

АДМИНИСТРИРОВАНИЕ СЕТЕВЫХ
ПОДСИСТЕМ

ЛАБОРАТОРНАЯ РАБОТА №11

НАСТРОЙКА БЕЗОПАСНОГО УДАЛЁННОГО ДОСТУПА ПО ПРОТОКОЛУ SSH

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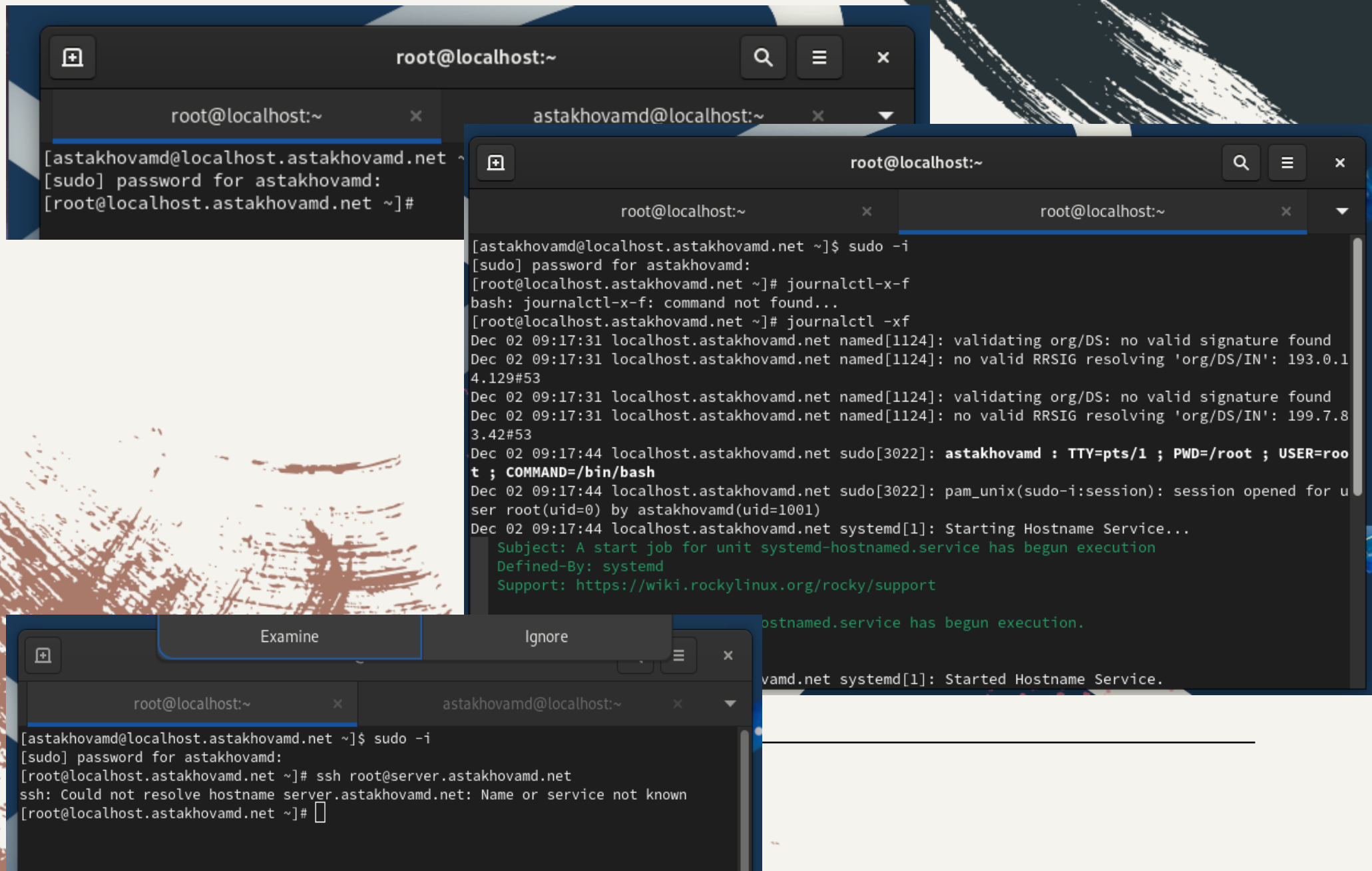
НПИБД02-23

