EPAM University Programs

DevOps external course

Module 2 Virtualization and Cloud Basic

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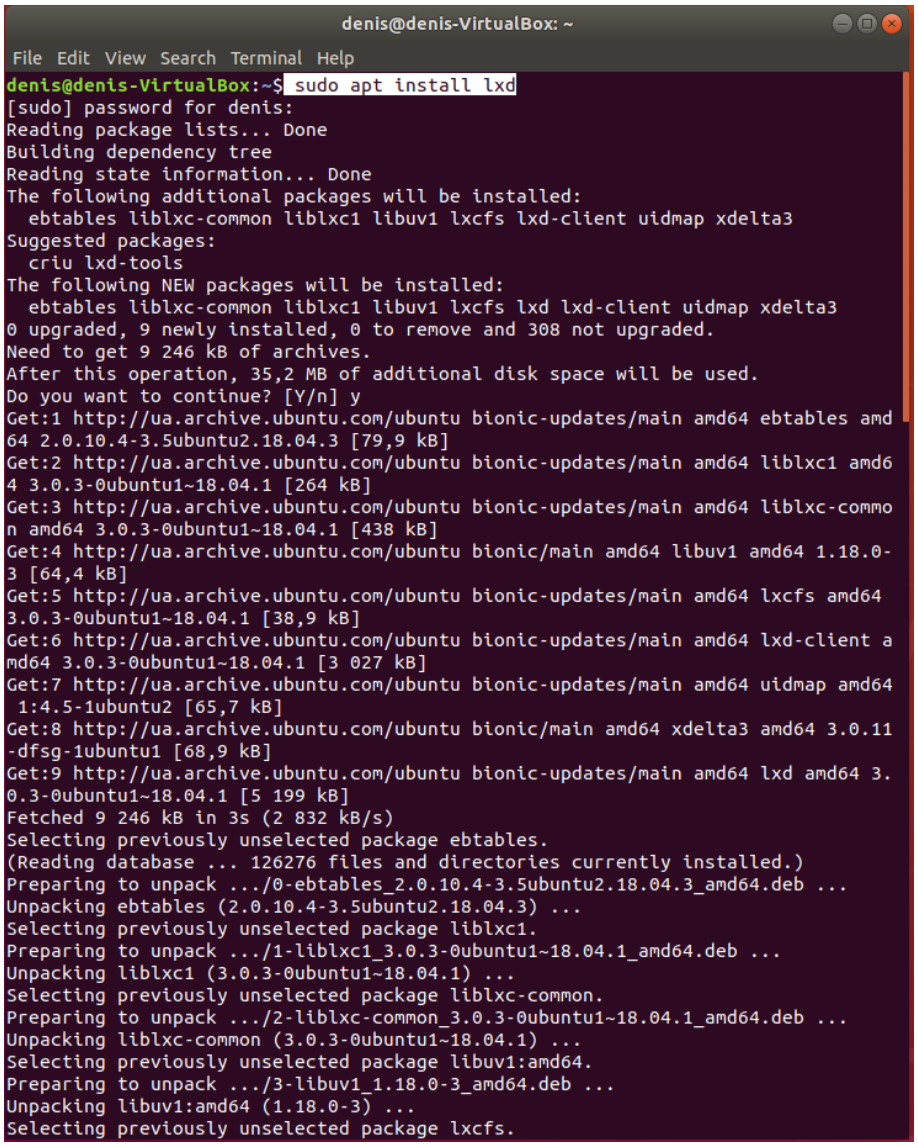
TASK 2.4

Работа с lxc в Ubuntu

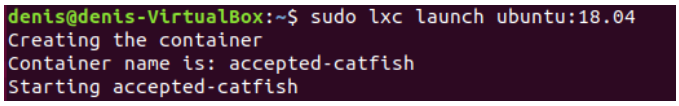
Documentation - https://help.ubuntu.com/lts/serverguide/lxd.html

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

1. Установить lxc (screenshot)



2. Запустить lxc launch для любой из версий Убунту (screenshot)



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

```
denis@denis-VirtualBox:~$ sudo lxc list
[sudo] password for denis:
+------------------+---------+---------------------+----------------------------------------------+------------+-----------+
|       NAME       |  STATE  |         IPV4        |                     IPV6                     |    TYPE    | SNAPSHOTS |
+------------------+---------+---------------------+----------------------------------------------+------------+-----------+
| accepted-catfish | RUNNING | 10.135.201.17 (eth0) | fd42:806d:99cf:70bc:216:3eff:fe91:80ec (eth0) | PERSISTENT | 0         |
+------------------+---------+---------------------+----------------------------------------------+------------+-----------+
```

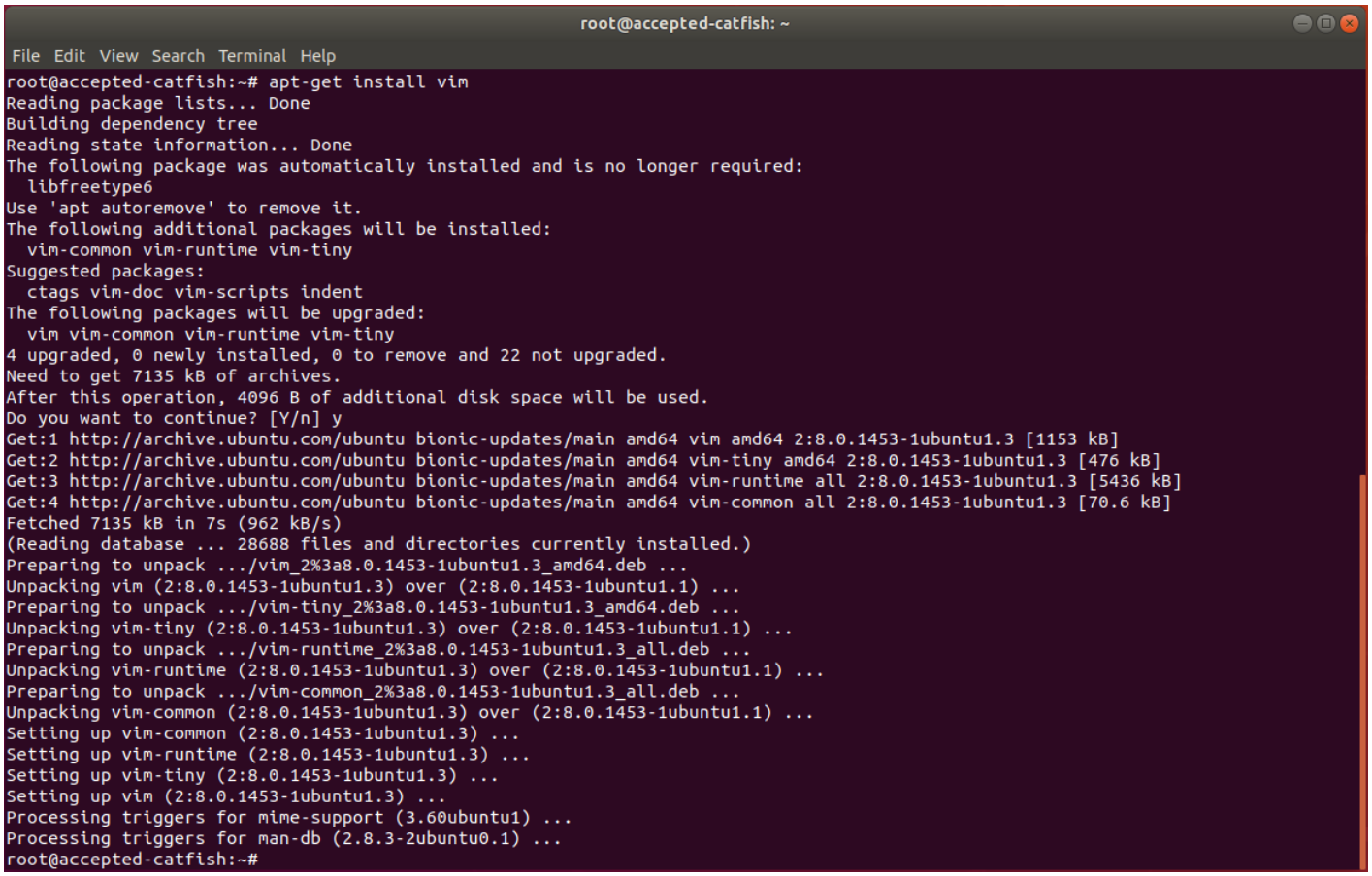
4. Зайдите в контейнер с командной строкой bash /bin/bash (screenshot)

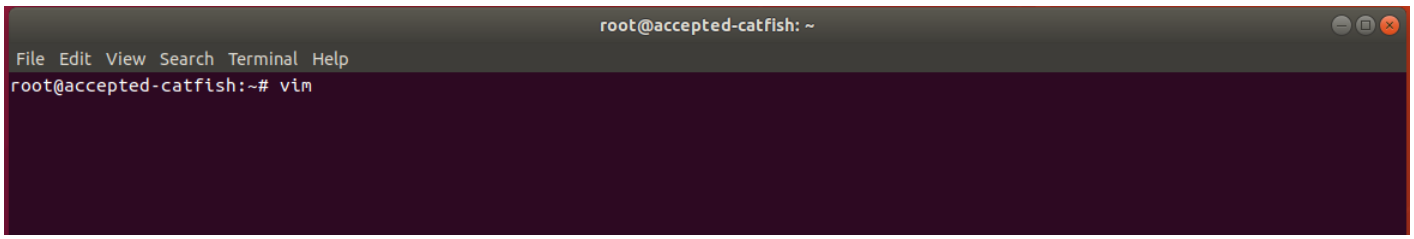
```
root@accepted-catfish: ~
File  Edit  View  Search  Terminal  Help
denis@denis-VirtualBox:~$ sudo lxc list
[sudo] password for denis:
+------------------+---------+---------------------+----------------------------------------------+------------+-----------+
|       NAME       |  STATE  |         IPV4        |                     IPV6                     |    TYPE    | SNAPSHOTS |
+------------------+---------+---------------------+----------------------------------------------+------------+-----------+
| accepted-catfish | RUNNING | 10.135.201.17 (eth0) | fd42:806d:99cf:70bc:216:3eff:fe91:80ec (eth0) | PERSISTENT | 0         |
+------------------+---------+---------------------+----------------------------------------------+------------+-----------+
denis@denis-VirtualBox:~$ sudo lxc exec accepted-catfish -- /bin/bash
root@accepted-catfish:~#
```

