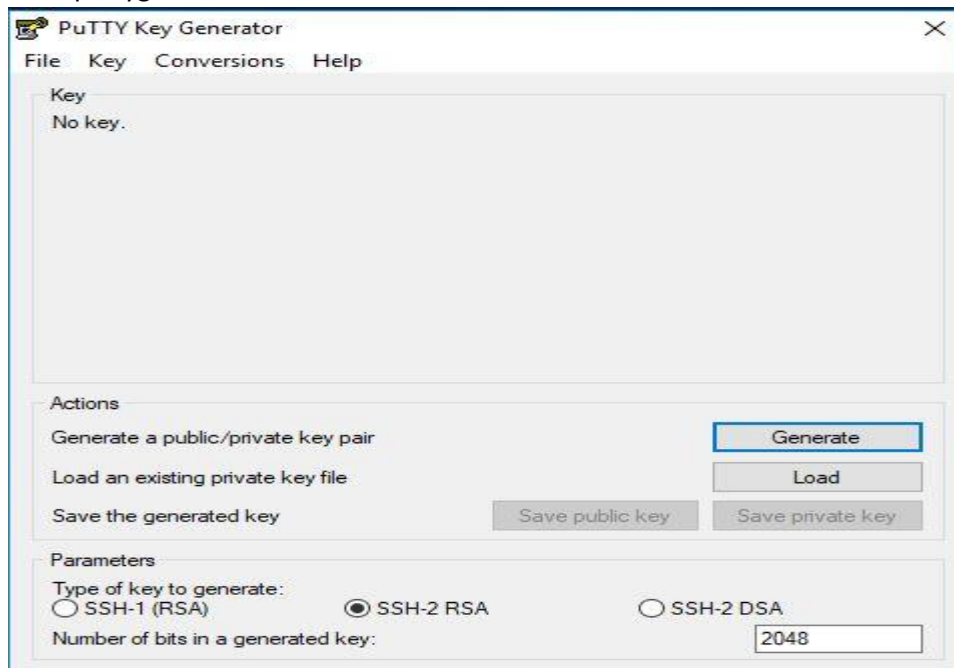


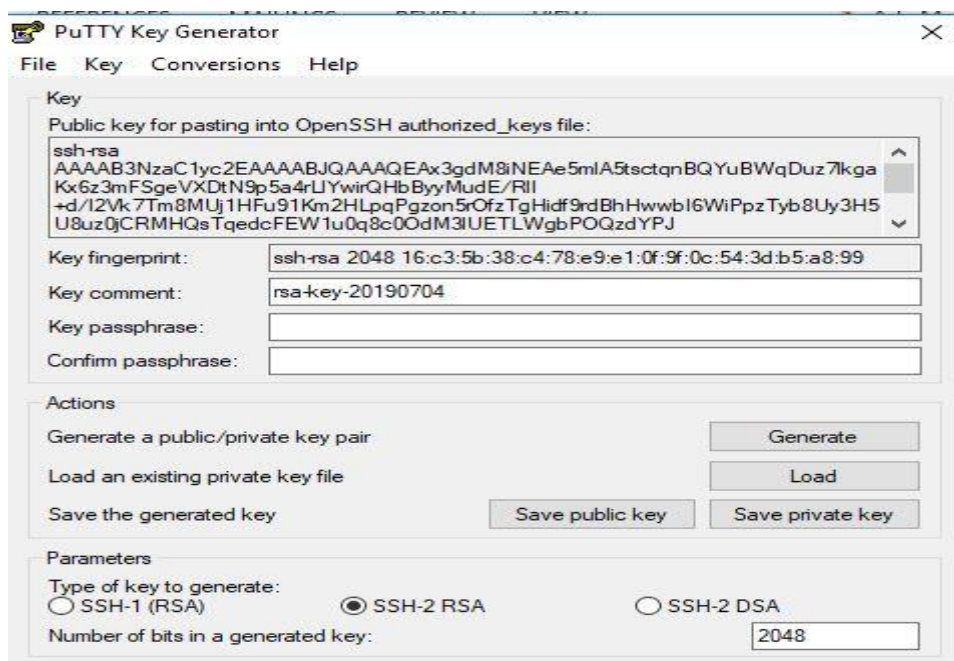
# PELATIHAN – GURU SMK

Membuat Key untuk tujuan remote SSH menggunakan PuttyGent sbb:

## 1. Buka puttygent



## 2. Klik: Generate, lalu tunggu beberapa saat sedang proses pembuatan key



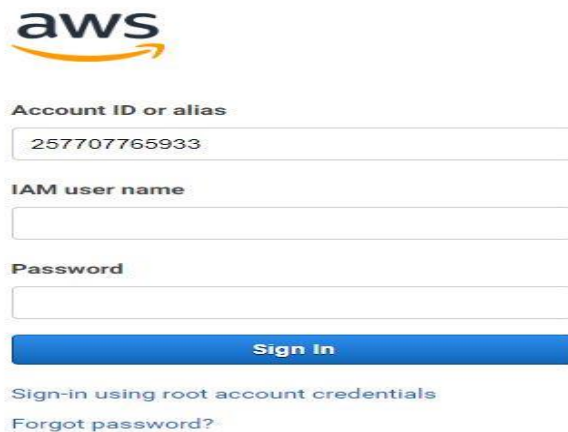
3. Klik: Save public key, lalu simpan file ke directory yang di inginkan dan berikan nama, misal: user-public-key => lalu Save
4. Klik: Save private key, lalu simpan file ke directory yang di inginkan dan berikan nama, missal: user-private-key => akan muncul pertanyaan sbb:



Klik: Yes, lalu arahkan ke directory yang di inginkan dan berikan nama, misal: user-private-key

Login ke dashboard AWS

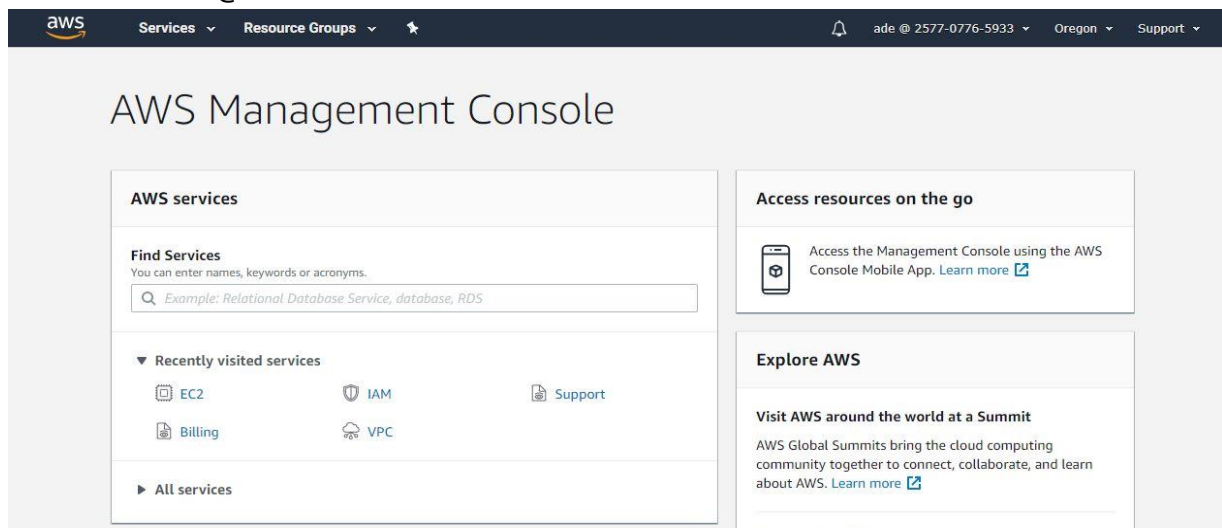
1. URL: <https://257707765933.signin.aws.amazon.com/console>

The AWS Sign In page. It features the AWS logo at the top. Below it are three input fields: "Account ID or alias" (containing "257707765933"), "IAM user name", and "Password". A blue "Sign In" button is below the password field. At the bottom, there are links for "Sign-in using root account credentials" and "Forgot password?".

1. Masukkan IAM username dan Password, dan akan tampil Dashboard AWS  
Note: Pastikan Region menggunakan: N. Virginia

IAM user name : userlatihan

Password : @dm1nLatih01



Total: 25 user

- Menggunakan 5 Region: tiap region 5 user

- Total 15 EC2 per Region

1. N. Virginia => subnet-543fd319 | subnet3-default | Default in use-east-1a

2. Ohio => subnet-d8f2fbb0 | Default in us-east-2a

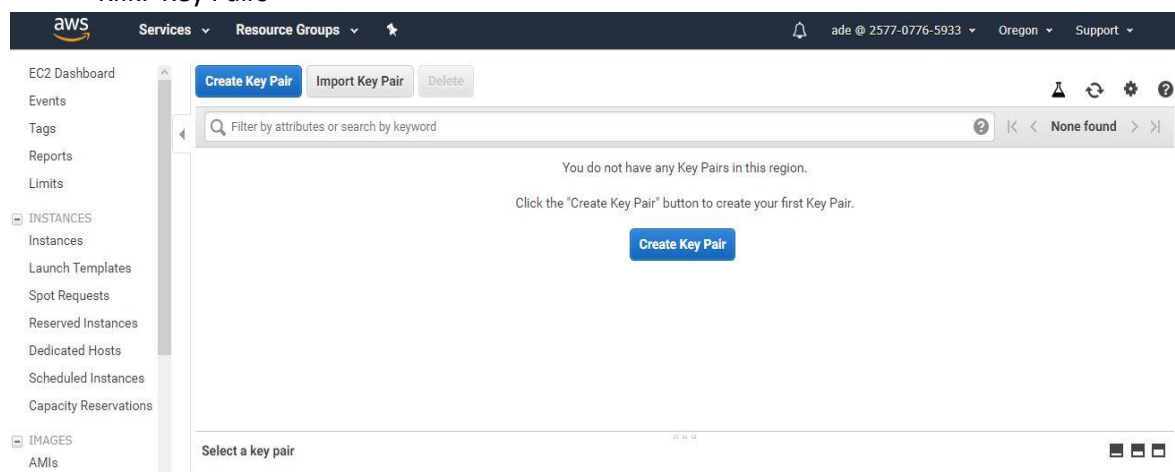
3. N. California => subnet-2b3c3070 | Default in us-west-1b

