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📍**“From Zero to Cloud Hero:”**

Day 5 of the 100-Day Journey to Mastering Cloud Computing.

✌️Amazon EC2✌️

EC2 Basics:-

🎯 EC2 is one of the most popular AWS offerings.

🎯 EC2 = Elastic Compute Cloud = Infrastructure as a Service

It mainly consists of the capability of **:-**

👉 Renting virtual machines (EC2).

👉Storing data on virtual drives (EBS).

👉Distributing load across machines (ELB).

👉Scaling the services using an auto-scaling group (ASG).

👉Knowing EC2 is fundamental to understanding how the Cloud world.

EC2 sizing **&** *configuration options* **:-**

👉***Operating System (OS)****: Linux, Windows, or Mac OS*

👉*How much compute power & cores (CPU)*

👉*How much random-access memory (RAM)*

EC2 sizing & **configuration options** :

Operating System (OS): Linux, Windows, or Mac OS

👉 How much compute power & cores (CPU)

👉How much random-access memory (RAM)

👉 How much storage space: Network-attached (EBS & EFS) and

Hardware(EC2 Instance Store)

👉 Network card: speed of the card, Public IP address

👉Firewall rules: security group

👉 Bootstrap script (configure at first launch): EC2 User Data

Create an EC2 Instance with EC2 User Data to have a Website Hands-On :

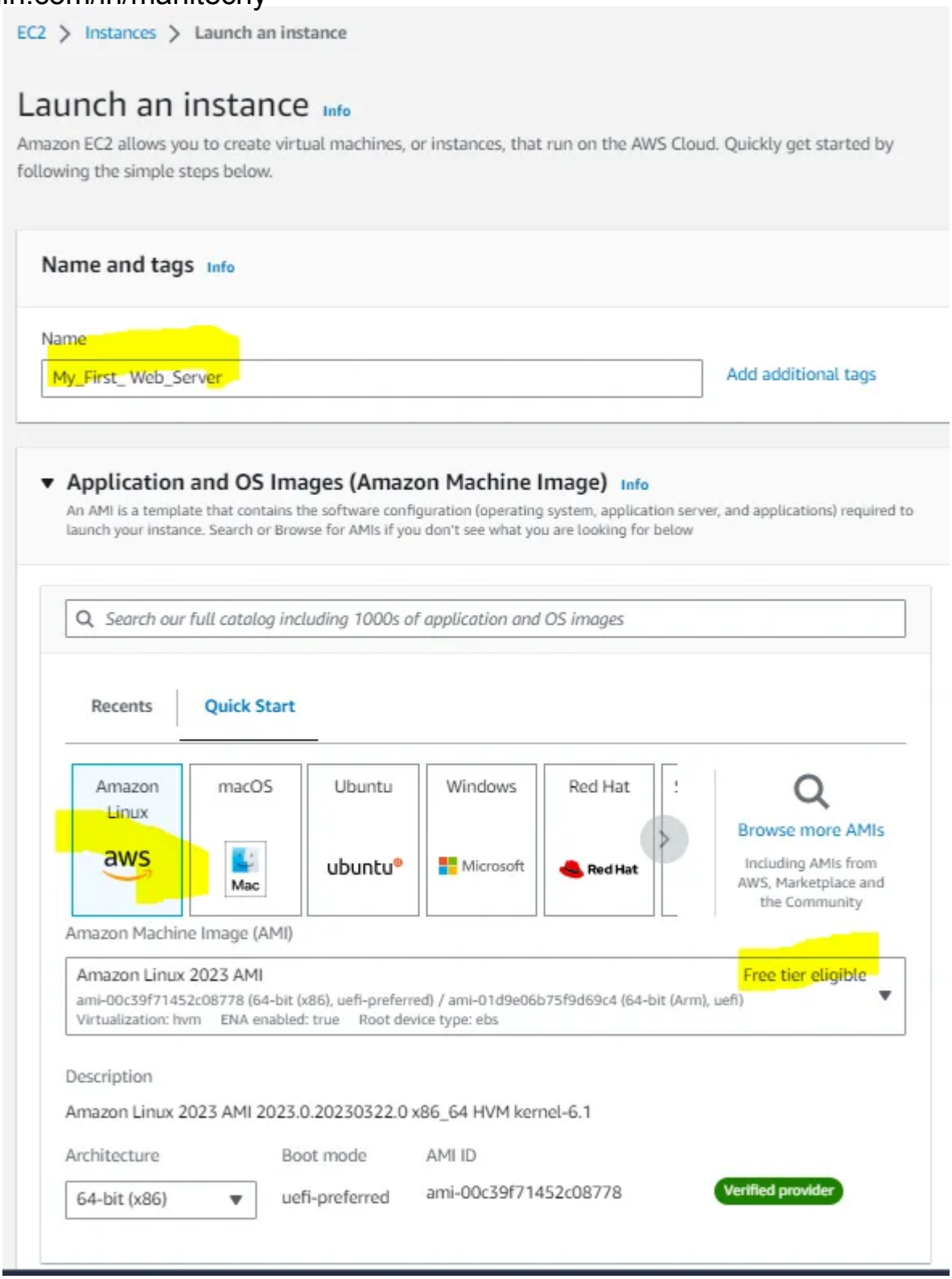
✍ We'll be launching our first virtual server using the AWS Console

