

# **Отчёт о лабораторной работе**

Лабораторная работа 11

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## **Содержание**

### **Цель работы**

Приобретение практических навыков по настройке удалённого доступа к серверу с помощью SSH.

### **Выполнение лабораторной работы**

Для начала зайдём на сервер и авторизуемся от рута, после чего сменим для него пароль (рис. [-@fig:001]).

```
[dmmosharov@server.dmmosharov.net ~]$ sudo -i  
[sudo] password for dmmosharov:  
[root@server.dmmosharov.net ~]# passwd root  
New password:  
BAD PASSWORD: The password is shorter than 8 characters  
Retype new password:  
passwd: password updated successfully  
[root@server.dmmosharov.net ~]#
```

Смена пароля для root

Во втором терминале запустим вывод логов journalctl в реальном времени (рис. [-@fig:002]).

```
[dmmosharov@server.dmmosharov.net ~]$ sudo -i
[sudo] password for dmmosharov:
[root@server.dmmosharov.net ~]# journalctl -x -f
Jan 30 22:30:09 server.dmmosharov.net systemd[1]: systemd-coredump@1452
1-186541-0.service: Deactivated successfully.
  Subject: Unit succeeded
  Defined-By: systemd
  Support: https://wiki.rockylinux.org/rocky/support

  The unit systemd-coredump@14521-186541-0.service has successfully en-
tered the 'dead' state.
Jan 30 22:30:14 server.dmmosharov.net kernel: traps: VBoxClient[186554]
trap int3 ip:41db4b sp:7ff750a35cd0 error:0 in VBoxClient[1db4b,400000
+bb000]
Jan 30 22:30:14 server.dmmosharov.net systemd-coredump[186555]: Process
186551 (VBoxClient) of user 1001 terminated abnormally with signal 5/T
RAP, processing...
Jan 30 22:30:14 server.dmmosharov.net systemd[1]: Started systemd-cored
ump@14522-186555-0.service - Process Core Dump (PID 186555/UID 0).
  Subject: A start job for unit systemd-coredump@14522-186555-0.servic
e has finished successfully
  Defined-By: systemd
  Support: https://wiki.rockylinux.org/rocky/support

  A start job for unit systemd-coredump@14522-186555-0.service has fin
ished successfully.

  The job identifier is 277664.
Jan 30 22:30:14 server.dmmosharov.net systemd-coredump[186556]: [..] Pro
cess 186551 (VBoxClient) of user 1001 dumped core.

                                         Module
libXau.so.6 from rpm libXau-1.0.11-8.el10.x86_64
                                         Module
libxcb.so.1 from rpm libxcb-1.17.0-3.el10.x86_64
                                         Module
libX11.so.6 from rpm libX11-1.8.10-1.el10.x86_64
                                         Module
libffi.so.8 from rpm libffi-3.4.4-9.el10.x86_64
                                         Module
libwayland-client.so.0 from rpm wayland-1.23.0-2.el10.x86_64
```

journalctl

Далее, зайдём на клиента. С клиента попытаемся по ssh подключиться к серверу от имени учётной записи root. Операция успешна (рис. [-@fig:003]).

```
[dmmosharov@server.dmmosharov.net ~]$ ssh root@server.dmmosharov.net
root@server.dmmosharov.net's password:
Activate the web console with: systemctl enable --now cockpit.socket

Last failed login: Fri Jan 30 23:23:07 UTC 2026 from 192.168.1.1 on ssh:notty
There were 18 failed login attempts since the last successful login.
root@server:~#
```

Авторизация под root по ssh

Посмотрим логи и увидим, что авторизация была разрешена, и пароль был принят (рис. [-@fig:004]).

```

should be reported to its vendor as a bug.
Jan 30 23:26:53 server.dmmosharov.net systemd[1]: systemd-coredump@1516
8-195032-0.service: Deactivated successfully.
  Subject: Unit succeeded
  Defined-By: systemd
  Support: https://wiki.rockylinux.org/rocky/support

  The unit systemd-coredump@15168-195032-0.service has successfully en-
tered the 'dead' state.
Jan 30 23:26:58 server.dmmosharov.net kernel: traps: VBoxClient[195041]
trap int3 ip:41db4b sp:7ff750a35cd0 error:0 in VBoxClient[1db4b,400000
+bb000]
Jan 30 23:26:58 server.dmmosharov.net systemd-coredump[195042]: Process
195038 (VBoxClient) of user 1001 terminated abnormally with signal 5/T
RAP, processing...
Jan 30 23:26:58 server.dmmosharov.net systemd[1]: Started systemd-cored
ump@15169-195042-0.service - Process Core Dump (PID 195042/UID 0).
  Subject: A start job for unit systemd-coredump@15169-195042-0.servic
e has finished successfully
  Defined-By: systemd
  Support: https://wiki.rockylinux.org/rocky/support

  A start job for unit systemd-coredump@15169-195042-0.service has fin
ished successfully.