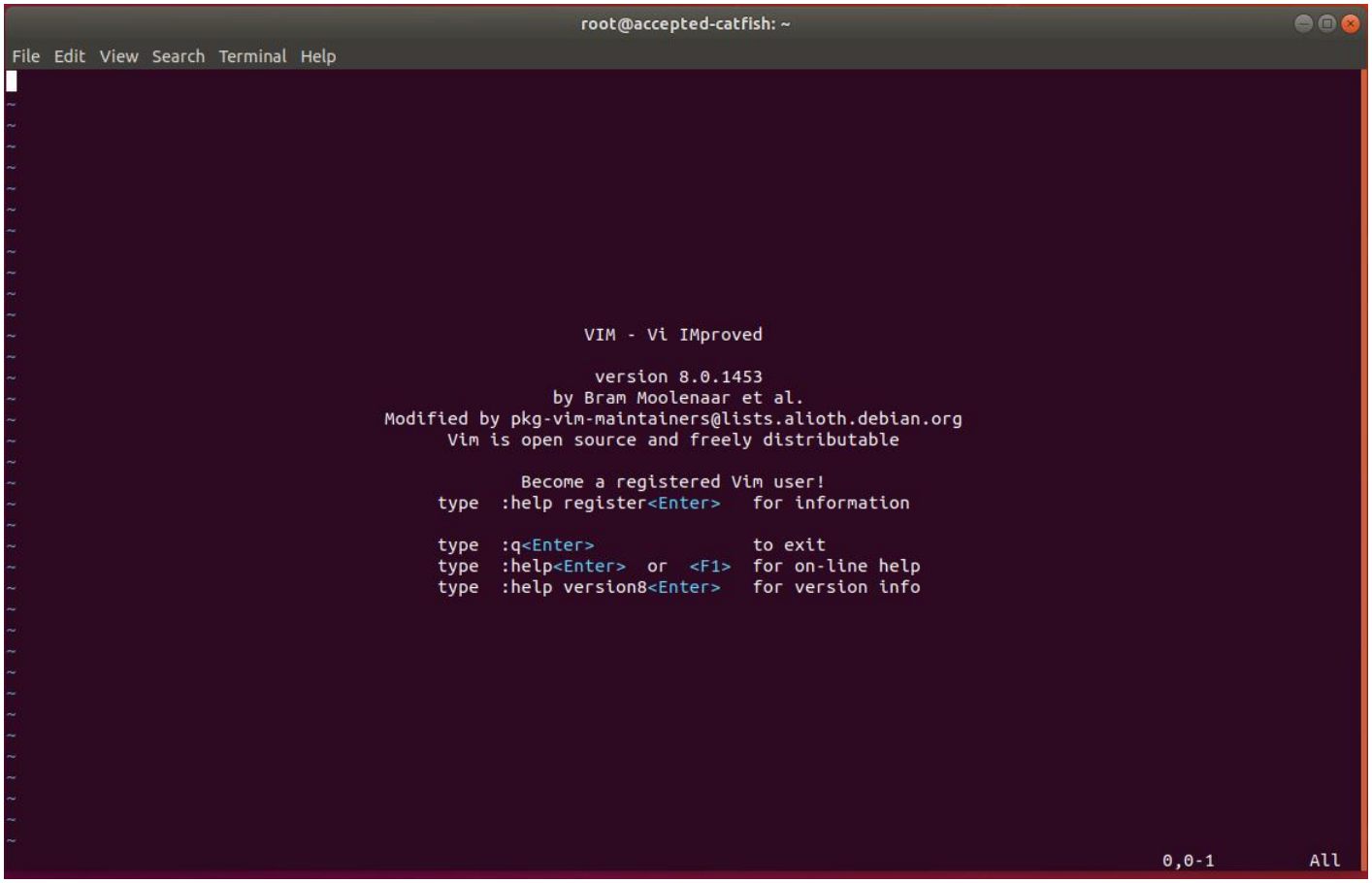
5. Запустите обновление apt-get update (screenshot)

```
root@accepted-catfish: ~
File  Edit  View  Search  Terminal  Help
| accepted-catfish | RUNNING | 10.135.201.17 (eth0) | fd42:806d:99cf:70bc:216:3eff:fe91:80ec (eth0) | PERSISTENT | 0         |
+------------------+---------+---------------------+----------------------------------------------+------------+-----------+
denis@denis-VirtualBox:~$ sudo lxc exec accepted-catfish -- /bin/bash
root@accepted-catfish:~# apt-get update
Hit:1 http://archive.ubuntu.com/ubuntu bionic InRelease
Get:2 http://security.ubuntu.com/ubuntu bionic-security InRelease [88.7 kB]
Get:3 http://archive.ubuntu.com/ubuntu bionic-updates 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://security.ubuntu.com/ubuntu bionic-security/main Translation-en [218 kB]
Get:8 http://security.ubuntu.com/ubuntu bionic-security/restricted amd64 Packages [28.5 kB]
Get:9 http://security.ubuntu.com/ubuntu bionic-security/restricted Translation-en [7568 B]
Get:10 http://security.ubuntu.com/ubuntu bionic-security/universe amd64 Packages [653 kB]
Get:11 http://security.ubuntu.com/ubuntu bionic-security/universe Translation-en [217 kB]
Get:12 http://security.ubuntu.com/ubuntu bionic-security/multiverse amd64 Packages [6968 B]
Get:13 http://security.ubuntu.com/ubuntu bionic-security/multiverse Translation-en [2732 B]
Get:14 http://archive.ubuntu.com/ubuntu bionic/universe Translation-en [4941 kB]
Get:15 http://archive.ubuntu.com/ubuntu bionic/multiverse amd64 Packages [151 kB]
Get:16 http://archive.ubuntu.com/ubuntu bionic/multiverse Translation-en [108 kB]
Get:17 http://archive.ubuntu.com/ubuntu bionic-updates/main amd64 Packages [897 kB]
Get:18 http://archive.ubuntu.com/ubuntu bionic-updates/main Translation-en [310 kB]
Get:19 http://archive.ubuntu.com/ubuntu bionic-updates/restricted amd64 Packages [37.5 kB]
Get:20 http://archive.ubuntu.com/ubuntu bionic-updates/restricted Translation-en [9524 B]
Get:21 http://archive.ubuntu.com/ubuntu bionic-updates/universe amd64 Packages [1061 kB]
Get:22 http://archive.ubuntu.com/ubuntu bionic-updates/universe Translation-en [329 kB]
Get:23 http://archive.ubuntu.com/ubuntu bionic-updates/multiverse amd64 Packages [10.5 kB]
Get:24 http://archive.ubuntu.com/ubuntu bionic-updates/multiverse Translation-en [4696 B]
Get:25 http://archive.ubuntu.com/ubuntu bionic-backports/main amd64 Packages [2512 B]
Get:26 http://archive.ubuntu.com/ubuntu bionic-backports/main Translation-en [1644 B]
Get:27 http://archive.ubuntu.com/ubuntu bionic-backports/universe amd64 Packages [4020 B]
Get:28 http://archive.ubuntu.com/ubuntu bionic-backports/universe Translation-en [1900 B]
Fetched 18.5 MB in 16s (1178 kB/s)
Reading package lists... Done
root@accepted-catfish:~#
```

