

## Sprawozdanie 2



POLITECHNIKA  
LUBELSKA  
WYDZIAŁ ELEKTROTECHNIKI  
I INFORMATYKI

### Zadanie 3.1

```
student@student-VirtualBox:~$ sudo docker pull ubuntu:latest
[sudo] hasło użytkownika student:
latest: Pulling from library/ubuntu
4d32b49e2995: Pull complete
Digest: sha256:bea6d19168bbfd6af8d77c2cc3c572114eb5d113e6f4225736
Status: Downloaded newer image for ubuntu:latest
docker.io/library/ubuntu:latest
student@student-VirtualBox:~$ docker images
Got permission denied while trying to connect to the Docker daemon socket at http://%2Fvar%2Frun%2Fdocker.sock/v1.24/images/json: dial unix
student@student-VirtualBox:~$ sudo docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
ubuntu               latest             ff0fea8310f3       3 days ago         72.8MB
hello-world          latest             feb5d9fea6a5       5 months ago       13.3kB
student@student-VirtualBox:~$
```

Pobranie obrazu ubuntu:latest

```
student@student-VirtualBox:~$ sudo docker run -itd --name zadanie3.1 ubuntu
8d3673ebf2257f2a2720a97f887dfaab7854c310a3cd0b2a6b6f72998af0d337
student@student-VirtualBox:~$ sudo docker ps -a
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS   NAMES
8d3673ebf225   ubuntu   "bash"    10 seconds ago    Up 6 seconds                zadanie3.1
01d416437ec3   hello-world   "/hello"   7 days ago        Exited (0) 7 days ago        objective_lewin
student@student-VirtualBox:~$
```

Uruchomienie kontenera

```
student@student-VirtualBox:~$ sudo apt-get update
Stary:1 http://pl.archive.ubuntu.com/ubuntu focal InRelease
Pobieranie:2 http://pl.archive.ubuntu.com/ubuntu focal-updates InRelease [114 k
B]
Pobieranie:3 http://pl.archive.ubuntu.com/ubuntu focal-backports InRelease [108
kB]
Pobieranie:4 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB
]
Pobieranie:5 http://pl.archive.ubuntu.com/ubuntu focal-updates/main i386 Packag
es [617 kB]
Pobieranie:6 http://security.ubuntu.com/ubuntu focal-security/main i386 Package
s [402 kB]
Pobieranie:7 http://pl.archive.ubuntu.com/ubuntu focal-updates/main amd64 Packa
g
Wyświetl programy
Pobieranie:8 http://pl.archive.ubuntu.com/ubuntu focal-updates/main Translation
```

Zaktualizowanie bazy repozytoriów ubuntu

```
student@student-VirtualBox:~$ sudo apt install wget
Czytanie list pakietów... Gotowe
Budowanie drzewa zależności
Odczyt informacji o stanie... Gotowe
wget is already the newest version (1.20.3-1ubuntu2).
wget zaznaczony jako zainstalowany ręcznie.
Następujący pakiet został zainstalowany automatycznie i nie jest już więcej wym
agany:
  libfwupdplugin1
Aby go usunąć należy użyć "sudo apt autoremove".
0 aktualizowanych, 0 nowo instalowanych, 0 usuwanych i 48 nieaktualizowanych.
student@student-VirtualBox:~$
```

Instalacja wget

```
student@student-VirtualBox:~$ which wget
/usr/bin/wget
student@student-VirtualBox:~$
```