Группа

Цель работы

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

ЗАПРЕТ УДАЛЁННОГО ДОСТУПА ПО SSH ДЛЯ ПОЛЬЗОВАТЕЛЯ ROOT



```
root@localhost:~  
[astakhovamd@localhost.astakhovamd.net ~]$ sudo -i  
[sudo] password for astakhovamd:  
[root@localhost.astakhovamd.net ~]#  
[astakhovamd@localhost.astakhovamd.net ~]$ sudo -i  
[sudo] password for astakhovamd:  
[root@localhost.astakhovamd.net ~]# journalctl-x-f  
bash: journalctl-x-f: command not found...  
[root@localhost.astakhovamd.net ~]# journalctl -xf  
Dec 02 09:17:31 localhost.astakhovamd.net named[1124]: validating org/DS: no valid signature found  
Dec 02 09:17:31 localhost.astakhovamd.net named[1124]: no valid RRSIG resolving 'org/DS/IN': 193.0.14.129#53  
Dec 02 09:17:31 localhost.astakhovamd.net named[1124]: validating org/DS: no valid signature found  
Dec 02 09:17:31 localhost.astakhovamd.net named[1124]: no valid RRSIG resolving 'org/DS/IN': 199.7.83.42#53  
Dec 02 09:17:44 localhost.astakhovamd.net sudo[3022]: astakhovamd : TTY=pts/1 ; PWD=/root ; USER=root ; COMMAND=/bin/bash  
Dec 02 09:17:44 localhost.astakhovamd.net sudo[3022]: pam_unix(sudo-i:session): session opened for user root(uid=0) by astakhovamd(uid=1001)  
Dec 02 09:17:44 localhost.astakhovamd.net systemd[1]: Starting Hostname Service...  
Subject: A start job for unit systemd-hostnamed.service has begun execution  
Defined-By: systemd  
Support: https://wiki.rockylinux.org/rocky/support  
hostnameed.service has begun execution.  
astakhovamd.net systemd[1]: Started Hostname Service.  
[astakhovamd@localhost.astakhovamd.net ~]$ sudo -i  
[sudo] password for astakhovamd:  
[root@localhost.astakhovamd.net ~]# ssh root@server.astakhovamd.net  
ssh: Could not resolve hostname server.astakhovamd.net: Name or service not known  
[root@localhost.astakhovamd.net ~]#
```

ОГРАНИЧЕНИЕ СПИСКА ПОЛЬЗОВАТЕЛЕЙ ДЛЯ УДАЛЁННОГО ДОСТУПА ПО SSH

```
[root@localhost.astakhovamd.net ssh]# sudo nano sshd_config
[root@localhost.astakhovamd.net ssh]# systemctl restart sshd
[root@localhost.astakhovamd.net ssh]#
```

A start job for unit sshd.service has finished successfully.

The job identifier is 2005.

Dec 02 09:22:56 localhost.astakhovamd.net PackageKit[2317]: daemon quit

Dec 02 09:22:56 localhost.astakhovamd.net systemd[1]: packagekit.service: Deactivated successfully.

Subject: Unit succeeded

Defined-By: systemd

Support: <https://wiki.rockylinux.org/rocky/support>

The unit packagekit.service has successfully entered the 'dead' state.

Dec 02 09:22:56 localhost.astakhovamd.net systemd[1]: packagekit.service: Consumed 2.897s CPU time.

Subject: Resources consumed by unit runtime

Defined-By: systemd

Support: <https://wiki.rockylinux.org/rocky/support>

The unit packagekit.service completed and consumed the indicated resources.

```
ssh: Could not resolve hostname server.astakhovamd.net: Name or service not known
[root@localhost.astakhovamd.net ~]# ssh root@server.astakhovamd.net
ssh: Could not resolve hostname server.astakhovamd.net: Name or service not known
[root@localhost.astakhovamd.net ~]# ssh root@server
ssh: Could not resolve hostname server: Name or service not known
[root@localhost.astakhovamd.net ~]#
```

```
ssh: Could not resolve hostname server: Name or service not known
[root@localhost.astakhovamd.net ~]# ssh astakhovamd@server.astakhovamd.net
ssh: Could not resolve hostname server.astakhovamd.net: Name or service not known
[root@localhost.astakhovamd.net ~]#
```

