

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@14521-186541-0.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 entered 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-coredump@14522-186555-0.service - Process Core Dump (PID 186555/UID 0).
   Subject: A start job for unit systemd-coredump@14522-186555-0.service 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 finished successfully.

   The job identifier is 277664.
Jan 30 22:30:14 server.dmmosharov.net systemd-coredump[186556]: [?] Process 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 клиент. 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@15168-195032-0.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 entered 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/TRAP, processing...
Jan 30 23:26:58 server.dmmosharov.net systemd[1]: Started systemd-coredump@15169-195042-0.service - Process Core Dump (PID 195042/UID 0).
    Subject: A start job for unit systemd-coredump@15169-195042-0.service 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 finished 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
# but this is overridden so installations will only check .ssh/authorized
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:F8sREGCc3d3bq03xJrbnrCFDPDWDlr/+seyPOjSDX9uI.
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]).

```
Jan 30 23:31:00 server.dmmosharov.net unix_chkpwd[195623]: password check failed for user (root)
Jan 30 23:31:00 server.dmmosharov.net sshd-session[195554]: pam_unix(sshd:auth): authentication failure; logname= uid=0 euid=0 tty=ssh ruser=rhost=127.0.0.1 user=root
Jan 30 23:31:02 server.dmmosharov.net sshd-session[195554]: Failed password 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/TRAP, processing...
Jan 30 23:31:04 server.dmmosharov.net systemd[1]: Started systemd-coredump@15216-195629-0.service - Process Core Dump (PID 195629/UID 0).
Subject: Start job for unit systemd-coredump@15216-195629-0.service
```

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 ^T 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 che

[ 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 ~]#
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
# but this is overridden so installations will only check .ssh/authorized
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]).

```
root@client:~# su - dmmosharov
Last login: Fri Jan 30 23:11:50 UTC 2026 on pts/3
[dmmosharov@client.dmmosharov.net ~]$ ssh-keygen
Generating public/private ed25519 key pair.
Enter file in which to save the key (/home/dmmosharov/.ssh/id_ed25519):
Enter passphrase for '/home/dmmosharov/.ssh/id_ed25519' (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/dmmosharov/.ssh/id_ed25519
Your public key has been saved in /home/dmmosharov/.ssh/id_ed25519.pub
The key fingerprint is:
SHA256:wAxwDKic8CEiScZVKLWXRcoCkJwxkCxUyikBra0BM3E dmmosharov@client.dmmosharov.net
The key's randomart image is:
+--[ED25519 256]--+
|/ %X o .+o      |
|@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_ed25519.pub'
/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	Backgro-P	dmmosharov	194u	IPv4	4843388	0t0	TCP	cl
tent.dmmosharov.net:45216->163.181.0.230:https	(ESTABLISHED)									
firefox	326857	327815	FSBroker3	dmmosharov	58u	IPv4	4977688	0t0	TCP	cl
tent.dmmosharov.net:50952->93.243.107.34.bc.googleusercontent.com:https	(ESTABLISHED)									
firefox	326857	327815	FSBroker3	dmmosharov	97u	IPv4	4858973	0t0	TCP	cl
tent.dmmosharov.net:53608->163.181.0.230:https	(ESTABLISHED)									
firefox	326857	327815	FSBroker3	dmmosharov	166u	IPv4	4845702	0t0	TCP	cl
tent.dmmosharov.net:45196->163.181.0.230:https	(ESTABLISHED)									
firefox	326857	327815	FSBroker3	dmmosharov	194u	IPv4	4843388	0t0	TCP	cl
tent.dmmosharov.net:45216->163.181.0.230:https	(ESTABLISHED)									
firefox	326857	327819	FSBroker3	dmmosharov	58u	IPv4	4977688	0t0	TCP	cl
tent.dmmosharov.net:50952->93.243.107.34.bc.googleusercontent.com:https	(ESTABLISHED)									
firefox	326857	327819	FSBroker3	dmmosharov	97u	IPv4	4858973	0t0	TCP	cl
tent.dmmosharov.net:53608->163.181.0.230:https	(ESTABLISHED)									
firefox	326857	327819	FSBroker3	dmmosharov	166u	IPv4	4845702	0t0	TCP	cl
tent.dmmosharov.net:45196->163.181.0.230:https	(ESTABLISHED)									
firefox	326857	327819	FSBroker3	dmmosharov	194u	IPv4	4843388	0t0	TCP	cl
tent.dmmosharov.net:45216->163.181.0.230:https	(ESTABLISHED)									
firefox	326857	328054	DOM\vx200o	dmmosharov	58u	IPv4	4977688	0t0	TCP	cl
tent.dmmosharov.net:50952->93.243.107.34.bc.googleusercontent.com:https	(ESTABLISHED)									
firefox	326857	328054	DOM\vx200o	dmmosharov	97u	IPv4	4858973	0t0	TCP	cl
tent.dmmosharov.net:53608->163.181.0.230:https	(ESTABLISHED)									
firefox	326857	328054	DOM\vx200o	dmmosharov	166u	IPv4	4845702	0t0	TCP	cl
tent.dmmosharov.net:45196->163.181.0.230:https	(ESTABLISHED)									
firefox	326857	328054	DOM\vx200o	dmmosharov	194u	IPv4	4843388	0t0	TCP	cl
tent.dmmosharov.net:45216->163.181.0.230:https	(ESTABLISHED)									
firefox	326857	328055	threaded	dmmosharov	58u	IPv4	4977688	0t0	TCP	cl

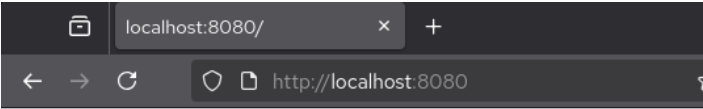
Список служб, использующих TCP

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
tent.dmmosharov.net:50952->93.243.107.34.bc.googleusercontent.com:https (ESTABLISHED)
firefox 326857 dmmosharov 97u IPv4 4858973 0t0 TCP cl
tent.dmmosharov.net:53608->163.181.0.230:https (ESTABLISHED)
firefox 326857 dmmosharov 166u IPv4 4845702 0t0 TCP cl
tent.dmmosharov.net:45196->163.181.0.230:https (ESTABLISHED)
firefox 326857 dmmosharov 194u IPv4 4843388 0t0 TCP cl
tent.dmmosharov.net:45216->163.181.0.230:https (ESTABLISHED)
firefox 326857 326877 AsyncS1-l dmmosharov 58u IPv4 4977688 0t0 TCP cl
tent.dmmosharov.net:50952->93.243.107.34.bc.googleusercontent.com:https (ESTABLISHED)
firefox 326857 326877 AsyncS1-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-r--r-- 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-vmvga-session-tty2-control.pid
-rw-r----- 1 dmmosharov dmmosharov 6 Jan 23 15:56 .vboxclient-vmvga-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 иксов

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 ~]#
```

