IoT Platform: Dockerization

- Date: 02-06-2024
- Dockerization for MERN Application

1. Materials

- Inspired from:
  1. (373) Learn Docker - DevOps with Node.js & Express - YouTube (Recommend)
  2. Deploying a MERN Application (with Docker, Atlas, and Digital Ocean!) (youtube.com)

2. First Demo: EggJS with Docker

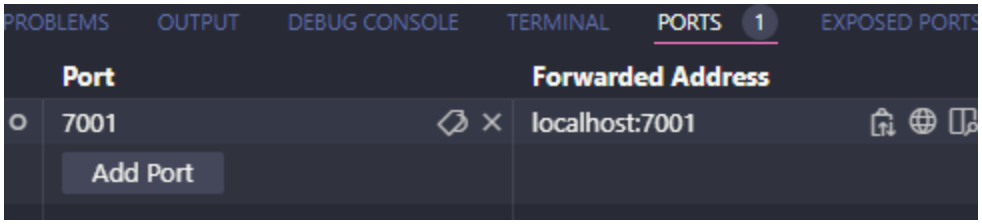
- NodeJS framework: egg - Born to build better enterprise frameworks and apps - Egg (eggjs.org)
- Presiquite: Node.js Runtime: 8.x or newer: Node.js — Download Node.js® (nodejs.org)
- VS Code Plugin: Docker - Visual Studio Marketplace

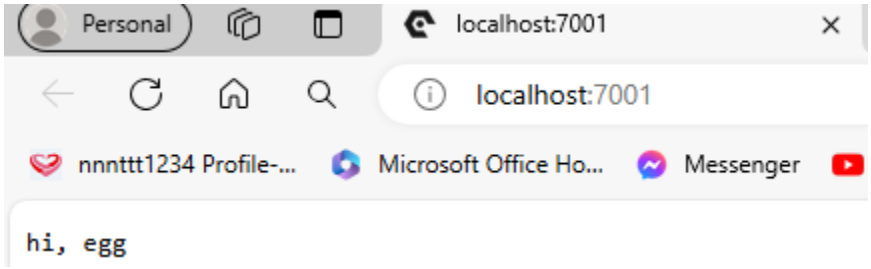
2.1. Create EggJS Project

- Follow: Quick Start - Egg (eggjs.org)
- Install initializer (only do it once): qtiot@qtiot:~/egg-example$ **npm i -g egg-init**
- qtiot@qtiot:~/egg-example$ **npm init egg --type=simple**
  - Choose the type: “simple - Simple egg app boilerplate”
- qtiot@qtiot:~/egg-example$ **npm i**
- qtiot@qtiot:~/egg-example$ **npm run dev**
  -
```
qtiot@qtiot:~/egg-example$ npm run dev

> example@1.0.0 dev
> egg-bin dev

[egg-ts-helper] create typings/app/controller/index.d.ts (1ms)
[egg-ts-helper] create typings/config/index.d.ts (10ms)
[egg-ts-helper] create typings/config/plugin.d.ts (0ms)
[egg-ts-helper] create typings/app/index.d.ts (0ms)
2024-06-02 08:26:31,073 INFO 3031 [master] node version v20.14.0
2024-06-02 08:26:31,074 INFO 3031 [master] egg version 3.23.0
2024-06-02 08:26:31,422 INFO 3031 [master] agent_worker#1:3050 started (347ms)
2024-06-02 08:26:31,779 INFO 3031 [master] egg started on http://127.0.0.1:7001 (705ms)
```
  - The EggJS has run in the port 7001 of the host machine

- 

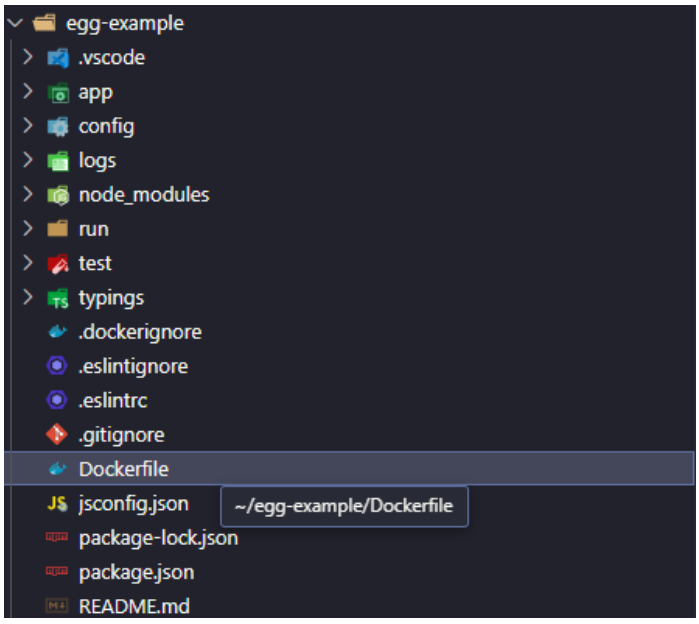
    - Should forward the port 7001 from the Virtual machine to show the result.
- 

    - Result when open the port 7001 of the localhost.

