EPAM University Programs

DevOps external course

Module 2 Virtualization and Cloud Basic

TASK 2.4

Работа с Ixc в Ubuntu

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

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

1. Установить Ixc (screenshot)

```
root@ubuntu1804:~# lxc ——version
3.0.3
root@ubuntu1804:~# _
```

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

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

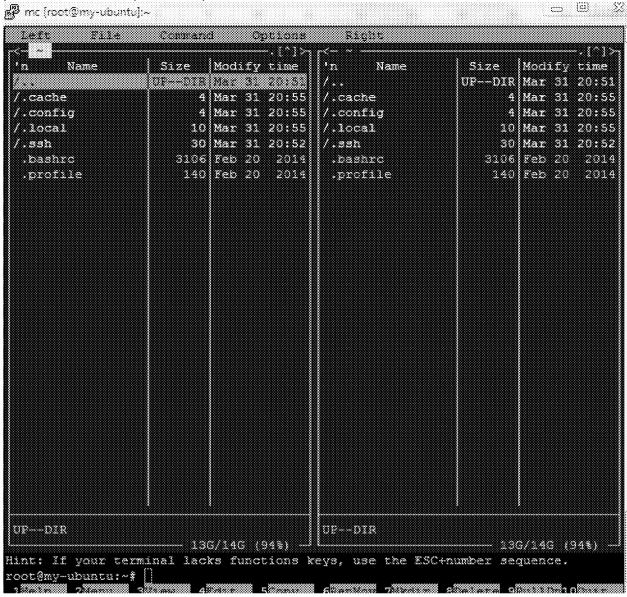
4. Зайдите в контейнер с командной строкой bash /bin/bash (screenshot)

```
root@ubuntu1804:~# lxc exec my-ubuntu -- /bin/bash
root@my-ubuntu:~# ||
```

5. Запустите обновление apt-get update (screenshot)

```
Get:15 http://archive.ubuntu.com trusty-updates/universe amd64 Packages (525 kB) «
Get:16 http://archive.ubuntu.com trusty-updates/multiverse smd64 Packages [14.6
Get:17 http://archive.ubuntu.com trusty-updates/main Translation-en [582 kB]
Get:18 http://archive.ubuntu.com trusty-updates/multiverse Translation-en (7616
Get:19 http://archive.ubuntu.com trusty-updates/restricted Translation-en {4028
83
Get:20 http://srchive.ubuntu.com trusty-updates/universe Translation-en [281 kB]
Get:21 http://srchive.ubuntu.com trusty-backports/main Sources [9709 B]
Get:22 http://srchive.ubuntu.com trusty-backports/restricted Sources [38 B]
Get:23 http://srchive.ubuntu.com trusty-backports/universe Sources [35.4 kB]
Get:24 http://archive.ubuntu.com trusty-backports/multiverse Sources [1896 B]
Hit http://archive.ubuntu.com trusty-backports/main amd64 Packages
Hit http://archive.ubuntu.com trusty-backports/restricted amd64 Packages
Hit http://archive.ubuntu.com trusty-backports/universe amd64 Packages
Hit http://archive.ubuntu.com trusty-backports/multiverse amd64 Packages
Hit http://archive.ubuntu.com trusty-backports/main Translation-en
Hit http://archive.ubuntu.com trusty-backports/multiverse Translation-en
Hit http://archive.ubuntu.com trusty-backports/restricted Translation-en
Hit http://archive.ubuntu.com trusty-backports/universe Translation-en
Hit http://archive.ubuntu.com trusty Release
Get:25 http://archive.ubuntu.com trusty/main Sources (1864 kB)
Get:26 http://archive.ubuntu.com trusty/restricted Sources [5433 B]
Get:27 http://erchive.ubuntu.com trusty/universe Sources [6399 kB]
Get:28 http://archive.ubuntu.com trusty/multiverse Sources [174 k8]
Hit http://archive.ubuntu.com trusty/main amd64 Packages
Hit http://archive.ubuntu.com trusty/restricted amd64 Fackages
Hit http://archive.ubuntu.com trusty/universe amd64 Fackages
Hit http://archive.ubuntu.com trusty/multiverse amd64 Fackages
Hit http://archive.ubuntu.com trusty/main Translation-en
Hit http://archive.ubuntu.com trusty/multiverse Translation-en
Hit http://archive.ubuntu.com trusty/restricted Translation-en
Hit http://archive.ubuntu.com trusty/universe Translation-en
Fetched 11.6 MB in 6s (1741 kB/s)
Reading package lists... Done
root@my-ubuntu:~#
```

