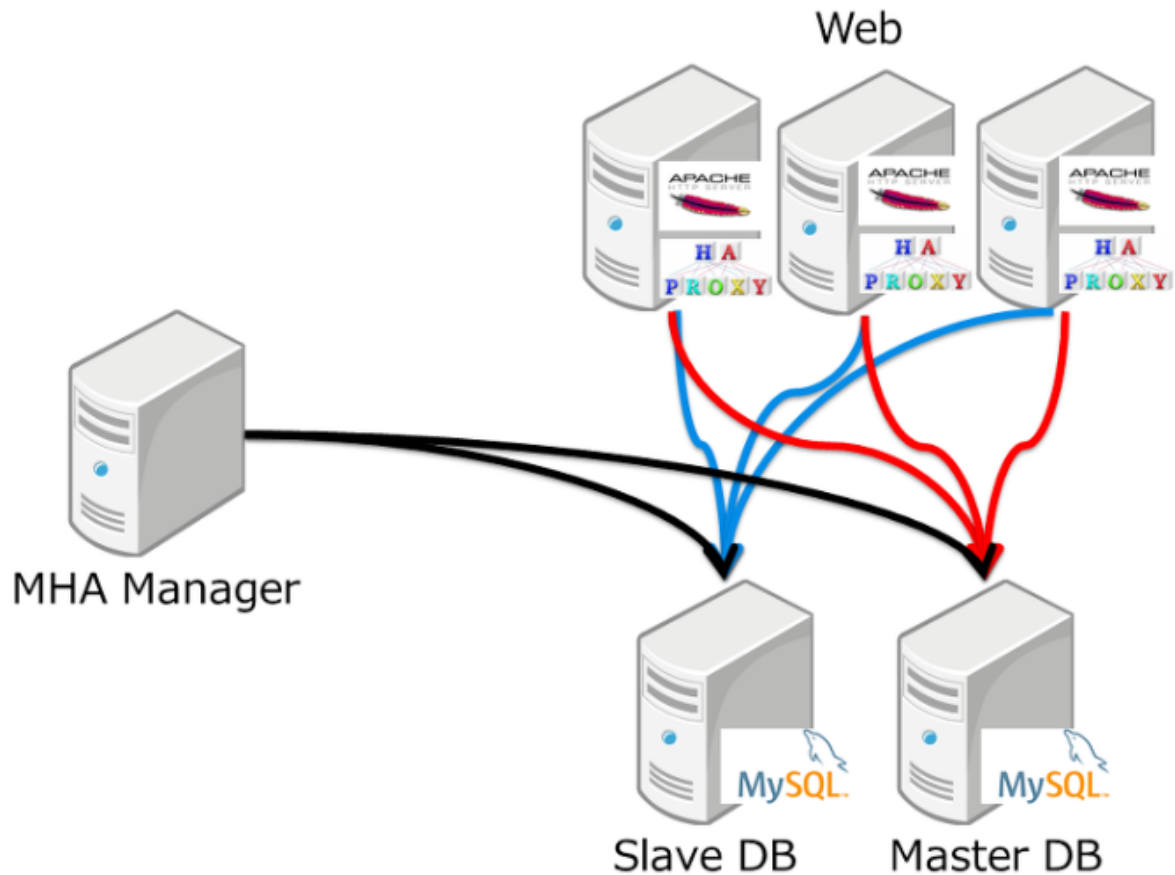


Database Replication

MHA(Master High Availability)은, Master DB가 장애가 발생하면, 자동으로 failover하여 Slave DB로 자동 failover



MHA는 MHA manager가 Master DB와 Slave DB를 관리하는 2개의 DB를 관리하는 구조이다.

