

# АДМИНИСТРИРОВАНИЕ СЕТЕВЫХ ПОДСИСТЕМ

ЛАБОРАТОРНАЯ РАБОТА №11

## НАСТРОЙКА БЕЗОПАСНОГО УДАЛЁННОГО ДОСТУПА ПО ПРОТОКОЛУ SSH

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# Цель работы

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

# ЗАПРЕТ УДАЛЁННОГО ДОСТУПА ПО SSH ДЛЯ ПОЛЬЗОВАТЕЛЯ ROOT

The screenshot shows a terminal window with multiple tabs. The tabs are:

- root@localhost:~
- astakhovamd@localhost:~
- root@localhost:~
- root@localhost:~

The bottom-most tab (root@localhost:~) contains the following command and its output:

```
[astakhovamd@localhost.astakhovam.net ~]$ sudo -i
[sudo] password for astakhovamd:
[root@localhost.astakhovam.net ~]# ssh root@server.astakhovam.net
ssh: Could not resolve hostname server.astakhovam.net: Name or service not known
[root@localhost.astakhovam.net ~]#
```

The second tab from the bottom (astakhovamd@localhost:~) contains the following command and its output:

```
[astakhovamd@localhost.astakhovam.net ~]$ journalctl -x-f
bash: journalctl-x-f: command not found...
[root@localhost.astakhovam.net ~]# journalctl -xf
Dec 02 09:17:31 localhost.astakhovam.net named[1124]: validating org/DS: no valid signature found
Dec 02 09:17:31 localhost.astakhovam.net named[1124]: no valid RRSIG resolving 'org/DS/IN': 193.0.1.4.129#53
Dec 02 09:17:31 localhost.astakhovam.net named[1124]: validating org/DS: no valid signature found
Dec 02 09:17:31 localhost.astakhovam.net named[1124]: no valid RRSIG resolving 'org/DS/IN': 199.7.8.3.42#53
Dec 02 09:17:44 localhost.astakhovam.net sudo[3022]: astakhovamd : TTY=pts/1 ; PWD=/root ; USER=root ; COMMAND=/bin/bash
Dec 02 09:17:44 localhost.astakhovam.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.astakhovam.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
```

The bottom-most tab (root@localhost:~) contains the following command and its output:

```
[astakhovamd@localhost.astakhovam.net ~]$ sudo -i
[sudo] password for astakhovamd:
[root@localhost.astakhovam.net ~]#
```

A context menu is open over the bottom-most tab, with the "Examine" option highlighted.

# 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
^X Exit      ^D Read File  ^L Read
```

```
[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 ~]$
```

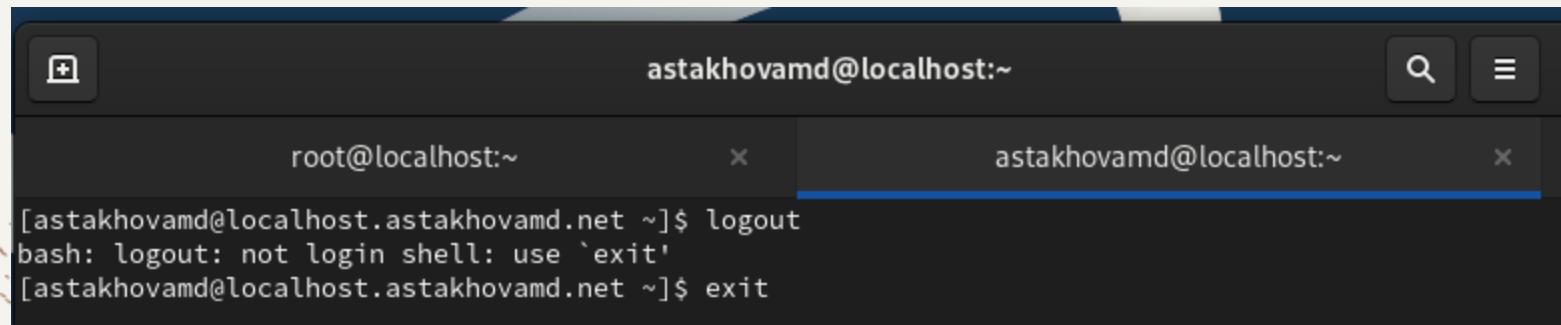
```
# Port 22
Port 2022
#AddressFamily any
#ListenAddress 0.0.
```

