

Universidad Modelo



Escuela de Ingeniería.

Carrera: Ingeniería en Desarrollo de Tecnología y Software

Asignatura: Herramientas de desarrollo de software

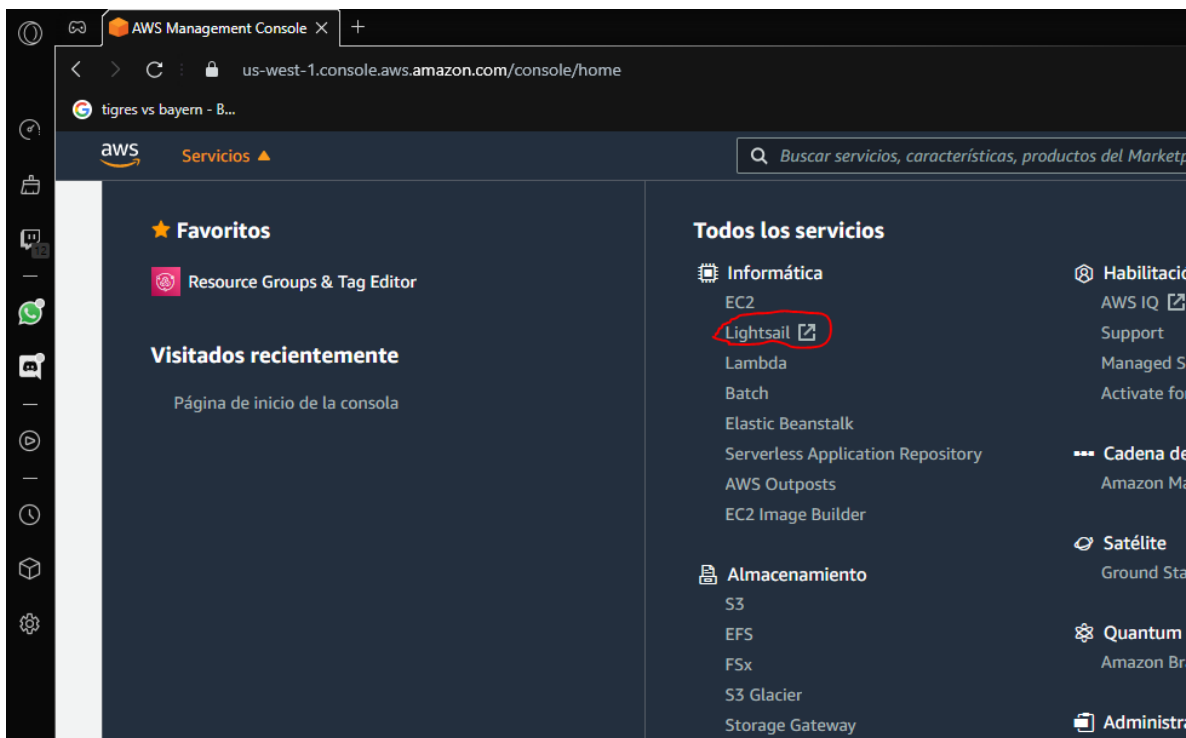
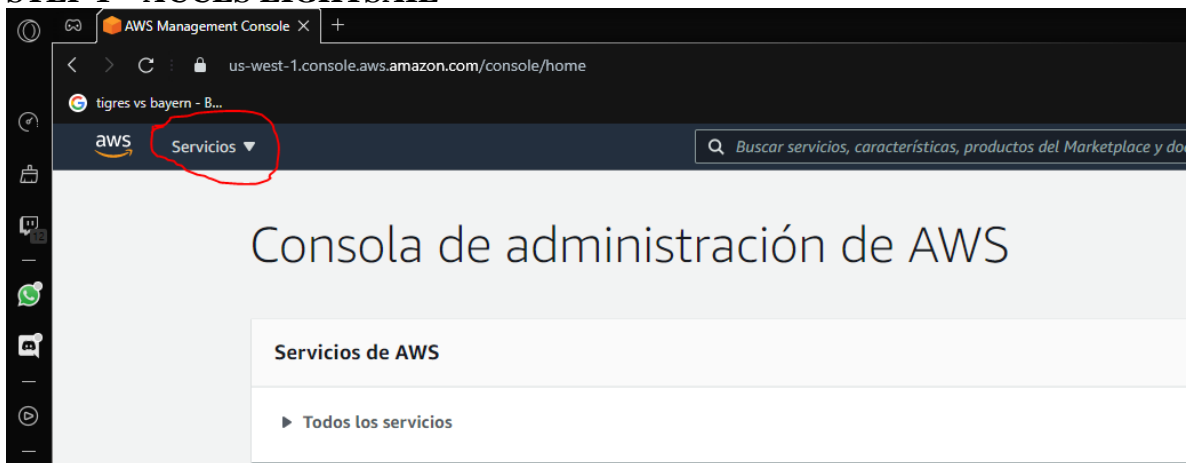
Nombre del Profesor: Mtro. Alfredo José Bolio Domínguez

Nombre de la Actividad: Evidencia balanceador de carga

Fecha de Entrega: miércoles 10 de marzo de 2021

Nombre del Alumno: Luis Alberto Sánchez Rios

## STEP 1 – ACCES LIGHTSAIL



## STEP 2 – CREATE INSTANCE

Good afternoon!

Filter by name, location, tag, or type

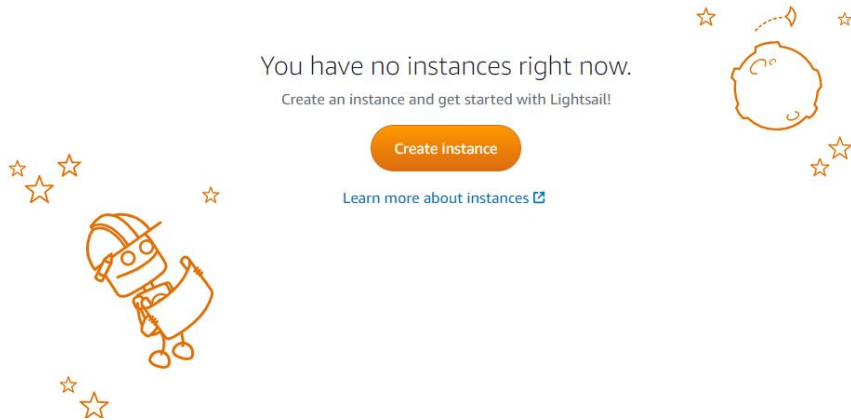
**Instances** Containers Databases Networking Storage Snapshots

You have no instances right now.

Create an instance and get started with Lightsail!

Create instance

[Learn more about instances](#)



Good afternoon!