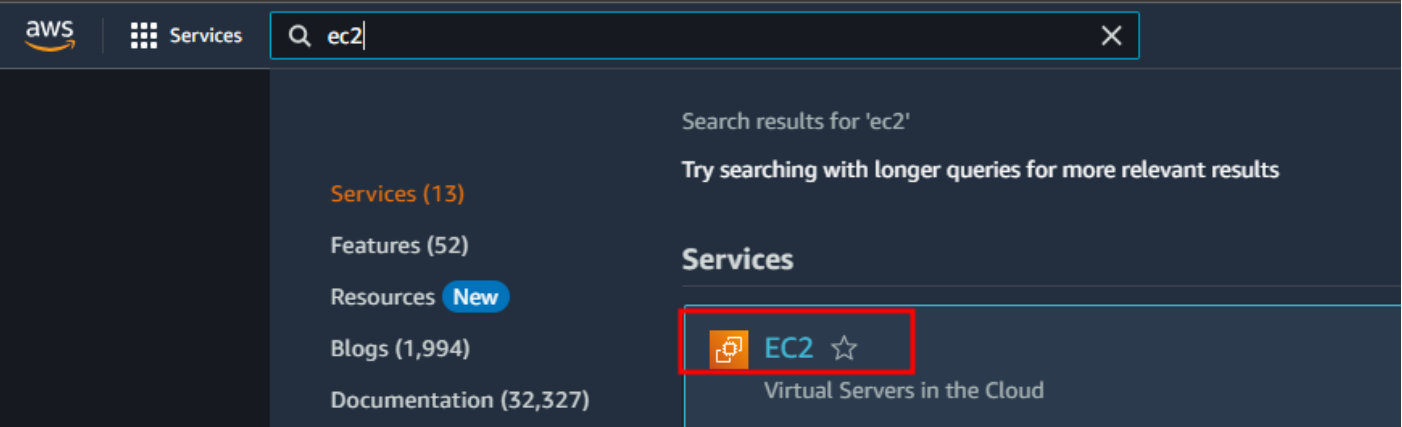
이 구조는 2개의 DB를 Master와 Slave(replication)DB로 구성하여 관리한다.

구현 방법

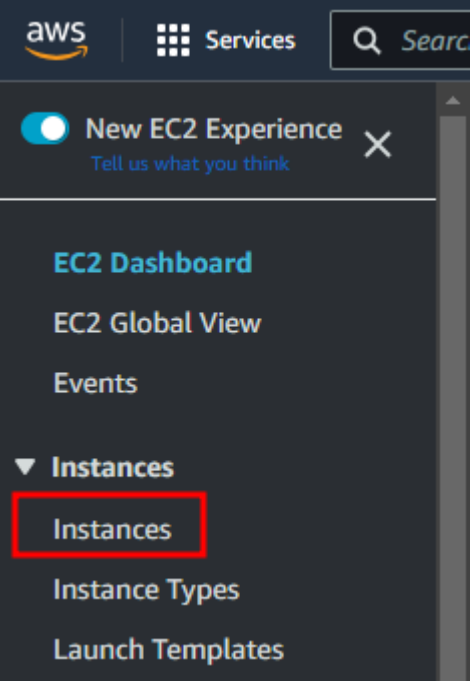
- 2개의 AWS EC2 인스턴스 (Cloud Virtual Machine)
- 1개의 x86_64 CPU 인스턴스 또는 1개의 ARM CPU 인스턴스
- DB-Master 인스턴스 (172.31.33.8)에 RHEL 9.2
- DB-Slave 인스턴스 (172.31.23.223)에 RHEL 9.2

EC2

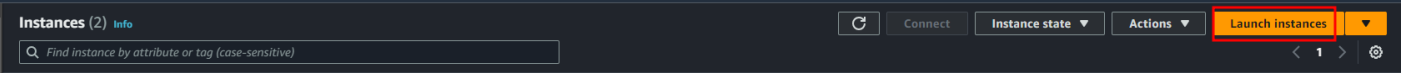
이 단원에서는 AWS 콘솔에서 EC2 인스턴스를 생성하는 방법을 소개합니다.



다음 단원에서는 'instances' 메뉴를 소개합니다.



다음 단원에서는 'Launch Instances' 버튼을 소개합니다.



이 단원에서는, EC2 인스턴스의 CPU 사양을 소개합니다.

Name and tags [Info](#)


Name

DB-Master

[Add additional tags](#)

▼ Application and OS Images (Amazon Machine Image) [Info](#)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. Search or Browse for AMIs if you don't see what you are looking for below

 Search our full catalog including 1000s of application and OS images

Recents

Quick Start

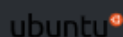
Amazon
Linux



macOS



Ubuntu



Windows



Red Hat



SUSE Li



[Browse more AMIs](#)

Including AMIs from
AWS, Marketplace and
the Community

Amazon Machine Image (AMI)

Red Hat Enterprise Linux 9 (HVM), SSD Volume Type

ami-004b403708f61ecd8 (64-bit (x86)) / ami-06d71950b140f27c5 (64-bit (Arm))

Virtualization: hvm ENA enabled: true Root device type: ebs

Free tier eligible ▼

Description

Provided by Red Hat, Inc.

