TASK 2.4

Работа с lxc в Ubuntu

Documentation - https://help.ubuntu.com/lts/serverguide/lxd.html

https://linuxcontainers.org/lxd/getting-started-cli/

1. Установить lxc

```
root@mruletkin:~# sudo apt install lxd
Reading package lists... Done
Building dependency tree
Reading state information... Done
lxd is already the newest version (3.0.3-0ubuntu1~18.04.1).
lxd set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 24 not upgraded.
root@mruletkin:~# _
```

2. Запустить lxc launch для любой из версий Убунту

```
root@mruletkin:~# lxc launch
If this is your first time running LXD on this machine, you should also run: lxd init
To start your first container, try: lxc launch ubuntu:18.04

Description:
  Create and start containers from images

Usage:
  lxc launch [<remote>:]<image> [<remote>:][<name>] [flags]

Examples:
  lxc launch ubuntu:16.04 u1

Flags:
  -c, --config        Config key/value to apply to the new container
  -e, --ephemeral     Ephemeral container
  -n, --network       Network name
      --no-profiles   Create the container with no profiles applied
  -p, --profile       Profile to apply to the new container
  -s, --storage       Storage pool name
      --target        Cluster member name
  -t, --type          Instance type

Global Flags:
      --debug         Show all debug messages
      --force-local   Force using the local unix socket
  -h, --help          Print help
  -v, --verbose       Show all information messages
      --version       Print version number
root@mruletkin:~# _
```

3. По окончании загрузки убедиться, что машина стартовала lxc list

```
root@mruletkin:~# lxc list
+-------+---------+---------------------+----------------------------------------------+-----------
+-----------+
| NAME  |  STATE  |        IPV4         |                     IPV6                     |    TYPE
| SNAPSHOTS |
+-------+---------+---------------------+----------------------------------------------+-----------
+-----------+
| first | RUNNING | 10.88.70.132 (eth0) | fd42:62cb:ae8:e244:216:3eff:fefa:15fb (eth0) | PERSISTENT
| 0         |
+-------+---------+---------------------+----------------------------------------------+-----------
+-----------+
root@mruletkin:~#
```