Filter by name, location, tag, or type

**Instances** Containers Databases Networking Storage Snapshots

Sort by **Date** ▼

Create instance



**PHP\_WEBAPP**

512 MB RAM, 1 vCPU, 20 GB SSD

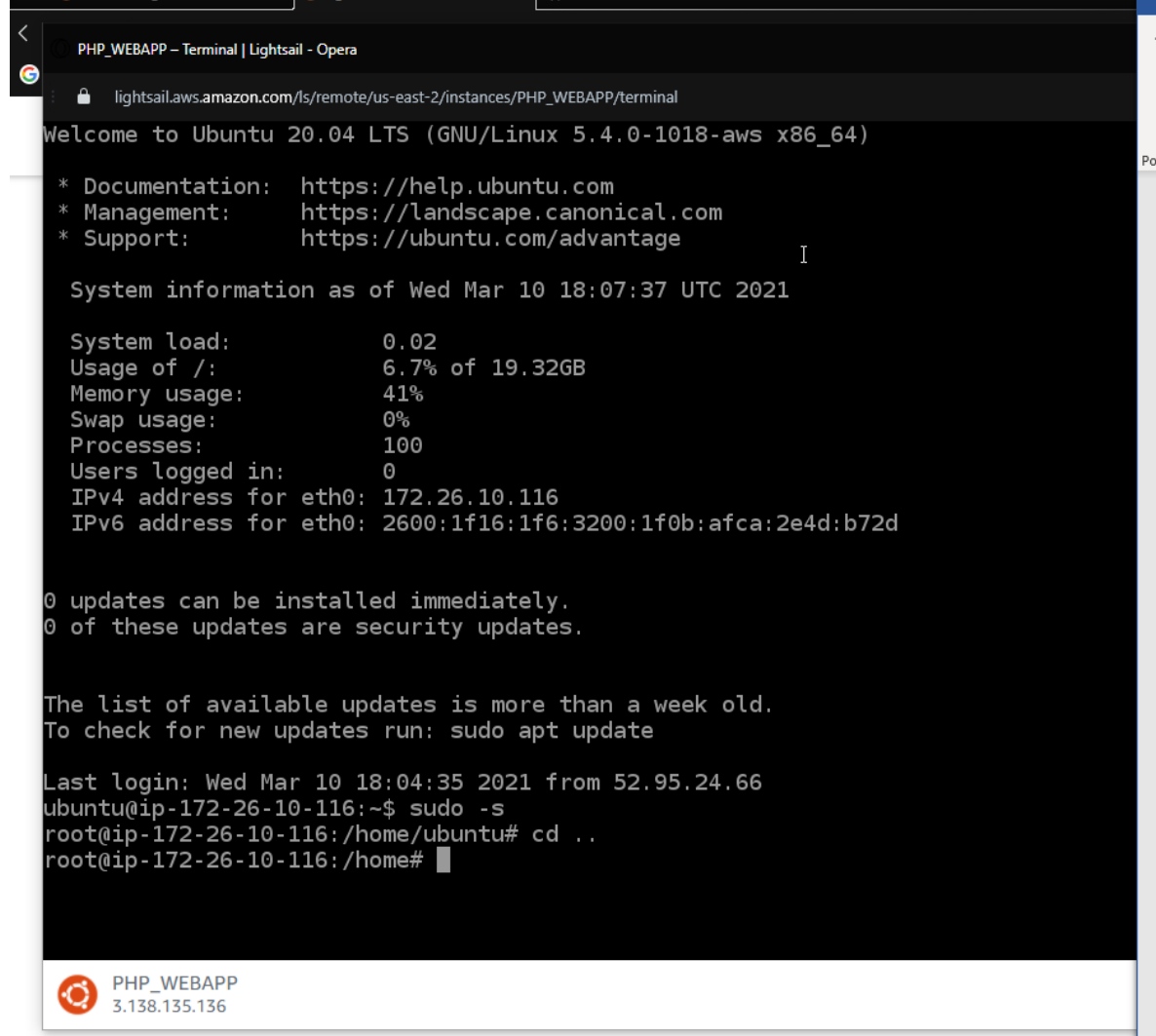
Pending

3.138.135.136

2600:1f16:1f6:3200:1f0b:afca:2e4...

Ohio, Zone A

### STEP 3 – OPEN THE INSTANCE’S COMMAND PROMPT, LOG IN AS ROOT, LOCATE YOURSELF IN THE /HOME FOLDER



The screenshot shows a terminal window titled "PHP\_WEBAPP - Terminal | Lightsail - Opera". The address bar shows the URL "lightsail.amazonaws.com/ls/remote/us-east-2/instances/PHP\_WEBAPP/terminal". The terminal output is as follows:

```
Welcome to Ubuntu 20.04 LTS (GNU/Linux 5.4.0-1018-aws x86_64)

* Documentation:  https://help.ubuntu.com
* Management:    https://landscape.canonical.com
* Support:       https://ubuntu.com/advantage

System information as of Wed Mar 10 18:07:37 UTC 2021

System load:          0.02
Usage of /:            6.7% of 19.32GB
Memory usage:         41%
Swap usage:           0%
Processes:            100
Users logged in:      0
IPv4 address for eth0: 172.26.10.116
IPv6 address for eth0: 2600:1f16:1f6:3200:1f0b:afca:2e4d:b72d

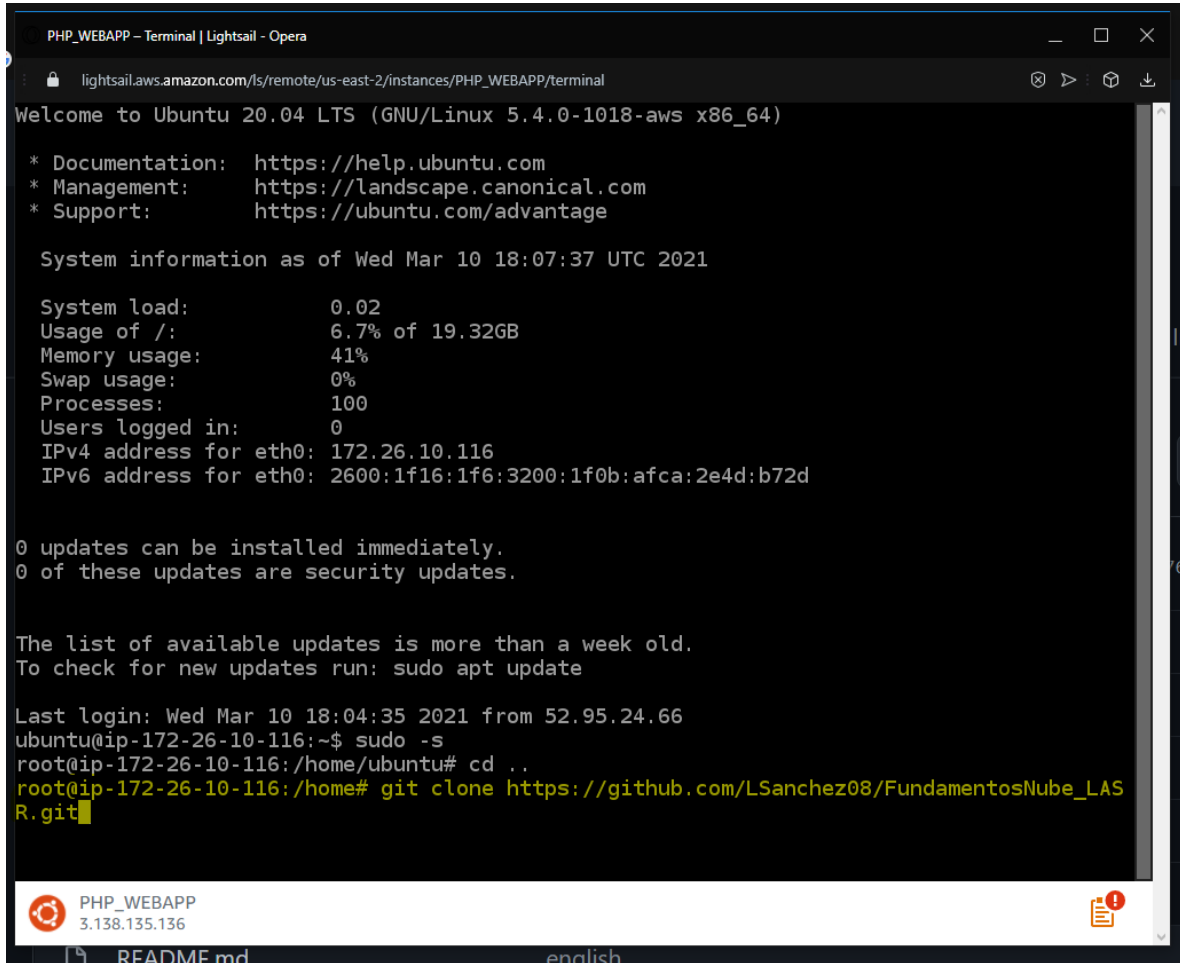
0 updates can be installed immediately.
0 of these updates are security updates.

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

Last login: Wed Mar 10 18:04:35 2021 from 52.95.24.66
ubuntu@ip-172-26-10-116:~$ sudo -s
root@ip-172-26-10-116:/home/ubuntu# cd ..
root@ip-172-26-10-116:/home#
```