Sprawdzenie czy jest w systemie wget

```
student@student-VirtualBox: ~
student@student-VirtualBox:~$ sudo docker diff zadanie3.1
[sudo] hasło użytkownika student:
student@student-VirtualBox:~$ docker diff zadanie3.1
Got permission denied while trying to connect to the Docker daemon socket at unix:///var/run/docker.sock: Get http://%2Fvar%2Frun%2Fdocker.sock/v1.24/containers/zadanie3.1/changes: dial unix /var/run/docker.sock: connect: permission denied
student@student-VirtualBox:~$ sudo docker diff zadanie3.1
student@student-VirtualBox:~$ docker diff
"docker diff" requires exactly 1 argument.
See 'docker diff --help'.

Usage:  docker diff CONTAINER

Inspect changes to files or directories on a container's filesystem
student@student-VirtualBox:~$ docker diff --help

Usage:  docker diff CONTAINER

Inspect changes to files or directories on a container's filesystem
student@student-VirtualBox:~$
```

Sprawdzenie docker diff

```
student@student-VirtualBox:~$ sudo docker commit zadanie3.1
sha256:39ece236e5cb09371672342b5027ea7059693828a7e79de98aa52efa8b56b54d
student@student-VirtualBox:~$ sudo docker images
REPOSITORY      TAG          IMAGE ID      CREATED       SIZE
<none>          <none>       39ece236e5cb  12 seconds ago  72.8MB
ubuntu          latest       ff0fea8310f3  3 days ago    72.8MB
hello-world     latest       feb5d9fea6a5  5 months ago  13.3kB
student@student-VirtualBox:~$ sudo docker tag ^C
student@student-VirtualBox:~$ sudo docker tag 39ece236e5cb zadanie3.1.modified
student@student-VirtualBox:~$ sudo docker images
REPOSITORY      TAG          IMAGE ID      CREATED       SIZE
zadanie3.1.modified  latest       39ece236e5cb  2 minutes ago  72.8MB
ubuntu          latest       ff0fea8310f3  3 days ago    72.8MB
hello-world     latest       feb5d9fea6a5  5 months ago  13.3kB
terminal it@student-VirtualBox:~$
```

Wykonanie komendy commit i otagowanie obrazu

```
student@student-VirtualBox:~$ sudo docker inspect zadanie3.1.modified
[
  {
    "Id": "sha256:39ece236e5cb09371672342b5027ea7059693828a7e79de98aa52efa8b56b54d",
    "RepoTags": [
      "zadanie3.1.modified:latest"
    ],
    "RepoDigests": [],
    "Parent": "sha256:ff0fea8310f3957d9b1e6ba494f3e4b63cb348c76160c6c15578e65995ffaa87",
    "Comment": "",
    "Created": "2022-03-21T17:24:29.798021479Z",
    "Container": "8d3673ebf2257f2a2720a97f887dfaab7854c310a3cd0b2a6b6f72998af0d337",
    "ContainerConfig": {
      "Hostname": "8d3673ebf225",
      "Domainname": "",
      "User": "",
      "AttachStdin": false,
      "AttachStdout": false,
      "AttachStderr": false,
      "Tty": true,
      "OpenStdin": true,
      "StdinOnce": false,
      "Env": [
        "PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin"
      ],
      "Cmd": [
        "bash"
      ],
      "Image": "ubuntu",
      "Volumes": null,
      "WorkingDir": "",
      "Entrypoint": null,
      "OnBuild": null,
      "Labels": {}
    },
    "DockerVersion": "20.10.7",
    "Author": "",
    "Config": {
      "Hostname": "8d3673ebf225",
      "Domainname": "",
      "User": "",
      "AttachStdin": false,
      "AttachStdout": false,
      "AttachStderr": false,
      "Tty": true,
```

```

        "AttachStdout": false,
        "AttachStderr": false,
        "Tty": true,
        "OpenStdin": true,
        "StdinOnce": false,
        "Env": [
            "PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin"
        ],
        "Cmd": [
            "bash"
        ],
        "Image": "ubuntu",
        "Volumes": null,
        "WorkingDir": "",
        "Entrypoint": null,
        "OnBuild": null,
        "Labels": {}
    },
    "Architecture": "amd64",
    "Os": "linux",
    "Size": 72759731,
    "VirtualSize": 72759731,
    "GraphDriver": {
        "Data": {
            "MergedDir": "/var/lib/docker/overlay2/c949e49783a33ecabe0db02089cb7c1dcd8b7305248ca6ac9c36d90e1fea4dff/merged",
            "UpperDir": "/var/lib/docker/overlay2/c949e49783a33ecabe0db02089cb7c1dcd8b7305248ca6ac9c36d90e1fea4dff/diff",
            "WorkDir": "/var/lib/docker/overlay2/c949e49783a33ecabe0db02089cb7c1dcd8b7305248ca6ac9c36d90e1fea4dff/work"
        },
        "Name": "overlay2"
    },
    "RootFS": {
        "Type": "layers",
        "Layers": [
            "sha256:867d0767a47c392f80acb51572851923d6d3e55289828b0cd84a96ba342660c7"
        ]
    },
    "Metadata": {
        "LastTagTime": "2022-03-21T18:27:11.980526927+01:00"
    }
}
]
student@student-VirtualBox:~$

student@student-VirtualBox:~$ sudo docker history zadanie3.1.modified
IMAGE          CREATED          CREATED BY          SIZE      COMMENT
39ece236e5cb   13 minutes ago   bash                0B
ff0fea8310f3   3 days ago      /bin/sh -c #(nop)  CMD ["bash"]       0B
<missing>      3 days ago      /bin/sh -c #(nop)  ADD file:1d3b09cf9e041d608... 72.8MB

