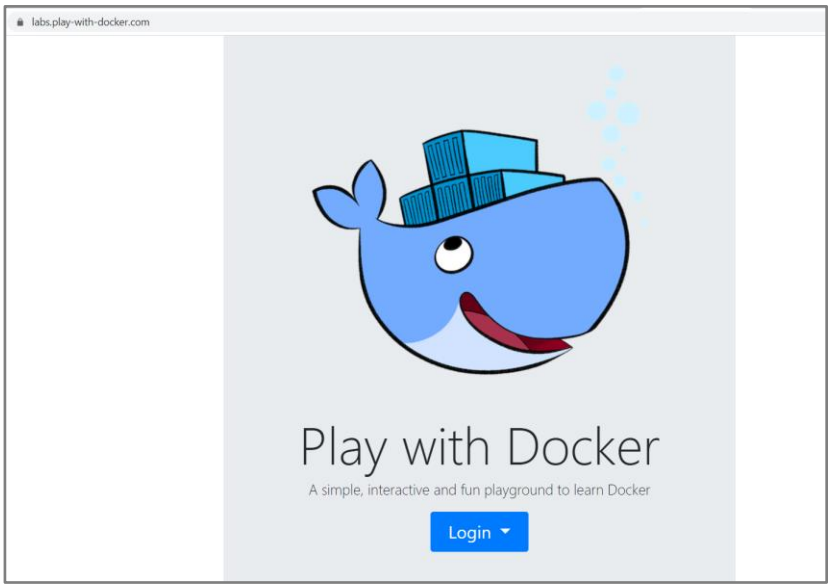
Lab: Linux and Linux Shell

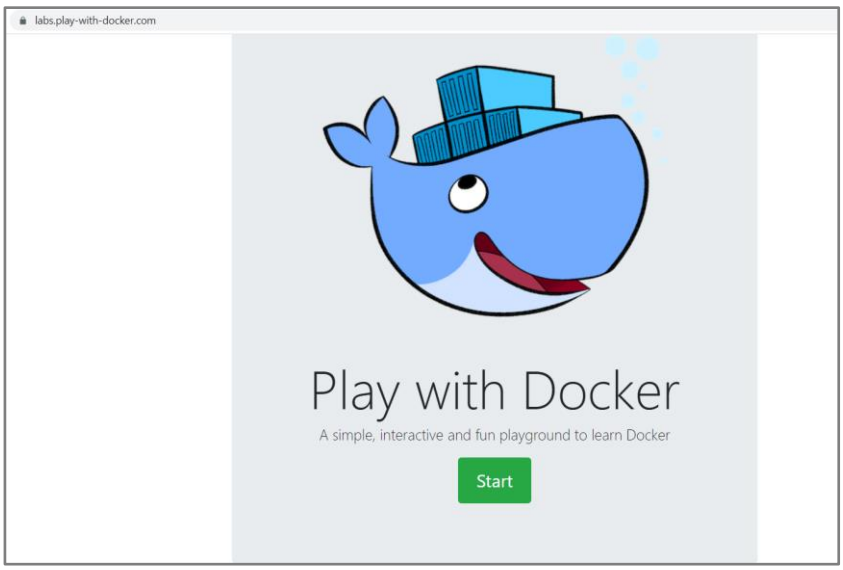
Lab for the "Containers and Clouds" course @ SoftUni