Architecture

64-bit (x86) ▼

AMI ID

ami-004b403708f61ecd8

Verified provider

Slave DB ARM

Name and tags [Info](#)


Name

DB-Slave

[Add additional tags](#)

▼ Application and OS Images (Amazon Machine Image) [Info](#)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. Search or Browse for AMIs if you don't see what you are looking for below

 Search our full catalog including 1000s of application and OS images

Recents

Quick Start

Amazon
Linux



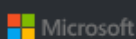
macOS



Ubuntu



Windows



Red Hat



SUSE Li



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AWS, Marketplace and
the Community

Amazon Machine Image (AMI)

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Virtualization: hvm ENA enabled: true Root device type: ebs

Description

Provided by Red Hat, Inc.

Architecture

64-bit (Arm)



AMI ID

ami-06d71950b140f27c5

Verified provider

□□□ □□□ □□ □□, □□□□ □□ □□□□ □□□□

▼ Instance type [Info](#)

Instance type

t4g.nano

Family: t4g 2 vCPU 0.5 GiB Memory Current generation: true

On-Demand Linux pricing: 0.0052 USD per Hour

On-Demand SUSE pricing: 0.0052 USD per Hour

☒ All generations

Compare instance types

► **Key pair (login)** [Info](#)

▼ **Network settings** [Info](#)

Edit

Network Info

vpc-05d0a325871436a03

Subnet Info

No preference (Default subnet in any availability zone)

Auto-assign public IP [Info](#)

Enable

Firewall (security groups) Info

- Create security group

- Select existing security group

Common security groups [Info](#)

Select security groups

C

Compare security group rules

Security groups that you add or remove here will be added to or removed from all your network interfaces.

▼ Configure storage [Info](#)

Advanced

1x

10

GiB

gp2

Root volume (Not encrypted)

AWS Firewall.

Block

이제 생성한 키 쌍을 사용하여, SSH 접속을 할 수 있습니다.

Create key pair

Key pair name

Key pairs allow you to connect to your instance securely.

keyfordb

The name can include upto 255 ASCII characters. It can't include leading or trailing spaces.

Key pair type

☒ RSA

RSA encrypted private and public key pair

☐ ED25519

ED25519 encrypted private and public key pair

Private key file format

☒ .pem

For use with OpenSSH

☐ .ppk

For use with PuTTY

⚠

When prompted, store the private key in a secure and accessible location on your computer. You will need it later to connect to your instance. [Learn more](#)

Cancel

Create key pair

이제 생성한 2개의 인스턴스를 볼 수 있습니다.

<input type="checkbox"/>	DB-Slave	i-0a7fa2b2f131ea44b	<div><div></div>Running</div>	<div><div></div><div></div></div>	t4g.small
<input type="checkbox"/>	DB-Master	i-097725e0ede023162	<div><div></div>Running</div>	<div><div></div><div></div></div>	t2.micro

이제 생성한 인스턴스에 SSH 접속을 할 수 있습니다.

1 DB-Master

2 DB-Slave

+

[root@ip-172-31-33-8 ~]#

OS DB CPU DB DB

DB OS

```
[root@ip-172-31-33-8 ~]# cat /etc/os-release
```

NAME="Red Hat Enterprise Linux"

VERSION="9.2 (Plow)"

DB CPU DB

```
[root@ip-172-31-33-8 ~]# lscpu
```

Architecture: x86_64

CPU op-mode(s): 32-bit, 64-bit

Address sizes: 46 bits physical, 48 bits virtual

Byte Order: Little Endian

CPU(s): 1

On-line CPU(s) list: 0

Vendor ID: GenuineIntel

BIOS Vendor ID: Intel

Model name: Intel(R) Xeon(R) CPU E5-2686 v4 @ 2.30GHz

Slave DB OS

```
[root@ip-172-31-23-223 ~]# cat /etc/os-release
```

NAME="Red Hat Enterprise Linux"

VERSION="9.2 (Plow)"