```

Analiza kontenera

### Zadanie 3.2

```
maciej@maciej-VirtualBox:~$ touch Dockerfile
maciej@maciej-VirtualBox:~$ ls
Dockerfile  Muzyka  Pobrane  Pulpit  Wideo
Dokumenty  Obrazy  Publiczny  Szablony
maciej@maciej-VirtualBox:~$ nano Dockerfile
maciej@maciej-VirtualBox:~$ cat Dockerfile
From ubuntu:latest
LABEL maintainer="Maciej Cieplowski maciej.cieplowski@pollub.edu.pl"
ENV var=Europe/Warsaw
RUN apt-get update
RUN ln -snf /usr/share/zoneinfo/$var /etc/localtime && echo $var > /etc/timezone
RUN apt-get install -y apache2
RUN apt-get install -y apache2-utils
RUN apt-get clean
EXPOSE 8080
CMD ["apache2ctl", "-D", "FOREGROUND"]
maciej@maciej-VirtualBox:~$
```

Utworzenie pliku Dockerfile

```
maciej@maciej-VirtualBox:~$ docker build -t web100 .
Got permission denied while trying to connect to the Docker daemon socket at unix:/
/var/run/docker.sock: Post http://%2Fvar%2Frun%2Fdocker.sock/v1.24/build?buildargs
=%7B%7D&cachefrom=%5B%5D&cgroupparent=&cpuperiod=0&cpuquota=0&cpusetcpus=&cpusetmem
s=&pushshares=0&dockerfile=Dockerfile&labels=%7B%7D&memory=0&memswap=0&networkmode=d
efault&rm=1&shmsize=0&t=web100&target=&ulimits=null&version=1: dial unix /var/run/d
ocker.sock: connect: permission denied
maciej@maciej-VirtualBox:~$ sudo su
[sudo] hasło użytkownika maciej:
root@maciej-VirtualBox:/home/maciej# docker build -t web100 .
Sending build context to Docker daemon  23.94MB
Step 1/10 : From ubuntu:latest
latest: Pulling from library/ubuntu
4d32b49e2995: Pull complete
Digest: sha256:bea6d19168bbfd6af8d77c2cc3c572114eb5d113e6f422573c93cb605a0e2ffb
Status: Downloaded newer image for ubuntu:latest
--> ff0fea8310f3
Step 2/10 : LABEL maintainer="Maciej Cieplowski maciej.cieplowski@pollub.edu.pl"
--> Running in 790f6c8c5da6
Removing intermediate container 790f6c8c5da6
--> 927b40e16d16
Step 3/10 : ENV var=Europe/Warsaw
--> Running in 0e059a8a0dd5
Removing intermediate container 0e059a8a0dd5
--> 388f1a5a2dd4
Step 4/10 : RUN apt-get update
--> Running in d982ea4e6b14
Get:1 http://archive.ubuntu.com/ubuntu focal InRelease [265 kB]
Get:2 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Get:3 http://archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
```

