Report on WordPress Website Integration in Amazon Web Services and Google Cloud Platform

Prepared By

Mizanur Rahman

INTRODUCTION:

Cloud computing model defined as on-demand and pay-as-you-go model access to a set of computing resources like storage, network, server, virtual machines that provided by cloud service providers like Amazon, Google, Microsoft which can be easily managed and operated via internet. [1]

In this report, I am going to compare Amazon web services and Google cloud services regarding their key service offerings, cost model and going to write the procedure to install WordPress website with Linux, Apache, MySQL, and PHP server on both platforms.

Beside comparison, I will suggest some improvement in the setup process, that I faced difficulties with, moreover I will discuss about the concepts of virtualization and elasticity and the implementation of these concepts on Amazon Web Services and Google Cloud platforms.

BACKGROUND INFORMATION:

Cloud computing is a board concept of using computing resources via internet on rent from cloud service providers like Amazon, Google, Microsoft and more. [1]

It has various key features, four deployed models and three service models. Using cloud computing a business can have scalability, security, easy maintainability, cost-effectiveness, and improved reliability. Moreover, cloud computing can be deployed like public, private, hybrid and community models, where the service models are Software as a Service (SaaS), Platform as a Service (PaaS), and Infrastructure as a Service (IaaS). Some giants provide cloud computing services among them Amazon Web Services, Google Cloud Provider, Microsoft Azure, IBM Cloud and Alibaba Cloud are popular. [2]

In this report, I am going to focus on Amazon Web Service and Google Cloud Provider, and the relevant services I have used from AWS (Amazon Web Services) and GCP (Google Cloud Platform) in my WordPress website creation.

Specifically, their Elastic Compute Cloud (EC2) and Virtual Machines (VM) services I have utilized most in my website creation.

I am going to highlight each step I followed to create instance and virtual machine in both platforms and to install Linux, Apache, MySQL, and PHP to integrate WordPress.

KEY SERVICE OFFERINGS:

Public, private, government and individuals can utilize Amazon Web Services for on-demand computing resources with pay-as-you-go billing style. Amazon do offer distinct services, and focused frameworks for computing needs. [3]

With internet, Amazon Elastic Compute Cloud provides a virtual environment, that client can access it continuously from anywhere and anytime. Where client can have the Facilites like a hardware computer, with equipment like CPU and GPU for processing, RAM, SSD for storing information without having a physical computer.

Client also can access database, server, network, and CRM using Amazon, and utilize the virtual machine for hosting his website online. [4]

In my project, I used Amazon's EC2's instances to create a virtual environment, where I installed Linux, Apache, MySQL, and PHP to connect WordPress website with the server.

Amazon Web Services offer more various facilities, like storage features, computation features, infrastructure features, and network features where we can use storage for files, blocks, disaster recovery, backups and archiving our data, moreover virtual server as a computation feature, and for server automation, monitoring, logging, cloud deployment, and cloud management services Amazon Web services provide infrastructure facilities. [5]

For Google cloud provider, it is a dominant as a Platform as a Service from other cloud service providers, it mostly offers powerfully cloud security to the business, also virtual machines to create instances and connect with virtual server. [6]

Google offers complete business solutions according to the modern demand for enterprises and individuals such as compute engine, cloud storage, networking, serverless facilities, and developer tools, etc.

I used compute engine to create a virtual machine and create instance to install WordPress and LAMP stack server.

COST MODEL COMPARISION:

When comparing the cost models of AWS Elastic Compute Cloud (EC2) and Google Cloud Platform (GCP) Virtual Machines (VMs), several key factors should be considered, including pricing structures, billing methods, and cost-saving options. Both platforms offer various pricing models tailored to different use cases, but they have distinct differences that can impact your overall cloud expenses.

1. Pricing Models:

AWS EC2:

On-Demand Instances: AWS charges by the second, with no upfront commitment, allowing you to pay only for the compute capacity you use. This model is flexible but generally more expensive than reserved or spot instances.

Reserved Instances (RIs): You can save up to 75% over On-Demand pricing by committing to a 1- or 3-year term. This model is ideal for predictable, steady-state workloads.

Spot Instances: Spot Instances allow you to purchase unused EC2 capacity at up to 90% discount compared to On-Demand prices. However, these instances can be interrupted when AWS needs the capacity back, making them suitable for fault-tolerant and flexible workloads.

GCP VMs:

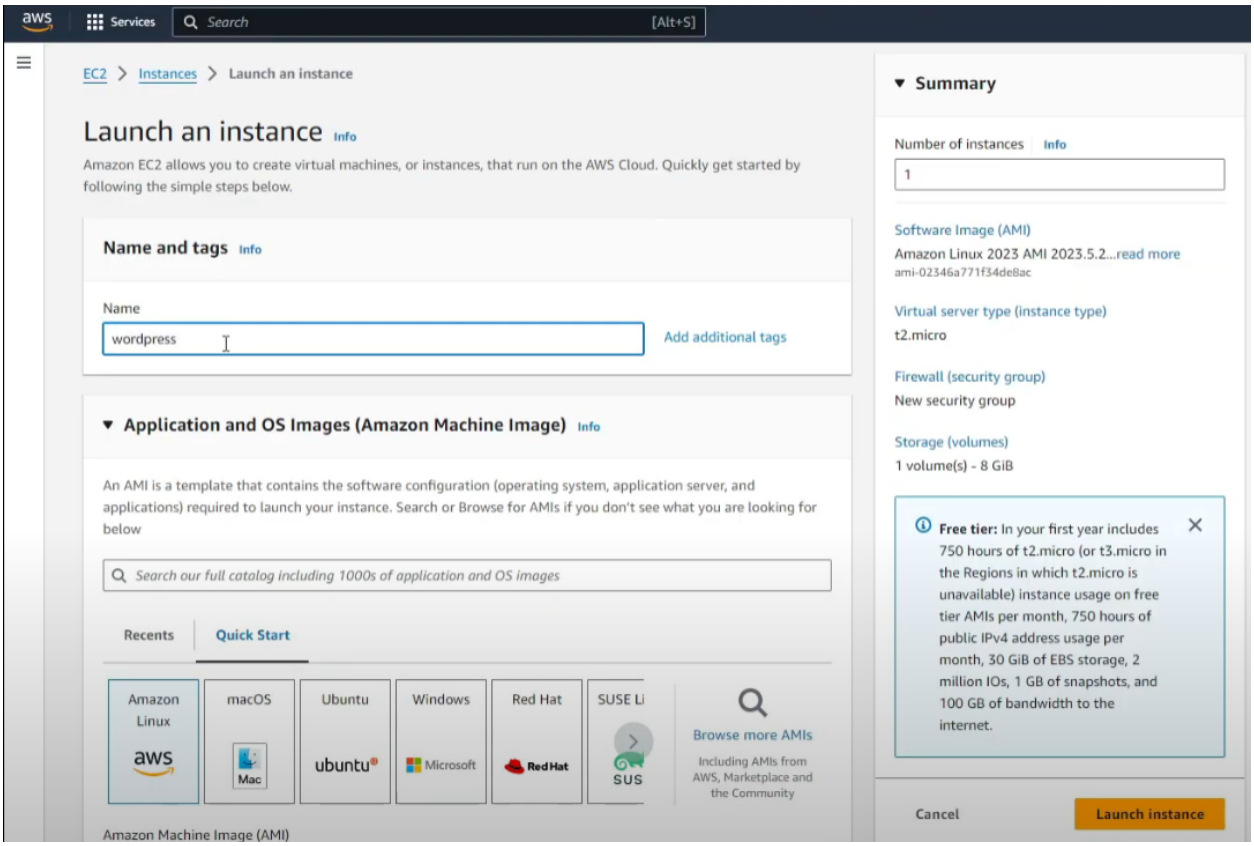
On-Demand Pricing: GCP also charges by the second, with a minimum of 1 minute, and there is no upfront commitment. This is similar to AWS's On-Demand model.

Committed Use Contracts: GCP offers a significant discount (up to 57%) when you commit to a specific amount of usage (e.g., a specific number of vCPUs and memory) for 1 or 3 years, similar to AWS Reserved Instances.

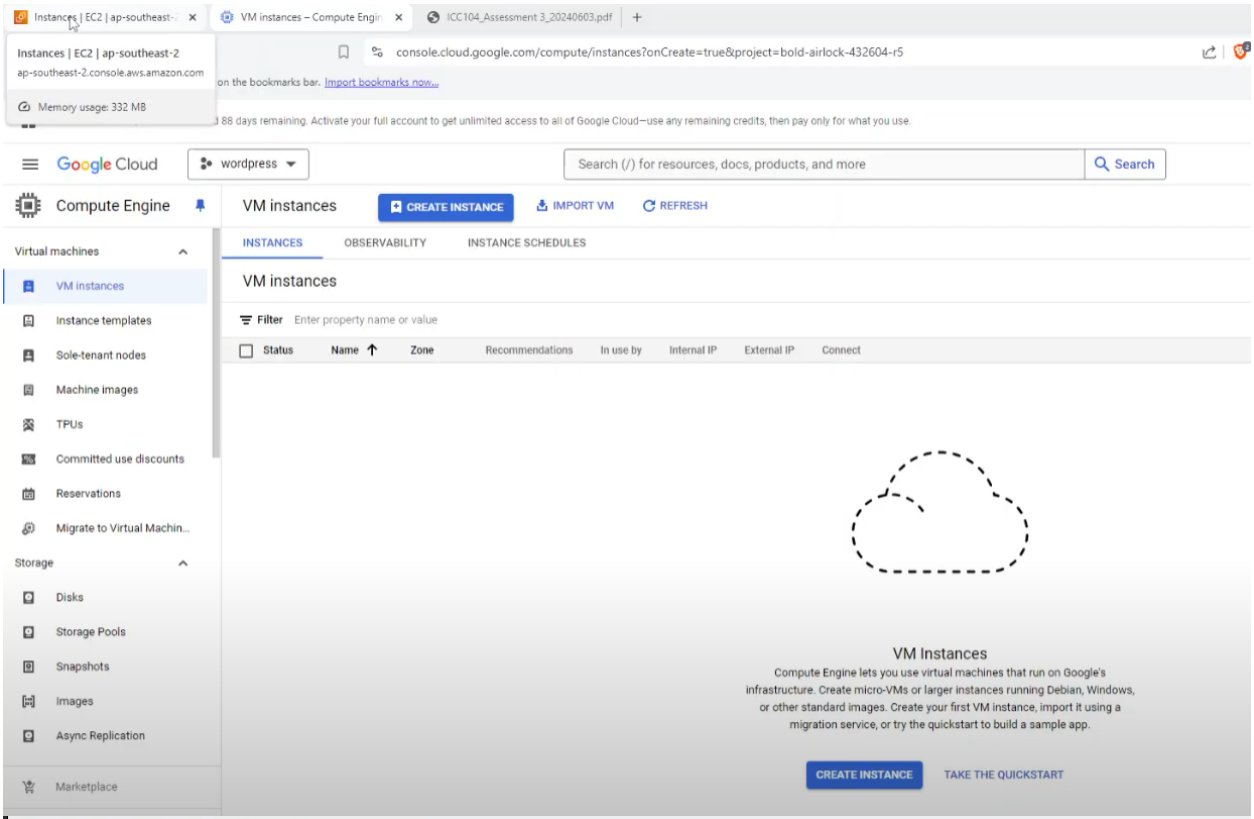
Preemptible VMs: These are equivalent to AWS Spot Instances, offering up to 80% savings. However, they are short-lived, as GCP can terminate them at any time, making them ideal for batch jobs and fault-tolerant workloads.

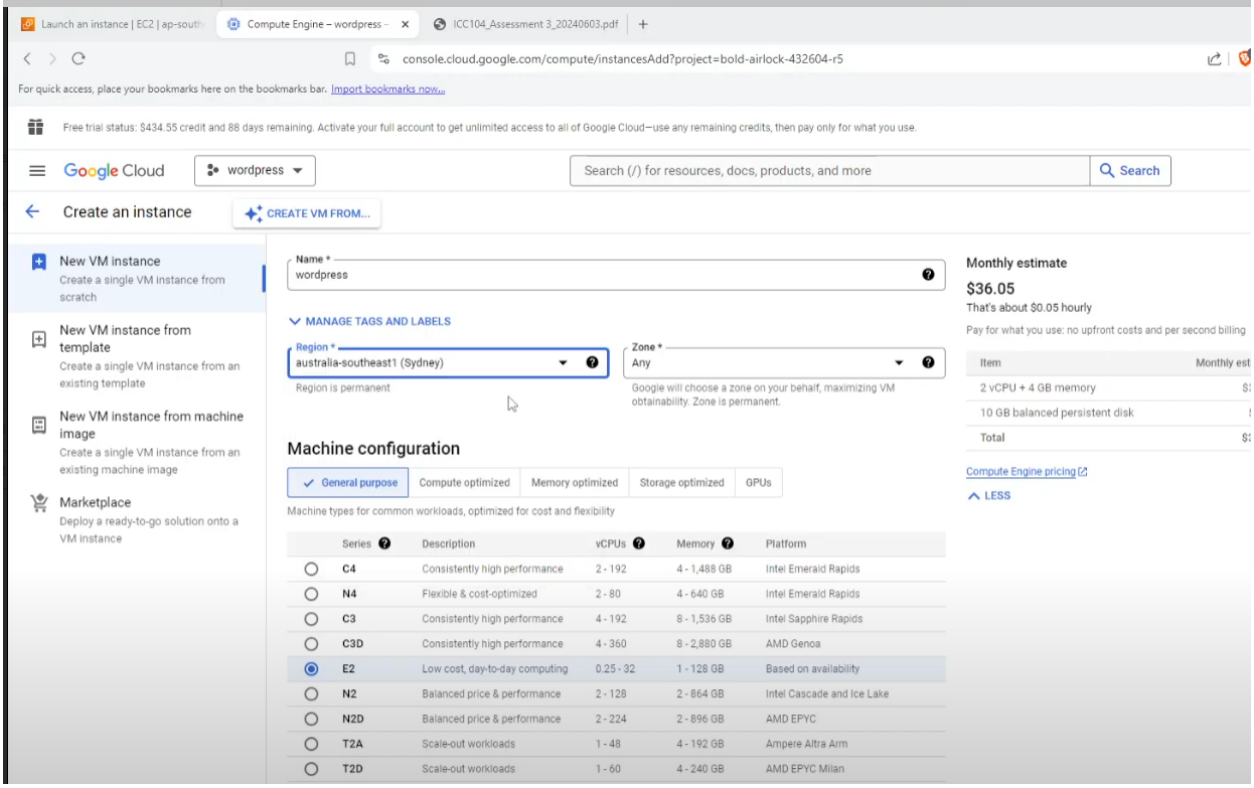
PROCEDURE:

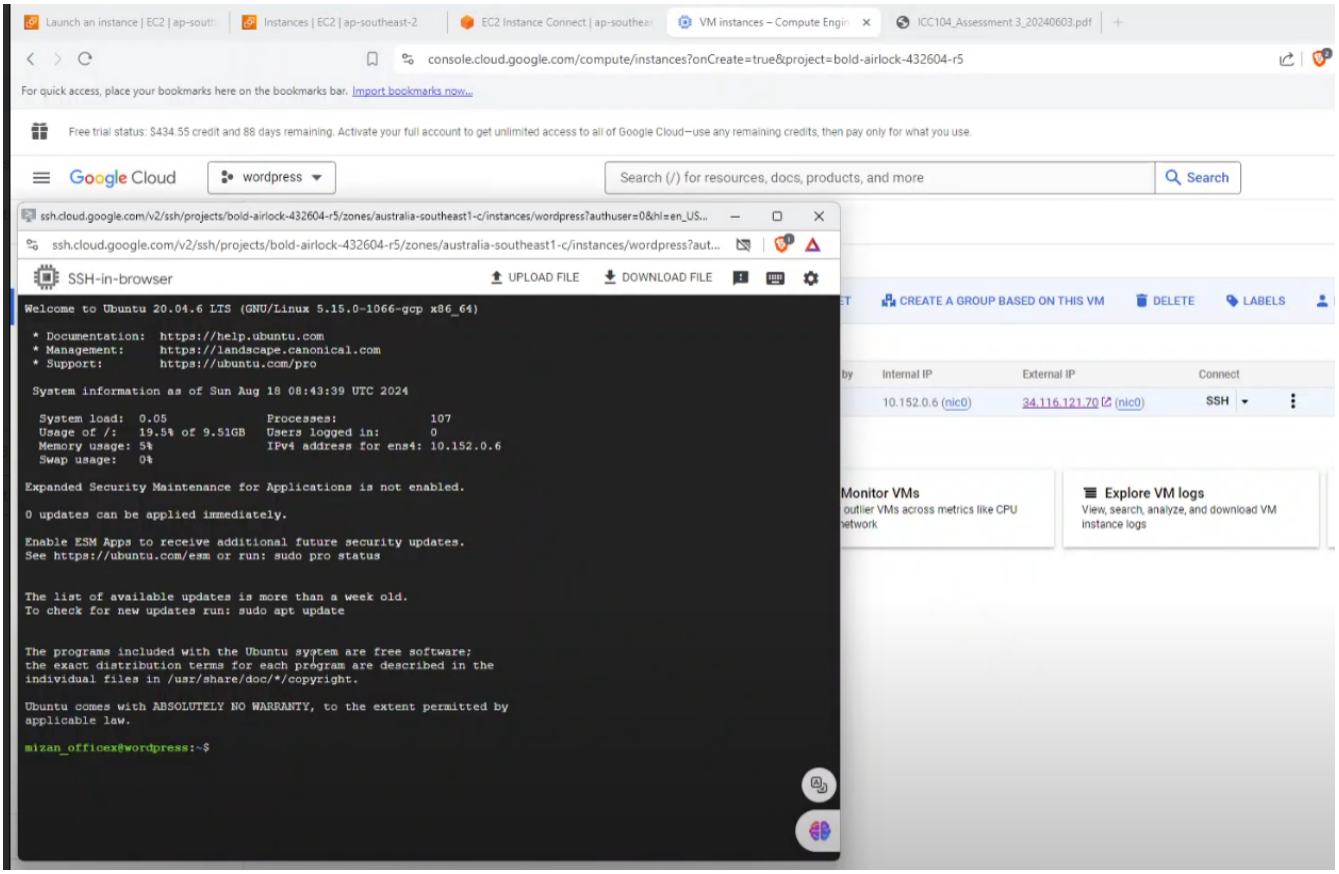
LAMP stack and WordPress installation on AWS and GCP:



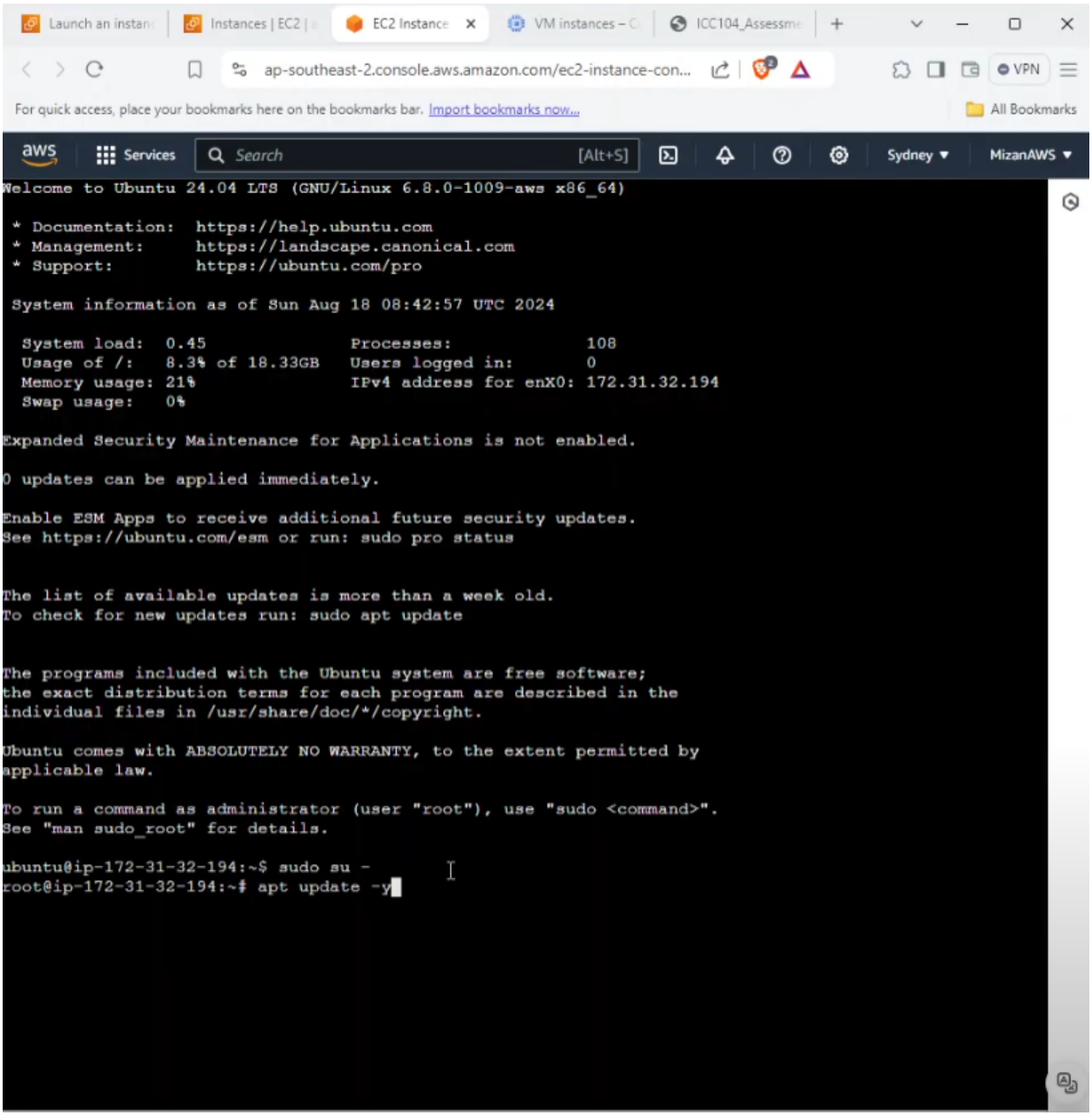
For creating EC2 instance on AWS I log in my AWS account and search EC2 on the search bar which accessed me on the instances. Then I created an instance named WordPress. When I set up the instance with ubuntu and 20gb storage, I made sure to allow all the https coming over the internet.


Instances | EC2 | ap-southeast-2
ap-southeast-2.console.aws.amazon.com
Memory usage: 332 MB
console.cloud.google.com/compute/instances?onCreate=true&project=bold-airlock-432604-r5
Google Cloud
wordpress
Search (/) for resources, docs, products, and more
Search
Compute Engine
VM instances
CREATE INSTANCE
IMPORT VM
REFRESH
INSTANCES
OBSERVABILITY
INSTANCE SCHEDULES
Virtual machines
VM instances
Instance templates
Sole-tenant nodes
Machine images
TPUs
Committed use discounts
Reservations
Migrate to Virtual Machin...
Storage
Disks
Storage Pools
Snapshots
Images
Async Replication
Marketplace
Filter Enter property name or value
Status
Name
Zone
Recommendations
In use by
Internal IP
External IP
Connect
VM Instances
Compute Engine lets you use virtual machines that run on Google's infrastructure. Create micro-VMs or larger instances running Debian, Windows, or other standard images. Create your first VM instance, import it using a migration service, or try the quickstart to build a sample app.
CREATE INSTANCE
TAKE THE QUICKSTART


console.cloud.google.com/compute/instancesAdd?project=bold-airlock-432604-r5
Free trial status: $434.55 credit and 88 days remaining. Activate your full account to get unlimited access to all of Google Cloud—use any remaining credits, then pay only for what you use.
Google Cloud
wordpress
Search (/) for resources, docs, products, and more
Search
Create an instance
CREATE VM FROM...
New VM instance
Create a single VM instance from scratch
New VM instance from template
Create a single VM instance from an existing template
New VM instance from machine image
Create a single VM instance from an existing machine image
Marketplace
Deploy a ready-to-go solution onto a VM instance
Name *
wordpress
MANAGE TAGS AND LABELS
Region *
australia-southeast1 (Sydney)
Region is permanent
Zone *
Any
Google will choose a zone on your behalf, maximizing VM obtainability. Zone is permanent.
Machine configuration
General purpose
Compute optimized
Memory optimized
Storage optimized
GPUs
Machine types for common workloads, optimized for cost and flexibility
Series
Description
vCPUs
Memory
Platform
C4 Consistently high performance 2 - 192 4 - 1,488 GB Intel Emerald Rapids
N4 Flexible & cost-optimized 2 - 80 4 - 640 GB Intel Emerald Rapids
C3 Consistently high performance 4 - 192 8 - 1,536 GB Intel Sapphire Rapids
C3D Consistently high performance 4 - 360 8 - 2,880 GB AMD Genoa
E2 Low cost, day-to-day computing 0.25 - 32 1 - 128 GB Based on availability
N2 Balanced price & performance 2 - 128 2 - 864 GB Intel Cascade and Ice Lake
N2D Balanced price & performance 2 - 224 2 - 896 GB AMD EPYC
T2A Scale-out workloads 1 - 48 4 - 192 GB Ampere Altra Arm
T2D Scale-out workloads 1 - 60 4 - 240 GB AMD EPYC Milan
Monthly estimate
$36.05
That's about $0.05 hourly
Pay for what you use: no upfront costs and per second billing
Item
Monthly est
2 vCPU + 4 GB memory
10 GB balanced persistent disk
Total
Compute Engine pricing
LESS