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

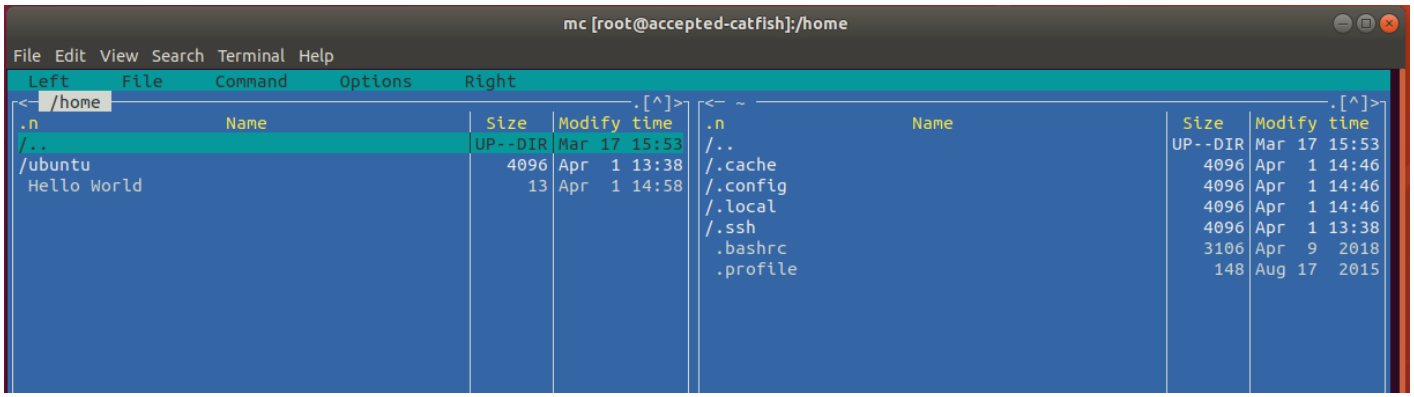


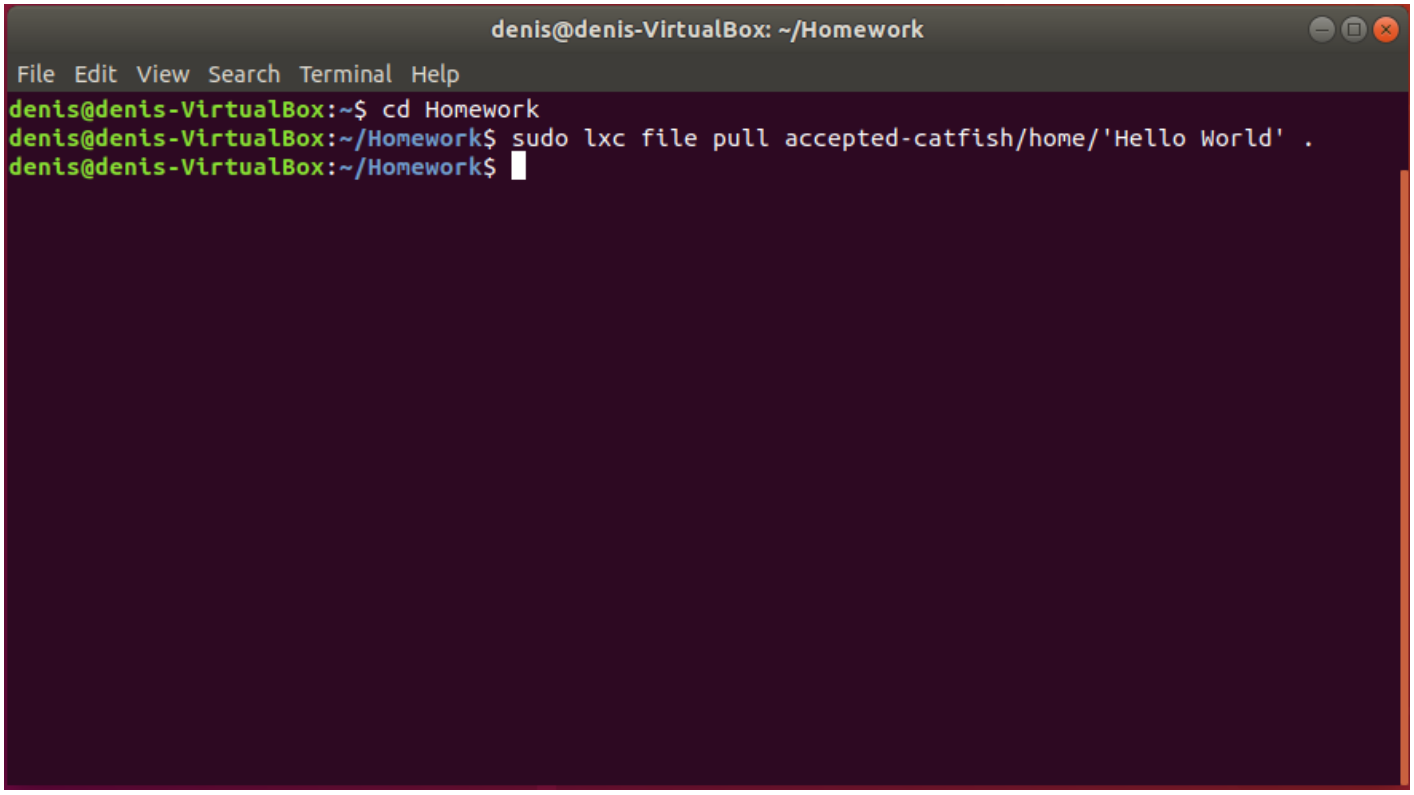


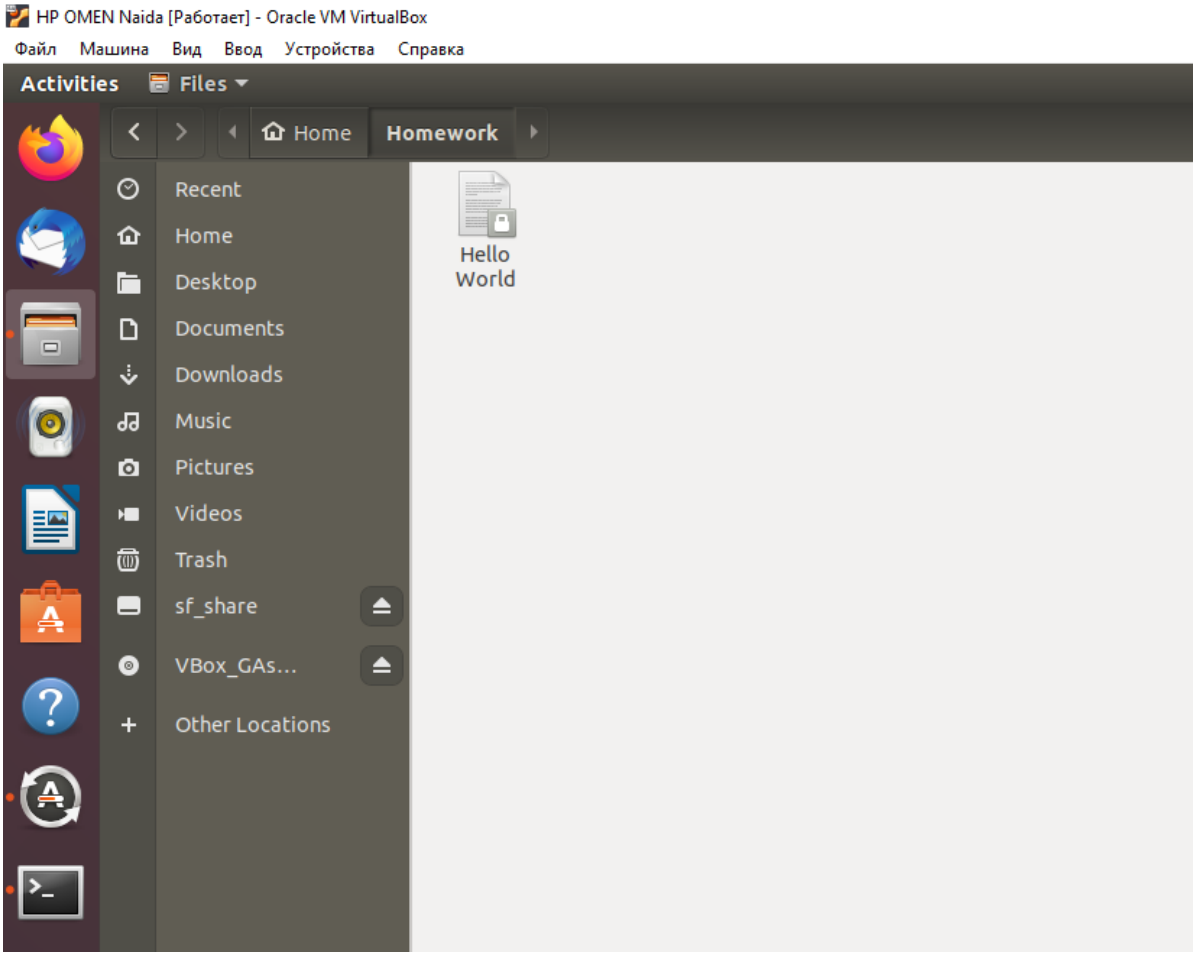


7. Загрузите в контейнер файл (screenshot) и скачайте с контейнера другой файл (screenshot).

```
denis@denis-VirtualBox:~$ sudo lxc file push 'Hello World' accepted-catfish/home/
denis@denis-VirtualBox:~$ sudo lxc exec accepted-catfish -- /bin/bash
root@accepted-catfish:~# mc
```




denis@denis-VirtualBox: ~/Homework
File Edit View Search Terminal Help
denis@denis-VirtualBox:~$ cd Homework
denis@denis-VirtualBox:~/Homework$ sudo lxc file pull accepted-catfish/home/'Hello World' .
denis@denis-VirtualBox:~/Homework$

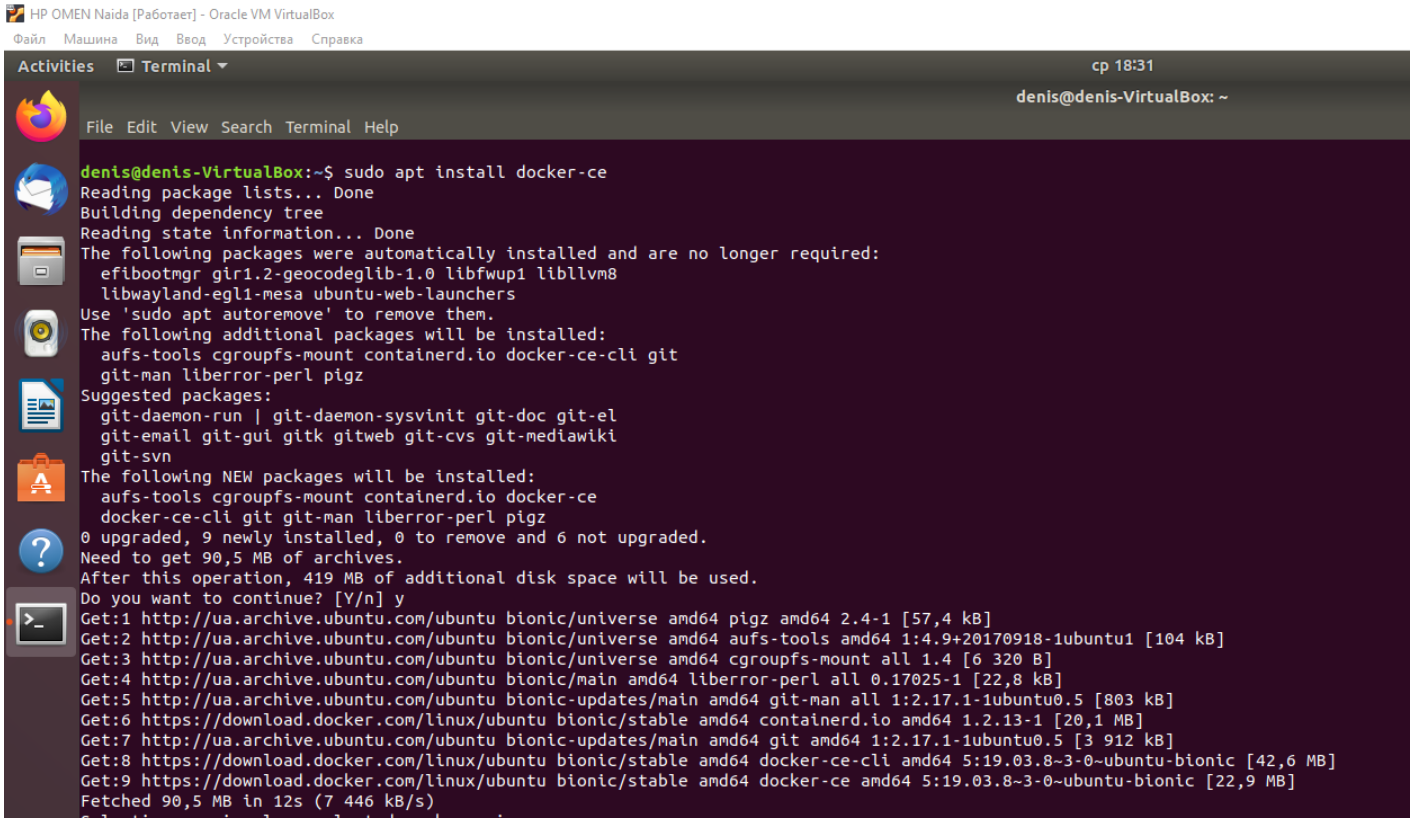

HP OMEN Naida [Работает] - Oracle VM VirtualBox
Файл Машина Вид Ввод Устройства Справка
Activities
Files
Home
Homework
Recent
Home
Desktop
Documents
Downloads
Music
Pictures
Videos
Trash
sf_share
VBox_GAs...
Other Locations
Hello World

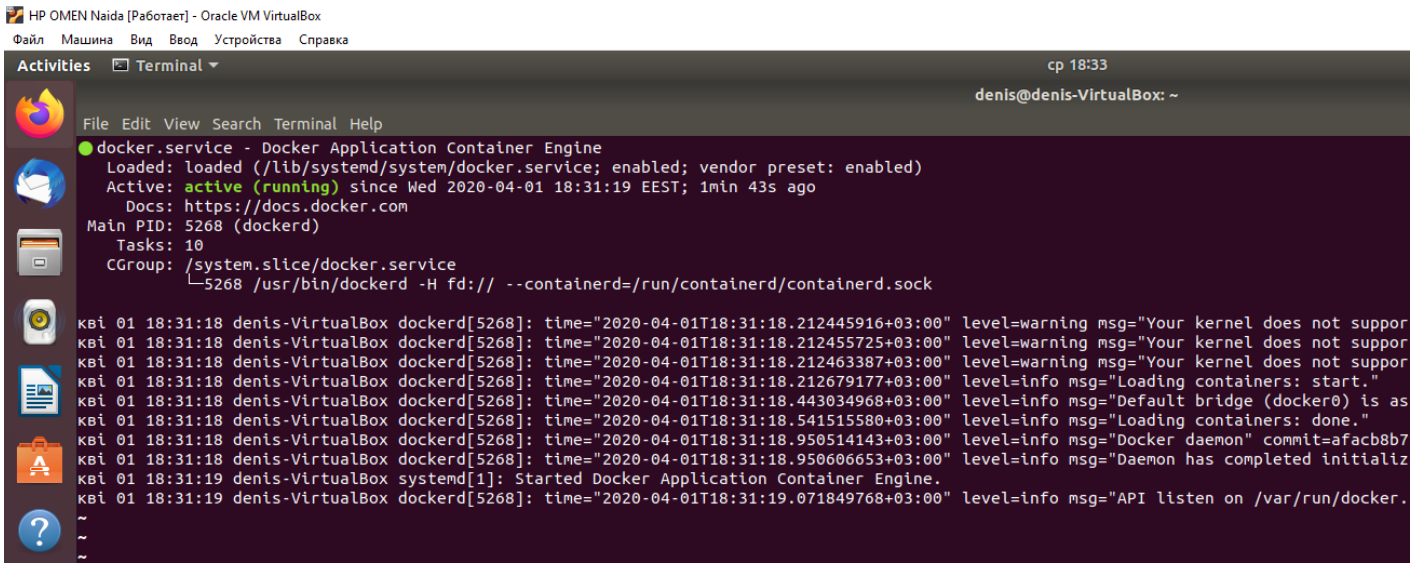
Работа с Docker в Ubuntu

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

https://docs.docker.com

1. Установить docker (screenshot)





