

Starting with Linux, homework

Tomasz Urban

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1 Homework, part 1

Ubuntu Installation and Configuration under VirtualBox

1.1 Download and Installation

From website

<https://www.virtualbox.org/wiki/Downloads>

Virtualbox has been downloaded.

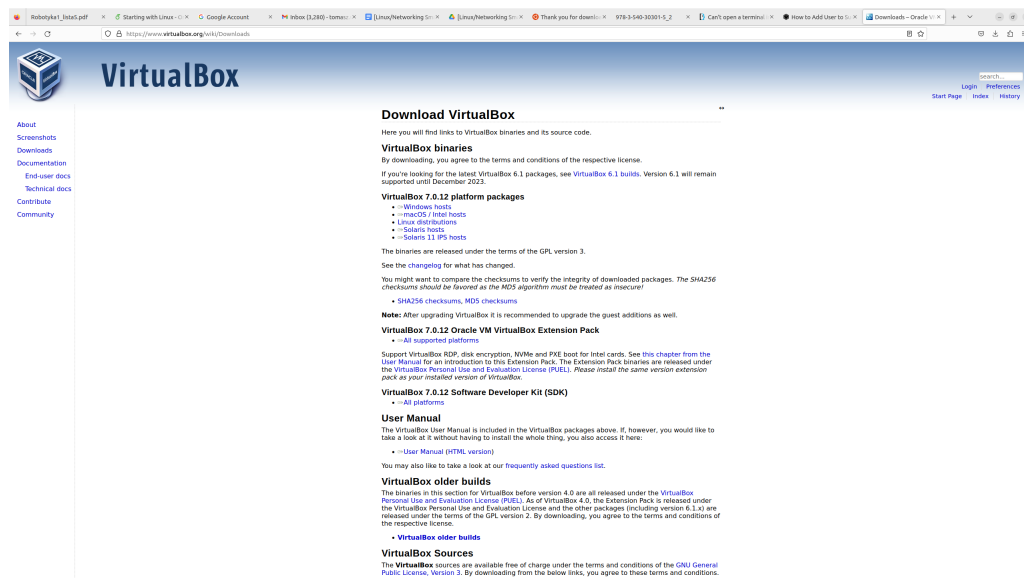


Figure 1: Website with VirtualBox installation files

1.2 Configuration

After successful installation of VirtualBox, following steps have been taken.

1.2.1 Creating Host-Only Network

In

File -> Tools -> NetworkManager

in VirtualBox, Host-Only Network Adapter has been created.

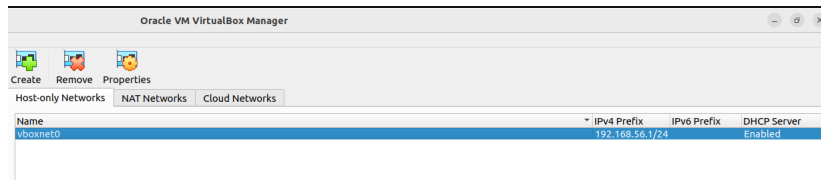


Figure 2: Creation of Host-Only Network

1.2.2 Creation of Virtual Machine

In next step, a new virtual machine has been created. Following configuration steps have been taken:

- An optical drive with Ubuntu ISO image has been added,
- A new SATA drive has been created and added to machine,
- Audio has been disabled,
- For each real network interface in host system a corresponding interface in guest system have been created. Furthermore a host-only adapter has been created. (3 network adapters created in virtualbox)