Stworzenie obrazu



```

Updating certificates in /etc/ssl/certs...
0 added, 0 removed; done.
Running hooks in /etc/ca-certificates/update.d...
done.
Removing intermediate container 94b952d47749
---> 381e14a9a0ff
Step 7/10 : RUN apt-get install -y apache2-utils
---> Running in 4548323840cf
Reading package lists...
Building dependency tree...
Reading state information...
apache2-utils is already the newest version (2.4.41-4ubuntu3.10).
apache2-utils set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
Removing intermediate container 4548323840cf
---> 9ef193d0b2d0
Step 8/10 : RUN apt-get clean
---> Running in c8d12e63e69f
Removing intermediate container c8d12e63e69f
---> 5f0067d224ae
Step 9/10 : EXPOSE 8080
---> Running in 56e932f991f0
Removing intermediate container 56e932f991f0
---> 0113210b282f
Step 10/10 : CMD ["apache2ctl", "-D", "FOREGROUND"]
---> Running in 5f838f74d3a6
Removing intermediate container 5f838f74d3a6
---> d01fb140baf2
Successfully built d01fb140baf2
Successfully tagged web100:latest
root@maciej-VirtualBox:/home/maciej#

```

```

root@maciej-VirtualBox:/home/maciej# docker history web100

```

IMAGE	COMMENT	CREATED	CREATED BY	SIZE
d01fb140baf2		2 minutes ago	/bin/sh -c #(nop) CMD ["apache2ctl" "-D" "F...	0B
0113210b282f		2 minutes ago	/bin/sh -c #(nop) EXPOSE 8080	0B
5f0067d224ae		2 minutes ago	/bin/sh -c apt-get clean	0B
9ef193d0b2d0		2 minutes ago	/bin/sh -c apt-get install -y apache2-utils	3.36 kB
381e14a9a0ff		2 minutes ago	/bin/sh -c apt-get install -y apache2	113MB
c409a71dda6d		2 minutes ago	/bin/sh -c ln -snf /usr/share/zoneinfo/\$var ...	47B
1095b2550bf7		2 minutes ago	/bin/sh -c apt-get update	34.6 MB
388f1a5a2dd4		2 minutes ago	/bin/sh -c #(nop) ENV var=Europe/Warsaw	0B
927b40e16d16		2 minutes ago	/bin/sh -c #(nop) LABEL maintainer=Maciej C...	0B
ff0fea8310f3		8 days ago	/bin/sh -c #(nop) CMD ["bash"]	0B
<missing>		8 days ago	/bin/sh -c #(nop) ADD file:1d3b09cf9e041d608...	72.8 MB

```

root@maciej-VirtualBox:/home/maciej#

```

Analiza kontenera web100

```
root@maciej-VirtualBox:/home/maciej# docker inspect web100 | jq '.[].RootFS.Layers'
[
  "sha256:867d0767a47c392f80acb51572851923d6d3e55289828b0cd84a96ba342660c7",
  "sha256:bd4c419e2eb06e6ad777bd22b89feae184330d609d353c2334d934bfa8e85023",
  "sha256:aff813ec12c6e3ced26d5189ef5d8c75ff030d7cc67579ec9695aadd79dd9076",
  "sha256:bf0fbb358698e8f2adc9a048c91850711a9c5b312a0e7993211ab796bd19791e",
  "sha256:309c3ab5cedff59ef61201098bdc3dd06c993de385d71242f5e5da94b9a2238b",
  "sha256:f3910712814cbb0149aea15e84297586744389eb76055012d640c1706d3a1581"
]
root@maciej-VirtualBox:/home/maciej#
```



## Unable to connect

Firefox can't establish a connection to the server at 10.0.2.15:1234.