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).

```
root@my-ubuntu/tmp

root@ubuntul804:-/shared# ls

hello

root@ubuntul804:-/shared# lxc file push hello my-ubuntu/tmp/

root@ubuntul804:-/shared# lxc exec my-ubuntu -- /bin/bash

root@my-ubuntu:-# cd /tmp

root@my-ubuntu:/tmp# ls

hello mc-root

root@my-ubuntu:/tmp# [
```

создали файл, вытягиваем его

```
root@ubuntu1804:~/shared# lxc exec my-ubuntu -- /bin/bash
root@my-ubuntu:~# cd /tmp
root@my-ubuntu:/tmp# ls
hello hellol mo-root
root@my-ubuntu:/tmp#
root@ubuntu1804:~/shared# ls
bello bosts
root@ubuntu1804:~/shared# lxc file pull my-ubuntu/tmp/hello1 .
root§ubuntu1804:-/shared# ls
hello hellol hosts
```

Работа с Docker в Ubuntu

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

https://docs.docker.com

1. Установить docker (screenshot)

```
rvice; membled; render present enabled;
x0:69:24 870; lowin ago
C-900 / Junc/bod/dochmad -0 761/7 -- continuency and Continuen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    not berned ones on argument seem setting tunner 
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or hearth done not unpact optom is structure! 
for consistency trains! 
It belows (dockbard is sealpred with se IP address 122,47,0,5/42, Se 
go containment done."
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De deeman:" committematadoobbatk graphatrizen(e)mezenleyk versiaami9.05.8
Sa hus dempleted koitsisikkastsom?
```

2. Запустить поиск сконфигурированных решений для "ubuntu" (screenshot)

```
eronen domes seineb ?-:606leronewyoo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DESCRIPTION

Universe as a Debisin-based Liquis operating aga.

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306/vbones

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scalintenset/ubuntu-18-apache-php-7.0
clips/sountu_7dx8
scalintenset/ubuntu-18-agache-php-papaysdmin-mariadb-10
scalintenset/ubuntu-18-agache-php-5.8
scalintenset/ubuntu-18-agache-php-7.1
scalintenset/ubuntu-18-apache-php-7.1
```

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

```
root@ubuntu1894:~$ docker pull ubuntu
Vsing default tag: latest
latest: Fulling from library/ubuntu
5bed26d33875: Pull complete
fl1b29a9c730: Pull complete
930bda195c84: Pull complete
78bf9a5ad49e: Pull complete
Rigest: shal56:bec5a2727be7ffff3d308193cfde3491f8fbalaZba392b7546b43a051853a341d
Status: Downloaded newer image for ubuntu:latest
docker.io/library/ubuntu:latest
```

Запустить команду просмотра загруженных на компьютер образов. (screenshot)

```
root@ubuntu1804:~ # docker images
repository
                    TAG
                                         IMAGE ID
                                                              CREATED
                                                                                   SIZE
                                         4e5021d210f6
                                                              13 days ago
                                                                                   64.288
salbaare tare
                    Latest
hello-world
                    latest
                                         fce289e99eb9
                                                              15 months ago
                                                                                   1.84kS
root@ubuntu1804:~f
```

5. Запустите обновление apt-get update (screenshot)

```
root&12636577bid9:/* apt-get update

Get:1 http://security.ubuntu.com/ubuntu bionic-security InRelease [88.7 kB]

Get:2 http://srchive.ubuntu.com/ubuntu bionic-updates InRelease [88.7 kB]

Get:3 http://archive.ubuntu.com/ubuntu bionic-updates InRelease [88.7 kB]

Get:4 http://security.ubuntu.com/ubuntu bionic-security/main amd64 Packages [870 kB]

Get:5 http://archive.ubuntu.com/ubuntu bionic-backports InRelease [74.6 kB]

Get:6 http://archive.ubuntu.com/ubuntu bionic/multiverse amd64 Packages [836 kB]

Get:7 http://security.ubuntu.com/ubuntu bionic-security/universe amd64 Packages [835 kB]

Get:8 http://security.ubuntu.com/ubuntu bionic/universe amd64 Packages [11.3 MB]

Get:9 http://security.ubuntu.com/ubuntu bionic-security/multiverse amd64 Packages [7904 B]

Get:10 http://security.ubuntu.com/ubuntu bionic-security/restricted amd64 Packages [37.0 kB]

Get:11 http://archive.ubuntu.com/ubuntu bionic/restricted amd64 Packages [13.5 kB]

Get:12 http://archive.ubuntu.com/ubuntu bionic/main amd64 Packages [1344 kB]

Get:13 http://archive.ubuntu.com/ubuntu bionic-updates/universe amd64 Packages [1367 kB]
```