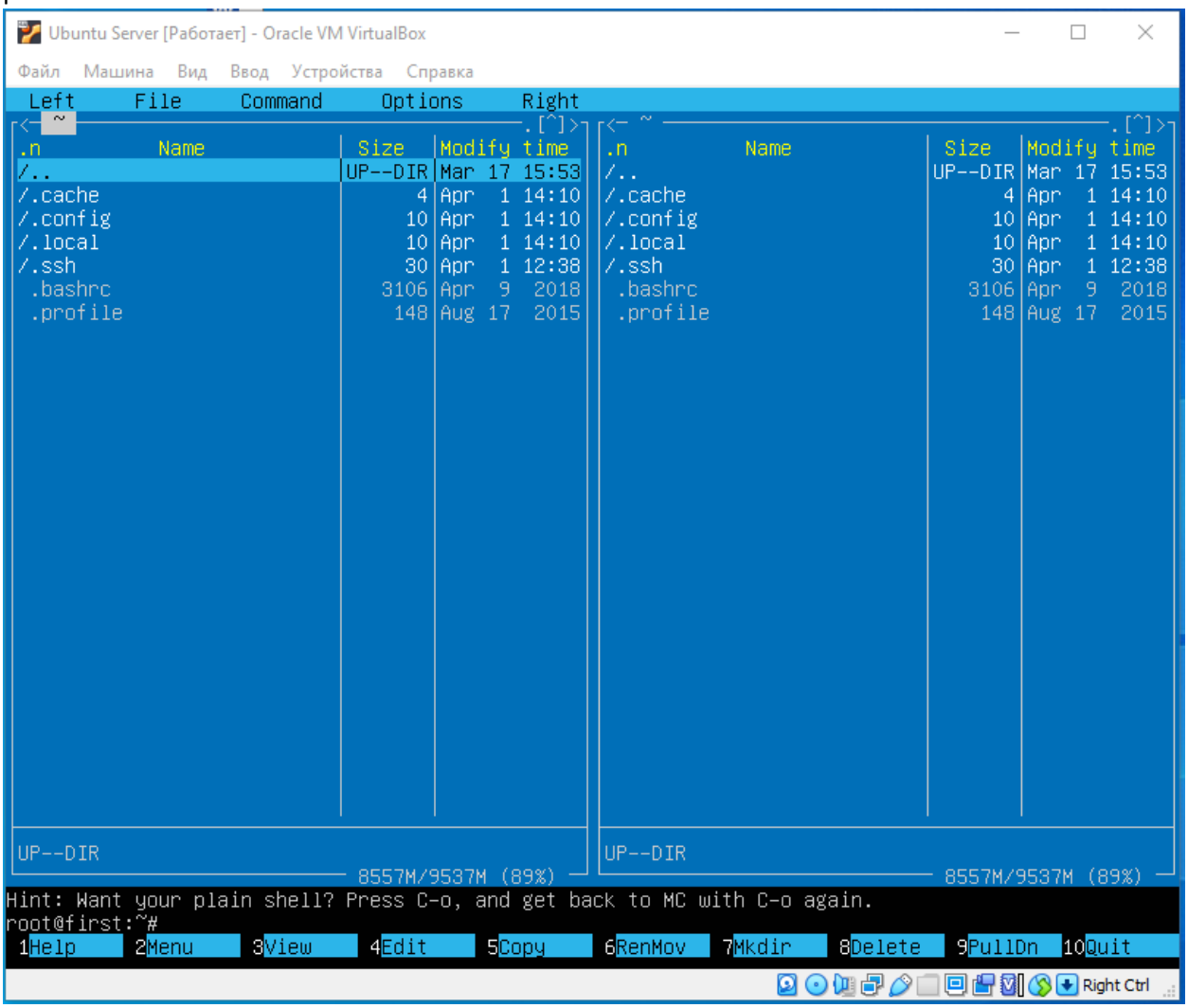
4. Зайдите в контейнер с командной строкой bash /bin/bash

```
root@mruletkin:~# lxc exec first -- /bin/bash
```

5. Запустите обновление apt-get update

```
root@first:~# apt-get update
Hit:1 http://archive.ubuntu.com/ubuntu bionic InRelease
Get:2 http://archive.ubuntu.com/ubuntu bionic-updates InRelease [88.7 kB]
Get:3 http://security.ubuntu.com/ubuntu bionic-security InRelease [88.7 kB]
Get:4 http://archive.ubuntu.com/ubuntu bionic-backports InRelease [74.6 kB]
Get:5 http://archive.ubuntu.com/ubuntu bionic/universe amd64 Packages [8570 kB]
Get:6 http://security.ubuntu.com/ubuntu bionic-security/main amd64 Packages [677 kB]
Get:7 http://archive.ubuntu.com/ubuntu bionic/universe Translation-en [4941 kB]
Get:8 http://security.ubuntu.com/ubuntu bionic-security/main Translation-en [218 kB]
Get:9 http://security.ubuntu.com/ubuntu bionic-security/restricted amd64 Packages [28.5 kB]
Get:10 http://security.ubuntu.com/ubuntu bionic-security/restricted Translation-en [7568 B]
Get:11 http://security.ubuntu.com/ubuntu bionic-security/universe amd64 Packages [653 kB]
Get:12 http://security.ubuntu.com/ubuntu bionic-security/universe Translation-en [217 kB]
Get:13 http://archive.ubuntu.com/ubuntu bionic/multiverse amd64 Packages [151 kB]
Get:14 http://archive.ubuntu.com/ubuntu bionic/multiverse Translation-en [108 kB]
Get:15 http://archive.ubuntu.com/ubuntu bionic-updates/main amd64 Packages [897 kB]
Get:16 http://archive.ubuntu.com/ubuntu bionic-updates/main Translation-en [310 kB]
Get:17 http://archive.ubuntu.com/ubuntu bionic-updates/restricted amd64 Packages [37.5 kB]
Get:18 http://archive.ubuntu.com/ubuntu bionic-updates/restricted Translation-en [9524 B]
Get:19 http://archive.ubuntu.com/ubuntu bionic-updates/universe amd64 Packages [1061 kB]
Get:20 http://archive.ubuntu.com/ubuntu bionic-updates/universe Translation-en [329 kB]
Get:21 http://archive.ubuntu.com/ubuntu bionic-updates/multiverse amd64 Packages [10.5 kB]
Get:22 http://archive.ubuntu.com/ubuntu bionic-updates/multiverse Translation-en [4696 B]
Get:23 http://archive.ubuntu.com/ubuntu bionic-backports/main amd64 Packages [2512 B]
Get:24 http://archive.ubuntu.com/ubuntu bionic-backports/main Translation-en [1644 B]
Get:25 http://archive.ubuntu.com/ubuntu bionic-backports/universe amd64 Packages [4020 B]
Get:26 http://archive.ubuntu.com/ubuntu bionic-backports/universe Translation-en [1900 B]
Get:27 http://security.ubuntu.com/ubuntu bionic-security/multiverse amd64 Packages [6968 B]
Get:28 http://security.ubuntu.com/ubuntu bionic-security/multiverse Translation-en [2732 B]
Fetched 18.5 MB in 7s (2697 kB/s)
Reading package lists... Done
root@first:~#
```

