Databases: MySQL, MariaDB, PostgreSQL and SQLite

Which databases a DXP project runs on, how to create each one with the right character set, which to choose for development and production, and how the skeleton's guide converts a running project from one engine to...

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This page is for developers who choose and prepare the database of a DXP project. The DXP stores content through Doctrine DBAL; the skeleton's guide documents four engines.

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Which engine

Engine	Minimum	Use it for	Notes
MySQL	8.0	Production	`utf8mb4` with `utf8mb4_unicode_520_ci`
MariaDB	10.3 (10.6 recommended)	Production	Same character set
PostgreSQL	14 (16 recommended)	Production	UTF8 encoding
SQLite	3.35	Development, tests, demos, offline installations	No server; not for concurrent public use (SQLite for development)

The guide's export path to Oracle is "export only"; Oracle is not an engine you install the DXP on.

Creating the database

MySQL or MariaDB:

SQL

```sql
CREATE DATABASE exponential CHARACTER SET utf8mb4 COLLATE utf8mb4_unicode_520_ci;
GRANT ALL PRIVILEGES ON exponential.* TO 'your_db_user'@'localhost';
FLUSH PRIVILEGES;
```

PostgreSQL:

Shell

```
psql -U postgres -c "CREATE DATABASE exponential ENCODING 'UTF8';"
```

Doctrine can also create it from your settings: `php bin/console doctrine:database:create`. SQLite needs no step: the install command creates the file.

Then set the database variables in `.env.local` (Environment variables).

Installing the schema

Shell

```
php bin/console exponential:install exponential-oss
```

On later updates, apply database changes with Doctrine migrations, not with the install command (Doctrine migrations).

Converting between engines

The skeleton's guide (section 21) converts a running project with free tools only:

From	To	Tool in the guide
MySQL or MariaDB	SQLite	`mysql2sqlite` (MIT) piped from `mysqldump`
PostgreSQL	SQLite	`pgloader`
SQLite	MySQL or MariaDB	`sqlite3-to-mysql` (Python, MIT)
SQLite	PostgreSQL	`pgloader`
MySQL or MariaDB	PostgreSQL	`pgloader`
PostgreSQL	MySQL or MariaDB	CSV export per table, schema with `pgloader`, import
Any	Oracle	export only

Example from the guide, MySQL to SQLite:

Shell

```
mysqldump --no-tablespaces --skip-extended-insert --compact \
  -u "$DATABASE_USER" -p"$DATABASE_PASSWORD" -h "$DATABASE_HOST" "$DATABASE_NAME" \
  | ./mysql2sqlite - | sqlite3 var/data_dev.db
```

Back up the database, `var/` and `.env.local` before you start, and do it in a maintenance window without traffic.

After a conversion

The guide's checklist (section 21g):

1. Update `.env.local` with the new database settings.
2. `php bin/console cache:clear` (the container caches the connection).
3. `php bin/console doctrine:schema:validate`.
4. `php bin/console doctrine:migration:migrate --allow-no-migration`.

5. `php bin/console exponential:reindex`.
6. Smoke-test the site and `/adminui/`.
7. For SQLite as the target, fix the file permissions.

Symptom	Cause	Fix
"Base table not found"	A table was not transferred	Validate the schema; read the converter's log
Garbled text	Character set mismatch at export	Export with `--default-character-set=utf8mb4` or `CLIENT_ENCODING=UTF8`
Image variations return 404	Rows missing in the field table	Compare row counts between source and target

Related pages

- SQLite for development
- SQLite for Exponential Platform
- AdminNeo database manager
- Free documentation: this page is free to copy, translate and improve under the GNU FDL 1.3.

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