4. Oregon => subnet-2 | Default in us-west-2a

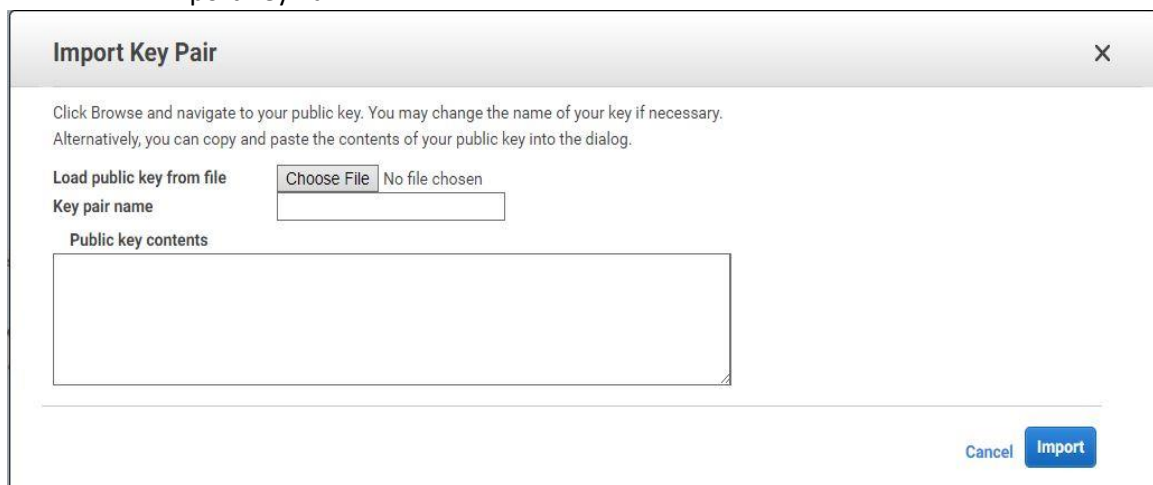
5. Singapore => subnet-4aa6442c | Default in ap-southeast-1a

## 1.1. Import Key

- Klik: Key Pairs



- Klik: Import Key Pair



- Klik: Choose File, dan arahkan ke Public Key yang telah dibuat

**Import Key Pair**
✕

Click **Browse** and navigate to your public key. You may change the name of your key if necessary. Alternatively, you can copy and paste the contents of your public key into the dialog.

**Load public key from file**

**Key pair name**

**Public key contents**

Choose File user-public-key

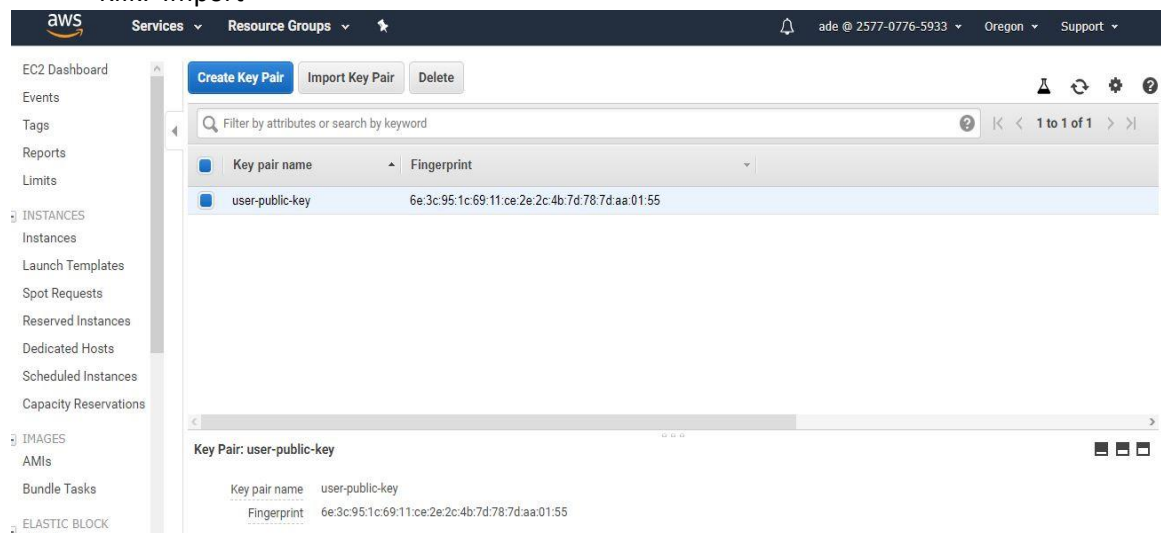
user-public-key

```

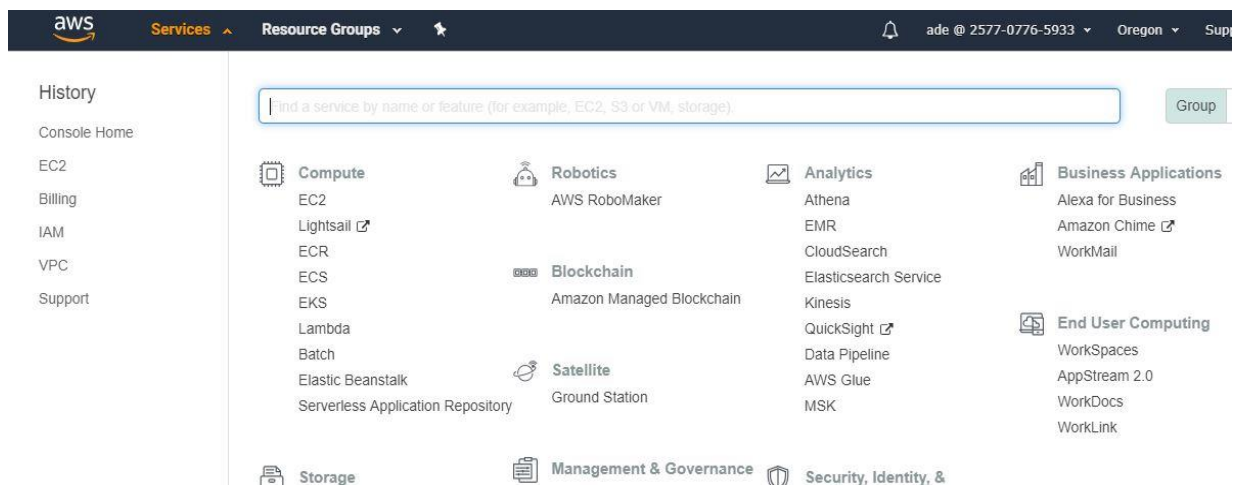
--- BEGIN SSH2 PUBLIC KEY ---
Comment: "rsa-key-20190704"
AAAAB3NzaC1yc2EAAAABJQAAAQEA6IZW2/Ben04WTCG+OFaZWsmHqLsxMLXNboL
xF8kKgi4AoiFj0i4GT+uQxLI/vS/rBCpBb/Bsv6fRjQrj+QLV/H6qo7/UX0iWBw
rwqTRp4I7ptYnAu0WzfKUVI3bjDTzWrKxNbHw7vzivpU/hAkGrcDr8dYq2yUYHUr
7AcZM9xfY3wBPPvyiBfJ849uZXuDvzx6T+0YsX8g7McLr34x1i1J/OVJUhl8LY/o
          
```