НАСТРОЙКА ДОПОЛНИТЕЛЬНЫХ ПОРТОВ ДЛЯ УДАЛЁННОГО ДОСТУПА ПО SSH

```
# X11Forwarding no
# AllowTcpForwarding no
# PermitTTY no
# ForceCommand cvs server

PermitRootLogin no
AllowUsers vagrant
```

```
^G Help      ^O Write Out  ^W Where
^Y Exit      ^D Read File  ^X Prev
```

```
#
Port 22
Port 2022
#AddressFamily any
#ListenAddress 0.0.
```

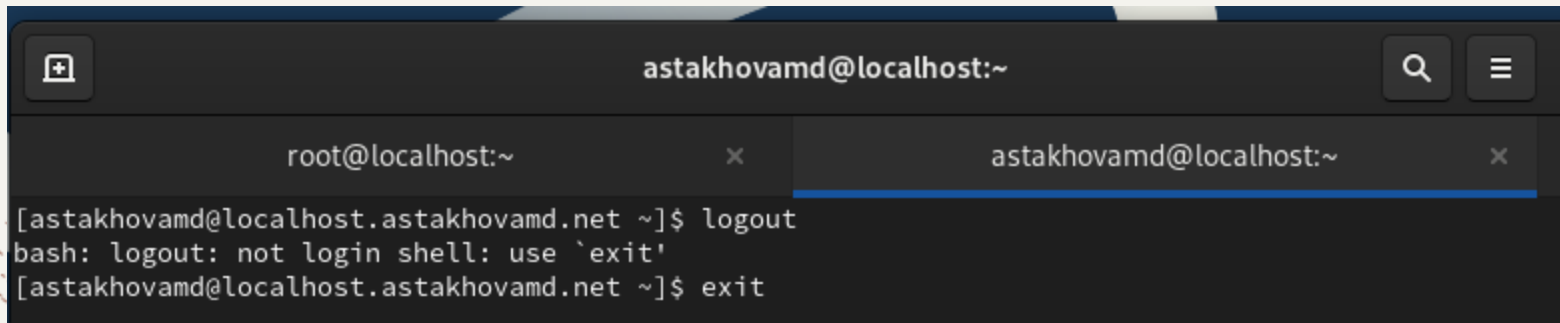
```
astakhovamd@localhost:~
root@localhost:~
[astakhovamd@localhost.astakhovamd.net ~]$ ssh astakhovamd@server.astakhovamd.net
ssh: Could not resolve hostname server.astakhovamd.net: Name or service not known
[astakhovamd@localhost.astakhovamd.net ~]$
```

```
[root@localhost.astakhovamd.net ssh]# systemctl restart sshd
[root@localhost.astakhovamd.net ssh]# systemctl status-l sshd
Unknown command verb status-l.
[root@localhost.astakhovamd.net ssh]#
```

```
Unknown command verb status-l.
[root@localhost.astakhovamd.net ssh]# semanage port-a-t ssh_port_t-p tcp 2022
usage: semanage [-h]
               {import,export,login,user,port,ibpkey,ibendport,interface,module,node,fcontext,boolean,permissive,dontaudit}
               ...
semanage: error: argument subcommand: invalid choice: 'port-a-t' (choose from 'import', 'export', 'login', 'user', 'port', 'ibpkey', 'ibendport', 'interface', 'module', 'node', 'fcontext', 'boolean', 'permissive', 'dontaudit')
[root@localhost.astakhovamd.net ssh]#
```

НАСТРОЙКА ДОПОЛНИТЕЛЬНЫХ ПОРТОВ ДЛЯ УДАЛЁННОГО ДОСТУПА ПО SSH

```
# SELinux about this change
# semanage port -a -t ssh
#
Port 22
Port 2022
#AddressFamily any
#ListenAddress 0.0.0.0
#ListenAddress ::
```



