



What is AWS EC2 (Elastic Compute Cloud)?

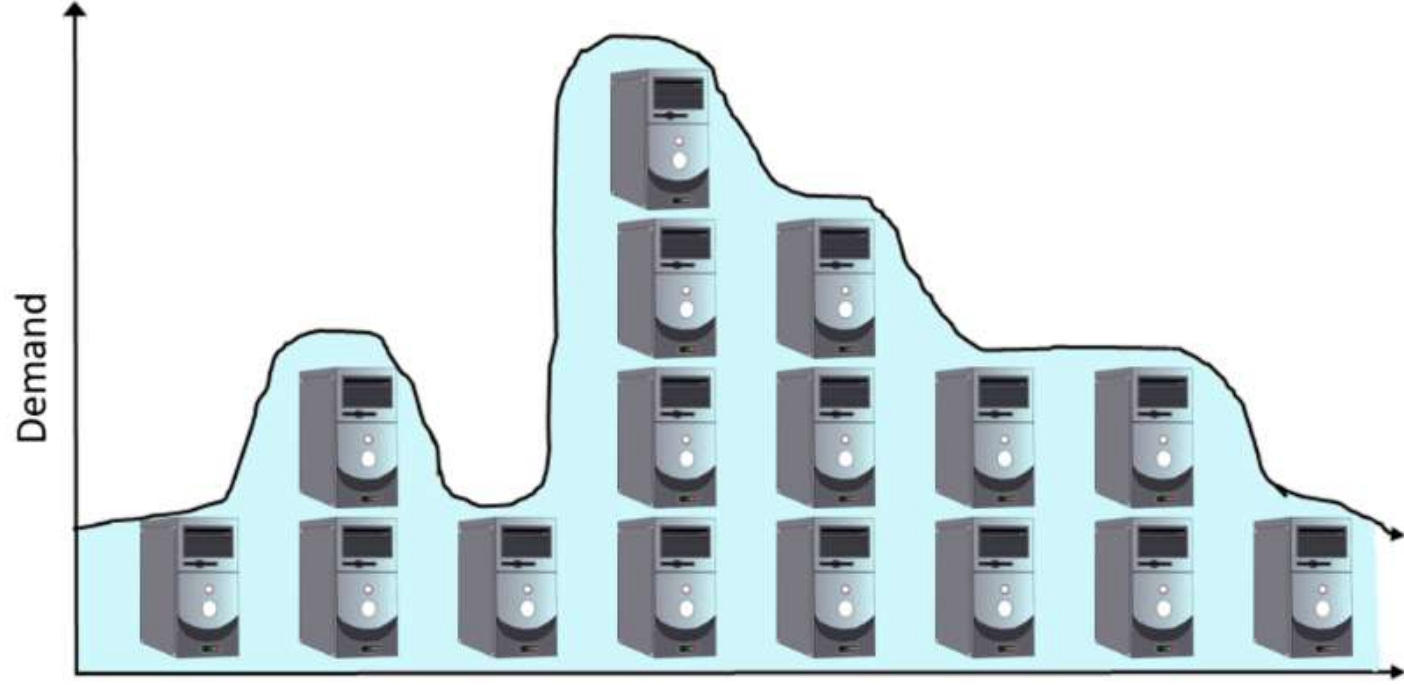
AWS EC2 stands for Amazon Elastic Compute Cloud. Amazon EC2 Service is the most used AWS service. It lets users create virtual machines of their own choice of configurations



AWS service that lets users launch and manage server instances, at any time and for as long as they need

EC2 is a machine with an operating system and hardware components of your choice. But the difference is that it is totally virtualized.

Amazon EC2 instances there is no need to maintain any rented hardware. It enables you to build and run applications faster. You can use EC2 in AWS to launch as many virtual servers as you need. Also, you can scale up or down when there is an increase or decrease in website traffic.



Why Amazon EC2?

Now that we know the EC2 overview, let's now move forward and understand Why exactly we need Amazon EC2. AWS Elastic Compute Cloud provides a lot of benefits

1. Renting Virtual Machine (EC2)
2. Storing data on virtual Devices (EBS) ==> Elastic block store
3. Distributing load across machines (ELB)
4. Scaling the services using an auto-scaling group (ASG)

Pay-as-you-Go:

Now that we know the EC2 overview, let's now move forward and understand Why exactly we need Amazon EC2. AWS Elastic Compute Cloud provides a lot of benefits

You will be charged by the hour, and you have to pay only for what you have used. A company, XYZ might be using 100 servers normally, and on Weekends, it scales down to 50 servers. So, it only has to pay for 50 servers those days, not the usual fee for the usage of 100 servers.

