**How to connect from ubuntu to aws instance ?**

**Ans :** ssh –i ubuntu.pem ubuntu@public ip

**How to copy file from ubuntu to aws instance ?**

Ans : scp –i ubuntu.pem login.java ubuntu@public ip

**1.What is pem file ?**

**Ans :** pem stands for **privacy Enhanced mail certificate**

 used to authenticate a secure website; typically imported from a Unix-based Apache Web server and compatible with OpenSSL applications. PEM certificate files are generated automatically and are not meant to be opened or edited manually. Some secure websites may ask users to upload a PEM file (possibly sent in an e-mail) in order to authenticate their identity

[**My Awsguru**](https://www.youtube.com/channel/UC2lrQrk6wnND-G6PyZ5zu9w) **- youtube**

**What is AWS?**

**Ans : cloud-computing services**

**What is Cloud Computing?**

Cloud computing is used to store, manage and process the data in internet rather than a local server or personal computer.

There are basically 3 categories in cloud computing:

* **SaaS (Software as a Service)**
  + It allows companies to use softwares without having to purchase them, which reduces the expenditure of the company drastically, since they are already installed on the cloud server they can be quickly deployed and therefore saves time.
* **PaaS (Platform as a Service)**
  + It allows developers to build applications, collaborate on projects without having to purchase or maintain infrastructure.
* **IaaS (Infrastructure as a Service)**
  + It allows companies to rent servers, storage space, etc. from a cloud provider

**There are different domains in aws :**

1. **Compute**
2. **Storage and Content Delivery**
3. **DatabaseNetworking**
4. **Management Tools**
5. **Security and Identity**
6. **Application Services**

**##compute :**

It is used to process data on the cloud by making use of powerful processors which serve multiple instances at a time.

**1.EC2 :** EC2 stands for Amazon Elastic Compute Cloud, EC2 is a web service from Amazon that provides **re-sizable** compute services in the cloud.

**How are they re-sizable**

They are re-sizable because you can quickly scale up or scale down the number of server instances you are using if your computing requirements change.

**What is an Instance?**

An instance is a virtual server for running applications on Amazon’s EC2.

**Difference between a service and an Instance?**

Let’s understand it this way:

* EC2 is a service along with other Amazon Web Services like S3 etc.
* When we use EC2 or any other service, we use it through an instance, e.g. t2.micro instance, in EC2 etc.

**Why EC2 ?**

If we want to work independently we have to buy some servers,we have to provide hard drive, memory, computing power and we have to look the updation of security patches every day, we get many problems/issues in the backend in the servers so we have to troubleshoot those issues.

But if you buy an EC2 instance, you don’t have to worry about any of these things as it will all be managed by Amazon…

## ****AWS EC2 Use Case****

**Login to AWS Management Console**

**Select your preferred Region.**

* **Select EC2 Service**Click EC2 under Compute section. This will take you to EC2 dashboard.
* Click **Launch Instance**.
* **Select an AMI :**because you require a Linux instance, in the row for the basic 64-bit Ubuntu AMI, click Select.
* **Choose an Instance**

 Select t2.micro instance, which is free tier eligible.

* **Configure Instance Details.**Configure all the details and then click on add storage
* **Tag an Instance**

Type a name for your AWS EC2 instance in the value box. This name, more correctly known as tag, will appear in the console when the instance launches. It makes it easy to keep track of running machines in a complex environment. Use a name that you can easily recognize and remember.

* **Create a Security Group**
* **Review and Launch an Instance**

Verify the details that you have configured to launch an instance.

* **Create a Key Pair & launch an Instance**

Next in this AWS EC2 Tutorial, select the option ‘Create a new key pair’ and give a name of a key pair. After that, download it in your system and save it for future use.

* **Converting Your Private Key Using PuTTYgen**

PuTTY does not natively support the private key format (.pem) generated by Amazon EC2. PuTTY has a tool called PuTTYgen, which can convert keys to the required PuTTY format (.ppk). You must convert your private key into this format (.ppk) before attempting to connect to your instance using PuTTY.

* Click Load. By default, PuTTYgen displays only files with the extension .ppk. To locate your .pem file, select the option to display files of all types.
* Select your.pem file for the key pair that you specified when you launch your instance, and then click Open. Click OK to dismiss the confirmation dialog box.
* Click Save private key to save the key in the format that PuTTY can use. PuTTYgen displays a warning about saving the key without a passphrase. Click Yes.
* Specify the same name for the key that you used for the key pair (for example, my-key-pair). PuTTY automatically adds the. ppk file extension.
* **Connect to EC2 instance using SSH and PuTTY**
* Open PuTTY.exe
* In the Host Name box, enter Public IP of your instance.
* In the Category list, expand SSH.
* Click Auth (don’t expand it).
* In the Private Key file for authentication box, browse to the PPK file that you downloaded and double-click it.
* Click Open.
* Type in Ubuntu when prompted for login ID.