2.2. Dockerize the EggJS app.

- Using Dockerization technique.

2.3. Dockerization Step 1: Create Dockerfile

- What Is a Dockerfile? | Cloudbees Blog
- 

    - Create the “Dockerfile” in the project root directory.

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    - This file simply illustrates how to build a Docker image.
    - Line 1: using the base image containing NodeJS: "node:20.14.0-slim"
    - Line 3: Choose the directory "/app/egg-example" in the docker image. This command acts as "cd "/app/egg-example" in a host machine.
    - Line 5: copy all file from the project root directory (the first dot) to the working directory "/app/egg-example" of the image (the second dot).
    - Line 7: install node packages.
    - Line 9: Open port 7001 of "**a container**".
    - Line 11: run the EggJS "npm run dev" in "**a container**".

2.4. Build a Dockerfile Image

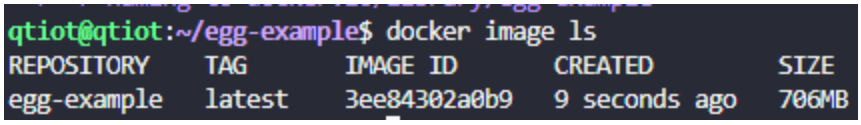
- egg-example > .dockerignore

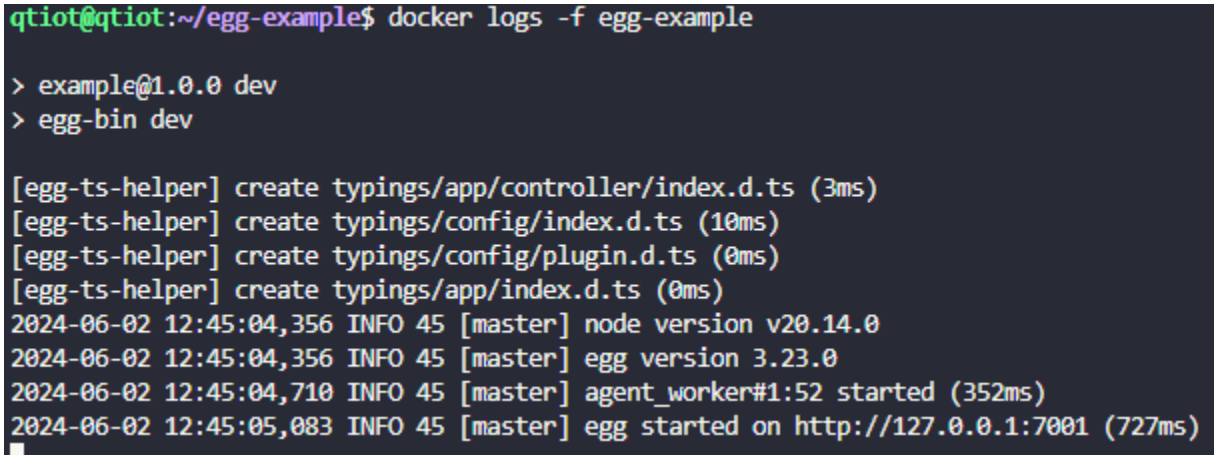
```
1  logs/
2  npm-debug.log
3  yarn-error.log
4  node_modules/
5  *-lock.json
6  *-lock.yaml
7  yarn.lock
8  coverage/
9  .idea/
10 run/
11 .DS_Store
12 *.sw*
13 *.un~
14 typings/
15 .nyc_output/
```

