



# INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

## AMAZON ELASTIC COMPUTE CLOUD (EC2)

<sup>1</sup>ANSHUMAN BHUSHAN SINGH, <sup>2</sup>MAANVENDRA PRAJAPATI, <sup>3</sup>APURVA, <sup>4</sup>SAHIL KUMAR SINGH, <sup>5</sup>SUDHA SHANKER PRASAD

<sup>1</sup>STUDENT, <sup>2</sup>STUDENT, <sup>3</sup>STUDENT, <sup>4</sup>STUDENT, <sup>5</sup>ASSISTANT PROFESSOR

<sup>1</sup>School of Computer Science and Engineering

<sup>1</sup>Lovely Professional University, Phagwara, India,

**Abstract:** Amazon Elastic Compute Cloud has the feature of scalability means a user can scale up or scale down the resources according to his need or convenience. Resources here are the RAM, CPU, Hard-disk, Network Bandwidth, GPU, storage, servers. Multiple virtual servers can be launched using Amazon EC2. Resources can be allocated during the peak time of a user or it can be taken back when there is no use.

### I. INTRODUCTION

In November 2010 Amazon switched its shopping site to use EC2 on AWS. Using Amazon EC2 is easy and convenient because it is simple web-based interface that can be accessed from any browser through mobile or laptop or tablets. For using EC2 a user simply needs to create an account on the AWS platform and have to select EC2 from the console. Generally, the user needs to pay per use model when using EC2 means he is only charged for the number of resources he is using. Resources are priced according to their size and for what time they are used.

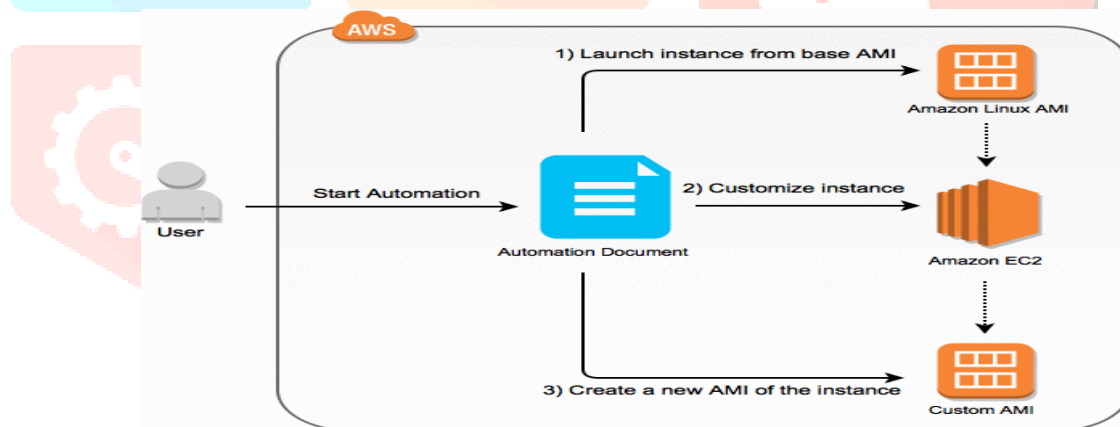


fig: a short description to create Instance

### 1.1 Some facts about EC2

Downtime is 7x fewer as compared to other cloud providers

Available in 22 regions and have 69 availability zone

Include startup.

### 1.2 What is Amazon EC2

The Amazon Elastic Compute Cloud helps in providing computing capacity which is scalable as a user can use the computing according to his need. He can use the resources as much he wants by seeing the number of users. He can also increase the resources during peak time or he can minimize them too. Amazon provides a web service which is called Amazon EC2.



fig: instance

Amazon EC2 is very useful for all the user as well as for developers as it helps to eliminate the need for buying hardware to faster deployment of the application. We can define an instance as it is a virtual server that is used for running applications or APIs on Amazon's Elastic Compute Cloud. We can also say that an instance is a tin part of a bigger computer, a small part which consists of its operating system, hard-disk, RAM, memory, network adapters, and drivers. However, when it comes to reality, they don't exist. They are virtual. On a single physical machine, a user can have n number of smaller computers which is termed as an instance.



fig: working of instance

### 1.3 Why AWS EC2

Suppose a developer is working independently so he can purchase as many servers he needs by estimating his likes computing power, payload, capacity, number of users, etc. After that he might face an issue for updating the security patch, there can be some server error at the back-end level which he has to look out and there are several other problems. However, if he purchases an instance of EC2, then all this problem will be solved because now it will be the responsibility of the Amazon to deal with all these problems. Now the developer can simply focus on the working of his application. All these features are available to him in a fraction of cost and time which is the biggest advantage of EC2.

