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Telp. 0251-8242411, email: prohumasi@smkwikrama.net, website :
www.smkwikrama.net

LK Cloud 3.1 – AWS VPC

Lembar Kerja Peserta Didik

NILAI

|	
Nama	**: Muhamad Dzakwan Ar Efendi**
NIS	**: 12209161**
Kelas	**: TJKT XII-3**
Judul Materi	**: Build AWS VPC & Launch EC2 Instance**

Petunjuk Kerja :

- Menyiapkan Software aplikasi pendukung

- Menyiapkan Laptop / PC

- Menyiapkan Koneksi Internet

- Menyiapkan peralatan Praktek

- Menyiapkan Modul Panduan Kerja (Handout) AWS VPC & EC2 Instance

Langkah Kerja

Skenario / Soal

Anda adalah seorang Cloud Engineer memiliki tanggung jawab untuk merancang, mengelola, dan mengoptimalkan infrastruktur komputasi awan (cloud computing) perusahaan. Tugas anda mencakup berbagai aspek yang terkait dengan cloud, termasuk penerapan, pengelolaan, keamanan, dan skalabilitas. Saat ini anda ditugaskan untuk membangun infrastruktur terisolasi menggunakan Amazon VPC dan menjalankan EC2 instance sesuai dengan topologi dibawah ini.
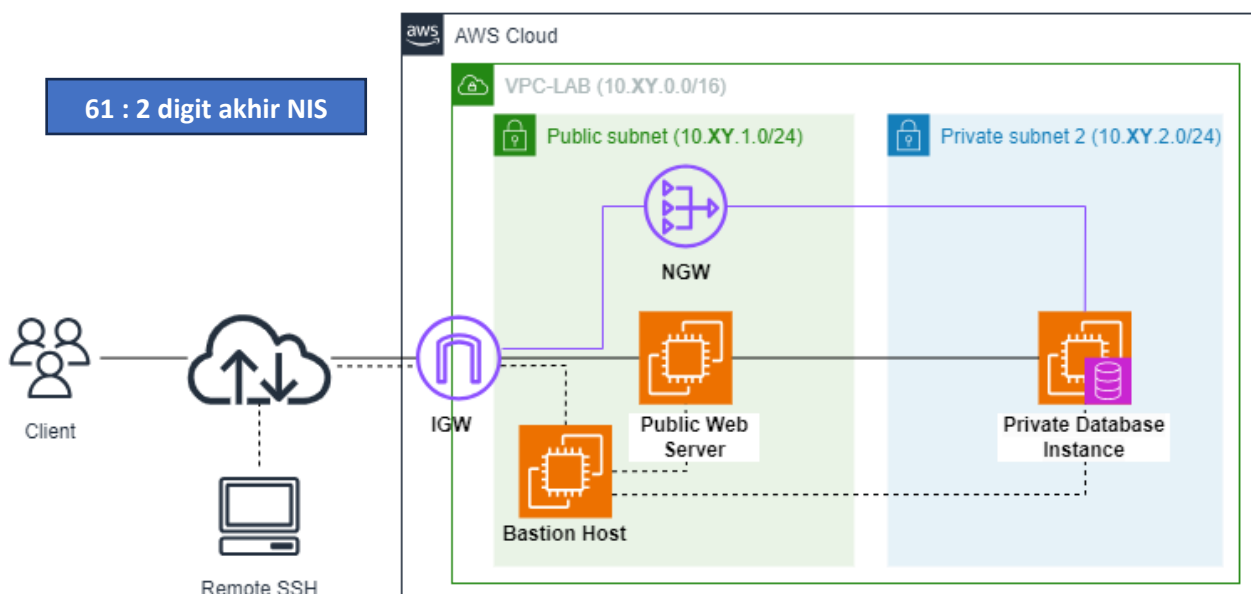
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Ketentuan konfigurasi :

- IP Address VPC

VPC	10.**61**.0.0/16
Public Subnet	10.**61**.1.0/24
Private Subnet	10.**61**.2.0/24

- Sources-code Web Dinamis
  https://github.com/suryamsj/tutorial-crud-php-native

- Konfigurasi database
  Host   : ip-private DBInstance
  Nama-db   : db_web**nama** (ex : db_webmaman).
  User-db   : admin**nama** (ex : adminmaman)
  Password   : P4ssw0rdDB