At the bottom of the terminal window, there is a status bar showing the Ubuntu logo, the instance name "PHP\_WEBAPP", and the IP address "3.138.135.136".

## STEP 4 – CLONE THE GIT REPOSITORY IN THE /HOME FOLDER



The screenshot shows a terminal window titled "PHP\_WEBAPP - Terminal | Lightsail - Opera" with the address bar displaying "lightsail.aws.amazon.com/ls/remote/us-east-2/instances/PHP\_WEBAPP/terminal". The terminal output includes the Ubuntu 20.04 LTS welcome message, system information as of Wed Mar 10 18:07:37 UTC 2021, and a list of updates. The user has executed the command "git clone https://github.com/LSanchez08/FundamentosNube\_LAS R.git".

```
PHP_WEBAPP - Terminal | Lightsail - Opera
lightsail.aws.amazon.com/ls/remote/us-east-2/instances/PHP_WEBAPP/terminal

Welcome to Ubuntu 20.04 LTS (GNU/Linux 5.4.0-1018-aws x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

System information as of Wed Mar 10 18:07:37 UTC 2021

System load:          0.02
Usage of /:            6.7% of 19.32GB
Memory usage:         41%
Swap usage:           0%
Processes:            100
Users logged in:      0
IPv4 address for eth0: 172.26.10.116
IPv6 address for eth0: 2600:1f16:1f6:3200:1f0b:afca:2e4d:b72d

0 updates can be installed immediately.
0 of these updates are security updates.

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

Last login: Wed Mar 10 18:04:35 2021 from 52.95.24.66
ubuntu@ip-172-26-10-116:~$ sudo -s
root@ip-172-26-10-116:/home/ubuntu# cd ..
root@ip-172-26-10-116:/home# git clone https://github.com/LSanchez08/FundamentosNube_LAS
R.git
```

At the bottom of the terminal window, there is a status bar showing "PHP\_WEBAPP 3.138.135.136" and a red icon with an exclamation mark. Below the terminal window, there is a file explorer bar showing "README.md" and "english".

```
PHP_WEBAPP - Terminal | Lightsail - Opera
lightsail.aws.amazon.com/ls/remote/us-east-2/instances/PHP_WEBAPP/terminal

Memory usage:      41%
Swap usage:        0%
Processes:         100
Users logged in:   0
IPv4 address for eth0: 172.26.10.116
IPv6 address for eth0: 2600:1f16:1f6:3200:1f0b:afca:2e4d:b72d

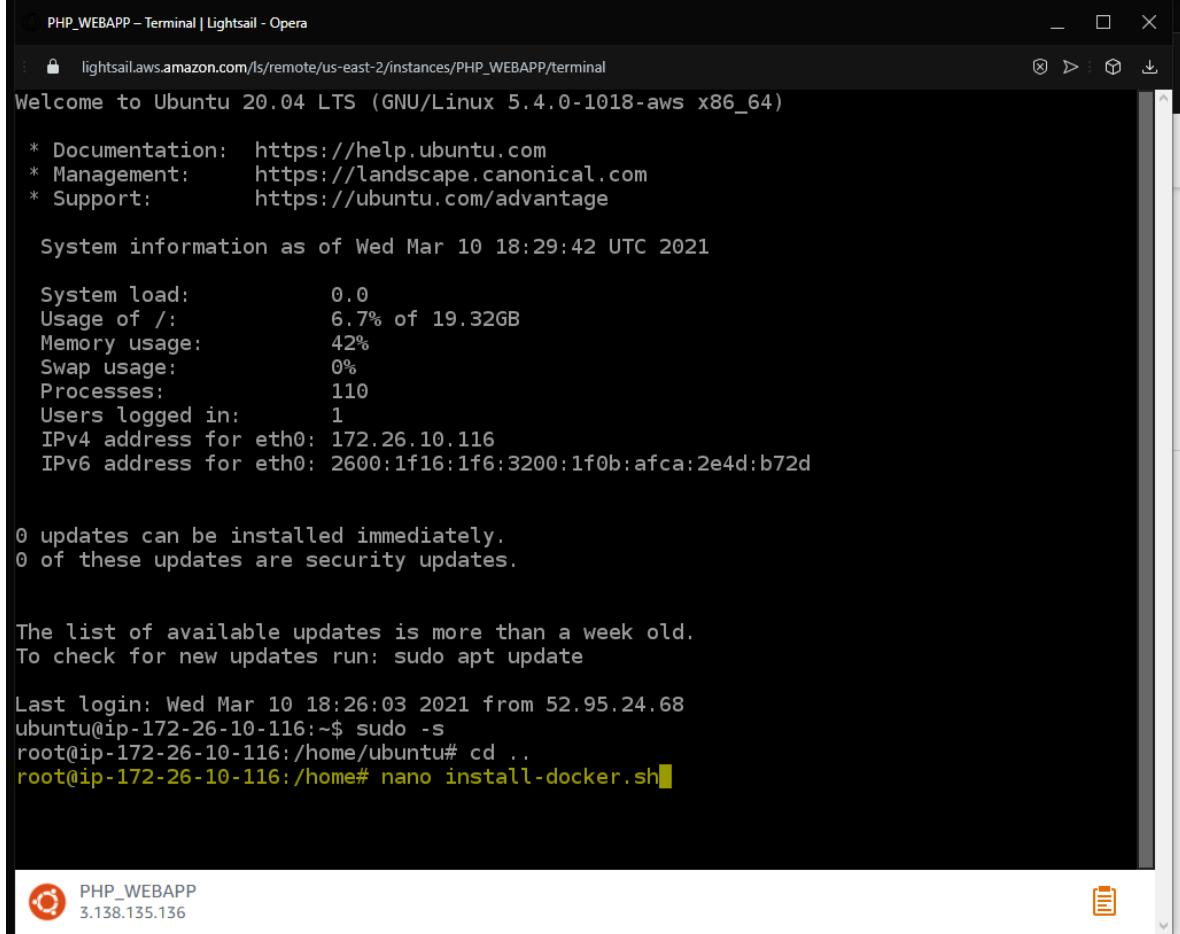
0 updates can be installed immediately.
0 of these updates are security updates.

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

Last login: Wed Mar 10 18:04:35 2021 from 52.95.24.66
ubuntu@ip-172-26-10-116:~$ sudo -s
root@ip-172-26-10-116:/home/ubuntu# cd ..
root@ip-172-26-10-116:/home# git clone https://github.com/LSanchez08/FundamentosNube_LASR.git
Cloning into 'FundamentosNube_LASR'...
Username for 'https://github.com': LSanchez08
Password for 'https://LSanchez08@github.com':
remote: Enumerating objects: 182, done.
remote: Counting objects: 100% (182/182), done.
remote: Compressing objects: 100% (89/89), done.
remote: Total 182 (delta 96), reused 160 (delta 77), pack-reused 0
Receiving objects: 100% (182/182), 1.99 MiB | 2.11 MiB/s, done.
Resolving deltas: 100% (96/96), done.
root@ip-172-26-10-116:/home# ls
FundamentosNube_LASR  ubuntu
root@ip-172-26-10-116:/home#
```