A terminal window titled 'astakhovamd@localhost:~' with a search icon and a menu icon in the top right. It shows two tabs: 'root@localhost:~' and 'astakhovamd@localhost:~'. The active tab shows the following commands and output:

```
[astakhovamd@localhost.astakhovamd.net ~]$ logout
bash: logout: not login shell: use `exit`
[astakhovamd@localhost.astakhovamd.net ~]$ exit
```

```
ED25519 key fingerprint is SHA256:y1D6CwwpAVWgmZ0LNexnVT25Q77Gy5XU7NfNuqLLZ68.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '[localhost]:2022' (ED25519) to the list of known hosts.
astakhovamd@localhost's password:
Activate the web console with: systemctl enable --now cockpit.socket

Last login: Tue Dec  2 09:55:56 2025 from ::1
[astakhovamd@localhost.astakhovamd.net ~]$
```


НАСТРОЙКА УДАЛЁННОГО ДОСТУПА ПО SSH ПО КЛЮЧУ

```
PermitRootLogin no
AllowUsers vagrant
PubkeyAuthentication yes
```

```
^G Help      ^O Write Out ^W Where Is  ^I
^Y Exit      ^D Read File ^V Replace   ^_
```

```
Last login: Tue Dec 2 09:55:56 2025 from ::1
[astakhovamd@localhost.astakhovamd.net ~]$ ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/home/astakhovamd/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/astakhovamd/.ssh/id_rsa
Your public key has been saved in /home/astakhovamd/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:XbDtc77idgC7uNSaGZkZFBKVG715Dq9x8M6xxR642Ts astakhovamd@localhost.astakhovamd.net
The key's randomart image is:
+---[RSA 3072]-----+
|      0000.      |
|      .O..+      |
|      .O.OO      |
|      ...*O.      |
|      S .Xoo.     |
|      *O 0++      |
|      *..B X..    |
|      ..=0 0 E.   |
|      =. 0.000    |
+----[SHA256]-----+
[astakhovamd@localhost.astakhovamd.net ~]$
```

```
+----[SHA256]-----+
[astakhovamd@localhost.astakhovamd.net ~]$ ssh-copy-id -p 2022 astakhovamd@localhost
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/astakhovamd/.ssh/id_rsa.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 the new keys
astakhovamd@localhost's password:

Number of key(s) added: 1

Now try logging into the machine, with:  "ssh -p '2022' 'astakhovamd@localhost'"
and check to make sure that only the key(s) you wanted were added.

[astakhovamd@localhost.astakhovamd.net ~]$
```

НАСТРОЙКА УДАЛЁННОГО ДОСТУПА ПО SSH ПО КЛЮЧУ

```
[astakhovamd@localhost.astakhovamd.net ~]$ ssh astakhovamd@localhost.astakhovamd.net
The authenticity of host 'localhost.astakhovamd.net (:::1)' can't be established.
ED25519 key fingerprint is SHA256:yiD6CwwpAVWgmZ0LNexnVt25Q77Gy5XU7NfNuqLLz68.
This host key is known by the following other names/addresses:
  ~/.ssh/known_hosts:1: localhost
Are you sure you want to continue connecting (yes/no/[fingerprint])? Y
Please type 'yes', 'no' or the fingerprint: yes
Warning: Permanently added 'localhost.astakhovamd.net' (ED25519) to the list of known hosts.
Activate the web console with: systemctl enable --now cockpit.socket

Last login: Tue Dec  2 10:07:26 2025 from :::1
[astakhovamd@localhost.astakhovamd.net ~]$
```