```

#### Лог авторизации

Теперь откроем на сервере файл /etc/ssh/sshd\_config и пропишем там PermitRootLogin как no, для запрета авторизации от имени рута (рис. [-@fig:005]).

```

Port 22
Port 2022
#AddressFamily any
#ListenAddress 0.0.0.0
#ListenAddress ::

#HostKey /etc/ssh/ssh_host_rsa_key
#HostKey /etc/ssh/ssh_host_ecdsa_key
#HostKey /etc/ssh/ssh_host_ed25519_key

# Ciphers and keying
#RekeyLimit default none

# Logging
#SyslogFacility AUTH
#LogLevel INFO

# Authentication:

#LoginGraceTime 2m
PermitRootLogin no
#StrictModes yes
#MaxAuthTries 6
#MaxSessions 10

#PubkeyAuthentication yes

# The default is to check both .ssh/authorized_keys and .ssh/authorized_keys2
# but this is overridden so installations will only check .ssh/authorized_keys
AuthorizedKeysFile      .ssh/authorized_keys

#AuthorizedPrincipalsFile none

#AuthorizedKeysCommand none
#AuthorizedKeysCommandUser nobody
          [ Wrote 132 lines ]
^G Help      ^O Write Out  ^F Where Is  ^K Cut        ^T Execute
^X Exit      ^R Read File  ^\ Replace   ^U Paste      ^J Justify

```

#### Редактирование /etc/ssh/sshd\_config

Перезапустим теперь службу sshd на сервере (рис. [-@fig:006]).

```
[root@server.dmmosharov.net ~]# systemctl restart sshd
[root@server.dmmosharov.net ~]#
```

#### Перезапуск sshd

Теперь на клиенте попробуем подключиться по ssh под пользователем root и увидим, что пароль неверный. Это не так, но это значит, что авторизация была запрещена (рис.

[[-@fig:007](#)]).

```
root@server:~# su - dmmosharov
Last login: Fri Jan 30 23:17:52 UTC 2026 from 192.168.1.30 on pts/5
[dmmosharov@server.dmmosharov.net ~]$ ssh root@server
The authenticity of host 'server (127.0.1.1)' can't be established.
ED25519 key fingerprint is SHA256:F8sREGCc3d3bqO3xJrbnrCFDPDWDr/+seyP0j5DX9uI.
This host key is known by the following other names/addresses:
    ~/ssh/known_hosts:1: server.dmmosharov.net
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'server' (ED25519) to the list of known hosts.
root@server's password:
Permission denied, please try again.
root@server's password: █
```

Повторная авторизация под root по ssh

В логах увидим, что авторизация провалена, и не удалось проверить пароль (рис. [[-@fig:008](#)]).

```
███ The unit systemd-coredump@15215-195616-0.service has successfully en
tered the 'dead' state.
Jan 30 23:31:00 server.dmmosharov.net unix_chkpwd[195623]: password che
ck failed for user (root)
Jan 30 23:31:00 server.dmmosharov.net sshd-session[195554]: pam_unix(ss
hd:auth): authentication failure; logname= uid=0 euid=0 tty=ssh ruser=ss
rhost=127.0.0.1 user=root
Jan 30 23:31:02 server.dmmosharov.net sshd-session[195554]: Failed pass
word for root from 127.0.0.1 port 34838 ssh2
Jan 30 23:31:04 server.dmmosharov.net kernel: traps: VBoxClient[195628]
trap int3 ip:41db4b sp:7ff750a35cd0 error:0 in VBoxClient[1db4b,400000
+bb000]
Jan 30 23:31:04 server.dmmosharov.net systemd-coredump[195629]: Process
195625 (VBoxClient) of user 1001 terminated abnormally with signal 5/T
RAP, processing...
Jan 30 23:31:04 server.dmmosharov.net systemd[1]: Started systemd-cored
ump@15216-195629-0.service - Process Core Dump (PID 195629/UID 0).
███ Subject: A start job for unit systemd-coredump@15216-195629-0.servic
```

