EPAM University Programs

DevOps external course

Module 2 Virtualization and Cloud Basic

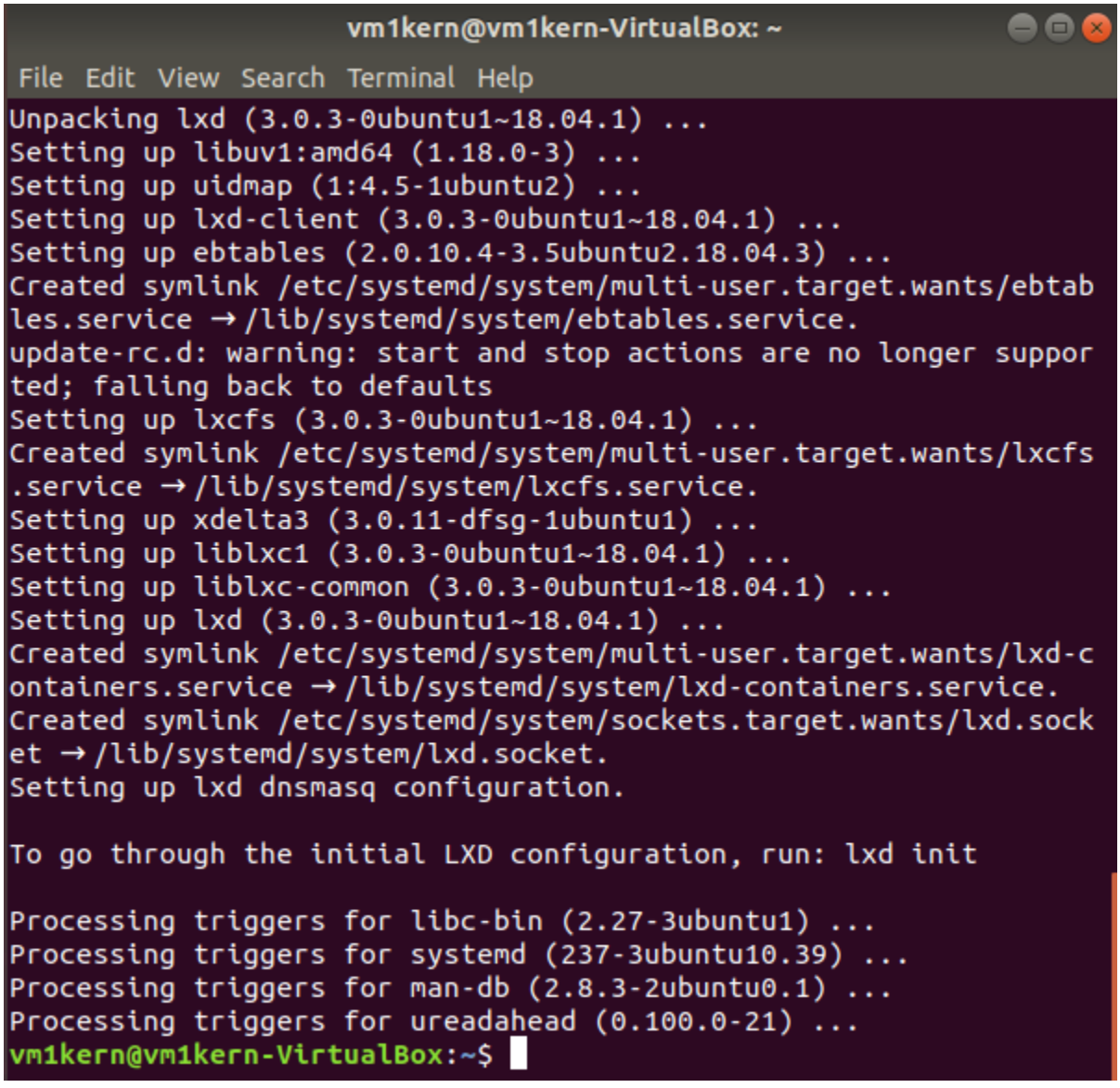
TASK 2.4

Работаclxcв Ubuntu

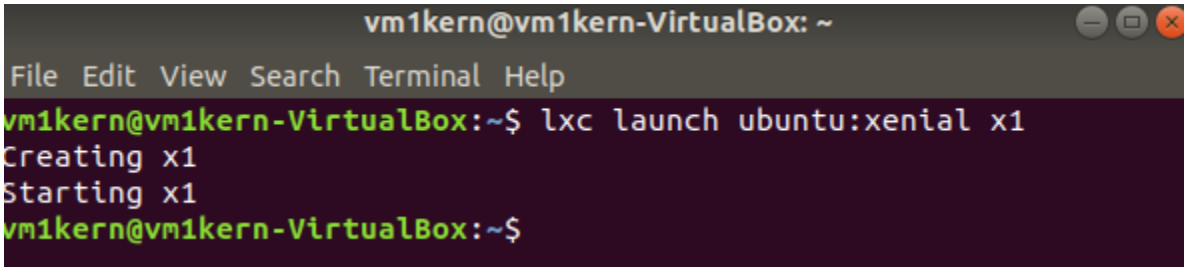
Documentation - https://help.ubuntu.com/lts/serverguide/lxd.html