### 1.4 Some great properties of Amazon EC2

- It consists of templates that are predefined and we call them as AMIs or Amazon Machine Image.
- The biggest advantage is that user can configure the CPU, memory, RAM, Hard-disk, Bandwidth, network adapters according to his need.
- It uses key pairs for secure login, so the login information is also safe.

### 1.5 EC2 Pricing

A new user can sign up for Amazon AWS than in the initial period, EC2 is free for him by using the AWS free tier for a limited time. Following purchasing instance option is available:

#### 1.5.1 On-Demand Instance

In this, a user needs to pay for the amount of instance he is using for a particular period

#### 1.5.2 Saving Plans

The cost of Amazon EC2 can be reduced if we agree with Amazon using a consistent amount of storage. The bill will be according to pay per use.

#### 1.5.3 Reserved Instances

Users can also reduce the cost of Amazon EC2 if he signs an agreement with Amazon which says to use some specific configuration of instances which includes which type of instance he can use and in which region and for how much time.

#### 1.5.4 Spot Instances

This user requests the EC2 instances which are unused to reduce the cost of Amazon EC2.

### 1.6 How to see billing

To see the bill and usage a user needs to go to the dashboard of Amazon EC2 called Billing and Cost Management Dashboard. It is located in the Cost and Billing Management console. Bill will contain a detailed report of what resources you are using and for what was the usage time.

## II. RESEARCH METHODOLOGY

### 2.1 What is performed

Practical implementation is performed to see how the AWS EC2 runs, what are the steps needed, how to do the setup. All the queries had been resolved and all the point has been taken into consideration.

### 2.2 AWS Sign Up

Amazon Web Services is a single sign-on platform that means when a user signs up on Amazon web services then he can use all the services which are provided by Amazon which also include the Amazon EC2. A new EC2 customer can use the resources for free for a limited time.

### 2.3 AWS Account creation steps

The very first step is to open the website of AWS that is [www.portal.aws.amazon.com/billing/signup](http://www.portal.aws.amazon.com/billing/signup). Then we have to follow the instructions which are displayed on the screen. The user will receive a Text SMS (OTP) or a call with OTP and you have to enter it for confirmation. The following task needs to be completed for the successful setup of Amazon EC2:

- User needs to Sign up for AWS
- Key Pair needs to be created.

The next step includes the creation of a security group.

### 2.4 Creation of Key Pair

To provide security to the login information, for instance, Amazon web service uses public-key cryptography method

### 2.5 Create a security group

The security group of AWS EC2 acts as a firewall or we can say IDPS Intrusion Detection Prevention System for the instances that are associated with EC2, and it also controls the traffic at the level of instance.

### 2.6 Running of the system in EC2

First of all, a user needs to login to his AWS account and have to click on AWS EC2. We will see create instance option inside that click on launch instance. After that in the next step, the user needs to select an Amazon Machine Image (AMI). AMI can be defined as a pre-configured template of operating systems and they hold the information which is needed for the launching of an instance. Suppose a user wants to launch an instance so he needs to select that which AMI he needs. The AMI could be anything like ubuntu, windows, etc.

We can configure the AMI according to our need or we can start with the default or pre-configured settings.

At the time of configuration, a step will come where we need to select an Elastic Block Storage option. EBS is a storage volume which we use with AWS and EC2

### 2.7 EC2 Computing Instance Types

The selection of the type of computing is dependent on the type of our task or we can say the nature of our task. Five type of instances are offered by AWS EC2.

#### 2.7.1 General Instance

Some applications need a balanced performance and cost, so there we use this type of instance. Eg: an acknowledgement system which prompts the response, since it does not require too much of processing and also it is not so much costly.

#### 2.7.2 Compute Instance

Some, time some applications need a lot of processing work and computing power. Eg: Analysis of data from the dataset.