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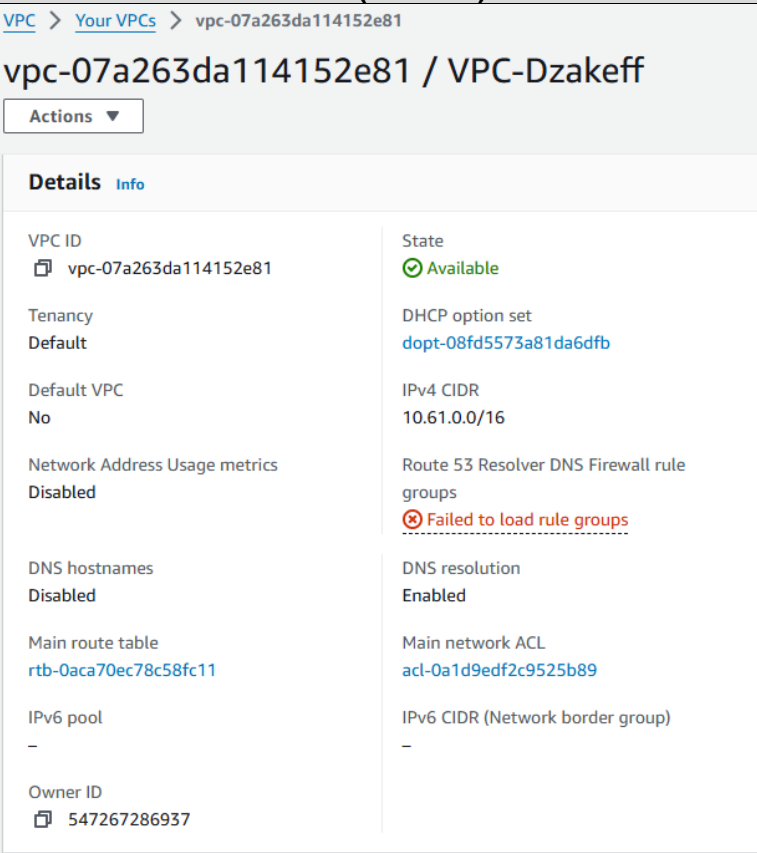Jl. Raya Wangun Kel. Sindangsari Kota Bogor
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Dokumentasi

1. Konfigurasi VPC
   ** Berikan detail langkah-langkah disetiap nomor*.

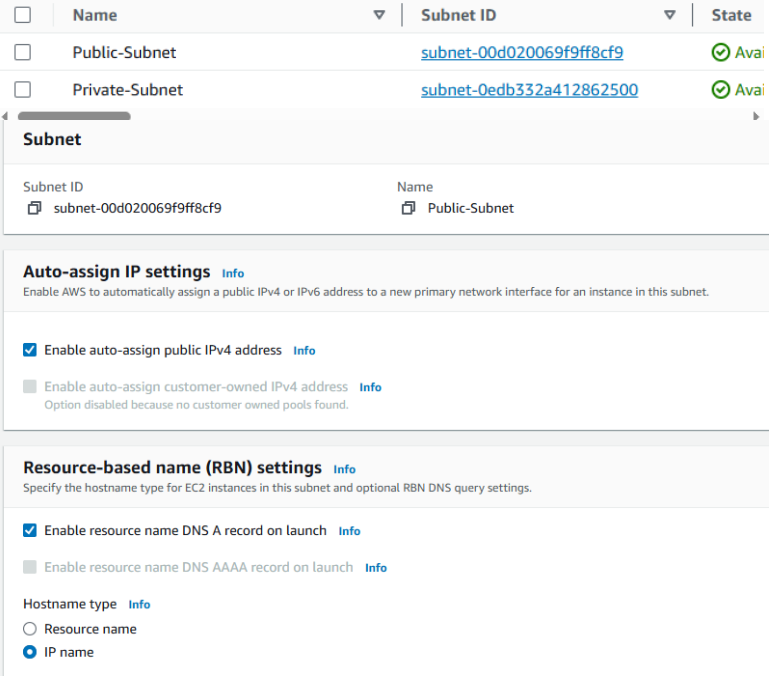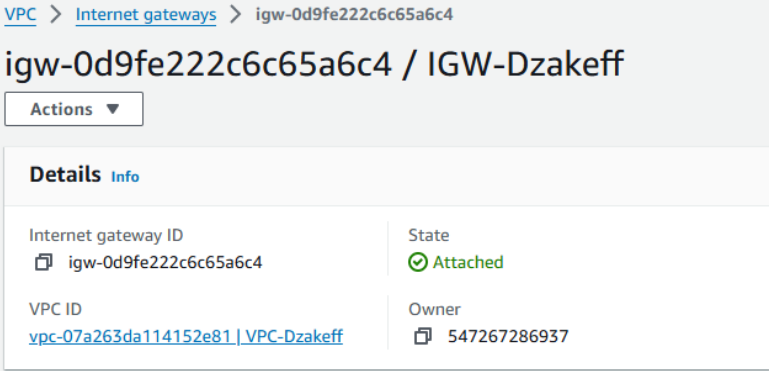| No	Keterangan Konfigurasi	Hasil (Gambar)
1	Membuat VPC *Detail langkah konfigurasi Pertama-pertama saya hanya membuat VPC saja tanpa menggunakan VPC and *more*. Kemudian namakan VPC sesuai selera, kemudian setting IPv4.	VPC > Your VPCs > vpc-07a263da114152e81 **vpc-07a263da114152e81 / VPC-Dzakeff** Actions ▼ **Details** Info VPC ID ▢ vpc-07a263da114152e81 State ⊘ Available Tenancy Default DHCP option set dopt-08fd5573a81da6dfb Default VPC No IPv4 CIDR 10.61.0.0/16 Network Address Usage metrics Disabled Route 53 Resolver DNS Firewall rule groups ⊗ Failed to load rule groups DNS hostnames Disabled DNS resolution Enabled Main route table rtb-0aca70ec78c58fc11 Main network ACL acl-0a1d9edf2c9525b89 IPv6 pool – IPv6 CIDR (Network border group) – Owner ID ▢ 547267286937

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2	Membuat Subnets.