- The site could be temporarily unavailable or too busy. Try again in a few moments.
- If you are unable to load any pages, check your computer's network connection.
- If your computer or network is protected by a firewall or proxy, make sure that Firefox is permitted to access the Web.

[Try Again](#)



```

root@maciej-VirtualBox:/home/maciej# docker ps -a
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS
PORTS         NAMES
2eb10192bbf5   web100    "apache2ctl -D FOREG..." 56 seconds ago Up 55 seconds
0.0.0.0:1234->8080/tcp, :::1234->8080/tcp   zadanie2
root@maciej-VirtualBox:/home/maciej# ifconfig
docker0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 172.17.0.1 netmask 255.255.0.0 broadcast 172.17.255.255
    inet6 fe80::42:92ff:fecf:412a prefixlen 64 scopeid 0x20<link>
    ether 02:42:92:cf:41:2a txqueuelen 0 (Ethernet)
    RX packets 12929 bytes 530071 (530.0 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 18346 bytes 46644900 (46.6 MB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255
    inet6 fe80::b2e8:df21:8b3e:990d prefixlen 64 scopeid 0x20<link>
    ether 08:00:27:f5:13:77 txqueuelen 1000 (Ethernet)
    RX packets 91759 bytes 130652292 (130.6 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 31918 bytes 1979631 (1.9 MB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 366 bytes 31708 (31.7 KB)
    RX errors 0 dropped 0 overruns 0 frame 0

```

### Zadanie 3.3

```
root@maciej-VirtualBox:/home/maciej# docker build -t dockerfile .
Sending build context to Docker daemon 95.45MB
Step 1/10 : From scratch
--->
Step 2/10 : ADD alpine-minitootfs-3.15.1-x86_64.tar.gz /
ADD failed: file not found in build context or excluded by .dockerignore: stat alpi
ne-minitootfs-3.15.1-x86_64.tar.gz: file does not exist
root@maciej-VirtualBox:/home/maciej#
```

```
GNU nano 4.8 Dockerfile
FROM scratch
ADD alpine-minirootfs-3.15.2-x86_64.tar.gz /
CMD ["bin/sh"]
LABEL maintainer="Maciej Cieplowski <maciej.cieplowski@pollub.edu.pl>"
LABEL description="Dockerfile z PHP i Apache."
ENV PHPVERSION=7
RUN apk add --update apache2 php${PHPVERSION}-apache2 php${PHPVERSION} && \
rm -rf /var/cache/apk/* && \
#mkdir /run/apache2/ && \
rm -rf /var/www/localhost/htdocs/index.html && \
echo "<?php phpinfo(); ?>" > /var/www/localhost/htdocs/index.php && \
chmod 755 /var/www/localhost/htdocs/index.php
EXPOSE 8080
ENTRYPOINT ["httpd"]
CMD ["-D", "FOREGROUND"]
```

Plik Dockerfile

```
maciej@maciej-VirtualBox:~$ nano Dockerfile
maciej@maciej-VirtualBox:~$ sudo docker build -t dockerfile .
Sending build context to Docker daemon 285.5MB
Step 1/10 : FROM scratch
--->
Step 2/10 : ADD alpine-minirootfs-3.15.2-x86_64.tar.gz /
---> Using cache
---> 8fc46f6471f4
Step 3/10 : CMD ["bin/sh"]
---> Running in 69cdaccc3fdb
Removing intermediate container 69cdaccc3fdb
---> 1747f4d6927e
Step 4/10 : LABEL maintainer="Maciej Cieplowski <maciej.cieplowski@pollub.edu.pl>"
---> Running in df9ef19d7117
Removing intermediate container df9ef19d7117
---> d29d7c1bffe6
Step 5/10 : LABEL description="Dockerfile z PHP i Apache."
---> Running in 2832a4b995a7
Removing intermediate container 2832a4b995a7
---> d46b3051a381
```

