

Российский университет дружбы народов
Факультет физико-математических и естественных наук

Отчёт по лабораторной работе №1

Москва 2023

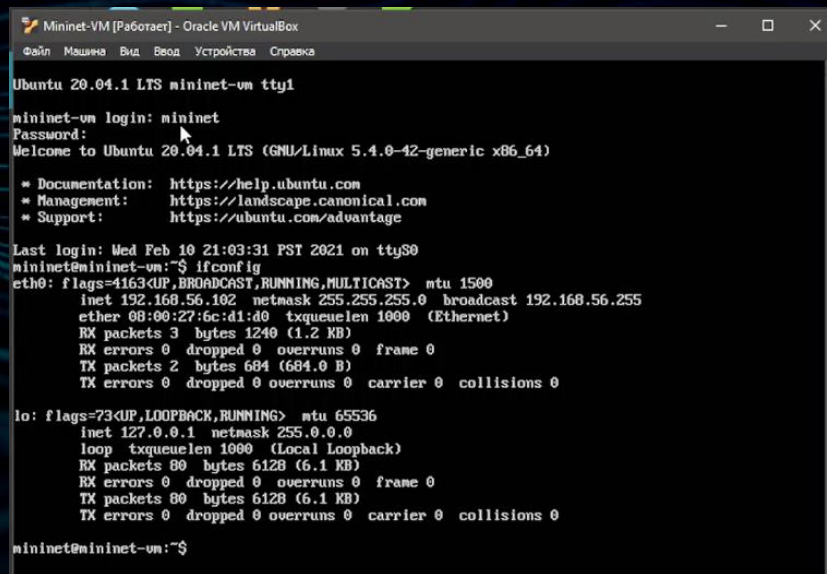
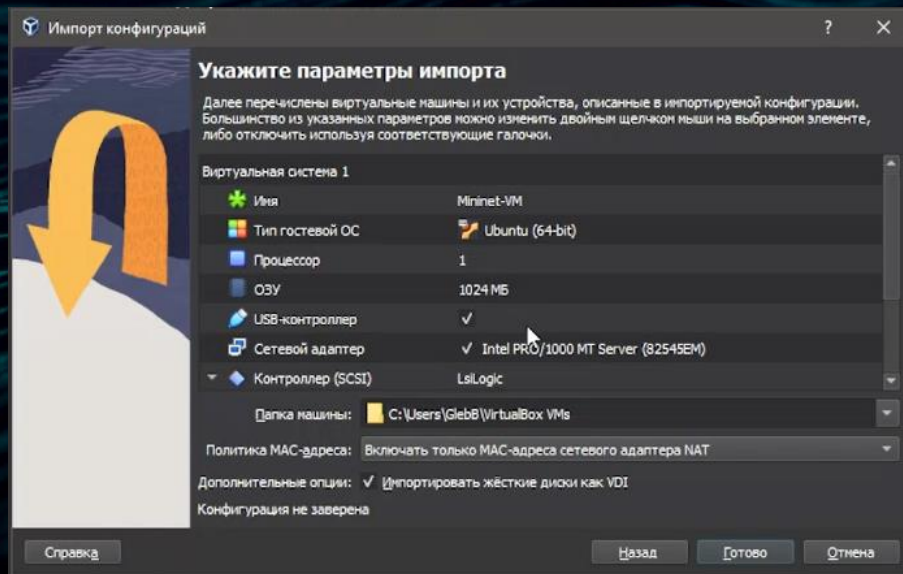
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Быстров Глеб

Цель работы (задание)

- Развёртывание в системе виртуализации mininet, знакомство с основными командами для работы с Mininet через командную строку и через графический интерфейс.