Cancel
Import

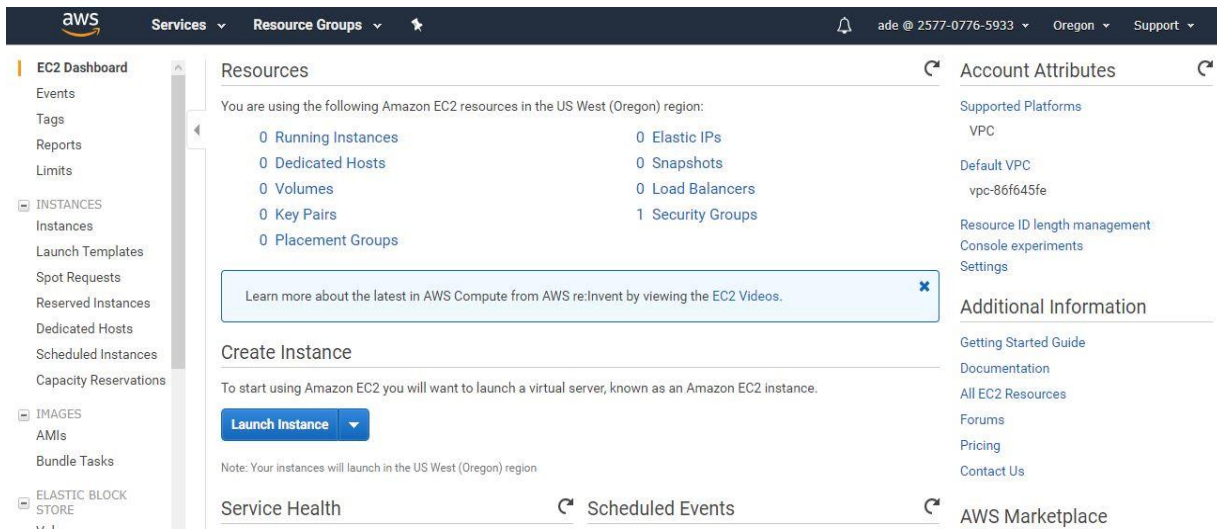
- Klik: Import



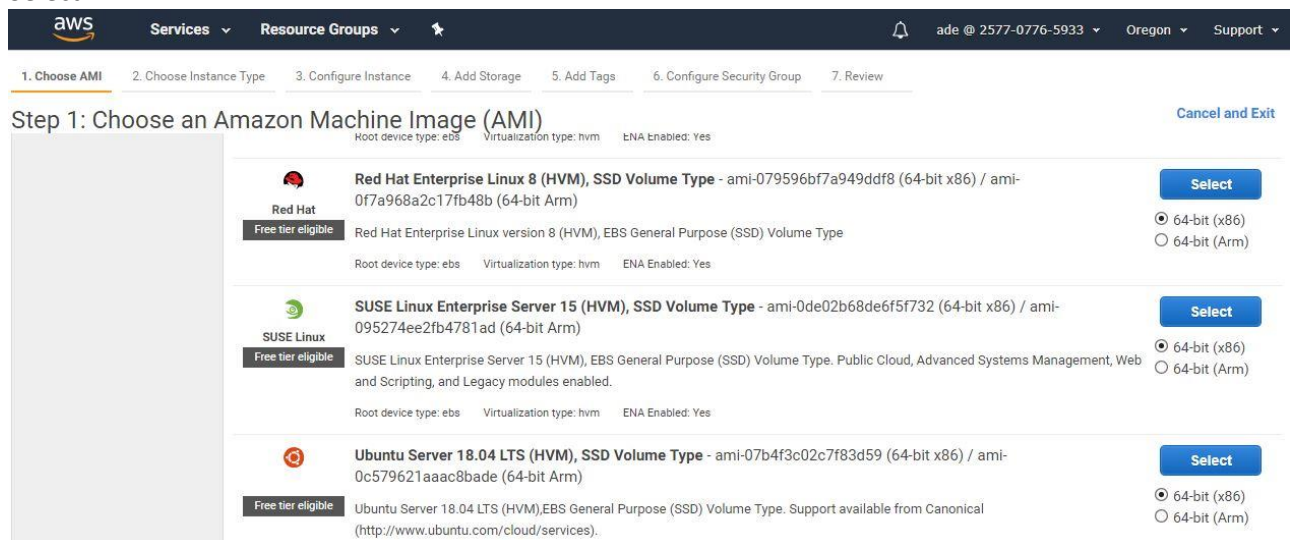
2. Kik tombol : Services di sebelah kiri atas dashboard



### 3. Klik: EC2 yang ada di bagian: Compute



### 4. Klik: Launch Instance, dan scrool ke bawah ke images OS: Ubuntu Server 18.04 (Free tier eligible), lalu klik: Select



### 5. Klik: Next: Configure Instance Details



**aws** Services Resource Groups

ade @ 2577-0776-5933 Oregon Support

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

### Step 2: Choose an Instance Type

Amazon EC2 provides a wide selection of instance types optimized to fit different use cases. Instances are virtual servers that can run applications. They have varying combinations of CPU, memory, storage, and networking capacity, and give you the flexibility to choose the appropriate mix of resources for your applications. [Learn more](#) about instance types and how they can meet your computing needs.

Filter by: All instance types Current generation Show/Hide Columns

Currently selected: t2.micro (Variable ECUs, 1 vCPUs, 2.5 GHz, Intel Xeon Family, 1 GiB memory, EBS only)

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance	IPv6 Support
<input type="checkbox"/>	General purpose	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
<input checked="" type="checkbox"/>	General purpose	t2.micro <small>Free tier eligible</small>	1	1	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.small	1	2	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.medium	2	4	EBS only	-	Low to Moderate	Yes

Cancel Previous **Review and Launch** Next: Configure Instance Details

## 6. Configure Instance sbb:

- Network => pilih: vpc-default
- Subnet => pilih: <Region yang telah dibagikan>

**aws** Services Resource Groups

ade @ 2577-0776-5933 Oregon Support

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

### Step 3: Configure Instance Details

Configure the instance to suit your requirements. You can launch multiple instances from the same AMI, request Spot instances to take advantage of the lower pricing, assign an access management role to the instance, and more.

Number of instances: 1 Launch into Auto Scaling Group

Purchasing option: ☐ Request Spot instances

Network: vpc-86f645fe | vpc-default (default) Create new VPC

Subnet: No preference (default subnet in any Availability Zone) Create new subnet

Auto-assign Public IP: Use subnet setting (Enable)

Placement group: ☐ Add instance to placement group

Capacity Reservation: Open Create new Capacity Reservation

IAM role: None Create new IAM role

Cancel Previous **Review and Launch** Next: Add Storage

## 7. Lalu klik => Next: Add Storage

**aws** Services Resource Groups

ade @ 2577-0776-5933 Oregon Support

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

### Step 4: Add Storage

Your instance will be launched with the following storage device settings. You can attach additional EBS volumes and instance store volumes to your instance, or edit the settings of the root volume. You can also attach additional EBS volumes after launching an instance, but not instance store volumes. [Learn more](#) about storage options in Amazon EC2.

Volume Type	Device	Snapshot	Size (GiB)	Volume Type	IOPS	Throughput (MB/s)	Delete on Termination	Encryption
Root	/dev/sda1	snap-0ee48372d32e83789	8	General Purpose SSD (gp2)	100 / 3000	N/A	<input checked="" type="checkbox"/>	Not Encrypt

Add New Volume

Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage. [Learn more](#) about free usage tier eligibility and usage restrictions.

Cancel Previous **Review and Launch** Next: Add Tags

## 8. Klik: Next: Add Tags, lalu klik: Add Tag

- Pada kolom: Key, ketik: Name
- Value, ketik missal: lb-namaUser

## - Klik: Next: Configure Security Group

**aws** Services Resource Groups

ade @ 2577-0776-5933 Oregon Support

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

### Step 5: Add Tags

A tag consists of a case-sensitive key-value pair. For example, you could define a tag with key = Name and value = Webserver.  
A copy of a tag can be applied to volumes, instances or both.  
Tags will be applied to all instances and volumes. [Learn more](#) about tagging your Amazon EC2 resources.

Key (128 characters maximum)	Value (256 characters maximum)	Instances	Volumes
Name	ade-ec2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

[Add another tag](#) (Up to 50 tags maximum)

[Cancel](#) [Previous](#) [Review and Launch](#) [Next: Configure Security Group](#)

## 9. Pada bagian: Assign a security group, pilih: Select an existing security group

### - Lalu pilih: sgPelatihan

**aws** Services Resource Groups

ade @ 2577-0776-5933 Oregon Support

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

### Step 6: Configure Security Group

A security group is a set of firewall rules that control the traffic for your instance. On this page, you can add rules to allow specific traffic to reach your instance. For example, if you want to set up a web server and allow Internet traffic to reach your instance, add rules that allow unrestricted access to the HTTP and HTTPS ports. You can create a new security group or select from an existing one below. [Learn more](#) about Amazon EC2 security groups.

Assign a security group: ☐ Create a new security group ☒ Select an existing security group

Security Group ID	Name	Description	Actions
sg-6076762c	default	default VPC security group	<a href="#">Copy to new</a>
<input checked="" type="checkbox"/> sg-0e9b5b4fb4907ffda	sgPelatihan	sgPelatihan	<a href="#">Copy to new</a>

Inbound rules for sg-0e9b5b4fb4907ffda (Selected security groups: sg-0e9b5b4fb4907ffda)

Type	Protocol	Port Range	Source	Description
HTTP	TCP	80	0.0.0.0/0	
Custom ICMP Rule - IPv4	Echo Reply	N/A	0.0.0.0/0	

[Cancel](#) [Previous](#) [Review and Launch](#)

## 10. Klik: Review and Launch

**aws** Services Resource Groups

ade @ 2577-0776-5933 Oregon Support

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

### Step 7: Review Instance Launch

Please review your instance launch details. You can go back to edit changes for each section. Click **Launch** to assign a key pair to your instance and complete the launch process.

**⚠ Improve your instances' security. Your security group, sgPelatihan, is open to the world.**  
Your instances may be accessible from any IP address. We recommend that you update your security group rules to allow access from known IP addresses only.  
You can also open additional ports in your security group to facilitate access to the application or service you're running, e.g., HTTP (80) for web servers. [Edit security groups](#)

AMI Details [Edit AMI](#)

Ubuntu Server 18.04 LTS (HVM), SSD Volume Type - ami-07b4f3c02c7f83d59  
Free tier eligible  
Root Device Type: ebs Virtualization type: hvm

Instance Type [Edit instance type](#)

Instance Type	ECUs	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance
t2.micro	Variable	1	1	EBS only	-	Low to Moderate

[Cancel](#) [Previous](#) [Launch](#)

## 11. Klik: Launch

## Select an existing key pair or create a new key pair



A key pair consists of a **public key** that AWS stores, and a **private key file** that you store. Together, they allow you to connect to your instance securely. For Windows AMIs, the private key file is required to obtain the password used to log into your instance. For Linux AMIs, the private key file allows you to securely SSH into your instance.