✍We'll get a first high-level approach to the various parameters

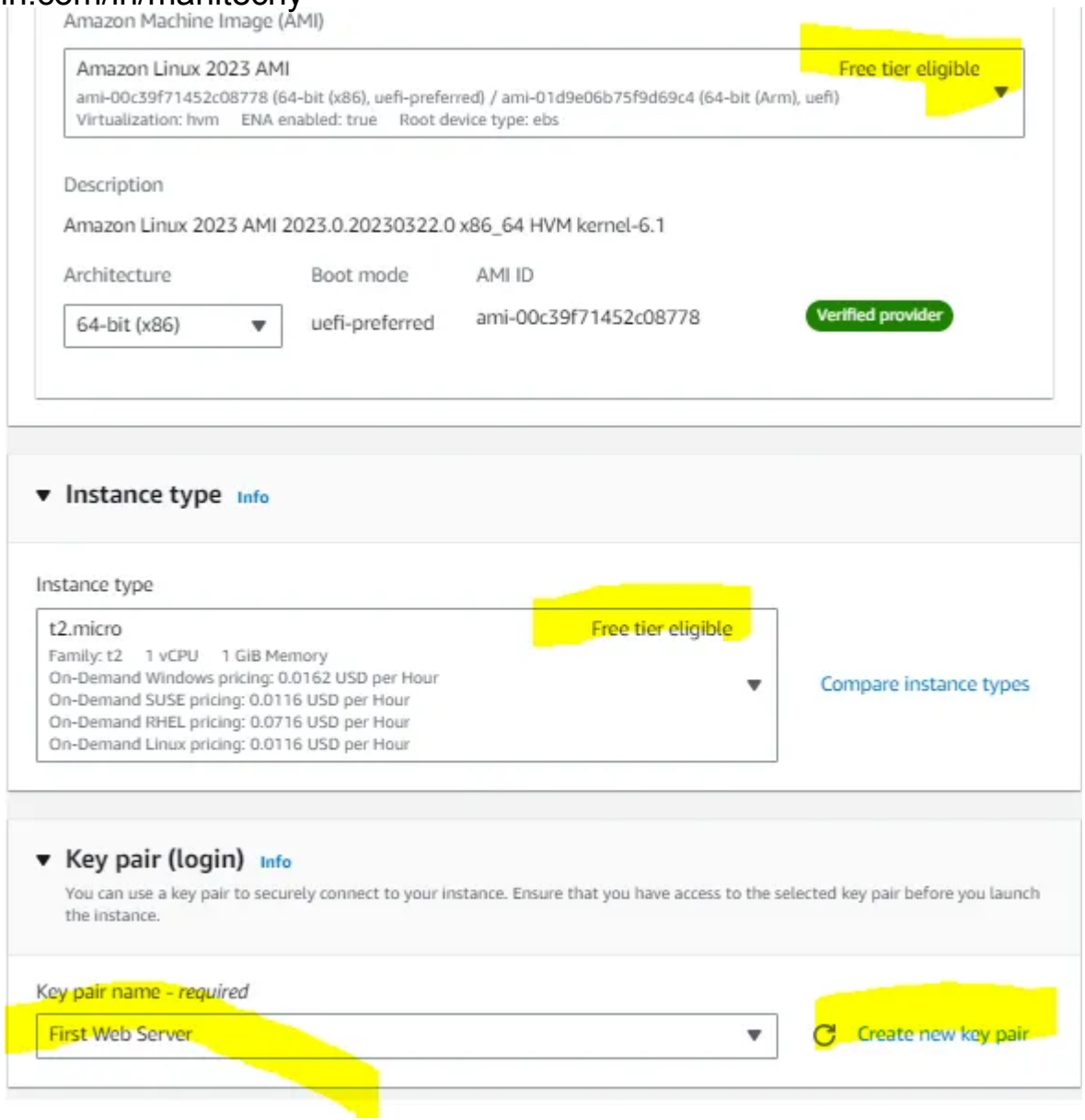
✍We'll see that our web server is launched using EC2 user data

✍ We'll learn how to start/stop/terminate our instance.