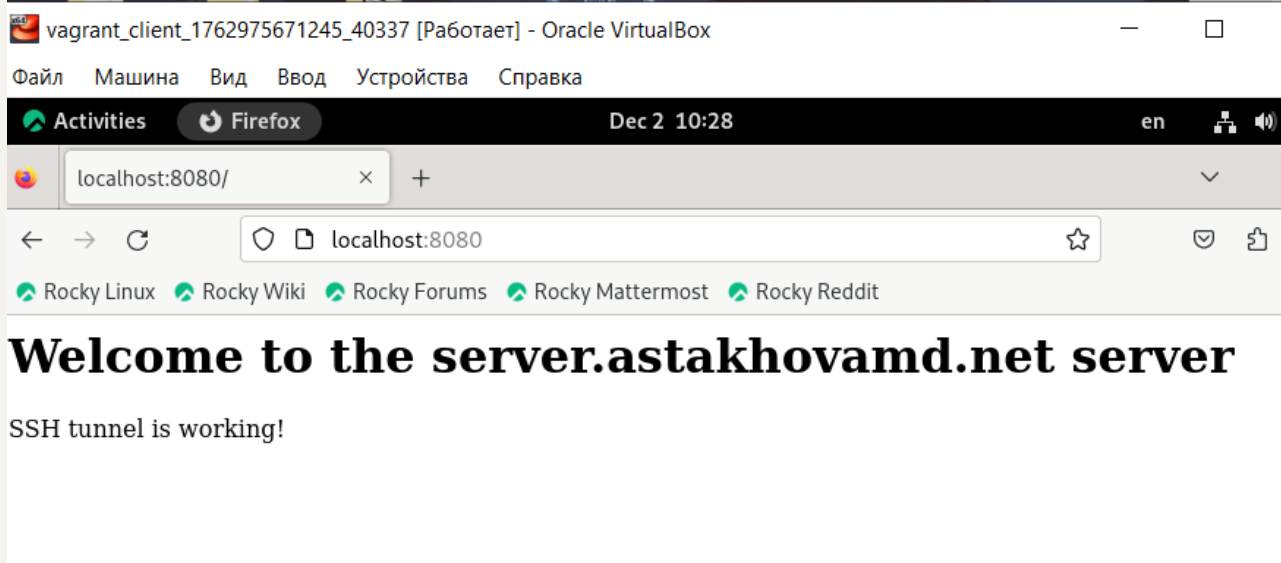
```
calhost:ssh->localhost:43722 (ESTABLISHED)
sshd      2913          astakhovamd      4u      IPv6      35749      0t0      TCP lo
calhost:ssh->localhost:43722 (ESTABLISHED)
sshd      3076          root            3u      IPv4      40249      0t0      TCP *:
down (LISTEN)
sshd      3076          root            4u      IPv6      40251      0t0      TCP *:
down (LISTEN)
sshd      3076          root            5u      IPv4      40253      0t0      TCP *:
ssh (LISTEN)
sshd      3076          root            6u      IPv6      40255      0t0      TCP *:
ssh (LISTEN)
ssh       3077          root            3u      IPv6      40286      0t0      TCP lo
calhost:51062->localhost:down (ESTABLISHED)
sshd      3078          root            4u      IPv6      40287      0t0      TCP lo
calhost:down->localhost:51062 (ESTABLISHED)
sshd      3084          astakhovamd      4u      IPv6      40287      0t0      TCP lo
calhost:down->localhost:51062 (ESTABLISHED)
ssh       3314          astakhovamd      3u      IPv6      43267      0t0      TCP lo
calhost:47610->localhost:ssh (ESTABLISHED)
sshd      3315          root            4u      IPv6      43268      0t0      TCP lo
calhost:ssh->localhost:47610 (ESTABLISHED)
sshd      3320          astakhovamd      4u      IPv6      43268      0t0      TCP lo
calhost:ssh->localhost:47610 (ESTABLISHED)
[root@localhost.astakhovamd.net ~]#
```


ОРГАНИЗАЦИЯ ТУННЕЛЕЙ SSH, ПЕРЕНАПРАВЛЕНИЕ TCP-ПОРТОВ

```
0t0      TCP localhost:ssh->localhost:52700 (ESTABLISHED)
ssh      3374          root      3u      IPv6      60474
0t0      TCP localhost:52700->localhost:ssh (ESTABLISHED)
ssh      3374          root      4u      IPv6      60518
0t0      TCP localhost:webcache (LISTEN)
ssh      3374          root      5u      IPv4      60519
0t0      TCP localhost:webcache (LISTEN)
sshd     3377          astakhovamd 4u      IPv6      60475
```

```
calhost:ssh->localhost:47610 (ESTABLISHED)
[root@localhost.astakhovamd.net ~]# ssh -fNL 8080:localhost:80 astakhovamd@localhost.astakhovamd.net
The authenticity of host 'localhost.astakhovamd.net (::1)' can't be established.
ED25519 key fingerprint is SHA256:yiD6CwwpAVWgmZ0LNexnVt25Q77Gy5XU7NfNuqLLz68.
This host key is known by the following other names/addresses:
  ~/.ssh/known_hosts:1: [localhost]:2022
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'localhost.astakhovamd.net' (ED25519) to the list of known hosts.
astakhovamd@localhost.astakhovamd.net's password:
[root@localhost.astakhovamd.net ~]#
```