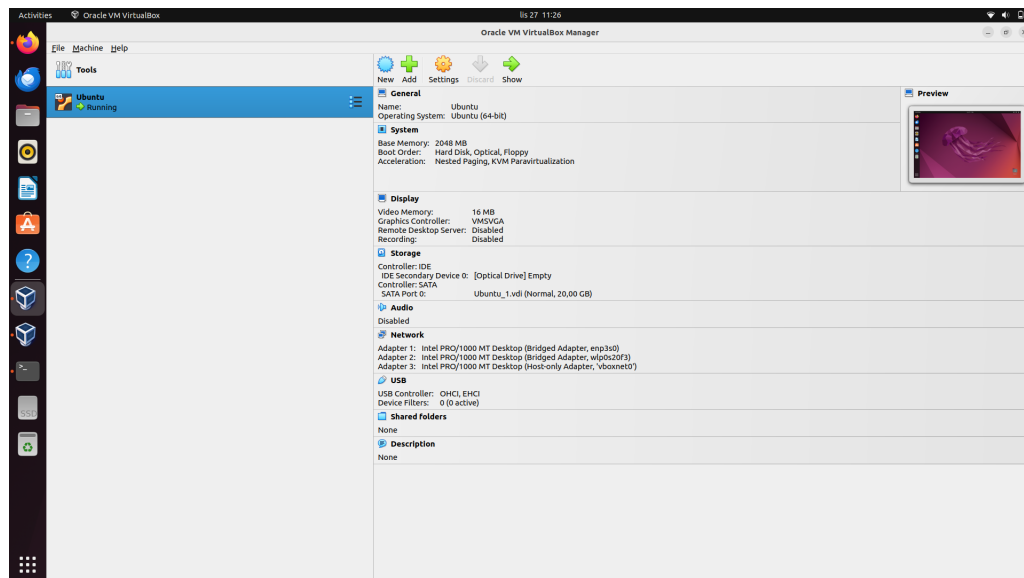


Figure 3: Configuration of Virtual Machine

1.2.3 Ubuntu Image Downloading

From Ubuntu website an Ubuntu 22.04 LTS image has been downloaded.

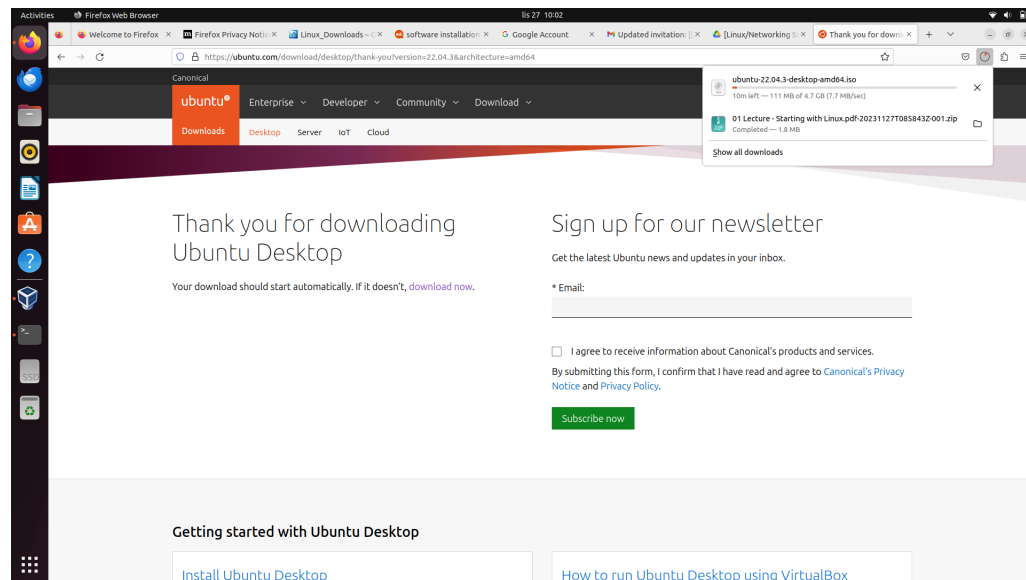


Figure 4: Ubuntu Image Download

1.2.4 Network configuration on guest system

- With ping 8.8.8.8 without specifying network interface checked guest system internet connection
- With ip a listed all network interfaces on guest system

```

tomasz@Ubuntu: ~
tomasz@Ubuntu:~$ ping 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data:
64 bytes from 8.8.8.8: icmp_seq=1 ttl=120 time=14.9 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=120 time=15.4 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=120 time=14.2 ms
64 bytes from 8.8.8.8: icmp_seq=4 ttl=120 time=14.4 ms
64 bytes from 8.8.8.8: icmp_seq=5 ttl=120 time=19.9 ms
64 bytes from 8.8.8.8: icmp_seq=6 ttl=120 time=15.1 ms
64 bytes from 8.8.8.8: icmp_seq=7 ttl=120 time=14.2 ms
^C
--- 8.8.8.8 ping statistics ---
7 packets transmitted, 7 received, 0% packet loss, time 6010ms
rtt min/avg/max/mdev = 14.174/15.443/19.870/1.858 ms
tomasz@Ubuntu:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:7d:ed:ff brd ff:ff:ff:ff:ff:ff
3: enp0s8: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:11:08:82 brd ff:ff:ff:ff:ff:ff
    inet 192.168.0.195/24 brd 192.168.0.255 scope global dynamic noprefixroute enp0s8
        valid_lft 6897sec preferred_lft 6897sec
    inet6 fe80::9a41:250e:df9c:2e4a/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
4: enp0s9: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:43:5a:4c brd ff:ff:ff:ff:ff:ff
    inet 192.168.56.102/24 brd 192.168.56.255 scope global dynamic noprefixroute enp0s9
        valid_lft 590sec preferred_lft 590sec
    inet6 fe80::70e3:14ad:d57:ad75/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
tomasz@Ubuntu:~$

```

Figure 5: Checking internet connection and network interfaces on guest system system

