

**САНКТ-ПЕТЕРБУРГСКИЙ НАЦИОНАЛЬНЫЙ
ИССЛЕДОВАТЕЛЬСКИЙ УНИВЕРСИТЕТ ИТМО**

Дисциплина: Бэк-энд разработка

Отчет

Лабораторная работа №4:
Docker, docker compose, docker swarm

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Задача

Необходимо упаковать ваше приложение в docker-контейнеры и обеспечить сетевое взаимодействие между различными частями вашего приложения. Делать это можно как с помощью docker-compose так и с помощью docker swarm.

Ход работы

- 1) Обеспечим сетевое взаимодействие между частями приложения с помощью docker compose, для этого необходимо создать docker-compose.yml файл с инструкцией для запуска и настройки сервисов:

```
LR_3 > docker-compose.yml
1  version: "3.9"
2
3  services:
4    gateway:
5      container_name: gateway
6      build:
7        context: ./gateway
8      volumes:
9        - ./gateway:/gateway
10       - /gateway/node_modules
11     ports:
12       - 8000:8000
13     restart: always
14     networks:
15       - mynetwork
16   user:
17     container_name: user
18     build:
19       context: ./user
20     volumes:
21       - ./user:/user
22       - /user/node_modules
23     depends_on:
24       - gateway
25     ports:
26       - 8001:8001
27     restart: always
28     networks:
29       - mynetwork
30   shop:
31     container_name: shop
32     build:
33       context: ./shop
```

- 2) Dockerfile для gateway и остальных сервисов содержит инструкцию для создания окружения:

```
LR_3 > gateway > Dockerfile > ...
1  FROM node:18-alpine
2
3  WORKDIR /gateway
4
5  COPY package*.json ./
6
7  COPY . .
8
9  RUN npm install|
10
11 EXPOSE 8000
12
13 CMD ["npm", "start"]
```

- 3) Dockerfile для user:

```
LR_3 > user > Dockerfile > ...
1  FROM node:18-alpine
2
3  WORKDIR /user
4
5  COPY package*.json ./
6
7  COPY . .
8
9  RUN npm install|
10
11
12 EXPOSE 8001
13
14 CMD ["make", "start"]
```

4) Dockerfile для shop:

```
LR_3 > shop > Dockerfile > ...
1 FROM node:18-alpine
2
3 WORKDIR /shop
4
5 COPY package*.json ./
6
7 COPY . .
8
9 RUN npm install
10
11 EXPOSE 8002
12
13 CMD ["make", "start"]
```

Далее необходимо было выполнить команду *docker-compose build* для сборки

```
PS C:\Users\tembe\Desktop\back\ITMO-ICT-Backend-2023\labs\K33402\Lors_Khava\LR_3> docker-compose build
[+] Building 91.1s (26/26) FINISHED
=> [gateway internal] load .dockerignore
=> => transferring context: 2B
=> [gateway internal] load build definition from Dockerfile
=> => transferring dockerfile: 174B
=> [user internal] load metadata for docker.io/library/node:18-alpine
=> CACHED [user 1/5] FROM docker.io/library/node:18-alpine@sha256:5850491d7879608eb7f7f7fe5beecd946b8b811356dab83c02699d7d77de61a2
=> => resolve docker.io/library/node:18-alpine@sha256:5850491d7879608eb7f7f7fe5beecd946b8b811356dab83c02699d7d77de61a2
=> => sha256:931b0e865bc24d4d3f7032c4a9b98b4790ee7bb8dcd0d2fd02e15e163d806034 47.48MB / 47.48MB
=> => sha256:60542df8b663b3c876b9fd0ad8459ac628a50bd8684149e54c3dff2e44397f03 2.35MB / 2.35MB
=> => sha256:5850491d7879608eb7f7f7fe5beecd946b8b811356dab83c02699d7d77de61a2 1.43kB / 1.43kB
=> => sha256:44aaf1ccc80eaed6572a0f2ef7d6b5a2982d54481e4255480041ac92221e2f11 1.16kB / 1.16kB
=> => sha256:6f44d13dd2586511d630d7708da1eaac09c05693d9e3e06f3f72206927d3201d 6.49kB / 6.49kB
=> => sha256:f56be85fc22e46face30e2c3de3f7fe7c15f8fd7c4e5add29d7f64b87abdaa09 3.37MB / 3.37MB
=> => sha256:062e26bc2446cf92691255ec92cacfd68fdb24004e2b9343f416105b2f7d4966 450B / 450B
=> => extracting sha256:f56be85fc22e46face30e2c3de3f7fe7c15f8fd7c4e5add29d7f64b87abdaa09
=> => extracting sha256:931b0e865bc24d4d3f7032c4a9b98b4790ee7bb8dcd0d2fd02e15e163d806034
=> => extracting sha256:60542df8b663b3c876b9fd0ad8459ac628a50bd8684149e54c3dff2e44397f03
=> => extracting sha256:062e26bc2446cf92691255ec92cacfd68fdb24004e2b9343f416105b2f7d4966
=> [gateway internal] load build context
=> => transferring context: 51.38MB
=> [gateway 2/5] WORKDIR /gateway
=> [gateway 3/5] COPY package*.json ./
=> [gateway 4/5] COPY . .
=> [gateway 5/5] RUN npm install
=> [gateway] exporting to image
=> => exporting layers
=> => writing image sha256:7531434d15bccde119672efb1282f6174f7903083c4a7d537b7b78cc7552823a
=> => naming to docker.io/library/lr_3-gateway
=> [shop internal] load .dockerignore
=> => transferring context: 2B
```