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

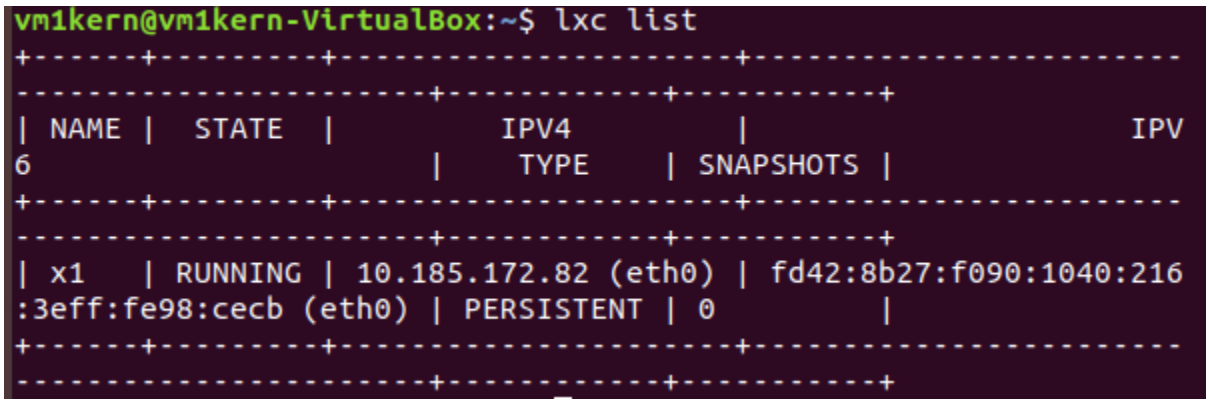
1. Установить lxc (screenshot)



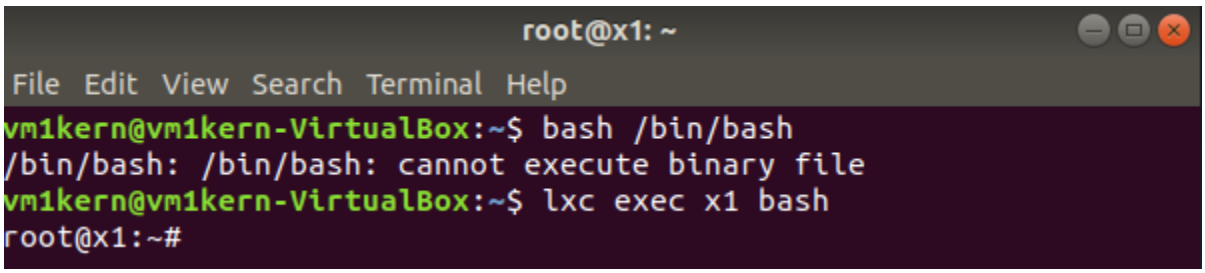
2. Запустить lxc launch для любой из версий Убунту(screenshot)