Note: The selected key pair will be added to the set of keys authorized for this instance. Learn more about [removing existing key pairs from a public AMI](#).

Choose an existing key pair

Select a key pair

user-public-key

☐ I acknowledge that I have access to the selected private key file (user-public-key.pem), and that without this file, I won't be able to log into my instance.

Cancel

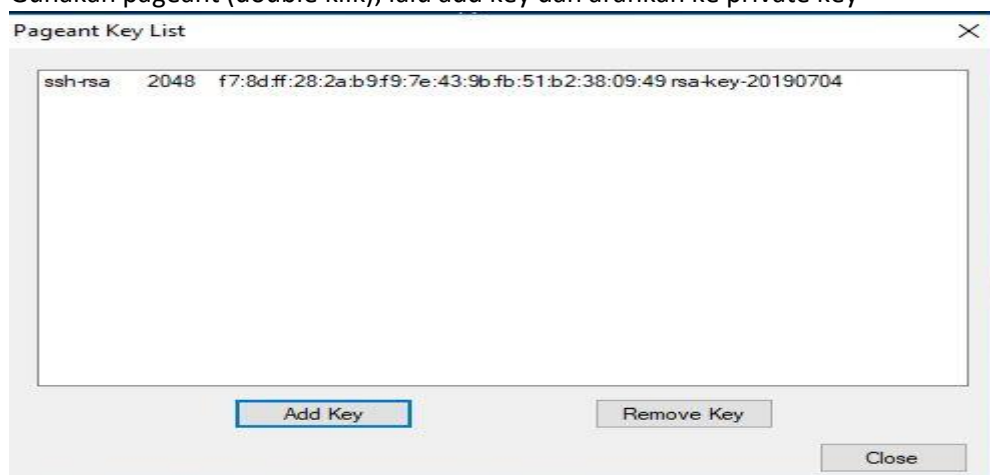
Launch Instances

### 12. Arahkan Public Key, dan

- Klik: I acknowledge that I have access to the selected private key file (user-public-key.pem), and that without this file, I won't be able to log into my instance.
- Klik: Launch Instances

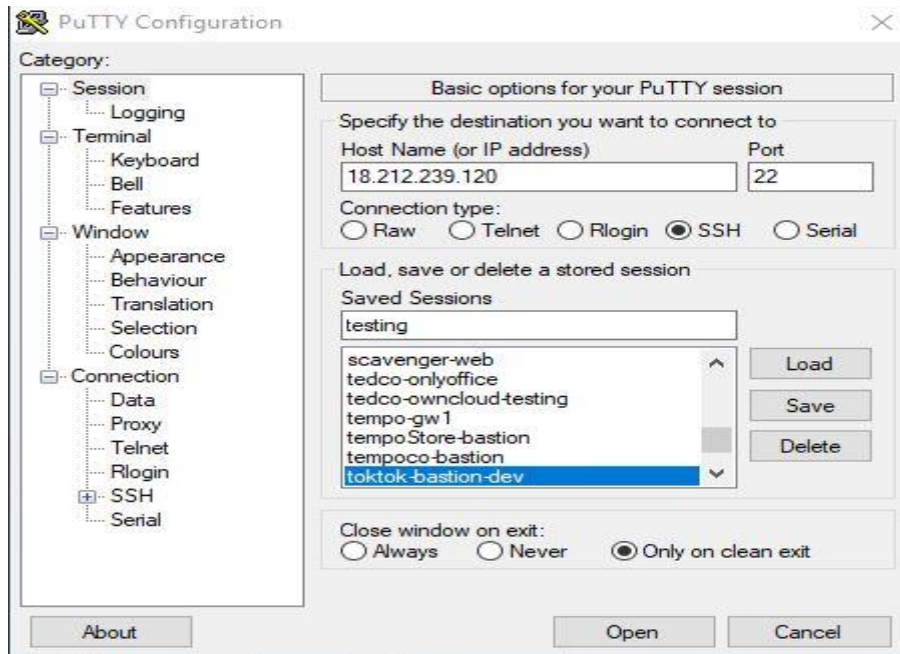
### Install LAMP (Linux Apache MySQL PHP)

1. ssh ke instance menggunakan key yang telah dibuat (private key)
2. Gunakan pageant (double klik), lalu add key dan arahkan ke private key



3. Buka putty dan ketik ip dari instance pada kolom Host Name
4. Ketik nama instance pada kolom: Saved Sessions, lalu: Save dan Open





##### 5. Gunakan login as: Ubuntu

```
ubuntu@ip-172-31-25-187: ~
System load: 0.0          Processes:           92
Usage of /:  16.7% of 7.69GB Users logged in:       1
Memory usage: 15%        IP address for eth0: 172.31.25.187
Swap usage:  0%

* MicroK8s 1.15 is out! It has already been installed on more
  than 14 different distros. Guess which ones?

  https://snapcraft.io/microk8s

* Canonical Livepatch is available for installation.
  - Reduce system reboots and improve kernel security. Activate at:
    https://ubuntu.com/livepatch

14 packages can be updated.
3 updates are security updates.

Last login: Fri Jul  5 15:13:56 2019 from 140.213.8.18
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-172-31-25-187:~$
```

##### 6. Install Apache

```
$ sudo apt-get install apache2 -y
```

##### 7. Test buka dengan ip melalui browser



## 8. Install MySQL

```
$ sudo apt-get install mysql-server -y
```

## 9. Secure for MySQL server

```
$ sudo mysql_secure_installation
```

Ketik: Y

```
ubuntu@ip-172-31-25-187: ~
Setting up libhttp-message-perl (6.14-1) ...
Setting up mysql-client-5.7 (5.7.26-0ubuntu0.18.04.1) ...
Setting up mysql-server-5.7 (5.7.26-0ubuntu0.18.04.1) ...
update-alternatives: using /etc/mysql/mysql.cnf to provide /etc/mysql/my.cnf (my.cnf) in auto mode
Renaming removed key buffer and myisam-recover options (if present)
Created symlink /etc/systemd/system/multi-user.target.wants/mysql.service → /lib/systemd/system/mysql.service.
Setting up mysql-server (5.7.26-0ubuntu0.18.04.1) ...
Processing triggers for libc-bin (2.27-3ubuntu1) ...
Processing triggers for ureadahead (0.100.0-21) ...
Processing triggers for systemd (237-3ubuntu10.23) ...
ubuntu@ip-172-31-25-187:~$ sudo mysql_secure_installation

Securing the MySQL server deployment.

Connecting to MySQL using a blank password.

VALIDATE PASSWORD PLUGIN can be used to test passwords
and improve security. It checks the strength of password
and allows the users to set only those passwords which are
secure enough. Would you like to setup VALIDATE PASSWORD plugin?

Press y|Y for Yes, any other key for No: y
```

Ketik: 2

```
ubuntu@ip-172-31-25-187: ~
Processing triggers for libc-bin (2.27-3ubuntu1) ...
Processing triggers for ureadahead (0.100.0-21) ...
Processing triggers for systemd (237-3ubuntu10.23) ...
ubuntu@ip-172-31-25-187:~$ sudo mysql_secure_installation

Securing the MySQL server deployment.

Connecting to MySQL using a blank password.

VALIDATE PASSWORD PLUGIN can be used to test passwords
and improve security. It checks the strength of password
and allows the users to set only those passwords which are
secure enough. Would you like to setup VALIDATE PASSWORD plugin?

Press y|Y for Yes, any other key for No: y

There are three levels of password validation policy:

LOW      Length >= 8
MEDIUM  Length >= 8, numeric, mixed case, and special characters
STRONG Length >= 8, numeric, mixed case, special characters and dictionary
        file

Please enter 0 = LOW, 1 = MEDIUM and 2 = STRONG: 2
```

Masukkan password dan jawab: Y (to continue with the password provided

Jawab: Y (Reload privilege table)

```
ubuntu@ip-172-31-25-187: ~  
Please enter 0 = LOW, 1 = MEDIUM and 2 = STRONG: 2  
Please set the password for root here.  
New password:  
Re-enter new password:  
Estimated strength of the password: 50  
Do you wish to continue with the password provided? (Press y|Y for Yes, any other  
key for No) : y  
By default, a MySQL installation has an anonymous user,  
allowing anyone to log into MySQL without having to have  
a user account created for them. This is intended only for  
testing, and to make the installation go a bit smoother.  
You should remove them before moving into a production  
environment.  
Remove anonymous users? (Press y|Y for Yes, any other key for No) : y  
Success.  
  
Normally, root should only be allowed to connect from  
'localhost'. This ensures that someone cannot guess at  
the root password from the network.  
Disallow root login remotely? (Press y|Y for Yes, any other key for No) : y  
Success.  
  
By default, MySQL comes with a database named 'test' that  
anyone can access. This is also intended only for testing,  
and should be removed before moving into a production  
environment.  
Remove test database and access to it? (Press y|Y for Yes, any other key for No)  
: y
```

