EC2 (elastic compute cloud)

What is Amazon EC2?

1. What is amazon Ec2 and its benefits

Amazon EC2, or Elastic Compute Cloud, is like renting a computer in the cloud. Imagine you need a powerful laptop or a server to do some work—instead of buying it, you can rent it from Amazon's cloud service. This computer is virtual, meaning it exists in Amazon's data centers, and you can use it just like your own computer to run applications, store data, or whatever else you need.

EC2's combination of scalability, cost-effectiveness, reliability, security, and flexibility makes it a powerful tool for businesses and developers looking to deploy applications and services in the cloud. Whether you're running a small blog or a large scale enterprise application, EC2 provides the infrastructure that can adjust to your needs.

1. Scalability: One of the primary benefits of EC2 is its scalability. You can easily increase or decrease your compute capacity depending on the demands of your application, often within minutes. This flexibility helps in managing fluctuating workloads efficiently.
2. Cost-Effectiveness: With EC2, you pay only for the compute time you consume. This pay-as-you-go model allows for cost savings compared to the expense of purchasing and maintaining physical servers. Additionally, AWS offers pricing models like Reserved Instances and Spot Instances that can provide significant savings over the standard on-demand pricing.
3. Reliability: EC2 is designed for high reliability and availability. It is hosted in multiple locations world-wide, which are composed of regions and Availability Zones.
4. Security: AWS provides several layers of security to safeguard your infrastructure, including network firewalls, encryption, and access controls.
5. (finding the area) Integration with AWS Services: EC2 integrates seamlessly(smoothly and continuously) with other AWS services like Amazon S3 for storage, Amazon RDS for databases, and AWS Lambda for serverless computing.
6. Customizable Environments: You have complete control over your virtual computing environment. This includes the selection of your operating system, the configuration of your network, and the choice of your security settings.

*2. There are three main purchasing options:*

*On-Demand Instances: With this option, you pay for compute capacity by the hour or second, depending on the instance type, with no long-term commitments or upfront payments. It's like paying for electricity; you only pay for what you use.*

*Reserved Instances: Reserved Instances involve making a one-time payment to reserve compute capacity for a specific instance type in a particular region. This option offers significant discounts compared to On-Demand pricing and is best suited for predictable workloads with steady-state usage.*

*Spot Instances: in AWS offer spare computing capacity at low prices, but they can be interrupted if demand increases or if others bid higher. They're best for flexible, non-urgent tasks like batch processing or testing.*

1. *Tenect types:*

*In Amazon Web Services (AWS), EC2 (Elastic Compute Cloud) provides resizable compute capacity in the cloud. The main tenancy types for EC2 instances are:*

*Shared Tenancy (default): Instances are launched on physical servers shared with other AWS accounts. This is cost-effective and suitable for most workloads.*

*Dedicated Tenancy: Instances run on physical servers dedicated to a single AWS account. There are two types:*

*Dedicated Instances: Instances run on hardware that's dedicated to a single AWS account, but the physical hardware can still be shared with other AWS resources.*

*Dedicated Hosts: Physical servers are dedicated exclusively to a single AWS account. This offers more control over instance placement and can address specific compliance or regulatory requirements.*

*What is status check*

*Certainly! In AWS EC2, status checks are health evaluations performed on your instances.*

*Instance Status Check (0/2, 1/2, 2/2):*

*Checks if the instance is reachable and operating properly.*

*Reported as 0/2, 1/2, or 2/2, indicating the number of passed checks out of two.*

*System Status Check:*

*Verifies the health of underlying infrastructure (hardware, network).*

*Instance Status Check:*

*Ensures the instance's software and configuration are functioning correctly.*

*These checks help identify and resolve issues affecting your EC2 instances' performance and avalibility.*

*How many security group are attached in in EC2 ?*

*In AWS EC2, you can attach multiple security groups to an instance. However, it's essential to note that the number of security groups attached to an EC2 instance is not limited. You can attach up to five security groups per network interface. This means that if your EC2 instance has multiple network interfaces, you can attach up to five security groups to each of them. Therefore, the total number of security groups attached to an EC2 instance depends on the number of network interfaces it has and how many security groups are attached to each interface.*

EBS (ELASTIC BLOCK STORAGE)