Лог авторизации

Попробуем подключиться по ssh к серверу от имени своей учётной записи. Как видим, авторизация успешна (рис. [[-@fig:009](#)]).

```
[dmmosharov@server.dmmosharov.net ~]$ ssh dmmosharov@server.dmmosharov.net
dmmosharov@server.dmmosharov.net's password:
Activate the web console with: systemctl enable --now cockpit.socket

Last login: Fri Jan 30 23:30:22 2026
[dmmosharov@server.dmmosharov.net ~]$ █
```

Авторизация под своей учётной записью по ssh

Теперь в файле конфигурации sshd пропишем список разрешённых пользователей для авторизации. Пока это будет 1 пользователь - vagrant (рис. [[-@fig:010](#)]).

```
GNU nano 8.1          /etc/ssh/sshd_config
# possible, but leave them commented. Uncommented options override the
# default value.

# To modify the system-wide sshd configuration, create a *.conf file
# /etc/ssh/sshd_config.d/ which will be automatically included below
Include /etc/ssh/sshd_config.d/*.conf

# If you want to change the port on a SELinux system, you have to tell
# SELinux about this change.
# semanage port -a -t ssh_port_t -p tcp #PORTNUMBER
#
#Port 22
Port 22
Port 2022
#AddressFamily any
#ListenAddress 0.0.0.0
#ListenAddress ::

#HostKey /etc/ssh/ssh_host_rsa_key
#HostKey /etc/ssh/ssh_host_ecdsa_key
#HostKey /etc/ssh/ssh_host_ed25519_key

# Ciphers and keying
#RekeyLimit default none

# Logging
#SyslogFacility AUTH
#LogLevel INFO

# Authentication:

#LoginGraceTime 2m
PermitRootLogin no
AllowUsers vagrant
#StrictModes yes
#MaxAuthTries 6
#MaxSessions 10

#PubkeyAuthentication yes
[ Wrote 133 lines ]
^G Help      ^O Write Out  ^F Where Is  ^K Cut      ^I Execute
```

Добавление белого списка пользователей

Перезапустим sshd (рис. [-@fig:011]).

```
[root@server.dmmosharov.net ~]# systemctl restart sshd
[root@server.dmmosharov.net ~]#
```

Перезапуск sshd

Вновь на клиенте попробуем авторизоваться под пользователем. Но теперь операция авторизации была провалена, поскольку пользователя нет в белом списке, обозначенном на прошлом этапе (рис. [-@fig:012]).

```
[dmmosharov@server.dmmosharov.net ~]$ ssh dmmosharov@server.dmmosharov.net
dmmosharov@server.dmmosharov.net's password:
Permission denied, please try again.
dmmosharov@server.dmmosharov.net's password:
```

Провальная авторизация под своей учётной записью

Снова откроем файл конфигурации на сервере и добавим пользователя в белый список (рис. [-@fig:013]).

```
#LoginGraceTime 2m
PermitRootLogin no
AllowUsers vagrant dmmosharov
#StrictModes yes
#MaxAuthTries 6
#MaxSessions 10

#PubkeyAuthentication yes

# The default is to check both .ssh/authorized_keys and
# but this is overridden so installations will only check one
[ Wrote 133 lines ]
^G Help      ^O Write Out  ^F Where Is  ^K Cut
^X Exit      ^R Read File  ^\ Replace   ^U Paste
```

Добавление нового пользователя в белый

После перезапуска службы мы увидим, что подключение с клиента на сервер под учётной записью пользователя проходит успешно (рис. [-@fig:014]).

```
[dmmosharov@server.dmmosharov.net ~]$ ssh dmmosharov@server.dmmosharov.net
dmmosharov@server.dmmosharov.net's password:
Activate the web console with: systemctl enable --now cockpit.socket

Last failed login: Fri Jan 30 23:36:52 UTC 2026 from 192.168.1.1 on ssh:notty
There were 2 failed login attempts since the last successful login.
Last login: Fri Jan 30 23:33:02 2026 from 192.168.1.1
[dmmosharov@server.dmmosharov.net ~]$
```