For Google Cloud Provider, I created an account on GCP, then logged on to console, where I searched for compute engine, and pressed VM instances, where I create an instance named as wordpress. Then pressing on ssh I connected to the console.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Instances | EC2 |
EC2 Instance
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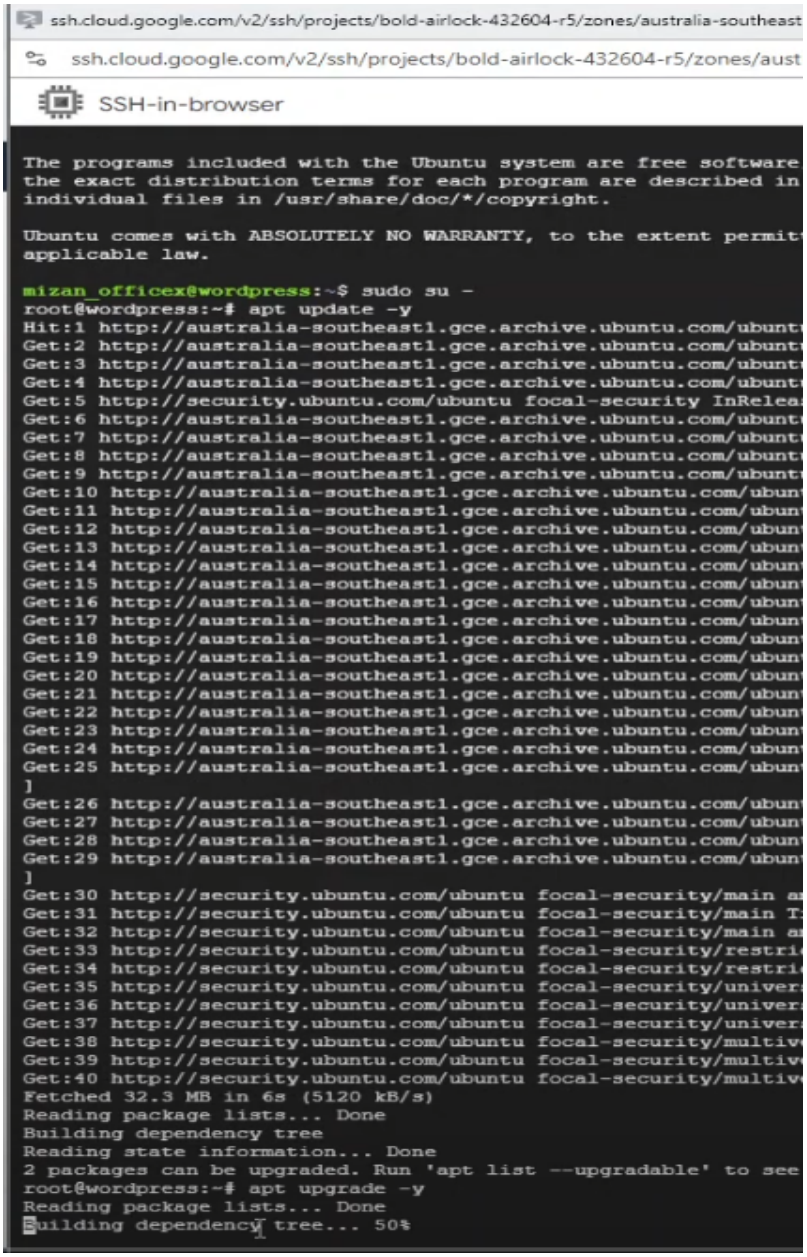
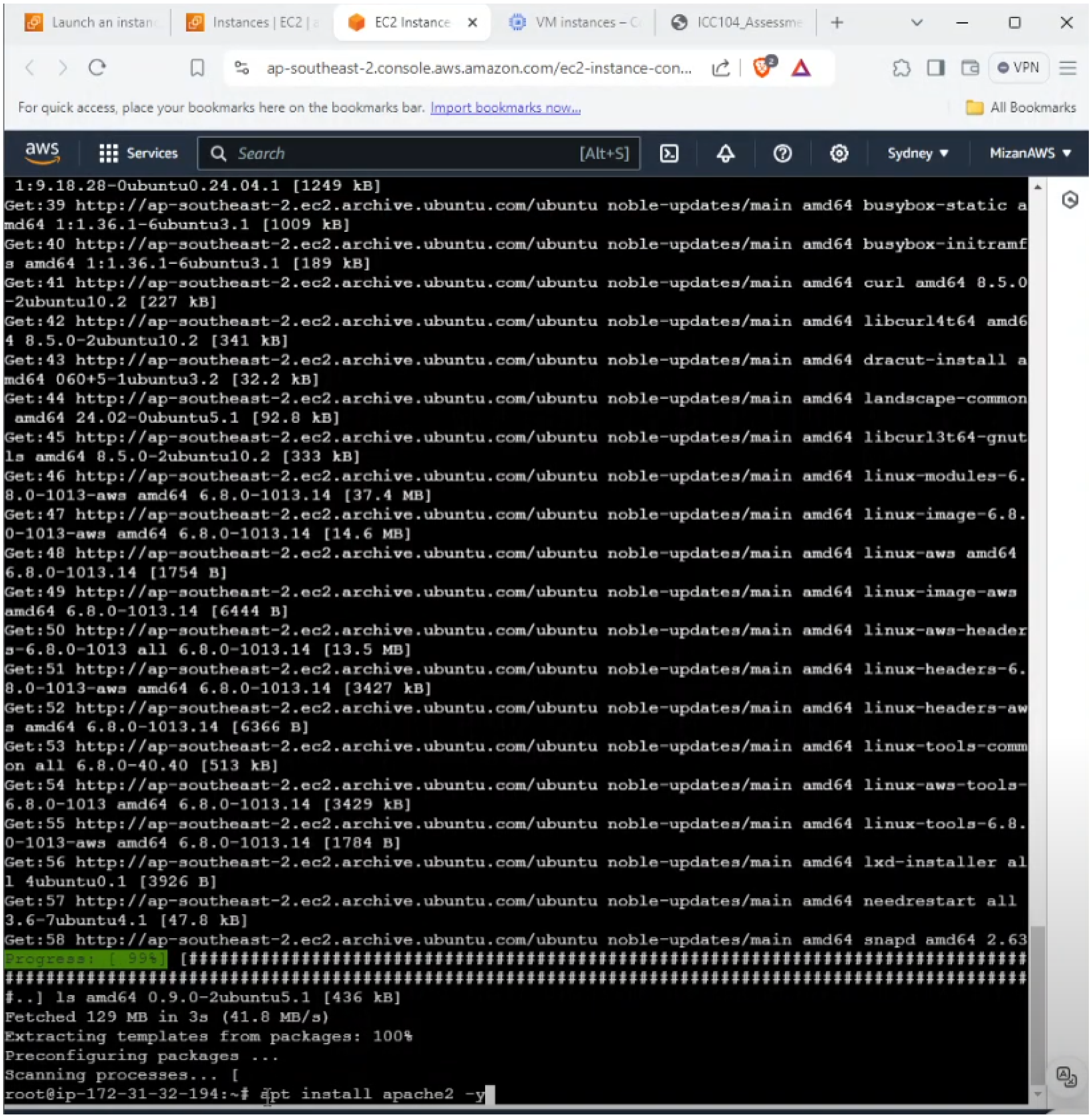
VPN
For quick access, place your bookmarks here on the bookmarks bar. Import bookmarks now...
All Bookmarks
aws
Services
Search
[Alt+S]
Sydney
MizanAWS
Welcome to Ubuntu 24.04 LTS (GNU/Linux 6.8.0-1009-aws x86_64)
* Documentation: https://help.ubuntu.com
* Management: https://landscape.canonical.com
* Support: https://ubuntu.com/pro
System information as of Sun Aug 18 08:42:57 UTC 2024
System load: 0.45
Usage of /: 8.3% of 18.33GB
Memory usage: 21%
Swap usage: 0%
Processes: 108
Users logged in: 0
IPv4 address for enX0: 172.31.32.194
Expanded Security Maintenance for Applications is not enabled.
0 updates can be applied immediately.
Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status
The list of available updates is more than a week old.
To check for new updates run: sudo apt update
The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.
Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.
ubuntu@ip-172-31-32-194:~$ sudo su -
root@ip-172-31-32-194:~# apt update -y



When I connected to the console, I used the following command to access the root user and update and upgrade the system.

```
sudo su-
apt update –y
apt upgrade -y
```


Launch an instan
Instances | EC2
EC2 Instance
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ICC104_Assessm
ap-southeast-2.console.aws.amazon.com/ec2-instance-con...
VPN
For quick access, place your bookmarks here on the bookmarks bar. Import bookmarks now...
All Bookmarks
aws
Services
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Get:39 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 busybox-static a
md64 1:1.36.1-6ubuntu3.1 [1009 kB]
Get:40 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 busybox-initramf
s amd64 1:1.36.1-6ubuntu3.1 [189 kB]
Get:41 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 curl amd64 8.5.0
-2ubuntu10.2 [227 kB]
Get:42 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 libcurl4t64 amd6
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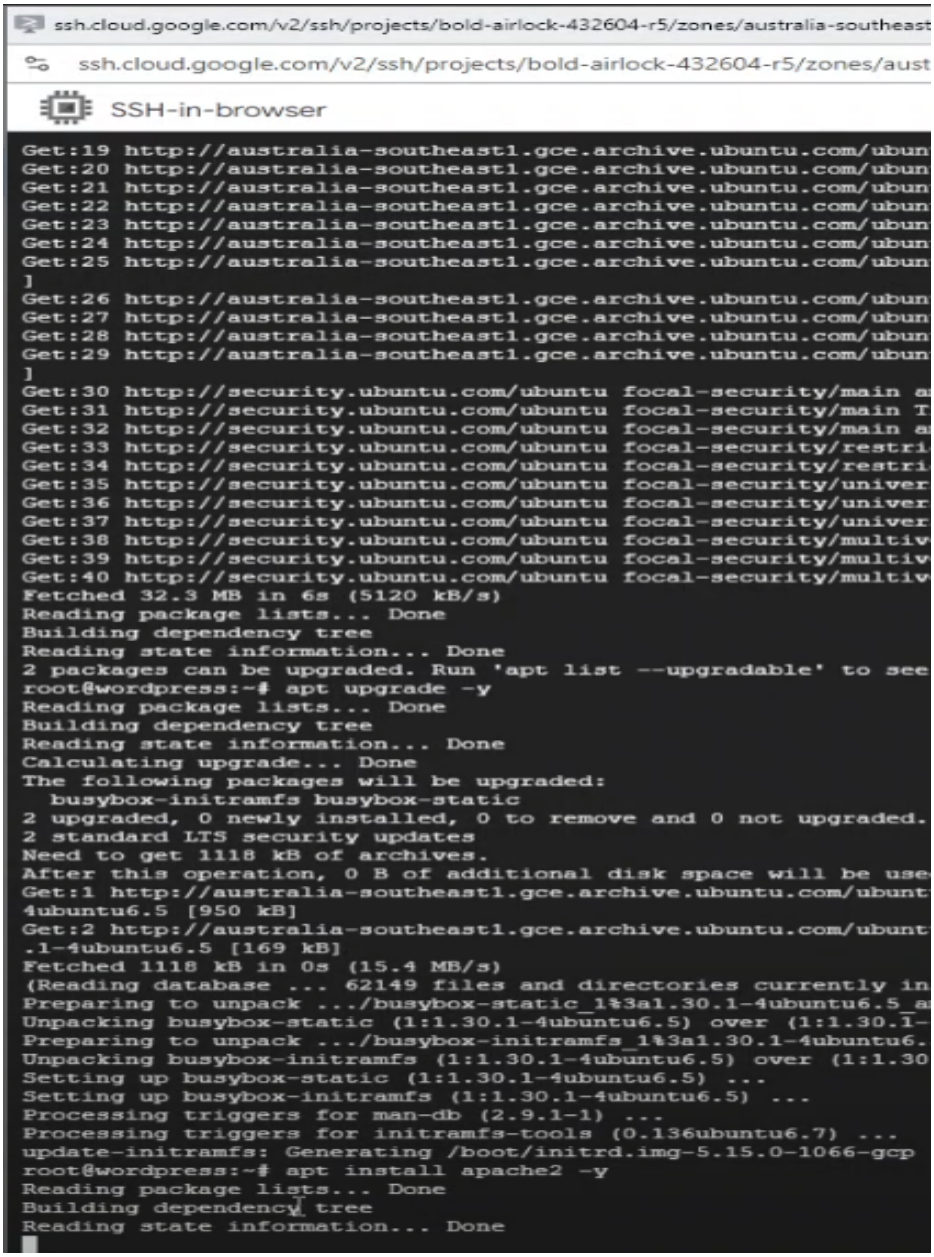
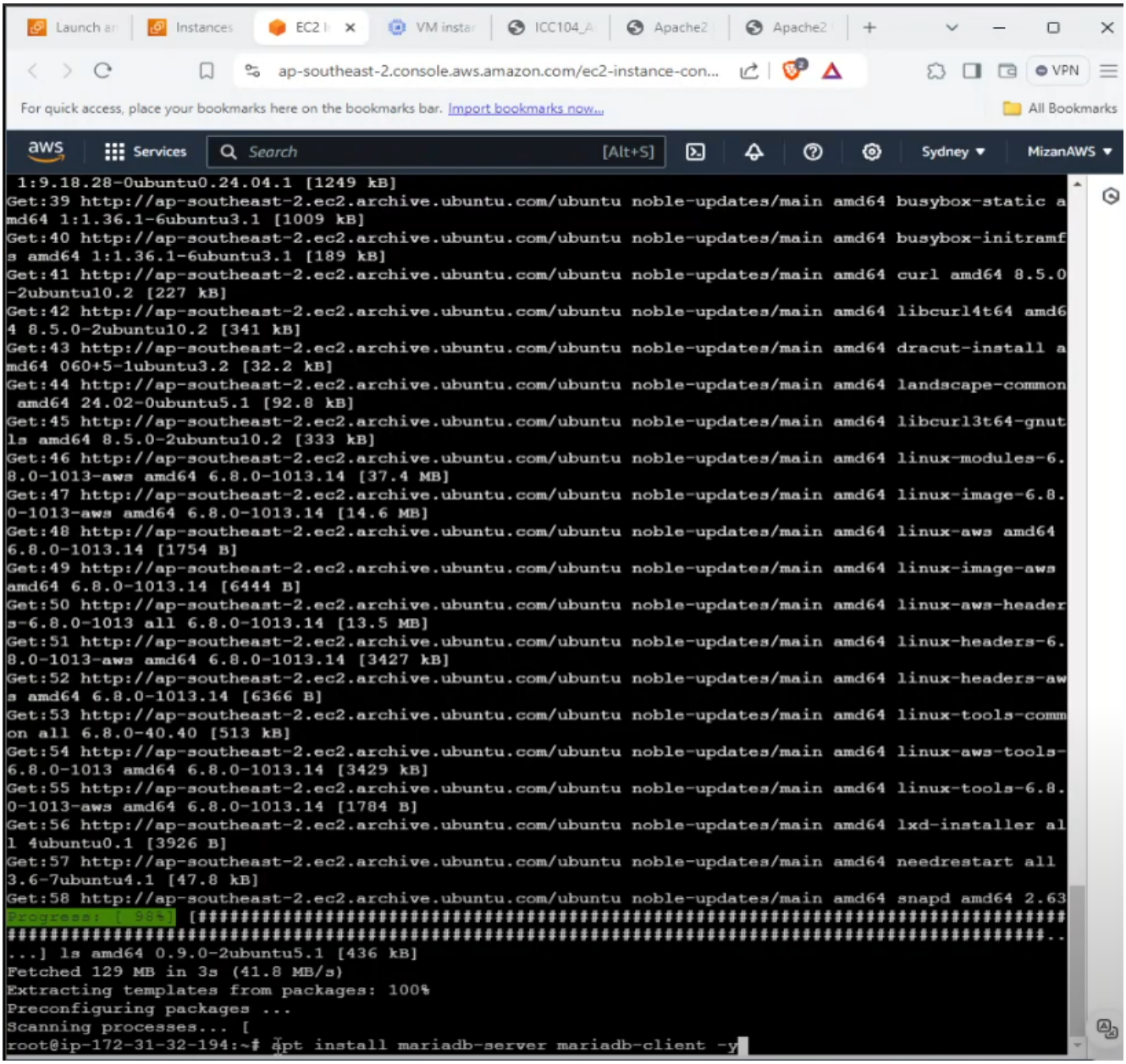
3.6-7ubuntu4.1 [47.8 kB]
Get:58 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 snapd amd64 2.63
Progress: [99%]
#..] ls amd64 0.9.0-2ubuntu5.1 [436 kB]
Fetched 129 MB in 3s (41.8 MB/s)
Extracting templates from packages: 100%
Preconfiguring packages ...
Scanning processes... [
root@ip-172-31-32-194:~# apt install apache2 -y



