Basics of Amazon EC2 That You Must Know

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In this guide, we are going to deep dive into the most important EC2 basics.

- EC2 is one of the most popular of AWS' offerings. It's used everywhere and stands for Elastic Compute Cloud (Infrastructure as a Service).

EC2 is not just one service; it is composed of a lot of services that enable you to do a lot of capabilities:

- Renting virtual machines (EC2 instances)
- Store data on virtual drives (EBS volumes)

- Distributing load across machines (Elastic Load Balancer)
- Scaling your services using an auto-scaling group (ASG)

EC2 sizing and configuration options

- Operating System (OS): Linux or Windows.
- How much compute power & cores (CPU) do you want on your virtual machine
- How much random-access memory (RAM)
- How much storage space:

Network-attached (EBS & EFS)

Hardware-attached (EC2 Instance store)

- Network card: speed of the card, Public IP address, type of network you want to attach to your EC2 instance. Do you want a network card that is going to be fast? What kind of public IP do you want.
- Firewall rules: Security group of your EC2 instance.
- Bootstrap script (configure your instance at first lunch): EC2 User Data.
- EC2 instances are elastic, meaning they can instantly grow or shrink to match the requirements of a specific application.
- You can pay-as-you-go for ec2 instances and per second.

Features of Amazon EC2

- Persistent storage volumes for your data using Elastic Block Store (Amazon EBS) multiple volumes can also be added to an instance.
- A firewall that enables you to specify protocols, ports, and source IP ranges that can reach your instances are security groups.
- You can have static IPv4 addresses or dynamic cloud computing, known as Elastic IP addresses.
- Metadata, known as tags, lets you create and assign data to your Amazon EC2 resources.

EC2 Pricing model

1. On-Demand Instances: Rent your instances for a few seconds, hours, days, etc. **(Pay as you go)**

2. Reserved instances: Pay upfront 1–3 years and save a lot. (up to 75%)
3. Spot instances: They may be available or not available for you to use, AWS can terminate your instances within two minutes of notice. Due to this approach, you get up to 90% cheaper than On-Demand Instances.

EC2 Monitoring

Cloudwatch Service provides basic **monitoring** for various EC2 instance metrics like CPU utilization, Network In/Out packets, In/Out Disk Read/Writes.

It does not provide metrics like memory(RAM) utilization. You can create custom metrics for things like Memory Utilization, and disk usage monitoring.

Roles: Add permissions to EC2

You can't access other AWS resources from your EC2 instance by default. You need to either:

1. **Hard code credentials**: (access key id and secret access key) I won't recommend this approach. A better way is to;
2. Attach Roles with Proper permissions to EC2, This way you can access services like S3, Dynamo DB, etc from EC2. This is safer because with roles you get to use temporary credentials.

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- Snapshots let you Backup data that lives on EBS volumes.

You can interface with your EC2 resources using the following mediums:

- AWS CLI
- AWS cloudformation
- AWS SDK (boto, nodejs, java)
- AWS REST API
- AWS Management console

EC2 Autoscaling: Increased performance and Availability:

You can use Amazon EC2 Autoscaling for dynamic scaling of EC2 instances in order to automatically increase the number of Amazon EC2 instances during demand spikes to maintain performance and decrease the capacity of EC2 instances when the demand goes down.

Steps to use EC2

The first step involves choosing your AMI. The AMI or Amazon machine image is a template that is used to create a new instance/ machine based on the user requirement.

AMI's are of 2 types:

- Pre-defined AMIs
- Custom AMIs

The AMI would contains: software information, Operating System information, Volume information, Access permissions.

- Pre-defined AMIs are created by Amazon and can be modified by the user.
- Custom AMIs are created by the user so that they can be reused.

2. Choosing an Instance type: An instance type specifies the hardware specifications that are required in the machine from the previous step.

The instance type is categorized into 5 main families. They are:

1. Compute Optimized: Compute-optimized gives you lots of compute power or processing power. If your application will require a lot of processing power you should be going for the compute-optimized instance.
2. Memory-Optimized: This is good for applications that require in-memory caching.
3. GPU Optimized: For setting up a gaming system or something with a large graphical requirement.
4. Storage Optimized: When you need to set up a storage server.
5. General-purpose: If you are not too sure about what to use, you can just end up using the General purpose. Here, the services are sort of equally balanced.

These instance types are fixed and their configurations cannot be altered.

3. Configuring your Instance: You have to specify the number of instances, purchasing options, the kind of network, the subnet, when to assign a public IP, the IAM role, the shutdown behavior, etc. Under the advanced details, users can add bootstrap scripts that are executed when the virtual machine starts up.

4. Adding storage: You can go for different storage, like Ephemeral storage, which is temporary and free, Amazon Elastic Block Store, which is a paid and permanent storage, or you can integrate your EC2 instance with S3 for the storage needs you want. Free

Users get to access up to 30GBs of SSD or Magnetic storage (which can be found under ‘volume type’)

5. Add tags: Tags are very helpful to identify your machine in an environment where we have over a thousand Vms running.

6. Configure Security groups: Security groups are the actual firewall that sits in front of your EC2 instance, and it protects your EC2 instance from unintended inbound and outbound traffic. With the Security groups, you can fine-tune access to your EC2 instance based on port numbers.

7. Finally you get to review your whole changes and configurations that you have made to find out if they are intact with the requirement, after that click on submit, that’s going to lunch your EC2 Instance.

> *Before your submit your configuration, you will have to download your key pair (.pem file), this will help you access your EC2 instance. A key pair, consisting of a public key and a private key, is* ***a set of security credentials that you use to prove your identity when connecting to an Amazon EC2 instance****. Amazon EC2 stores the public key on your instance, and you store the private key.*

Gracias

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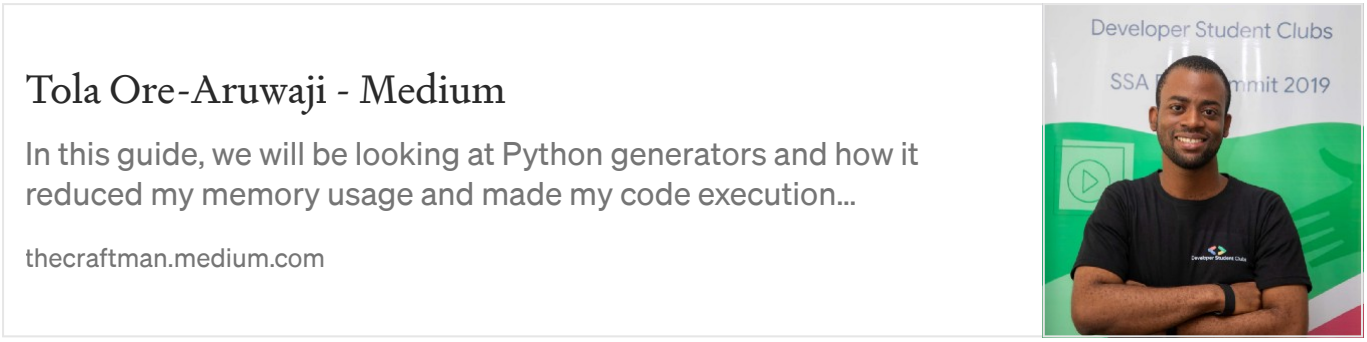

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