Even when you use your Amazon EC2 instances services for a few hours, you only need to pay for that time period and nothing more.



Increased Reliability:

AWS is spread across 31 worldwide regions with 99 availability zones (AZs) which helps your business when it is expanding. Also, this will increase the load speed of your application around the world.

You can always store multiple copies of your application in multiple AZs so that when one data center fails or loses data, the application will not fail completely.

Elasticity:

Instead of 10 low-configuration machines, you could rent a single high-configuration machine with an OS of your preferred choice for your application. Elasticity is the feature from which Elastic Compute Cloud got its name.

AWS has the following naming Convention:

m5.2xlarge

m: instance class

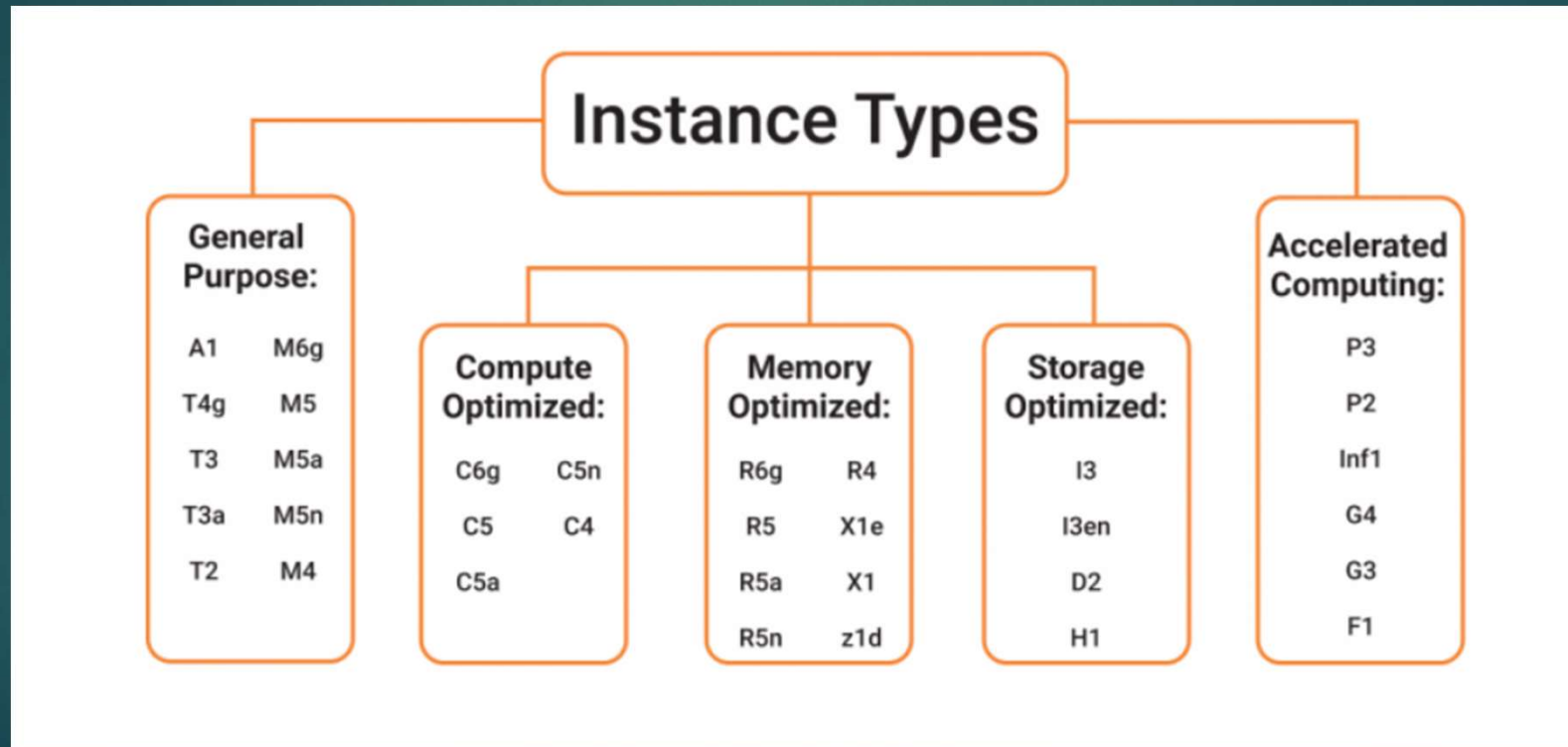
5: generation (Aws improves them over time)

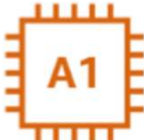

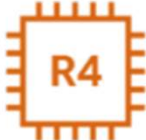







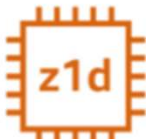
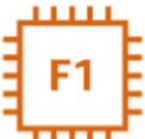

2xlarge: size within the instance class

Amazon EC2 – Instance Types

Different Amazon EC2 instance types are designed for certain activities. Consider the unique requirements of your workloads and applications when choosing an instance type.