Задачи (метод выполнения)

- Настройка стенда виртуальной машины Mininet



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```
root@mininet-vm:~# apt-get install mc
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libssh2-1 mc-data unzip
Suggested packages:
  arj catdvi | texlive-binaries dbview djvulibre-bin epub-utils genisoimage gv imagemagick libaspell-dev links | w3m | lynx odt2txt
  poppler-utils python python-boto python-tz xpdf | pdf-viewer zip
```

```
python -m pip uninstall -y mininet || true
Found existing installation: mininet 2.3.0
Uninstalling mininet-2.3.0:
  Successfully uninstalled mininet-2.3.0
python -m pip install .
Processing /home/mininet/mininet
Requirement already satisfied: setuptools in /usr/lib/python3/dist-packages (from mininet==2.3.1b4) (45.2.0)
Building wheels for collected packages: mininet
  Building wheel for mininet (setup.py) ... done
  Created wheel for mininet: filename=mininet-2.3.1b4-py3-none-any.whl size=160942 sha256=9ab2979fb93837d0c8df7b6bec11736b99ca37e51776af2c029fb9daf56b45df
  Stored in directory: /tmp/pip-ephem-wheel-cache-vo6r3lap/wheels/cd/7d/a7/aafelb3eaff31efd6ba4e2ea6c9690a717bdf739db6cfe8d45
Successfully built mininet
Installing collected packages: mininet
Successfully installed mininet-2.3.1b4
mininet@mininet-vm:~/mininet$ mn --version
2.3.1b4
mininet@mininet-vm:~/mininet$ sudo mcedit /etc/X11/app-defaults/XTerm
mininet@mininet-vm:~/mininet$ sudo ~/mininet/mininet/examples/miniedit.py
```

Задачи (метод выполнения)

- Настройка стенда виртуальной машины Mininet

```
Администратор: Windows PowerShell
Windows PowerShell
(C) Корпорация Майкрософт (Microsoft Corporation). Все права защищены.

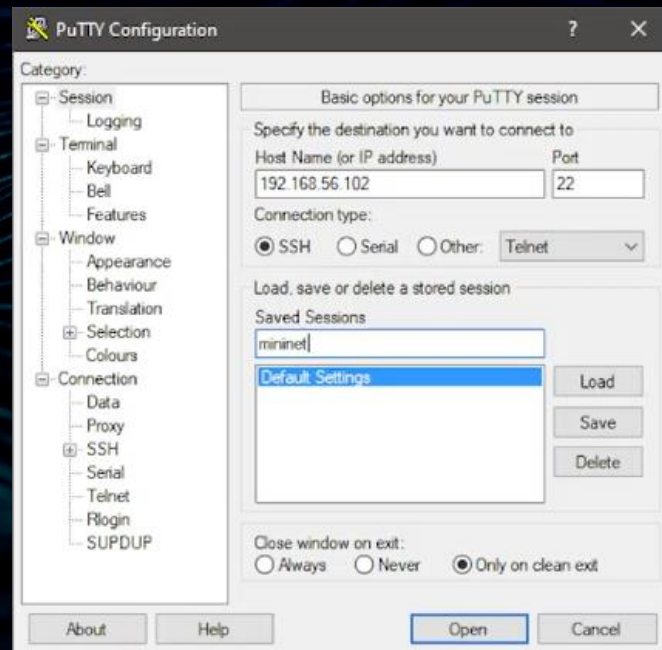
Попробуйте новую кроссплатформенную оболочку PowerShell (https://aka.ms/pscore6)

PS C:\Windows\system32> choco install putty -y
Chocolatey v1.2.1
Installing the following packages:
putty
By installing, you accept licenses for the packages.
Progress: Downloading putty.portable 0.79.0... 100%
Progress: Downloading putty 0.79.0... 100%

putty.portable v0.79.0 [Approved]
putty.portable package files install completed. Performing other installation steps.
Extracting 64-bit C:\ProgramData\chocolatey\lib\putty.portable\tools\putty_x64.zip to C:\ProgramData\chocolatey\lib\putty.portable\tools...
C:\ProgramData\chocolatey\lib\putty.portable\tools
ShimGen has successfully created a gui shim for PAGEANT.EXE
ShimGen has successfully created a shim for PLINK.EXE
ShimGen has successfully created a shim for PSCP.EXE
ShimGen has successfully created a shim for PSFTP.EXE
ShimGen has successfully created a gui shim for PUTTY.EXE
ShimGen has successfully created a gui shim for PUTTYGEN.EXE
The install of putty.portable was successful.
Software installed to 'C:\ProgramData\chocolatey\lib\putty.portable\tools'

putty v0.79.0 [Approved]
putty package files install completed. Performing other installation steps.
The install of putty was successful.
Software installed to 'C:\ProgramData\chocolatey\lib\putty'