After updating and upgrading I install apache2 server on the console to do so the code is:

```
apt install apache2 -y
```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VPN
For quick access, place your bookmarks here on the bookmarks bar. Import bookmarks now...
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aws
Services
Search
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MizanAWS
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amd64 6.8.0-1013.14 [6444 B]
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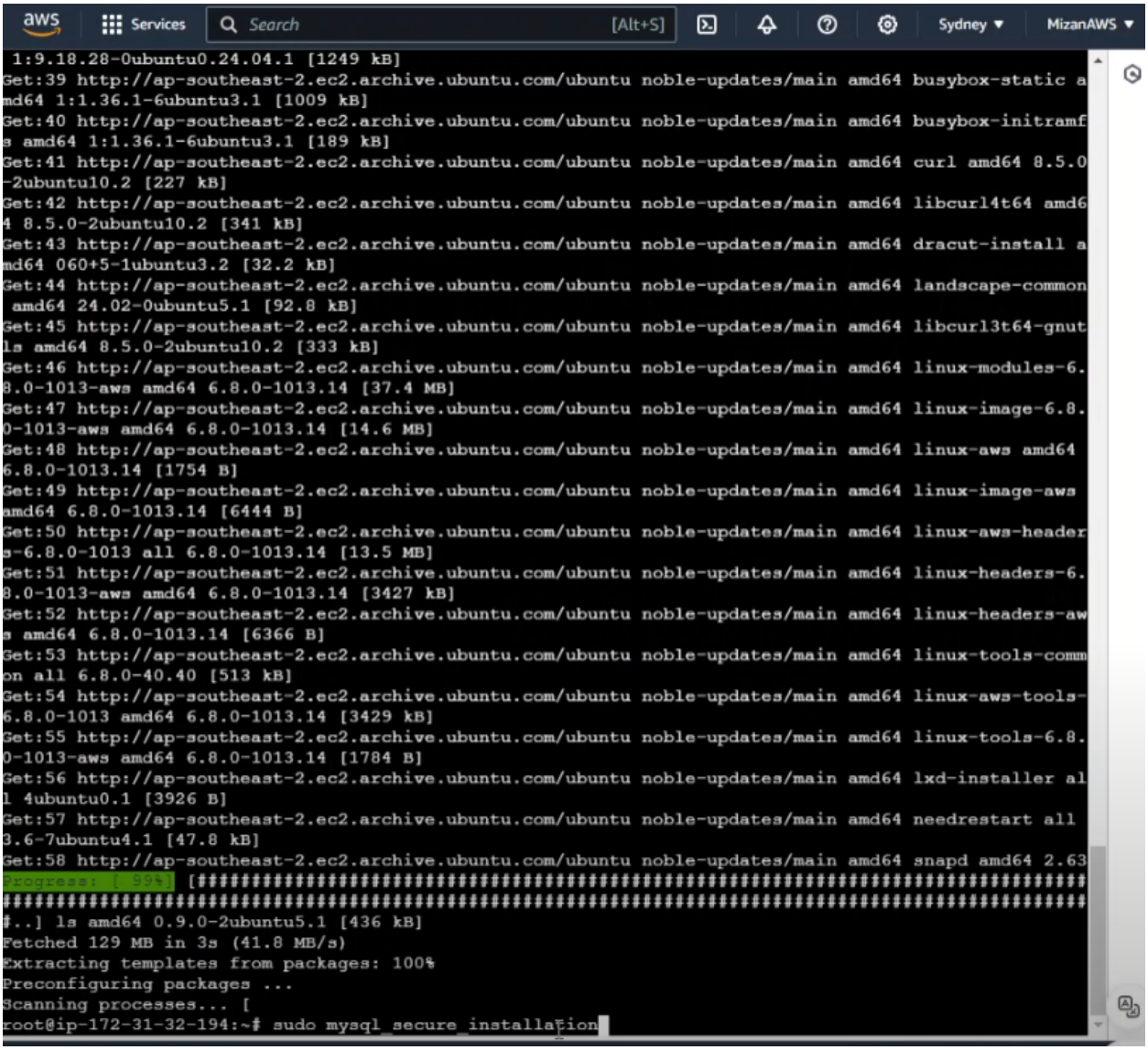
Progress: [98%] [
...] ls amd64 0.9.0-2ubuntu5.1 [436 kB]
Fetched 129 MB in 3s (41.8 MB/s)
Extracting templates from packages: 100%
Preconfiguring packages ...
Scanning processes... [
root@ip-172-31-32-194:~# apt install mariadb-server mariadb-client -y

When Apache2 installed, I installed MariaDB server on the console with the following code:

```
apt install mariadb-server mariadb-client -y
```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Get:52 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-headers-aw
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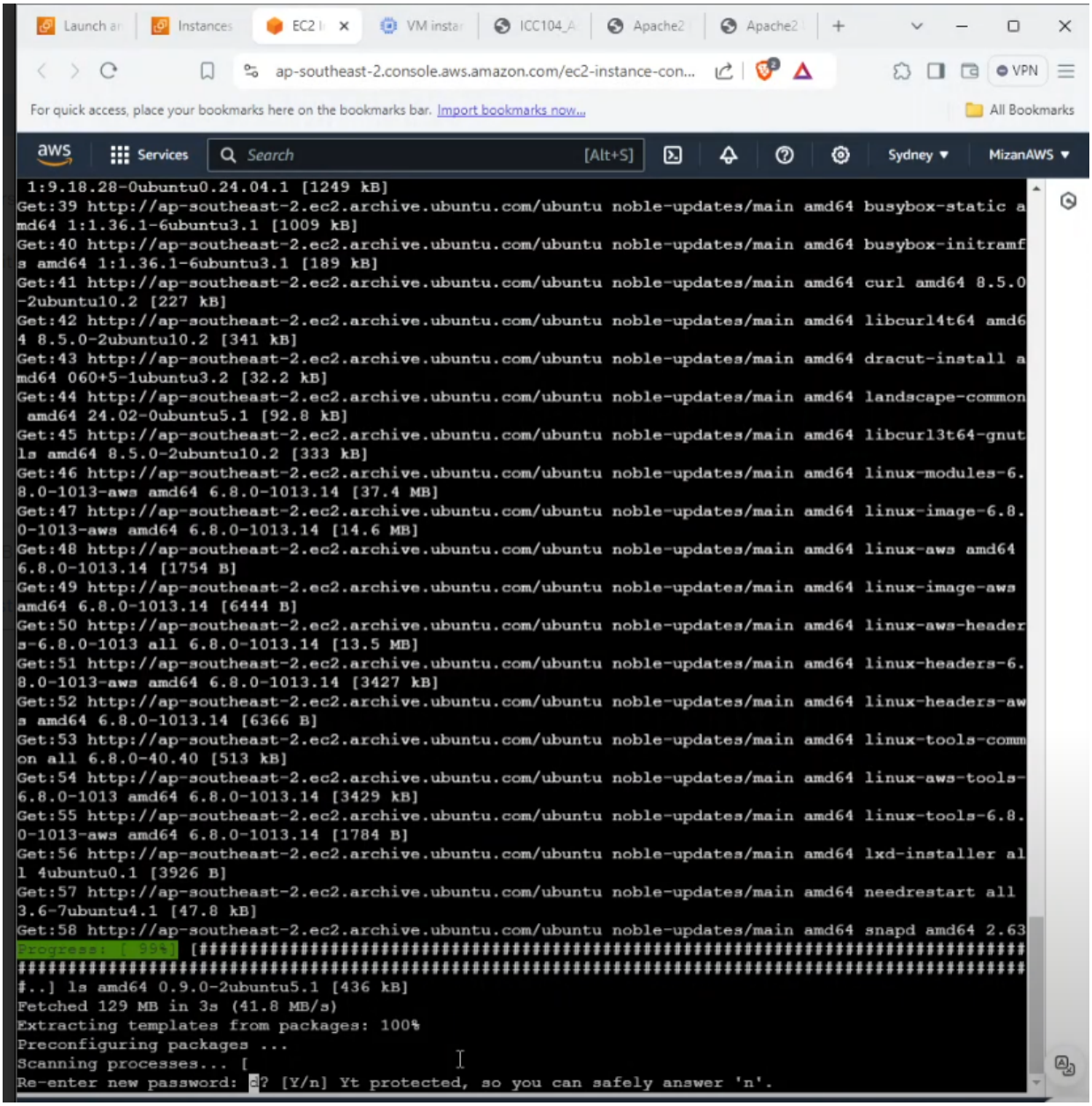
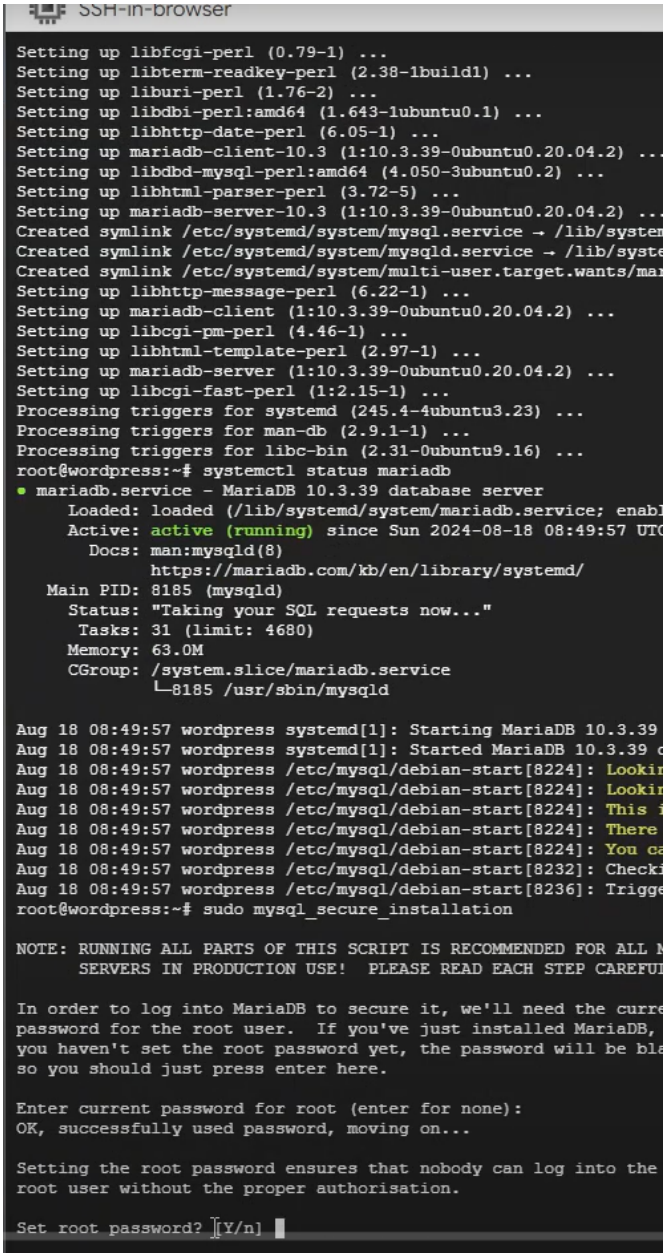
on all 6.8.0-40.40 [513 kB]
Get:54 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-aws-tools-
6.8.0-1013 amd64 6.8.0-1013.14 [3429 kB]
Get:55 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-tools-6.8.
0-1013-aws amd64 6.8.0-1013.14 [1784 B]
Get:56 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 lxd-installer al
l 4ubuntu0.1 [3926 B]
Get:57 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 needrestart all
3.6-7ubuntu4.1 [47.8 kB]
Get:58 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 snapd amd64 2.63
Progress: [99%] [##
##
#..] ls amd64 0.9.0-2ubuntu5.1 [436 kB]
Fetched 129 MB in 3s (41.8 MB/s)
Extracting templates from packages: 100%
Preconfiguring packages ...
Scanning processes... [
root@ip-172-31-32-194:~# sudo mysql_secure_installation