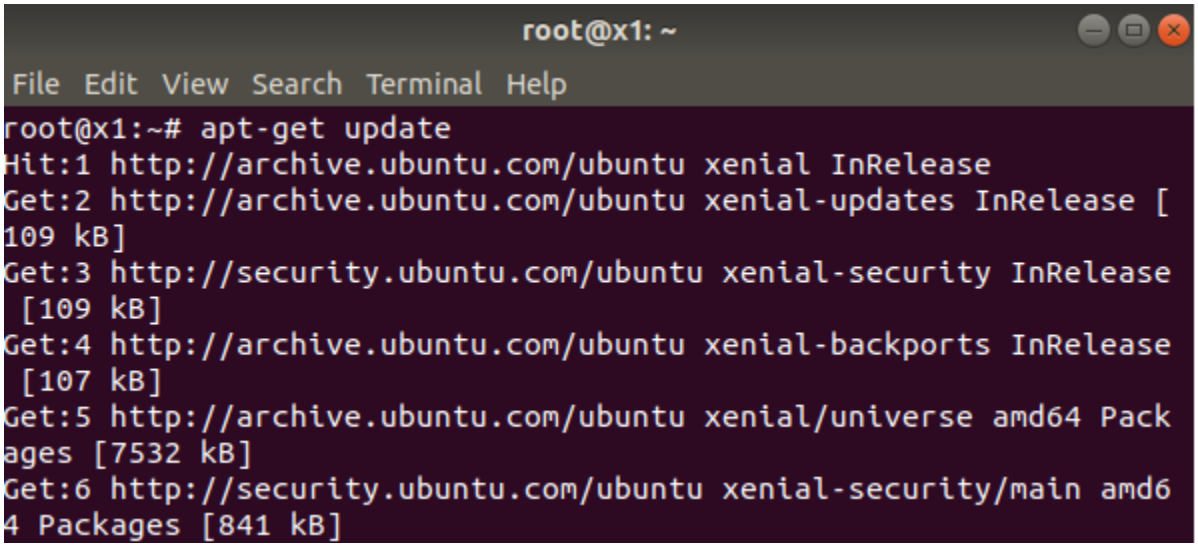
3. По окончании загрузки убедиться, что машина стартовала lxclist(screenshot)