*Detail langkah konfigurasi Disini SysAdmin membuat dua subnet yaitu subnet public dan subnet private. Kemudian pilih zona virginia 1a (karena virginia memiliki tarif yang paling murah). Kemudian SysAdmin memakai IP 10.61.1.0/24 untuk subnet public dan 10.61.2.0/24 untuk subenet private. (khusus public-subnet, saya centang setting *auto-assign public* IPv4 *address* dan *enable resource name* DNS A *record on launch*)

	Name	▽	Subnet ID	▽	State
☐	Public-Subnet		subnet-00d020069f9ff8cf9		⊘ Avai
☐	Private-Subnet		subnet-0edb332a412862500		⊘ Avai

Subnet

Subnet ID
☐ subnet-00d020069f9ff8cf9

Name
☐ Public-Subnet

Auto-assign IP settings Info
Enable AWS to automatically assign a public IPv4 or IPv6 address to a new primary network interface for an instance in this subnet.

☑ Enable auto-assign public IPv4 address Info

☐ Enable auto-assign customer-owned IPv4 address Info
Option disabled because no customer owned pools found.

Resource-based name (RBN) settings Info
Specify the hostname type for EC2 instances in this subnet and optional RBN DNS query settings.

☑ Enable resource name DNS A record on launch Info

☐ Enable resource name DNS AAAA record on launch Info

Hostname type Info
○ Resource name
● IP name

3	Membuat Internet Gateway

*Detail langkah konfigurasi Disini SysAdmin menambahkan internet gateway yang berfungsi agar server bisa akses internet dari VPC.

VPC > Internet gateways > igw-0d9fe222c6c65a6c4

igw-0d9fe222c6c65a6c4 / IGW-Dzakeff

Actions ▼

Details Info

Internet gateway ID
☐ igw-0d9fe222c6c65a6c4

State
⊘ Attached

VPC ID
vpc-07a263da114152e81 | VPC-Dzakeff

Owner
☐ 547267286937

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4	Membuat NAT Gateway	
	*Detail langkah konfigurasi SysAdmin membuat NAT Gateway karena database itu tidak menggunakan IP public. Jadi memelukan NAT gateway agar bisa terkoneksi ke internet.	VPC > NAT gateways > nat-05e51e16dac00974e **nat-05e51e16dac00974e / NGW-Dzakeff** Actions ▼ **Details** NAT gateway ID nat-05e51e16dac00974e NAT gateway ARN arn:aws:ec2:us-east-1:547267286937:natgateway/nat-05e51e16dac00974e VPC vpc-07a263da114152e81 / VPC-Dzakeff State ⊙ Pending Primary private IPv4 address 10.61.1.61 Created Tuesday, July 30, 2024 at 10:42:06 GMT+7 Connectivity type Public Primary public IPv4 address – Subnet subnet-00d020069f9ff8cf9 / Public-Subnet State message Info – Primary network interface ID eni-0c659bcbe7982652d ↗ Deleted –

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5	Membuat Tabel Routing
	*Detail langkah konfigurasi Disini SysAdmin menambahkan route tables guna untuk mengatur arah jaringannya akan kemana. Untuk public-RT menggunakan IGW (Internet Gateway) dan untuk private-RT menggunakan NGW (NAT Gateway). (Gunakan VPC yang sudah dibuat dan gunakan subnet yang sesuai).

rtb-0078f0d6fb94477f8 / Public-RT   Actions ▼

Details Info

Route table ID
rtb-0078f0d6fb94477f8

Main
No

VPC
vpc-07a263da114152e81 | VPC-Dzakeff

Owner ID
547267286937

Explicit subnet associations
subnet-00d020069f9ff8cf9 / Public-Subnet

Edge associations
–

< **Routes** | Subnet associations | Edge associations | Route propagatio >

Routes (2)   Both ▼   Edit routes

Q Filter routes

< 1 > ⚙

Destination ▽	Target ▽	Status ▽	Propagated ▽
0.0.0.0/0	igw-0d9fe222c6...	⊘ Active	No
10.61.0.0/16	local	⊘ Active	No

rtb-0119faedf03e63fae / Private-RT   Actions ▼

Details Info

Route table ID
rtb-0119faedf03e63fae

Main
No

VPC
vpc-07a263da114152e81 | VPC-Dzakeff

Owner ID
547267286937

Explicit subnet associations
subnet-0edb332a412862500 / Private-Subnet

Edge associations
–

< **Routes** | Subnet associations | Edge associations | Route propagatio >

Routes (2)   Both ▼   Edit routes

Q Filter routes

< 1 > ⚙

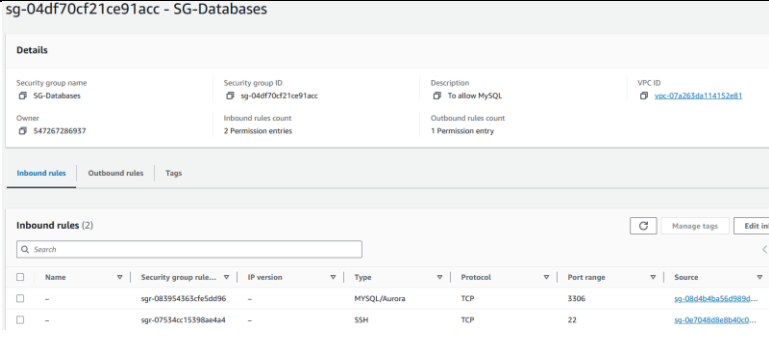| Destination ▽	Target ▽	Status ▽	Propagated ▽
0.0.0.0/0	nat-05e51e16da...	⊘ Active	No
10.61.0.0/16	local	⊘ Active	No

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2. Membuat Security Group
   ** Screenshoot pengaturan inbound-rules.