**What is an AMI ?**

AMI is a Preconfigured templates which is used for creating virtual servers(EC2 instances) in the aws environment.

And It is an image of a server including an operating system and additional software which runs on aws

**@Creating an image :**

First click on instances in Ec2 dashboard and click on action and select image and create image and it opens some configurations so we have to adjust those configurations and an image will be stored in My AMIS…..

**What is key pair ?**

Public + private key = key pair

Amazon EC2 uses public and private key cryptography to encrypt and decrypt login information

Public key encrypts a piece of data, while recipient uses private key to decrypt the same.

**When u launch a vm on EC2 what is that vm called ?**

Instance

**What is the difference between a dedicated host and a dedicated instance ?**

Dedicated host means ur instance is served by a single machine; dedicated instance means ur instance is accessed by a single user

**What is the difference between public ip and elastic ip ?**

|  |  |  |
| --- | --- | --- |
| **Characteristic** | **Public ip** | **Elastic ip** |
| Allocation | Automatically assigned to the instance, not to the account | Associated with the account and can freely associated it with any aws instance |
| Instance stop stage | The public ip will be released , and new ip is generated after restarting the instance | Elastic ip is permanent, which can be owned and are associated to a specific aws instance id |
| Fees | No extra cost | Hourly charges are applied for every Elastic ip that are not attached to a running instance |

**Elstic ip address :**

Elastic ip addresses are static ip address designed for dynamic ccloud computing

An elastic ip address is allocated to your account unless you release it

You are limited to % elastic ips per region, but request can be given for more elastic ips

Elastic ip cn be created under EC2-classic or EC2-VPC

**Which of the following will occur when an EC2 instance in a vpc(virtual private cloud) with an associated Elastic ip is stopped and started ?**

* 1. The elastic ip will stay associated with the instance
  2. The date on ebs(elastic block store)Devices will stay untouched

c)the ENI(elastic network interface) connection state will not change

**answer** d) ALL The Above

Explanation : the elastic ip is the static ip therefore it will stay connected , the data on ebs will be charged according to the amount of storage, therefore the data will not be lost.

**Every account in aws is limited to only 5 elastic ip addresses by default why ?**

* 1. Public (IPV4) internet addresses are a scare resource
  2. There are only 5 network interface per instance
  3. Hardware restrictions
  4. For security reasons

**Explanation** : Elastic ips are static ips, that is an ip which is exclusively assigned to u, usually an ip which is assigned to ur instance, the moment ur session gets over it gets detached from ur instance and goes back into the pool of ip addresses, in this case it stays attached to ur instance until u detach it, and since ip addresses are finite, they should be used efficiently and that is why by default amazon limits the no.of elastic ip addresses to 5 per account.

**\*Security group** is basically a firewall which controls inbound and outbound traffic

**Is aws addressing for all ipv4 ?**

Ipv6 support is available for S3 alone ..No support for EC2

\*\*\*deploy a wordpress in ubuntu \*\*\*[type in google and install ]

**2.Elatic beanstalk :**

Elastic Beanstalk is used to deploy and manage web applications in AWS cloud

You can use elastic beanstalk to deploy applications developed with the programming languages like java, .net, php, ruby, python…

After uploading the application in elastic beanstalk automatically handles deployement details of capacity provisioning , load balancing, auto scaling, and application health monitoring

You can use amazon cloud watch with aws elastic beanstalk to get metrics and set alarms

**Will I able to control the resources powering my application?**

**Yes u can access** the resources at any time

**What are the other aws resources ?**

Elastic beanstalk relies aws services such as amazon elastic compute cloud, auto scaling, elastic load balancing, and amazon simple storage service, to deliver a highly reliable, scalable, and cost-effective infrastructure

**How do I monitor my applications performance ?**

You can use amazon cloud watch with aws elastic beanstalk to get metrics and set alarms

**How do I get started ?**

An easy way to access elastic beanstalk is through the aws management console.you can also use elastic beanstalk command line interface,or the elastic beanstalk API. Aws also provides toolkits and SDKs.

**There are a lot of ways to access it but how secure is it ?**

An additional layer of security by setting up a amazon vpc to create a private subnet for your aws resources

**Is there any way to manage access to my application for users and groups ?**

**Y**ou can control and restrict/limit permissions to read only access to aws elastic beanstalk by creating aws identity and access management (IAM) users

**How to create elastic beanstalk ?**

1.In amazon management console click the aws elastic beanstalk icon to open its console

2.From the region drop-down list, select a region that is closest to you.For this example we will take the default region, Oregon

3.on the aws elastic beanstalk application navigation bar, click create a new application

4.Enter a name for the application and an optional description if you want.

