EC2

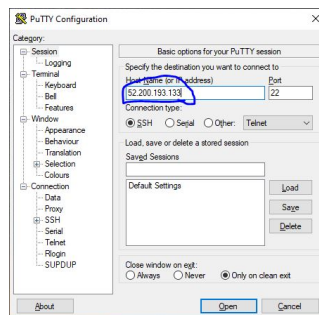


Figure 16: Using the PuTTY client on Windows for connecting the EC2

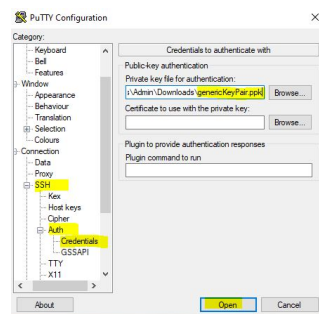


Figure 17: Giving the key pair of the instance for connecting the instance

```
ubuntu@ip-172-31-90-215: ~  
login as: ubuntu  
Authenticating with public key "genericKeyPair"  
Welcome to Ubuntu 22.04.1 LTS (GNU/Linux 5.15.0-1026-aws x86_64)  
  
* Documentation:  https://help.ubuntu.com  
* Management:    https://landscape.canonical.com  
* Support:       https://ubuntu.com/advantage  
  
System information as of Tue Dec 20 11:19:17 UTC 2022  
  
System load:  0.0               Processes:    97  
Usage of /:   19.6% of 7.57GB   Users logged in:  0  
Memory usage: 21%              IPv4 address for eth0: 172.31.90.215  
Swap usage:   0%  
  
0 updates can be applied immediately.  
  
The list of available updates is more than a week old.  
To check for new updates run: sudo apt update  
  
The programs included with the Ubuntu system are free software;  
the exact distribution terms for each program are described in the  
individual files in /usr/share/doc/*/copyright.  
  
Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by  
applicable law.  
  
To run a command as administrator (user "root"), use "sudo <command>".  
See "man sudo_root" for details.  
ubuntu@ip-172-31-90-215:~$
```

Figure 18: Successful connection established using the PuTTY with EC2

```
root@ip-172-31-90-215: /var/www/html  
<html>  
  <head></head>  
  <body>  
    <h2>Hello from instance of Raunak</h2>  
  </body>  
</html>  
"index.html" 6L, 88B      6,7      All
```

Figure 19: Creation of basic static web-page that returns an output using vim editor in var/www/html directory of the root user for saving the page





Figure 20: Output of the hosted page on the public IP address that was allocated with Elastic IP service

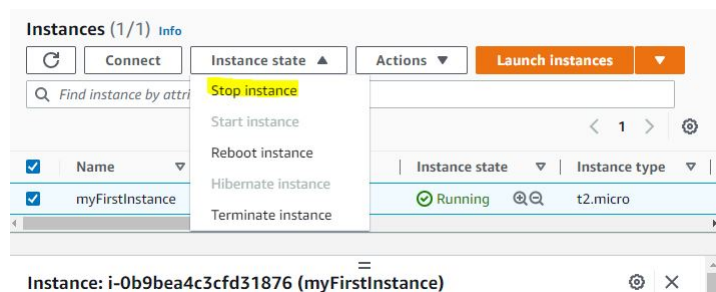


Figure 21: Stopping the instance using the Instance State option on Instance Dashboard

## Conclusion

In this experiment successful interpretation and implementation of the EC2 basics are covered. Apart from that a detailed walk-through of the Elastic IP service offered by AWS was also used. After that remotely establishing the connection with the EC2 using PuTTY client for Windows based machine was done. Hosting of a static web page was also done in a concise manner.