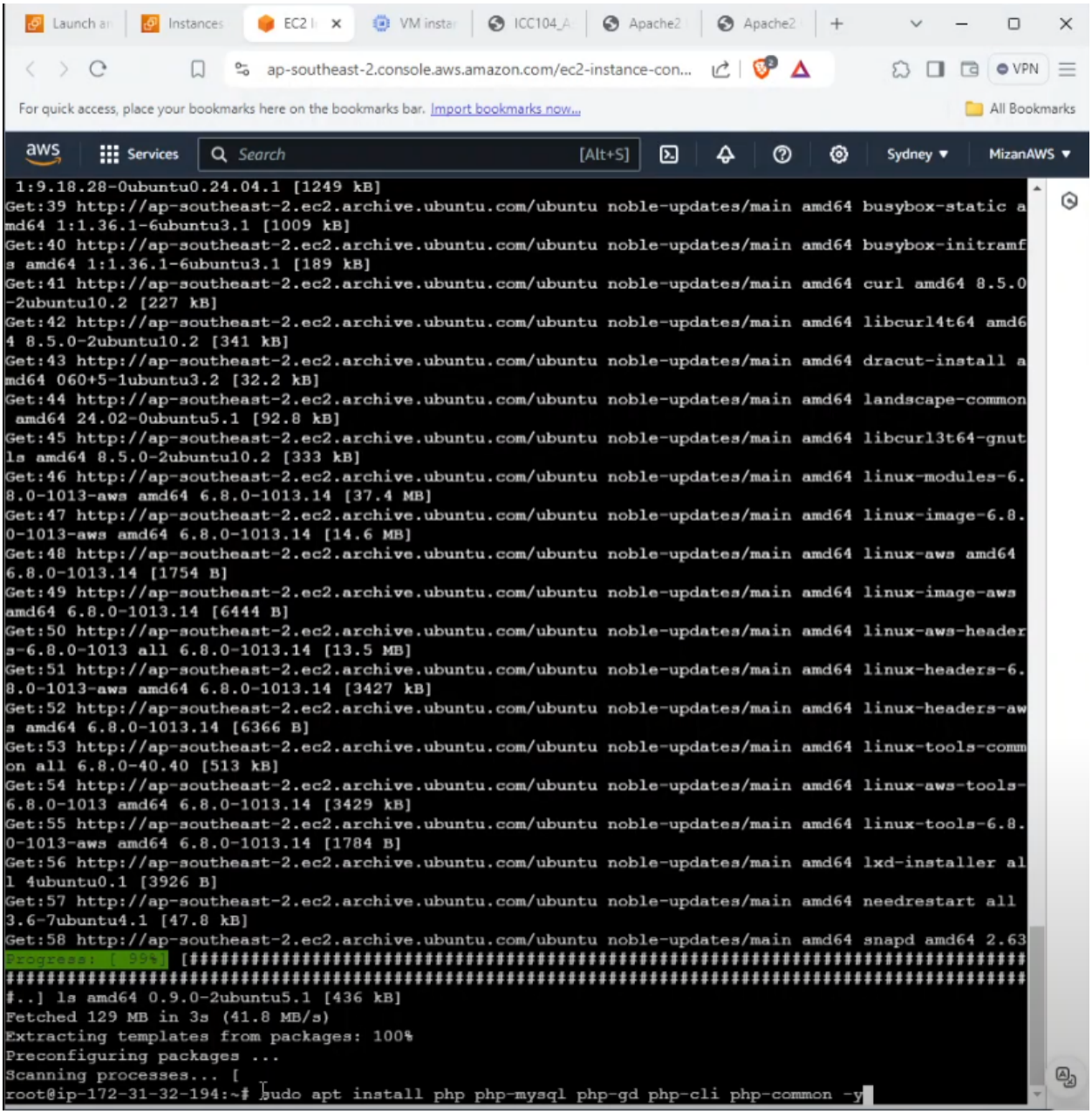

Launch ar
Instances
EC2 I
VM instar
ICC104_A
Apache2
Apache2
ap-southeast-2.console.aws.amazon.com/ec2-instance-con...
VPN
For quick access, place your bookmarks here on the bookmarks bar. Import bookmarks now...
All Bookmarks
aws
Services
Search
[Alt+S]
Sydney
MizanAWS
1:9.18.28-0ubuntu0.24.04.1 [1249 kB]
Get:39 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 busybox-static amd64 1:1.36.1-6ubuntu3.1 [1009 kB]
Get:40 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 busybox-initramfs amd64 1:1.36.1-6ubuntu3.1 [189 kB]
Get:41 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 curl amd64 8.5.0-2ubuntu10.2 [227 kB]
Get:42 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 libcurl4t64 amd64 8.5.0-2ubuntu10.2 [341 kB]
Get:43 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 dracut-install amd64 060+5-1ubuntu3.2 [32.2 kB]
Get:44 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 landscape-common amd64 24.02-0ubuntu5.1 [92.8 kB]
Get:45 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 libcurl3t64-gnutls amd64 8.5.0-2ubuntu10.2 [333 kB]
Get:46 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-modules-6.8.0-1013-aws amd64 6.8.0-1013.14 [37.4 MB]
Get:47 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-image-6.8.0-1013-aws amd64 6.8.0-1013.14 [14.6 MB]
Get:48 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-aws amd64 6.8.0-1013.14 [1754 B]
Get:49 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-image-aws amd64 6.8.0-1013.14 [6444 B]
Get:50 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-aws-headers-6.8.0-1013 all 6.8.0-1013.14 [13.5 MB]
Get:51 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-headers-6.8.0-1013-aws amd64 6.8.0-1013.14 [3427 kB]
Get:52 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-headers-aws amd64 6.8.0-1013.14 [6366 B]
Get:53 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-tools-common all 6.8.0-40.40 [513 kB]
Get:54 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-aws-tools-6.8.0-1013 amd64 6.8.0-1013.14 [3429 kB]
Get:55 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-tools-6.8.0-1013-aws amd64 6.8.0-1013.14 [1784 B]
Get:56 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 lxd-installer all 4ubuntu0.1 [3926 B]
Get:57 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 needrestart all 3.6-7ubuntu4.1 [47.8 kB]
Get:58 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 snapd amd64 2.63
Progress: [99%] [##
##
#..] ls amd64 0.9.0-2ubuntu5.1 [436 kB]
Fetched 129 MB in 3s (41.8 MB/s)
Extracting templates from packages: 100%
Preconfiguring packages ...
Scanning processes... [
Re-enter new password: ?? [Y/n] Yt protected, so you can safely answer 'n'.

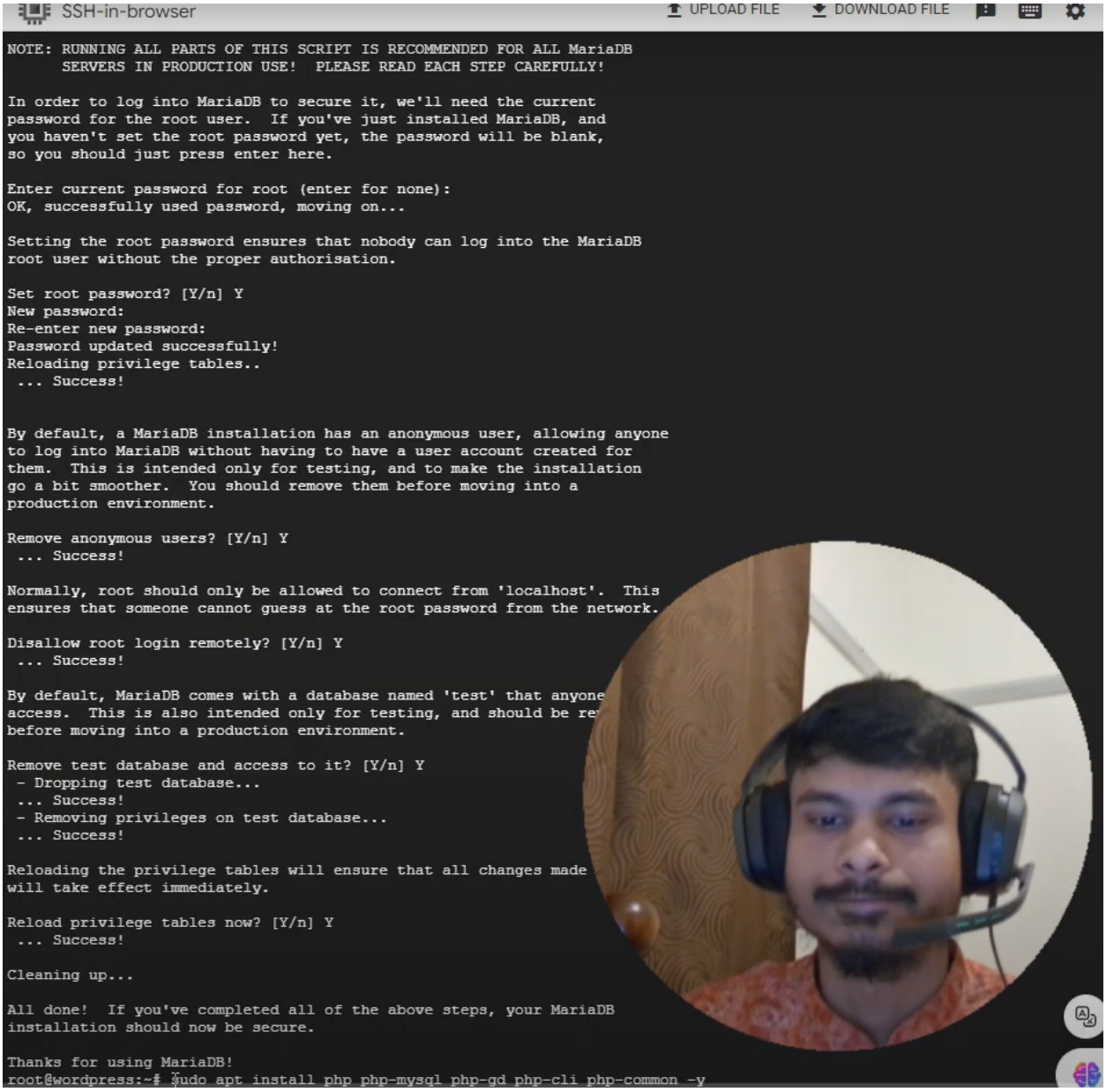


When I install MySQL with the following code;

```
sudo mysql_secure_installation
```

It asked for root password, we must press enter to move to the next task, then it will ask to set a new root password, where I set my root password as “icc104”. It will ask some basic questions that need to be pressed as “yes” to move on.