Успешная авторизация под своей учётной записью

Теперь в файле конфигурации на сервере добавим рабочие порты 22 и 2022 (рис. [-@fig:015]).

```
# To modify the system-wide sshd configuration, create a *.conf file
# /etc/ssh/sshd_config.d/ which will be automatically included below
Include /etc/ssh/sshd_config.d/*.conf

# If you want to change the port on a SELinux system, you have to tell
# SELinux about this change.
# semanage port -a -t ssh_port_t -p tcp #PORTNUMBER
#
#Port 22
Port 22
Port 2022
#AddressFamily any
#ListenAddress 0.0.0.0
#ListenAddress ::

#HostKey /etc/ssh/ssh_host_rsa_key
#HostKey /etc/ssh/ssh_host_ecdsa_key
```

Добавление портов

Теперь с клиента попробуем подключиться к серверу по ssh, используя добавленные нами порты. Как видим, оба подключения прошли успешно (рис. [-@fig:019]).

```
[dmmosharov@server.dmmosharov.net ~]$ ssh dmmosharov@server.dmmosharov.net
dmmosharov@server.dmmosharov.net's password:
Activate the web console with: systemctl enable --now cockpit.socket

Last login: Fri Jan 30 23:36:59 2026 from 192.168.1.1
[dmmosharov@server.dmmosharov.net ~]$ sudo -i
[sudo] password for dmmosharov:
[root@server.dmmosharov.net ~]# logout
[dmmosharov@server.dmmosharov.net ~]$ sudo -i
[root@server.dmmosharov.net ~]# logout
[dmmosharov@server.dmmosharov.net ~]$ logout
Connection to server.dmmosharov.net closed.
[dmmosharov@server.dmmosharov.net ~]$ ssh -p2022 dmmosharov@server.dmmosharov.net
dmmosharov@server.dmmosharov.net's password:
Activate the web console with: systemctl enable --now cockpit.socket

Last login: Fri Jan 30 23:47:44 2026 from 192.168.1.1
[dmmosharov@server.dmmosharov.net ~]$ sudo -i
[sudo] password for dmmosharov:
[root@server.dmmosharov.net ~]#
[root@server.dmmosharov.net ~]# logout
[dmmosharov@server.dmmosharov.net ~]$ logout
Connection to server.dmmosharov.net closed.
[dmmosharov@server.dmmosharov.net ~]$
```

### Проверка портов

Вновь откроем файл конфигурации и разрешим авторизацию по ключу (рис. [-@fig:020]).

```
GNU nano 8.1          /etc/ssh/sshd_config
# semanage port -a -t ssh_port_t -p tcp #PORTNUMBER
#
#Port 22
Port 22
Port 2022
#AddressFamily any
#ListenAddress 0.0.0.0
#ListenAddress ::

#HostKey /etc/ssh/ssh_host_rsa_key
#HostKey /etc/ssh/ssh_host_ecdsa_key
#HostKey /etc/ssh/ssh_host_ed25519_key

# Ciphers and keying
#RekeyLimit default none

# Logging
#SyslogFacility AUTH
#LogLevel INFO

# Authentication:

#LoginGraceTime 2m
PermitRootLogin no
AllowUsers vagrant dmmosharov
PubkeyAuthentication yes
#StrictModes yes
#MaxAuthTries 6
#MaxSessions 10

#PubkeyAuthentication yes

# The default is to check both .ssh/authorized_keys and .ssh/authorized_keys2
# but this is overridden so installations will only check .ssh/authorized_keys
AuthorizedKeysFile      .ssh/authorized_keys

#AuthorizedPrincipalsFile none

#AuthorizedKeysCommand none
[Wrote 134 lines]
^G Help      ^O Write Out  ^F Where Is   ^K Cut        ^T Execute
^X Exit      ^R Read File  ^\ Replace    ^U Paste      ^J Justify
```

### Включение авторизации по ключу

Перезапустим sshd (рис. [-@fig:021]).

```
[root@server.dmmosharov.net ~]# systemctl restart sshd
[root@server.dmmosharov.net ~]#
```

