EC2

* EC2 stands for Amazon Elastic Compute Cloud.
* Amazon EC2 is a web service that provides resizable compute capacity in the cloud or we can say that, vitural machines
* Amazon EC2 reduces the time required to obtain and boot new user instances to minutes
* You can scale the compute (computer resources) capacity up and down as per the computing requirement changes
* Amazon EC2 changes the economics of computing by allowing you to pay only for the resources that you actually use.

## EC2 Pricing Options

### On Demand

* It allows you to pay a fixed rate by the hour or even by the second with no commitment.
* Linux instance is by the second and windows instance is by the hour.
* On Demand is perfect for the users who want low cost and flexibility of Amazon EC2 without any up-front investment or long-term commitment.
* On Demand instance is recommended when you are not sure which instance type is required for your performance needs.

### Reserved

* It is a way of making a reservation with Amazon or we can say that we make a contract with Amazon. The contract can be for 1 or 3 years in length.
* In a Reserved instance, you are making a contract means you are paying some upfront, so it gives you a significant discount on the hourly charge for an instance.
* It is useful for applications with steady state or predictable usage.
* It is used for those applications that require reserved capacity.
* Users can make up-front payments to reduce their total computing costs. For example, if you pay all your upfronts and you do 3 years contract, then only you can get a maximum discount, and if you do not pay all upfronts and do one year contract then you will not be able to get as much discount as you can get If you do 3 year contract and pay all the upfronts.

#### Types of Reserved Instances:

* Standard Reserved Instances
* Convertible Reserved Instances
* Scheduled Reserved Instances

#### Standard Reserved Instances

* It provides a discount of up to 75% off on demand. For example, you are paying all up-fronts for 3 year contract.
* It is useful when your Application is at the steady-state.

#### Convertible Reserved Instances

* It provides a discount of up to 54% off on demand.
* It provides the feature that has the capability to change the attributes of RI as long as the exchange results in the creation of Reserved Instances of equal or greater value.
* Like Standard Reserved Instances, it is also useful for the steady state applications.

#### Scheduled Reserved Instances

* Scheduled Reserved Instances are available to launch within the specified time window you reserve.
* It allows you to match your capacity reservation to a predictable recurring schedule that only requires a fraction of a day, a week, or a month

### Spot Instances

* It allows you to bid for a price whatever price that you want for instance capacity, and providing better savings if your applications have flexible start and end times.
* Spot Instances are useful for those applications that have flexible start and end times.
* It is useful for those applications that are feasible at very low compute prices.
* It is useful for those users who have an urgent need for large amounts of additional computing capacity.
* EC2 Spot Instances provide less discounts as compared to On Demand prices.
* Spot Instances are used to optimize your costs on the AWS cloud and scale your application's throughput up to 10X.
* EC2 Spot Instances will continue to exist until you terminate these instances

### Dedicated Hosts

* A dedicated host is a physical server with EC2 instance capacity which is fully dedicated to your use.
* The physical EC2 server is the dedicated host that can help you to reduce costs by allowing you to use your existing server-bound software licenses. For example, Vmware, Oracle, SQL Server depending on the licenses that you can bring over to AWS and then they can use the Dedicated host.
* Dedicated hosts are used to address compliance requirements and reduces host by allowing to use your existing server-bound server licenses.
* It can be purchased as a Reservation for up to 70% off On-Demand price.

What is EBS?

* EBS stands for **Elastic Block Store**.
* EC2 is a virtual server in a cloud while EBS is a virtual disk in a cloud.
* Amazon EBS allows you to create storage volumes and attach them to the EC2 instances.
* Once the storage volume is created, you can create a file system on the top of these volumes, and then you can run a database, store the files, applications or you can even use them as a block device in some other way.
* Amazon EBS volumes are placed in a specific availability zone, and they are automatically replicated to protect you from the failure of a single component.
* EBS volume does not exist on one disk, it spreads across the Availability Zone. EBS volume is a disk which is attached to an EC2 instance.
* EBS volume attached to the EC2 instance where windows or Linux is installed known as Root device of volume.

## EBS Volume Types

EBS Volume types fall into two parts:

* SSD-backed volumes
* HDD-backed volumes

### SSD

* SSD stands for solid-state Drives.
* In June 2014, SSD storage was introduced.
* It is a general purpose storage.
* It supports up to 4000 IOPS which is quite very high.
* SSD storage is very high performing, but it is quite expensive as compared to HDD (Hard Disk Drive) storage.
* SSD volume types are optimized for transactional workloads such as frequent read/write operations with small I/O size, where the performance attribute is IOPS.

SSD is further classified into two parts:

**General Purpose SSD**

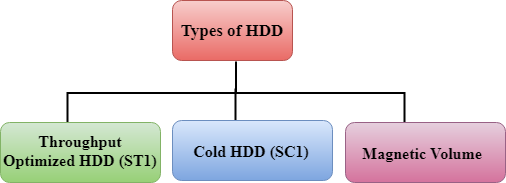
* General Purpose SSD is also sometimes referred to as a GP2.
* It is a General purpose SSD volume that balances both price and performance

**Provisioned IOPS SSD**

* It is also referred to as IO1.
* It is mainly used for high-performance applications such as intense applications, relational databases.
* It is designed for I/O intensive applications such as large relational or NOSQL databases.
* It is used when you require more than 10,000 IOPS.

## HDD

* It stands for Hard Disk Drive.
* HDD based storage was introduced in 2008.
* The size of the HDD based storage could be between 1 GB to 1TB.
* It can support up to 100 IOPS which is very low.



# Creating an EC2 instance

* Sign in to the AWS Management Console.
* Click on the EC2 service.
* Click on instances navigation bar
* Click on the **Launch Instance** button to create a new instance.
* Give the name to instance
* Select the amazon machine image
* Choose an Instance Type, choose key pair or create new pair (note : key pair is also region specific),choose network settings and security group, choose storage configuration
* Then click on launch instance