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Quickstart: Docker Compose and Django

This quick-start guide demonstrates how to use Docker Compose to set up and run a simple Django/PostgreSQL app. Before starting, you'll need to have Compose installed [../../compose/install/].

Define the project components

For this project, you need to create a Dockerfile, a Python dependencies file, and a `docker-compose.yml` file.

1. Create an empty project directory.

   You can name the directory something easy for you to remember. This directory is the context for your application image. The directory should only contain resources to build that image.

2. Create a new file called `Dockerfile` in your project directory.

   The Dockerfile defines an application's image content via one or more build commands that configure that image. Once built, you can run the image in a container. For more information on `Dockerfiles`, see the Docker user guide [../../engine/tutorials/dockerimages/#building-an-image-from-a-dockerfile] and the Dockerfile reference [../../engine/reference/builder/].

3. Add the following content to the `Dockerfile`.

```
FROM python:2.7
ENV PYTHONUNBUFFERED 1
RUN mkdir /code
WORKDIR /code
ADD requirements.txt /code/
RUN pip install -r requirements.txt
ADD . /code/
```

This `Dockerfile` starts with a Python 2.7 base image. The base image is modified by adding a new `code` directory. The base image is further modified by installing the Python requirements defined in the `requirements.txt` file.

4. Save and close the `Dockerfile` .
5. Create a `requirements.txt` in your project directory.

   This file is used by the `RUN pip install -r requirements.txt` command in your `Dockerfile` .
6. Add the required software in the file.

```
Django
psycopg2
```

7. Save and close the `requirements.txt` file.
8. Create a file called `docker-compose.yml` in your project directory.

   The `docker-compose.yml` file describes the services that make your app. In this example those services are a web server and database. The compose file also describes which Docker images these services use, how they link together, any volumes they might need mounted inside the containers. Finally, the `docker-compose.yml` file describes which ports these services expose. See the `docker-compose.yml` reference [../../compose/compose-file/] for more information on how this file works.
9. Add the following configuration to the file.

```
version: '2'
services:
  db:
    image: postgres
  web:
    build: .
    command: python manage.py runserver 0.0.0.0:8000
    volumes:
      - .:/code
    ports:
      - "8000:8000"
    depends_on:
      - db
```

This file defines two services: The `db` service and the `web` service.

10. Save and close the `docker-compose.yml` file.

Create a Django project

In this step, you create a Django started project by building the image from the build context defined in the previous procedure.

1. Change to the root of your project directory.
2. Create the Django project using the `docker-compose` command.

```
$ docker-compose run web django-admin.py startproject composeexample .
```

This instructs Compose to run `django-admin.py startproject composeeexample` in a container, using the `web` service's image and configuration. Because the `web` image doesn't exist yet, Compose builds it from the current directory, as specified by the `build: .` line in `docker-compose.yml`.

Once the `web` service image is built, Compose runs it and executes the `django-admin.py startproject` command in the container. This command instructs Django to create a set of files and directories representing a Django project.

3. After the `docker-compose` command completes, list the contents of your project.

```
$ ls -l
drwxr-xr-x 2 root   root   composeexample
-rw-rw-r-- 1 user   user   docker-compose.yml
-rw-rw-r-- 1 user   user   Dockerfile
-rwxr-xr-x 1 root   root   manage.py
-rw-rw-r-- 1 user   user   requirements.txt
```

If you are running Docker on Linux, the files `django-admin` created are owned by root. This happens because the container runs as the root user. Change the ownership of the the new files.

```
sudo chown -R $USER:$USER .
```

If you are running Docker on Mac or Windows, you should already have ownership of all files, including those generated by `django-admin` . List the files just verify this.

```
$ ls -l
total 32
-rw-r--r--  1 user  staff  145 Feb 13 23:00 Dockerfile
drwxr-xr-x  6 user  staff  204 Feb 13 23:07 composeexample
-rw-r--r--  1 user  staff  159 Feb 13 23:02 docker-compose.yml
-rwxr-xr-x  1 user  staff  257 Feb 13 23:07 manage.py
-rw-r--r--  1 user  staff   16 Feb 13 23:01 requirements.txt
```

Connect the database

In this section, you set up the database connection for Django.

1. In your project directory, edit the `composeexample/settings.py` file.
2. Replace the `DATABASES = ...` with the following:

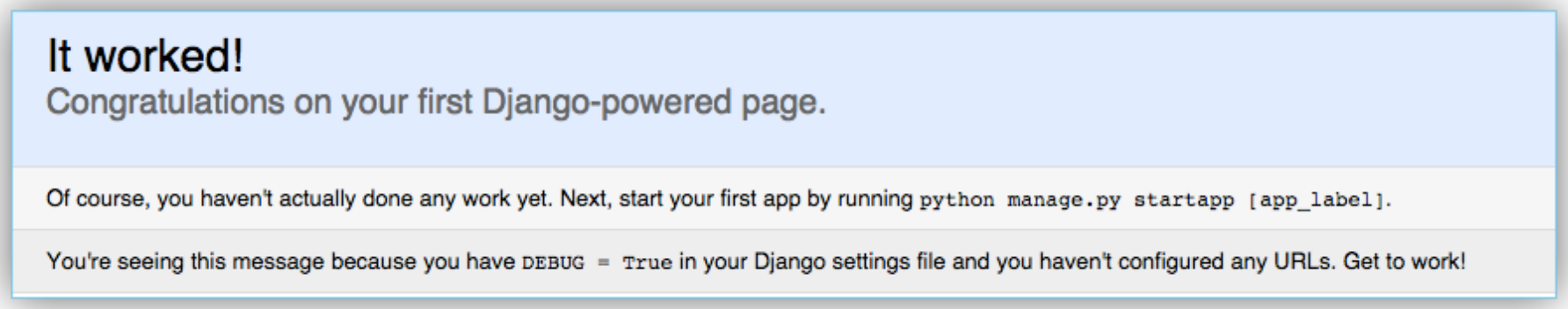
```
DATABASES = {
    'default': {
        'ENGINE': 'django.db.backends.postgresql_psycopg2',
        'NAME': 'postgres',
        'USER': 'postgres',
        'HOST': 'db',
        'PORT': 5432,
    }
}
```

These settings are determined by the postgres [https://hub.docker.com/_/postgres/] Docker image specified in `docker-compose.yml` .

3. Save and close the file.
4. Run the `docker-compose up` command.

```
$ docker-compose up
Starting composepractice_db_1...
Starting composepractice_web_1...
Attaching to composepractice_db_1, composepractice_web_1
...
db_1  | PostgreSQL init process complete; ready for start up.
...
db_1  | LOG:  database system is ready to accept connections
db_1  | LOG:  autovacuum launcher started
..
web_1 | Django version 1.8.4, using settings 'composeexample.settings'
web_1 | Starting development server at http://0.0.0.0:8000/
web_1 | Quit the server with CONTROL-C.
```

At this point, your Django app should be running at port `8000` on your Docker host. If you are using a Docker Machine VM, you can use the `docker-machine ip MACHINE_NAME` to get the IP address.



More Compose documentation

- User guide [../../compose/]
- Installing Compose [../../compose/install/]
- Getting Started [../../compose/gettingstarted/]
- Get started with Rails [../../compose/rails/]
- Get started with WordPress [../../compose/wordpress/]
- Command line reference [../../compose/reference/]
- Compose file reference [../../compose/compose-file/]

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