PHP\_WEBAPP  
3.138.135.136

## STEP 5 – CREATE THE FILE *install-docker.sh* IN THE INSTANCE



The screenshot shows a terminal window titled "PHP\_WEBAPP - Terminal | Lightsail - Opera". The terminal output displays the Ubuntu 20.04 LTS welcome message, system information as of Wed Mar 10 18:29:42 UTC 2021, and update status. The system information includes system load, disk usage, memory usage, swap usage, processes, users logged in, and network addresses. The update status shows 0 updates can be installed immediately, with 0 of these being security updates. The terminal also shows the last login time and the user switching to root via sudo. The final command executed is `nano install-docker.sh`.

```
lightsail.aws.amazon.com/ls/remote/us-east-2/instances/PHP_WEBAPP/terminal
Welcome to Ubuntu 20.04 LTS (GNU/Linux 5.4.0-1018-aws x86_64)

* Documentation:  https://help.ubuntu.com
* Management:    https://landscape.canonical.com
* Support:       https://ubuntu.com/advantage

System information as of Wed Mar 10 18:29:42 UTC 2021

System load:          0.0
Usage of /:            6.7% of 19.32GB
Memory usage:         42%
Swap usage:           0%
Processes:            110
Users logged in:      1
IPv4 address for eth0: 172.26.10.116
IPv6 address for eth0: 2600:1f16:1f6:3200:1f0b:afca:2e4d:b72d

0 updates can be installed immediately.
0 of these updates are security updates.

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

Last login: Wed Mar 10 18:26:03 2021 from 52.95.24.68
ubuntu@ip-172-26-10-116:~$ sudo -s
root@ip-172-26-10-116:/home/ubuntu# cd ..
root@ip-172-26-10-116:/home# nano install-docker.sh
```

PHP\_WEBAPP  
3.138.135.136

```
sudo apt-get update

sudo apt-get install \
    apt-transport-https \
    ca-certificates \
    curl \
    gnupg-agent \
    software-properties-common













curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo apt-key add -

sudo apt-key fingerprint 0EBFCD88

sudo add-apt-repository \
    "deb [arch=amd64] https://download.docker.com/linux/ubuntu \
    $(lsb_release -cs) \
    stable"

sudo apt-get update
sudo apt-get install docker-ce docker-ce-cli containerd.io

sudo curl -L
    "https://github.com/docker/compose/releases/download/1.25
    .5/docker-compose-$(uname -s)-$(uname -m)" -o /usr/local/bin/docker-compose
sudo chmod +x /usr/local/bin/docker-compose
sudo ln -s /usr/local/bin/docker-compose /usr/bin/docker-compose
```

 Get Help	 Write Out	 Where Is	 Cut Text	 Justify	 Cur Pos
 Exit	 Read File	 Replace	 Paste Text	 To Spell	 Go To Line