## Перезапуск sshd

Теперь на клиенте сгенерируем rsa ключ и отправим его на сервер (рис. [-@fig:022]).

```
kostyaclient: # su - dmmosharov
Last login: Fri Jan 30 23:11:50 UTC 2026 on pts/3
[dmmosharov@client.dmmosharov.net ~]$ ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/home/dmmosharov/.ssh/id_rsa):
Enter same passphrase again:
Your identification has been saved in /home/dmmosharov/.ssh/id_rsa
Your public key has been saved in /home/dmmosharov/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:wAxwOKICoCEIScZVKlWXRcoCkJwxkCxUyIKbraOBM3E dmmosharov@client.dmmosharov.net
The key's randomart image is:
+--[RSA key]--+
/ @ X o ..+
@ O * . + o ..
= = . . + o ..
+ + . .
+ E S .
. +
[B
. =
].
-----[SHA256]-----
[dmmosharov@client.dmmosharov.net ~]$ ssh-copy-id dmmosharov@server.dmmosharov.net
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: '/home/dmmosharov/.ssh/id_rsa'
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter out any that are already
installed
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are prompted now it is to install t
he new keys

Number of key(s) added: 1

Now try logging into the machine, with: "ssh 'dmmosharov@server.dmmosharov.net'"
and check to make sure that only the key(s) you wanted were added.

[dmmosharov@client.dmmosharov.net ~]$
```

## Формирование ключа для авторизации

Теперь попробуем подключиться к серверу по ssh, и на этот раз у нас не спросят пароль (рис. [-@fig:023]).

```
[dmmosharov@client.dmmosharov.net ~]$ ssh dmmosharov@server.dmmosharov.net
Activate the web console with: systemctl enable --now cockpit.socket

Last login: Fri Jan 30 23:54:32 2026
[dmmosharov@server.dmmosharov.net ~]$ logout
Connection to server.dmmosharov.net closed.
[dmmosharov@client.dmmosharov.net ~]$
```

## Подключение без пароля

Теперь выведем список служб, использующих TCP (рис. [-@fig:024]).

firefox	326857	327607	Background-P	dmmosharov	194u	IPv4	4843388	0t0	TCP cl
lient.dmmosharov.net:45216->163.181.0.230:https	(ESTABLISHED)								
firefox	326857	327815	FSBroker3	dmmosharov	58u	IPv4	4977688	0t0	TCP cl
lient.dmmosharov.net:50952->93.243.107.34.bc.googleusercontent.com:https	(ESTABLISHED)								
firefox	326857	327815	FSBroker3	dmmosharov	97u	IPv4	4858973	0t0	TCP cl
lient.dmmosharov.net:53608->163.181.0.230:https	(ESTABLISHED)								
firefox	326857	327815	FSBroker3	dmmosharov	166u	IPv4	4845702	0t0	TCP cl
lient.dmmosharov.net:45196->163.181.0.230:https	(ESTABLISHED)								
firefox	326857	327815	FSBroker3	dmmosharov	194u	IPv4	4843388	0t0	TCP cl
lient.dmmosharov.net:45216->163.181.0.230:https	(ESTABLISHED)								
firefox	326857	327819	FSBroker3	dmmosharov	58u	IPv4	4977688	0t0	TCP cl
lient.dmmosharov.net:50952->93.243.107.34.bc.googleusercontent.com:https	(ESTABLISHED)								
firefox	326857	327819	FSBroker3	dmmosharov	97u	IPv4	4858973	0t0	TCP cl
lient.dmmosharov.net:53608->163.181.0.230:https	(ESTABLISHED)								
firefox	326857	327819	FSBroker3	dmmosharov	166u	IPv4	4845702	0t0	TCP cl
lient.dmmosharov.net:45196->163.181.0.230:https	(ESTABLISHED)								
firefox	326857	327819	FSBroker3	dmmosharov	194u	IPv4	4843388	0t0	TCP cl
lient.dmmosharov.net:45216->163.181.0.230:https	(ESTABLISHED)								
firefox	326857	328054	DOMx20W0	dmmosharov	58u	IPv4	4977688	0t0	TCP cl
lient.dmmosharov.net:50952->93.243.107.34.bc.googleusercontent.com:https	(ESTABLISHED)								
firefox	326857	328054	DOMx20W0	dmmosharov	97u	IPv4	4858973	0t0	TCP cl
lient.dmmosharov.net:53608->163.181.0.230:https	(ESTABLISHED)								
firefox	326857	328054	DOMx20W0	dmmosharov	166u	IPv4	4845702	0t0	TCP cl
lient.dmmosharov.net:45196->163.181.0.230:https	(ESTABLISHED)								
firefox	326857	328054	DOMx20W0	dmmosharov	194u	IPv4	4843388	0t0	TCP cl
lient.dmmosharov.net:45216->163.181.0.230:https	(ESTABLISHED)								
firefox	326857	328055	firewalled	dmmosharov	58u	IPv4	4977698	0t0	TCP cl