The types of Amazon EC2 Instances are:



General Purpose	Compute Optimised	Memory Optimised	Accelerated Computing	Storage Optimised
 <p>A1</p> <p>ARM based core and custom silicon</p>	 <p>C4</p> <p>Compute - CPU intensive apps and DBs</p>	 <p>R4</p> <p>RAM - Memory intensive apps and DB's</p>	 <p>P2</p> <p>Processing optimised- Machine Learning</p>	 <p>H1</p> <p>High Disk Throughput - Big data clusters</p>
 <p>T2</p> <p>Tiny - Web servers and small DBs</p>		 <p>X1</p> <p>Xtreme RAM - For SAP/Spark</p>	 <p>G3</p> <p>Graphics Intensive - Video and streaming</p>	 <p>I3</p> <p>IOPS - NoSQL DBs</p>
 <p>M4</p> <p>Main - App servers and general purpose</p>		 <p>z1d</p> <p>High Compute and High Memory - Gaming</p>	 <p>F1</p> <p>Field Programmable - Hardware acceleration</p>	 <p>D2</p> <p>Dense Storage - Data Warehousing</p>



Introduction to Security Groups:

1) Security groups are the fundamentals of networking security in AWS

They control how traffic is allowed into or out of our EC2 instance

3. Security group only contains allow rules

4. Security group rules can reference by IP

5. Security groups are acting as a "firewall" on EC2 instances



Security groups (good to know)

1. Can be attached to multiple instances
2. All inbound traffic is blocked by default
3. All outbound traffic is authorized by default
4. If your application gives a "connection refused" error, then its a security group issue



Webserver

A web server is a software and hardware that uses HTTP (Hypertext Transfer Protocol) and other protocols to respond to client requests made over the World Wide Web. (Internet)

The main job of a web server is to display website content through storing, processing, and delivering web pages to users.

Webserver

Apache web Server. Developed by Apache Software Foundation, it is a free and open-source web server for Windows, Mac OS, Unix, Linux, and other operating systems

Nginx Web Server. A popular open-source web server for administrators because of its light resource utilization and scalability. Nginx also can be used as a proxy server and load balancer.

Microsoft Internet Information Services (IIS). Developed by Microsoft for Microsoft platforms; it is not open source, but widely used.



HTML headings are defined with the

<h1>Your Name</h1>

Secure Copy Protocol (SCP)

scp -i keypairname.pem filename ubuntu@serverip:/home/ubuntu



User Data Script

1. It is possible to bootstrap our instance using an EC2 user data script
2. Bootstrapping means launching commands when a machine starts
3. That script is only run once at the instance the first start

EC2 user data

1. Installing updates
2. Install software
3. Download common files
4. Anything you can think of
4. EC2 user data script runs with the root user

User Data Script

```
#!/bin/bash  
apt update -y  
apt install apache2 -y  
systemctl restart apache2.service  
echo "<h1>Hello-AWS</h1>" >/var/www/html/index.html
```


EBS Volume..!!

1. AN EBS (Elastic Block Store) Volume is a network drive you can attach to your instance while they run
2. it allows your instance it persist data, even after their termination
3. They can only be mounted to one instance at a time
4. They are bound to a specific AZ

Free Tier: 30GB of Free EBS storage of type SSD or Magnetic per month

ubuntu

lsblk command to view your available disk devices and their mount points



EBS Snapshots

- 1. Make a Backup (snapshots) of your EBS volume at a point in time**
- 2. Not Necessary to detach volume to do a snapshot, but recommended**
- 3. Can copy snapshots Across AZ or region**



AMI Amazon Machine Image:

AMI Are Customization of an EC2 Instance

- 1. You can add your own software, Configuration, Tools...**
- 2. Faster boot / Configuration time because all your software is pre-installed**
- 3. AMI are built for a specific region (and can be copied across regions)**

Snapshots vs AMIs

In a

Snapshots

employees is facing issues with launching

AMI

- It is used as a backup of a single EBS volume attached to the EC2 instance
- Opt for this when the instance contains multiple static EBS volumes
- It is a non-bootable image on EBS volume

- It is used as a backup of an EC2 instance
- This is widely used to replace a failed EC2 instance
- It is a bootable image on EC2 instance

launch
ces with
tion.

ther
r AMI