## STEP 6 – GIVE THE FILE EXECUTION PERMISSION

```
PHP_WEBAPP - Terminal | Lightsail - Opera
lightsail.aws.amazon.com/ls/remote/us-east-2/instances/PHP_WEBAPP/terminal

Welcome to Ubuntu 20.04 LTS (GNU/Linux 5.4.0-1018-aws x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

System information as of Wed Mar 10 18:29:42 UTC 2021

System load:          0.0
Usage of /:            6.7% of 19.32GB
Memory usage:         42%
Swap usage:           0%
Processes:            110
Users logged in:      1
IPv4 address for eth0: 172.26.10.116
IPv6 address for eth0: 2600:1f16:1f6:3200:1f0b:afca:2e4d:b72d

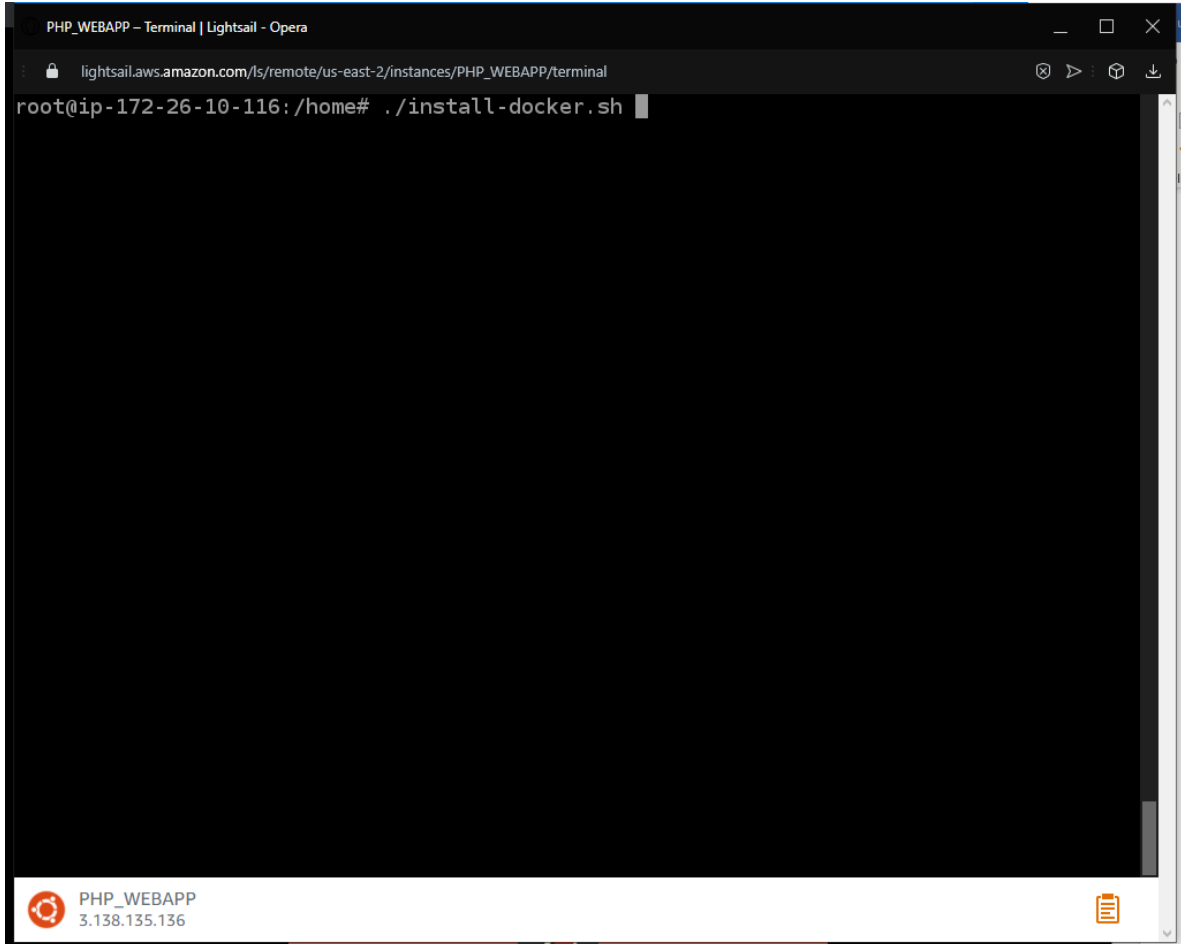
0 updates can be installed immediately.
0 of these updates are security updates.

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

Last login: Wed Mar 10 18:26:03 2021 from 52.95.24.68
ubuntu@ip-172-26-10-116:~$ sudo -s
root@ip-172-26-10-116:/home/ubuntu# cd ..
root@ip-172-26-10-116:/home# ls
FundamentosNube_LASR  install-docker.sh  ubuntu
root@ip-172-26-10-116:/home# chmod +755 install-docker.sh
```

```
ubuntu@ip-172-26-10-116:~$ sudo -s
root@ip-172-26-10-116:/home/ubuntu# cd ..
root@ip-172-26-10-116:/home# ls
FundamentosNube_LASR  install-docker.sh  ubuntu
root@ip-172-26-10-116:/home# chmod +755 install-docker.sh
root@ip-172-26-10-116:/home# ls
FundamentosNube_LASR  install-docker.sh  ubuntu
root@ip-172-26-10-116:/home#
```