2. Запустить поиск сконфигурированных решений для “ubuntu”(screenshot)

```
denis@denis-VirtualBox: ~
File  Edit  View  Search  Terminal  Help

denis@denis-VirtualBox:~$ sudo docker search ubuntu
NAME                                                DESCRIPTION                                     STARS               OFFICIAL            AUTOMATED
ubuntu                                              Ubuntu is a Debian-based Linux operating sys…   10699               [OK]
dorowu/ubuntu-desktop-lxde-vnc                      Docker image to provide HTML5 VNC interface …   410                                     [OK]
rastasheep/ubuntu-sshd                              Dockerized SSH service, built on top of offi…   245                                     [OK]
consol/ubuntu-xfce-vnc                              Ubuntu container with "headless" VNC session…   212                                     [OK]
ubuntu-upstart                                      Upstart is an event-based replacement for th…   107                 [OK]
neurodebian                                         NeuroDebian provides neuroscience research s…   67                  [OK]
1and1internet/ubuntu-16-nginx-php-phpmyadmin-mysql-5   ubuntu-16-nginx-php-phpmyadmin-mysql-5          50                                      [OK]
ubuntu-debootstrap                                  debootstrap --variant=minbase --components=m…   43                  [OK]
nuagebec/ubuntu                                     Simple always updated Ubuntu docker images w…   24                                      [OK]
i386/ubuntu                                         Ubuntu is a Debian-based Linux operating sys…   19
1and1internet/ubuntu-16-apache-php-5.6              ubuntu-16-apache-php-5.6                        14                                      [OK]
1and1internet/ubuntu-16-apache-php-7.0              ubuntu-16-apache-php-7.0                        13                                      [OK]
ppc64le/ubuntu                                      Ubuntu is a Debian-based Linux operating sys…   13
1and1internet/ubuntu-16-nginx-php-phpmyadmin-mariadb-10   ubuntu-16-nginx-php-phpmyadmin-mariadb-10     11                                      [OK]
1and1internet/ubuntu-16-nginx-php-5.6               ubuntu-16-nginx-php-5.6                         8                                       [OK]
1and1internet/ubuntu-16-nginx-php-5.6-wordpress-4   ubuntu-16-nginx-php-5.6-wordpress-4             7                                       [OK]
1and1internet/ubuntu-16-apache-php-7.1              ubuntu-16-apache-php-7.1                        6                                       [OK]
darksheer/ubuntu                                    Base Ubuntu Image -- Updated hourly             5                                       [OK]
pivotaldata/ubuntu                                  A quick freshening-up of the base Ubuntu doc…   4
1and1internet/ubuntu-16-nginx-php-7.0               ubuntu-16-nginx-php-7.0                         4                                       [OK]
pivotaldata/ubuntu16.04-build                       Ubuntu 16.04 image for GPDB compilation         2
pivotaldata/ubuntu-gpdb-dev                         Ubuntu images for GPDB development              1
smartentry/ubuntu                                   ubuntu with smartentry                          1                                       [OK]
1and1internet/ubuntu-16-sshd                        ubuntu-16-sshd                                  1                                       [OK]
1and1internet/ubuntu-16-php-7.1                     ubuntu-16-php-7.1                               1                                       [OK]
denis@denis-VirtualBox:~$
```

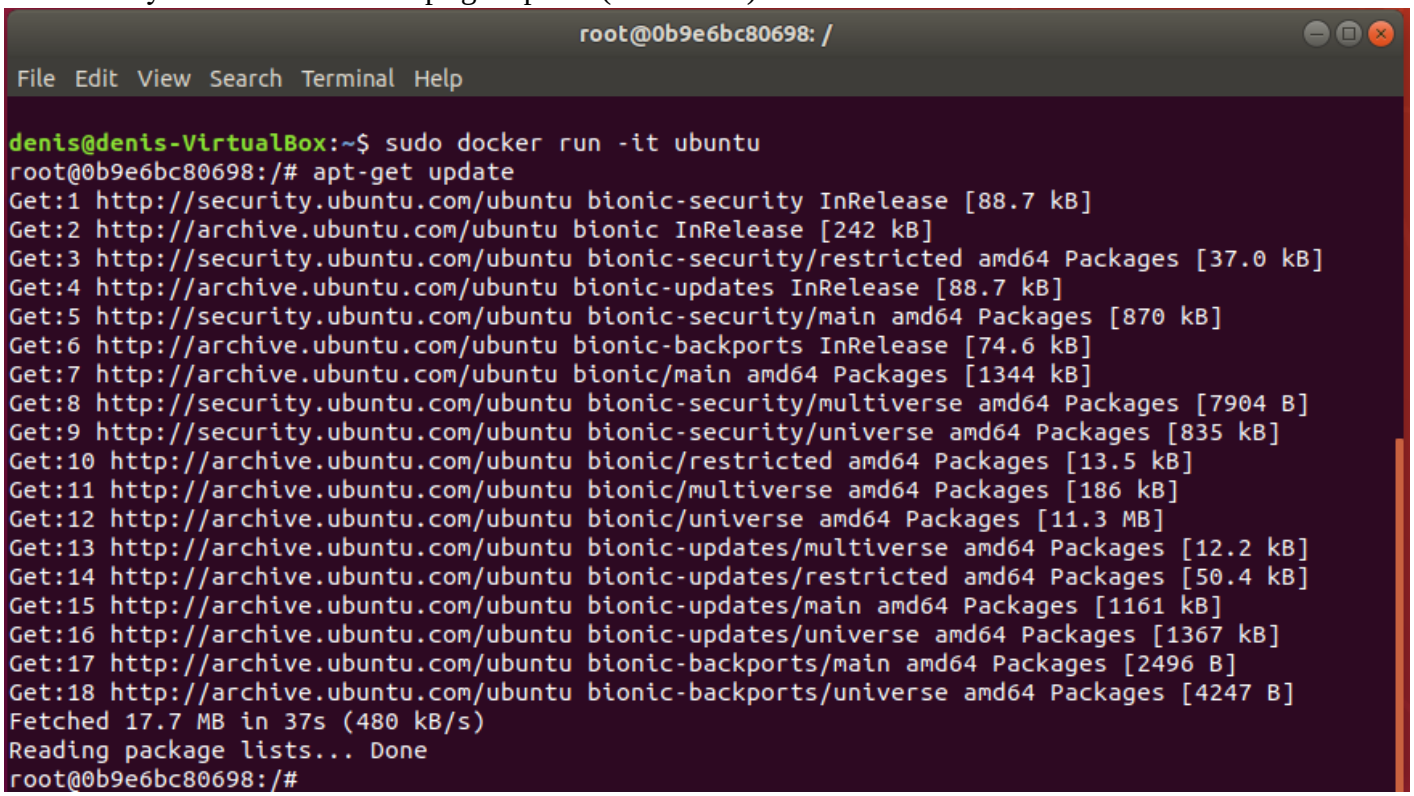
3. Скачать любой из образов на локальную машину. (screenshot)

```
denis@denis-VirtualBox: ~
File  Edit  View  Search  Terminal  Help
denis@denis-VirtualBox:~$ 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
```

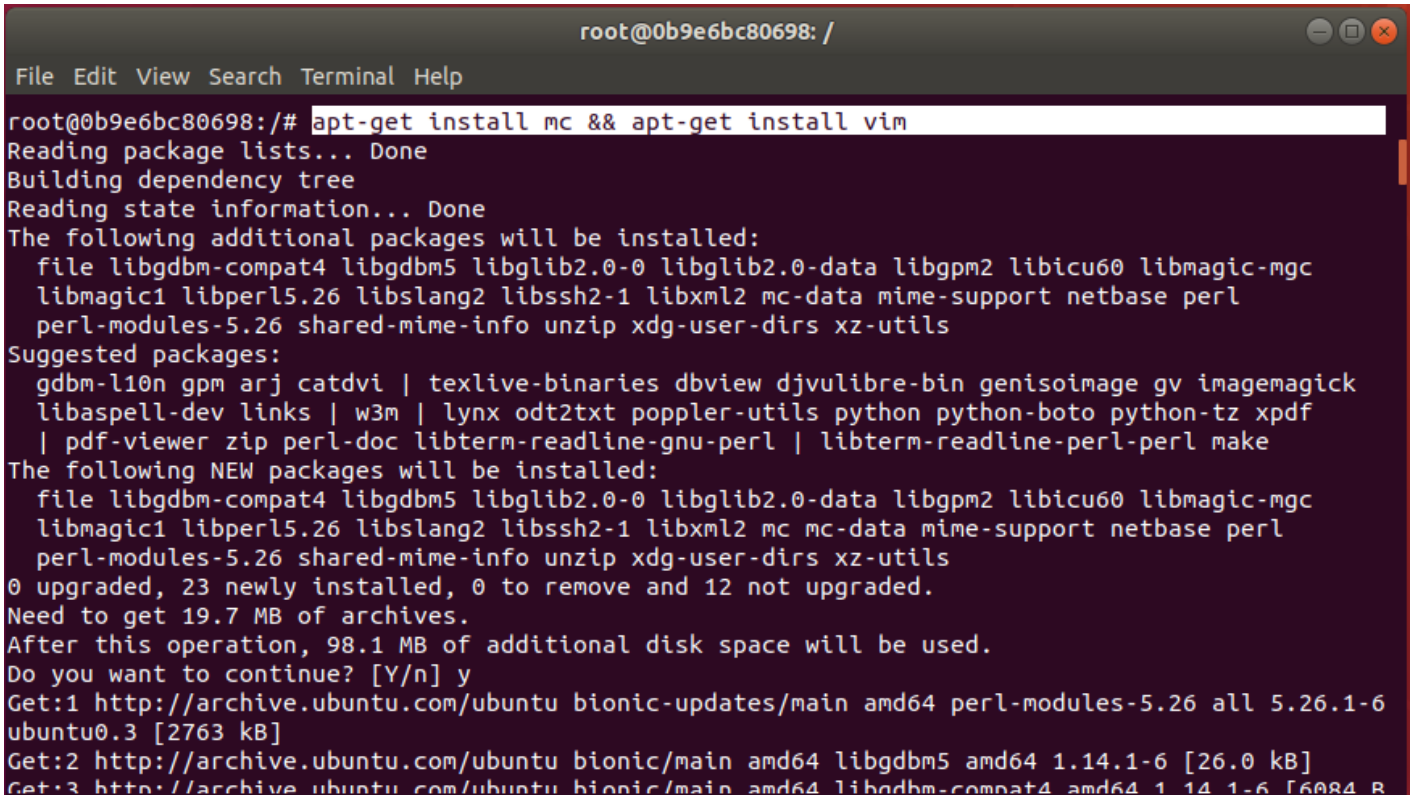
4. Запустить команду просмотра загруженных на компьютер образов. (screenshot)

