

SQL サーバとは

折角、Linux を学習していますので現在、無料の RDB(リレーショナルデータベース)の世界でシェアの高い MariaDB (データベースサーバ)を用いて簡単なデータベースを構築してみましょう！

MariaDB では、同一サーバ内に複数のデータベースを作成します。さらに、データベースの中にテーブルを作成して利用します。なお、OS で用意されるユーザーとは別に、MariaDB では専用の権限情報を使用します。そのため、**OS 上にアカウントを持っても、MariaDB で正しく権限設定をしていなければ使用できません。**

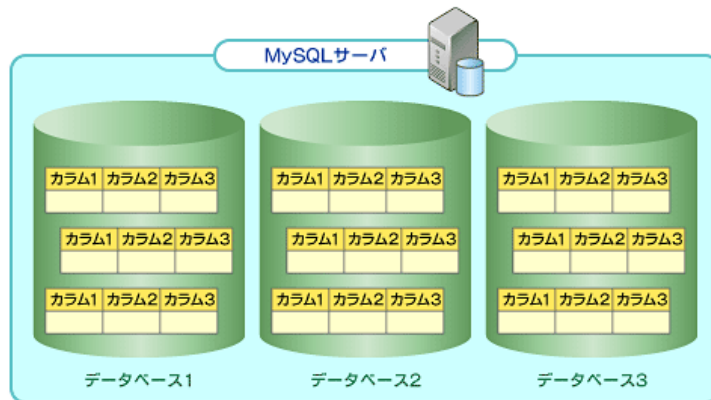


図1 MariaDB サーバの概念図

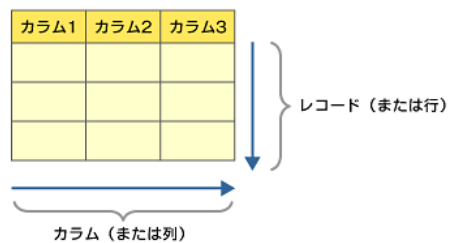


図2 テーブルの概念図

SQL 基本操作

(1) MariaDB のインストール

```
[hal@motobe ~]$ rpm -q mariadb-server
```

```
mariadb-server-10.5.16-2.el9.x86_64
```

※「NT43 Linux 資料 04 プログラムのインストール(5月8日)」でインストール済み

※インストールしてない時は(プロキシ設定が必要)

```
[hal@motobe ~]$ sudo yum -y install mariadb-server
```

(2) MariaDB の設定ファイル変更

```
[hal@motobe ~]$ sudo vi /etc/my.cnf.d/charset.cnf
```

```
# 新規作成
# デフォルトの文字コードを設定
# 未設定の場合のデフォルトは [latin1]
# 絵文字等 4 バイト長の文字を扱う場合は [utf8mb4]
[mysqld]
character-set-server = utf8mb4
```

```
[client]
default-character-set = utf8mb4
```

(3) MariaDB の起動

①MariaDB を起動する

```
[hal@motobe ~]$ sudo systemctl start mariadb
```

②Firewall 設定

```
[hal@motobe ~]$ sudo firewall-cmd --zone=public --list-services --permanent
cockpit dhcpv6-client ftp http https ssh
```

※まだ「sql」が許可されていません

```
[hal@motobe ~]$ sudo firewall-cmd --add-service=mysql --permanent
success
```

※サービス名が「mysql」って・・・

```
[hal@motobe ~]$ sudo firewall-cmd --reload
success
```

```
[hal@motobe ~]$ sudo firewall-cmd --zone=public --list-services --permanent
cockpit dhcpv6-client ftp http https mysql ssh
```

②MariaDB の初期設定

```
[hal@motobe ~]$ sudo mysql_secure_installation
```

In order to log into MariaDB to secure it, we'll need the current password for the root user. If you've just installed MariaDB, and you haven't set the root password yet, the password will be blank, so you should just press enter here.