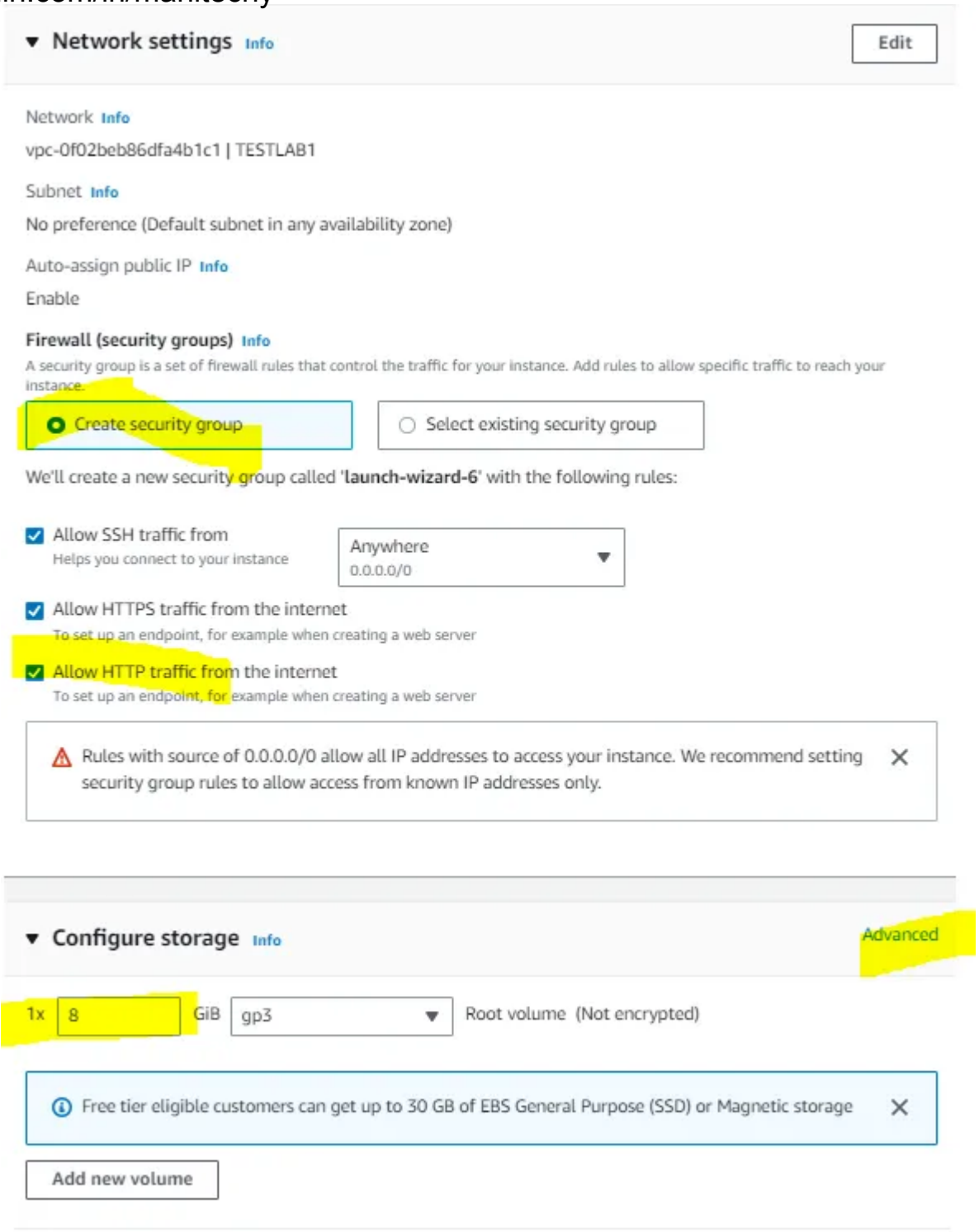
*Goto **EC2 Dashboard:** 👉EC2 👉Instances👉 **Launch an instance.***