Chocolatey installed 2/2 packages.
See the log for details (C:\ProgramData\chocolatey\logs\chocolatey.log).
PS C:\Windows\system32> choco install vcxsrv -y
Chocolatey v1.2.1
Installing the following packages:
vcxsrv
By installing, you accept licenses for the packages.
Progress: Downloading vcxsrv 1.20.14.0... 100%
```



Задачи (метод выполнения)

- Работа с Mininet с помощью командной строки

```
*** Starting controller
c0
*** Starting 1 switches
s1 ...
*** Starting CLI:
mininet> help

Documented commands (type help <topic>):
=====
EOF      gterm  iperfudp  nodes      pingpair    py      switch  xterm
dpctl    help   link      noecho     pingpairfull  quit    time
dump     intfs  links     pingall    ports       sh      wait
exit     iperf  net       pingallfull px          source  x

You may also send a command to a node using:
<node> command {args}
For example:
mininet> h1 ifconfig

The interpreter automatically substitutes IP addresses
for node names when a node is the first arg, so commands
like
mininet> h2 ping h3
should work.

Some character-oriented interactive commands require
noecho:
mininet> noecho h2 vi foo.py
However, starting up an xterm/gterm is generally better:
mininet> xterm h2

mininet> nodes
available nodes are:
c0 h1 h2 s1
mininet> net
h1 h1-eth0:s1-eth1
h2 h2-eth0:s1-eth2
s1 lo: s1-eth1:h1-eth0 s1-eth2:h2-eth0
c0
mininet>
```

Задачи (метод выполнения)

- Работа с Mininet с помощью командной строки

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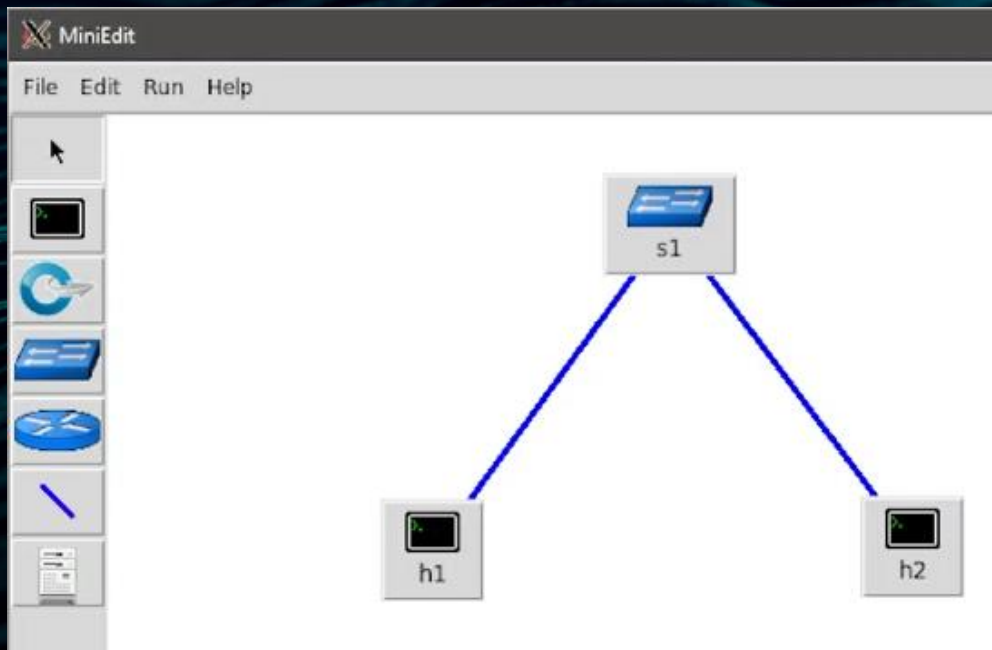
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c0 h1 h2 s1
mininet> net
h1 h1-eth0:s1-eth1
h2 h2-eth0:s1-eth2
s1 lo: s1-eth1:h1-eth0 s1-eth2:h2-eth0
c0
mininet> h1 ifconfig
h1-eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
    inet 10.0.0.1  netmask 255.0.0.0  broadcast 10.255.255.255
    ether 5e:7d:b8:82:42:ca  txqueuelen 1000  (Ethernet)
    RX packets 0  bytes 0 (0.0 B)
    RX errors 0  dropped 0  overruns 0  frame 0
    TX packets 0  bytes 0 (0.0 B)
    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
    loop txqueuelen 1000  (Local Loopback)
    RX packets 0  bytes 0 (0.0 B)
    RX errors 0  dropped 0  overruns 0  frame 0
    TX packets 0  bytes 0 (0.0 B)
    TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

mininet> h1 ping 10.0.0.2
PING 10.0.0.2 (10.0.0.2) 56(84) bytes of data.
64 bytes from 10.0.0.2: icmp_seq=1 ttl=64 time=4.08 ms
64 bytes from 10.0.0.2: icmp_seq=2 ttl=64 time=0.269 ms
64 bytes from 10.0.0.2: icmp_seq=3 ttl=64 time=0.046 ms
64 bytes from 10.0.0.2: icmp_seq=4 ttl=64 time=0.074 ms
64 bytes from 10.0.0.2: icmp_seq=5 ttl=64 time=0.180 ms
```