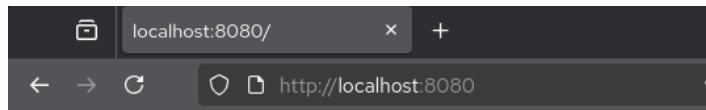
## Список служб, использующих TCP

Теперь перенаправим порт 8080 на server.nsandryushin.net на 80 порт локалхоста (рис. [-@fig:025]).

```
[dmmosharov@client.dmmosharov.net ~]$ ssh -fNL 8080:localhost:80 dmmosharov@server.dmmosharov.net
[dmmosharov@client.dmmosharov.net ~]$ lsof | grep TCP
lsof: WARNING: can't stat() fuse.gvfsd-fuse file system /run/user/1000/gvfs
      Output information may be incomplete.
lsof: WARNING: can't stat() fuse.portal file system /run/user/1000/doc
      Output information may be incomplete.
lsof: WARNING: can't stat() fuse.gvfsd-fuse file system /run/user/0/gvfs
      Output information may be incomplete.
firefox 326857 dmmosharov 58u IPv4 4977688 0t0 TCP cl
inet.dmmosharov.net:50952->93.243.107.34.bc.googleusercontent.com:https (ESTABLISHED)
firefox 326857 dmmosharov 97u IPv4 4858973 0t0 TCP cl
inet.dmmosharov.net:53608->163.181.0.230:https (ESTABLISHED)
firefox 326857 dmmosharov 166u IPv4 4845702 0t0 TCP cl
inet.dmmosharov.net:45196->163.181.0.230:https (ESTABLISHED)
firefox 326857 dmmosharov 194u IPv4 4843388 0t0 TCP cl
inet.dmmosharov.net:45216->163.181.0.230:https (ESTABLISHED)
firefox 326857 326877 AsyncSi-l dmmosharov 58u IPv4 4977688 0t0 TCP cl
inet.dmmosharov.net:50952->93.243.107.34.bc.googleusercontent.com:https (ESTABLISHED)
firefox 326857 326877 AsyncSi-l dmmosharov 97u IPv4 4858973 0t0 TCP cl
```

#### Перенаправление порта

Теперь, обращаясь к localhost:8080 мы видим наш сайт по адресу server.nsandryushin.net:80 (рис. [-@fig:027]).



Welcome to the server.dmmosharov.net server.