ЗАПУСК КОНСОЛЬНЫХ ПРИЛОЖЕНИЙ ЧЕРЕЗ SSH



```
[sudo] password for astakhovamd:
[astakhovamd@localhost.astakhovamd.net ~]$ sudo firewall-cmd --permanent --add-service=http
sudo firewall-cmd --reload
success
success
[astakhovamd@localhost.astakhovamd.net ~]$ curl http://127.0.0.1
<html><body><h1>Welcome to the server.astakhovamd.net server</h1><p>SSH tunnel is working!</p><
body></html>
[astakhovamd@localhost.astakhovamd.net ~]$ ssh astakhovamd@localhost.astakhovamd.net hostname
localhost.astakhovamd.net
```

```
[astakhovamd@localhost.astakhovamd.net ~]$ ssh astakhovamd@server.astakhovamd.net ls -Al
The authenticity of host 'server.astakhovamd.net (127.0.0.1)' can't be established.
ED25519 key fingerprint is SHA256:yiD6CwWpAVWgmZ0LNexnVt25Q77Gy5XU7NfNuqLLz68.
This host key is known by the following other names/addresses:
  ~/.ssh/known_hosts:1: localhost
  ~/.ssh/known_hosts:4: localhost.astakhovamd.net
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'server.astakhovamd.net' (ED25519) to the list of known hosts.
total 60
-rw-----. 1 astakhovamd astakhovamd 2717 Dec  2 10:26 .bash_history
-rw-r--r--. 1 astakhovamd astakhovamd  18 Apr 30 2024 .bash_logout
-rw-r--r--. 1 astakhovamd astakhovamd 141 Apr 30 2024 .bash_profile
-rw-r--r--. 1 astakhovamd astakhovamd  519 Nov 12 20:00 .bashrc
drwx-----. 12 astakhovamd astakhovamd 4096 Nov 26 11:34 .cache
```

ЗАПУСК ГРАФИЧЕСКИХ ПРИЛОЖЕНИЙ ЧЕРЕЗ SSH (X11FORWARDING)

```
[astakhovamd@localhost.astakhovamd.net ~]$ ssh astakhovamd@server.astakhovamd.net  
/ mail  
s-nail: No mail for astakhovamd at /home/astakhovamd/Maildir/  
s-nail: /home/astakhovamd/Maildir/: No such entry, file or directory  
[astakhovamd@localhost.astakhovamd.net ~]$
```

```
[astakhovamd@localhost.astakhovamd.net ~]$ ssh astakhovamd@server.astakhovamd.net MAIL=/home/astakhovamd/Maildir  
/ mail  
s-nail: No mail for astakhovamd at /home/astakhovamd/Maildir/  
s-nail: /home/astakhovamd/Maildir/: No such entry, file or directory  
[astakhovamd@localhost.astakhovamd.net ~]$ sudo nano /etc/ssh/sshd_config  
[sudo] password for astakhovamd:  
[astakhovamd@localhost.astakhovamd.net ~]$ ssh -YC astakhovamd@server.astakhovamd.net firefox  
/usr/bin/xaauth: file /home/astakhovamd/.Xauthority does not exist  
Crash Annotation GraphicsCriticalError: |[0][GFX1-]: glxtest: ManageChildProcess failed  
(t=0.272104) [GFX1-]: glxtest: ManageChildProcess failed  
  
Crash Annotation GraphicsCriticalError: |[0][GFX1-]: glxtest: ManageChildProcess failed  
(t=0.272104) |[1][GFX1-]: glxtest: X error, error_code=1, request_code=155, minor_code=1 (t=0.2  
73115) [GFX1-]: glxtest: X error, error_code=1, request_code=155, minor_code=1  
█
```

```
PermitRootLogin no  
AllowUsers vagrant  
PubkeyAuthentication yes  
X11Forwarding yes
```

