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AMAZON EC2 (ELASTIC CLOUD COMPUTE)

ABOUT EC2:

1) Resizable compute capacity.
2) Complete control of your computing resources.
3) Reduced time required to obtain and boot new server instances.
4) Provides pay-as-you-go pricing and a broad selection of hardware and software:
   - ➔ Use Amazon Machine Images (AMIs).
   - ➔ Add or terminate instances as needed.
   - ➔ Pause and resume your instances.
5) Template for:
   - ➔ Storage volumes.
   - ➔ Launch permissions.
   - ➔ A block device mapping.
6) Examples: Application Server, Web Server, Database Server, Game Server, Mail Server, Media Server, Catalog Server, File Server.

BENEFITS OF EC2:

1) Elasticity
2) Control
3) Flexibility
4) Integrated
5) Reliable
6) Secure
7) Inexpensive
8) Easy

EC2 INSTANCE FAMILIES AND NAMES:

- Choosing the correct type of instance is very important for efficient use of instances and cost reduction.

INSTANCE FAMILY	USE CASES
General Purpose - **A1, T3, T3a, T2, M6g, M5**	✓ Low-traffic websites and web applications. ✓ Small databases and midsize databases.
Compute Optimized - **C5, C5n, C4, C7g**	✓ High-performance web servers. ✓ Video encoding.
Memory Optimized - **R5, R5n, X1e, X1, z1d**	✓ High-performance databases. ✓ Distributed memory caches.
Storage Optimized - **I3, I3en, D2, H1**	✓ Data warehousing. ✓ Log or data processing applications.
Accelerated Computing - **P3, P2, Inf1, G4, G3, F1**	✓ 3D visualizations. ✓ Machine learning.

EC2 PRICING:

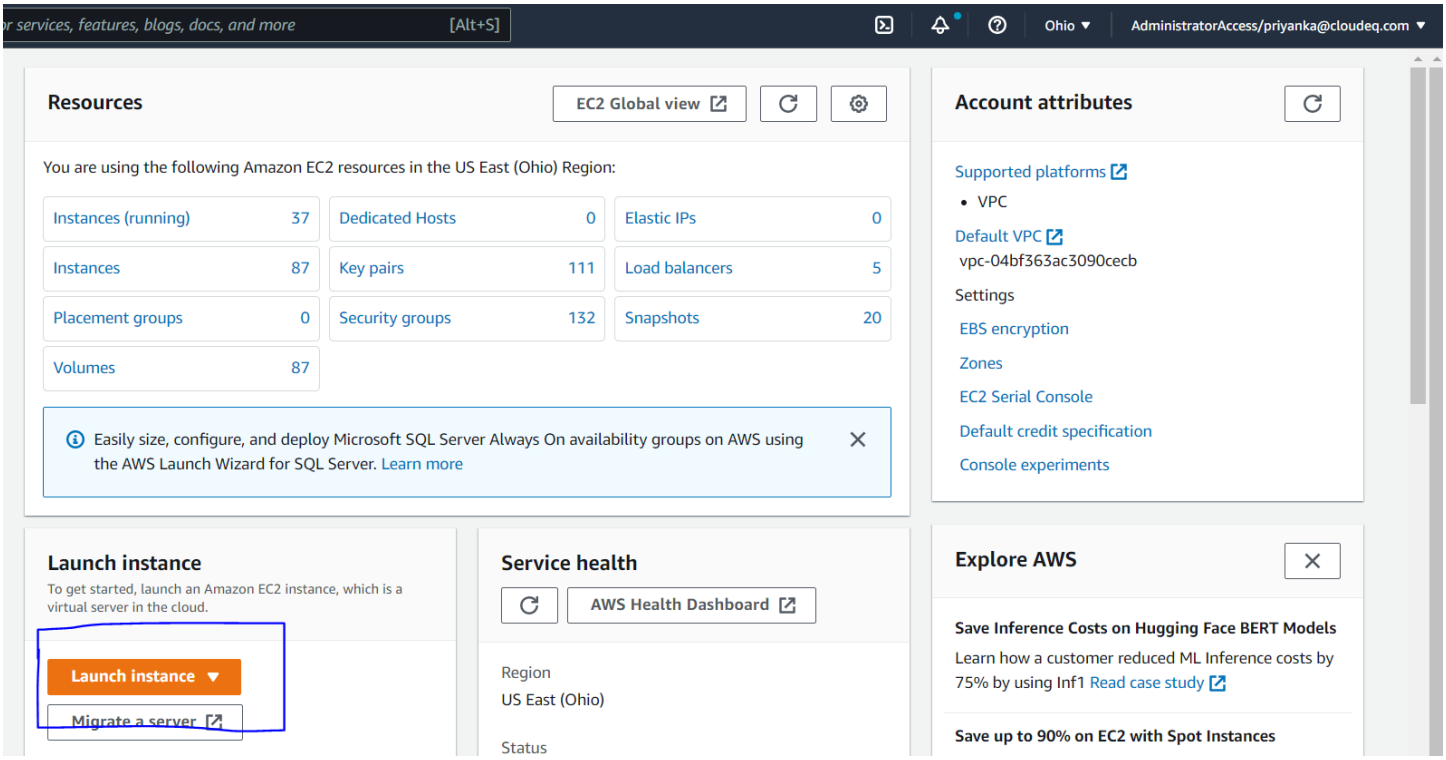
- Per-second billing for supported instances.