## STEP 7- EXECUTE THE FILE

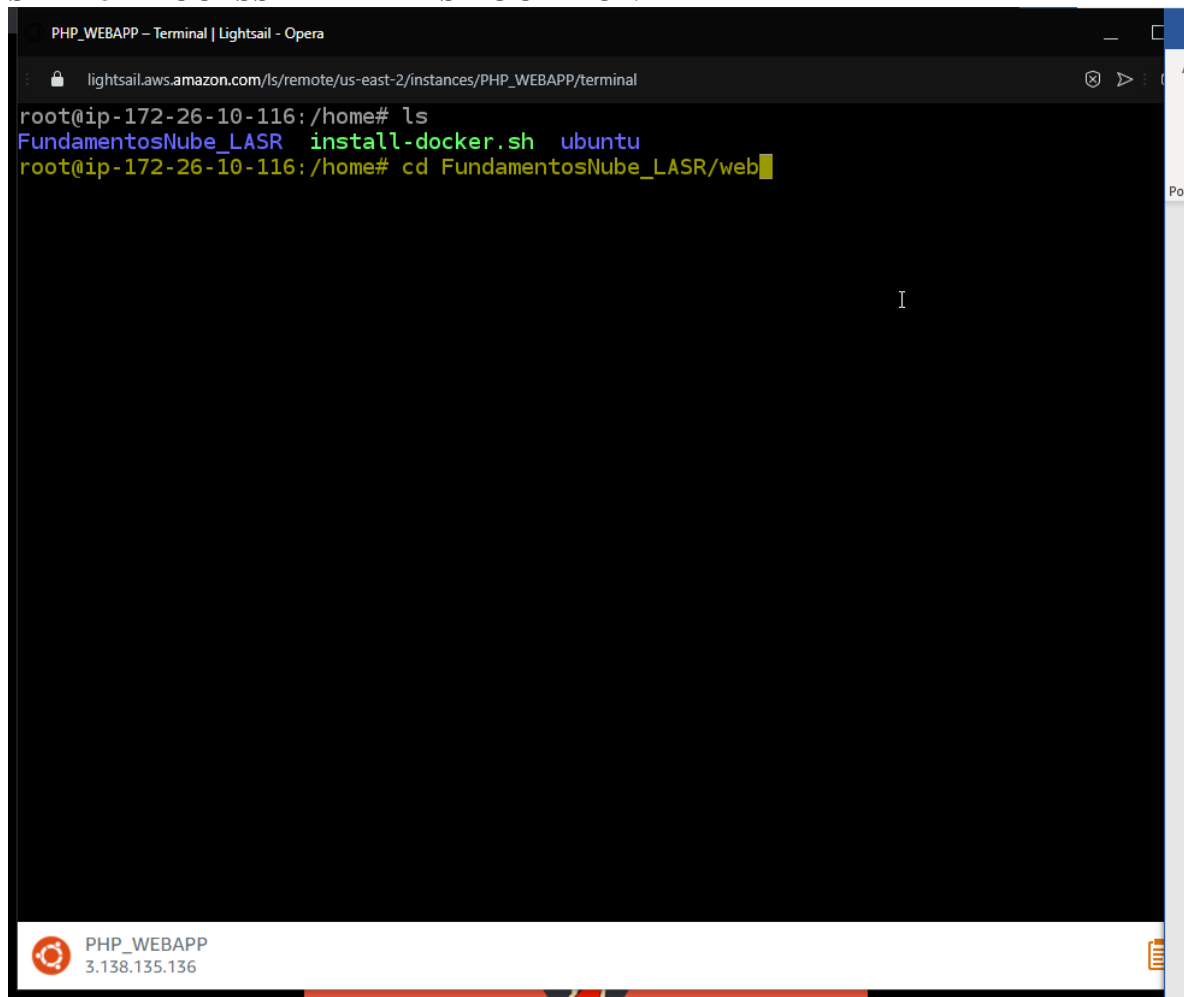


The screenshot shows a web browser window with a terminal interface. The browser's address bar displays the URL `lightsail.aws.amazon.com/ls/remote/us-east-2/instances/PHP_WEBAPP/terminal`. The terminal window has a title bar that reads "PHP\_WEBAPP - Terminal | Lightsail - Opera". Inside the terminal, the prompt is `root@ip-172-26-10-116: /home#` and the command `./install-docker.sh` has been entered. The terminal area is mostly black, indicating that the command's output is not visible. At the bottom of the browser window, a status bar shows the instance name "PHP\_WEBAPP" and its IP address "3.138.135.136" next to a Linux logo icon. On the right side of the status bar, there is a clipboard icon.

```
PHP_WEBAPP - Terminal | Lightsail - Opera
lightsail.aws.amazon.com/ls/remote/us-east-2/instances/PHP_WEBAPP/terminal
root@ip-172-26-10-116: /home# ./install-docker.sh
```

PHP\_WEBAPP  
3.138.135.136

## STEP 8 – ACCESS THE FILE’S LOCATION

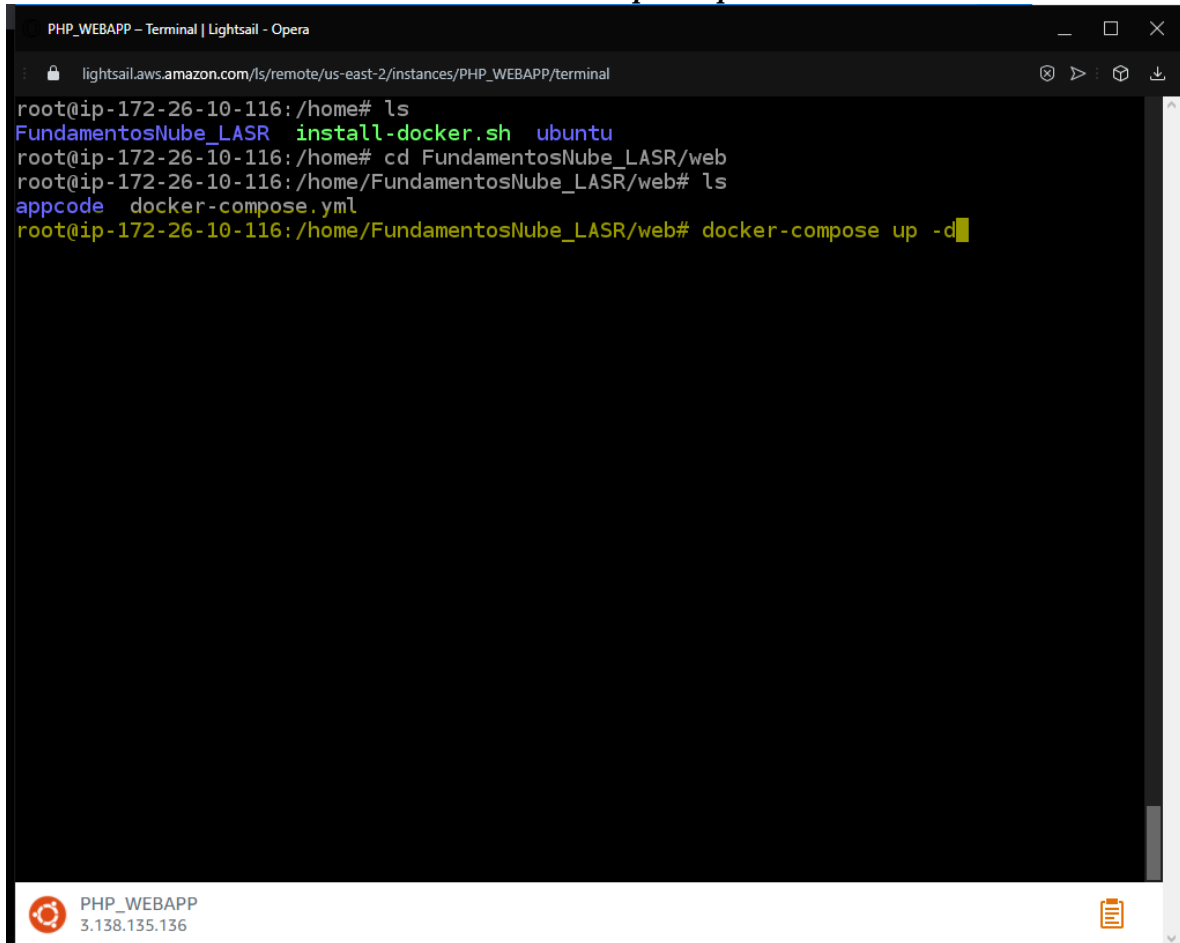


The screenshot shows a terminal window titled "PHP\_WEBAPP - Terminal | Lightsail - Opera". The address bar displays "lightsail.aws.amazon.com/ls/remote/us-east-2/instances/PHP\_WEBAPP/terminal". The terminal content shows the following commands and output:

```
root@ip-172-26-10-116:/home# ls
FundamentosNube_LASR  install-docker.sh  ubuntu
root@ip-172-26-10-116:/home# cd FundamentosNube_LASR/web
```

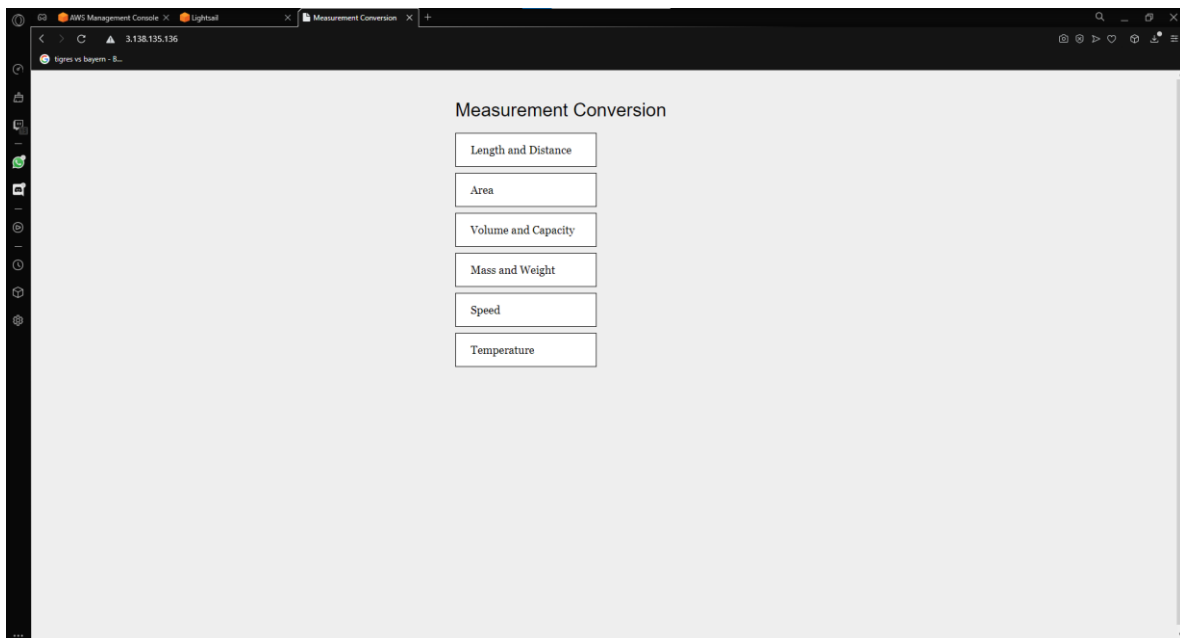
The terminal window has a dark background with a cursor at the end of the last command. The bottom status bar shows the Ubuntu logo, the instance name "PHP\_WEBAPP", and the IP address "3.138.135.136".