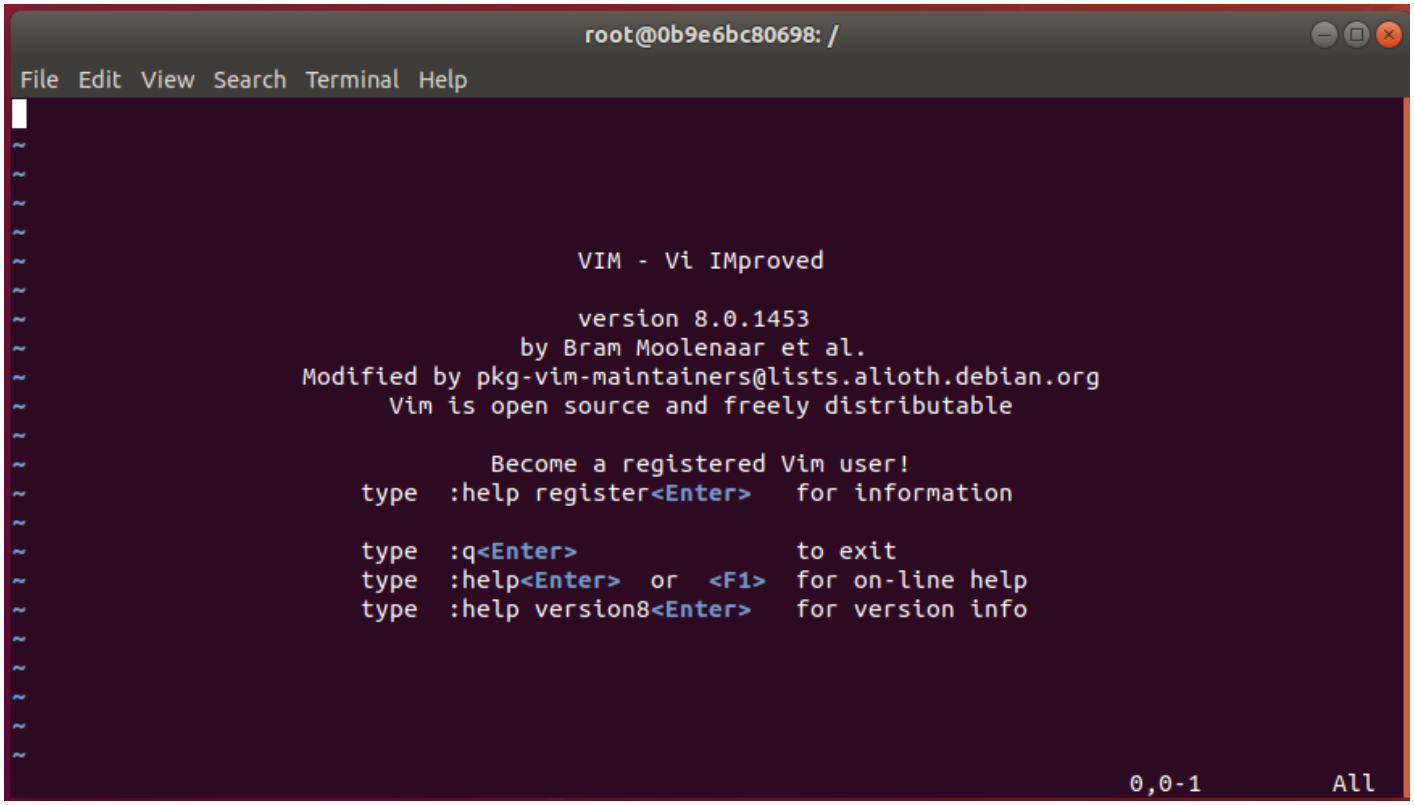
```
denis@denis-VirtualBox: ~
File  Edit  View  Search  Terminal  Help
denis@denis-VirtualBox:~$ docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
ubuntu              latest              4e5021d210f6        12 days ago         64.2MB
denis@denis-VirtualBox:~$
```

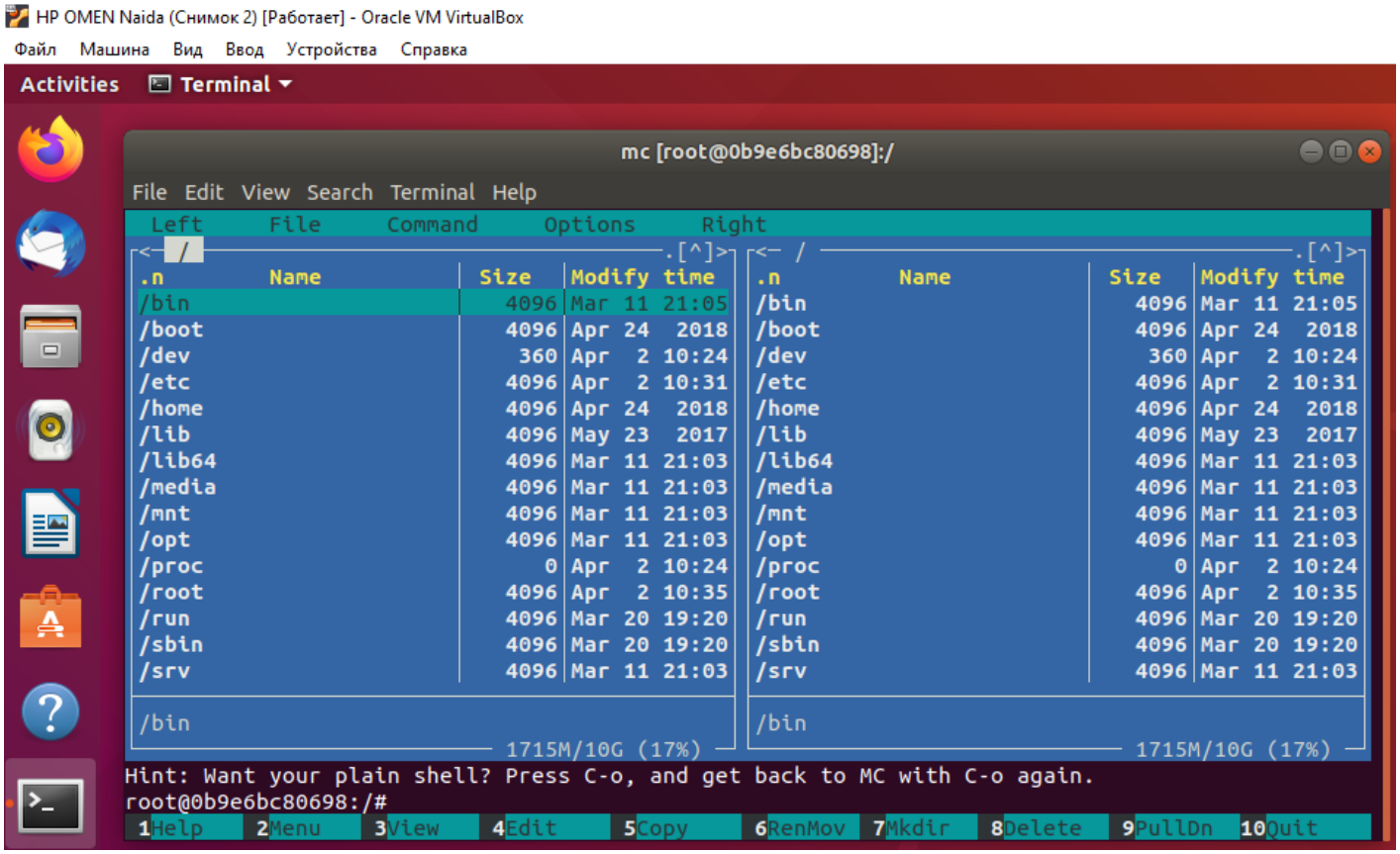
5. Запустите обновление apt-get update (screenshot)