Stworzenie obrazu

```
maciej@maciej-VirtualBox:~$ sudo docker images
REPOSITORY          TAG                 IMAGE ID            CREATED             SIZE
dockerfile           latest              174a244af98c       45 seconds ago     45.9MB
local/scratch        1.0                4242002f0d2c       9 minutes ago      5.57MB
web100               latest              d01fb140baf2       About an hour ago   221MB
ubuntu               latest              ff0fea8310f3       8 days ago         72.8MB
```

Porównanie rozmiarów kontenerów web100 i obrazu dockerfile

PHP 7.4.28 - phpinfo()

← → ↺

localhost:8080/index.php

## PHP Version 7.4.28

System	Linux 2cac0410da61 5.13.0-37-generic #42~20.04.1-Ubuntu SMP Tue
Build Date	Feb 19 2022 01:20:27
Configure Command	./configure '--build=x86_64-alpine-linux-musl' '--host=x86_64-alpine program-suffix=7' '--libdir=/usr/lib/php7' '--datadir=/usr/share/php7' ' localstatedir=/var' '--with-layout=GNU' '--with-pic' '--with-config-file-p file-scan-dir=/etc/php7/conf.d' '--disable-short-tags' '--enable-bcmath enable-calendar=shared' '--enable-ctype=shared' '--with-curl=shared dbmaker=shared' '--with-gdbm' '--with-lmdb' '--enable-dom=shared' ' enable-exif=shared' '--with-ffi=shared' '--enable-fileinfo=shared' '--en gd=shared' '--with-freetype' '--with-jpeg' '--with-webp' '--with-xpm' '-- gettext=shared' '--with-gmp=shared' '--with-iconv=shared' '--with-im enable-intl=shared' '--enable-json=shared' '--with-ldap=shared' '--wit with-libxml' '--enable-mbstring=shared' '--with-mysqli=shared,mysqli /mysqld/mysqld.sock' '--enable-mysqlnd=shared' '--enable-openssl= '--with-kerberos' '--with-system-ciphers' '--with-password-argon2' '--er external-pcre' '--enable-pdo=shared' '--with-pdo-dblib=shared' '--with with-pdo-odbc=shared,unixODBC,/usr' '--with-pdo-pgsql=shared' '--w pgsql=shared' '--enable-phar=shared' '--enable-posix=shared' '--with readline' '--enable-session=shared' '--enable-shmop=shared' '--enabl snmp=shared' '--enable-soap=shared' '--with-sodium=shared' '--enabl sqlite3=shared' '--enable-sysvmsg=shared' '--enable-sysvsem=share '--with-tidy=shared' '--enable-tokenizer=shared' '--with-unixODBC=sh xml=shared' '--enable-xmlreader=shared' '--with-xmlrpc=shared' '--e with-xsl=shared' '--with-zip=shared' '--with-zlib' '--disable-phpdbg' '-- 'build_alias=x86_64-alpine-linux-musl' 'host_alias=x86_64-alpine-linu
Server API	Apache 2.0 Handler

Sprawdzenie działania pliku włączonego obrazu dockera

Wnioski:

Zadanie 1:

- Komenda diff pokazuje jakie pliki uległy zmianie od czasu utworzenia kontenera.
- Obraz modified znajduje się w lokalnym repozytorium i zajmuje on więcej miejsca niż pierwotny obraz

Zadanie 2:

- Obraz posiada 6 warstw

Zadanie 3:

- Obraz utworzony na bazie ubuntu zajmuje o wiele więcej miejsca niż obraz na bazie alpine 45.9MB, a ubuntu 221MB