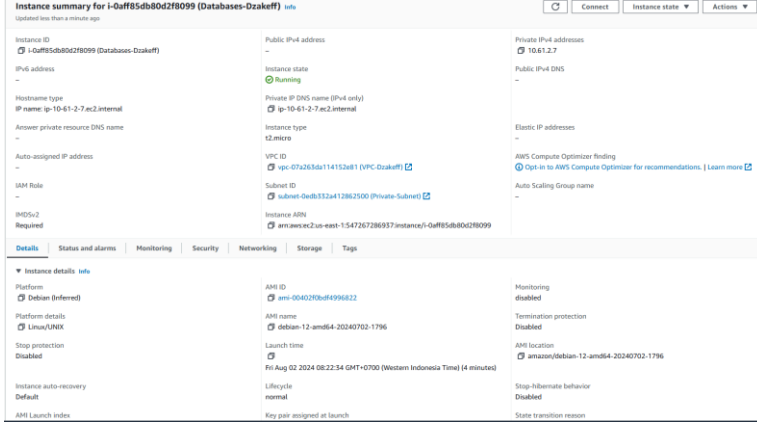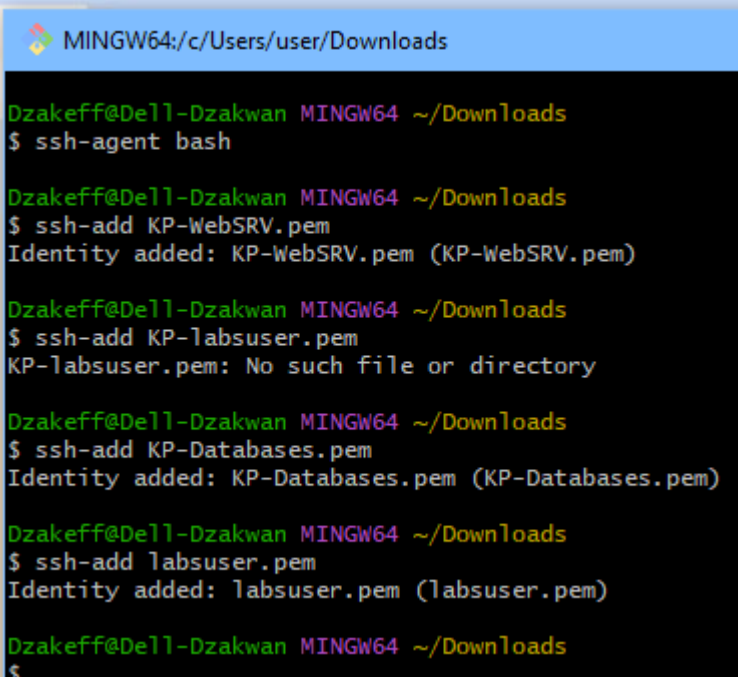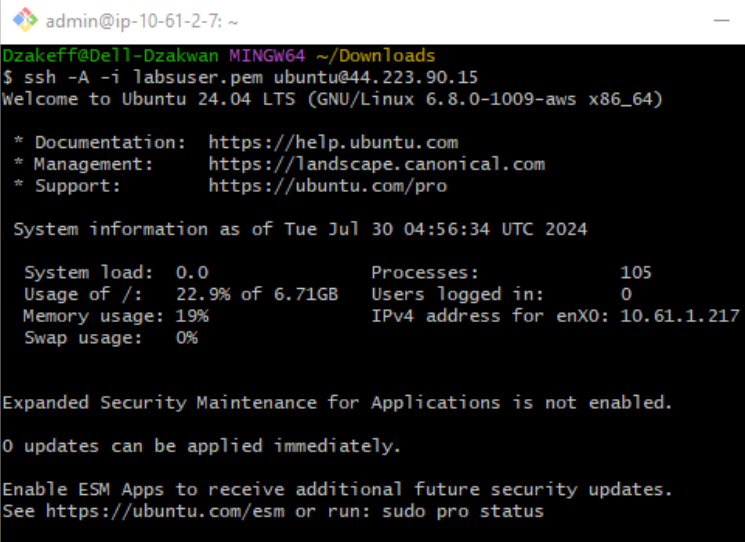| No	Keterangan Konfigurasi	Hasil (Gambar)
1	Security Group : BastionHost *Detail langkah konfigurasi Disini SysAdmin membuat security grup berguna untuk mengatur instance apa saja yang menggunakan suatu port. (contoh untuk bastion membuka port 22 (SSH) untuk ke semua IP yang dapat mengakses).	
2	Security Group : Web Server *Detail langkah konfigurasi Disini SysAdmin membuat security grup berguna untuk mengatur instace apa saja yang menggunakan suatu port. (contoh untuk web server membuka port 80 (HTTP) dan 443 (HTTPS) untuk ke semua IP yang dapat mengakses. Khusus untuk port 22 (SSH), gunakan source dari SG-Bastion. Karena instance web server hanya boleh di remote dari instance Bastion saja).	
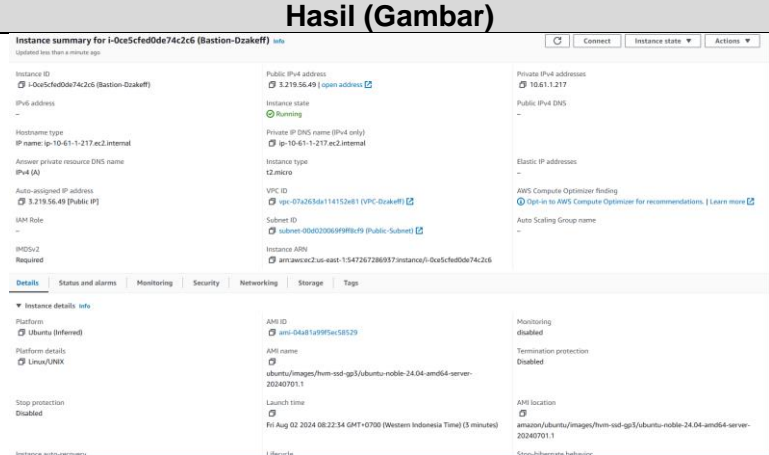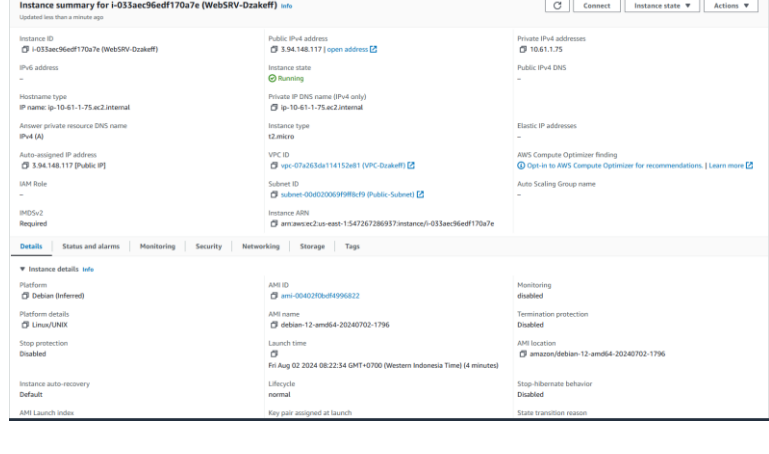
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3	Security Group : DBInstace	
	*Detail langkah konfigurasi Disini SysAdmin membuat security grup berguna untuk mengatur instace apa saja yang menggunakan suatu port. (contoh untuk Database membuka port 3306 (MYSQL) agar dapat di akses oleh instance webserver dan port 22 SSH agar bisa di remote oleh instance bastion.	

