

МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ РФ

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«Национальный исследовательский университет ИТМО»

**Факультет программной инженерии и компьютерной техники**

**Лабораторная работа №3.1**

по дисциплине  
“Технологии виртуализации”

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# Задача

Ознакомиться с функционалом создания контейнеров в Docker

## Ход работы

### Docker

```
glados@GLaDOS:~/Desktop/University/University/ITMO_4/autumn/VirtualizationTechnologies/lab4$ ./scripts/docker-init.sh
Проверяю, установлен ли докер
docker --version
Docker version 28.4.0, build d8eb465
Docker установлен. Ну или ты меня хорошо обманываешь Т_Т
Запускаю hello-контейнер
docker run --name hello_delete_me hello-world

Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
 1. The Docker client contacted the Docker daemon.
 2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
    (amd64)
 3. The Docker daemon created a new container from that image which runs the
    executable that produces the output you are currently reading.
 4. The Docker daemon streamed that output to the Docker client, which sent it
    to your terminal.

To try something more ambitious, you can run an Ubuntu container with:
$ docker run -it ubuntu bash

Share images, automate workflows, and more with a free Docker ID:
https://hub.docker.com/

For more examples and ideas, visit:
https://docs.docker.com/get-started/

Список контейнеров
docker container ls --all
CONTAINER ID        IMAGE               COMMAND             CREATED            STATUS              PORTS               NAMES
1fa113b28691        hello-world        "/hello"           Less than a second ago   Exited (0) Less than a second ago   hello_delete_me
edd09b9fc6e9        bsord/tetris       "/docker-entrypoint..."  9 hours ago        Exited (0) 9 hours ago        tetris
6341c8355af9        nginx:alpine       "/docker-entrypoint..."  9 hours ago        Exited (0) 9 hours ago        nextcloud_web
cb3a6354c68e        nextcloud:latest     "/entrypoint.sh apac..."  9 hours ago        Exited (0) 9 hours ago        nextcloud_app
7807a6eee637a      mariadb:latest     "docker-entrypoint.s..."  9 hours ago        Exited (0) 9 hours ago        nextcloud_db
69c49fecf22f        bambooocz/phpvirtualbox:latest  "/bin/sh -c 'php82 /...'"  10 hours ago      Exited (0) 10 hours ago      phpvirtualbox

Не знаю какой смысл запускать что бы то ни было из второго пункта лр - но вот
docker run Hello_Rumskiy
docker: invalid reference format: repository name (library/Hello_Rumskiy) must be lowercase

Run 'docker run --help' for more information
Перейти к запуску Apache(у/н)?
S
```

# Nginx

```
glados@GLaDOS:~/Desktop/University/University/ITMO_4/autmn/VirtualizationTechnologies/lab4$ ./scripts/init-nginx.sh
Подготавливаем к запуску контейнер с nginx
    Создаем html файл
        file:///home/glados/Desktop/University/University/ITMO_4/autmn/VirtualizationTechnologies/lab4/dockerfiles/nginx/index.html
        Собираем docker image для nginx2
Содержимое docker-файла:
FROM nginx:alpine

RUN mkdir -p /home/www/html
COPY index.html /home/www/html/

RUN echo 'server { \
    listen 80; \
    root /home/www/html; \
    index index.html; \
}' > /etc/nginx/conf.d/default.conf

EXPOSE 80
docker build --no-cache -t xoeqvdp/lab3-nginx .
[+] Building 0.5s (9/9) FINISHED
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 256B
=> [internal] load metadata for docker.io/library/nginx:alpine
=> [internal] load .dockerrcignore
=> => transferring context: 2B
=> CACHED [1/4] FROM docker.io/library/nginx:alpine
=> [internal] load build context
=> => transferring context: 116B
=> [2/4] RUN mkdir -p /home/www/html
=> [3/4] COPY index.html /home/www/html/
=> [4/4] RUN echo 'server { \
    listen 80; \
    root /home/www/html; \
    index index.html; \
}' > /etc/nginx/conf.d/default.conf
=> => exporting image
=> => exporting layers
=> => writing image sha256:d747a22dc18d668db7781b035c2f44a2a69e5398663fedd40f0c1e3d1523dc96
=> => naming to docker.io/xoeqvdp/lab3-nginx
    Запускаем конейтер в фоне
docker run -d -p 8080:80 -name nginx-app xoeqvdp/lab3-nginx
318caadd40acf09210b5df0a187283470b9346f2ab470ce504b3ead607394974
Проверить доступность
Тыкал на меня, давай, ДАВАЙ ХЕ.
Перейти к запуску MariaDB(у/n)?
n
Ну и не надо Т.Т
glados@GLaDOS:~/Desktop/University/University/ITMO_4/autmn/VirtualizationTechnologies/lab4$
```