Create key New pair I Created with the first web Server



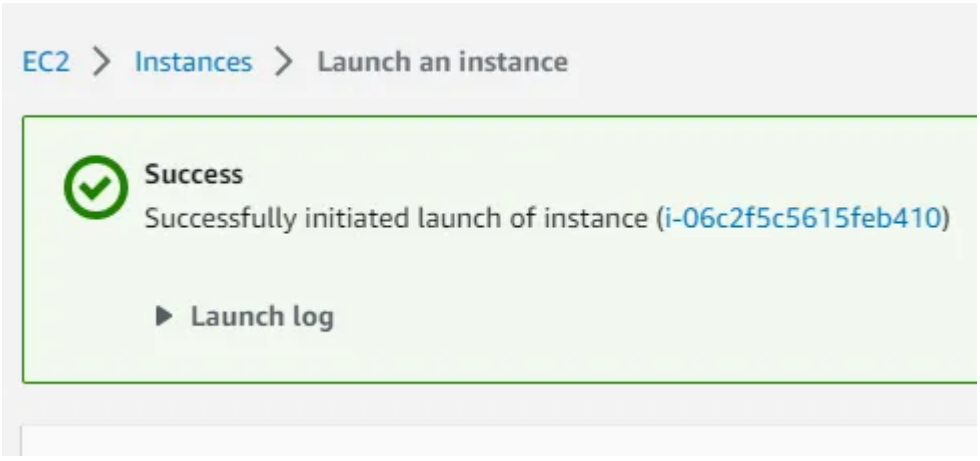
click advanced options:-



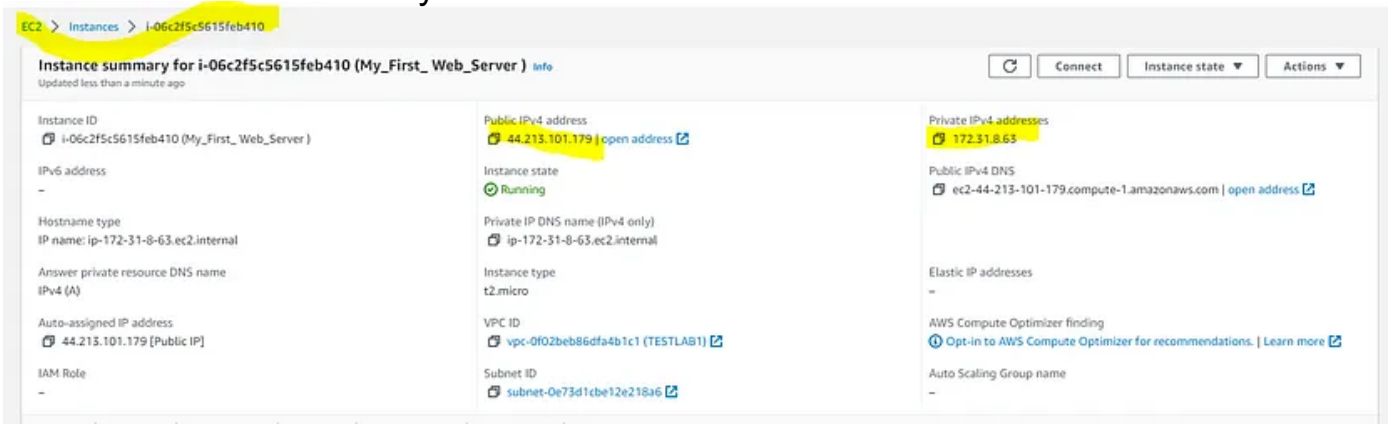
Advanced details 👉 User data — *optional put the bash script and click launch Instance.*

Repo: https://github.com/gefkkd/From-Zero-to-Cloud-Hero-A-100-Day-Journey-to-Mastering-Cloud-Computing.git

```
#!/bin/bash
# Use this for your user data (script from top to bottom)
# install httpd (Linux 2 version)
yum update -y
yum install -y httpd
systemctl start httpd
systemctl enable httpd
echo "<h1 style='color:blue;font-size:30px;'>Hello World from $(hostname -f)</h1>" > /var/www/html/index.html
```