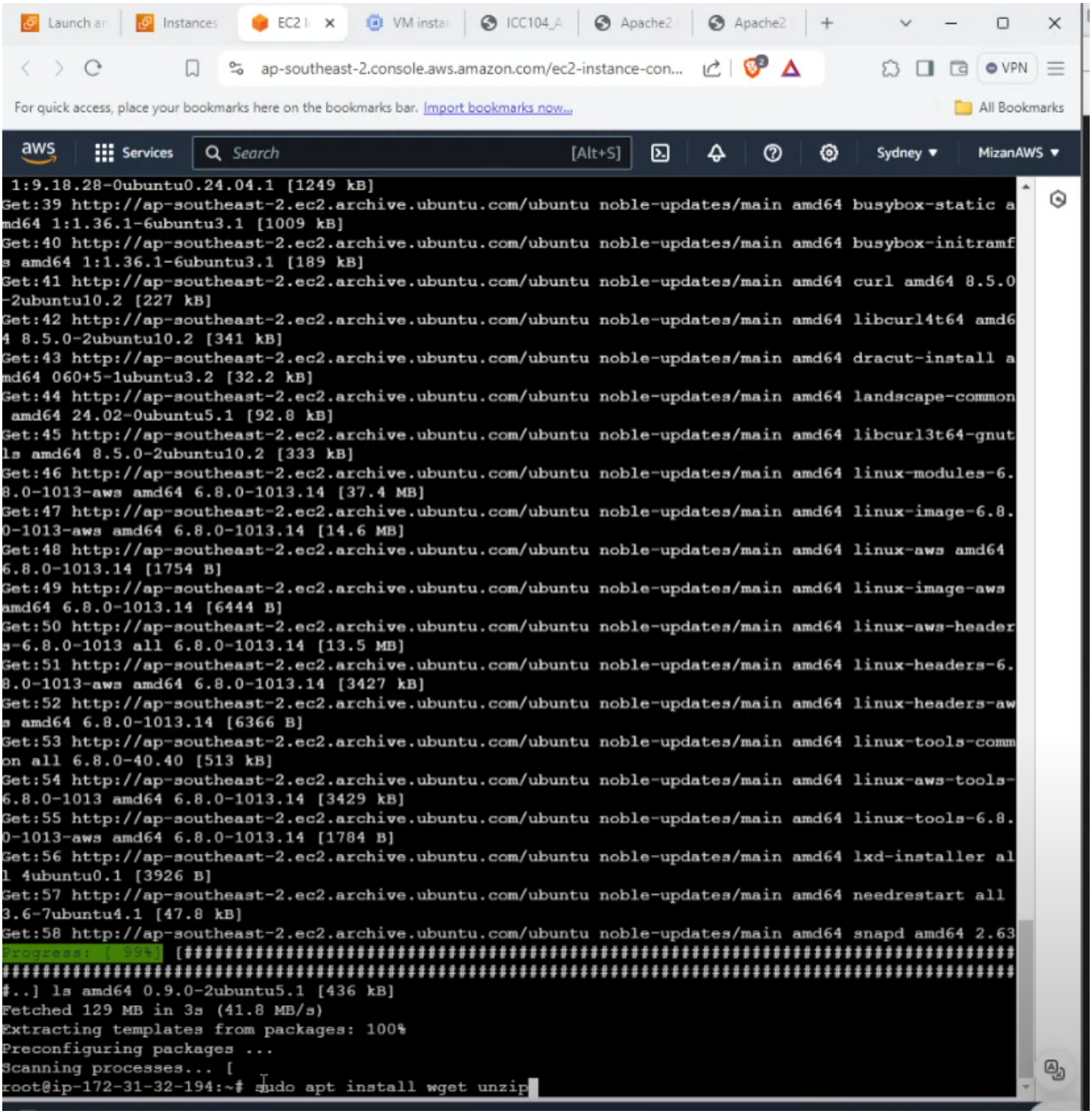


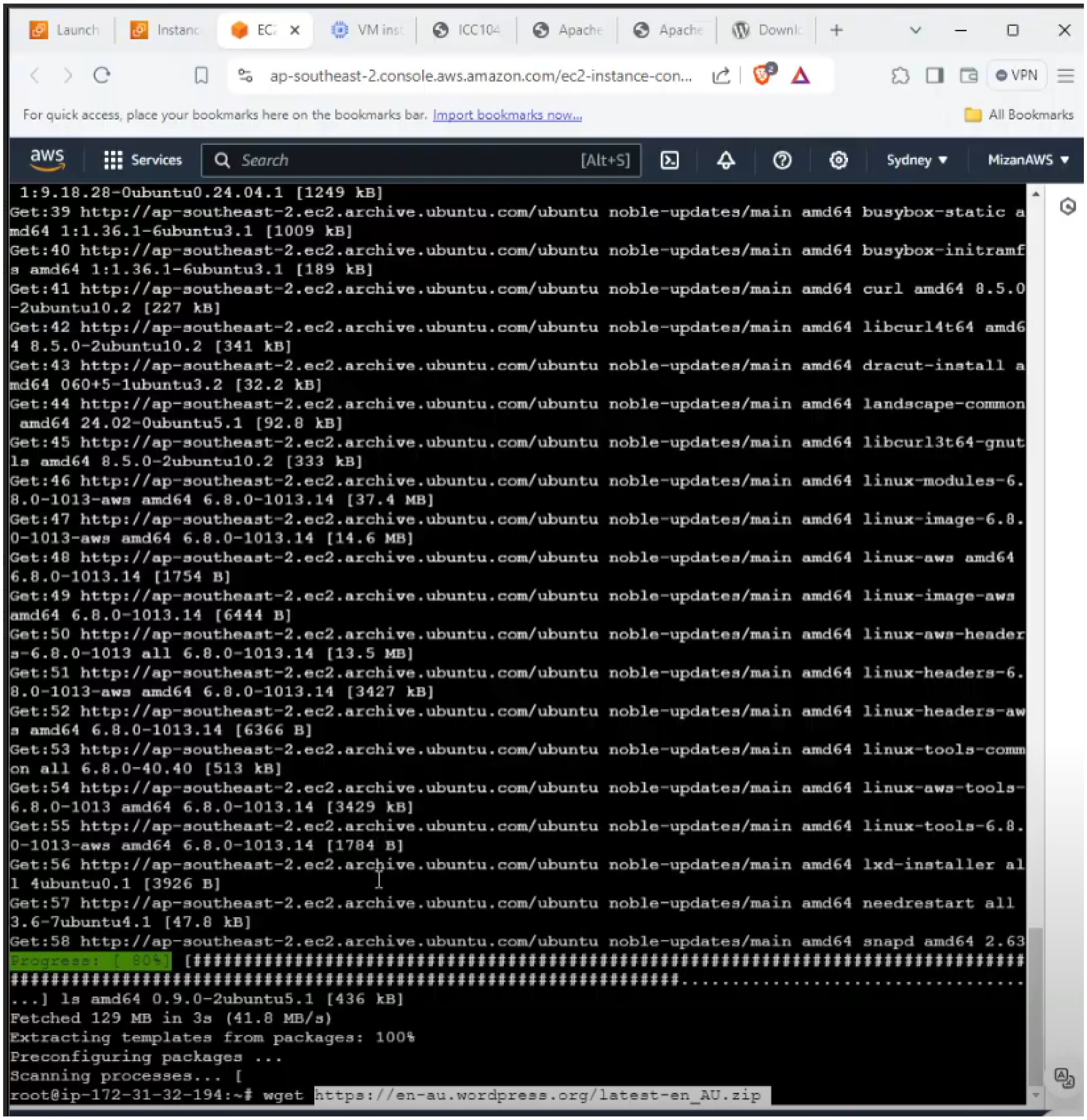


After MySQL secure installation I must install PHP to the console, for that I used:

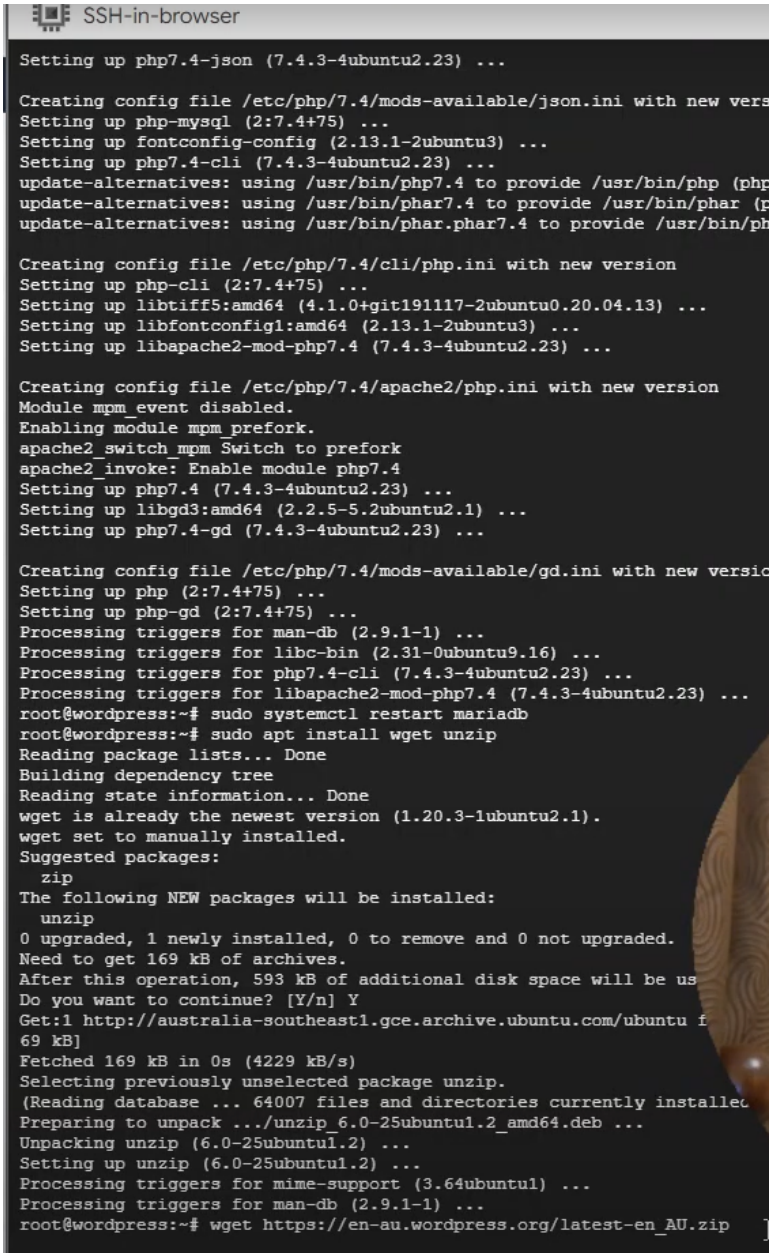
```
sudo apt install php php-mysql php-gd php-cli php-common -y
```

After installing the PHP I restarted the MariaDB and installed an unzip software named wget then download the WordPress zip from their website and unzip it with wget.


Launch ar
Instances
EC2 I
VM instar
ICC104_A
Apache2
Apache2
ap-southeast-2.console.aws.amazon.com/ec2-instance-con...
VPN
For quick access, place your bookmarks here on the bookmarks bar. Import bookmarks now...
All Bookmarks
aws
Services
Search
[Alt+S]
Sydney
MizanAWS
1:9.18.28-0ubuntu0.24.04.1 [1249 kB]
Get:39 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 busybox-static amd64 1:1.36.1-6ubuntu3.1 [1009 kB]
Get:40 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 busybox-initramfs amd64 1:1.36.1-6ubuntu3.1 [189 kB]
Get:41 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 curl amd64 8.5.0-2ubuntu10.2 [227 kB]
Get:42 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 libcurl4t64 amd64 8.5.0-2ubuntu10.2 [341 kB]
Get:43 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 dracut-install amd64 060+5-1ubuntu3.2 [32.2 kB]
Get:44 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 landscape-common amd64 24.02-0ubuntu5.1 [92.8 kB]
Get:45 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 libcurl3t64-gnutls amd64 8.5.0-2ubuntu10.2 [333 kB]
Get:46 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-modules-6.8.0-1013-aws amd64 6.8.0-1013.14 [37.4 MB]
Get:47 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-image-6.8.0-1013-aws amd64 6.8.0-1013.14 [14.6 MB]
Get:48 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-aws amd64 6.8.0-1013.14 [1754 B]
Get:49 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-image-aws amd64 6.8.0-1013.14 [6444 B]
Get:50 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-aws-headers-6.8.0-1013 all 6.8.0-1013.14 [13.5 MB]
Get:51 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-headers-6.8.0-1013-aws amd64 6.8.0-1013.14 [3427 kB]
Get:52 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-headers-aws amd64 6.8.0-1013.14 [6366 B]
Get:53 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-tools-common all 6.8.0-40.40 [513 kB]
Get:54 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-aws-tools-6.8.0-1013 amd64 6.8.0-1013.14 [3429 kB]
Get:55 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-tools-6.8.0-1013-aws amd64 6.8.0-1013.14 [1784 B]
Get:56 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 lxd-installer all 4ubuntu0.1 [3926 B]
Get:57 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 needrestart all 3.6-7ubuntu4.1 [47.8 kB]
Get:58 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 snapd amd64 2.63
Progress: [99%] [
#..] ls amd64 0.9.0-2ubuntu5.1 [436 kB]
Fetched 129 MB in 3s (41.8 MB/s)
Extracting templates from packages: 100%
Preconfiguring packages ...
Scanning processes... [
root@ip-172-31-32-194:~# sudo apt install wget unzip

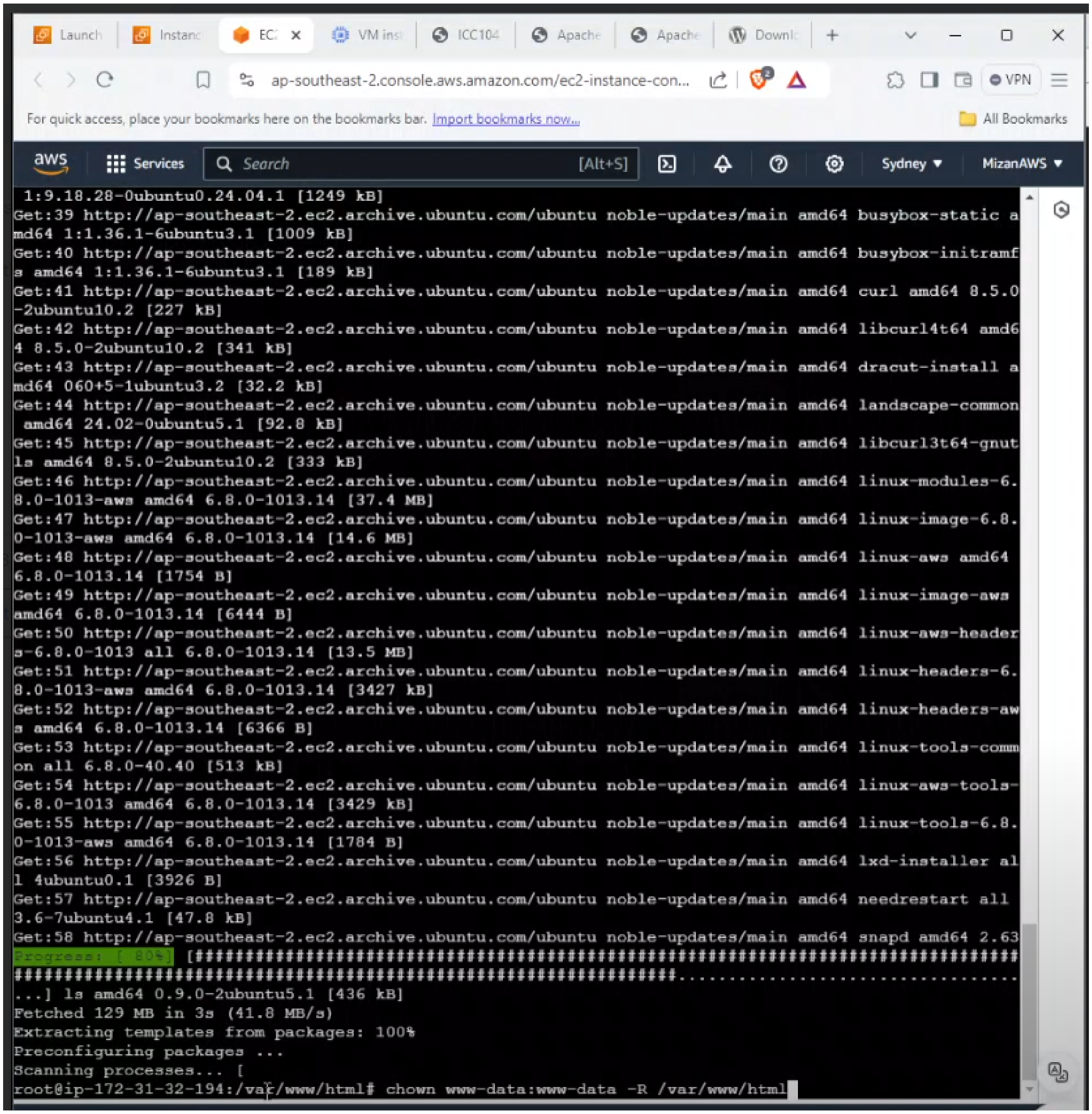


ap-southeast-2.console.aws.amazon.com/ec2-instance-con...
For quick access, place your bookmarks here on the bookmarks bar. Import bookmarks now...
All Bookmarks
Services
Search
[Alt+S]
Sydney
MizanAWS
1:9.18.28-0ubuntu0.24.04.1 [1249 kB]
Get:39 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 busybox-static amd64 1:1.36.1-6ubuntu3.1 [1009 kB]
Get:40 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 busybox-initramfs amd64 1:1.36.1-6ubuntu3.1 [189 kB]
Get:41 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 curl amd64 8.5.0-2ubuntu10.2 [227 kB]
Get:42 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 libcurl4t64 amd64 8.5.0-2ubuntu10.2 [341 kB]
Get:43 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 dracut-install amd64 060+5-1ubuntu3.2 [32.2 kB]
Get:44 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 landscape-common amd64 24.02-0ubuntu5.1 [92.8 kB]
Get:45 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 libcurl3t64-gnutls amd64 8.5.0-2ubuntu10.2 [333 kB]
Get:46 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-modules-6.8.0-1013-aws amd64 6.8.0-1013.14 [37.4 MB]
Get:47 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-image-6.8.0-1013-aws amd64 6.8.0-1013.14 [14.6 MB]
Get:48 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-aws amd64 6.8.0-1013.14 [1754 B]
Get:49 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-image-aws amd64 6.8.0-1013.14 [6444 B]
Get:50 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-aws-headers-6.8.0-1013 all 6.8.0-1013.14 [13.5 MB]
Get:51 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-headers-6.8.0-1013-aws amd64 6.8.0-1013.14 [3427 kB]
Get:52 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-headers-aws amd64 6.8.0-1013.14 [6366 B]
Get:53 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-tools-common all 6.8.0-40.40 [513 kB]
Get:54 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-aws-tools-6.8.0-1013 amd64 6.8.0-1013.14 [3429 kB]
Get:55 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-tools-6.8.0-1013-aws amd64 6.8.0-1013.14 [1784 B]
Get:56 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 lxd-installer all 4ubuntu0.1 [3926 B]
Get:57 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 needrestart all 3.6-7ubuntu4.1 [47.8 kB]
Get:58 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 snapd amd64 2.63
...] ls amd64 0.9.0-2ubuntu5.1 [436 kB]
Fetched 129 MB in 3s (41.8 MB/s)
Extracting templates from packages: 100%
Preconfiguring packages ...
Scanning processes... [
root@ip-172-31-32-194:~# wget https://en-au.wordpress.org/latest-en_AU.zip