#### 10. Testing MySQL server

```
$ sudo mysql -u root -p
```

```
ubuntu@ip-172-31-25-187:~$ sudo mysql -u root -p  
Enter password:  
Welcome to the MySQL monitor.  Commands end with ; or \g.  
Your MySQL connection id is 4  
Server version: 5.7.26-0ubuntu0.18.04.1 (Ubuntu)  
  
Copyright (c) 2000, 2019, Oracle and/or its affiliates. All rights reserved.  
  
Oracle is a registered trademark of Oracle Corporation and/or its  
affiliates. Other names may be trademarks of their respective  
owners.  
  
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.  
mysql>
```

```
mysql> show databases;
```

```
mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| performance_schema |
| sys |
+-----+
4 rows in set (0.00 sec)

mysql>
```

11. Install PHP

```
$ sudo apt-get install php libapache2-mod-php php-mysql php-gd php-xml
```

12. Testing PHP

```
$ cd /var/www/html
$ sudo nano info.php
```

Ketikkan ini:

```
<?php phpinfo(); ?>
```

Save dengan menggunakan: ctrl-x lalu: Y dan tekan tombol: Enter

13. Test buka file info.php melalui browser

Contoh: <http://18.212.239.120/info.php>

14. Install phpMyAdmin

```
$ cd /var/www/html
$ sudo wget https://files.phpmyadmin.net/phpMyAdmin/4.9.0.1/phpMyAdmin-4.9.0.1-all-languages.zip
$ sudo apt-get install unzip
$ sudo unzip phpMyAdmin-4.9.0.1-all-languages.zip
$ sudo mv phpMyAdmin-4.9.0.1-all-languages phpmyadmin
$ cd phpmyadmin
$ sudo cp config.sample.inc.php config.inc.php
$ sudo mysql -u root -p
```

```
mysql> CREATE USER 'userlatihan'@'%' IDENTIFIED BY '@dm1nLatih01';
Query OK, 0 rows affected (0.00 sec)
```

```
mysql> GRANT ALL PRIVILEGES ON *.* TO 'userlatihan'@'%' WITH GRANT OPTION;
Query OK, 0 rows affected (0.00 sec)
```

```
mysql> exit;
```

15. Buka phpMyAdmin melalui browser

Misal: <http://18.212.239.120/phpmyadmin/>





**phpMyAdmin**  
Welcome to phpMyAdmin

**Language**  
English

**Log in**

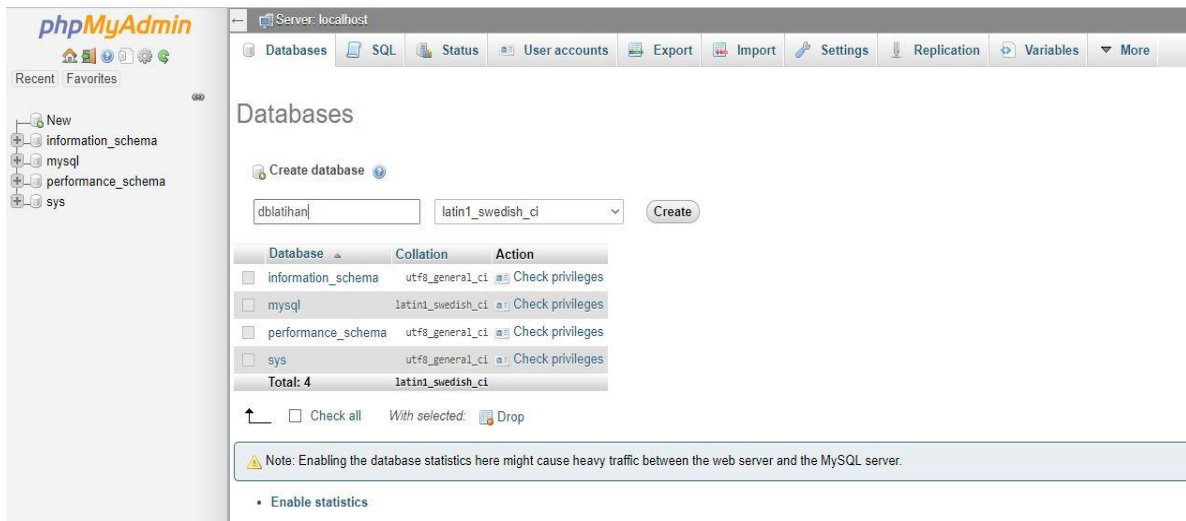
**Username:**

**Password:**

**Go**

Username: userlatihan  
Password: @dmlnLatih01

16. Test membuat database dari phpMyAdmin  
Pada kolom: Create database, ketik nama database: dblatihan



Server: localhost

**Databases**

Create database

dblatihan latin1\_swedish\_ci **Create**

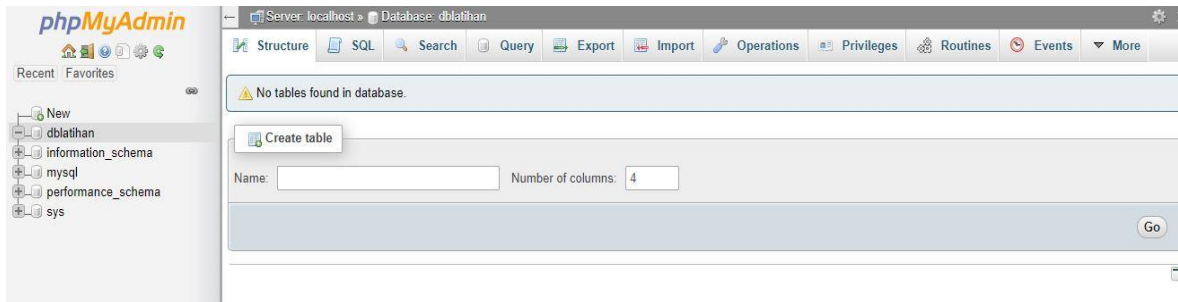
Database	Collation	Action
<input type="checkbox"/> information_schema	utf8_general_ci	<a href="#">Check privileges</a>
<input type="checkbox"/> mysql	latin1_swedish_ci	<a href="#">Check privileges</a>
<input type="checkbox"/> performance_schema	utf8_general_ci	<a href="#">Check privileges</a>
<input type="checkbox"/> sys	utf8_general_ci	<a href="#">Check privileges</a>
<b>Total: 4</b>	<b>latin1_swedish_ci</b>	

☐ Check all With selected: [Drop](#)

Note: Enabling the database statistics here might cause heavy traffic between the web server and the MySQL server.

[Enable statistics](#)

Lalu klik tombol: Create



Server: localhost » Database: dblatihan

**Create table**

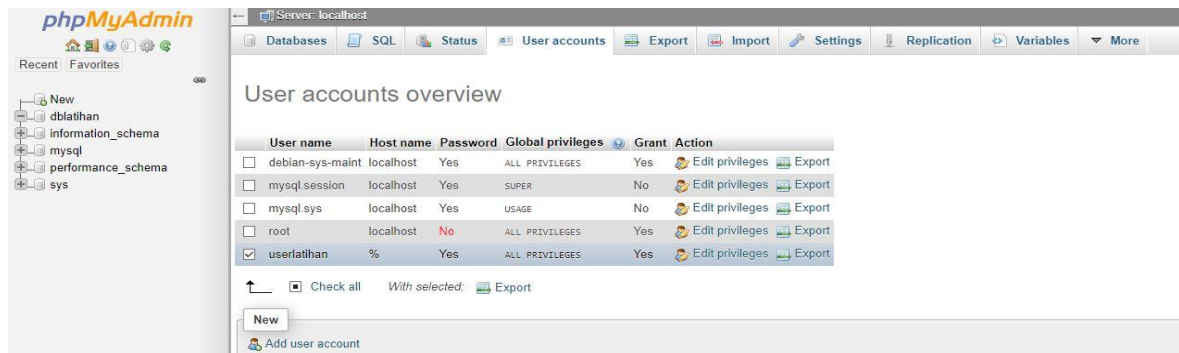
No tables found in database.

Name:  Number of columns:

**Go**

17. Mengarahkan dan memberikan permit user ke database  
17.1. Kembali ke Home phpMyAdmin dan klik: User accounts

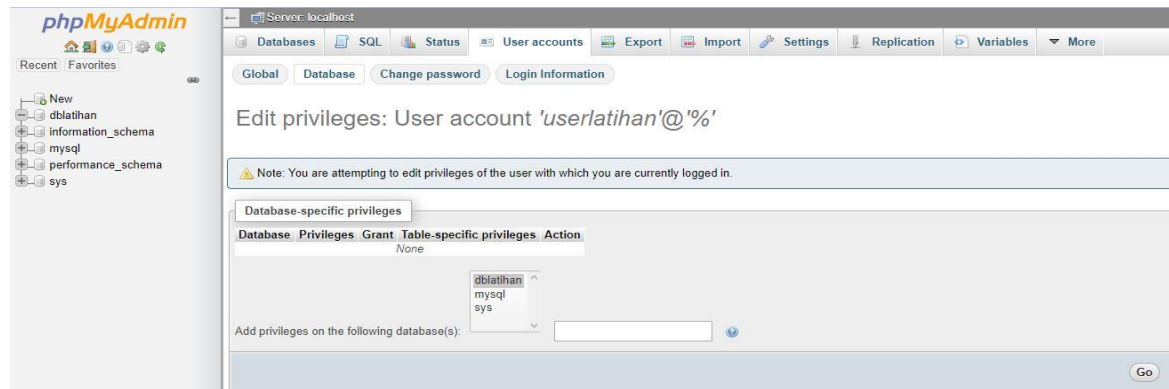




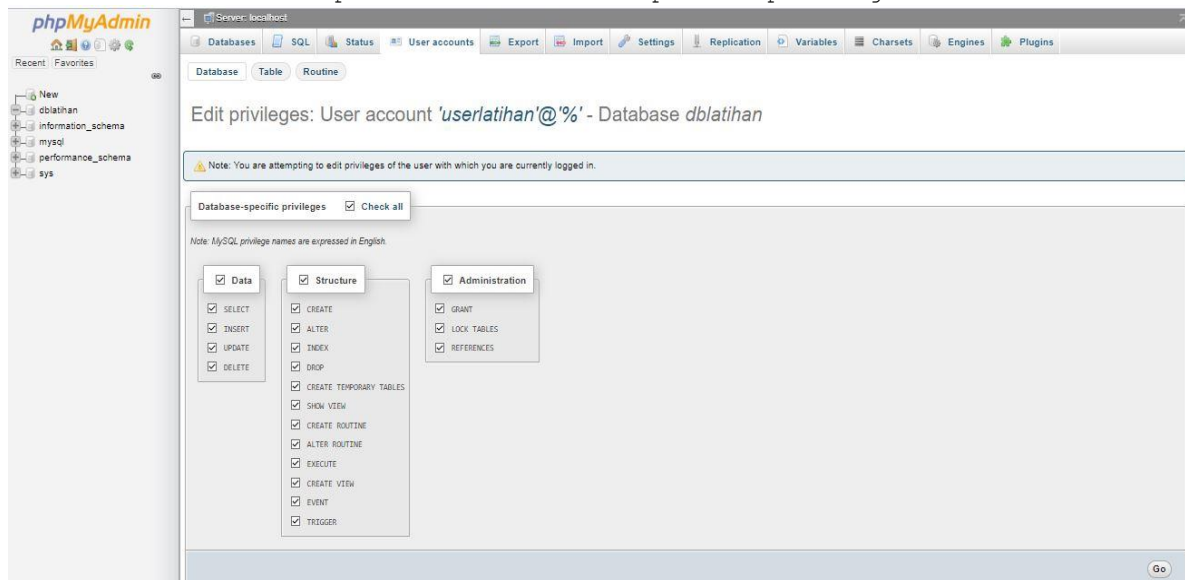
17.2. Klik: Edit privileges

17.3. Klik: Database, dan pilih nama database, yaitu: dblatihan

17.4. Klik: Go



17.5. Klik: Check all pada kolom: Database-specific privileges



**Note:** Disarankan jangan menggunakan account root pada saat menggunakan phpMyAdmin atau pada script web untuk alasan keamanan

## SSL/HTTPS (Generat private key dan certificate .crt)

```
$ sudo openssl req -x509 -nodes -days 365 -newkey rsa:2048 -keyout  
/etc/ssl/private/pelatihan.com.key -out /etc/ssl/certs/pelatihan.com.crt
```

```
139956474339776:error:2406F079:random number generator:RAND_load_file:Cannot open  
file:../crypto/rand/randfile.c
```

```
:88:Filename=/home/ubuntu/.rnd
```

```
Generating a RSA private key
```

```
.....+++++  
..+++++
```

```
writing new private key to '/etc/ssl/private/pelatihan.com.key'
```

```
-----
```

```
You are about to be asked to enter information that will be incorporated  
into your certificate request.
```

```
What you are about to enter is what is called a Distinguished Name or a DN.
```

```
There are quite a few fields but you can leave some blank
```

```
For some fields there will be a default value,
```

```
If you enter '.', the field will be left blank.
```

```
-----
```

```
Country Name (2 letter code) [AU]:IN
```

```
State or Province Name (full name) [Some-State]:Jawa Tengah
```

```
Locality Name (eg, city) []:Batang
```

```
Organization Name (eg, company) [Internet Widgits Pty Ltd]:Kominfo
```

```
Organizational Unit Name (eg, section) []:IT Divisi
```

```
Common Name (e.g. server FQDN or YOUR name) []:pelatihan.com
```

```
Email Address []:training@pelatihan.com
```

```
$ cd /etc/apache2/sites-available
```

```
$ cp default-ssl.conf default-ssl.conf-backup
```

```
$ sudo default-ssl.conf
```

```
<IfModule mod_ssl.c>
```

```
<VirtualHost _default_:443>
```

```
    ServerAdmin webmaster@localhost
```

```
    ServerName pelatihan.com
```

```
    ServerAlias www.pelatihan.com
```

```
    DocumentRoot /var/www/html
```

```
    ErrorLog ${APACHE_LOG_DIR}/error.log
```

```
    CustomLog ${APACHE_LOG_DIR}/access.log combined
```

```
    #Include conf-available/serve-cgi-bin.conf
```

```
    # SSL Engine Switch:
```

```
    # Enable/Disable SSL for this virtual host.
```

```
    SSLEngine on
```

```
    SSLCertificateFile      /etc/ssl/certs/pelatihan.com.crt
```

```
    SSLCertificateKeyFile   /etc/ssl/private/pelatihan.com.key
```

```
    #
```

```
    #SSLCertificateFile      /etc/ssl/certs/ssl-cert-snakeoil.pem
```

```
    #SSLCertificateKeyFile   /etc/ssl/private/ssl-cert-snakeoil.key
```

```
</VirtualHost>
```

```
</IfModule>
```

```
$ cd /etc/apache2/sites-available/
```

```
$ sudo cp 000-default.conf 000-default.conf-backup
```

```
$ sudo nano 000-default.conf
```

```
<VirtualHost *:80>
```

```
    # The ServerName directive sets the request scheme, hostname and port that
```

```
    # value is not decisive as it is used as a last resort host regardless.
```

```
    # However, you must set it for any further virtual host explicitly.
```

```
    ServerName pelatihan.com
```

```
    ServerAlias www.pelatihan.com
```

```
DocumentRoot /var/www/html
</VirtualHost>

$ sudo apachectl configtest
$ sudo a2enmod ssl
$ sudo a2ensite default-ssl
$ sudo systemctl restart apache2.service

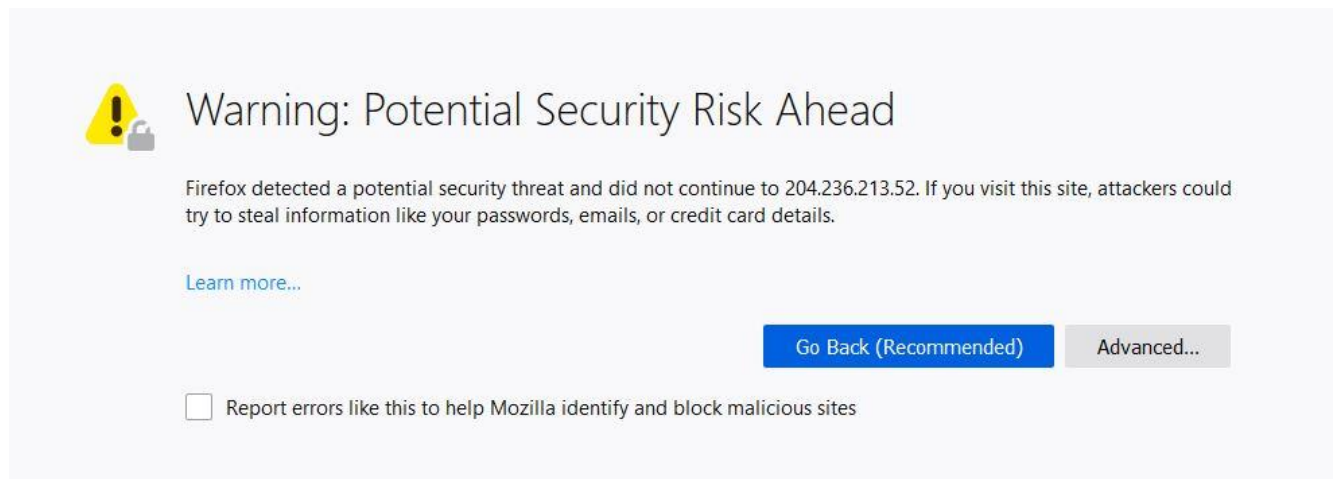
or

$ sudo service apache2 restart
```