и запустить приложение

```
user | Running server on port 8001
user | Executing (default): SELECT name FROM sqlite_master WHERE type='table' AND name='Users';
user | Executing (default): SELECT 1+1 AS result
user | Executing (default): PRAGMA INDEX_LIST('Users')
user | Connection has been established successfully.
user | Executing (default): PRAGMA INDEX_INFO('sqlite_autoindex_Users_1')
user | Executing (default): PRAGMA INDEX_INFO('sqlite_autoindex_Users_2')
user | Executing (default): SELECT name FROM sqlite_master WHERE type='table' AND name='RefreshTokens';
user | Executing (default): PRAGMA INDEX_LIST('RefreshTokens')
user | Executing (default): PRAGMA INDEX_INFO('sqlite_autoindex_RefreshTokens_1')
user | Executing (default): SELECT name FROM sqlite_master WHERE type='table' AND name='Workers';
user | Executing (default): PRAGMA INDEX_LIST('Workers')
user | Executing (default): PRAGMA INDEX_INFO('sqlite_autoindex_Workers_1')
user | synced models
user | Executing (default): SELECT `id`, `username`, `firstName`, `lastName`, `email`, `password`, `createdAt`, `updatedAt` FROM `Users` AS `User`
WHERE `User`.`id` = 1;
```

```
PS C:\Users\tembe\Desktop\back\ITMO-ICT-Backend-2023\labs\K33402\Lors_Khava\LR_3> docker ps -a
```

| CONTAINER ID | IMAGE | COMMAND | CREATED | STATUS | PORTS | NAMES |
|--------------|---------------------------------|--------------------------|----------------|-----------------------------|----------------------|-----------------|
| 1b6f844a1398 | lr_3-user | "docker-entrypoint.s..." | 35 minutes ago | Exited (143) 28 minutes ago | | user |
| ef8d0494581e | lr_3-shop | "docker-entrypoint.s..." | 35 minutes ago | Exited (143) 28 minutes ago | | shop |
| a693b0612fa6 | lr_3-gateway | "docker-entrypoint.s..." | 35 minutes ago | Exited (143) 28 minutes ago | | gateway |
| 6c21 | docker/welcome-to-docker:latest | "/docker-entrypoint..." | 4 hours ago | Up 4 hours | 0.0.0.0:8088->80/tcp | welcome-to-dock |

Образы и контейнеры:

| | | | | |
|--|--------|------------------------|-------------|-----------|
| lr_3-user b67372e78f73 | latest | In use | 3 hours ago | 291.69 MB |
| lr_3-shop ce4255566dac | latest | In use | 3 hours ago | 291.29 MB |
| lr_3-gateway 5c2ec0cc39c5 | latest | In use | 3 hours ago | 255 MB |

| | | | |
|---|------------------------------|---------------|---------------------------|
| lr_3 | | Running (3/3) | |
| gateway a693b0612fa6 | lr_3-gateway | Running | 8000:8000 |
| shop ef8d0494581e | lr_3-shop | Running | 8002:8002 |
| user 1b6f844a1398 | lr_3-user | Running | 8001:8001 |

Вывод

В ходе выполнения лабораторной работы были получены практические навыки работы с обеспечением сетевого взаимодействия между docker-контейнерами.