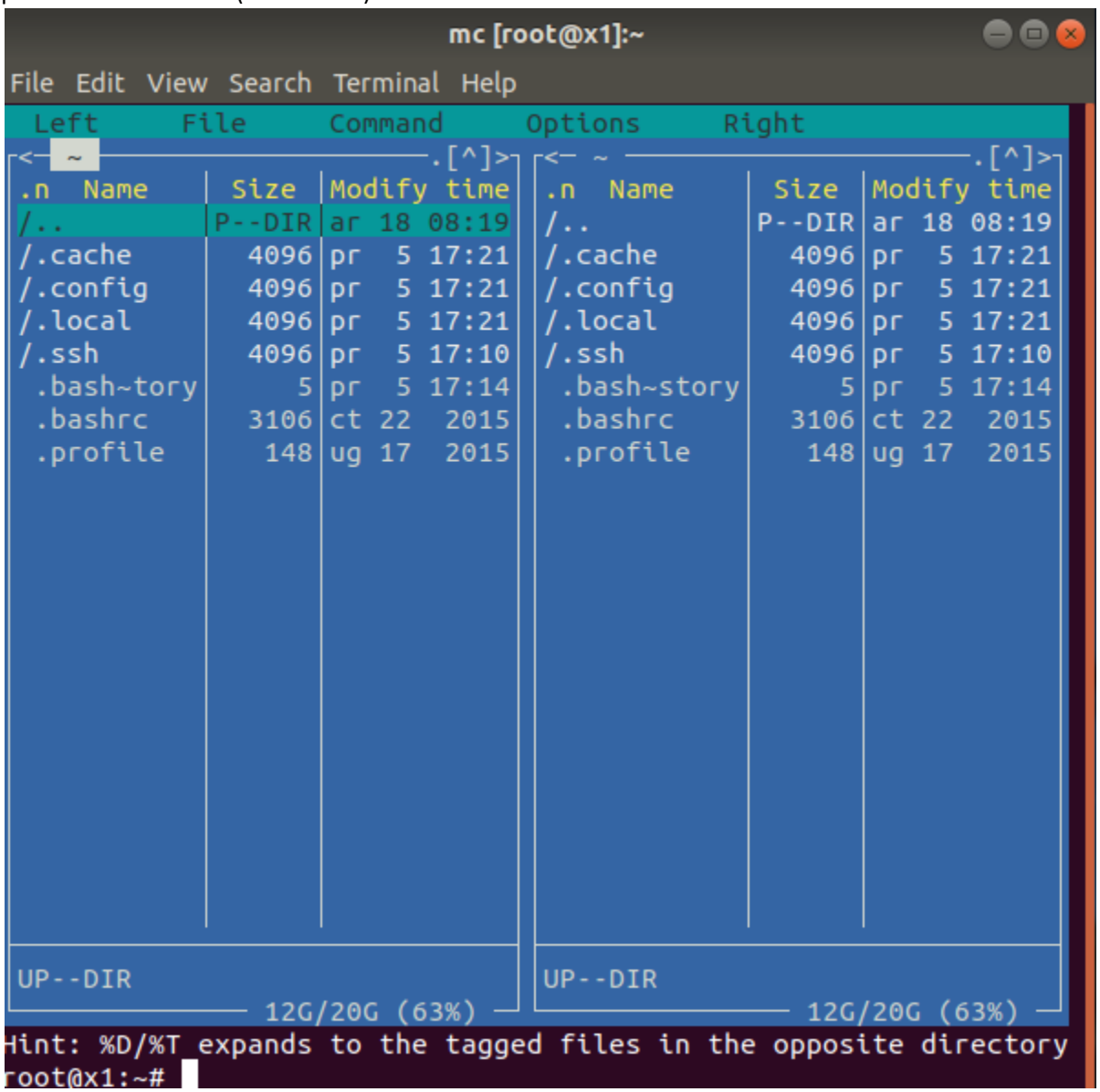
4. Зайдите в контейнер с командной строкой bash /bin/bash(screenshot)



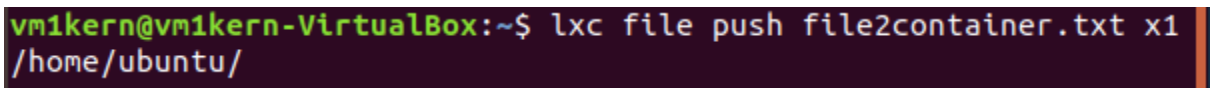
5. Запустите обновление apt-get update (screenshot)

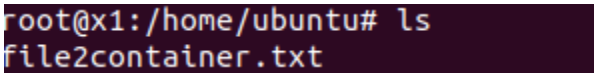


6. Установите (apt-getinstall) любую программу в контейнер. Например mc. Проверьте работоспособность. (screenshot)



7. Загрузите в контейнер файл(screenshot)





и скачайте с контейнера другой файл(screenshot).

```
vm1kern@vm1kern-VirtualBox:~$ lxc file pull x1/home/ubuntu/file2h
ost.txt .
vm1kern@vm1kern-VirtualBox:~$ ls
Desktop    examples.desktop   Music     Templates
Documents  file2container.txt Pictures  Videos
Downloads  file2host.txt      Public
```