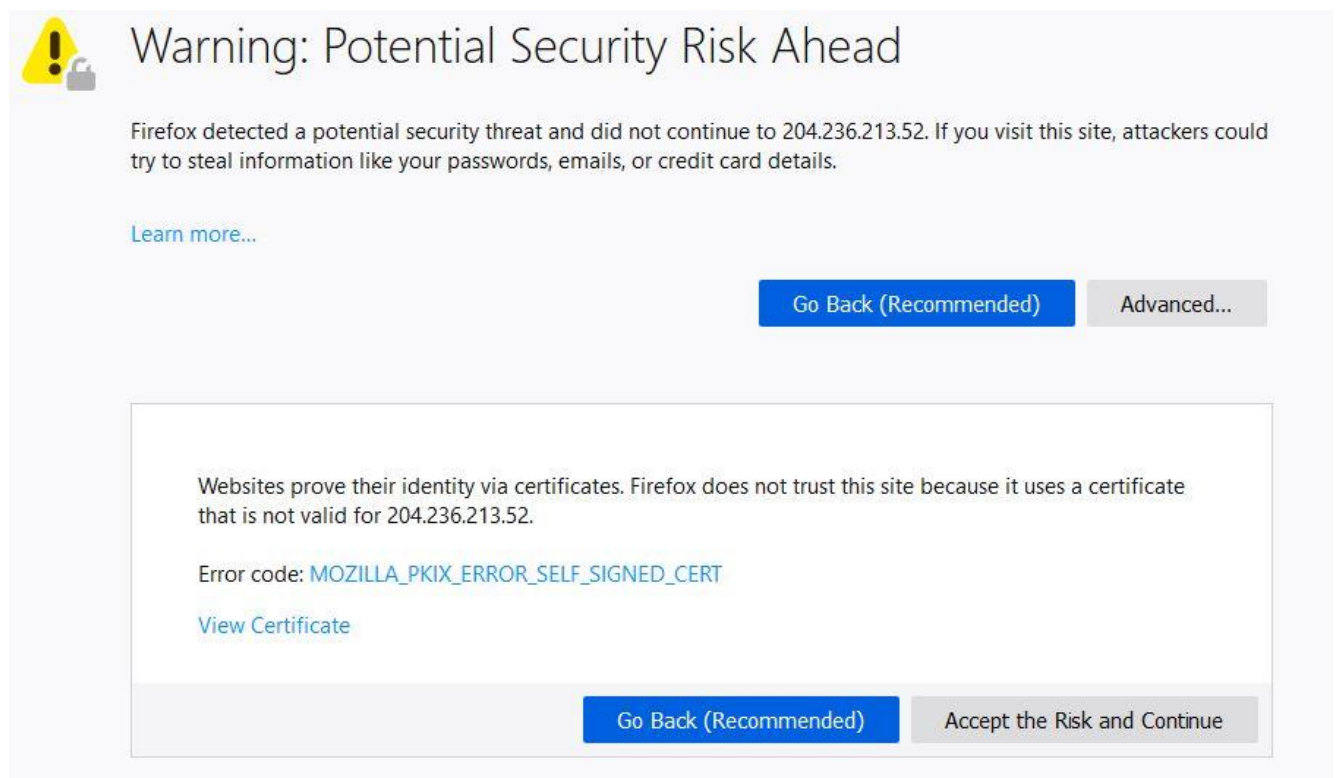
### Test Buka halaman web

Contoh: <https://204.236.213.52/>

Akan muncul sbb:



Lalu klik: Advanced dan Accept the Risk and Continue



Redirect web ke https

```
$ sudo vim /etc/apache2/sites-available/000-default.conf
```

```
<VirtualHost *:80>
    . . .
    Redirect permanent "/" "https://pelatihan.com/"
    . . .
</VirtualHost>
```

Save dengan command: ctrl-x (lalu jawab: Y)

```
$ sudo systemctl restart apache2
```

## LOAD BALANCING

1. Membuat key di instance-1 agar dapat ssh ke instance-2 dan instance-3

```
$ ssh-keygen -b 2048
$ cd /home/ubuntu/.ssh
$ cat id_rsa.pub >> authorized_keys
```

2. Membuat Snapshot instance/vm

Klik: Actions - Image - Create Image

Create Image

Instance ID

i-01f848bad493912d8

Image name

tes-snapshot

Image description

tes-snapshot

No reboot

☐

Instance Volumes

Volume Type	Device	Snapshot	Size (GiB)	Volume Type	IOPS	Throughput (MB/s)	Delete on Termination	Encrypted
Root	/dev/sda1	snap-07194ef8dbd9625b8	8	General Purpose SSD (gp2)	100 / 3000	N/A	<input checked="" type="checkbox"/>	Not Encrypted

Add New Volume

Total size of EBS Volumes: 8 GiB

When you create an EBS image, an EBS snapshot will also be created for each of the above volumes.

Cancel

Create Image

Image name : (misal: test-snapshot)

Image description : (misal: test-snapshot)

Klik: Create Image - Close

Create Image

✓

Create Image request received.

View pending image [ami-01758fd2224f30bec](#)

Any snapshots backing your new EBS image can be managed on the [snapshots screen](#) after successful image creation.

Close

## Membuat Instance dari Image Snapshot

### 1. Ke dashboard: Instance

Klik: Launch Instance

Klik: My AMIs (Pilih Image Snapshot yang telah dibuat)

Klik: Select => Next: Configure Instance Details

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

### Step 2: Choose an Instance Type

Amazon EC2 provides a wide selection of instance types optimized to fit different use cases. Instances are virtual servers that can run applications. They have varying combinations of CPU, memory, storage, and networking capacity, and give you the flexibility to choose the appropriate mix of resources for your applications. [Learn more about instance types and how they can meet your computing needs.](#)

Filter by: All instance types Current generation Show/Hide Columns

Currently selected: t2.micro (Variable ECUs, 1 vCPUs, 2.5 GHz, Intel Xeon Family, 1 GiB memory, EBS only)

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance	IPv6 Support
<input type="checkbox"/>	General purpose	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
<input checked="" type="checkbox"/>	General purpose	t2.micro Free tier eligible	1	1	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.small	1	2	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.medium	2	4	EBS only	-	Low to Moderate	Yes

Cancel

Previous

Review and Launch

Next: Configure Instance Details

### 2. Configure Instance Detail

2.1. Subnet: subnet3-default | Default in us-east-1a

2.2. Auto-assign Public IP : Disable

2.3. Klik => Next: Add Storage

2.4. Klik => Next: Add Tags

2.5. Klik => Add tag

2.6. Pada kolom: Key, ketik: Name

2.7. Pada kolom: Value, ketik: (misal: test2)

2.8. Klik: Next: Configure Security Group

2.9. Assign a security group, pilih: Select an existing security group

2.10. Pilih: sgPelatihan

2.11. Klik: Review and Launch

2.12. Klik: Launch

2.13. Pilih: Proceed without a key pair

Dan klik: I acknowledge that I will not be able to connect to this instance unless I already know the password built into this AMI.

### Select an existing key pair or create a new key pair

A key pair consists of a **public key** that AWS stores, and a **private key file** that you store. Together, they allow you to connect to your instance securely. For Windows AMIs, the private key file is required to obtain the password used to log into your instance. For Linux AMIs, the private key file allows you to securely SSH into your instance.

**Note:** The selected key pair will be added to the set of keys authorized for this instance. [Learn more about removing existing key pairs from a public AMI.](#)

Proceed without a key pair
☐ I acknowledge that I will not be able to connect to this instance unless I already know the password built into this AMI.

Cancel
Launch Instances

2.14. Klik: View Instances

### 3. Membuat instance-3 dimana proses sama seperti pada point 1 hingga 2 diatas

### 4. SSH ke instance pertama

5. Buka file hosts di instance ke-1, dan tambahkan ip instance ke-2 dan instance ke-3 dengan ip private-nya

```
$ sudo nano /etc/hosts
```

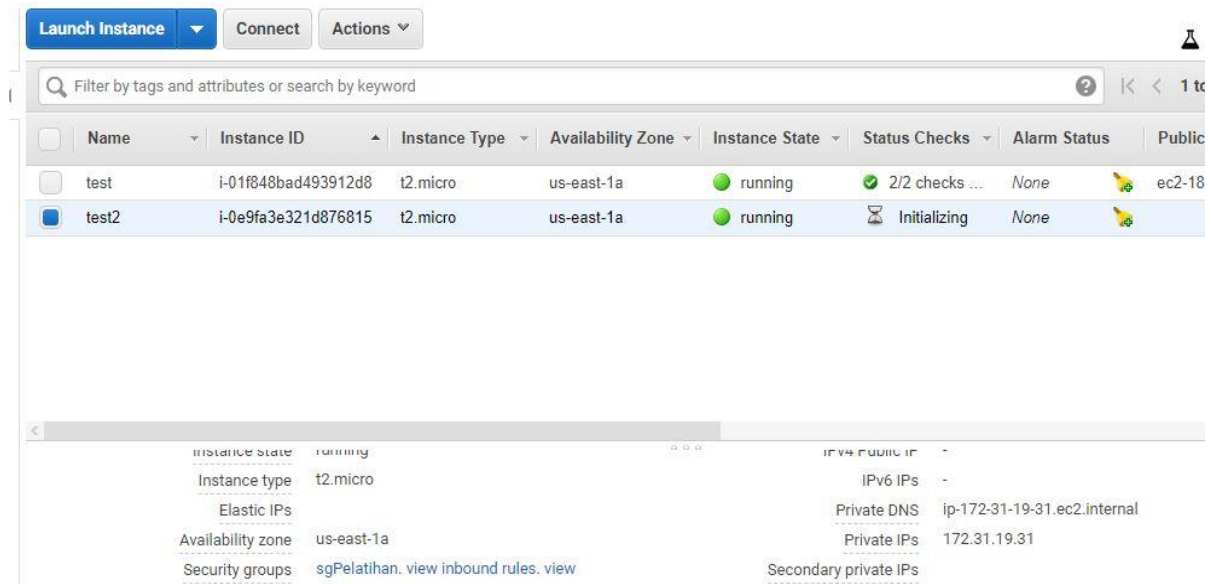


Misal:

172.31.19.31 web1

172.31.22.231 web2

Lalu save dengan tombol: ctrl-X lalu jawab: y dan Enter



Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public
test	i-01f848bad493912d8	t2.micro	us-east-1a	running	2/2 checks ...	None	ec2-18
test2	i-0e9fa3e321d876815	t2.micro	us-east-1a	initializing	Initializing	None	

Instance details for test2:

- Instance state: running
- Instance type: t2.micro
- Elastic IPs: None
- Availability zone: us-east-1a
- Security groups: sgPelatihan, view inbound rules, view
- IPv4 Public IP: None
- IPv6 IPs: None
- Private DNS: ip-172-31-19-31.ec2.internal
- Private IPs: 172.31.19.31
- Secondary private IPs: None

6. Test ssh dari instance-1 ke instance-2 dan instance-3

```
$ ssh ubuntu@test2
```

Muncul pertanyaan: Are you sure you want to continue connecting (yes/no)?