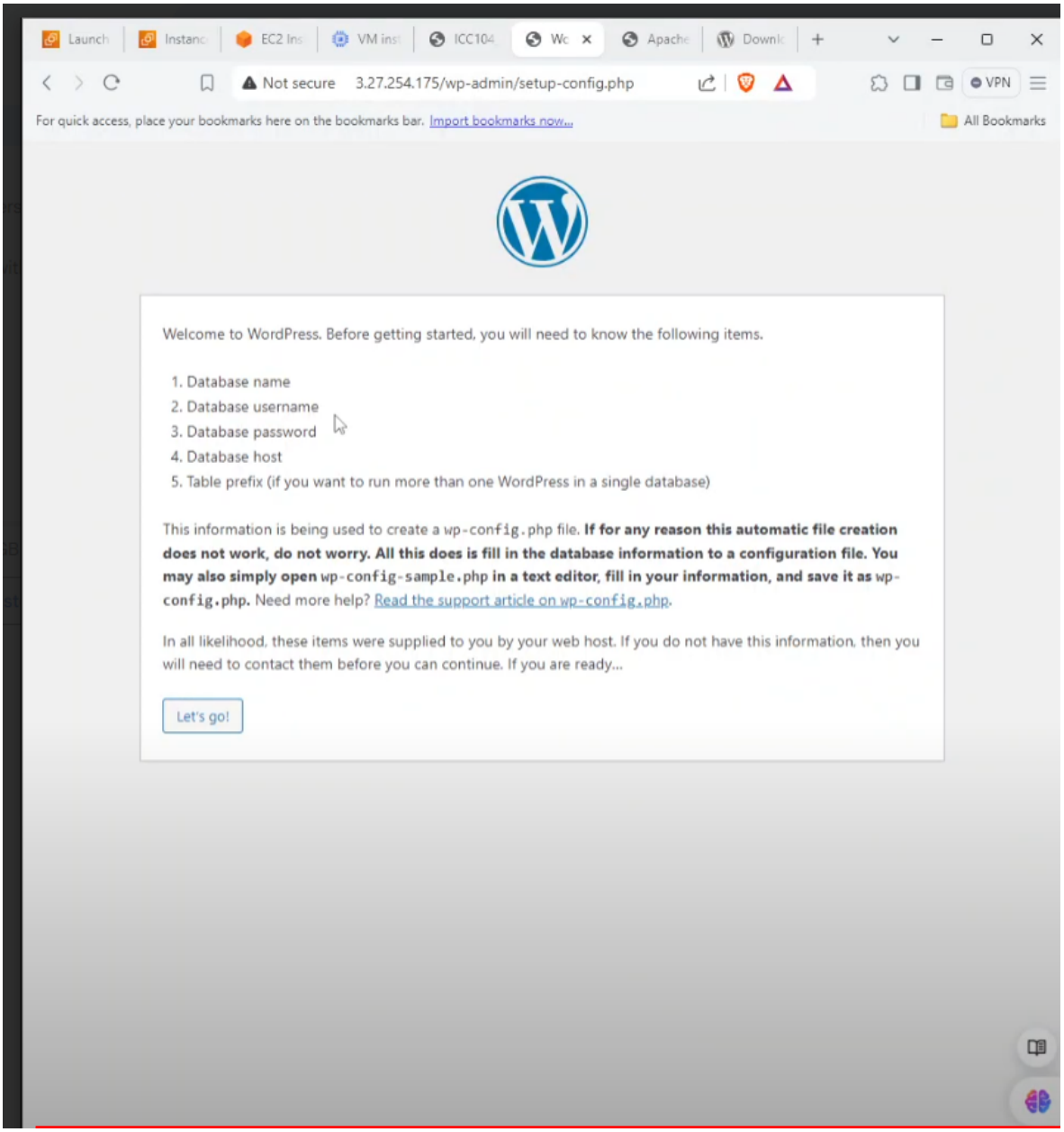
To install wget software and download WordPress zip and to unzip the following code I used.

sudo apt install wget unzip wget (paste WordPress download link) unzip “latest-en_AU.zip”


ap-southeast-2.console.aws.amazon.com/ec2-instance-con...
For quick access, place your bookmarks here on the bookmarks bar. Import bookmarks now...
All Bookmarks
Services
Search
[Alt+S]
Sydney
MizanAWS
1:9.18.28-0ubuntu0.24.04.1 [1249 kB]
Get:39 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 busybox-static amd64 1:1.36.1-6ubuntu3.1 [1009 kB]
Get:40 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 busybox-initramfs amd64 1:1.36.1-6ubuntu3.1 [189 kB]
Get:41 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 curl amd64 8.5.0-2ubuntu10.2 [227 kB]
Get:42 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 libcurl4t64 amd64 8.5.0-2ubuntu10.2 [341 kB]
Get:43 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 dracut-install amd64 060+5-1ubuntu3.2 [32.2 kB]
Get:44 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 landscape-common amd64 24.02-0ubuntu5.1 [92.8 kB]
Get:45 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 libcurl3t64-gnutls amd64 8.5.0-2ubuntu10.2 [333 kB]
Get:46 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-modules-6.8.0-1013-aws amd64 6.8.0-1013.14 [37.4 MB]
Get:47 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-image-6.8.0-1013-aws amd64 6.8.0-1013.14 [14.6 MB]
Get:48 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-aws amd64 6.8.0-1013.14 [1754 B]
Get:49 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-image-aws amd64 6.8.0-1013.14 [6444 B]
Get:50 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-aws-headers-6.8.0-1013 all 6.8.0-1013.14 [13.5 MB]
Get:51 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-headers-6.8.0-1013-aws amd64 6.8.0-1013.14 [3427 kB]
Get:52 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-headers-aws amd64 6.8.0-1013.14 [6366 B]
Get:53 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-tools-common all 6.8.0-40.40 [513 kB]
Get:54 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-aws-tools-6.8.0-1013 amd64 6.8.0-1013.14 [3429 kB]
Get:55 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 linux-tools-6.8.0-1013-aws amd64 6.8.0-1013.14 [1784 B]
Get:56 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 lxd-installer all 4ubuntu0.1 [3926 B]
Get:57 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 needrestart all 3.6-7ubuntu4.1 [47.8 kB]
Get:58 http://ap-southeast-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 snapd amd64 2.63
...] ls amd64 0.9.0-2ubuntu5.1 [436 kB]
Fetched 129 MB in 3s (41.8 MB/s)
Extracting templates from packages: 100%
Preconfiguring packages ...
Scanning processes... [
root@ip-172-31-32-194:/var/www/html# chown www-data:www-data -R /var/www/html

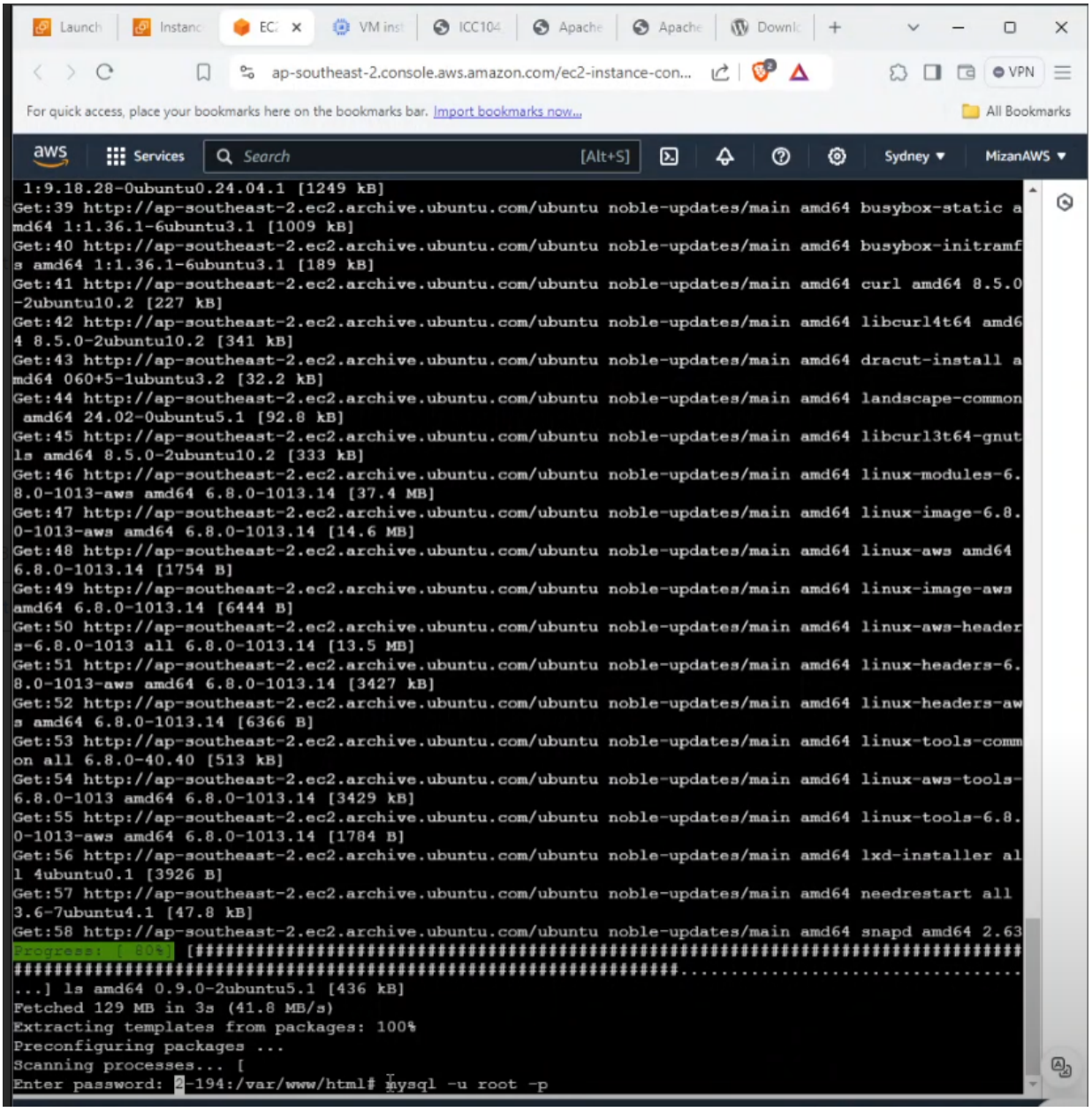
When WordPress unzipping was done, I copied WordPress files to Apache directory and removed default Apache index. For that I used:

```
cp –r wordpress/* /var /www/html

cd /var /www/html/

chown www-data:www-data –R /var /www/html/

To remove default Apache Index:

rm –rf index.html
```



