Database Cache

All of Fedora's persistent content and metadata are stored on disk in an OCFL storage root. For performance reasons, Fedora maintains a cache of system and user metadata in a rebuildable database.

For quickly spinning up Fedora in a testing / experimental context, a default H2 database is available by default.

However, for production installations, it is recommended to use a MariaDB, MySQL or PostgreSQL database.

Fedora currently supports the following versions:

- PostgresQL 12.3
- MariaDB 10.5.3
- MySQL 8.0

Below are the steps to use MySQL, MariaDB or PostgreSQL, as well as Docker instructions if you choose to run your database in a Docker container.

For the full list of database properties, please refer to the **Database** section of the Properties documentation.

Native Database Setup

MariaDB

1. Install an instance of MariaDB and create a database called `fcrepo` and a user account that can access it
2. Run Fedora with the following properties defined either in your properties file or in your `JAVA_OPTS`:

```
fcrepo.db.url=jdbc:mariadb://localhost:3306/fcrepo
fcrepo.db.user=<username>
fcrepo.db.password=<password>
```

Note, the `fcrepo` database must be manually created, but the tables will be automatically created.

PostgreSQL

1. Install an instance of PostgreSQL and create a database called `fcrepo` and a user account that can access it
2. Run Fedora with the following properties defined either in your properties file or in your `JAVA_OPTS:`

```
fcrepo.db.url=jdbc:postgresql://localhost:5432/fcrepo
fcrepo.db.user=<username>
fcrepo.db.password=<password>
```

Note, the `fcrepo` database must be manually created, but the tables will be automatically created.

MySQL

1. Install an instance of MySQL and create a database called `fcrepo` and a user account that can access it
2. Run Fedora with the following properties defined either in your properties file or in your `JAVA_OPTS:`

```
fcrepo.db.url=jdbc:mysql://localhost:3306/fcrepo
fcrepo.db.user=<username>
fcrepo.db.password=<password>
```

Note, the `fcrepo` database must be manually created, but the tables will be automatically created.

Database Initialization

MySQL and MariaDB

To create a new database and user in MySQL, assuming a username of `user1` and a password of `xyz`:

```
$ mysql -u root -p
> CREATE DATABASE fcrepo CHARACTER SET utf8mb4 COLLATE utf8mb4_bin;
> CREATE USER 'user1'@'localhost' IDENTIFIED BY 'xyz';
> GRANT ALL PRIVILEGES ON fcrepo.* to 'user1'@'localhost';
> \q
```

MySQL and MariaDB use case insensitive collations by default, but resources in Fedora are case sensitive. If you decide to create your database using a case insensitive collation, then Fedora will not be able to handle case appropriately, leading to undefined behavior.

PostgreSQL

To create a new database and user in PostgreSQL, assuming a username of `user1` and a password of `xyz`:

```
$ sudo -u postgres psql
> CREATE DATABASE fcrepo;
> CREATE USER user1;
> ALTER USER user1 PASSWORD 'xyz';
> GRANT ALL PRIVILEGES ON DATABASE fcrepo TO user1;
> \q
```

Docker-based Database Setup

The following instructions detail how to run your database in a Docker container.

MariaDB

The following instructions use the database username of "fcrepo-user" and password of "fcrepo-pw". You will want to change these to something more secure.

```
docker run --name f6-mariadb -e MYSQL_ROOT_PASSWORD=root-pw -e MYSQL_DATABASE=fcrepo -e MYSQL_USER=fcrepo-user -
e MYSQL_PASSWORD=fcrepo-pw -p 3306:3306 -d mariadb:10.5.3 --character-set-server=utf8mb4 --collation-
server=utf8mb4_bin

..when done with the database:
docker stop f6-mariadb
docker rm f6-mariadb
```

MariaDB CLI Client

To connect via the command line with the above database, the following command may be used:

```
docker exec -it f6-mariadb mysql -ufcrepo-user -pfcrepo-pw -Dfcrepo
```

In order for Fedora to connect with a database configured as above, the Fedora should be started with the following properties:

```
fcrepo.db.url=jdbc:mariadb://localhost:3306/fcrepo
fcrepo.db.user=fcrepo-user
fcrepo.db.password=fcrepo-pw
```

PostgreSQL

The following instructions use the database username of "fcrepo-user" and password of "fcrepo-pw". You will want to change these to something more secure.

```
docker run --name f6-postgres -e POSTGRES_USER=fcrepo-user -e POSTGRES_PASSWORD=fcrepo-pw -e POSTGRES_DB=fcrepo
-p 5432:5432 -d postgres:12.3

..when done with the database:
docker stop f6-postgres
docker rm f6-postgres
```

PostgreSQL CLI Client

To connect via the command line with the above database, the following command may be used:

```
docker exec -it f6-postgres psql -U fcrepo-user -d fcrepo
```

In order for Fedora to connect with a database configured as above, the Fedora should be started with the following properties:

```
fcrepo.db.url=jdbc:postgresql://localhost:5432/fcrepo
fcrepo.db.user=fcrepo-user
fcrepo.db.password=fcrepo-pw
```

MySQL

The following instructions use the database username of "fcrepo-user" and password of "fcrepo-pw". You will want to change these to something more secure.

```
docker run --name f6-mysql -e MYSQL_ROOT_PASSWORD=root-pw -e MYSQL_DATABASE=fcrepo -e MYSQL_USER=fcrepo-user -e
MYSQL_PASSWORD=fcrepo-pw -p 3306:3306 -d mysql:8.0  --character-set-server=utf8mb4 --collation-
server=utf8mb4_bin

..when done with the database:
docker stop f6-mysql
docker rm f6-mysql
```

MySQL CLI Client

To connect via the command line with the above database, the following command may be used:

```
docker exec -it f6-mysql mysql -ufcrepo-user -pfcrepo-pw -Dfcrepo
```

In order for Fedora to connect with a database configured as above, the Fedora should be started with the following properties:

```
fcrepo.db.url=jdbc:mysql://localhost:3306/fcrepo
fcrepo.db.user=fcrepo-user
fcrepo.db.password=fcrepo-pw
```