```
[root@localhost.astakhovamd.net ~]$ 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_t -p tcp 2222  
#  
Port 22  
Port 2222  
#AddressFamily any  
#ListenAddress 0.0.0.0  
#ListenAddress ::
```



```
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]:2222' (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
```

**AG Help** **^O Write Out** **^W Where Is** **A**  
**^X Exit** **^R Read File** **^U Replace** **A**

```
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]---+
|      oooo.   |
|     .o..+     |
|     .o.oo     |
|     ...*o.    |
|     S .Xoo.   |
|     *o O++    |
|     *..B X..   |
|     ..=o O E.  |
|     =. o.ooo  |
+---[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 ~]$
```

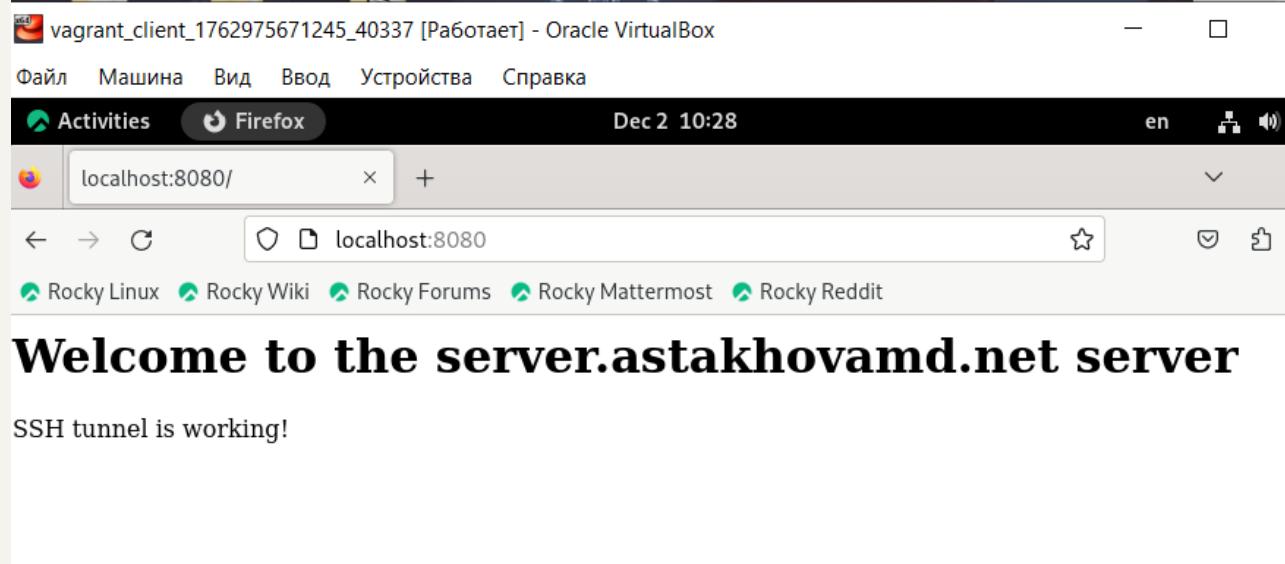
```
calhost:ssh->localhost:43722 (ESTABLISHED)
sshd      2913                  astakhovamd    4u      IPv6          35749      0t0      TCP  lo
calhost:ssh->localhost:43722 (ESTABLISHED)
sshd      3076                  root        3u      IPv4          40249      0t0      TCP  *:
down     (LISTEN)
sshd      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)
sshd      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	<b>TCP</b>	localhost:ssh->localhost:52700	(ESTABLISHED)			
ssh	3374		root 3u IPv6			60474
0t0	<b>TCP</b>	localhost:52700->localhost:ssh	(ESTABLISHED)			
ssh	3374		root 4u IPv6			60518
0t0	<b>TCP</b>	localhost:webcache	(LISTEN)			
ssh	3374		root 5u IPv4			60519
0t0	<b>TCP</b>	localhost:webcache	(LISTEN)			
sshd	2277	astakhovamd	4u IPv6			60475

```
localhost: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:yiD6CwpAVWgmZ0LNexnVt25Q77Gy5XU7NfNuqLLz68.
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=~/mail/un  
/ 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/xauth:  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
```