1. Configure Connectivity of the VM

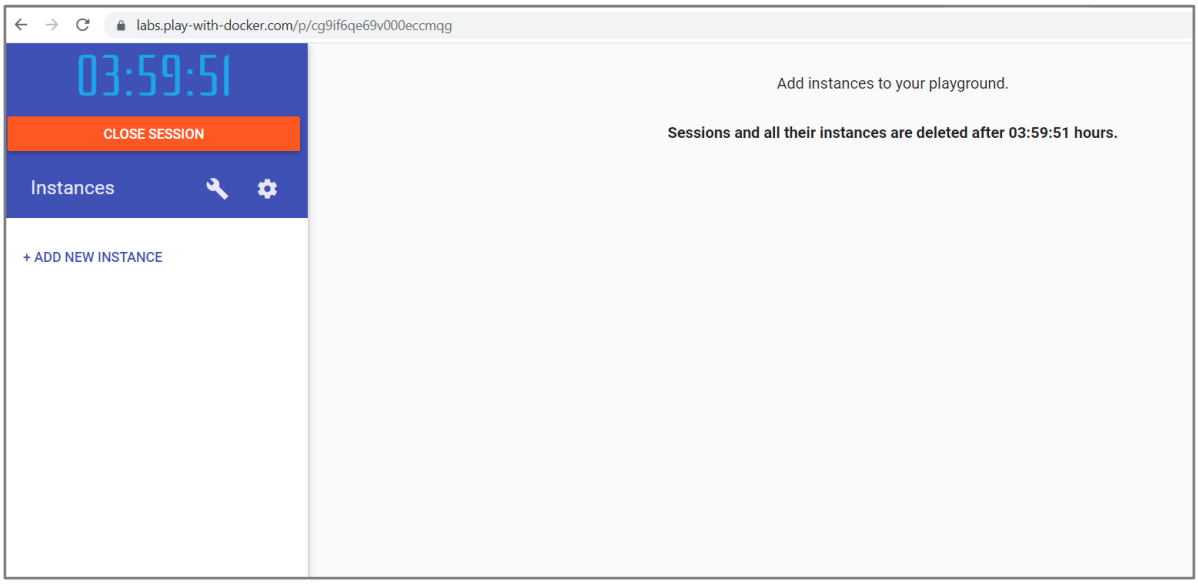
The first step is to open the link – https://labs.play-with-docker.com/.



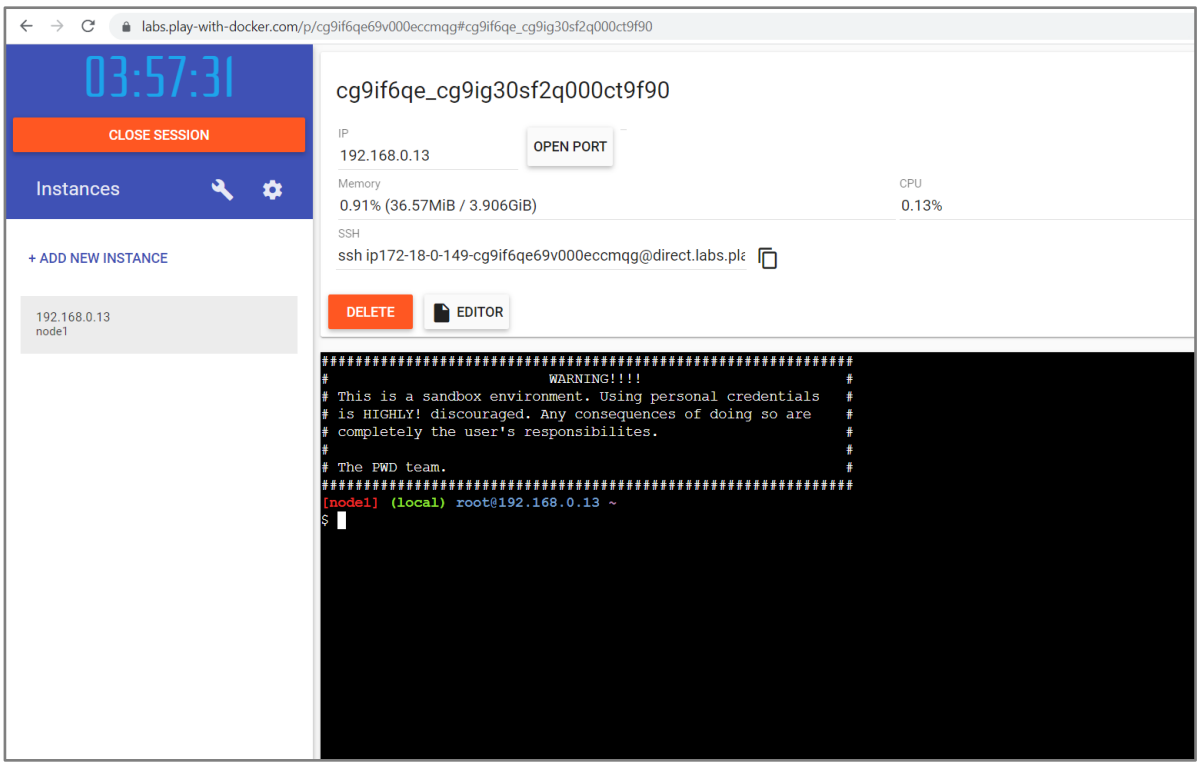
Then press the **[Login]** button and click on "**docker**". A new dialog box opens, which is for **docker registration**. If you don't have a registration click on **[Sign Up]**. You have to create an account with a username, password and email. Then sign in to your account. It takes you to a page to select the plan you want – click on "**Continue to Free**" (Personal plan). Log in to the email you registered with and **confirm your account**. You may need to reload the page until you see this:



Click on the **[Start]** button.



You should see this. Click on **`[+ add new instance]`**.



We are ready for work!

2. Getting to Know the Console

Let's start writing the command in the docker playground.

On the prompt, we can **input the user and password** that we created during the installation. Of course, we can use the **root user**, but it is not considered a good practice.

Now, let's check where (in which **folder**) **we are** with the **`pwd`** command:

```
[node1] (local) root@192.168.0.13 ~
pwd
/root
```

It appears that we are in our **home folder** (**`/home/1sauser`**).

Check what we have here:

```
[node1] (local) root@192.168.0.13 ~
$ ls
```

There is **nothing** or at least it appears to be this way. Of course, what we will see here on a **clean new installation** depends on what **distribution we chose** and **what settings** there are by default.

Even though we are not familiar with all options on the **`ls`** command yet, let's check if there are **any hidden files and folders** with:

```
[node1] (local) root@192.168.0.13 ~
$ ls -al
total 16
drwx------    1 root     root            18 Jul 25  2022 .
drwxr-xr-x    1 root     root            57 Mar 16 14:30 ..
-rw-rw-r--    1 root     root            43 Jan 17  2018 .gitconfig
-rw-rw-r--    1 root     root          1865 Jan 17  2018 .inputrc
-rw-rw-r--    1 root     root           207 Oct 22  2019 .profile
drwxr-xr-x    2 root     root            61 Jul 25  2022 .ssh
-rw-rw-r--    1 root     root            85 Jan 17  2018 .vimrc
```

Note that you can **autocomplete commands** by clicking the **`[Tab]` button twice** (**`Tab-Tab`**).

So, **there are some files** after all. Those are considered **hidden files**, because their name starts with the **dot symbol** (**`.`**). The same rule applies to **folders** as well.

Now, let's execute this:

```
[node1] (local) root@192.168.0.13 ~
$ ls -a
.           .gitconfig  .profile    .vimrc
..          .inputrc    .ssh
```