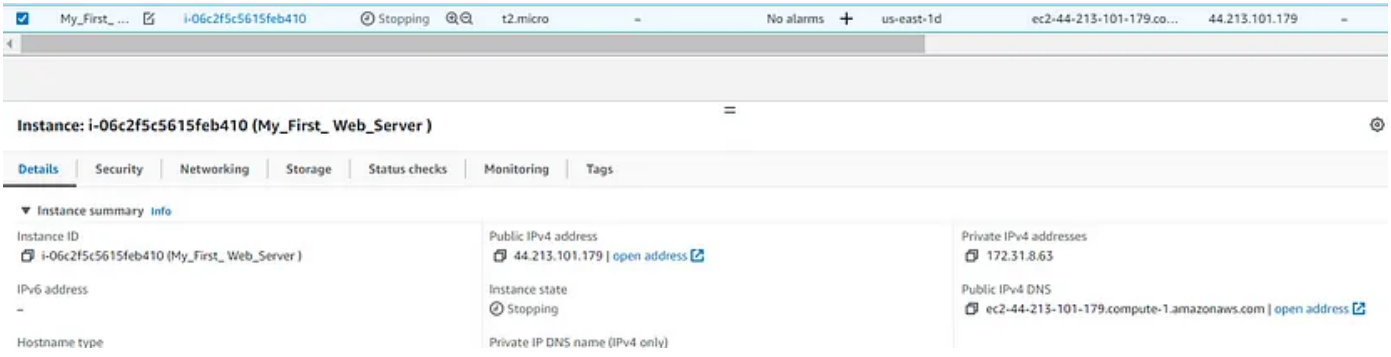


Goto EC2 Dashboard: 👉EC2 👉Instances : -



copy the public lp and put any web browser :

If stop the instance web site not accessble and continue loading the page



This site can't be reached

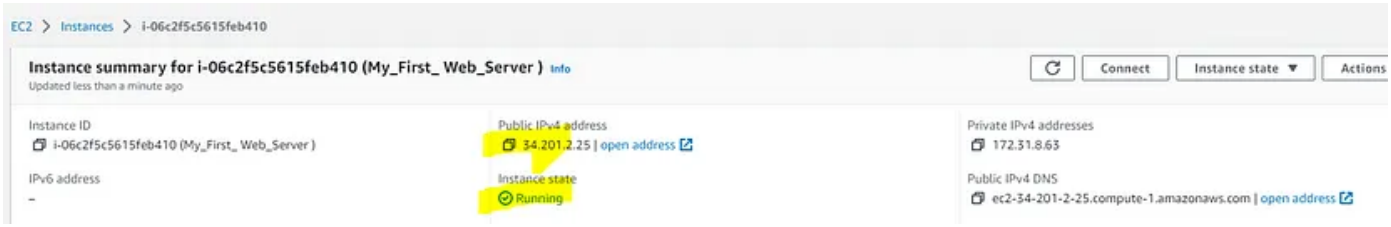
44.213.101.179 took too long to respond.

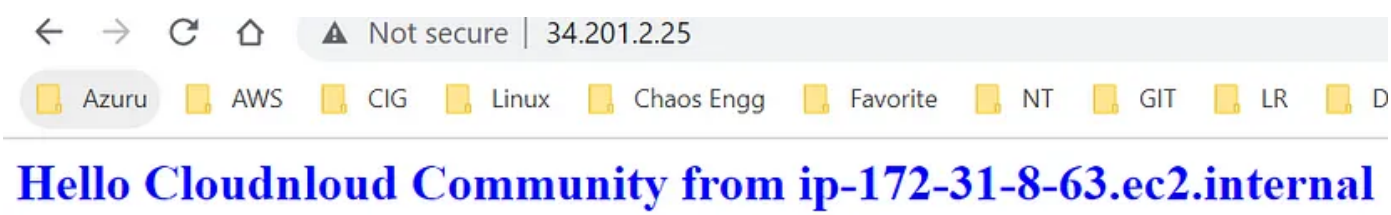
Try:

- Checking the connection
- Checking the proxy and the firewall
- Running Windows Network Diagnostics

ERR_CONNECTION_TIMED_OUT

Again restarted Instance the EC2 👉I instances copy the public lp and put any web browser :





🏄 **Successfully create an EC2 instance with EC2 user data to host a simple website.**

EC2 Instance Types — Overview:-

You can use different types of EC2 instances that are optimized for

different use cases (https://aws.amazon.com/ec2/instance-types/)

AWS has the following naming convention: m5.2xlarge

👉m: instance class

👉5: generation (AWS improves them over time)