6. Установите (apt-get install) любую программу в контейнер. Например mc. Проверьте работоспособность.



7. Загрузите в контейнер файл (screenshot) и скачайте с контейнера другой файл (screenshot).

Работа с Docker в Ubuntu

Documentation - https://www.digitalocean.com/community/tutorials/how-to-install-and-use-docker-on-ubuntu-18-04

https://docs.docker.com

1. Установить docker

```
● docker.service - Docker Application Container Engine
   Loaded: loaded (/lib/systemd/system/docker.service; enabled; vendor preset: enabled)
   Active: active (running) since Sun 2020-04-05 12:35:31 UTC; 1min 31s ago
     Docs: https://docs.docker.com
 Main PID: 3618 (dockerd)
    Tasks: 8
   CGroup: /system.slice/docker.service
           └─3618 /usr/bin/dockerd -H fd:// --containerd=/run/containerd/containerd.sock

Apr 05 12:35:30 mruletkin dockerd[3618]: time="2020-04-05T12:35:30.875304864Z" level=warning msg="Y
Apr 05 12:35:30 mruletkin dockerd[3618]: time="2020-04-05T12:35:30.875932614Z" level=warning msg="Y
Apr 05 12:35:30 mruletkin dockerd[3618]: time="2020-04-05T12:35:30.876415925Z" level=warning msg="Y
Apr 05 12:35:30 mruletkin dockerd[3618]: time="2020-04-05T12:35:30.877254764Z" level=info msg="Load
Apr 05 12:35:31 mruletkin dockerd[3618]: time="2020-04-05T12:35:31.281035703Z" level=info msg="Defa
Apr 05 12:35:31 mruletkin dockerd[3618]: time="2020-04-05T12:35:31.468810678Z" level=info msg="Load
Apr 05 12:35:31 mruletkin dockerd[3618]: time="2020-04-05T12:35:31.531150150Z" level=info msg="Dock
Apr 05 12:35:31 mruletkin dockerd[3618]: time="2020-04-05T12:35:31.532381329Z" level=info msg="Daem
Apr 05 12:35:31 mruletkin systemd[1]: Started Docker Application Container Engine.
Apr 05 12:35:31 mruletkin dockerd[3618]: time="2020-04-05T12:35:31.606952517Z" level=info msg="API
log file: _
```

2. Запустить поиск сконфигурированных решений для “ubuntu”

```
root@mruletkin:~# docker search ubuntu
NAME                                                     DESCRIPTION
      STARS               OFFICIAL            AUTOMATED
ubuntu                                                   Ubuntu is a Debian-based Linux operating s
ys…   10715               [OK]
dorowu/ubuntu-desktop-lxde-vnc                           Docker image to provide HTML5 VNC interfac
e …   410                                 [OK]
rastasheep/ubuntu-sshd                                   Dockerized SSH service, built on top of of
fi…   245                                 [OK]
consol/ubuntu-xfce-vnc                                   Ubuntu container with "headless" VNC sessi
on…   212                                 [OK]
ubuntu-upstart                                           Upstart is an event-based replacement for
th…   107                 [OK]
ansible/ubuntu14.04-ansible                              Ubuntu 14.04 LTS with ansible
      98                                  [OK]
neurodebian                                              NeuroDebian provides neuroscience research
 s…   68                  [OK]
1and1internet/ubuntu-16-nginx-php-phpmyadmin-mysql-5     ubuntu-16-nginx-php-phpmyadmin-mysql-5
```

