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**KELAS : INFORMATIKA 1**

## **MODUL 6**

### **Implementasi Sistem Terdistribusi Sederhana dengan MySQL Antar VM di AWS EC2**

#### **PEMBAHASAN**

Implementasi ini bertujuan untuk memahami dan mempraktikkan konsep sistem terdistribusi dengan menggunakan layanan Amazon Web Services (AWS), khususnya Elastic Compute Cloud (EC2) sebagai media komputasi virtual.

Dalam praktik ini, dibuat dua Virtual Machine (VM) atau instance EC2 yang masing-masing memiliki peran berbeda, yaitu:

- VM Server (Server Database) – berfungsi sebagai server MySQL, tempat penyimpanan dan pengelolaan data.
- VM Client (Client) – berperan sebagai client yang melakukan koneksi dan eksekusi *query* ke MySQL server di VM Server melalui jaringan.

Dengan konfigurasi tersebut, kedua VM saling berkomunikasi melalui alamat IP publik atau private, membentuk lingkungan yang menyerupai arsitektur client-server.

Persiapkan Virtual Machine Server dan Virtual Machine Client, bisa menggunakan Virtual Machine di pertemuan sebelumnya.

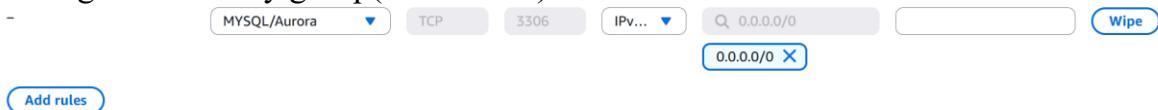
#### **KESIMPULAN**

Saya hari ini belajar tentang bagaimana menginstall MySQL pada AWS.

Disini juga saya menguji dengan memasukan data kemudian ditampilkan pada bentuk tabel. Bisa dilihat pada gambar terahir.

#### **LAMPIRAN**

1. Konfigurasi security group(VM Server)



2. Update sistem

```
ubuntu@ip-172-31-23-166:~$ sudo apt update && sudo apt upgrade -y
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble InRelease
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]
Get:4 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Get:5 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 Packages [15.0 MB]
Get:6 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe Translation-en [5982 kB]
Get:7 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [1301 kB]
Get:8 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 Components [3871 kB]
Get:9 http://security.ubuntu.com/ubuntu noble-security/main Translation-en [214 kB]
Get:10 http://security.ubuntu.com/ubuntu noble-security/main amd64 Components [21.5 kB]
Get:11 http://security.ubuntu.com/ubuntu noble-security/main amd64 c-n-f Metadata [9336 B]
Get:12 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Packages [906 kB]
Get:13 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 c-n-f Metadata [301 kB]
Get:14 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 Packages [269 kB]
Get:15 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse Translation-en [118 kB]
Get:16 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 Components [35.0 kB]
Get:17 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 c-n-f Metadata [8328 B]
Get:18 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [1584 kB]
Get:19 http://security.ubuntu.com/ubuntu noble-security/universe Translation-en [203 kB]
Get:20 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Components [52.2 kB]
```

i-019aa1aac2f3b5678 (vm-MySQL)