Jawab: yes, Lalu: Enter

Jika telah berhasil ssh ke instance-2 dan instance-3, lalu keluar kembali dengan mengetik: **Exit**

## INSTALL LOAD BALANCING

```
$ sudo apt-get install software-properties-common
```

```
$ sudo add-apt-repository ppa:vbernat/haproxy-2.0
```

```
HAProxy is a free, very fast and reliable solution offering high availability, load balancing, and proxying for TCP and HTTP-based applications. It is particularly suited for web sites crawling under very high loads while needing persistence or Layer7 processing. Supporting tens of thousands of connections is clearly realistic with todays hardware. Its mode of operation makes its integration into existing architectures very easy and riskless, while still offering the possibility not to expose fragile web servers to the Net.

This PPA contains packages for HAProxy 2.0.
More info: https://launchpad.net/~vbernat/+archive/ubuntu/haproxy-2.0
Press [ENTER] to continue or Ctrl-c to cancel adding it.
```

Tekan: Enter

```
$ sudo apt-get update
```

```
$ sudo apt-get install haproxy
```

```
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  liblua5.3-0 libpcre2-8-0
Suggested packages:
  vim-haproxy haproxy-doc
The following NEW packages will be installed:
  haproxy liblua5.3-0 libpcre2-8-0
0 upgraded, 3 newly installed, 0 to remove and 20 not upgraded.
Need to get 1786 kB of archives.
After this operation, 4177 kB of additional disk space will be used.
Do you want to continue? [Y/n]
```

Tekan: y    lalu: Enter

```
$ cd /etc/haproxy.cfg
$ sudo cp haproxy.cfg haproxy.cfg-backup
$ sudo nano haproxy.cfg
```

**Tambahkan di baris paling akhir sbb:**

```
listen stats
  bind 172.31.19.31:80
  mode http
  default_backend My_Web_Servers
  stats enable
  stats hide-version
  stats refresh 30s
  stats show-node
  stats auth admin:@dm1nLatih01
  stats uri /stats

backend My_Web_Servers
  mode http
  balance roundrobin
  option forwardfor
  option httpchk OPTIONS /
  server web1 172.31.25.23:80 check
  server web2 172.31.16.194:80 check
```

Lalu: **Save**

**NOTE:**

**Pada bagian: stats auth → ketik password admin sesuai yang diinginkan**

```
$ sudo /etc/init.d/haproxy restart
```

Buka browser dan ketikkan ip dari Instance/VM Load Balancing

Contoh: <http://3.216.14.193/stats>

```
<VirtualHost *:80>
# The ServerName directive sets the request scheme, hostname and port that
# the server uses to identify itself. This is used when creating
# redirection URLs. In the context of virtual hosts, the ServerName
# specifies what hostname must appear in the request's Host: header to
# match this virtual host. For the default virtual host (this file) this
# value is not decisive as it is used as a last resort host regardless.
# However, you must set it for any further virtual host explicitly.
#ServerName www.example.com

ServerName pelatihan.com
ServerAlias www.pelatihan.com
ServerAdmin webmaster@localhost
DocumentRoot /var/www/html

#Redirect permanent "/" "https://pelatihan.com/"
```

Lalu: Save

```
$ sudo /etc/init.d/apache2 restart
$ exit
```

### SSH ke Web2

```
$ ssh ubuntu@web2
$ cd /var/www/html
$ sudo cp index.html index.html-backup
$ sudo su
# cat /dev/null > index.html
# exit
$ sudo nano /var/www/html/index.html
```

Ketik: Ini adalah Web Server 2

Lalu: Save

```
$ sudo nano /etc/apache2/sites-available/000-default.conf
```

Ketik tanda pagar (\*) di depan tulisan: Redirect permanent "/" <https://pelatihan.com/>

```
<VirtualHost *:80>
    # The ServerName directive sets the request scheme, hostname and port that
    # the server uses to identify itself. This is used when creating
    # redirection URLs. In the context of virtual hosts, the ServerName
    # specifies what hostname must appear in the request's Host: header to
    # match this virtual host. For the default virtual host (this file) this
    # value is not decisive as it is used as a last resort host regardless.
    # However, you must set it for any further virtual host explicitly.
    #ServerName www.example.com

    ServerName pelatihan.com
    ServerAlias www.pelatihan.com
    ServerAdmin webmaster@localhost
    DocumentRoot /var/www/html

    # Redirect permanent "/" "https://pelatihan.com/"
```

Lalu: Save

```
$ sudo /etc/init.d/apache2 restart
$ exit
```

## INSTALL BASTION SERVER MENGGUNAKAN IPTABLES

### SSH ke instance LB

```
$ sudo /etc/init.d/ufw stop
$ sudo /etc/init.d/ufw status
```

### Check status ufw dan pastikan sudah disable

```
ufw.service - Uncomplicated firewall
Loaded: loaded (/lib/systemd/system/ufw.service; enabled; vendor preset: enabled)
Active: inactive (dead) since Wed 2019-07-10 11:36:03 UTC; 2min 42s ago
Docs: man:ufw(8)
Process: 4006 ExecStop=/lib/ufw/ufw-init stop (code=exited, status=0/SUCCESS)
Main PID: 387 (code=exited, status=0/SUCCESS)

Jul 10 11:36:03 ip-172-31-19-31 systemd[1]: Stopping Uncomplicated firewall...
Jul 10 11:36:03 ip-172-31-19-31 ufw-init[4006]: Skip stopping firewall: ufw (not enabled)
Jul 10 11:36:03 ip-172-31-19-31 systemd[1]: Stopped Uncomplicated firewall.
Warning: Journal has been rotated since unit was started. Log output is incomplete or unavailable.
ubuntu@ip-172-31-19-31:~$
```

Copy iptables default

```
$ sudo iptables-save > iptables-baru
$ sudo iptables -L
ubuntu@ip-172-31-19-31:~$ sudo iptables -L
Chain INPUT (policy ACCEPT)
target     prot opt source                destination

Chain FORWARD (policy ACCEPT)
target     prot opt source                destination

Chain OUTPUT (policy ACCEPT)
target     prot opt source                destination
ubuntu@ip-172-31-19-31:~$
```

Skenarionya kita akan coba ssh ke instance web1 dan web2 dari luar melalui server bastion dengan cara Forwarding Port

**Buat file untuk menandakan posisi ssh ada di server mana**

```
$ ssh ubuntu@web1
$ sudo nano ssh-ke-web1
```

Isi dengan:  
ssh key web1

Lalu: **Save**

```
$ ll
$ exit
$ ssh ubuntu@web2
$ sudo nano ssh-ke-web2
```

Isi dengan:  
ssh ke web2

Lalu: **Save**

```
$ ll
$ exit
```

**Check ip forward apakah dalam kondisi Enable atau Disable**

**Note:**

```
$ cat /proc/sys/net/ipv4/ip_forward
0 = Disable
1 = Enable
```

**Enable ip forward:**

```
$ sudo sysctl net.ipv4.ip_forward=1
$ cat /proc/sys/net/ipv4/ip_forward
1
$ cat /etc/hosts
```

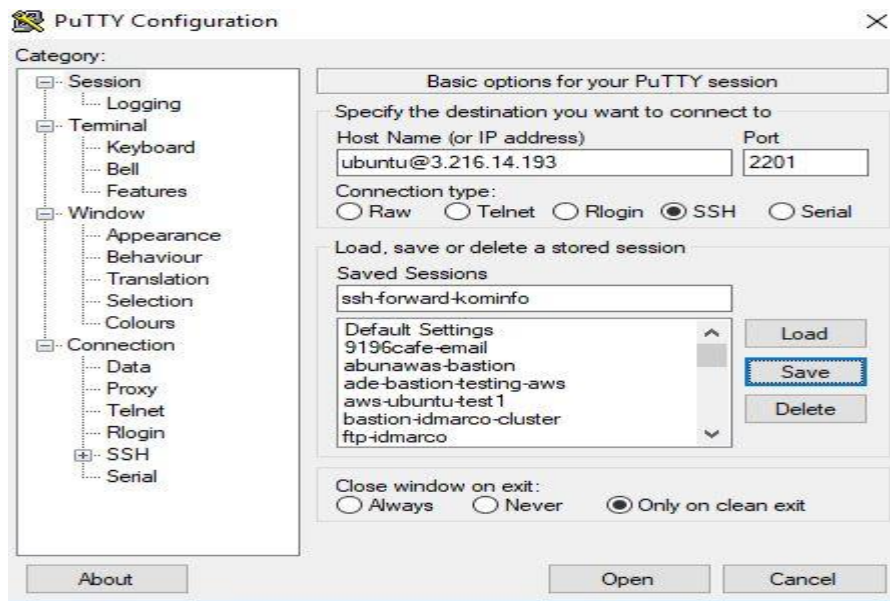
**Catat ip web1 dan web2 untuk dimasukkan ke iptables**

```
$ sudo nano iptables-baru
$ sudo iptables-restore < iptables-baru
$ sudo iptables -L
```



## TEST SSH KE WEB1 DAN WEB2 MELALUI BASTION SERVER

### 1. Buka putty



#### SSH ke Web1

Host Name : [ubuntu@3.216.14.193](https://3.216.14.193)

Port : 2201

Saved Sessions : ssh-forward-kominfo

\$ ll

#### Note:

- Cek apakah ada file ssh-ke-web1 (jika ada berarti benar ssh ke web1)
- Lalu coba ssh ke web2, dengan mengganti portnya ke port 2202