РаботасDockerв Ubuntu

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

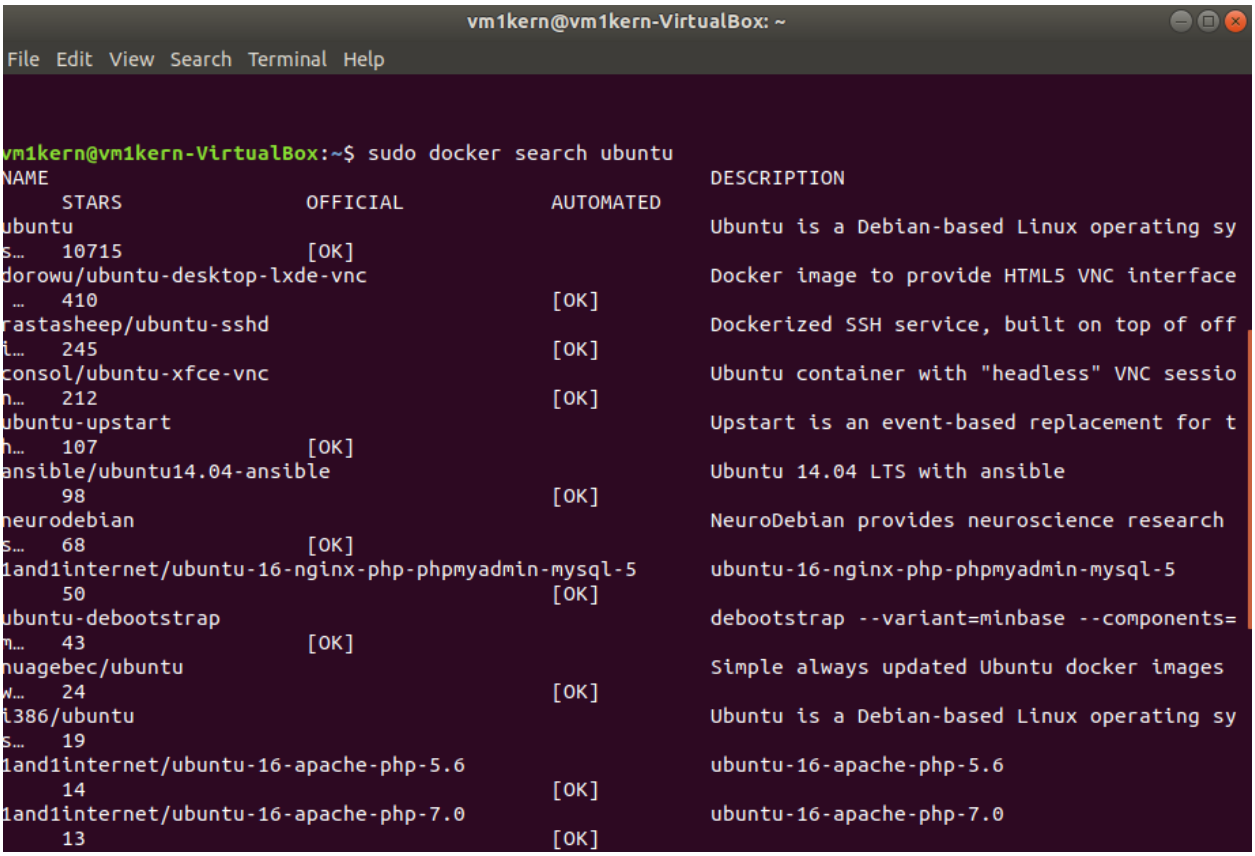
https://docs.docker.com

1. Установить docker (screenshot)