PublicIPs: 3.95.248.218 PrivateIPs: 172.31.23.166

### 3. Install MySQL

```
ubuntu@ip-172-31-23-166:~$ sudo apt install mysql-server -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  libcgi-fast-perl libcgi-pm-perl libclone-perl libencode-locale-perl libevent-pthreads-2.1-7t64 libfcgi-bin libfcgi-perl libfcgi0t64
  libhtml-parser-perl libhtml-tagset-perl libhttp-template-perl libhttp-date-perl libhttp-message-perl libio-html-perl
  liblwp-mediatypes-perl libmecab2 libprotobuf-lite32t64 libtimedate-perl liburi-perl mecab-ipadic mecab-ipadic-utf8 mecab-utils
  mysql-client-8.0 mysql-client-core-8.0 mysql-common mysql-server-8.0 mysql-server-core-8.0
Suggested packages:
  libdata-dump-perl libipc-sharedcache-perl libio-compress-brotli-perl libbusiness-isbn-perl libregexp-ipv6-perl libwww-perl mailx tinyca
The following NEW packages will be installed:
  libcgi-fast-perl libcgi-pm-perl libclone-perl libencode-locale-perl libevent-pthreads-2.1-7t64 libfcgi-bin libfcgi-perl libfcgi0t64
  libhtml-parser-perl libhtml-tagset-perl libhttp-template-perl libhttp-date-perl libhttp-message-perl libio-html-perl
  liblwp-mediatypes-perl libmecab2 libprotobuf-lite32t64 libtimedate-perl liburi-perl mecab-ipadic mecab-ipadic-utf8 mecab-utils
  mysql-client-8.0 mysql-client-core-8.0 mysql-common mysql-server mysql-server-8.0 mysql-server-core-8.0
0 upgraded, 28 newly installed, 0 to remove and 0 not upgraded.
Need to get 29.6 MB of archives.
After this operation, 243 MB of additional disk space will be used.
Get:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/main amd64 mysql-common all 5.8+1.1.0build1 [6746 B]
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu/noble-updates/main amd64 mysql-client-core-8.0 amd64 8.0.43-0ubuntu0.24.04.2 [2740 kB]
```

i-019aa1aac2f3b5678 (vm-MySQL)

PublicIPs: 3.95.248.218 PrivateIPs: 172.31.23.166

```
ubuntu@ip-172-31-23-166:~$ sudo systemctl enable mysql
Synchronizing state of mysql.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable mysql
ubuntu@ip-172-31-23-166:~$
```

i-019aa1aac2f3b5678 (vm-MySQL)

PublicIPs: 3.95.248.218 PrivateIPs: 172.31.23.166

```
ubuntu@ip-172-31-23-166:~$ sudo systemctl start mysql
ubuntu@ip-172-31-23-166:~$
```

i-019aa1aac2f3b5678 (vm-MySQL)

PublicIPs: 3.95.248.218 PrivateIPs: 172.31.23.166

### 4. Konfigurasi MySQL agar Bisa Diakses dari VM Lain

<b>bind-address</b>	= 127.0.0.1
<b>bind-address</b>	= 0.0.0.0

```
ubuntu@ip-172-31-23-166:~$ sudo systemctl restart mysql
ubuntu@ip-172-31-23-166:~$
```

i-019aa1aac2f3b5678 (vm-MySQL)

PublicIPs: 3.95.248.218 PrivateIPs: 172.31.23.166

### 5. Membuat user untuk akses jarak jauh

```
ubuntu@ip-172-31-23-166:~$ sudo systemctl enable mysql
Synchronizing state of mysql.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable mysql
ubuntu@ip-172-31-23-166:~$ sudo systemctl start mysql
ubuntu@ip-172-31-23-166:~$ sudo nano /etc/mysql/mysql.conf.d/mysqld.cnf
ubuntu@ip-172-31-23-166:~$ sudo systemctl restart mysql
ubuntu@ip-172-31-23-166:~$ sudo nano /etc/mysql/mysql.conf.d/mysqld.cnf
ubuntu@ip-172-31-23-166:~$ sudo systemctl restart mysql
ubuntu@ip-172-31-23-166:~$ sudo mysql
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 8
Server version: 8.0.43-Ubuntu0.24.04.2 (Ubuntu)

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owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.
```

i-019aa1aac2f3b5678 (vm-MySQL)

PublicIPs: 3.95.248.218 PrivateIPs: 172.31.23.166

```
mysql> CREATE USER 'akbar'@'%' IDENTIFIED BY 'password123';
Query OK, 0 rows affected (0.02 sec)

mysql> GRANT ALL PRIVILEGES ON *.* TO 'akbar'@'%' WITH GRANT OPTION;
Query OK, 0 rows affected (0.01 sec)

mysql> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.00 sec)

mysql> 
```

i-019aa1aac2f3b5678 (vm-MySQL)