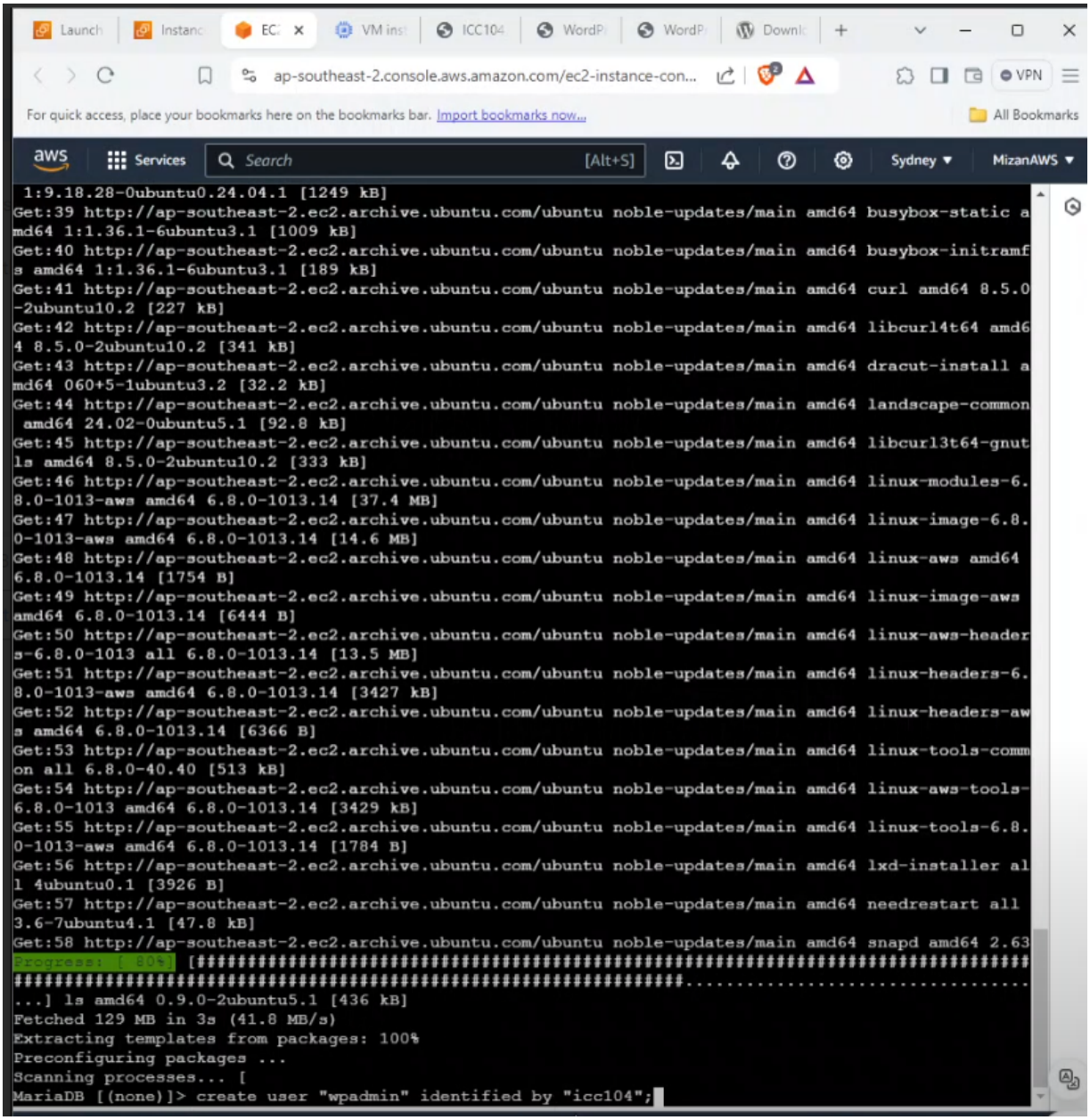
After setting up the downloaded zip file, and unzipping it, when I refresh the browser with public Ip, it accessed me to WordPress.

Then to set up WordPress database I logged in MariaDB, created database, username, and password, and granted all privileges to admin to access the WordPress.



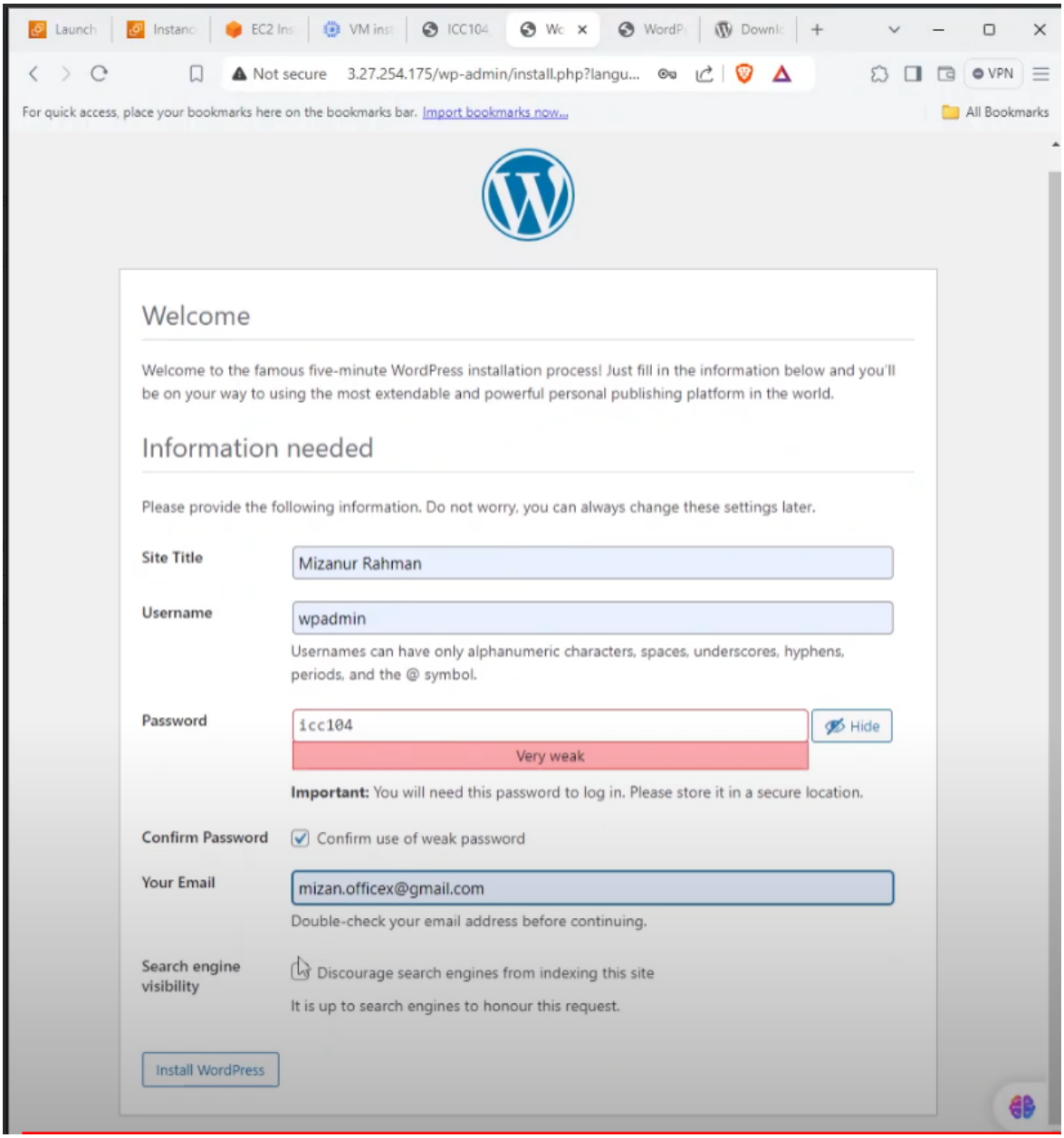
To log in to MariaDB:

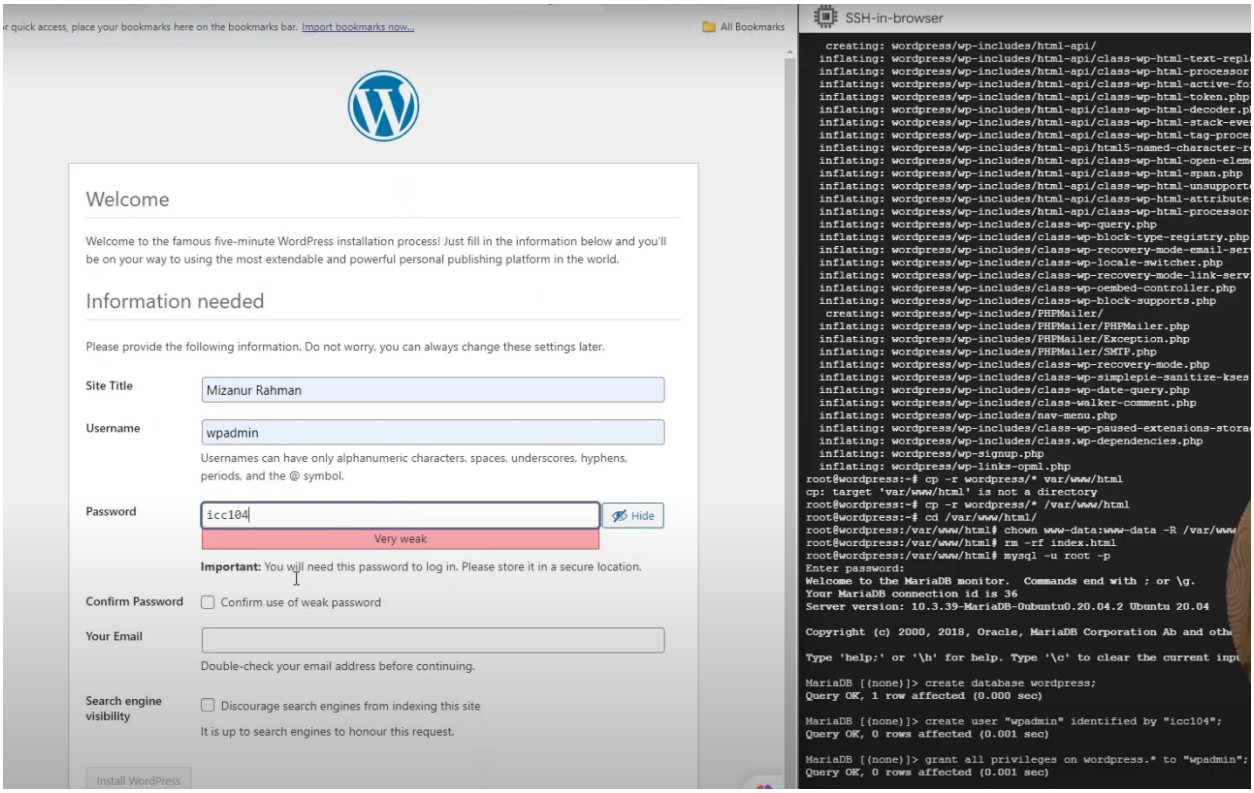
```
mysql –u root –p
```



I created the database and named it as “wordress” and created a user as “wpadmin” which can be accessed with “icc104” password. Then granted permission for wpadmin. The following query I wrote to create database and manage it on MariaDB.

```
create database wordpress;
create user “wpadmin” identified by “icc104”;
grant all privileges on wordpress.* to “wpadmin”;
```


Launch
Instanc
EC2 Ins
VM inst
ICC104
Wc
WordP
Downlc
Not secure
3.27.254.175/wp-admin/install.php?langu...
VPN
For quick access, place your bookmarks here on the bookmarks bar. Import bookmarks now...
All Bookmarks
Welcome
Welcome to the famous five-minute WordPress installation process! Just fill in the information below and you'll be on your way to using the most extendable and powerful personal publishing platform in the world.
Information needed
Please provide the following information. Do not worry, you can always change these settings later.
Site Title
Mizanur Rahman
Username
wpadmin
Usernames can have only alphanumeric characters, spaces, underscores, hyphens, periods, and the @ symbol.
Password
icc104
Hide
Very weak
Important: You will need this password to log in. Please store it in a secure location.
Confirm Password
Confirm use of weak password
Your Email
mizan.officex@gmail.com
Double-check your email address before continuing.
Search engine visibility
Discourage search engines from indexing this site
It is up to search engines to honour this request.
Install WordPress



After setting up the wordpress log on, I setup my site to look stunning. To access my AWS wordpress site the following Ip can be used: http://3.27.254.175/

And to access the Google cloud: http://34.116.121.70/

IMPROVEMENT SUGGESTIONS:

The project outlies only the basic WordPress website deployment, it has many potentialities to improve by enhancing its security, automation, implementation of CI/CD pipelines, implementation of load balancing and auto scaling, website responsiveness and user experience.

Firstly, with SSL certificate the Ip can be secure and tested, then with domain integration the website can be fully accessible with brand image quality. Then with AWS cloud formation and

Google cloud deployment manager, we can automate the deployment of the LAMP stack and Wordpress.

Using elastic load balancer or Google cloud load balancing and with auto scaling group combination, we can distribute traffic and scale resources.

Moreover, for saving data and handling unwanted data diester, we can set up automated backups and create a disaster recovery plan. To get real-time insights, health of the application, and quick response to any issues, we can implement AWS's AWS cloud Watch and GCP's Google cloud monitoring.

Briefly, the project has a large scope to improve by using both platforms and other services and has potential to make the wordpress website to stand out the crowd.

COMPARISON OF PLATFORMS:

We can compare cloud providers based on services, prices, and advantages. For service providing amazon is the main provider for accessible could benefits and a pioneer in the global market. For design and monitoring, AWS is a dominant provider. [4]

Where Google Cloud is a hub for engineers of administrations for cloud solution collections. It has the supportive, adaptive, mobilize and discounts for its deals. [4]

For price, Amazon charges for the hourly installation, and provides a free year for the newcomer's tier, to utilize the platform before confirming the purchase. And Google Cloud offers a purchase as you go, where they charge per minute or per second. [4]

As a leading cloud company, AWS has the world's best developers, and architects, also it has competitive advantages over other cloud providers. Where Google Cloud is well known for cloud security, it has 500 security engineers to protect from cyber deals. [4]

VIRTUALIZATION AND ELASTIC RESOURCES:

In my project I used, AWS's Elastic Compute and GCP's virtual machine to get the benefit of virtualizing and elasticity, going on internet server and having the access to command line interface to control the computing services, I experienced the virtualization of cloud computing.

Where I benefited with scalability, resource efficiency, I did not have to pay for physical resources and hardware costs. The virtual machine owns an operating system and applications and can run applications.

On the other hand, elasticity refers to scale resources up and down based on demand, it adjusts the resources automatically to match the demand, it optimizes the performances during its peak hours.

Conclusion:

In this project, I utilized Amazon Web Services EC2 and Google Cloud Providers VMs to deploy WordPress website installing LAMP stack, where I compare Amazon Web Services and Google Cloud Provider regarding key services, price models, and virtual capabilities.

From the report, I can conclude that AWS is most popular for wider Services and flexibility, in most large businesses use AWS for their business solutions, on the other hand, GCP provides more affordability to the customer and mostly focus on Platform as a Service.

Although, the both platform is capable of providing efficiency and reliability to support cloud based solutions to the customers, between these two platforms can be chosen based on customer specific project needs, budget planning, and demanded features.

In conclusion, although the wordpress website deployment in each platform reflects the best utilization of AWS's elastic compute and GCP's virtual machine they have more potentialities to solve complex business, corporate and government problems with varieties features.

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