Slave DB CPU DB

```
[root@ip-172-31-23-223 ~]# lscpu
```

Architecture: aarch64

CPU op-mode(s): 32-bit, 64-bit

Byte Order: Little Endian

CPU(s): 2

On-line CPU(s) list: 0,1

Vendor ID: ARM

BIOS Vendor ID: AWS

Model name: Neoverse-N1

BIOS Model name: AWS Graviton2

MariaDB v15.1

```
mariaDB[0] Monty mysql [0] MontyProgram AB[0] mariaDB[0]  
[0] mariaDB[0] mysql [0]
```

MariaDB   Master  Slave  .   Master  Slave   mariaDB    

```
# 111 1111
sudo dnf update -y

# MariaDB 111 11
sudo dnf -y install mariadb-*

# MariaDB 11 11
sudo systemctl enable mariadb
sudo systemctl start mariadb

# MasteDB111 MariaDB 11 11
[root@ip-172-31-33-8 ~]# mariadb --version
mariadb Ver 15.1 Distrib 10.5.16-MariaDB, for Linux (x86_64) using EditLine wrapper

# SlaveDB111 MariaDB 11 11
[root@ip-172-31-23-223 ~]# mariadb --version
mariadb Ver 15.1 Distrib 10.5.16-MariaDB, for Linux (aarch64) using EditLine wrapper

# root 1111 MariaDB 11 11 1111 11
sudo su - root
mysql_secure_installation

# 11 111 1111
Enter current password for root (enter for none):
OK, successfully used password, moving on...

Remove anonymous users? [Y/n] y
... Success!

Disallow root login remotely? [Y/n] n
... skipping.
```


Remove test database and access to it? [Y/n] y

- Dropping test database...

... Success!

Removing privileges on test database...

... Success!

Reload privilege tables now? [Y/n] y

... Success!

Cleaning up...

All done!

Thanks for using MariaDB!

MariaDB

MariaDB

vi /etc/my.cnf.d/mariadb-server.cnf

log-bin=mysql-bin

server-id=1

MariaDBMS

mysql -u root

DB

MariaDB [(none)]> create database testDB;

DB

MariaDB [(none)]> show databases;

+-----+

| Database |

+-----+

| information_schema |

| mysql |

| performance_schema |

```
| testDB          |
```

```
+-----+
```

```
4 rows in set (0.000 sec)
```

```
# Master DB Privileges
```

```
MariaDB [mysql]> grant all privileges on testDB.* to 'Master'@'%' identified by '1';
```

```
Query OK, 0 rows affected (0.003 sec)
```

```
# SlaveDB replication
```

```
MariaDB [mysql]> grant replication slave on *.* to 'Slave'@'%' identified by '1';
```

```
Query OK, 0 rows affected (0.001 sec)
```

```
## DBMS mariadb
```

```
MariaDB [mysql]> exit
```

```
systemctl restart mariadb
```

```
# SlaveDB Position ID
```

```
mysql -u root -p -e "show master status"
```

```
+-----+-----+-----+-----+
```

```
| File          | Position | Binlog_Do_DB | Binlog_Ignore_DB |
```

```
+-----+-----+-----+-----+
```

```
| mysql-bin.000003 | 342 | | |
```

```
+-----+-----+-----+-----+
```

```
# DB Backup
```

```
mysqldump -u root --all-databases > backup.sql
```

```
# SCP DB Backup SlaveDB
```

```
scp backup.sql root@172.31.23.223:/root/
```

SlaveDB

```
# MariaDB
```

```
vi /etc/my.cnf.d/mariadb-server.cnf
```

```
server-id=2
```

```
replicate-do-db='testDB'
```

```
mysql -u root< backup.sql
```

MariaDBMS

```
mysql -u root
```

```
# MasterDB DB
```

```
MariaDB [(none)]> show databases;
```

$$+ \text{-----} +$$

| Database |

$$+ \text{-----} +$$

```
| testDB |
```

```
| information_schema |
```

```
| mysql |
```

| performance_schema |

$$+ \text{-----} +$$

4 rows in set (0.007 sec)

Slave ☐

```
MariaDB [(none)]> change master to master_host='172.31.33.8',
```

```
-> master_user='Slave',
```

```
-> master_password='1',
```

```
-> master_log_file='mysql-bin.000003',
```

```
-> master_log_pos=342;
```

Query OK, 0 rows affected (0.009 sec)

MariaDB ☐

```
systemctl restart mariadb
```

```
Master Slave [ ] [ ] [ ] [ ] [ ]. [ ] [ ] [ ] [ ] 'testDB' [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]
```

```
## MasterDB
```

```
[root@ip-172-31-33-8 ~]# mysql -u root
```

Welcome to the MariaDB monitor. Commands end with ; or \g.