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

a distage 21 disposition	x 40962Apt
e Bookbar : 78 dexx/dex	s 55000p:
	. 103654gr 193674gr 2. 203636g
1704 atte	4.79Ex9lex
a Affection 1 23 Chart 1999	40 1500 hr. 959 e-242
2 1036CUpt 11 21:63pc/he223	X ACGERMAN
v 1096/Mar : 1 23:0000/003E	x 409000le:
Control of the Contro	2 40 9000 30 6 6 8 6 5
7 8560 1 22:66x76:00	0.Apr
E 1996/Agr 2 19:57	z 40 PEGE
x 499edfar 20 39123ba/xbb	92-664bz 9-674cs 4-7-920bs
n NOBONNE SO 20:5 Describir	x 4699zMaz
C MISCONAL IN INCOME.	40 M (Ne.
	09460 6696566 6096586
	400000
	10.000,000
	x 200
	· · · · · · · · · · · · · · · · · · ·
	* ×

````	

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

```
root@ubuntu1804:~# docker run -itd ubuntu
cfd77627eec864e9a2db3f292541a48a24915f15b81434fa6f66016a6cabf4e9
root@ubuntu1804:~# docker ps
CONTAINER ID
 IMAGE COMMAND CREATED STATUS
 NAMES
cfd77627eec8 ubuntu "/bin/bash" 3 seconds ago Up 1 second
hungry_moore
root@ubuntu1804:~# docker exec -it cfd77627eec8 sh
id
uid=0(root) gid=0(root) groups=0(root)
exit
root@ubuntu1804:~# docker ps
CONTAINER ID
 IMAGE COMMAND CREATED STATUS
PORTS
 NAMES
cfd77627eec8 ubuntu "/bin/bash" 22 seconds ago Up 20 seconds
hungry_moore
root@ubuntu1804:~# docker exec -it cfd77627eec8 sh
```

```
touch test.txt
1s -a
. .. .dockerenv bin boot dev etc home lib lib64 media mnt opt proc root run sbin
srv sys test.txt tmp usr var
ls -al
total 72
-rw-r--r-- 1 root root 0 Apr 2 20:48 test.txt
exit
root@ubuntu1804:~# docker ps -a
CONTAINER ID
 IMAGE COMMAND CREATED STATUS
 NAMES
cfd77627eec8 ubuntu "/bin/bash" About a minute ago Up About a minute
hungry moore
root@ubuntu1804:∼# touch text1.txt
root@ubuntu1804:~# docker cp text1.txt cfd77627eec8:/root
root@ubuntu1804:~# docker exec -it cfd77627eec8 sh
1s -a1
total 72
-rw-r--r-- 1 root root 0 Apr 2 20:48 test.txt
cd /root
1s
text1.txt
```

```
root@ubuntu1804:-# docker cp cfd77627eec8:/test.txt .
root@ubustu1894:~# ls -al
total 48
drwxr-xr-x 6 haviras haviras 4096 Apr 2 20:52 .
drwxr-xr-x 4 root
 root
 4096 Mar 24 22:50 ..
-rw----- 1 root
 946 Apr 2 20:38 .bash history
 reat
 4 2018 .bash logout
 rw-r--r-- 1 haviras haviras 220 Apr
-rw-r--r-- 1 baviras baviras 3771 Apr
 4 2016 .bashrc
drwx----- 2 haviras haviras 4096 Mar 24 14:35 .cache
drwwr-x--- 3 root - root - 4096 Mar 31 20:44 .comfig
drwx---- 3 haviras haviras 4096 Mar 24 14:35 .gmwpg
-rw----- 1 root
 root
 28 Apr 2 18:59 .lessbst
-rw-r--r- 1 haviras haviras 807 Apr 4 2018 .profile
 0 Mar 24 14:36 .sudo as admin successful
 rw-r--r-- 1 haviras haviras
rw----- 1 root
 754 Mar 24 15:02 .viminfo
 root
drwxrwxr-x 2 baviras baviras 4096 Mar 31 21:11 sbared
-rw-r--r-- 1 root
 root
 0 Apr 2 20:48 test.txt
rw-r--r- 1 root
 root
 0 Apr 2 20:49 text1.txt
root@ubuntu1804:~# root@ubuntu1804:~# docker cp cfd77627eec8:/test.txt
```