Enter current password for root (enter for none): ←初期パスワードは空欄なので

そのままエンター

OK, successfully used password, moving on...

Setting the root password ensures that nobody can log into the MariaDB root user without the proper authorisation.

Set root password? [Y/n] y ←root パスワードを設定

New password: ←Linux とは別の SQL 用のパスワード(halhalhal)

Re-enter new password: ←確認(halhalhal)

Password updated successfully!

Reloading privilege tables..

... Success!

By default, a MariaDB installation has an anonymous user, allowing anyone to log into MariaDB 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? [Y/n] y ←匿名ユーザーは削除

... 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? [Y/n] y

←root のリモートログインは無効

... Success!

By default, MariaDB 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? [Y/n] y

←テストデータベースは削除

- Dropping test database...

... Success!

- Removing privileges on test database...

... Success!

Reloading the privilege tables will ensure that all changes made so far will take effect immediately.

Reload privilege tables now? [Y/n] y

←特権情報リロード

... Success!

Cleaning up...

All done! If you've completed all of the above steps, your MariaDB installation should now be secure.

Thanks for using MariaDB!

③MariaDB へのログイン

[hal@motobe ~]\$ **mysql -u root -p**

←MariaDB に root ユーザーで接続

Enter password:

←設定したパスワード(halhalhal)

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

Your MariaDB connection id is 13

Server version: 10.5.16-MariaDB MariaDB Server

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

Type 'help;' or 'Yh' for help. Type 'Yc' to clear the current input statement.

MariaDB [(none)]> ←ログイン出来ました！

MariaDB [(none)]> select user,host,password from mysql.user; ←ユーザ情報確認

```
+-----+-----+-----+
| User          | Host          | Password                                     |
+-----+-----+-----+
| mariadb.sys   | localhost     |                                             |
| root          | localhost     | *F5A8C80B7E35376A505B9B497EED6B95EEDBBF09 |
| mysql         | localhost     | invalid                                     |
+-----+-----+-----+
3 rows in set (0.002 sec)
```

MariaDB [(none)]> show databases; ←データベースの確認

```
+-----+
| Database      |
+-----+
| information_schema |
| mysql         |
| performance_schema |
+-----+
3 rows in set (0.00 sec)
```

MariaDB [(none)]> grant all privileges on test.* to cent@localhost identified by 'halhalhal';

Query OK, 0 rows affected (0.00 sec)

← test データベースへの全てのアクセス権限を持った、新規ユーザーcent を登録

MariaDB [(none)]> select user from mysql.user where user='cent';

← cent ユーザー登録確認

```
+-----+
| user |
+-----+
| cent |
+-----+
1 row in set (0.00 sec)
```

MariaDB [(none)]> **exit**

← ログアウト

Bye

●今度は cent ユーザでログイン

[hal@motobe ~]\$ **mysql -u cent -p**

Enter password: ←設定したパスワード(halhalhal)

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

Your MariaDB connection id is 14

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.

MariaDB [(none)]> ←cent ユーザでログイン出来ました！

④MariaDB の基本操作 ←皆さんには必要ありませんが、一応・・・

MariaDB [(none)]> show databases; ←データベースの確認

```
+-----+
| Database          |
+-----+
| information_schema |
+-----+
1 row in set (0.00 sec)
```

MariaDB [(none)]> create database test; ←データベース test 作成

Query OK, 1 row affected (0.01 sec)

MariaDB [(none)]> show databases; ←データベース作成確認

```
+-----+
| Database          |
+-----+
| information_schema |
| test              |
+-----+
2 rows in set (0.01 sec)
```

MariaDB [(none)]> **use test;**

Database changed

←test データベースへ接続

MariaDB [test]> **show tables;**

Empty set (0.00 sec)

←現在のテーブル確認

MariaDB [test]>**create table osaka(num int, name varchar(50));** ←osaka テーブル作成

Query OK, 0 rows affected (0.00 sec)