3. Скачать любой из образов на локальную машину.

```
root@mruletkin:~# docker pull ubuntu
Using default tag: latest
latest: Pulling from library/ubuntu
5bed26d33875: Pull complete
f11b29a9c730: Pull complete
930bda195c84: Pull complete
78bf9a5ad49e: Pull complete
Digest: sha256:bec5a2727be7fff3d308193cfde3491f8fba1a2ba392b7546b43a051853a341d
Status: Downloaded newer image for ubuntu:latest
docker.io/library/ubuntu:latest
root@mruletkin:~#
```

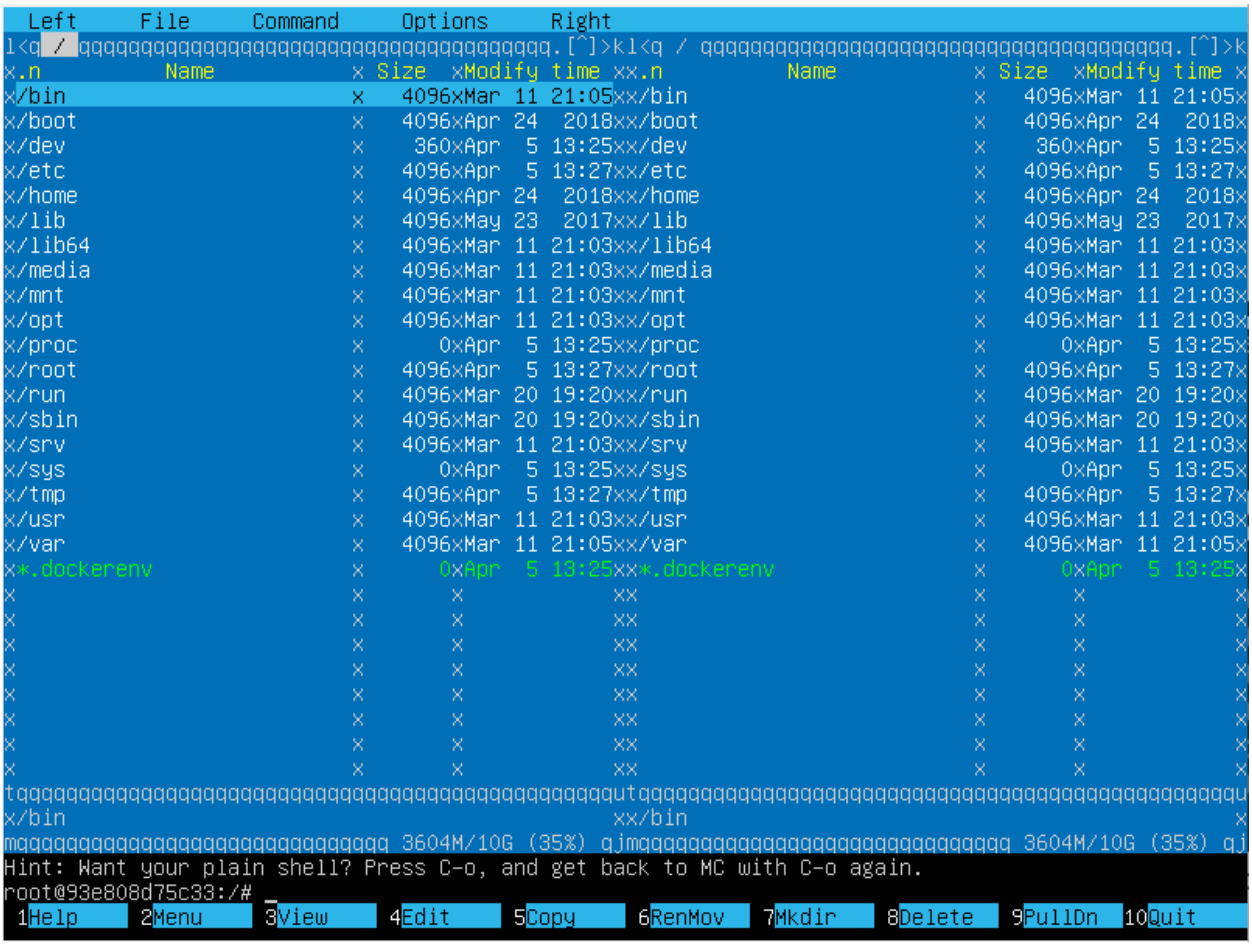
4. Запустить команду просмотра загруженных на компьютер образов.

```
root@mruletkin:~# docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
ubuntu              latest              4e5021d210f6        2 weeks ago         64.2MB
hello-world         latest              fce289e99eb9        15 months ago       1.84kB
root@mruletkin:~# _
```