[Rocky Linux](#) [Rocky Wiki](#) [Rocky Forums](#) [Rocky Mattermost](#) [Rocky Reddit](#)

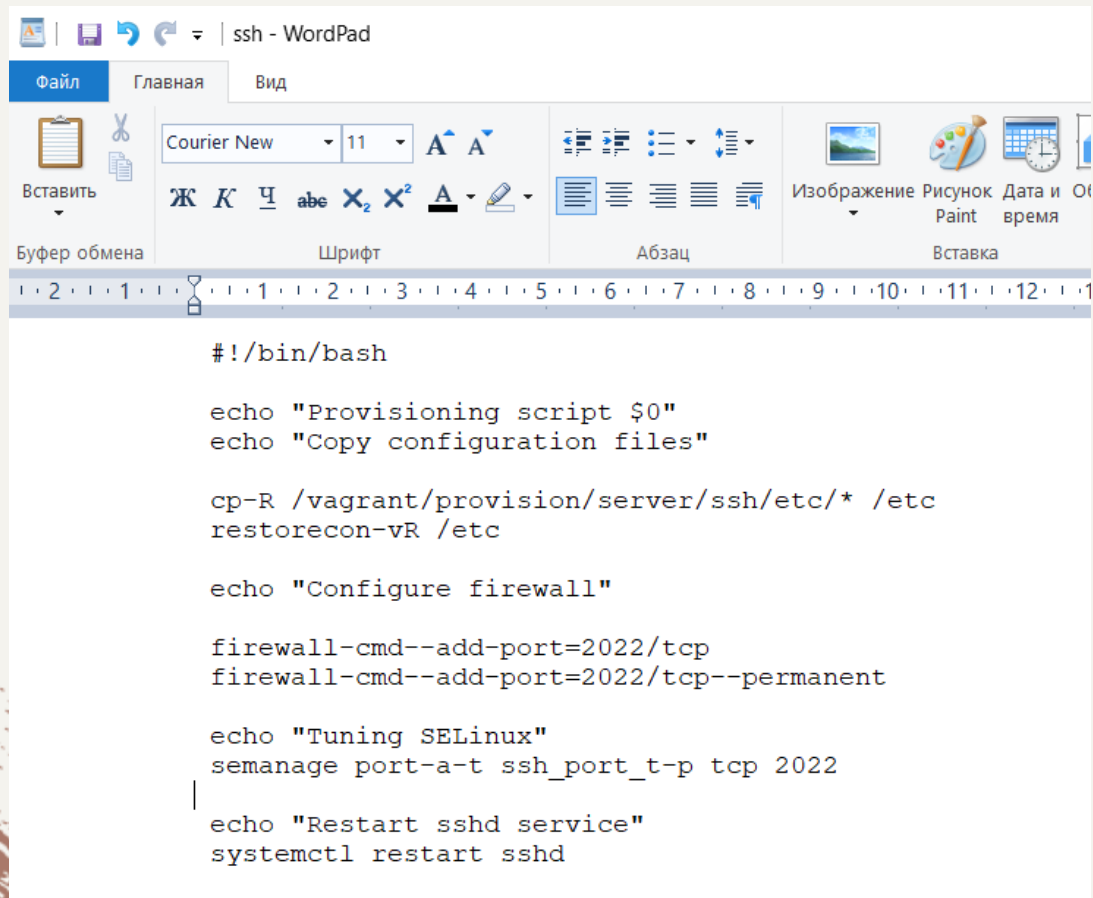
ROCKY LINUX 9

Welcome to Rocky Linux

A community Enterprise Operating System

Rocky Linux is an enterprise Linux distribution based on the sources available from Red Hat, Inc. used for Red Hat Enterprise Linux. Rocky Linux intends to be binary compatible with the upstream vendor. Source code will be in our [Git](#)

ВНЕСЕНИЕ ИЗМЕНЕНИЙ В НАСТРОЙКИ ВНУТРЕННЕГО ОКРУЖЕНИЯ ВИРТУАЛЬНОЙ МАШИНЫ



```
#!/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
```

```
path: "provision/server/mail.sh"

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

end
```