#### Результат переадресации

На клиенте теперь попробуем вызвать несколько консольных утилит через ssh на сервере, а именно вывод имени хоста, вывод содержимого домашнего каталога и вывод почты (рис. [-@fig:028]).

```
[dmmosharov@client.dmmosharov.net ~]$ ssh dmmosharov@server.dmmosharov.net hostname
server.dmmosharov.net
[dmmosharov@client.dmmosharov.net ~]$ ssh dmmosharov@server.dmmosharov.net ls -Al
total 56
-rw----- 1 dmmosharov dmmosharov 863 Jan 30 23:55 .bash_history
-rw-r--r-- 1 dmmosharov dmmosharov 18 Oct 29 2024 .bash_logout
-rw-r--r-- 1 dmmosharov dmmosharov 144 Oct 29 2024 .bash_profile
-rw-r--r-- 1 dmmosharov dmmosharov 603 Nov 25 19:31 .bashrc
drwx----- 12 dmmosharov dmmosharov 4096 Dec 16 23:53 .cache
drwx----- 11 dmmosharov dmmosharov 4096 Dec 17 02:02 .config
drwxr-xr-x 2 dmmosharov dmmosharov 6 Nov 25 19:31 Desktop
drwxr-xr-x 2 dmmosharov dmmosharov 6 Nov 25 19:31 Documents
drwxr-xr-x 2 dmmosharov dmmosharov 46 Jan 20 16:40 Downloads
drwx----- 4 dmmosharov dmmosharov 32 Nov 25 19:31 .local
drwx----- 5 dmmosharov dmmosharov 4096 Jan 30 21:42 Maildir
drwxr-xr-x 5 dmmosharov dmmosharov 54 Dec 16 22:38 .mozilla
drwxr-xr-x 2 dmmosharov dmmosharov 6 Nov 25 19:31 Music
drwxr-xr-x 3 dmmosharov dmmosharov 25 Dec 17 17:46 Pictures
drwxr-xr-x 2 dmmosharov dmmosharov 6 Nov 25 19:31 Public
drwx----- 2 dmmosharov dmmosharov 71 Jan 30 23:26 .ssh
drwxr-xr-x 2 dmmosharov dmmosharov 6 Nov 25 19:31 Templates
-rw-r----- 1 dmmosharov dmmosharov 6 Jan 23 15:56 .vboxclient-clipboard-tty2-control.pid
-rw-r----- 1 dmmosharov dmmosharov 7 Jan 31 00:05 .vboxclient-clipboard-tty2-service.pid
-rw-r----- 1 dmmosharov dmmosharov 6 Jan 23 15:56 .vboxclient-draganddrop-tty2-control.pid
-rw-r----- 1 dmmosharov dmmosharov 6 Jan 23 15:56 .vboxclient-hostversion-tty2-control.pid
-rw-r----- 1 dmmosharov dmmosharov 6 Jan 23 15:56 .vboxclient-seamless-tty2-control.pid
-rw-r----- 1 dmmosharov dmmosharov 6 Jan 23 15:56 .vboxclient-vmsvga-session-tty2-control.pid
-rw-r----- 1 dmmosharov dmmosharov 6 Jan 23 15:56 .vboxclient-vmsvga-session-tty2-service.pid
drwxr-xr-x 2 dmmosharov dmmosharov 6 Nov 25 19:31 Videos
[dmmosharov@client.dmmosharov.net ~]$ ssh dmmosharov@server.dmmosharov.net MAIL=~/.Maildir/mail
s-nail version v14.9.24. Type '?' for help
/home/dmmosharov/Maildir: 3 messages 2 unread
  1 Denis Mosharov 2026-01-29 21:41 18/656 *test *
•U 2 Super User 2026-01-30 21:12 21/833 *LMTP test *
  U 3 Denis Mosharov 2026-01-30 21:42 21/828 *lab10test *
```

#### Запуск консольных утилит по ssh

В конфигурационном файле sshd на сервере включим форвардинг X11 (рис. [-@fig:029]).

```

GNU nano 8.1          /etc/ssh/sshd_config
# SELinux about this change.
# semanage port -a -t ssh_port_t -p tcp #PORTNUMBER
#
#Port 22
Port 22
Port 2022
#AddressFamily any
#ListenAddress 0.0.0.0
#ListenAddress ::

#HostKey /etc/ssh/ssh_host_rsa_key
#HostKey /etc/ssh/ssh_host_ecdsa_key
#HostKey /etc/ssh/ssh_host_ed25519_key

# Ciphers and keying
#RekeyLimit default none

# Logging
#SyslogFacility AUTH
#LogLevel INFO

# Authentication:

#LoginGraceTime 2m
PermitRootLogin no
AllowUsers vagrant dmmosharov
PubkeyAuthentication yes
X11Forwarding yes
#StrictModes yes
#MaxAuthTries 6
#MaxSessions 10

#PubkeyAuthentication yes

# The default is to check both .ssh/authorized_keys and .ssh/authorized
# but this is overridden so installations will only check .ssh/authorized
AuthorizedKeysFile      .ssh/authorized_keys

#AuthorizedPrincipalsFile none
[ Wrote 135 lines ]
^G Help      ^O Write Out  ^F Where Is  ^K Cut        ^T Execute
^X Exit      ^R Read File  ^\ Replace   ^U Paste      ^J Justify

```

Включение форвардинга иков

Перезапустим sshd (рис. [-@fig:030]).

```

[root@server.dmmosharov.net ~]# nano /etc/ssh/sshd_config
[root@server.dmmosharov.net ~]# systemctl restart sshd
[root@server.dmmosharov.net ~]#

```

Перезапуск sshd

И запустим графическое приложение, например firefox, по ssh (рис. [-@fig:031]).