3. Launch EC2 Instance
   ** Screenshoot tampilan EC2 details information.

No	Keterangan Konfigurasi	Hasil (Gambar)
1	Launch instance : BastionHost *Detail langkah konfigurasi Disini membuat instance bastion untuk remote ke webserver dan database. Sesuaikan VPC dan Security Group(untuk settingan key pair masih menggunakan vockey).	
2	Launch instance: Web Server *Detail langkah konfigurasi Disini membuat instance Webserver untuk setting website. Sesuaikan VPC dan Security Group(untuk settingan key pair Menggunakan key yang baru dengan nama KP-WebSRV).	

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3	Launch instance: Database *Detail langkah konfigurasi Disini membuat instance Database untuk menyimpan informasi untuk website. Sesuaikan VPC dan Security Group(untuk settingan key pair Menggunakan key yang baru dengan nama KP-Databases).	

Tabel IP-Address Instance

Nama Instance	IP Public	IP Private
Bastion Host	3.238.188.162	10.61.1.217
Web Server	18.215.188.87	10.61.1.75
Database	-	10.61.2.7

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4. Remote SSH melalui BationHost
   ** Praktikan akses SSH bation host menggunakan GitBash dan Putty.

No	Keterangan Konfigurasi	Hasil (Gambar)
Praktik menggunakan GitHub	
1	Running ssh-agent & tambahkan keypair.	
2	Remote ke instance BastionHost	

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3	Akses SSH ke Instance Web Server	
4	Akses SSH ke DBInstance	

	Praktik menggunakan Putty	
1	Convert file .pem ke .ppk *Detail langkah konfigurasi Pertama, masukan key pair format .pem ke putty gen. Kemudian klik save private key	

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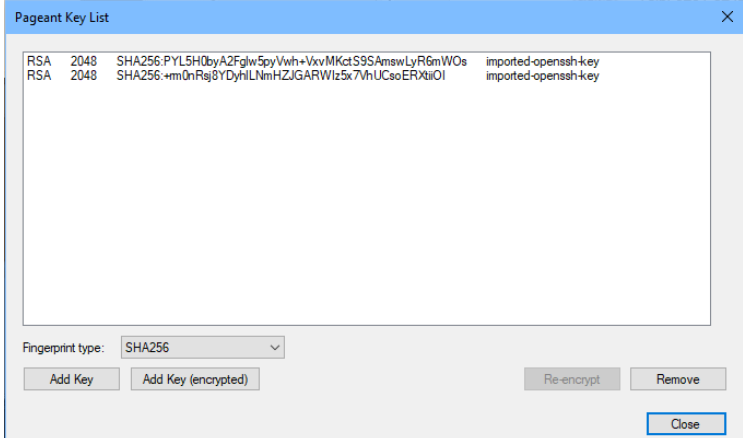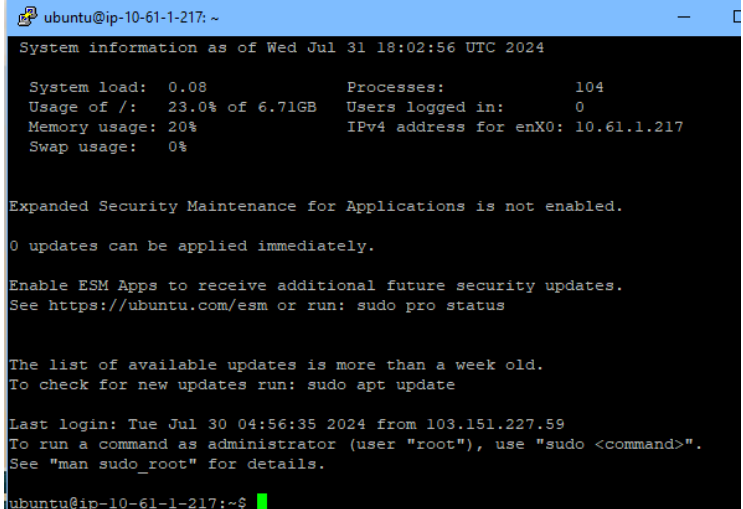|		
2	Tambahkan keypair ke pageant.exe	
3	Remote ke instance Bastion Host	