We can also **give arguments**, not only options. For example, we can check what we have in the **main** (**root**) **folder**. The "**/**" symbol is used to state that we want to **access the root of our file system**:

```
[node1] (local) root@192.168.0.13 ~
$ ls -al /
total 336
drwxr-xr-x    1 root     root            57 Mar 16 14:30 .
drwxr-xr-x    1 root     root            57 Mar 16 14:30 ..
-rwxr-xr-x    1 root     root             0 Mar 16 14:30 .dockerenv
drwxr-xr-x    1 root     root           166 Jul 13  2022 bin
drwxrwxrwt    3 root     root            20 Jun 27  2022 certs
drwxr-xr-x   13 root     root          3660 Mar 16 14:30 dev
-rw-r--r--    1 root     root        340217 Mar 16 15:23 docker.log
drwxr-xr-x    1 root     root            95 Mar 16 14:30 etc
drwxr-xr-x    1 root     root            23 Jun 27  2022 home
drwxr-xr-x    1 root     root           208 Jul 13  2022 lib
drwxr-xr-x    2 root     root            34 May 27  2022 lib64
drwxr-xr-x    5 root     root            44 May 23  2022 media
drwxr-xr-x    2 root     root             6 May 23  2022 mnt
drwxr-xr-x    1 root     root            24 Mar 16 14:30 opt
dr-xr-xr-x 1637 root     root             0 Mar 16 14:30 proc
drwx------    1 root     root            18 Jul 25  2022 root
drwxr-xr-x    1 root     root           117 Mar 16 14:30 run
drwxr-xr-x    1 root     root            22 Jul 13  2022 sbin
drwxr-xr-x    2 root     root             6 May 23  2022 srv
```

```
drwxrwxrwx   13 root     root             0 Jan 24 19:50 sys
drwxrwxrwt    2 root     root             6 May 23  2022 tmp
drwxr-xr-x    1 root     root            19 Jul 13  2022 usr
drwxr-xr-x    1 root     root            41 Jul 13  2022 var
```

We can note that there is a **folder** named "**/root**". This is the **home folder for the root user**.

Let's **change the folder**. For example, go to the "**/etc**" **folder**. This is the place where most of the **configuration files are stored**. Then we can check if indeed we **changed the folder**:

```
[node1] (local) root@192.168.0.13 ~
$ cd /etc
[node1] (local) root@192.168.0.13 /etc
$ pwd
/etc
```

As we can see, there is **no need** to execute **pwd**. The **prompt reflects or shows** where in the **file system tree** we are currently.

When we want to **address all files which name starts with something**, no matter what, and how many symbols their name contains, we can use the "*****" symbol. For example, ask for **all files** starting with "**os***":

```
[node1] (local) root@192.168.0.13 /etc
$ ls os*
os-release
```

Okay, now that we know that this **file exists**, let's check **what it contains** (the actual output may be different):

```
[node1] (local) root@192.168.0.13 /etc
$ cat os-release
NAME="Alpine Linux"
ID=alpine
VERSION_ID=3.16.0
PRETTY_NAME="Alpine Linux v3.16"
HOME_URL="https://alpinelinux.org/"
BUG_REPORT_URL="https://gitlab.alpinelinux.org/alpine/aports/-/issues"
```

It appears, that this **file** contains **detailed information about our distribution**.

Similar or additional information about the distribution we can get by executing:

```
[node1] (local) root@192.168.0.13 /etc
$ uname -a
Linux node1 4.4.0-210-generic #242-Ubuntu SMP Fri Apr 16 09:57:56 UTC 2021 x86_64 Linux
```

Beside the information about the kernel, we can extract information about the **name of the host**:

```
[node1] (local) root@192.168.0.13 /etc
$ hostname
node1
```

Now, let's **return to our home folder**:

```
[node1] (local) root@192.168.0.13 /etc
$ cd
[node1] (local) root@192.168.0.13 ~
$ pwd
/root
```

As we can see, if we execute the **cd** command **without any arguments**, the result is that we are "**back home**". There is also a **special symbol** that we can use – it is again the tilde symbol – "**~**".

Now, let's try a different approach. In general, no matter what distribution we use, there is a **common set of commands** that is always available.

```
lsauser@ubuntu:~$ cat /etc/hostname
softuni.lsa.lab
lsauser@ubuntu:~$ cat /etc/machine-info
PRETTY_HOSTNAME="SoftUni Lab Server"
```

In order the **changes to be reflected in the prompt**, we must **close the session**, and **open a new one**. So, type **`logout`** and **log back in**:

```
[node1] (local) root@192.168.0.13 ~
$ logout
################################################################
#                          WARNING!!!!                         #
# This is a sandbox environment. Using personal credentials    #
# is HIGHLY! discouraged. Any consequences of doing so are     #
# completely the user's responsibilites.                       #
#                                                              #
# The PWD team.                                                #
################################################################
```

We can see that the **new name is applied**.