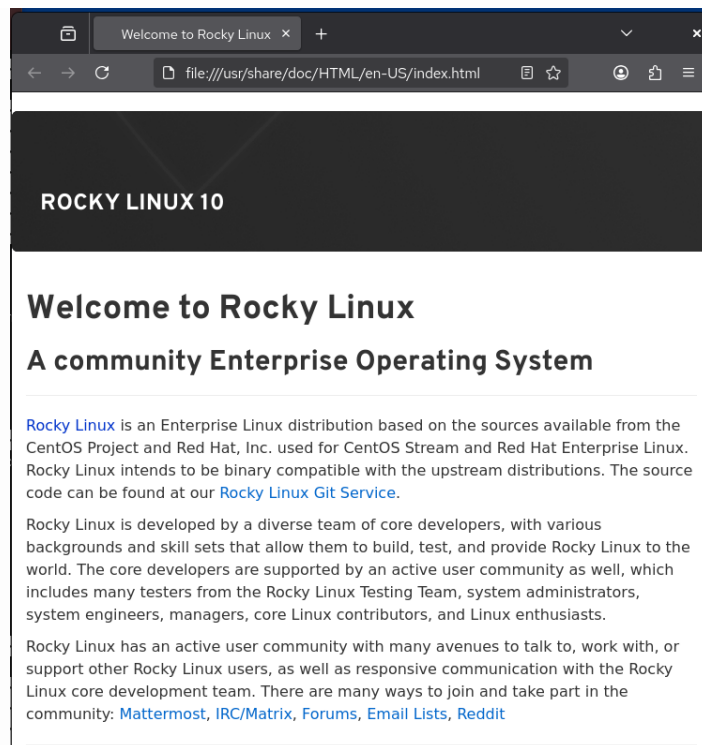
Перезапуск sshd

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
/ssh/etc/ssh
[root@server.dmmosharov.net server]# cp -R /etc/ssh/sshd_config /vagrant
/vagrant/provision/server/ssh/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