5.click NEXT to select the environment type

6.select radio button UPLOAD YOUR OWN

7. Now chose the sample application zip file we just downloaded

8.click next

9.next additional resources

10.in configuration details page u can determine processing power/ enable remote login/ get notifications emailed to u about changes to ur environment. U can also grant permissions with IAM

11.after u Review , click launch

12.then we can see the status green..that mean ur application is ready to use

13.open the application by cliking the url in the environment page

**3.Elastic load balancing(ELB) :**

ELB automatically manages the workload on your instances and distributes them to other instances in case of an instance failure.

Elb is the one which distributes the traffic to the backend running instances and also monitors Health check of each instances periodically

**@@configuring ELB :**

**1.**In ec2 dashboard click on elastic load balancers option and click create load balancer…and we enter into configure page we enter name, listener configurations…so on and after that click assign security groups then it enters into the configure page we select create a new security group or select existing new security group after that click configure health check and then it enters into the configure page like which protocol(http) , port , path (index.html) and some advanced details (response time and all..)….after that click add ec2 instances and we attach required instances and we click on add tags and we provide a name for that and click review and create ……….

**4.Aws Lambda :**

AWS Lambda is used to execute backend code without worrying about the underlying architecture, you just upload the code and it runs……….

**5.Autoscaling :**

**-**The Autoscaling is used to scale up and down automatically

**-** Adds more instances during high load

**-** Removes instances during less load

**-** Runs desired number of amazon Ec2 instances

**###aws autoscaling components :**

**@Launch configurstions (Template):**

* + - **AMI(Ex:Amazon linux, redhat linux)=**what kind of operating system we need
    - Instance type (**Ex : t2.micro, m4.large**)=what kind of hardware we want either t2 or m4 like that
    - Storage
    - Security type
    - Ssh-keypair

@**Autoscaling Group :**

* + - Launch configurations
    - Network/subnets
    - Scaling policies for increase
    - Scaling policies for decrease
    - Monitoring and alarm

**###Storage and Content Delivery**

**1.S3 :[simple storage service] :**

S3 is an oriented file system….the files stored in s3 is treated as objects….we cannot stores files directly to the s3 first we have to create a bucket..a bucket is basically a folder/root folder

-S3 to be used for WORM(Write once read many times)

-Unlimited storage

-But not suitable for hosting operating system files or database files

Ebs is a hard drive to an ec2 instance….when we use instance our operating system stores our software anywhere……ebs cant be used independently….it has to be used with ec2 only….

-Ebs works best as server disks(hosting operating system or database files)

-persistent and high performance in terms of read and write

-Replicated with Availability zone and could be mounted to one Ec2 in the same Availability Zone

One ec2 instaance can connect to the multiple ebs volumes but one ebs volume cannot be connected to the multiple instances…

**2**. **Amazon CloudFront :**

CloudFront is a content delivery network which is used to cache data to an edge location which reduces latency.

**3.Amazon EBS :**

Amazon Elastic Block Storage is a storage service wherein each block of storage acts like a separate hard drive.

IOPS : input output per second

The storage (EBS) and server(instance) should be in same availability zone(us-east-2a)

Encrypt is nothing but secure need a key to access..

**Snapshot :**

**Snapshot** is a nothing but backup a useful feature in aws

And this snapshot will be compressed and stored in s3 bucket…

If u want to make filesystem :

mkfs.ext4 /dev/xvdf

mkdir /app

mount –t ext4 /dev/xvdf /app

Df –kh

**@@Configuring :**

First we have to select volume in ec2 dashboard and click on create volume after that it takes u to configure page we have to provide type, size, availability zone,[instance and ebs should be in same availability zone] and click o create ..

After creating a volume u have to attach to an instance ….so first click on actions and select attach volume and we have to provide instance and click on attach…so it will be attached..

4.**Glacier :**

Amazon glacier is a data archieving service, offering low price storage….when u have to backup ur data from s3 or ec2 instances because they use magnetic tapes…they are cheap..

**Which data we have to store in amazon glacier ?**

We store the data which we frequently access….retrival time will be more and cheaper..