#### 2.7.3 Memory Instance

There can be an application that requires a lot of memory/RAM so there we use this instance. Eg: Time can come when multiple applications are running in the background called multitasking.

#### 2.7.4 Storage Instance

This type of instance is needed when applications need a huge amount of space in the system.

#### 2.7.5 GPU Instance

Applications can need a large number of effects or we can say graphics. So, there we use this instance.

### 2.8 EC2 Instance creation (Linux)

Logging in into Management console of AWS. We will go to the management console of the AWS in My Account section.

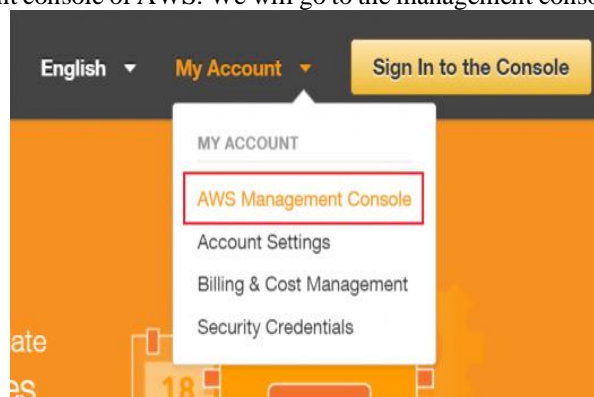


fig: management console

After going in AWS management console, we need to select the preferred region from the drop-down menu which means in which region we want to use EC2. In the next step we need to select the services of EC2, so a user needs to click on the option EC2 in the section of compute. This step will open the dashboard of EC2. Then the user needs to click on launch instance option.

## Compute

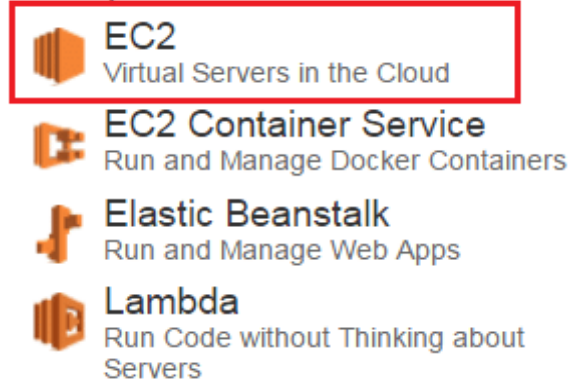


fig: selection of instance

In the next step the user needs to select the AMI. Since this paper is about Linux instance therefore, we will select the Ubuntu option, because we are creating an instance of LINUX. We will select the Ubuntu Server version name. Then we will move to the next step which is selection of an instance. In this we will choose t2.micro instance because it is freely available.

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)
<input type="radio"/>	General purpose	t2.nano	1	0.5	EBS only
<input checked="" type="radio"/>	General purpose	t2.micro Free tier eligible	1	1	EBS only

fig: instance selection

In the next step we will do the configuration of the Instance that we created. So, we will configure the details which we have made earlier and we will also combine the storage with that instance. To add the storage, we will click on Next: Add storage after configuration.

### 2.9 Applying Tag to an Instance

In this step, we have to give a name to our AWS EC2 instance in the space provided. This name is termed as a Tag, and it will appear at the time of launching of instance on the console. Tag helps us to keep a record on the machines which are running in a complex environment. Through this name, we can easily recognize and remember our machines. After that we will create the security group and do its configuration so we will add a security group name by clicking on create a new security group and we will further click on review and launch.

### 2.10 Review and launch of instance

In this step, we will review the details and we will verify them that they are correct or not and after that we will initiate the launching of an instance.

## III. Steps to add the key

### 3.1 Creation of a key pair

In this step, we have to select the option of Create a new key pair and we have to also specify the name of the key pair. After that, we will download that in our system for further use. We will create a new key pair and assign a name to it, and we will download it and will keep it safe for further use. And then we will launch the instance.

### 3.2 Checking the details of launched Instance

We will check the details that whether, the changes we have done are reflected back or not, settings we have made is correct or not, and all the changes which we made are visible like instance type, instance name, instance ID, instance state etc.