Задачи (метод выполнения)

- Работа с Mininet с помощью графического интерфейса



The screenshot shows a configuration dialog box for a host. It contains the following fields and controls:

- Hostname:
- IP Address:
- Default Route:
- Amount CPU: host
- Cores:
- Start Command:
- Stop Command:

At the bottom of the dialog are two buttons: "OK" and "Cancel".

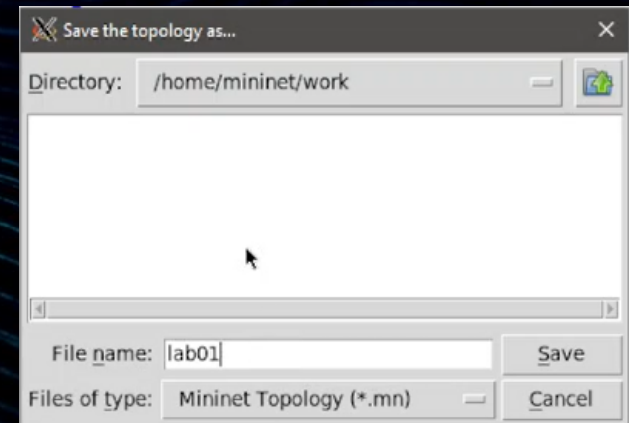
Задачи (метод выполнения)

- Работа с Mininet с помощью графического интерфейса

```
Host: h2@mininet-vm
root@mininet-vm:/home/mininet# ifconfig
h2-eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
    inet 10.0.0.2  netmask 255.0.0.0  broadcast 10.255.255.255
    ether 4e:5d:95:49:01:14  txqueuelen 1000  (Ethernet)
    RX packets 9  bytes 770 (770.0 B)
    RX errors 0  dropped 0  overruns 0  frame 0
    TX packets 9  bytes 770 (770.0 B)
    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
    loop txqueuelen 1000  (Local Loopback)
    RX packets 858  bytes 225220 (225.2 KB)
    RX errors 0  dropped 0  overruns 0  frame 0
    TX packets 858  bytes 225220 (225.2 KB)
    TX errors 0  dropped 0  overruns 0  carrier 0  collisions 0

root@mininet-vm:/home/mininet# ping 10.0.0.1
PING 10.0.0.1 (10.0.0.1) 56(84) bytes of data.
64 bytes from 10.0.0.1: icmp_seq=1 ttl=64 time=0.295 ms
64 bytes from 10.0.0.1: icmp_seq=2 ttl=64 time=0.113 ms
64 bytes from 10.0.0.1: icmp_seq=3 ttl=64 time=0.048 ms
64 bytes from 10.0.0.1: icmp_seq=4 ttl=64 time=0.076 ms
```



Результаты и их анализ

- Успешно удалось развернуть в системе виртуализации mininet, познакомиться с основными командами для работы с Mininet через командную строку и через графический интерфейс.



Благодарю за внимание