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

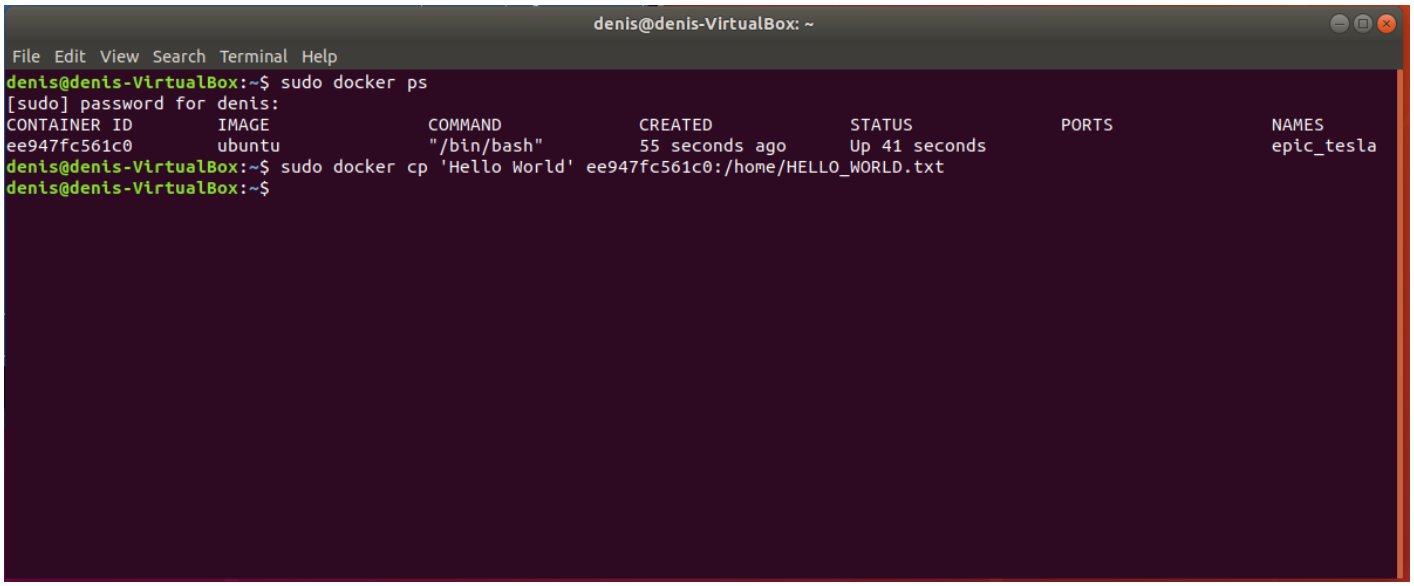


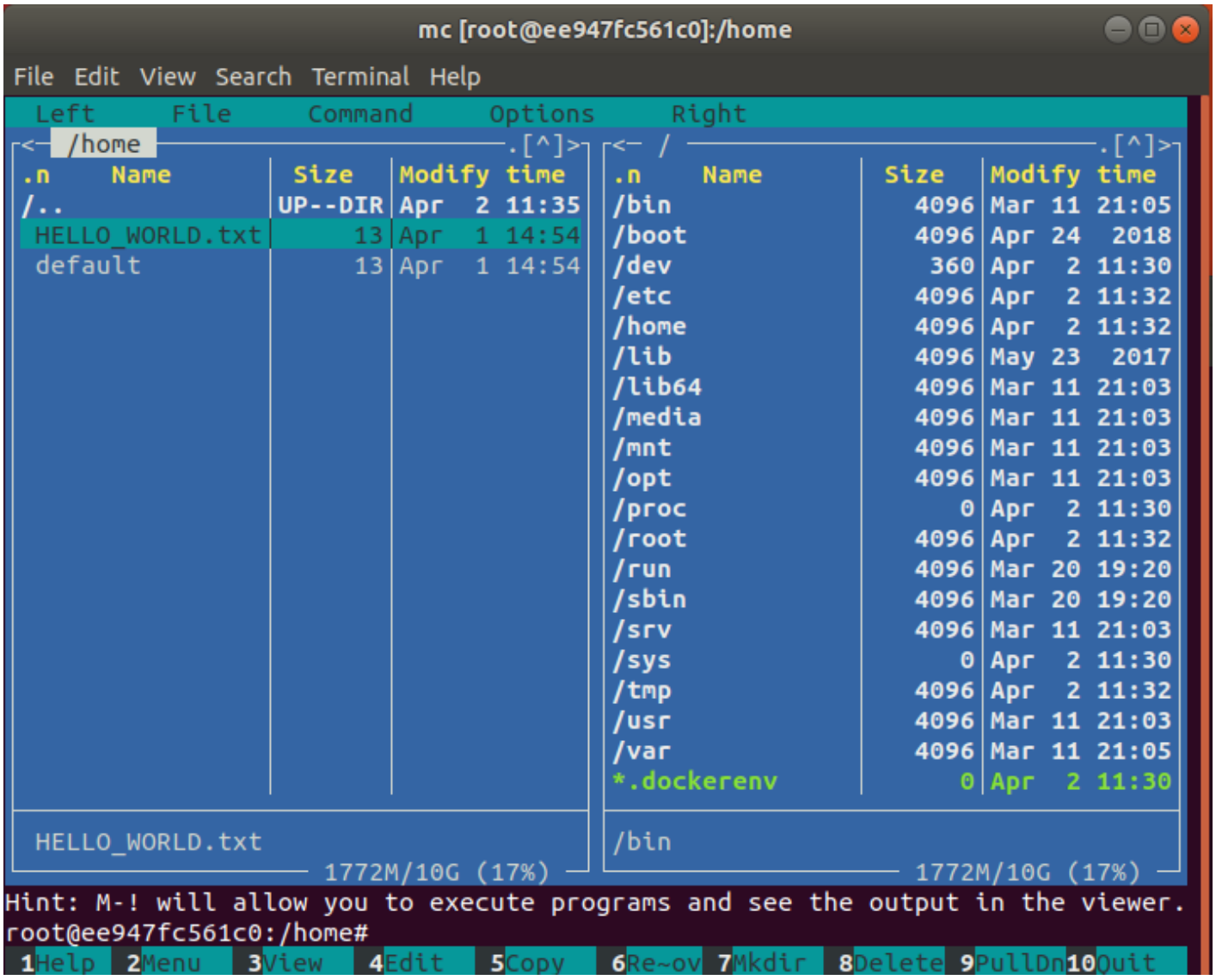

root@0b9e6bc80698: /
File Edit View Search Terminal Help
VIM - Vi IMproved
version 8.0.1453
by Bram Moolenaar et al.
Modified by pkg-vim-maintainers@lists.alioth.debian.org
Vim is open source and freely distributable
Become a registered Vim user!
type :help register<Enter> for information
type :q<Enter> to exit
type :help<Enter> or <F1> for on-line help
type :help version8<Enter> for version info
0,0-1 All


HP OMEN Naida (Снимок 2) [Работает] - Oracle VM VirtualBox
Файл Машина Вид Ввод Устройства Справка
Activities
Terminal
mc [root@0b9e6bc80698]:/
File Edit View Search Terminal Help
Left File Command Options Right
.n Name Size Modify time
/bin 4096 Mar 11 21:05
/boot 4096 Apr 24 2018
/dev 360 Apr 2 10:24
/etc 4096 Apr 2 10:31
/home 4096 Apr 24 2018
/lib 4096 May 23 2017
/lib64 4096 Mar 11 21:03
/media 4096 Mar 11 21:03
/mnt 4096 Mar 11 21:03
/opt 4096 Mar 11 21:03
/proc 0 Apr 2 10:24
/root 4096 Apr 2 10:35
/run 4096 Mar 20 19:20
/sbin 4096 Mar 20 19:20
/srv 4096 Mar 11 21:03
1715M/10G (17%)
Hint: Want your plain shell? Press C-o, and get back to MC with C-o again.
root@0b9e6bc80698:/#
1Help 2Menu 3View 4Edit 5Copy 6RenMov 7Mkdir 8Delete 9PullDn 10Quit

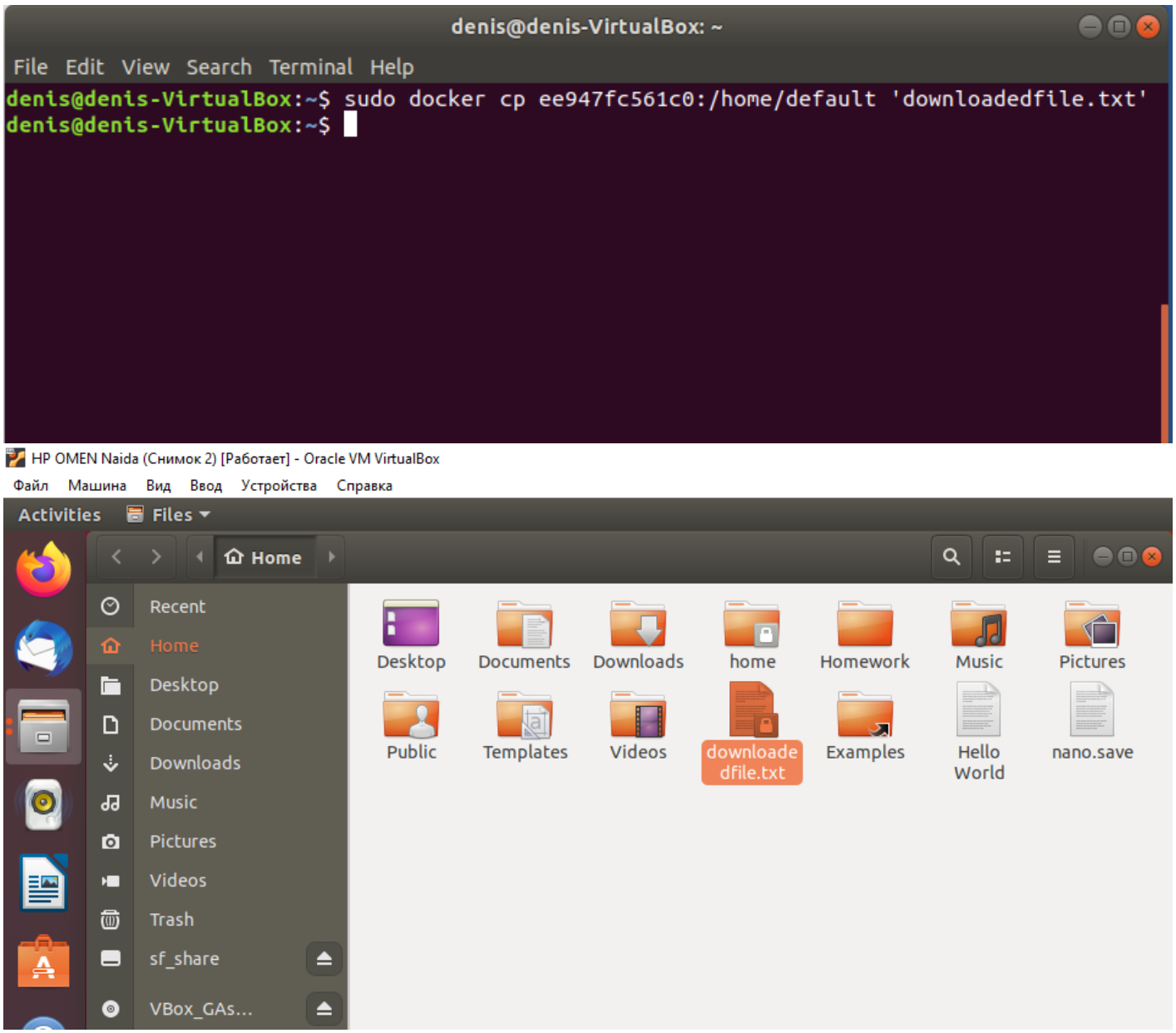
7. Загрузите в контейнер файл (screenshot) и скачайте с контейнера другой файл (screenshot).

Загрузка с хоста в контейнер





Скачивание из контейнера на хост



8. Прочитать документацию и кратко описать основные 7 команд Dockerfile

kill – «Убивает» один или более запущенных контейнеров. Для использования необходимо ввести в командную строку: *docker kill [опции] <id контейнера>*

run – Запускает контейнер с выбранным образом. Для использования необходимо ввести в командную строку: *docker run [опции] <имя образа>*. При добавление параметра *-i* и *-t* (*-it*) после *run*, предоставляется интерактивный доступ к контейнеру с помощью командной строки.

commit – Позволяет создать новый образ на основе изменений, внесенных в контейнер. Для использования необходимо ввести: *docker commit [опции] <id контейнера> <название репозитория>/<имя нового образа>*

push – Позволяет выгрузить образ в репозиторий. Для использования необходимо залогиниться в Docker Hub и после этого ввести в командную строку: *docker push [опции] <имя вашего репозитория>/<имя образа>*

pull – Позволяет скачать образ из репозитория. Для использования необходимо ввести в командную строку: *docker pull <имя образа>*

create – Позволяет создать новый контейнер. Для использования необходимо ввести в командную строку: *docker create [OPTIONS] IMAGE [COMMAND] [ARG...]*