## STEP 9 – RUN THE COMMAND *docker-compose up -d*



A terminal window titled "PHP\_WEBAPP - Terminal | Lightsail - Opera" showing a series of commands and their outputs. The terminal is connected to an AWS Lightsail instance named "PHP\_WEBAPP" with IP address "3.138.135.136". The commands executed are: `ls`, `install-docker.sh ubuntu`, `cd FundamentosNube_LASR/web`, `ls`, and `docker-compose up -d`. The output of the last command is not visible in the screenshot.


```
root@ip-172-26-10-116: /home# ls
FundamentosNube_LASR install-docker.sh ubuntu
root@ip-172-26-10-116: /home# cd FundamentosNube_LASR/web
root@ip-172-26-10-116: /home/FundamentosNube_LASR/web# ls
appcode docker-compose.yml
root@ip-172-26-10-116: /home/FundamentosNube_LASR/web# docker-compose up -d
```





## STEP 10 – CREATE THE SNAPSHOT OF THE INSTANCE


[Instances](#) [Containers](#) [Databases](#) [Networking](#) [Storage](#) [Snapshots](#)

Sort by **Date** ▼

**PHP\_WEBAPP**  
512 MB RAM, 1 vCPU, 20 GB SSD



Running 3.138.135.136  
2600:1f16:1f6:3200:1f0b:afca:2e4...  
Ohio, Zone A

**PHP\_WEBAPP**  
512 MB RAM, 1 vCPU, 20 GB SSD  
Ubuntu  
Ohio, Zone A (us-east-2a)

Stop



Reboot

Status: **Running**

Public IP: **3.138.135.136**  
Private IP: 172.26.10.116  
Public IPv6: 2600:1f16:1f6:3200:1f0b:afca:2e4d:b72d  
[Learn more about IPv6](#)


[Connect](#) [Storage](#) [Metrics](#) [Networking](#) [Snapshots](#) [Tags](#) [History](#) [Delete](#)

Manual snapshots [?](#)  
You can create a snapshot to back up your instance, its system disk, and attached disks.  
[+ Create snapshot](#)

>  **March 10, 2021 - 1:24 PM** "PHP\_WEBAPP\_Copy" 

Showing 1 of 1 snapshots

Automatic snapshots [?](#)  
You can enable automatic snapshots to back up your resource every day. We will store your seven most recent snapshots.

☐ 

 Automatic snapshots are disabled

[Home](#)
[Docs](#)

[Account](#)
[Billing](#)

# PHP\_WEBAPP

512 MB RAM, 1 vCPU, 20 GB SSD  
Ubuntu  
Ohio, Zone A (us-east-2a)

Stop Reboot

Status: **Running**

Public IP: **3.138.135.136**  
Private IP: 172.26.10.116  
Public IPv6: 2600:1f16:1f6:3200:1f0b:afca:2e4d:b72d  
[Learn more about IPv6](#)

[Connect](#)
[Storage](#)
[Metrics](#)
[Networking](#)
[Snapshots](#)
[Tags](#)
[History](#)
[Delete](#)

## Manual snapshots

You can create a snapshot to back up your instance, its system disk, and attached disks.

[+ Create snapshot](#)

Snapshotting...	"PHP_WEBAPP_Copy"
Showing 1 of 1 snapshots	

## Automatic snapshots

You can enable automatic snapshots to back up your resource every day. We will store your seven most recent snapshots.

☒ Automatic snapshots are disabled

## STEP 11 – CREATE THE SECOND INSTANCE

# PHP\_WEBAPP

512 MB RAM, 1 vCPU, 20 GB SSD  
Ubuntu  
Ohio, Zone A (us-east-2a)

Stop Reboot

Status: **Running**

Public IP: **3.138.135.136**  
Private IP: 172.26.10.116  
Public IPv6: 2600:1f16:1f6:3200:1f0b:afca:2e4d:b72d  
[Learn more about IPv6](#)

[Connect](#)
[Storage](#)
[Metrics](#)
[Networking](#)
[Snapshots](#)
[Tags](#)
[History](#)
[Delete](#)

## Manual snapshots

You can create a snapshot to back up your instance, its system disk, and attached disks.

[+ Create snapshot](#)

Snapshotting...	"PHP_WEBAPP_Copy"
Showing 1 of 1 snapshots	

## Automatic snapshots

You can enable automatic snapshots to back up your resource every day. We will store your seven most recent snapshots.

☒ Automatic snapshots are disabled

[Create new instance](#)  
[Copy to another Region](#)  
[Export to Amazon EC2](#)  
[Delete snapshot](#)

## STEP 12 – CREATE THE LOAD BALANCER

Good afternoon!

Filter by name, location, tag, or type


[Instances](#)
[Containers](#)
[Databases](#)
[Networking](#)
[Storage](#)
[Snapshots](#)

Connect your project!

Networking resources allow you to specify how users and outside services connect to your Lightsail resources. They can be used to specify routing of internet traffic, speed up the delivery of your content, improve redundancy, and increase the capacity of your resources.




Capacity of your resources.




**Static IP**  
A static IP is a fixed, public IP address that you can attach to an instance.  
[Learn more about static IPs](#)

Create static IP




**Distribution**  
A content delivery network (CDN) distribution speeds up the delivery of your content to your users around the world.  
[Learn more about distributions](#)

Create distribution



**Load balancer**  
A load balancer adds redundancy and increases capacity by distributing traffic to multiple instances.  
[Learn more about load balancers](#)

Create load balancer



**DNS zone**  
A domain name system (DNS) zone defines subdomains for your domain, and routes traffic to your resources.  
[Learn more about DNS zones](#)

Create DNS zone

## Identify your load balancer

Your Lightsail load balancers must all have unique names.

### TAGGING OPTIONS

Use tags to filter and organize your resources in the Lightsail console. Key-value tags can also be used to organize your billing, and to control access to your resources.

[Learn more about tagging](#)

Key-only tags ?

+ Add key-only tags

Key-value tags ?

+ Add key-value tag


This load balancer will cost 18 USD per month.