Your MariaDB connection id is 4

Server version: 10.5.16-MariaDB-log MariaDB Server

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

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

MariaDB [(none)]> use testDB;

Reading table information for completion of table and column names

You can turn off this feature to get a quicker startup with -A

Database changed

MariaDB [testDB]> show tables;

```
+-----+
| Tables_in_testDB |
+-----+
| test              |
+-----+
1 row in set (0.000 sec)
```

test2 ☐☐☐☐

MariaDB [testDB]> create table test2 (a int);

Query OK, 0 rows affected (0.009 sec)

MariaDB [testDB]> show tables;

```
+-----+
| Tables_in_testDB |
+-----+
| test              |
| test2             |
+-----+
2 rows in set (0.001 sec)
```

test3 ☐☐☐☐☐☐

MariaDB [testDB]> create table test3 (a int);

Query OK, 0 rows affected (0.007 sec)

MariaDB [testDB]> show tables;

```
+-----+
| Tables_in_testDB |
+-----+
| test              |
| test2             |
```

```
| test3      |
+-----+
3 rows in set (0.000 sec)
```

SlaveDB Replication

```
## SlaveDB
[root@ip-172-31-23-223 ~]# mysql -u root
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 6
Server version: 10.5.16-MariaDB MariaDB Server

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

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

## testDB
MariaDB [(none)]> use testDB;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
# MasterDB test2
MariaDB [testDB]> show tables;
+-----+
| Tables_in_testDB |
+-----+
| test              |
| test2             |
+-----+
2 rows in set (0.000 sec)

# MasterDB test3
MariaDB [testDB]> show tables;
+-----+
| Tables_in_testDB |
+-----+
| test              |
```

```
| test2      |
| test3      |
+-----+
3 rows in set (0.000 sec)
```

MHA Manager 環境 構築 MHA MySQL DB Replication 構築

環境 構築 MySQL v5.7 環境 構築, MHA manager, MasterDB 構築 SlaveDB 構築 構築 構築. MHA manager 構築 構築 au 構築 構築 構築

- 3 構築 AWS EC2 構築 (Cloud 構築 Virtual Machine)
- 2 構築(MHA+Master)構築 x86_64 CPU 構築 構築 構築 1(Slave)構築 ARM CPU 構築 構築 構築
- MHA-Manager 構築 (172.31.45.57) 構築 RHEL 9.2
- DB-Master 構築 (172.31.35.181) 構築 RHEL 9.2
- DB-Slave 構築 (172.31.25.160) 構築 RHEL 9.2

EC2 構築 構築 構築 構築 構築 構築 構築 OS 構築 CPU Architecture 構築 構築 構築.

```
## MHA OS 構築 構築 構築
$ cat /etc/os-release
NAME="Red Hat Enterprise Linux"
VERSION="9.2 (Plow)"

$ lscpu
Architecture:      x86_64

## 構築 DB OS 構築 構築 構築
$ cat /etc/os-release
NAME="Red Hat Enterprise Linux"
VERSION="9.2 (Plow)"

$ lscpu
Architecture:      x86_64

## Slave DB OS 構築 構築 構築
$ cat /etc/os-release
NAME="Red Hat Enterprise Linux"
```

```
VERSION="9.2 (Plow)"
```

```
$ lscpu
```

```
Architecture:      aarch64
```

DB 安装

安装 MySQL v5.7

MySQL 安装 rpm 包, 安装 rpm 包

```
# GPG 导入
sudo rpm --import https://repo.mysql.com/RPM-GPG-KEY-mysql-2022

# rpm 安装
wget https://dev.mysql.com/get/mysql57-community-release-el7-11.noarch.rpm

# mysql 安装
yum localinstall mysql57-community-release-el7-11.noarch.rpm
yum repolist enabled | grep "mysql.-community."
yum install mysql-community-server -y

# mysqld 启动
systemctl start mysqld
systemctl status mysqld
```

Revision #5

Created 7 July 2023 13:54:37 by

Updated 22 July 2023 09:53:57 by