VIRTUAL MACHINES (EC2) v/s PHYSICAL SERVERS:

- EC2 can solve some problems that are more difficult with an on-premises server:
  - ➔ Data-driven decisions.
  - ➔ Quick iterations.
  - ➔ Free to make mistakes.

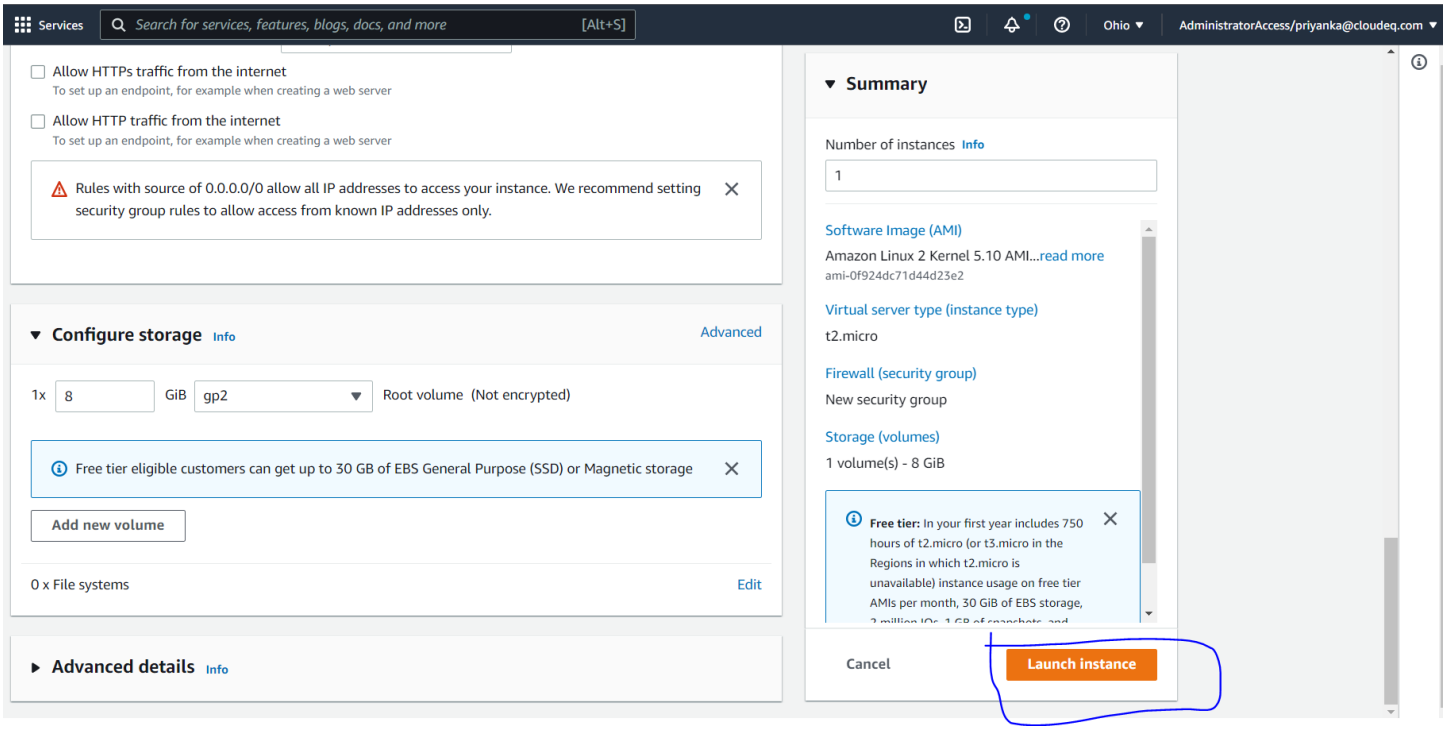
STEPS TO CREATE AN EC2 INSTANCE:

- ➔ Login to console.
- ➔ Search for EC2 and open it.
- ➔ Click launch instance to launch the instance.

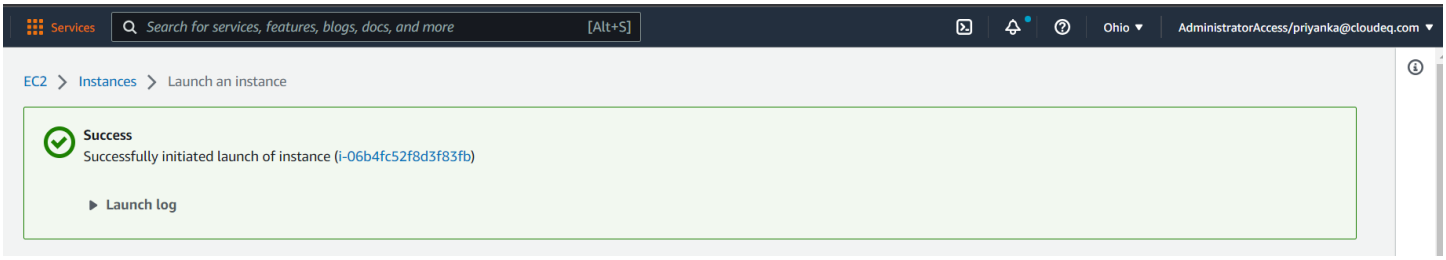


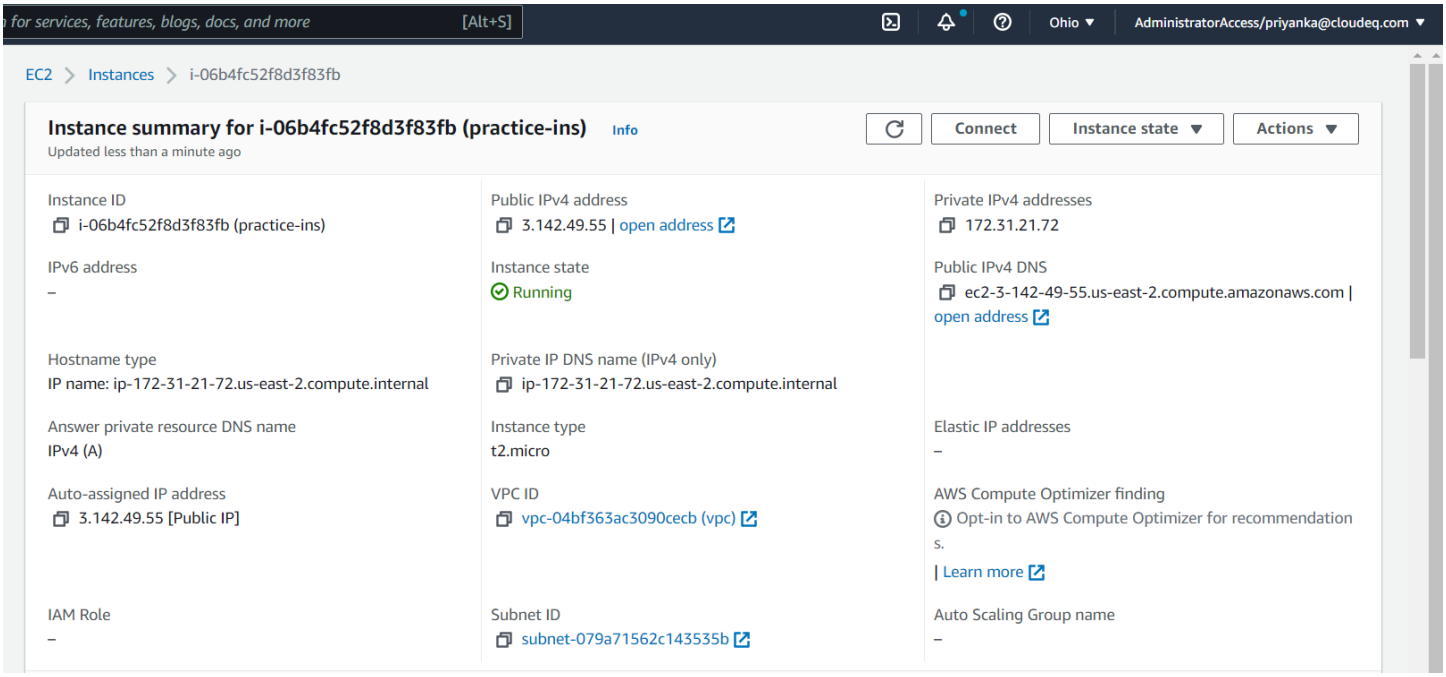
- ➔ Give the details of the type of instance you want:
  - ■ Name of instance.
  - ■ The AMI you want.
  - ■ Instance Type.
  - ■ Choose or create your key-pair.
  - ■ Set-up your security group or choose the default one.
  - ■ Configure the storage.
  - ■ Add advanced details (if you have any).
- ➔ Check the summary of your instance.

➔ Again, click launch instance to finally launch it.



➔ Instance is successfully launched.





DOCKER v/s VIRTUAL MACHINE

ABOUT DOCKER:

1) Virtualization software that helps in developing, deploying, monitoring and running applications in a Docker Container with all their dependencies.
2) Docker Container includes all dependencies (framework, libraries etc.) to run an application in an efficient and bug-free manner.
3) Benefits:
   - ➔ Light-Weight.
   - ➔ Applications run in isolation.
   - ➔ Occupies less space.
   - ➔ Easily portable and highly secure.
   - ➔ Short boot-up time.

ABOUT VIRTUAL MACHINE:

- Computing environment or software that aids developers to access an operating system via a physical machine.

KEY DIFFERENCES BETWEEN DOCKER AND VIRTUAL MACHINE:

DOCKER	VIRTUAL MACHINE
Container-based model where containers are software packages used for executing an application on any operating system.	Not container-based model instead uses user space along with the kernel space of an OS.
Share the host kernel i.e., execution engine.	Doesn't share the host kernel i.e., uses hypervisor.
Multiple workloads can run on a single OS.	Each workload needs a complete OS or hypervisor.
High-performance as they use the same operating system with no additional software (like hypervisor)	VM uses a separate OS; it causes more resources to be used.
Start-up quickly and result in less boot-up time.	Don't start quickly and lead to poor performance.
Users can create application and store it into a container image and then can run it across any host environment.	Portability issues as it doesn't have central hub and requires more memory to store data.
Lightweight (KB/ MB).	Few GBs.