Amazon Elastic Block Store (EBS):

Amazon EBS (Elastic Block Store) provides different types of storage options called volumes, which are like hard drives that you can attach to your Amazon EC2 instances. Each type of volume is designed for specific use cases and offers a balance between performance (speed), durability (how safe your data is), and cost. Here’s a simple explanation of each type:

1. General Purpose SSD (gp2 and gp3)

gp2: These are the all-rounder volumes that offer a good balance of performance and cost. They're great for most everyday applications or development environments. Think of them as the versatile sneakers you can wear for various activities.

gp3: The newer version of general-purpose volumes, which provide better performance and cost-efficiency than gp2. You can set the speed and throughput (how much data can be moved at a time) according to your needs. It's like having sneakers you can customize for running, walking, or hiking.

2. Provisioned IOPS SSD (io1 and io2)

io1: These volumes are like sports cars—fast and responsive. They're designed for applications that need to perform a lot of read and write operations quickly, like busy databases.

io2: This is an upgraded version of io1, offering even more durability and performance. It's for critical applications that cannot tolerate any delays or data loss, similar to having a top-of-the-line sports car with added safety features.

3. Throughput Optimized HDD (st1)

st1: These are like delivery trucks designed for moving large amounts of data at a steady speed. They're not as fast as SSDs for random access but are great for big data, data warehouses, and other tasks that involve reading and writing lots of data in sequence.

4. Cold HDD (sc1)

sc1: These are like storing your stuff in a budget storage unit. It's very affordable, but not as quick to access. These volumes are best for data that you rarely need but want to keep on hand, like old photos or records.

5. Magnetic (Standard)

Magnetic: These are the old-school hard drives. They offer the lowest cost for storing data that's not accessed often and don't require fast access speeds. It's like keeping files in a filing cabinet; you can get to them when you need to, but it's not as quick or convenient as having them on your desk.

*CPU credit is only applicable to ec2 instance type?*

*CPU credit is indeed specific to certain types of Amazon EC2 instances that utilize the "burstable performance" model. These instances are known as T2, T3, T3a, T4g, and T4g instances.*

*They are suitable for a wide range of workloads including development/testing environments, low to moderate traffic websites, microservices, and more, where CPU usage may vary over time.*

*Overall, T series instances provide flexibility and cost-effectiveness for applications with fluctuating CPU demands, making them popular choices for many AWS users.*

*how to convert launch configuration into launch template ?*

*Converting an AWS Launch Configuration into a Launch Template involves several steps. Below is a step-by-step guide to accomplish this:*

*Create a New Launch Template:*

*Go to the AWS Management Console and navigate to the EC2 dashboard.*

*In the navigation pane, under "Instances", select "Launch Templates".*

*Click on the "Create launch template" button.*

*Enter Details:*

*Provide a name and description for the new launch template.*

*Choose the appropriate AMI (Amazon Machine Image) for your instances.*

*Configure other settings such as instance type, key pair, security groups, IAM role, etc., according to your requirements.*

*Add Configuration Details:*

*Scroll down to the "Advanced details" section of the launch template creation wizard.*

*Configure additional settings such as user data, instance tags, monitoring options, etc., as needed.*

*Add Storage and Network Settings:*

*Configure settings related to instance storage (EBS volumes) and networking (VPC, subnet, security groups).*

*Convert Configuration Settings:*

*Review the settings in your existing launch configuration and ensure they are replicated accurately in the launch template. Adjust any settings as necessary to match your requirements.*

*Save the Launch Template:*

*Once all the necessary settings are configured, click on the "Create launch template" button to save your changes.*

*Update Auto Scaling Groups (ASGs):*

*If your Launch Configuration is associated with any Auto Scaling Groups, you'll need to update them to use the new Launch Template.*

*Go to the Auto Scaling Groups section in the EC2 dashboard.*

*Select the appropriate Auto Scaling Group and update its launch template configuration to use the newly created launch template.*

*Verify and Test:*

*After updating the Auto Scaling Groups, ensure that your instances are launched correctly using the new launch template.*

*Monitor the instances to confirm that they behave as expected.*

*By following these steps, you can successfully convert an existing Launch Configuration into a Launch Template in AWS EC2.*