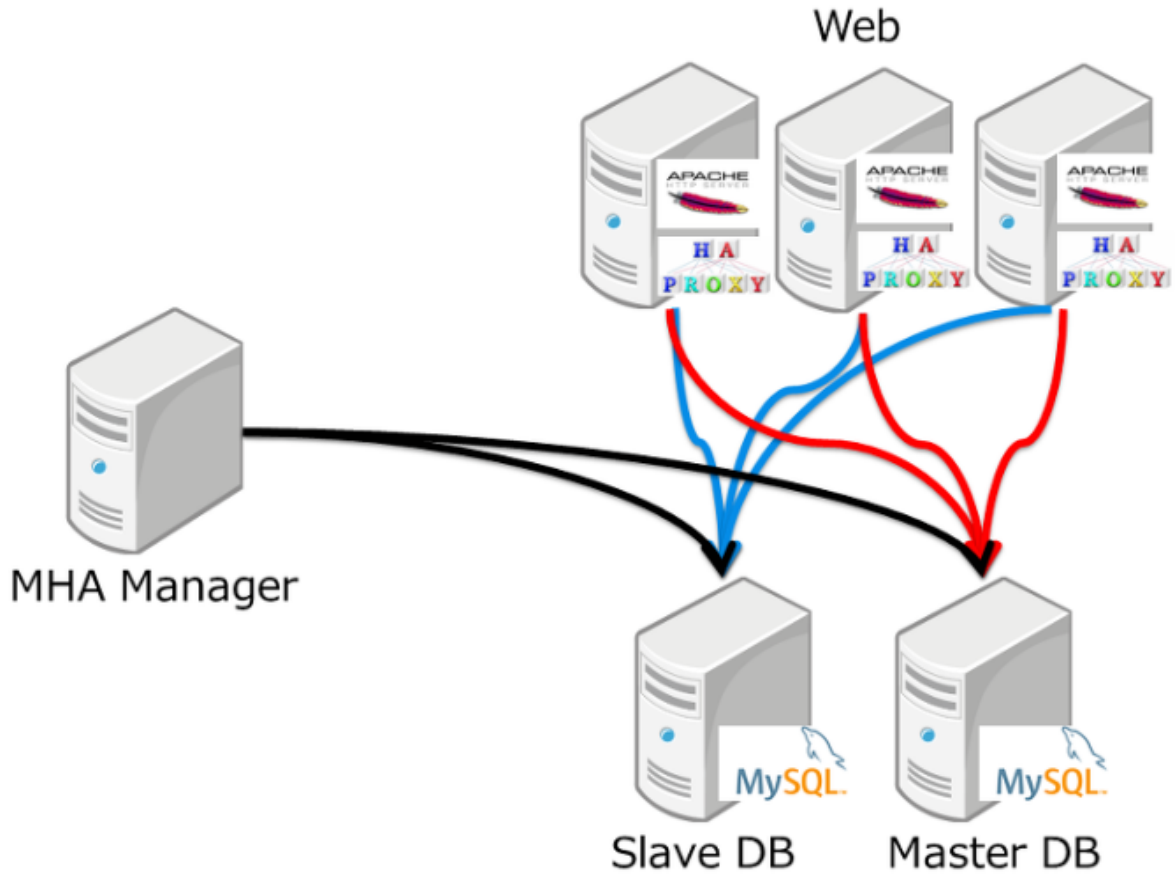


Database: Linux

- [Database Replication](#)

Database Replication

MHA(Master High Availability)은 Master DB의 장애를 감지하고, Slave DB로 failover를 수행하여 High Availability를 보장하는 솔루션이다.



MHA는 MHA manager와 MHA agent로 구성되며, MasterDB와 SlaveDB를 2개의 DB로 구성하여 High Availability를 보장한다.

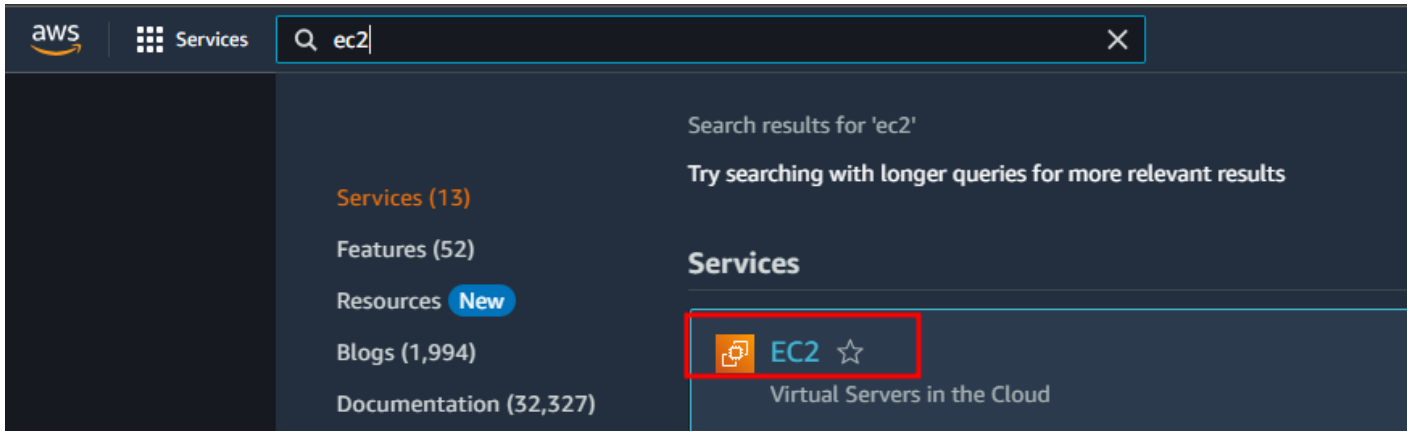
2개의 DB는 Master와 Slave(replication)DB로 구성된다.