Create load balancer

Your use of AWS services is subject to the [AWS Customer Agreement](#)

## Target instances

Traffic will be evenly distributed to the following instances:

 Attach another  
All available instances in **Ohio** attached



### PHP\_WEBAPP

512 MB RAM, 1 vCPU, 20 GB SSD  
Ubuntu



### PHP\_WEBAPP\_copy

512 MB RAM, 1 vCPU, 20 GB SSD  
Ubuntu

 Attaching...

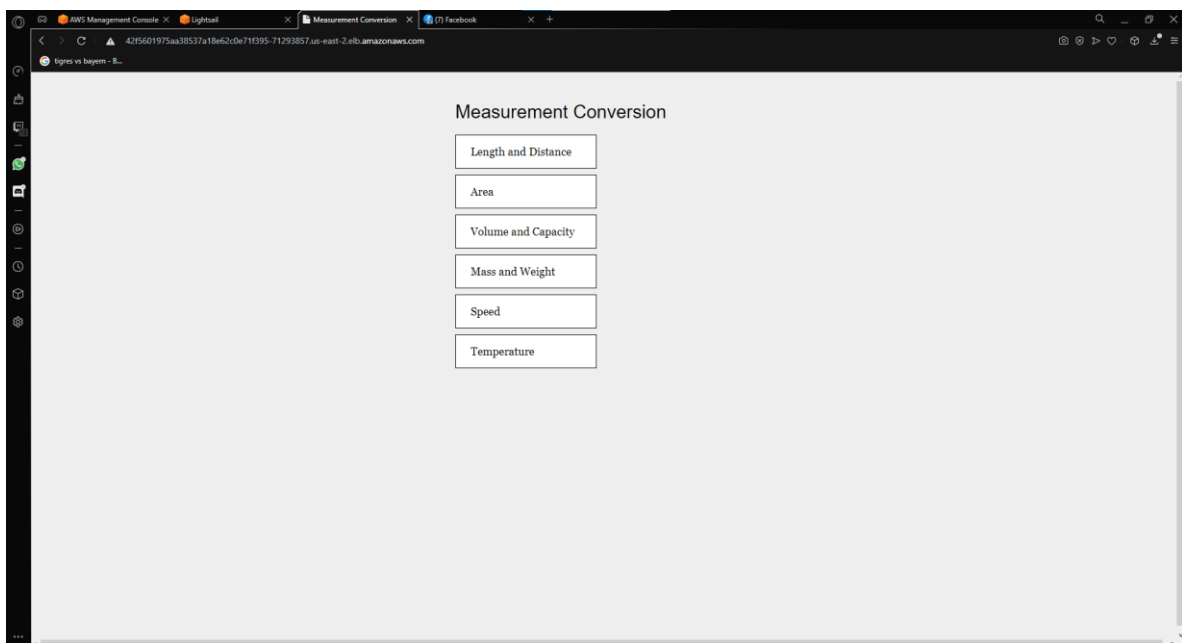


Your instances will receive traffic from this load balancer on port 80

[Learn more about load balancing](#)

[Learn more about load balancing](#)

## STEP 12 - VERIFY



Open both of the instances console, log in as root and run the command *top*



Measurement Conversion

Length and Distance

Area

Volume and Capacity

Mass and Weight

PHP\_WEBAPP - Terminal | Lightail - Opera

lightail.aws.amazon.com/fu/remote/us-east-2/instances/PHP\_WEBAPP/terminal

top - 19:48:02 up 1:45, 3 users, load average: 0.04, 0.01, 0.00  
Tasks: 126 total, 1 running, 124 sleeping, 1 stopped, 0 zombie  
%Cpu(s): 0.0 us, 0.3 sy, 0.0 ni, 99.7 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st  
Mem : 475.4 total, 27.8 free, 283.6 used, 164.0 buff/cache  
Mem Swap: 0.0 total, 0.0 free, 0.0 used, 165.2 avail Mem

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
27851	root	20	0	11004	3772	3252	R	0.3	0.8	0:00.03	top
1	root	20	0	168480	8840	4536	S	0.0	1.8	0:04.68	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kthreadd
3	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	rcu_gp
4	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	rcu_par_gp
6	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/0:0H-kb+
9	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	mm_percpu_wq
10	root	20	0	0	0	0	S	0.0	0.0	0:00.34	kssoftirqd/0
11	root	20	0	0	0	0	I	0.0	0.0	0:01.08	rcu_sched
12	root	rt	0	0	0	0	S	0.0	0.0	0:00.02	migration/0
13	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/0
14	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kdevtmpfs
15	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	netns
16	root	20	0	0	0	0	S	0.0	0.0	0:00.00	rcu_tasks_kthre
17	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kauditd
18	root	20	0	0	0	0	S	0.0	0.0	0:00.00	xenbus
19	root	20	0	0	0	0	S	0.0	0.0	0:00.02	xenwatch
20	root	20	0	0	0	0	S	0.0	0.0	0:00.00	khungtaskd
21	root	20	0	0	0	0	S	0.0	0.0	0:00.00	oom_reaper

PHP\_WEBAPP\_COPY - Terminal | Lightail - Opera

lightail.aws.amazon.com/fu/remote/us-east-2/instances/PHP\_WEBAPP\_COPY/terminal

top - 19:48:02 up 8 min, 1 user, load average: 0.04, 0.19, 0.16  
Tasks: 107 total, 1 running, 106 sleeping, 0 stopped, 0 zombie  
%Cpu(s): 0.0 us, 0.3 sy, 0.0 ni, 99.7 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st  
Mem : 475.4 total, 34.3 free, 242.8 used, 198.2 buff/cache  
Mem Swap: 0.0 total, 0.0 free, 0.0 used, 208.0 avail Mem

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
1	root	20	0	167312	9676	6720	S	0.0	2.0	0:03.88	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kthreadd
3	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	rcu_gp
4	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	rcu_par_gp
5	root	20	0	0	0	0	I	0.0	0.0	0:00.03	kworker/0:0H-
6	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/0:0H-
8	root	20	0	0	0	0	I	0.0	0.0	0:00.01	kworker/0:0H-
9	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	mm_percpu_wq
10	root	20	0	0	0	0	S	0.0	0.0	0:00.06	kssoftirqd/0
11	root	20	0	0	0	0	I	0.0	0.0	0:00.32	rcu_sched
12	root	rt	0	0	0	0	S	0.0	0.0	0:00.00	migration/0
13	root	20	0	0	0	0	S	0.0	0.0	0:00.00	cpuhp/0
14	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kdevtmpfs
15	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	netns
16	root	20	0	0	0	0	S	0.0	0.0	0:00.00	rcu_tasks_kt
17	root	20	0	0	0	0	S	0.0	0.0	0:00.00	kauditd
18	root	20	0	0	0	0	S	0.0	0.0	0:00.00	xenbus
19	root	20	0	0	0	0	S	0.0	0.0	0:00.01	xenwatch
20	root	20	0	0	0	0	S	0.0	0.0	0:00.00	khungtaskd