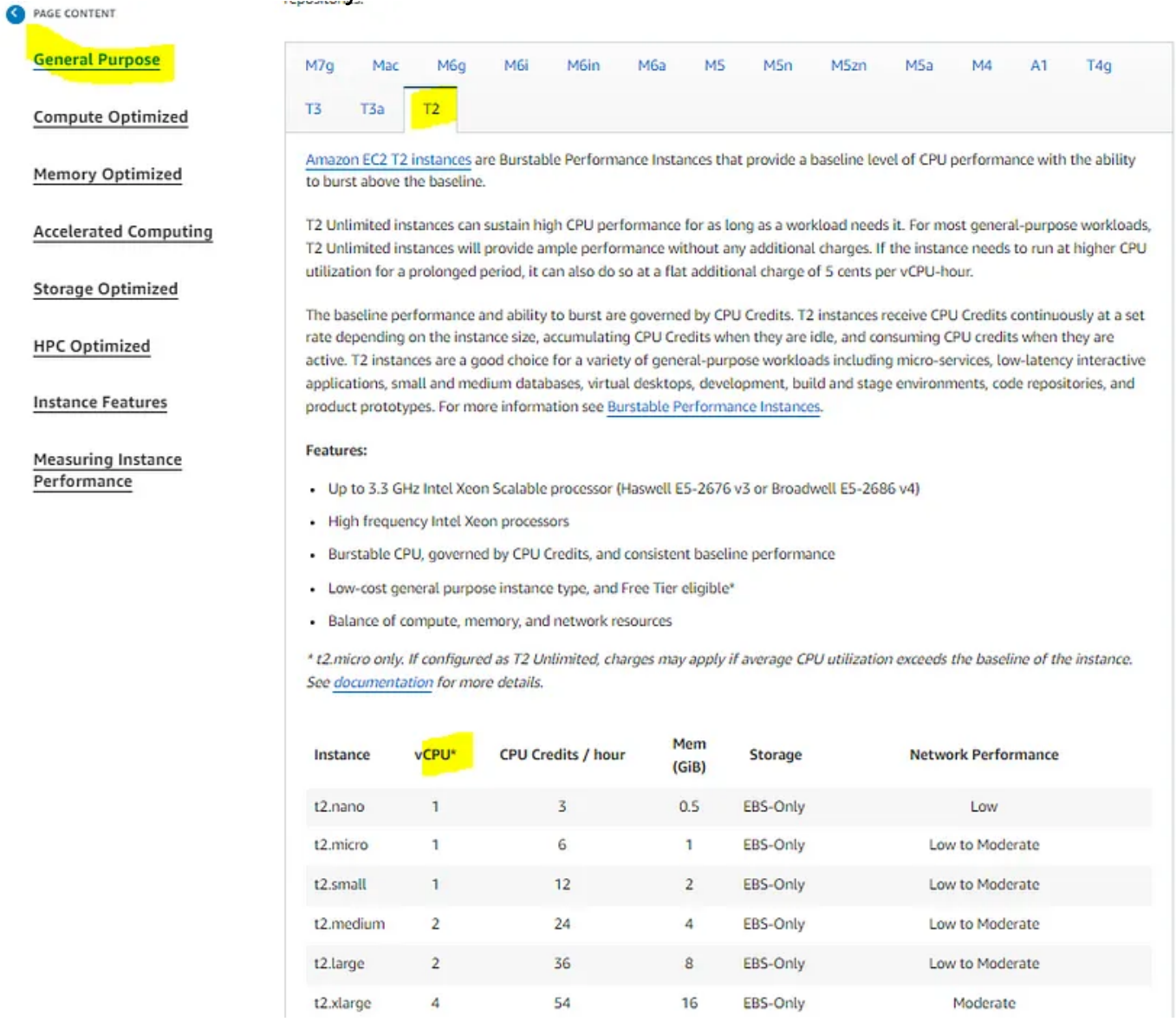
👉2xlarge: size within the instance class.

EC2 Instance Types — General Purpose

Great for a diversity of workloads such as web servers or code repositories

The balance between Compute Memory Networking

- In the course, we will be using the t2.micro which is a General Purpose EC2



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General Purpose

Compute Optimized

Memory Optimized

Accelerated Computing

Storage Optimized

HPC Optimized

Instance Features

Measuring Instance Performance

M7g Mac M6g M6i M6in M6a M5 M5n M5zn M5a M4 A1 T4g

T3 T3a T2

Amazon EC2 T2 instances are Burstable Performance Instances that provide a baseline level of CPU performance with the ability to burst above the baseline.

T2 Unlimited instances can sustain high CPU performance for as long as a workload needs it. For most general-purpose workloads, T2 Unlimited instances will provide ample performance without any additional charges. If the instance needs to run at higher CPU utilization for a prolonged period, it can also do so at a flat additional charge of 5 cents per vCPU-hour.

The baseline performance and ability to burst are governed by CPU Credits. T2 instances receive CPU Credits continuously at a set rate depending on the instance size, accumulating CPU Credits when they are idle, and consuming CPU credits when they are active. T2 instances are a good choice for a variety of general-purpose workloads including micro-services, low-latency interactive applications, small and medium databases, virtual desktops, development, build and stage environments, code repositories, and product prototypes. For more information see Burstable Performance Instances.