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4	Remote ke instance Web Server	`ubuntu@ip-10-61-1-217:~$ ssh admin@10.61.1.75`
		`Linux ip-10-61-1-75 6.1.0-22-cloud-amd64 #1 SMP PREEMPT_`
		`(2024-06-21) x86_64`
		
		`The programs included with the Debian GNU/Linux system a`
		`the exact distribution terms for each program are descri`
		`individual files in /usr/share/doc/*/copyright.`
		
		`Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to t`
		`permitted by applicable law.`
		`Last login: Tue Jul 30 05:03:49 2024 from 10.61.1.217`
		`admin@ip-10-61-1-75:~$`

5	Remote ke DBInstance	`ubuntu@ip-10-61-1-217:~$ ssh admin@10.61.2.7`
		`Linux ip-10-61-2-7 6.1.0-22-cloud-amd64 #1 SMP PREEMPT_DYNAMIC Debia`
		`2024-06-21) x86_64`
		
		`The programs included with the Debian GNU/Linux system are free soft`
		`the exact distribution terms for each program are described in the`
		`individual files in /usr/share/doc/*/copyright.`
		
		`Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent`
		`permitted by applicable law.`
		`Last login: Tue Jul 30 04:59:56 2024 from 10.61.1.217`
		`admin@ip-10-61-2-7:~$`

5. Instalasi dan Konfigurasi Web Dinamis

No	Keterangan Konfigurasi	Hasil (Gambar)

1	Update dan upgrade paket di instance Web Server	`root@ip-10-61-1-75:~# apt update`
		`Get:1 file:/etc/apt/mirrors/debian.list Mirrorlist [38 B]`
		`Get:5 file:/etc/apt/mirrors/debian-security.list Mirrorlist [47 B]`
		`Get:2 https://cdn-aws.deb.debian.org/debian bookworm InRelease [151 kB]`
		`Get:3 https://cdn-aws.deb.debian.org/debian bookworm-updates InRelease`
		`Get:4 https://cdn-aws.deb.debian.org/debian bookworm-backports InReleas`
		`Get:6 https://cdn-aws.deb.debian.org/debian-security bookworm-security`
		`Get:7 https://cdn-aws.deb.debian.org/debian bookworm/main Sources [9485`
		`Get:8 https://cdn-aws.deb.debian.org/debian bookworm/main amd64 Package`
		`Get:9 https://cdn-aws.deb.debian.org/debian bookworm/main Translation-e`
		`Get:10 https://cdn-aws.deb.debian.org/debian bookworm-updates/main Sour`
		`Get:11 https://cdn-aws.deb.debian.org/debian bookworm-updates/main amd6`
		`Get:12 https://cdn-aws.deb.debian.org/debian bookworm-updates/main Tran`
		`Get:13 https://cdn-aws.deb.debian.org/debian bookworm-backports/main So`
		`Get:14 https://cdn-aws.deb.debian.org/debian bookworm-backports/main am`
		`Get:15 https://cdn-aws.deb.debian.org/debian bookworm-backports/main Tr`
		`Get:16 https://cdn-aws.deb.debian.org/debian-security bookworm-security`
		`Get:17 https://cdn-aws.deb.debian.org/debian-security bookworm-security`
		`Get:18 https://cdn-aws.deb.debian.org/debian-security bookworm-security`
		`Fetched 25.8 MB in 4s (6866 kB/s)`
		`Reading package lists... Done`
		`Building dependency tree... Done`
		`Reading state information... Done`
		`7 packages can be upgraded. Run 'apt list --upgradable' to see them.`
		`root@ip-10-61-1-75:~#`
		`root@ip-10-61-1-75:~# apt upgrade -y`
		`Reading package lists... Done`
		`Building dependency tree... Done`
		`Reading state information... Done`
		`Calculating upgrade... Done`
		`The following NEW packages will be installed:`
		`  firmware-linux-free linux-image-6.1.0-23-cloud-amd64`
		`The following packages will be upgraded:`
		`  bind9-host bind9-libs libgssapi-krb5-2 libk5crypto3 libkrb5-3 libkrb5support0`
		`7 upgraded, 2 newly installed, 0 to remove and 0 not upgraded.`
		`Need to get 28.1 MB of archives.`