Запустите обновление apt-get update

```
root@mruletkin:~# apt-get update
Hit:1 http://ua.archive.ubuntu.com/ubuntu bionic InRelease
Hit:2 http://ua.archive.ubuntu.com/ubuntu bionic-updates InRelease
Hit:3 http://ua.archive.ubuntu.com/ubuntu bionic-backports InRelease
Hit:4 http://ua.archive.ubuntu.com/ubuntu bionic-security InRelease
Hit:5 https://download.docker.com/linux/ubuntu bionic InRelease
Reading package lists... Done
root@mruletkin:~#
```

5. Установите (apt-get install) любую программу в контейнер. Например mc. Проверьте работоспособность.



6. Загрузите в контейнер файл (screenshot) и скачайте с контейнера другой файл

```
root@mruletkin:~# docker cp file.txt 686802e99c53:/file.txt
root@mruletkin:~# docker ls
docker: 'ls' is not a docker command.
See 'docker --help'
root@mruletkin:~# docker run -it ubuntu
root@badc0670a5dd:/# ls
bin   dev  file.txt  lib    media  opt   root  sbin  sys  usr
boot  etc  home      lib64  mnt    proc  run   srv   tmp  var
root@badc0670a5dd:/# _
```

7. Прочитать документацию и кратко описать основные 7 команд Dockerfile
   - Docker ps – просмотреть список запущенных контейнеров
   - Docker pull – загрузить образ
   - Docker run – запустить контейнер
   - Docker stop – остановить контейнер
   - Docker search – поиск образа
   - Docker create – создание контейнера
   - Docker rm – удаление контейнера

Работа с Kubernetes в Ubuntu

https://ubuntu.com/kubernetes/install ; https://microk8s.io/docs/

1. Установить microk8s

```
root@mruletkin:~# snap install microk8s --classic
microk8s v1.18.0 from Canonical♦ installed
root@mruletkin:~# _
```

2. Проверьте статус

```
root@mruletkin:~# microk8s status --wait-ready
microk8s is running
addons:
cilium: disabled
dashboard: disabled
dns: disabled
fluentd: disabled
gpu: disabled
helm: disabled
helm3: disabled
ingress: disabled
istio: disabled
jaeger: disabled
knative: disabled
kubeflow: disabled
linkerd: disabled
metallb: disabled
metrics-server: disabled
prometheus: disabled
rbac: disabled
registry: disabled
storage: disabled
root@mruletkin:~# _
```

и команды менеджера кластера (screenshot).

3. Просмотрите установленные в докере образы; заверните один из них в образ *.tar

```
root@mruletkin:~# ls ubuntu.tar
ubuntu.tar
```

4. Импортируйте образ в Kubernetes

```
root@mruletkin:~# microk8s.ctr image import ubuntu.tar
unpacking docker.io/library/ubuntu:latest (sha256:6867deccdd432c925dfcf1f265443d878079f7
16e955328cd9dc)...done
root@mruletkin:~#
```

5. Запустите образ и убедитесь, что он работает. (screenshot)