Now, we can check **what date is today** and **what is the time now**:

```
[node1] (local) root@192.168.0.13 ~
$ date
Thu Mar 16 15:32:34 UTC 2023
```

There is a way to **modify the output** of the **`date`** command:

```
[node1] (local) root@192.168.0.13 ~
$ date +%Y-%m-%d
2023-03-16
```

This way, we will receive the **current date**, represented in "**YYYY-MM-DD**" format.

Should we need a **calendar** on the command line, we can have it easily with:

```
[node1] (local) root@192.168.0.13 ~
$ cal -3
    February 2023          March 2023           April 2023
Su Mo Tu We Th Fr Sa  Su Mo Tu We Th Fr Sa  Su Mo Tu We Th Fr Sa
          1  2  3  4            1  2  3  4                     1
 5  6  7  8  9 10 11   5  6  7  8  9 10 11   2  3  4  5  6  7  8
12 13 14 15 16 17 18  12 13 14 15 16 17 18   9 10 11 12 13 14 15
19 20 21 22 23 24 25  19 20 21 22 23 24 25  16 17 18 19 20 21 22
26 27 28              26 27 28 29 30 31     23 24 25 26 27 28 29
                                            30
```

If we need to know **since when or how long our system is operating**, we can do it with:

```
[node1] (local) root@192.168.0.13 ~
$ uptime
 15:33:58 up 56 days, 23:41,  0 users,  load average: 13.56, 21.57, 23.02
```

At any point we can ask for the **history of executed commands**:

```
[node1] (local) root@192.168.0.13 ~
$ history
    1  pwd
    2  ls
    3  ls -al
    4  ls -a
    5  ls -al /
    6  cd /etc
    7  pwd
    8  ls os*
    9  cat os-release
   10  uname -a
   11  hostname
   12  cd
   13  pwd
   14  hostnamectl
   15  hostnamectl
   16  sudo hostnamect1
   17  systemd
   18  hostnamectl
   19  sudo hostnamectl set-hostname --pretty 'SoftUni Lab Server'
   20  logout
   21  date
```

```
   21  date
   22  date +%Y-%m-%d
   23  cal -3
   24  uptime
   25  history
```

If we want to **end our session**, we can do it with either **`exit`** or **`logout`**. Issuing any of these will close our session but will leave the machine up and running. Let's type **`exit`** and press the **`[Enter]`** key. Our **session is closed** now:

```
[node1] (local) root@192.168.0.13 ~
$ exit
logout
##############################################################
#                          WARNING!!!!                       #
# This is a sandbox environment. Using personal credentials  #
# is HIGHLY! discouraged. Any consequences of doing so are   #
# completely the user's responsibilites.                     #
#                                                            #
# The PWD team.                                              #
##############################################################
```

Now **log in back again** and **ask for all files** (including hidden ones) in our **home folder**:

```
[node1] (local) root@192.168.0.13 ~
$ ls -a
.              .bash_history  .inputrc       .ssh
..             .gitconfig     .profile       .vimrc
```

It appears that there is a **special file** that takes care for our **history** – **`.bash_history`**. Let's check its **contents**:

```
[node1] (local) root@192.168.0.13 ~
$ cat .bash_history
pwd
ls
ls -al
ls -a
ls -al /
cd /etc
pwd
ls os*
cat os-release
uname -a
hostname
cd
pwd
hostnamectl
hostnamectl
sudo hostnamectl
systemd
hostnamectl
sudo hostnamectl set-hostname --pretty 'SoftUni Lab Server'
logout
date
```

```
date +%Y-%m-%d
cal -3
uptime
history
exit
```

As we can see the **last few commands are not here** and there is a perfect explanation for this. The reason is that they are **kept in a buffer** and are stored on the disk only when certain events occur, like session end.