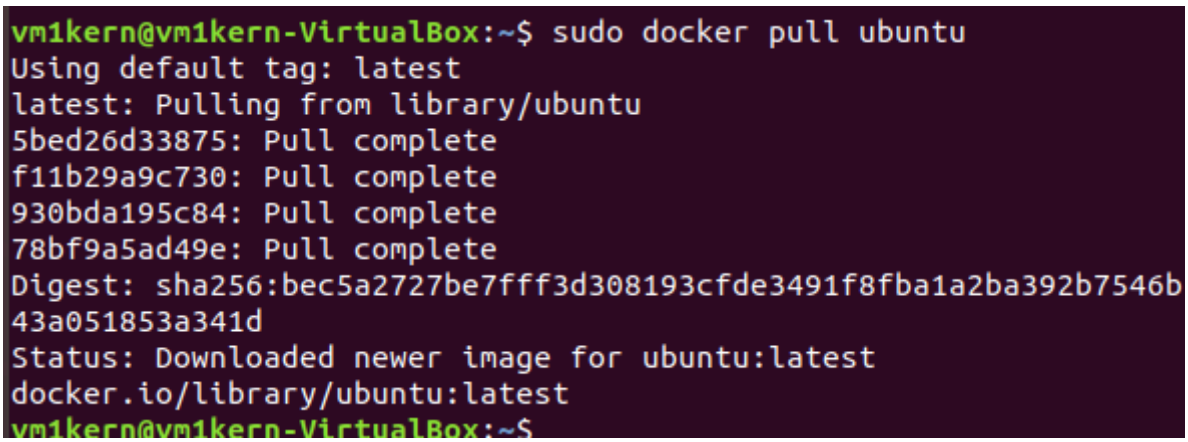
```
vm1kern@vm1kern-VirtualBox:~$ sudo systemctl status docker
● docker.service - Docker Application Container Engine
   Loaded: loaded (/lib/systemd/system/docker.service; enabled; v
   Active: active (running) since Sun 2020-04-05 22:06:22 EEST; 1
     Docs: https://docs.docker.com
 Main PID: 7386 (dockerd)
    Tasks: 8
   CGroup: /system.slice/docker.service
           └─7386 /usr/bin/dockerd -H fd:// --containerd=/run/con

кві 05 22:06:22 vm1kern-VirtualBox dockerd[7386]: time="2020-04-0
кві 05 22:06:22 vm1kern-VirtualBox dockerd[7386]: time="2020-04-0
кві 05 22:06:22 vm1kern-VirtualBox dockerd[7386]: time="2020-04-0
кві 05 22:06:22 vm1kern-VirtualBox dockerd[7386]: time="2020-04-0
кві 05 22:06:22 vm1kern-VirtualBox dockerd[7386]: time="2020-04-0
кві 05 22:06:22 vm1kern-VirtualBox dockerd[7386]: time="2020-04-0
кві 05 22:06:22 vm1kern-VirtualBox dockerd[7386]: time="2020-04-0
кві 05 22:06:22 vm1kern-VirtualBox dockerd[7386]: time="2020-04-0
кві 05 22:06:22 vm1kern-VirtualBox systemd[1]: Started Docker App
кві 05 22:06:22 vm1kern-VirtualBox dockerd[7386]: time="2020-04-0
```

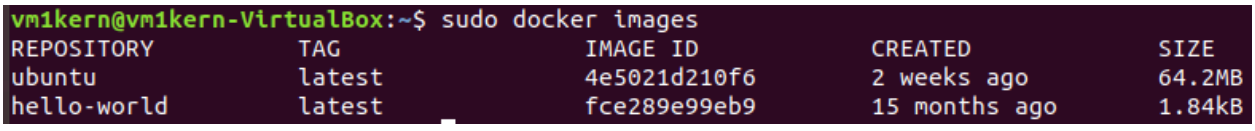
2. Запустить поиск сконфигурированных решений для “ubuntu”(screenshot)