After that, each network interface has been checked.

```
tomasz@Ubuntu:~$ ip a show enp0s3
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:7d:ed:ff brd ff:ff:ff:ff:ff:ff
tomasz@Ubuntu:~$ ip a show enp0s8
3: enp0s8: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:11:88:a2 brd ff:ff:ff:ff:ff:ff
    inet 192.168.0.195/24 brd 192.168.0.255 scope global dynamic noprefixroute enp0s8
        valid_lft 6838sec preferred_lft 6838sec
    inet6 fe80::9a41:256e:df9c:2e4a/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
tomasz@Ubuntu:~$ ip a show enp0s9
4: enp0s9: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:43:5a:4c brd ff:ff:ff:ff:ff:ff
    inet 192.168.56.102/24 brd 192.168.56.255 scope global dynamic noprefixroute enp0s9
        valid_lft 534sec preferred_lft 534sec
    inet6 fe80::78e1:314a:dd57:ad75/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
tomasz@Ubuntu:~$
```

Figure 6: Checking network interfaces

- enp03s- network interface not connected to internet (on host system, ethernet input)
- enp08s- network interface connected to network 192.168.0.0/24 with ip address 192.168.0.195
- enp09s- network interface (host-only adapter), connected to network 192.168.56.0/24 with ip address 192.168.56.102

After that, enp0s9 network interface has been checked. When properly set, enp09s interface:

- not able to connect to remote host (tested 8.8.8.8),
- is able to connect to host 192.168.56.1

```
tomasz@Ubuntu:~$ ping -I enp0s9 -c 4 8.8.8.8
ping: invalid argument: '8.8.8.8'
tomasz@Ubuntu:~$ ping -I enp0s9 -c 4 8.8.8.8
PING 8.8.8.8 (8.8.8.8) from 192.168.56.102 enp0s9: 56(84) bytes of data.
From 192.168.56.102 icmp_seq=1 Destination Host Unreachable
From 192.168.56.102 icmp_seq=2 Destination Host Unreachable
From 192.168.56.102 icmp_seq=3 Destination Host Unreachable
From 192.168.56.102 icmp_seq=4 Destination Host Unreachable

--- 8.8.8.8 ping statistics ---
4 packets transmitted, 0 received, +4 errors, 100% packet loss, time 3051ms
pipe 4
tomasz@Ubuntu:~$ ping -I enp0s9 -c 4 192.168.56.1
ping: invalid argument: '192.168.56.1'
tomasz@Ubuntu:~$ ping -I enp0s9 -c 4 192.168.56.1
PING 192.168.56.1 (192.168.56.1) from 192.168.56.102 enp0s9: 56(84) bytes of data.
64 bytes from 192.168.56.1: icmp_seq=1 ttl=64 time=1.48 ms
r: 64 bytes from 192.168.56.1: icmp_seq=2 ttl=64 time=0.746 ms
UbuntuSoftware 32.168.56.1: icmp_seq=3 ttl=64 time=0.691 ms
64 bytes from 192.168.56.1: icmp_seq=4 ttl=64 time=0.462 ms

--- 192.168.56.1 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3042ms
rtt min/avg/max/mdev = 0.462/0.823/1.396/0.347 ms
tomasz@Ubuntu:~$
```

Figure 7: Checking enp0s9 interface

Results:

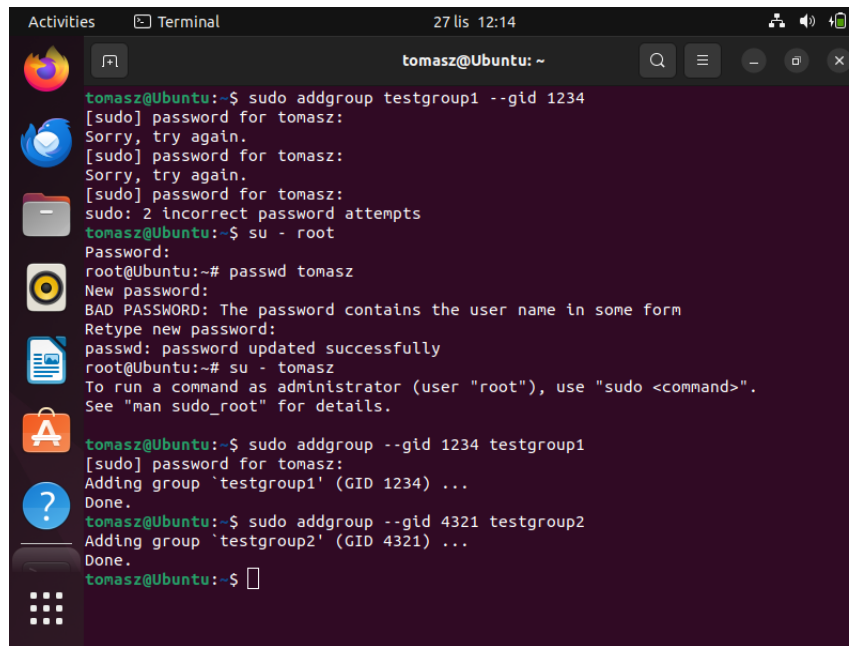
- successfully connecting to host 192.168.56.1
- unsuccessfully connecting to host 8.8.8.8

Network interfaces have successfully been configured on guest system.