```
Прочитать документацию и кратко описать основные 7 команд Dockerfile

ехес — запустить в существующем контейнере команду
attach - зайти в существующий контейнер
kill — остановить контейнер
create - создать контейнер
images — посмотреть доступные образы в репозитории
pull — загрузить шаблоны из репозитория
ps — просмотр состояния контейнеров
rm — удалить контейнер
run — запустить команды в контейнере
commit — создать новый образ из измненений в первоначальном контейнере
```

8.

Работа с Kubernetes в Ubuntu

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

1. Установить microk8s (screenshot)

```
microx8s (1.17/stable) v1.17.4 from Canonicaly installed
root@ebuntul804:~$ snap info microk8s
seme s
 microk8s
 Kubernetes for workstations and appliances
publisher: Canonicaly
store-url: https://smaporaft.io/microk8s
contact: https://github.com/wbuntu/microk8s
license:
 3355.8A ft
description: {
 MicroKês is a small, fast, secure, single node Kubernetes that installs on just about any Linux
 box. Use it for offline development, prototyping, testing, or use it on a VM as a small, cheap, reliable k8s for CI/CD. It's also a great k8s for appliances - develop your IoT apps for k8s and
 deploy them to Microffs on your boxes.
 ommands:
 - microkSs.add-mode
 - microkās.cilium
 - microkss.config
 microkSs.ct
```

```
rootgubuntu1804:~# microk8s.status
 microkSs is running
 addons:
 cílium: dísabled
 dashboard: disabled
 dns: disabled
 fluentd: disabled
 gpu: disabled
 nelm: disabled
 ingress: disabled
 istio: disabled
 iaeger: disabled
 juju: disabled
 knative: disabled
 kubeflow: disabled
 linkerd: disabled
 metallb: disabled
 metrics-server: disabled
 orometheus: disabled
 rbac: disabled
 reqistry: disabled
 storage: disabled
 root@ubuntul884:~ #microk8s.kubectl cluster-info
 Rebernetes master is running at https://127.0.0.1:16443
3. Просмотрите установленные в докере образы; заверните один из них в образ *.tar
 coot@ubuntu1804:~$ docker save -c ubuntu3.tar withmo
 cot@ubuntu1804:-* <u>11</u>
 cetal 434824
 irwxrwxr-x 2 haviras haviras 4096 Mar 31 21:11 shaned/
 irwnr-xr-x 4 root root 4896 Apr 3 20:47 sometype-work/
-rw-r--r-- 1 root root 8 Apr 2 20:48 test.txt
-rw-r--r-- 1 root root 8 Apr 2 20:49 text1.txt
 -rw-r--r-- 1 root root 8 Apr 2 20:49 text1.txt
-rw-r--r-- 1 root root 65612224 Apr 2 21:41 ubuntu.tar
-rw-r--r-- 1 root root 65613224 Apr 4 23:21 ubuntu2
-rw----- 1 root root 191558564 Apr 4 23:53 ubuntu3.tar
4. Импортируйте образ в Kubernetes (screenshot)
 reon@inhoutsit804:-} microtic cor loage import Nomesh3.tzr
unpacking docker.lo/sibrary/withmo:latest (shal50:Sife1750c20s4s870305le002c55esf3dd8es95d3Sc9a3d2756in437e44eb90b1...done
 omulSokinē mamackās une lesyme 20 | geep 595
G/libras/Velbbacieras
- Vell-3 Nal Soun/geed6
- Vell-3 Nal Soun/geed6
- Vell-3 Nal Soun/geed6
 syphosicorend.ord lawge.assifert.wisjoer
ic.esi-contained.ibsgermaaged
application/red.ord.issge.assifess.wisjoo
 95a256:61f1fa175653Fa4a67899F34666265
5. Запустите образ и убедитесь, что он работает. (screenshot)
```

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