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



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



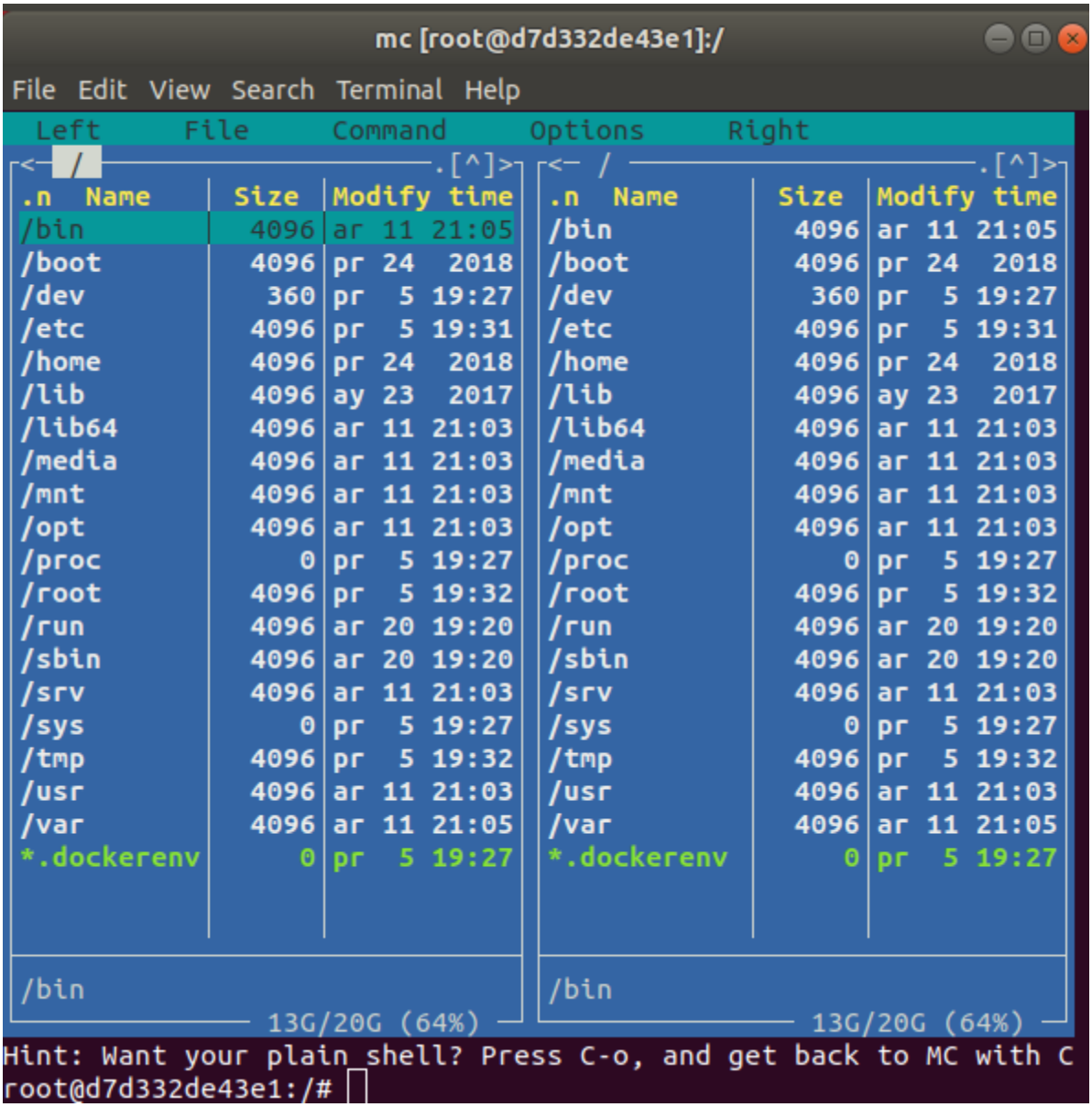
5. Запустите обновление apt-get update (screenshot)

```
Get:18 http://archive.ubuntu.com/ubuntu bionic-backports/universe a
md64 Packages [4247 B]
Fetched 17.7 MB in 6s (2930 kB/s)
Reading package lists... Done
root@d7d332de43e1:/#
```

6. Установите (apt-getinstall) любую программу в контейнер. Например mc.

```
root@d7d332de43e1:/# apt-get install mc
Reading package lists... Done
Building dependency tree
Reading state information... Done
```

Проверьтеработоспособность. (screenshot)



7. Загрузите в контейнер файл(screenshot)

```
vm1kern@vm1kern-VirtualBox:~$ sudo docker cp ./file2image.txt doc
kern-y:/home/
```

```
root@d7d332de43e1:/home# ls
file2image.txt
```

и скачайте с контейнера другой файл(screenshot).

```
vm1kern@vm1kern-VirtualBox:~$ sudo docker cp dockern-y:/home/back
2host.txt /home/vm1kern
vm1kern@vm1kern-VirtualBox:~$ pwd
/home/vm1kern
vm1kern@vm1kern-VirtualBox:~$ ls
back2host.txt  Downloads         Music     Templates
Desktop        examples.desktop  Pictures  Videos
Documents      file2image.txt    Public
```