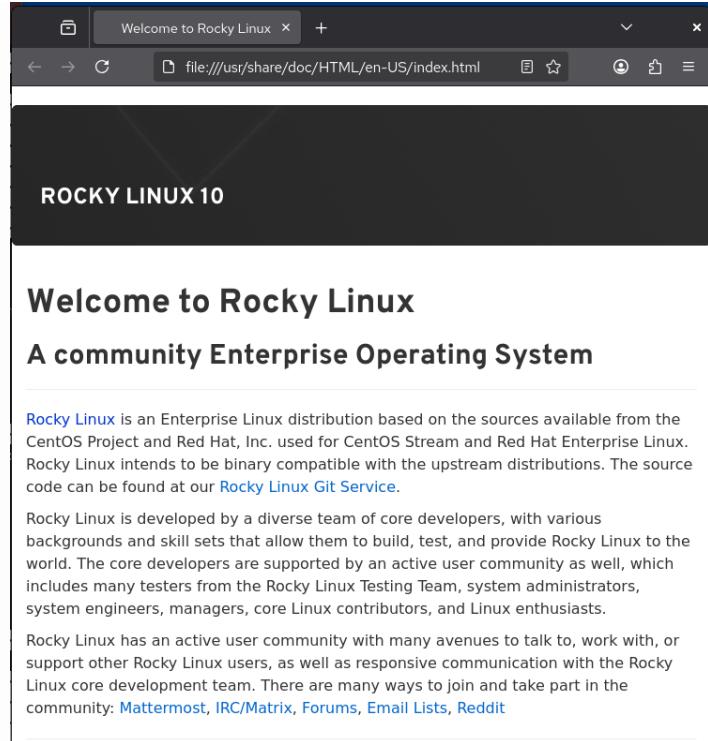
```

error: no DISPLAY environment variable specified
[dmmosharov@client.dmmosharov.net ~]$ ssh -YC dmmosharov@server.dmmosharov.net firefox

```

Запуск графического приложения по ssh

Как видим, на сервере запустился firefox (рис. [-@fig:032]).



Результат запуска графического приложения по ssh

Теперь сохраним файлы, с которыми велась работа, в vagrant (рис. [-@fig:033]).

```
[root@server.dmmosharov.net ~]# cd /vagrant/provision/server
[root@server.dmmosharov.net server]# mkdir -p /vagrant/provision/server
/vagrant/etc/ssh
[root@server.dmmosharov.net server]# cp -R /etc/ssh/sshd_config /vagrant/provision/server/etc/ssh/
[root@server.dmmosharov.net server]# cd /vagrant/provision/server
[root@server.dmmosharov.net server]# touch ssh.sh
[root@server.dmmosharov.net server]# chmod +x ssh.sh
[root@server.dmmosharov.net server]# nano ssh.sh
```

Сохранение в vagrant

Создадим скрипт ssh.sh и наполним его следующим содержимым (рис. [-@fig:034]).

```
GNU nano 8.1                               ssh.sh
#!/bin/bash
echo "Provisioning script $0"
echo "Copy configuration files"
cp -R /vagrant/provision/server/ssh/etc/* /etc
restorecon -vR /etc
echo "Configure firewall"
firewall-cmd --add-port=2022/tcp
firewall-cmd --add-port=2022/tcp --permanent
echo "Tuning SELinux"
semanage port -a -t ssh_port_t -p tcp 2022
echo "Restart sshd service"
systemctl restart sshd
```

ssh.sh

И добавим этот скрипт в vagrantfile (рис. [-@fig:035]).

```
      path: "provision/server/firewall.sh"
    server.vm.provision "server mail",
      type: "shell",
      preserve_order: true,
      path: "provision/server/mail.sh"

    server.vm.provision "server ssh",
      type: "shell",
      preserve_order: true,
      path: "provision/server/ssh.sh"
  end

## Client configuration
```

Vagrantfile

## Выводы

В результате выполнения лабораторной работы были получены навыки настройки ssh, форвардинга через него и настройки авторизации