Features:

- Up to 3.3 GHz Intel Xeon Scalable processor (Haswell E5-2676 v3 or Broadwell E5-2686 v4)
- High frequency Intel Xeon processors
- Burstable CPU, governed by CPU Credits, and consistent baseline performance
- Low-cost general purpose instance type, and Free Tier eligible*
- Balance of compute, memory, and network resources

* t2.micro only. If configured as T2 Unlimited, charges may apply if average CPU utilization exceeds the baseline of the instance. See documentation for more details.

Instance	vCPU*	CPU Credits / hour	Mem (GiB)	Storage	Network Performance
t2.nano	1	3	0.5	EBS-Only	Low
t2.micro	1	6	1	EBS-Only	Low to Moderate
t2.small	1	12	2	EBS-Only	Low to Moderate
t2.medium	2	24	4	EBS-Only	Low to Moderate
t2.large	2	36	8	EBS-Only	Low to Moderate
t2.xlarge	4	54	16	EBS-Only	Moderate

EC2 Instance Types — Compute Optimized

Great for compute-intensive tasks that require high performance

processors:

👉Batch processing workloads

👉Media transcoding

👉High-performance web servers

👉High-performance computing (HPC)

👉Scientific modeling & machine learning

👉Dedicated gaming servers

EC2 Instance Types — Memory Optimized

Fast performance for workloads that process large data sets in memory

Use cases:

👉 High-performance, relational/non-relational databases

👉 Distributed web-scale cache stores

👉 In-memory databases optimized for BI (business intelligence)

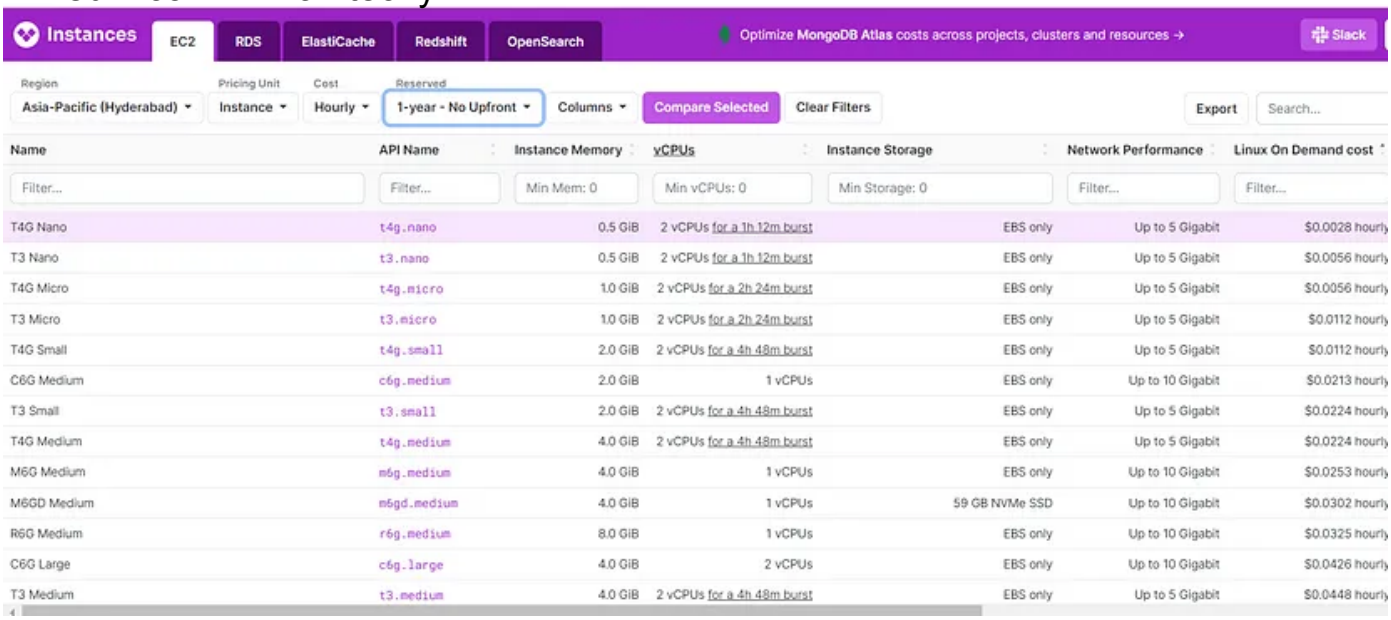
👉 Applications performing real-time processing of big unstructured data