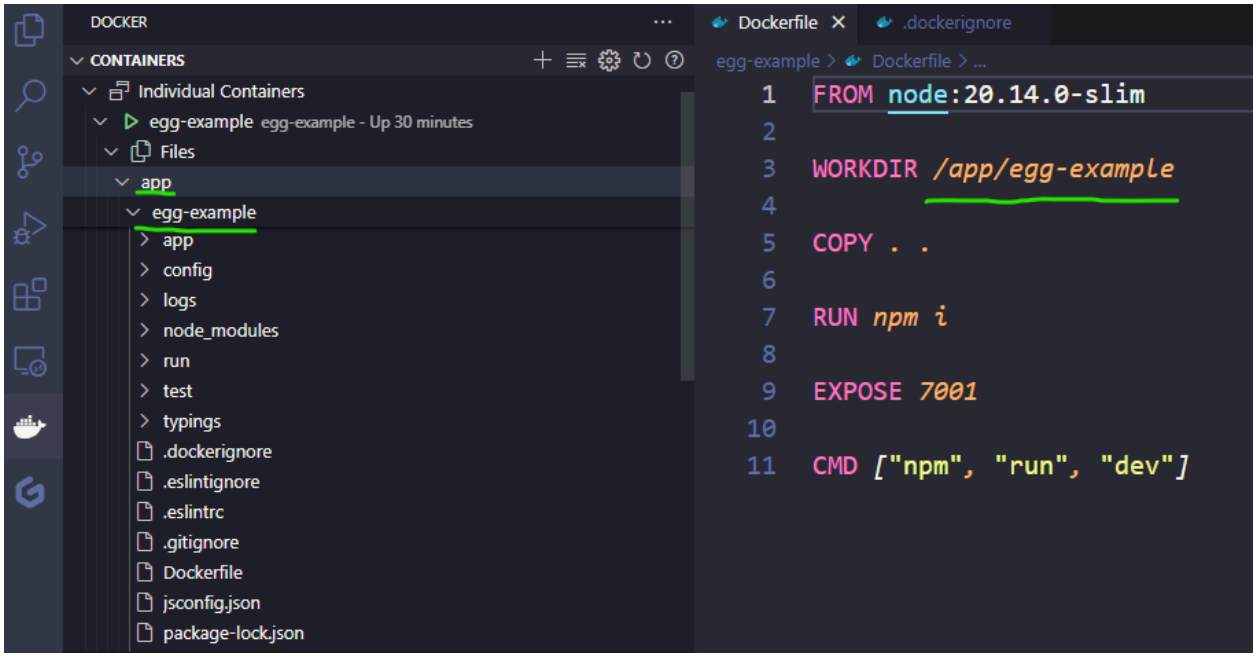
  - First, create a file ".dockerignore" to list ignore files/folders to prevent them from being copiable from the command "COPY . ." in the Dockerfile.
  - List the "node_modules" folder to prevent it from being copied to the container.
- qtiot@qtiot:~/egg-example$ **docker build -t egg-example .**
  - [docker build | Docker Docs]
  - [How to Build a Docker Image from Dockerfile | Cherry Servers]

```
qtiot@qtiot:~/egg-example$ docker build -t egg-example .
[+] Building 2.9s (9/9) FINISHED
 => [internal] load build definition from Dockerfile
 => => transferring dockerfile: 146B
 => [internal] load metadata for docker.io/library/node:20.14.0-slim
 => [internal] load .dockerignore
 => => transferring context: 190B
 => [1/4] FROM docker.io/library/node:20.14.0-slim@sha256:a16301294ba66d2ad22d3beded4a52720f96ab208c1db0973c034d0127a4ccb0
 => [internal] load build context
 => => transferring context: 723B
 => CACHED [2/4] WORKDIR /app/egg-example
 => CACHED [3/4] COPY . .
 => CACHED [4/4] RUN npm i
 => exporting to image
 => => exporting layers
 => => writing image sha256:3ee84302a0b98f7532a92fe4d68990da77f38e2d345f5ac860cf959dd2157eb8
 => => naming to docker.io/library/egg-example
```

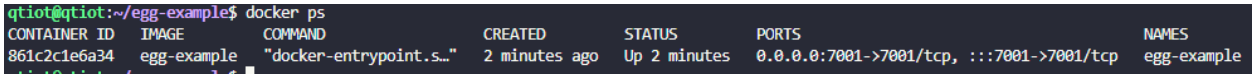
  - Build process.

- 

  - After building the image, use the command “docker image ls” to show the built image.
- qtiot@qtiot:~$ **docker run --name egg-example -p 7001:7001 -d egg-example**
  - Run a docker container with detached mode: [Run your Go image as a container | Docker Docs]
- 

  - View the docker container’s logs through the command: “qtiot@qtiot:~/egg-example$ **docker logs -f egg-example**”.
- 

  - Through the Docker plugin, we can see what sources in “/app/egg-example” of the executed container.

- 

    - Show information of executed containers through the command "qtiot@qtiot:~/egg-example$ **docker ps**".
- GitHub source for this example: [DESLab-Resources/egg-example (github.com)]