### 3.3 Conversion of Private key by the help of PuTTYgen

PuTTY does not support the private key format (.pem) which is generated by Amazon. There is an inbuilt tool termed as PuTTYgen in PuTTY, and this tool helps in converting the key in the desired PuTTY format (.ppk). Conversion of private keys in this format is the necessary step before trying to connect to the instance using PuTTY. After that we have to click on Load, now this will only display the file which has the extension pf (.ppk). User must select display files of all type to see the extension. Now a user needs to select his .pem file for the key pair that he has specified during the launching of the instance and then he needs to click on the option open. The next step is confirmation by the selection of the option OK. Now the user has to save the key in the format that is used by PuTTY, so he needs to click on Save private key. The key needs to be saved with passphrase because without the passphrase PuTTYgen displays a warning box. Yes, the option needs to click and the user needs to give the same name for the key which he has given to the key pair earlier.

### 3.4 Connection of EC2 instance using SSH and PuTTY

In the first step, PuTTY.exe needs to open. We will see a hostname box in which we have to enter the public IP of the instance. In the next step, SSH needs to be expanded in the category list. In the next step, Auth needs to be clicked, and the user needs to look for the PPK file that he has downloaded and have to double click on it. This step needs to be done in the authentication box of Private Key. In the next step, the user needs to click on Open. Now the user needs to enter his login ID in the ubuntu when he will see the terminal window.

## IV. Functionality of AMAZON EC2

### 4.1 Reliable

Amazon EC2 is very good in terms of reliability as it is very reliable in terms of service. The service rarely fails and offer 99% availability for every Amazon EC2 region. The service provided by EC2 is very good and have very good SLA agreement in terms of reliability. A vendor can completely depend on the EC2 when he purchases an instance.

### 4.2 Secure

The security feature offered by Amazon EC2 is outstanding as it uses end to end encryption and SSH methods and have a high security mechanism for the security of the resources. A vendor can configure the security settings on his own and can set the IP range he wants to use and can connect to different IT infrastructure using various encryption methods. It also provides the feature of isolation. The algorithm used in encryption is very high and cannot be easily traced by some malicious user.

### 4.3 Elastic

Elasticity is the best feature of Amazon EC2. This feature allows the vendor or user to escalate the storage within a minute, and also user can decrease the capacity of storage according to his need. A large number of instances can be launched simultaneously, and the application can be scaled up and scaled down according to the need of user. A user can choose the CPU configuration, TAM size, memory type, and various others feature are available for the user. A user can also choose the type of operating system.

### 4.4 On-demand Instance

A user needs to pay for the instances he uses and not for all the reserved instance. So, it saves the cost and is affordable for small vendors also. This feature helps a lot during cloud burst or when a large number of users tries to access the application simultaneously. A user only pays for the time he used the service and need not to make any contract for long time. This free the user from complexity of maintaining hardware and software.

### 4.5 Reserved Instance

A user can make a payment for each instance he uses and reserve that for use and he can also avail a discount on the hourly charges. A user will only pay when he will use the instance and will not pay when the resources will not be used

## V. RESULTS AND DISCUSSION

### 5.1 EC2 Launched Successfully

Finally, an EC2 Ubuntu instance is launched successfully. User can further modify the settings according to his convenience by going into the control panel or we can say console of EC2. Resources can be allocated as you want and it will be billed accordingly. This is the biggest advantage that you pay per usage. Amazon EC2 services are provided strictly according to its SLA which is Service Level Agreement and EULA that is called End-user License Agreement. SLA agreement is a document that tells the customer that these services are provided by the provider. And service provider is bound to provide all the services that are written inside an SLA

## REFERENCES

- [1] <https://www.youtube.com/watch?v=izyqJPI9wW8>
- [2] <https://docs.mongodb.com/ecosystem/platforms/amazon-ec2/>
- [3] <https://www.wowza.com/products/streaming-engine/deployment-options/aws>
- [4] [https://www.youtube.com/watch?v=PHOo3Ekb\\_Ys](https://www.youtube.com/watch?v=PHOo3Ekb_Ys)
- [5] [https://en.wikipedia.org/wiki/Amazon\\_Elastic\\_Compute\\_Cloud](https://en.wikipedia.org/wiki/Amazon_Elastic_Compute_Cloud).
- [6] <https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/ec2-ug.pdf>