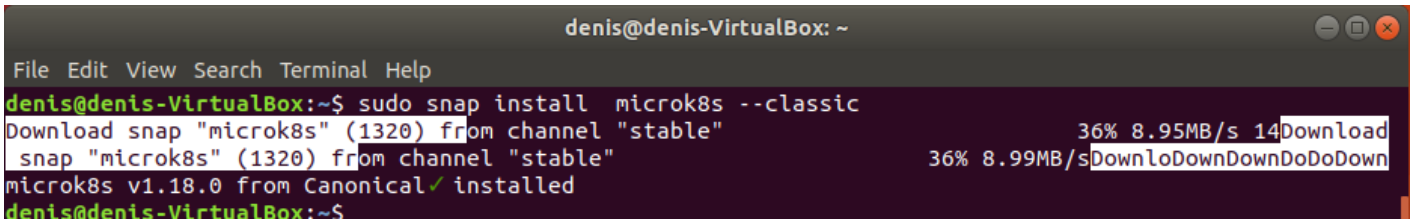
exec – Позволяет выполнить команду в уже запущенном контейнере. Для использования необходимо ввести в командную строку: *docker exec [опции] <команда> [опции]*

Работа с Kubernetes в Ubuntu

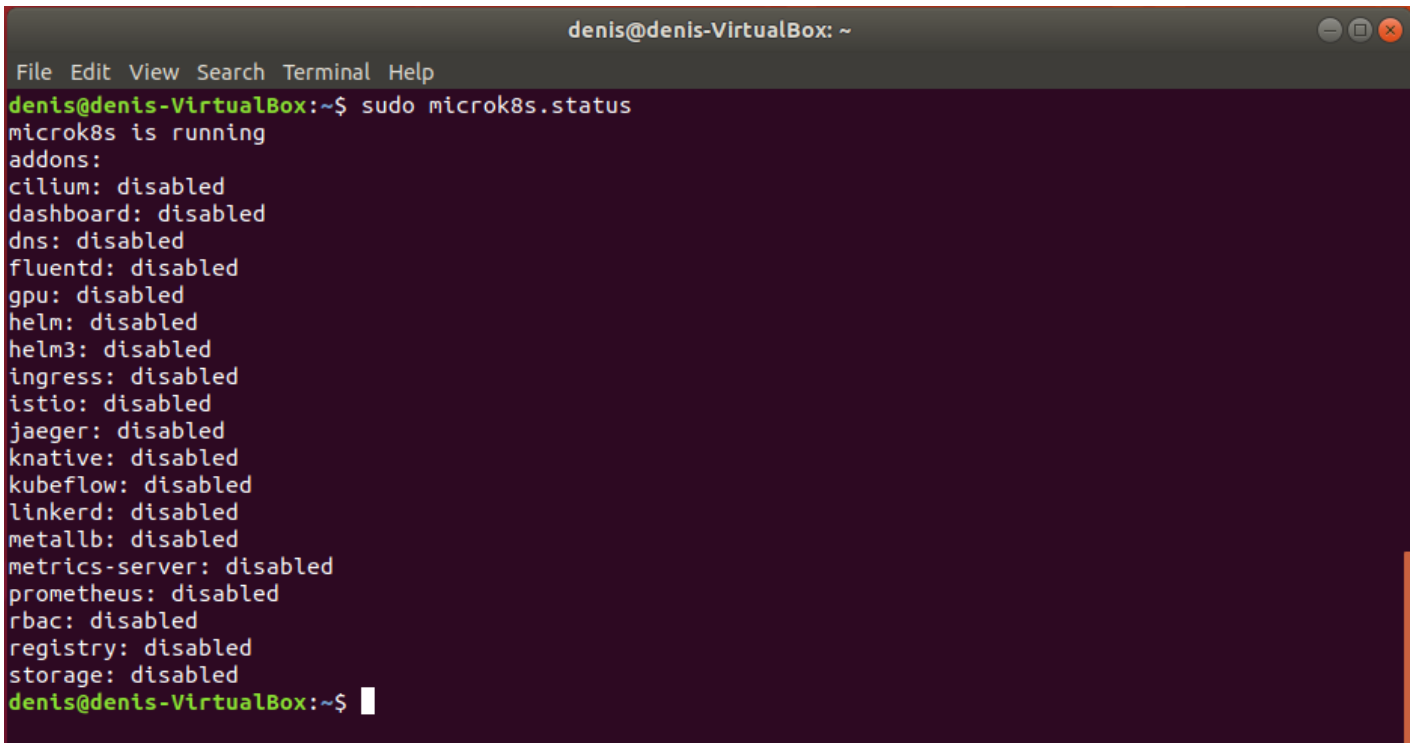
https://ubuntu.com/kubernetes/install ;

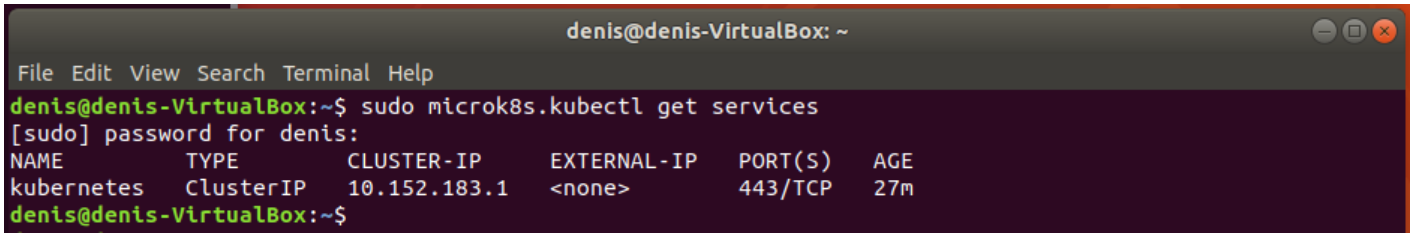
https://microk8s.io/docs/

1. Установить microk8s (screenshot)

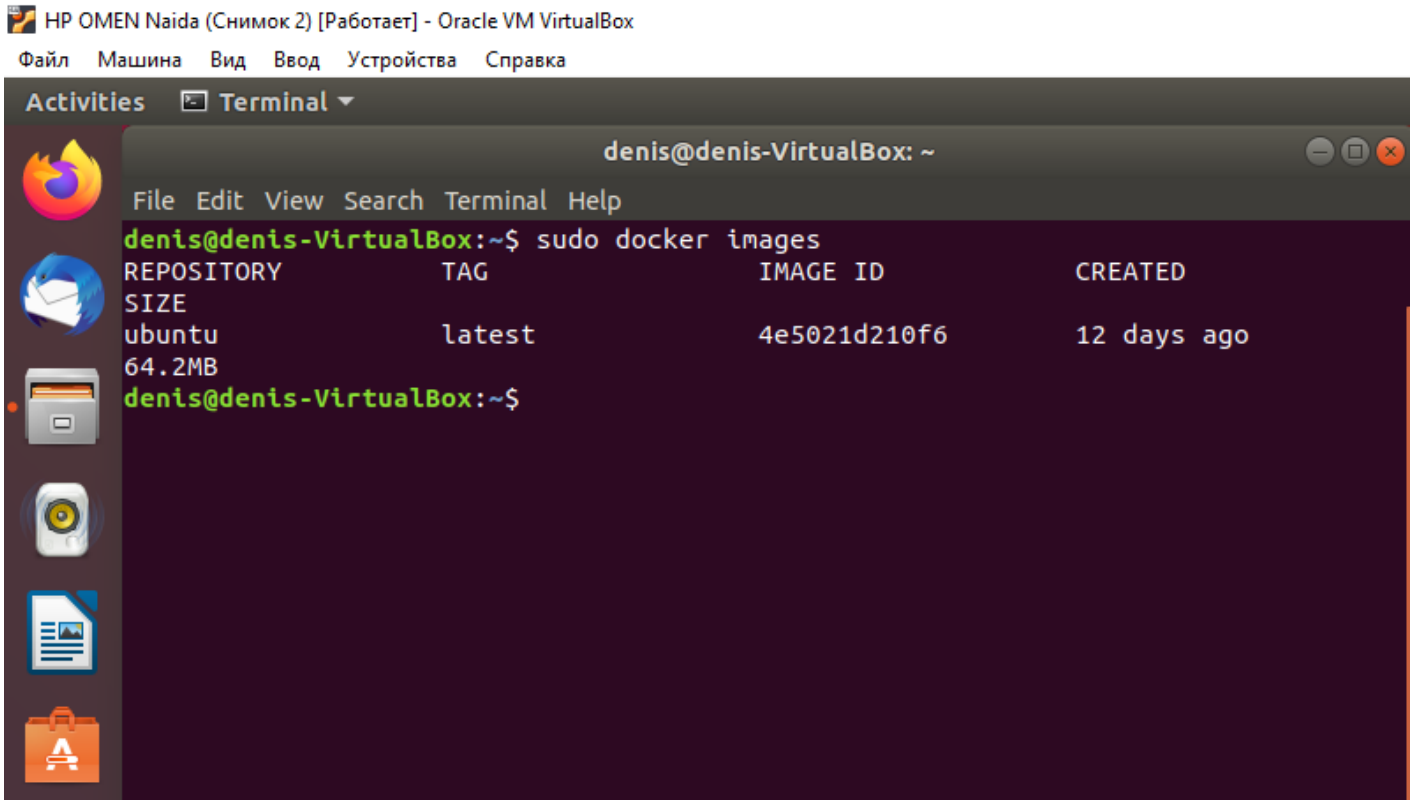


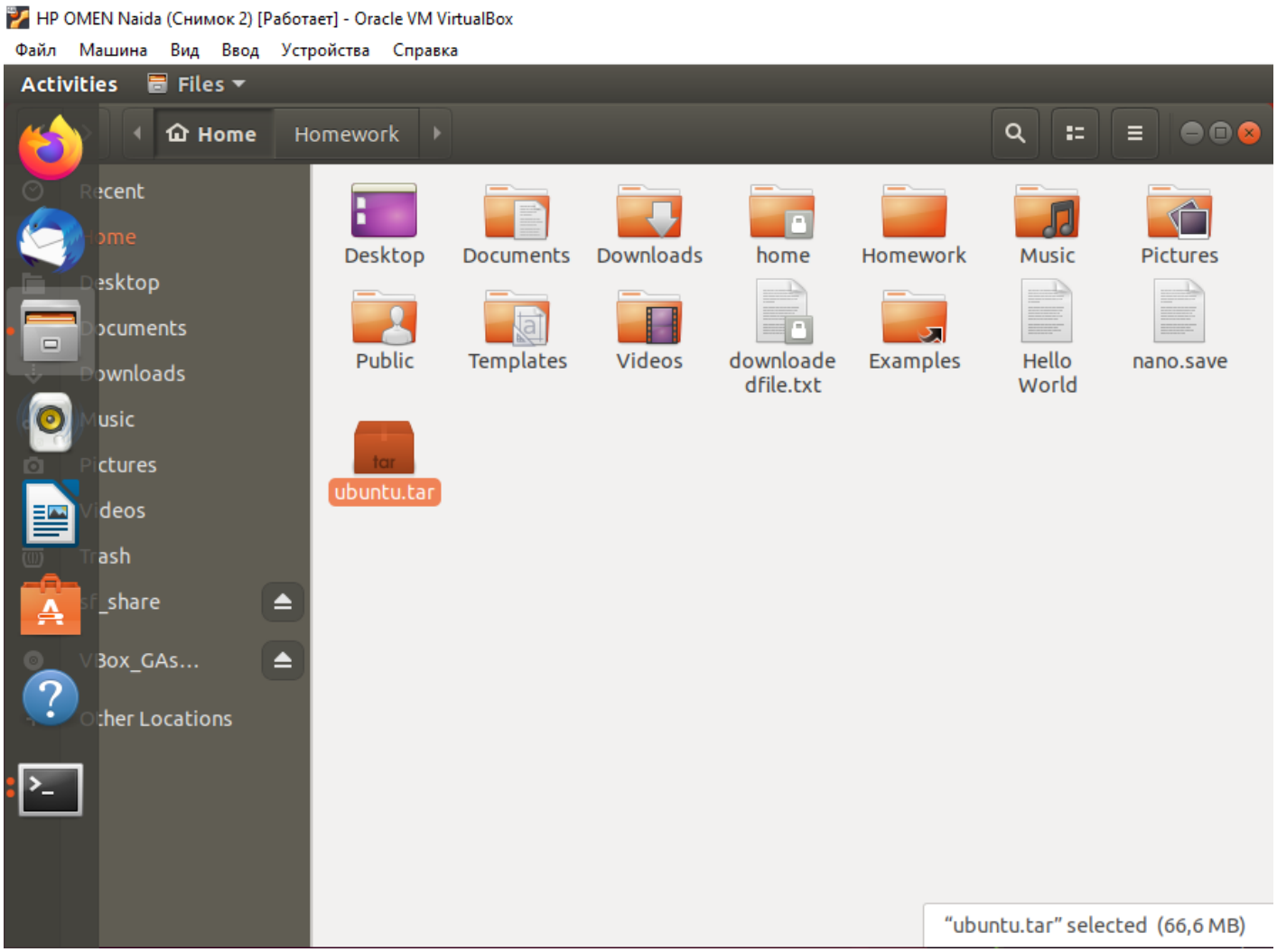
2. Проверьте статус (screenshot) и команды менеджера кластера (screenshot).