MariaDB [test]> **show tables;**

←テーブル作成確認

+-----+

| Tables_in_test |

+-----+

| **osaka** |

+-----+

1 row in set (0.00 sec)

MariaDB [test]> **select * from osaka;**

←データ確認

Empty set (0.00 sec)

MariaDB [test]> **insert into osaka values(1,'山田太郎');**

←osaka テーブルへデータ登録

Query OK, 1 row affected (0.00 sec)

MariaDB [test]> **select * from osaka;**

←データ登録確認

+-----+

| num | name |

+-----+

| **1 | 山田太郎** |

+-----+

1 row in set (0.01 sec)

MariaDB [test]> **update osaka set name='山田次郎';**

←osaka テーブル内データ更新

Query OK, 1 row affected (0.00 sec)

Rows matched: 1 Changed: 1 Warnings: 0

MariaDB [test]> **select * from osaka;**

←データ更新確認

```
+-----+-----+
| num   | name       |
+-----+-----+
| 1     | 山田次郎   |
+-----+-----+
1 row in set (0.00 sec)
```

MariaDB [test]> **delete from osaka where num=1;**

←osaka テーブル内データ削除

Query OK, 1 row affected (0.00 sec)

MariaDB [test]> **select * from osaka;**

←データ削除確認

Empty set (0.00 sec)

MariaDB [test]> **show tables;**

← 現在のテーブル確認

```
+-----+
| Tables_in_test |
+-----+
| osaka          |
+-----+
```

MariaDB [test]> **drop table osaka;**

←osaka テーブル削除

Query OK, 0 rows affected (0.01 sec)

MariaDB [test]> **show tables;**

←テーブル削除確認

Empty set (0.00 sec)

MariaDB [test]> **show databases;**

← 現在のデータベース確認

```
+-----+
| Database          |
+-----+
| information_schema |
| test              |
+-----+
2 rows in set (0.00 sec)
```

MariaDB [test]> **drop database test;**

← データベース test 削除

Query OK, 0 rows affected (0.01 sec)

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

← データベース削除確認

```
+-----+
| Database          |
+-----+
| information_schema |
+-----+
1 row in set (0.00 sec)
```

MariaDB [(none)]> **exit**

Bye

●cent ユーザの削除

[hal@motobe ~]\$ **mysql -u root -p**

Enter password:

←設定したパスワード(halhalhal)

MariaDB [(none)]> **select user from mysql.user;**

←ユーザ確認

```
+-----+
| User          |
+-----+
| cent          |
| mariadb.sys  |
| mysql        |
| root         |
+-----+
4 rows in set (0.00 sec)
```

MariaDB [(none)]> **revoke all privileges on *.* from cent@localhost;**

Query OK, 0 rows affected (0.01 sec)

←cent ユーザーから全てのデータベースへのアクセス権限を剥奪

MariaDB [(none)]> **delete from mysql.user where user='cent' and host='localhost';**

Query OK, 1 row affected (0.00 sec)

←cent ユーザー削除

MariaDB [(none)]> **select user from mysql.user;**

←削除確認

```
+-----+
| User      |
+-----+
| mariadb.sys |
| mysql      |
| root       |
+-----+
3 rows in set (0.001 sec)
```

MariaDB [(none)]> **flush privileges;**

←cent ユーザーの削除を MariaDB サーバーへ反映

Query OK, 0 rows affected (0.00 sec)

MariaDB [(none)]> **exit**

←ログアウト

Bye

⑤MariaDB の既存のデータを全て消去して初期化する場合

[hal@motobe ~]\$ **sudo systemctl stop mariadb**

[hal@motobe ~]\$ **sudo rm -rf /var/lib/mysql/***

[hal@motobe ~]\$ **sudo mysql_install_db --datadir=/var/lib/mysql --user=mysql**

[hal@motobe ~]\$ **sudo systemctl restart mariadb**

以上！