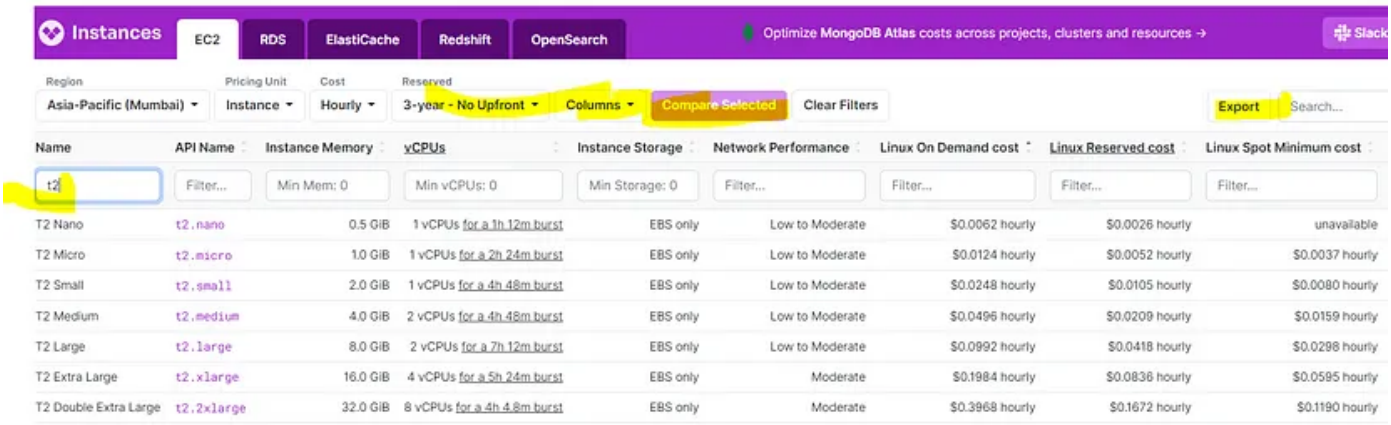
EC2 Instance Types: example

Instance	vCPU	Mem (GiB)	Storage	Network Performance	EBS Bandwidth (Mbps)
t2.micro	1	1	EBS-Only	Low to Moderate	
t2.xlarge	4	16	EBS-Only	Moderate	
c5d.4xlarge	16	32	1 x 400 NVMe SSD	Up to 10 Gbps	4,750
r5.16xlarge	64	512	EBS Only	20 Gbps	13,600
m5.8xlarge	32	128	EBS Only	10 Gbps	6,800

t2.micro is part of the AWS free tier (up to 750 hours per month)

Great website: https://instances.vantage.sh





We can export the cost report on expert share with the clients

A	B	C	D	E	F	G	H	I	J	K
Name	API Name	Instance Memory	vCPUs	Instance S	Network Performance	Linux On Demand cost	Linux Reserved cost	Linux Spot Minimum cost	Windows On Demand cost	Windows Reser
T2 Nano	t2.nano	0.5 GiB	1 vCPUs	EBS only	Low to Moderate	$0.0062 hourly	$0.0037 hourly	unavailable	$0.0085 hourly	$0.0059 hourly
T2 Micro	t2.micro	1.0 GiB	1 vCPUs	EBS only	Low to Moderate	$0.0124 hourly	$0.0072 hourly	$0.0037 hourly	$0.0170 hourly	$0.0118 hourly
T2 Small	t2.small	2.0 GiB	1 vCPUs	EBS only	Low to Moderate	$0.0248 hourly	$0.0144 hourly	$0.0080 hourly	$0.0340 hourly	$0.0236 hourly
T2 Mediur	t2.medium	4.0 GiB	2 vCPUs	EBS only	Low to Moderate	$0.0496 hourly	$0.0289 hourly	$0.0159 hourly	$0.0676 hourly	$0.0468 hourly
T2 Large	t2.large	8.0 GiB	2 vCPUs	EBS only	Low to Moderate	$0.0992 hourly	$0.0576 hourly	$0.0298 hourly	$0.1272 hourly	$0.0857 hourly
T2 Extra L	t2.xlarge	16.0 GiB	4 vCPUs	EBS only	Moderate	$0.1984 hourly	$0.1154 hourly	$0.0595 hourly	$0.2394 hourly	$0.1564 hourly
T2 Double	t2.2xlarge	32.0 GiB	8 vCPUs	EBS only	Moderate	$0.3968 hourly	$0.2308 hourly	$0.1190 hourly	$0.4588 hourly	$0.2928 hourly

Sources: AWS.

That's it, thank you for reading.

https://github.com/gefkkd/From-Zero-to-Cloud-Hero-A-100-Day-Journey-to-Mastering-Cloud-Computing.git

👉 In case you would like to continue the discussion, you can always reach out to me on Twitter or on LinkedIn for professional networking, if you feel like following me on GitHub you can also do that.

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