구현 방법

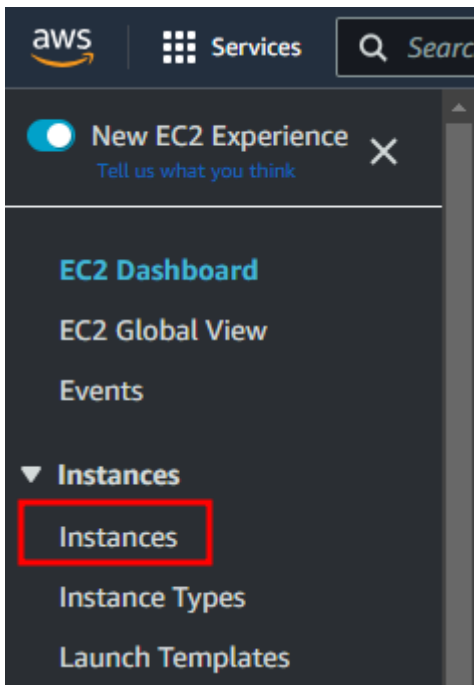
- 2개의 AWS EC2 인스턴스 (Cloud Virtual Machine)
- 1개의 x86_64 CPU 인스턴스 또는 1개의 ARM CPU 인스턴스
- DB-Master 인스턴스 (172.31.33.8) - RHEL 9.2
- DB-Slave 인스턴스 (172.31.23.223) - RHEL 9.2

EC2 인스턴스

☐ ☐ ☐ ☐ AWS ☐ ☐ ☐ ☐ ☐ EC2 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐



☐ ☐ ☐ ☐ ☐ 'instances' ☐ ☐ ☐ ☐



☐ ☐ ☐ ☐ ☐ 'Launch Instances' ☐ ☐ ☐



☐ ☐ ☐ ☐ ☐, ☐ ☐ ☐ CPU ☐ ☐ ☐ ☐ ☐

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

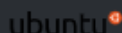
Amazon
Linux



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

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

Free tier eligible

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

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](#)

A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.

Create security group

Select existing security group

Common security groups [Info](#)

Select security groups



[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 ☐ ☐ ☐ ☐ ☐

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐, SSH ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Create key pair ✕

Key pair name
Key pairs allow you to connect to your instance securely.

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

☐ ☐ ☐ ☐ 2 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

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

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ SSH ☐ ☐ ☐ ☐

```
1 DB-Master x 2 DB-Slave x +  
[root@ip-172-31-33-8 ~]#
```

OS CPU

DB OS

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

```
NAME="Red Hat Enterprise Linux"
```

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

DB CPU

```
[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

```
[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
```

如何安装 MariaDB v15.1

如何安装 MariaDB v15.1 的 MySQL 二进制包。MySQL 二进制包由 MySQL 公司开发，而 MariaDB 二进制包由 MariaDB 公司开发。MariaDB 二进制包与 MySQL 二进制包兼容，但 MariaDB 二进制包不支持 MySQL 的某些功能。

如何安装 MariaDB v15.1 的 Master-Slave 复制。MariaDB 的 Master-Slave 复制与 MySQL 的 Master-Slave 复制类似，但 MariaDB 的 Master-Slave 复制不支持 MySQL 的某些功能。

```
# 更新系统
sudo dnf update -y

# MariaDB 安装
sudo dnf -y install mariadb-*

# MariaDB 服务
sudo systemctl enable mariadb
sudo systemctl start mariadb

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

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

# 以 root 用户身份安装 MariaDB
sudo su - root
mysql_secure_installation

# 设置 root 用户密码
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'

```


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 000 00 00 MHA MySQL DB Replication 00

00 00000 MySQL v5.7 00 00, MHA manager, MasterDB 0 SlaveDB 000 000 00 000. MHA manager 000 au

00000 000 000

- 3 00 AWS EC2 0000 (Cloud 0 Virtual Machine)
- 2 0(MHA+Master) 0 x86_64 CPU 00000 00 000 1(Slave) 00 ARM CPU 00000 0000
- MHA-Manager 0000 (172.31.45.57) 0 RHEL 9.2
- DB-Master 0000 (172.31.35.181) 0 RHEL 9.2
- DB-Slave 0000 (172.31.25.160) 0 RHEL 9.2

EC2 0000 00 0 00 0000 00 00 0000 00 OS 0 CPU Architecture 00 00 00.

```
## MHA OS 0 0000 00
$ cat /etc/os-release
NAME="Red Hat Enterprise Linux"
VERSION="9.2 (Plow)"

$ lscpu
Architecture:      x86_64

## 000 DB OS 0 0000 00
$ cat /etc/os-release
NAME="Red Hat Enterprise Linux"
VERSION="9.2 (Plow)"

$ lscpu
Architecture:      x86_64

## Slave DB OS 0 0000 00
$ cat /etc/os-release
NAME="Red Hat Enterprise Linux"
```

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

```
$ lscpu
```

```
Architecture:      aarch64
```

DB 00 00

00 0000 MySQL v5.7 00 00

MySQL 00 00 rpm 0000 000 00, 00 0000 00 00 00

```
# GPG 00 import 00
```

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

```
# rpm 00 0000 00
```

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

```
# mysql 00
```

```
yum localinstall mysql57-community-release-el7-11.noarch.rpm
```

```
yum repolist enabled | grep "mysql.-community."
```

```
yum install mysql-community-server -y
```

```
# mysqld 00 00 00 00
```

```
systemctl start mysqld
```

```
systemctl status mysqld
```