8. Прочитать документацию и кратко описать основные 7 команд Dockerfile
   according to docker --help commands are divided for Management commands and other commands, that makes work with CLI more convenient

   help - not wordy documentation about docker commands
   ps - shows the list of containers (with details such as ID, name, status etc..)
   rename - rename a container
   exec - run a command in a running container
   push/pull are related to image/repository and a registry(not as in lxd, where we used these commands to transfer files between the container and the host)
   create - create a new container
   cp - copy files/folders between a container and the local filesystem

Работа с Kubernetes в Ubuntu

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

1. Установить microk8s (screenshot)

```
vm1kern@vm1kern-VirtualBox:~$ sudo snap install microk8s --class
ic --channel=1.18/stable
microk8s (1.18/stable) v1.18.0 from Canonical✓ installed
```

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

```
vm1kern@vm1kern-VirtualBox:~$ 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
```

```
vm1kern@vm1kern-VirtualBox:~$ microk8s.kubectl
kubectl controls the Kubernetes cluster manager.

 Find more information at: https://kubernetes.io/docs/reference/
kubectl/overview/

Basic Commands (Beginner):
  create        Create a resource from a file or from stdin.
  expose        Take a replication controller, service, deployme
nt or pod and expose it as a new Kubernetes Service
  run           Run a particular image on the cluster
  set           Set specific features on objects

Basic Commands (Intermediate):
  explain       Documentation of resources
  get           Display one or many resources
  edit          Edit a resource on the server
  delete        Delete resources by filenames, stdin, resources
and names, or by resources and label selector

Deploy Commands:
  rollout       Manage the rollout of a resource
  scale         Set a new size for a Deployment, ReplicaSet or R
```

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

```
vm1kern@vm1kern-VirtualBox:/tmp$ sudo docker save ubuntu > /tmp/
ubuntu.tar
```

```
vm1kern@vm1kern-VirtualBox:/tmp$ ls
[redacted]
ubuntu.tar
```

4. Импортируйте образ в Kubernetes (screenshot)

According to doc https://microk8s.io/docs/registry-images it requires to have an image with The Tag local, not latest, so I changed the tag with following commands:

$ docker tag ubuntu:latest ubuntu:local

$docker rmi ubuntu:latest

When I imported the image to microk8s, after running command images ls I did not see the image, so I ran the command again. And then got 2images

```
vm1kern@vm1kern-VirtualBox:~$ sudo microk8s ctr image import ubu
ntu.tar
unpacking docker.io/library/ubuntu:local (sha256:6867deccdd432c9
25dfcf1f265443d878079f790f34bfa428116e955328cd9dc)...done
vm1kern@vm1kern-VirtualBox:~$ sudo microk8s ctr images ls
REF
        TYPE                                          DIGEST
                                                              SIZE
    PLATFORMS   LABELS
docker.io/library/ubuntu:local
        application/vnd.oci.image.manifest.v1+json sha256:6867de
ccdd432c925dfcf1f265443d878079f790f34bfa428116e955328cd9dc 63.5
MiB linux/amd64 io.cri-containerd.image=managed
sha256:4e5021d210f65ebe915670c7089120120bc0a303b90208592851708c1
b8c04bd application/vnd.oci.image.manifest.v1+json sha256:6867de
ccdd432c925dfcf1f265443d878079f790f34bfa428116e955328cd9dc 63.5
MiB linux/amd64 io.cri-containerd.image=managed
```

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

```
vm1kern@vm1kern-VirtualBox:~$ sudo microk8s.kubectl run -it pfirs
t --image=ubuntu:local --restart=Never
If you don't see a command prompt, try pressing enter.
root@pfirst:/#
```

```
vm1kern@vm1kern-VirtualBox:~$ sudo microk8s.kubectl get pods
NAME     READY   STATUS    RESTARTS   AGE
pfirst   1/1     Running   0          6m1s
```