# MariaDB

```
glados@GlaOS:~/Desktop/University/University/ITMO_4/autumn/VirtualizationTechnologies/lab4$ ./scripts/init-mariadb.sh
Запуск контейнера с Mariadb
Содержимое докер-файла:
FROM mariadb:latest

ENV MYSQL_ROOT_PASSWORD=rootpass
ENV MYSQL_USER=labuser
ENV MYSQL_PASSWORD=userpass

WORKDIR /home/DB

COPY init.sql /docker-entrypoint-initdb.d/

EXPOSE 3306

Создаю изображение
docker build -t xoeqvdp/lab3-mariadb .
[+] Building 0.1s (8/8) FINISHED
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 220B
=> WARN: SecretsUsedInArgOrEnv: Do not use ARG or ENV instructions for sensitive data (ENV "MYSQL_ROOT_PASSWORD") (line 3)
=> WARN: SecretsUsedInArgOrEnv: Do not use ARG or ENV instructions for sensitive data (ENV "MYSQL_PASSWORD") (line 5)
=> [internal] load metadata for docker.io/library/mariadb:latest
=> [internal] load .dockercfg
=> transferring context: 2B
=> [1/3] FROM docker.io/library/mariadb:latest
=> [internal] load build context
=> transferring context: 30B
=> CACHED [2/3] WORKDIR /home/DB
=> CACHED [3/3] COPY init.sql /docker-entrypoint-initdb.d/
=> exporting to image
=> => exporting layers
=> => writing image sha256:7060f5bea4833c3675d634b2d7c8c6f49c6e8908bd6b1ab87c88444d957baa36
=> naming to docker.io/xoeqvdp/lab3-mariadb

2 warnings found (use docker --debug to expand):
- SecretsUsedInArgOrEnv: Do not use ARG or ENV instructions for sensitive data (ENV "MYSQL_ROOT_PASSWORD") (line 3)
- SecretsUsedInArgOrEnv: Do not use ARG or ENV instructions for sensitive data (ENV "MYSQL_PASSWORD") (line 5)

Создаю контейнер
docker run -d -p 3306:3306 --name mariadb-app xoeqvdp/lab3-mariadb
8ef61997886e9eb3984f9846e37b84a8450f88fb2b2031a61e89a272c7ebf2
Для подключения к БД(пароль - rootpass):
docker exec -it mariadb-app mariadb -u root -p
glados@GlaOS:~/Desktop/University/University/ITMO_4/autumn/VirtualizationTechnologies/lab4$
```

```
glados@GLaDOS:~/Desktop/University/University/ITMO_4/autumn/VirtualizationTechnologies/lab4$ docker exec -it mariadb-app mariadb -u root -p
Enter password:
Welcome to the MariaDB monitor. Commands end with ; or \g.
Your MariaDB connection id is 3
Server version: 12.1.2-MariaDB-ubuntu2404 mariadb.org binary distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> use rumskiy;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
MariaDB [rumskiy]> select * from messages;
+----+-----+
| id | text |
+----+-----+
| 1 | hello |
| 2 | darkness |
| 3 | my |
| 4 | old |
| 5 | friend |
+----+-----+
5 rows in set (0.002 sec)
```