**6.Snowball :**

Transferring data to aws infrastructure or transferring back from the infrastructure. When we have large data and sending through internet it takes more time but through snow ball its fast

**7.Storage gateway :**

Storage gateay is used between your database servers and application servers and taking snapshots of database servers and storing on the s3 …suppose if we have 3 or 4 data base centers and if any database server is corrupted for any reason at the time storage gateway recognize the failure has happen and restore that respective database

## #####Database :

## ****1.Amazon Aurora :****

## Amazon RDS is a managed relational database service which does routine database tasks  in 6 familiar databases like  Amazon Aurora, MySQL, MariaDB, Oracle, Microsoft SQL Server, and PostgreSQL

**2.Amazon RDS :[Relational Database Service]**

Amazon RDS is a managed relational database service which does routine database tasks  in 6 familiar databases like  Amazon Aurora, MySQL, MariaDB, Oracle, Microsoft SQL Server, and PostgreSQL

**3.Amazon DynamoDB :**

It is a fully managed No-SQL database service. It is known for extremely low latencies and scalability.

**4.Amazon ElastiCache :**

It is a web service that makes it easy to set up, manage and scale a distributed cache-in environment in the cloud.

**5.Amazon Redshift**

Amazon Redshift is a fully managed petabyte-scale data warehouse service in the cloud

**#####Networking :**

**1.VPC :**

Amazon VPC lets you launch AWS resources in a virtual network that you define. It closely resembles a traditional network that you’d operate in your data center.

-A virtual private cloud is a virtual network dedicated to ur account

-it is logically isolated from other virtual networks in the aws cloud

-this virtual network closely resembles a traditional network that u had operate in ur own data center

- u can launch your aws resources , such as amazon Ec2 instances , into your vpc

What is subnet ?

- a subnet is a range of ip addresses in ur vpc

- you can launch aws resources into a subnet that u select

- use a public subnet for resources that must be connected to the internet.

- use a private subnet for resources that wont be connected to the internet.

What is a Routing table ?

* + - A route table contains a set of rules, called routes, that are used to determine where network traffic is directed.
    - Each subnet in your vpc must be associated with a route table , the table controls the routing for the subnet
    - A subnet can only be associated with one route table at a time , but u can associate multiple subnets with the same.

What is Internet GateWay (IGW) :

* + - An internet gatewaty is a horizontally scaled, redundant and highly available VPC component that allows communication between instances in your VPC and the internet
    - It therefore imposes no availability risks or badwidth constraints on ur network traffic
    - An internet gateway serves two purposes
    - Provide a target in ur VPC route tables for internet-routable traffic
    - Perform network address translation (NAT) for instances that have been assigned public IP addresses

**Configuring VPC :**

**In VPC dashboard click on create vpc and after that u enter into configuring pages provide name, network(CIDR block), tenancy andc click on create ……..**

**After creating VPC select subnet option in vpc dashboard and click on create subnet and it takes u to configure page enter name, VPC, Availability Zone, network(CIDR block) and click on create……**

**After creating Subnet, select internet gateway option in vpc dashboard and click on create internet gateway it takes u to configure page their u provide name and create and click on attach vpc and attach costum vpc**

**After creating Internet gateway, select option routing table in vpc dashboard and click on create routing table it takes u to configure page there we provide name, VPC, and click on create ..**

**In VPC we can create Multiple subnets….for example we create two subnets called private and public subnets….**

**Internet gateway is used to get internet connection for vpc…..for example my vpc need internet connection so my vpc has to attach to the internet gateway….**

**But in my Vpc I have two subnets one is private and another one is public …..**

**My goal is that public has to get internet connection and private has to be no internet connection…**

**So, now we have to create a routing table and and attach to the public subnet which u want to connect to the internet.**

**12.AWS Direct Connect :**

It helps you establish a private connection between your premises and AWS, therefore giving better network performance and throughput than an Internet based connection.

**3.Amazon Route 53**

Route 53 is a highly scalable and highly available Domain Name System by Amazon AWS. The name is in reference to the TCP and UDP’s port 53 where DNS requests are addressed.

**####Management Tools**

**1.Amazon CloudWatch**

 It is a monitoring tool by AWS which is used to keep a track on the AWS resources and the applications you run on Amazon AWS.

**2.AWS CloudFormation**

**3.AWS CloudTrail**

**4.AWS Command Line Tool**

**5.AWS OpsWorks**

**6.Trusted Advisor**

**####Security and Identity**

**1.AWS Identity and Access Management(IAM)**

It is an AWS service that helps you control access to your AWS resources for your users

**2.AWS Key Management Service**

**####Application Services**

**1.Amazon SES :**

**2.Amazon SNS :**

**3.Amazon SQS :**

**Vpc :** if we include all the aws resources that we launched in one vpc..then all this resources can visible to each other or interactive to each other

It provides security it makes communication between aws services easy.

**Direct connect :**

Is a leased line using which u can directly connect to the aws infrastructure

**Route53 :**

Is a domain name system

**Cloud watch :**

Is a cloud monitoring tool which is used to monitor all ur aws resources in ur aws infrastructure