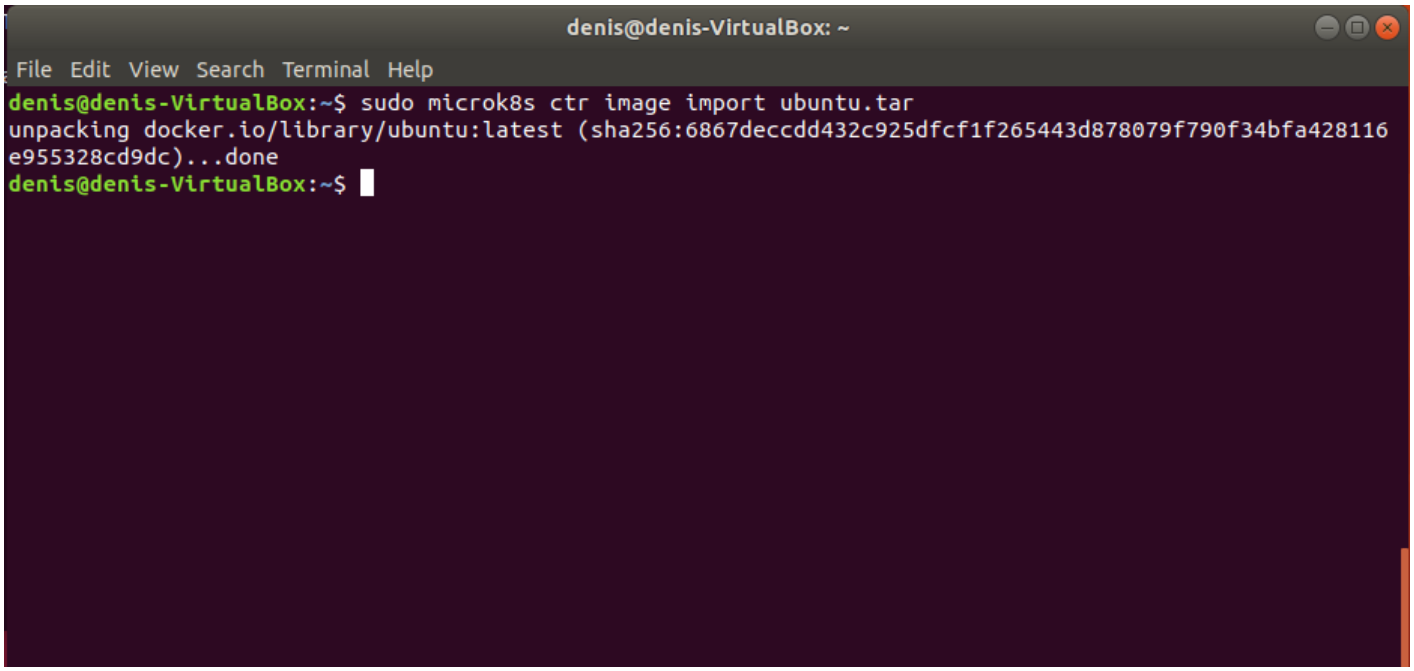


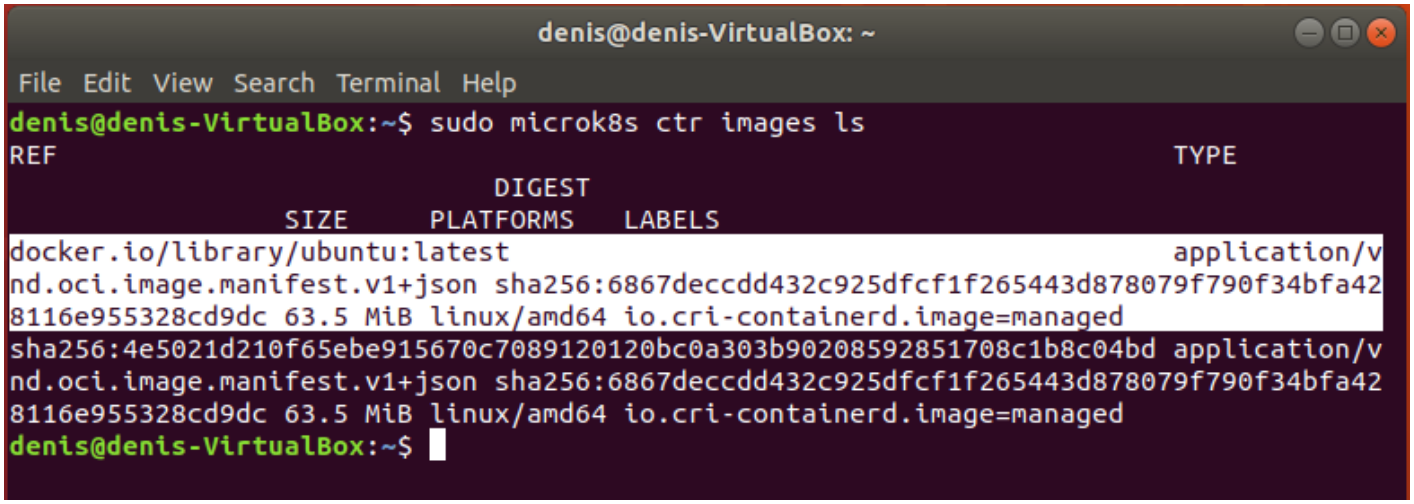
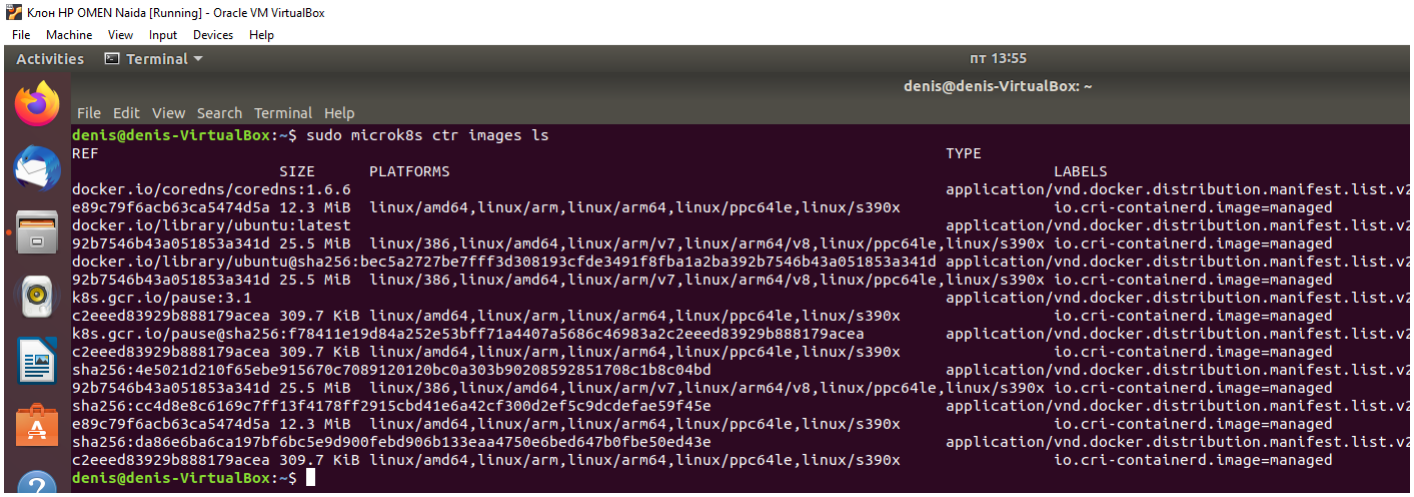
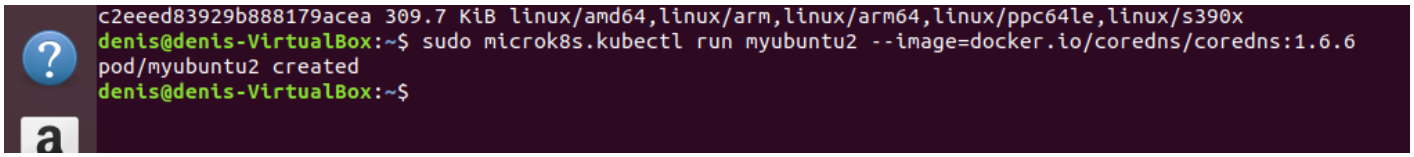
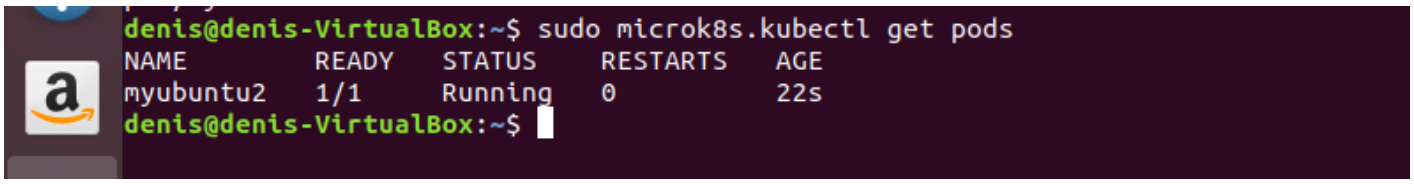
3. Просмотрите установленные в докере образы; заверните один из них в образ *.tar





4. Импортируйте образ в Kubernetes (screenshot)





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