2 Homework, part 2

In this part, task was to create two users and two groups, with specified requirements.

2.1 Groups creation

A terminal window titled 'Terminal' with the date '27 lis 12:14' and the user 'tomasz@Ubuntu: ~'. The terminal shows the following commands and output:

```
tomasz@Ubuntu:~$ sudo addgroup testgroup1 --gid 1234
[sudo] password for tomasz:
Sorry, try again.
[sudo] password for tomasz:
Sorry, try again.
[sudo] password for tomasz:
sudo: 2 incorrect password attempts
tomasz@Ubuntu:~$ su - root
Password:
root@Ubuntu:~# passwd tomasz
New password:
BAD PASSWORD: The password contains the user name in some form
Retype new password:
passwd: password updated successfully
root@Ubuntu:~# su - tomasz
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.
tomasz@Ubuntu:~$ sudo addgroup --gid 1234 testgroup1
[sudo] password for tomasz:
Adding group 'testgroup1' (GID 1234) ...
Done.
tomasz@Ubuntu:~$ sudo addgroup --gid 4321 testgroup2
Adding group 'testgroup2' (GID 4321) ...
Done.
tomasz@Ubuntu:~$
```

Figure 8: Terminal with commands for creating groups with specified GID

2.2 Users creation

Requirements:

- "testuser"

- Create user "testuser",
- Automatically create home directory
- UID 1234
- GID 1234
- Default shell: /bin/bash
- Used command:

```
sudo useradd --gid 1234 --uid 1234 testuser -m --shell /bin/bash
```

- After creation, both username and home directory should be changed
- Used command:

```
sudo usermod -l testuser1 -d /home/testuser1 -m testuser
```

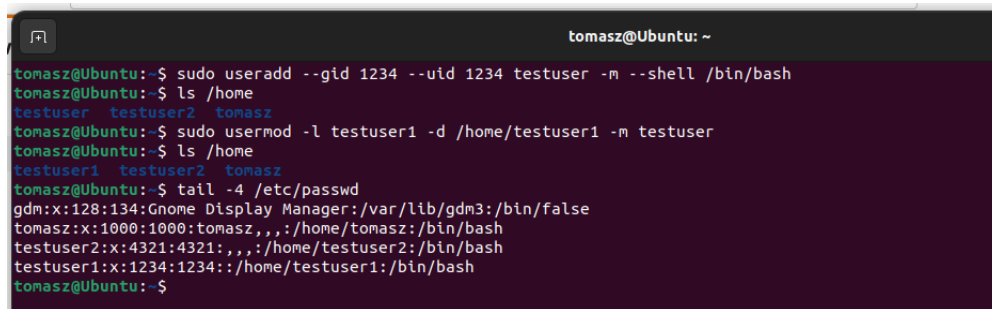
For "testuser2":

- "testuser2"

- Create user "testuser2",
- Automatically create home directory
- UID 4321
- GID 4321
- Default shell: /bin/bash

– Used command:

```
sudo useradd --gid 4321 --uid 4321 testuser2 -m --shell /bin/bash
```

A terminal window titled 'tomasz@Ubuntu: ~' showing a series of commands and their outputs. The commands include creating a user 'testuser' with gid 1234 and uid 1234, listing the contents of /home, modifying the home directory of 'testuser1' to '/home/testuser1', and viewing the last four lines of the /etc/passwd file. The output shows the directory listing for /home and the relevant entries from the /etc/passwd file.

```
tomasz@Ubuntu:~$ sudo useradd --gid 1234 --uid 1234 testuser -m --shell /bin/bash
tomasz@Ubuntu:~$ ls /home
testuser  testuser2  tomasz
tomasz@Ubuntu:~$ sudo usermod -l testuser1 -d /home/testuser1 -m testuser
tomasz@Ubuntu:~$ ls /home
testuser1  testuser2  tomasz
tomasz@Ubuntu:~$ tail -4 /etc/passwd
gdm:x:128:134:Gnome Display Manager:/var/lib/gdm3:/bin/false
tomasz:x:1000:1000:tomasz,,:/home/tomasz:/bin/bash
testuser2:x:4321:4321:,,,:/home/testuser2:/bin/bash
testuser1:x:1234:1234:,,,:/home/testuser1:/bin/bash
tomasz@Ubuntu:~$
```

Figure 9: Terminal with commands for creating user "testuser". After creation of "testuser" it's name and home directory has been changed.