# NextCloud

```
glados@GLaDOS:~/Desktop/University/University_ITMO_4/autmn/VirtualizationTechnologies/lab4$ ./scripts/init-nextCloud.sh
Запуск контейнера с NextCloud
Содержимое докер-файла:
version: '3.8'

services:
  nextcloud:
    image: nextcloud:latest
    ports:
      - "8088:80"
    volumes:
      - /home/www/NextCloud:/var/www/html
    environment:
      - NEXTCLOUD_ADMIN_USER=admin
      - NEXTCLOUD_ADMIN_PASSWORD=adminpass
    restart: unless-stopped
Запускаем через docker-compose
docker compose up -d
WARN[0000] /home/glados/Desktop/University/University_ITMO_4/autmn/VirtualizationTechnologies/lab4/dockerfiles/nextcloud/docker-compose.yaml: the attribute `version` is obsolete, it will be ignored, please remove it to avoid potential confusion
[+] Running 2/2
  ✓ Network nextcloud_default          Created
  ✓ Container nextcloud-nextcloud-1    Started
Проверить доступность
Тихая на меня, давай, ДАВАЙ ЖЕ.
glados@GLaDOS:~/Desktop/University/University_ITMO_4/autmn/VirtualizationTechnologies/lab4$
```

Display name	Account name	Password	Email	Groups	Group admin for
A admin	admin			admin	
БА Белозубов А.В.	belozubovsv				
РА Румский А.М.	rumskiyam				



# Compose

Файл:

```
version: '3.8'
```

```
services:
```

```
db:
```

```
  image: mariadb:latest
```

```
  container_name: nextcloud_db
```

```
  restart: unless-stopped
```

```
  environment:
```

```
    MYSQL_ROOT_PASSWORD: rootpass
```

```
    MYSQL_USER: labuser
```

```
    MYSQL_PASSWORD: userpass
```

```
volumes:
```

```
  - /home/DB:/docker-entrypoint-initdb.d/
```

```
  - db_data:/var/lib/mysql
```

```
networks:
```

```
  - nextcloud_net
```

```
web:
```

```
  image: nginx:alpine
```

```
  container_name: nextcloud_web
```

```
  restart: unless-stopped
```

```
volumes:
```

```
  - /home/www/html:/usr/share/nginx/html
```

```
  - ./nginx.conf:/etc/nginx/conf.d/default.conf
```

```
ports:
```

```
  - "80:80"
```

```
depends_on:
```

- nextcloud

networks:

- nextcloud\_net

nextcloud:

image: nextcloud:latest

container\_name: nextcloud\_app

restart: unless-stopped

ports:

- "2022:80"

volumes:

- /home/www/NextCloud:/var/www/html

environment:

- NEXTCLOUD\_ADMIN\_USER=admin

- NEXTCLOUD\_ADMIN\_PASSWORD=adminpass

- MYSQL\_HOST=db

- MYSQL\_USER=root

- MYSQL\_PASSWORD=rootpass

- MYSQL\_DATABASE=nextcloud

depends\_on:

- db

networks:

- nextcloud\_net

volumes:

db\_data:

networks:

nextcloud\_net:

driver: bridge

The screenshot shows a web application interface for managing user accounts. At the top, there is a header bar with a back arrow, forward arrow, and refresh button. The URL 'http://localhost:2022/settings/users' is displayed. Below the header is a navigation bar with icons for account, file, image, and lightning bolt.

The main content area has a blue header bar with a 'New account' button and a search bar labeled 'Search groups...'. On the left, there is a sidebar with sections for 'All accounts' (3), 'Admins' (1), 'Recently active' (1), and 'Groups' (+). A search bar for groups is also present.

The main table lists three user accounts:

Display name	Account name	Password
A admin	admin	(redacted)
БА Белозубов А.В.	belozubovsv	(redacted)
РА Румский А.М.	rumskiyam	(redacted)

Below the table, it says '3 accounts'.

## Game

Команда: docker run -d -p 80:80 --name tetris bsord/tetris

Или, если запуск повторный: docker start tetris