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| 2 | Install web server, php, php-mysql, git dan mariadb-client. | ```
root@ip-10-61-1-75:~# apt list  apache2 php php-mysql git mariadb-client
Listing... Done
apache2/stable-security,now 2.4.61-1~deb12u1 amd64 [installed]
git/stable,now 1:2.39.2-1.1 amd64 [installed]
mariadb-client/stable,now 1:10.11.6-0+deb12u1 amd64 [installed]
php-mysql/stable,now 2:8.2+93 all [installed]
php/stable,now 2:8.2+93 all [installed]
root@ip-10-61-1-75:~#
``` |
|---|---|---|
| 3 | Restart service apache2 | ```
php/stable,now 2:8.2:93 all [installed]
root@ip-10-61-1-75:~# systemctl restart apache2
root@ip-10-61-1-75:~#
``` |
| 4 | Remote ke DBInstance kemudian update dan upgrade paket APT | ```
root@ip-10-61-2-7:~# apt update && apt upgrade -y
Get:1 file:/etc/apt/mirrors/debian.list Mirrorlist [38 B]
Get:5 file:/etc/apt/mirrors/debian-security.list Mirrorlist [47 B]
Hit:2 https://cdn-aws.deb.debian.org/debian bookworm InRelease
Hit:3 https://cdn-aws.deb.debian.org/debian bookworm-updates InRelease
Hit:4 https://cdn-aws.deb.debian.org/debian bookworm-backports InRelease
Hit:6 https://cdn-aws.deb.debian.org/debian-security bookworm-security InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
All packages are up to date.
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Calculating upgrade... Done
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
root@ip-10-61-2-7:~#
``` |
| 5 | Instalasi DBMS mariadb di DBInstance<br><br>*Detail langkah konfigurasi Pada instance database, dilakukan install mariadb-server untuk menyimpan data user. | ```
root@ip-10-61-2-7:~# apt list mariadb-server
Listing... Done
mariadb-server/stable,now 1:10.11.6-0+deb12u1 amd64 [installed]
root@ip-10-61-2-7:~#
``` |

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6	Konfigurasi database untuk web CRUD.	
	* Tambahkan keterangan / penjelasan Disini saya membuat database baru dengan nama db_webdzakeff. Kemudian saya membuat user admindzakeff dengan password P4ssw0rdDB. Kemudian saya memberikan full akses kepada akun admindzakeff. Setelah itu saya flush privileged yang berguna untuk menerapkan hasil settingan akses yang baru dilakukan tanpa perlu me-restart mariadb-server/server.	
	** *perhatikan ketentuan diatas.*	
7	Edit file connection.php	

Step 6 terminal output:
```
MariaDB [(none)]> create database db_webdzakeff;
Query OK, 1 row affected (0.000 sec)

MariaDB [(none)]> create user 'admindzakeff'@'%' identified by 'P4ssw0rdDB';
Query OK, 0 rows affected (0.004 sec)

MariaDB [(none)]> grant all privileges on "." to 'admindzakeff'@'%';
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual th
rsion for the right syntax to use near '"." to 'admindzakeff'@'%'' at line 1
MariaDB [(none)]> grant all privileges on *.* to 'admindzakeff'@'%';
Query OK, 0 rows affected (0.001 sec)

MariaDB [(none)]> flush priviledges;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual th
rsion for the right syntax to use near 'priviledges' at line 1
MariaDB [(none)]> flush privileges;
Query OK, 0 rows affected (0.001 sec)
```

Step 7 connection.php:
```php
GNU nano 7.2                              function/connection.php *
<?php

$hostname = "10.61.2.7";
$username = "admindzakeff";
$password = "P4ssw0rdDB";
$database = "db_webdzakeff";

$connection = mysqli_connect($hostname, $username, $password, $database);

if (!$connection) {
    die(mysqli_error($connection));
}
```

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www.smkwikrama.net

8	Edit file 50-server.cnf	
| | * Tambahkan keterangan / penjelasan Disini SysAdmin memberi pagar pada baris bind-address agar database bisa di akses lebih luas. | ```
GNU nano 7.2                              /etc/mysq
#
# These groups are read by MariaDB server.
# Use it for options that only the server (but not
                                                    
# this is read by the standalone daemon and embedd
[server]
                                                    
# this is only for the mysqld standalone daemon
[mysqld]
                                                    
#
# * Basic Settings
#
                                                    
#user                        = mysql
pid-file                     = /run/mysqld/mysqld.pid
basedir                      = /usr
#datadir                     = /var/lib/mysql
#tmpdir                      = /tmp
                                                    