```
apiVersion: apps/vl
kind: Deployment
menadana:
 name: pod01
 labels:
 app: mc
ಪಾಕರ:
 selector:
 matchLabels:
 app: mc
 template:
 metadata:
 labels:
 app: wo
 speca
 containers:
 - name: mc01
 image: withmo:latest
 imagePullFolicy: Never
```

#### применил его

```
root@ubuntul804:~ microk8s kubectl apply -f withmc.yaml
deployment.apps/pod01 configured
```

kubectl выдал статус контейнера CrashLoopBackOff потому что mc сразу завершает себя

```
root%ubuntul804:~$ microk8s kubecti get pods
WAME RESTARTS AGE
Firstpodl-6d7d849965-dkrkp 0/1 CrashLoopBackOff 1 9s
pod01-7dcf58cfb4-x5tm9 0/1 CrashLoopBackOff 1 9s
```

Поэтому лучше использовать постоянно работающий сервис, например nginx

Создаем докер файл

```
SNU meno 2.9.3

SROM nginx

WORKDIR /usr/share/nginx/html

COPY index.html ./index.html

EXPOSE 80
```

Импортируем в кубернетс

## Создаем index.html с произвольным содержанием

```
SNU meno 2.9.3

Sabmid

KNU meno 2.9.3

KNU me
```

## Создаем образ

```
root@ubuntul804:-/docker# docker build --tag mynginm:1.0 .
Sending build context to Docker daemon 3.972kB
Step 1/4 : FROM sginx
latest: Pulling from library/mginz
c499e6d256d6: Pull complete
74cda408e262: Pull complete
ffadhd415ab7: Full complete
Digest: sha256:282530fcb7cd19f3848c7b611043f82ae4be3781cb00105a1d593d7e6286b596
Status: Downloaded newer image for aginx:latest
---> ed21b7a8aee9
Step 2/4 : WORKDIR /usr/abare/nginz/btml
----> Running in 40342efc819a
Removing intermediate container 40342efc819a
---> 137be9fb213c
Step 3/4 : COPY index.html ./index.html
---> c7d0dc0366f9
Step 4/4 : EXPOSE 80
---> Running in f277118a26b7
Removing intermediate container f277118a26b7
---> 4086e0a2f31c
Successfully built 4086e0a2f31c
Successfully tagged mynginx:1.0
root@abanta1804:~/docker#
```

## Экспортируем в tar

```
root@ubuntu1804:~/docker# docker save -o nginx1.tar mynginx:1.0
root@ubuntu1804:~/docker# ll
total 127588
drwxr-xr-x 2 root
 root
 4096 Apr 5 01:07 ./
drwxr-xr-x 13 haviras haviras
 4096 Apr 5 00:59 ../
 80 Apr 5 01:01 Dockerfile
-rw-r--r-- 1 root
 root
rw-r--r- 1 root
 41 Apr 5 01:02 index.html
 JOOI
 root
 5 01:07 nginxl.tan
 1 root
 130626048 Apr
```

## Описали pod в yaml файле

```
One the common approval

Construction to the common and a common approval

Action to the common action acti
```

#### Запускаем под

```
root@ubuntu1894:~/docker# microk&s kubectl apply -f mynginw.yaml
deployment.apps/mynginx01 created
root@ubuntu1804:~/docker# microk8s kubectl get pods
NAME
 READY
 STATUS
 RESTARTS
 ASE
Eirstpodl-6d7d849965-dkrkp
 0/1
 CrashLoopBackOff
 Ċ,
 26m
nynginx01-9f67dbff4-zctd4
 1/1
 0
 Running
 245
```

## Пробрасываем порт (это неправильно! Надо использовать cubefwd?)

```
root&ubuntu1804:~/docker# microkës kubectl port-forward deployment/mymginx51 80:85 --address 0.0.5.5
Porwarding from 0.5.0.3:85 -> 88
Exadling connection for 80
```

### Вывод в браузер

```
← → C :: © Na Paccaccesc : 192 158 254 304
```

### Hello, Docker!

## А вообще в контейнер можно зайти вот так