PublicIPs: 3.95.248.218 PrivateIPs: 172.31.23.166

## 6. Menguji koneksi dari vm client

```
ubuntu@ip-172-31-19-9:~$ sudo apt update
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble InRelease
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]
Get:4 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Get:5 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 Packages [15.0 MB]
Get:6 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [1301 kB]
Get:7 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe Translation-en [5982 kB]
Get:8 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 Components [3871 kB]
Get:9 http://security.ubuntu.com/ubuntu noble-security/main Translation-en [214 kB]
Get:10 http://security.ubuntu.com/ubuntu noble-security/main amd64 Components [21.5 kB]
Get:11 http://security.ubuntu.com/ubuntu noble-security/main amd64 c-n-f Metadata [9336 B]
Get:12 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Packages [906 kB]
Get:13 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 c-n-f Metadata [301 kB]
Get:14 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 Packages [269 kB]
Get:15 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse Translation-en [118 kB]
Get:16 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 Components [35.0 kB]
Get:17 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/multiverse amd64 c-n-f Metadata [8328 B]
Get:18 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [1584 kB]
Get:19 http://security.ubuntu.com/ubuntu noble-security/universe Translation-en [203 kB]
Get:20 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Components [52.2 kB]
```

i-0f427cff747d38ea7 (vm-Client)

PublicIPs: 98.84.127.234 PrivateIPs: 172.31.19.9

```
ubuntu@ip-172-31-19-9:~$ sudo apt install mysql-client -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  mysql-client-8.0 mysql-client-core-8.0 mysql-common
The following NEW packages will be installed:
  mysql-client mysql-client-8.0 mysql-client-core-8.0 mysql-common
0 upgraded, 4 newly installed, 0 to remove and 9 not upgraded.
Need to get 2779 kB of archives.
After this operation, 61.8 MB of additional disk space will be used.
Get:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 mysql-client-core-8.0 amd64 8.0.43-Ubuntu0.24.04.2 [2740 kB]
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 mysql-common all 5.8+1.1.0build1 [6746 B]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 mysql-client-8.0 amd64 8.0.43-Ubuntu0.24.04.2 [22.4 kB]
Get:4 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 mysql-client all 8.0.43-Ubuntu0.24.04.2 [9404 B]
Fetched 2779 kB in 0s (45.5 MB/s)
Selecting previously unselected package mysql-client-core-8.0.
(Reading database ... 71735 files and directories currently installed.)
Preparing to unpack .../mysql-client-core-8.0_8.0.43-Ubuntu0.24.04.2_amd64.deb ...
Unpacking mysql-client-core-8.0 (8.0.43-Ubuntu0.24.04.2) ...
Selecting previously unselected package mysql-common.
```

i-0f427cff747d38ea7 (vm-Client)

PublicIPs: 98.84.127.234 PrivateIPs: 172.31.19.9

```
ubuntu@ip-172-31-19-9:~$ mysql -h 172.31.23.166 -u akbar -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 10
Server version: 8.0.43-Ubuntu0.24.04.2 (Ubuntu)

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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> [REDACTED]
```

i-Of427cff747d38ea7 (vm-Client)

PublicIPs: 98.84.127.234 PrivateIPs: 172.31.19.9

## 7. Melakukan query antar VM

```
mysql> USE mahasiswa;
Database changed
mysql> CREATE TABLE mahasiswa (
    ->     nim VARCHAR(20) PRIMARY KEY,
    ->     nama VARCHAR(100)
    -> );
Query OK, 0 rows affected (0.04 sec)

mysql> INSERT INTO mahasiswa (nim, nama) VALUES
    ->     ('235410023', 'Agung'),
    ->     ('235410026', 'Budi'),
    ->     ('235410022', 'Sari');
Query OK, 3 rows affected (0.01 sec)
Records: 3  Duplicates: 0  Warnings: 0
mysql> SELECT * FROM mahasiswa;
+-----+-----+
| nim   | nama  |
+-----+-----+
| 235410022 | Sari  |
| 235410023 | Agung |
| 235410026 | Budi  |
+-----+-----+
3 rows in set (0.00 sec)

mysql> [REDACTED]
```

i-Of427cff747d38ea7 (vm-Client)

PublicIPs: 98.84.127.234 PrivateIPs: 172.31.19.9