# Broken reverse DNS slows down connections consid
# safe to skip if there are no "host by domain nam
#skip-name-resolve
                                                    
# Instead of skip-networking the default is now to
# localhost which is more compatible and is not le
#bind-address                = 127.0.0.1
``` |
| 9 | Restart mariadb | ```
root@ip-10-61-2-7:~# systemctl restart mysql
root@ip-10-61-2-7:~# systemctl status mysql
● mariadb.service - MariaDB 10.11.6 database server
     Loaded: loaded (/lib/systemd/system/mariadb.service; enabled; preset: enabled)
     Active: active (running) since Wed 2024-07-31 18:29:58 UTC; 10s ago
       Docs: man:mariadbd(8)
             https://mariadb.com/kb/en/library/systemd/
    Process: 6110 ExecStartPre=/usr/bin/install -m 755 -o mysql -g root -d /var/run/mys
    Process: 6112 ExecStartPre=/bin/sh -c systemctl unset-environment _WSREP_START_POSI
    Process: 6114 ExecStartPre=/bin/sh -c [ ! -e /usr/bin/galera_recovery ] && VAR= ||
    Process: 6180 ExecStartPost=/bin/sh -c systemctl unset-environment _WSREP_START_POS
    Process: 6183 ExecStartPost=/etc/mysql/debian-start (code=exited, status=0/SUCCESS)
   Main PID: 6170 (mariadbd)
     Status: "Taking your SQL requests now..."
      Tasks: 12 (limit: 1137)
     Memory: 84.6M
        CPU: 398ms
     CGroup: /system.slice/mariadb.service
             └─6170 /usr/sbin/mariadbd
root@ip-10-61-2-7:~# ^C
root@ip-10-61-2-7:~# systemctl restart mariadb
root@ip-10-61-2-7:~# systemctl status mariadb
● mariadb.service - MariaDB 10.11.6 database server
     Loaded: loaded (/lib/systemd/system/mariadb.service,
     Active: active (running) since Wed 2024-07-31 18:32
       Docs: man:mariadbd(8)
             https://mariadb.com/kb/en/library/systemd/
    Process: 6236 ExecStartPre=/usr/bin/install -m 755 -o
    Process: 6238 ExecStartPre=/bin/sh -c systemctl unse
    Process: 6240 ExecStartPre=/bin/sh -c [ ! -e /usr/bi
    Process: 6305 ExecStartPost=/bin/sh -c systemctl unse
``` |
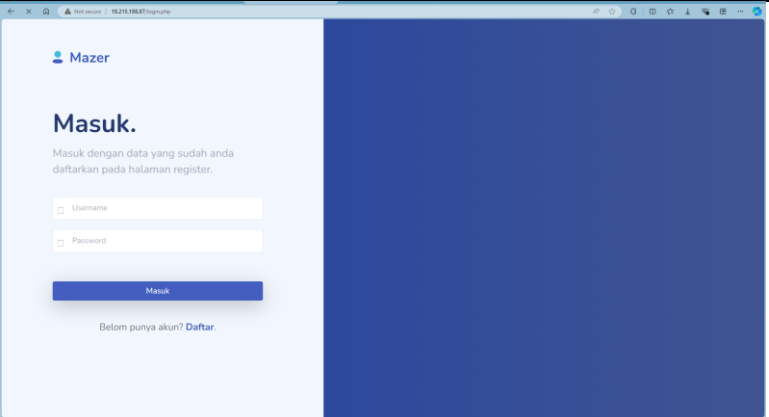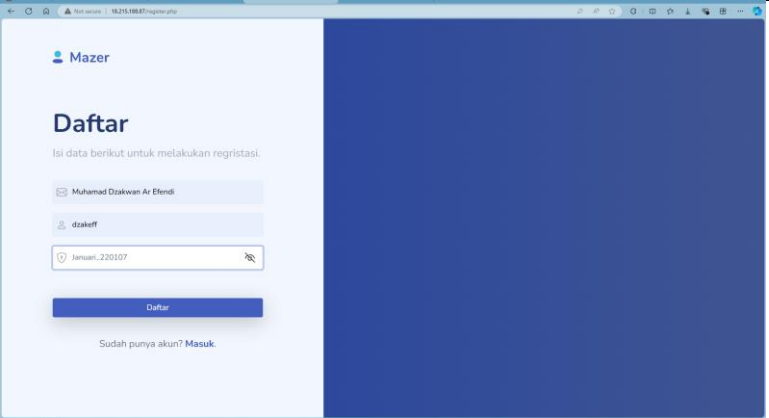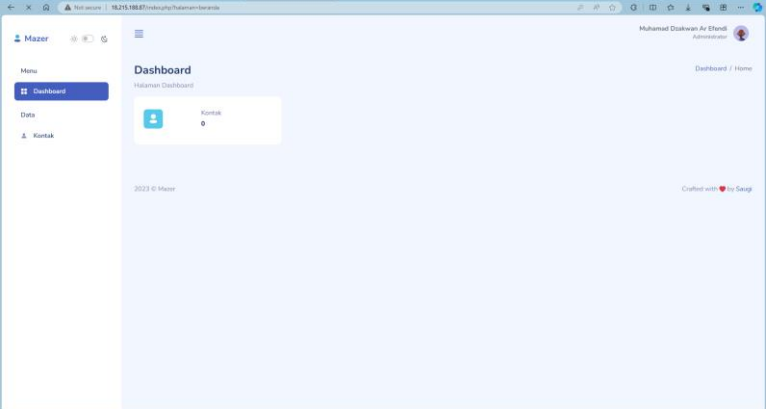
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6. Pengujian CRUD di Web dinamis

No	Tampilan	Hasil Gambar
1.	Akses website menggunakan IP Public / DNS	
2.	Membuat user baru	
3.	Tampilan dashboard web	

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4.	Praktik CRUD (Create, Read, Update, & Delete) *Tambahkan keterangan / penjelasan Disini SysAdmin mencoba membuat kontak Maserati dan police kemudian mengubah nomor Maserati dan menghapus kontak police. CRUD sudah berhasil dilakukan.	

** Boleh tambahkan tabel ujicoba sesuai kebutuhan.

☺ Selamat Mengerjakan☺