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

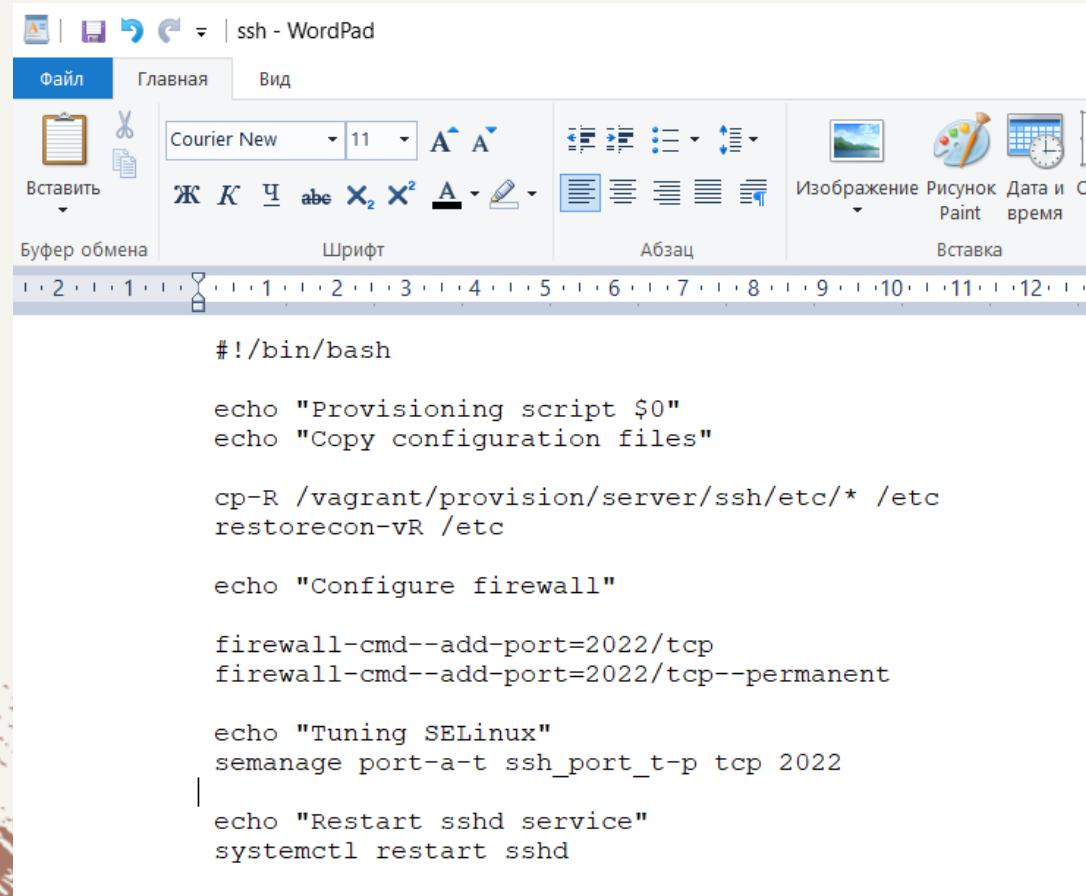
ROCKY LINUX 9

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](#)

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

# ВНЕСЕНИЕ ИЗМЕНЕНИЙ В НАСТРОЙКИ ВНУТРЕННЕГО ОКРУЖЕНИЯ ВИРТУАЛЬНОЙ МАШИНЫ



The screenshot shows a Microsoft WordPad window titled "ssh - WordPad". The ribbon tabs are "Файл", "Главная", and "Вид". The "Главная" tab is selected. The toolbar includes icons for "Вставить" (Insert), "Шрифт" (Font), "Абзац" (Paragraph), and "Вставка" (Insert). The font is set to "Courier New" at size 11. The paragraph style includes bold, italic, and underline options. The "Вставка" tab has icons for "Изображение" (Image), "Рисунок" (Picture), "Дата и время" (Date and Time), and "Paint". The status bar at the bottom shows a ruler from 1 to 12 and a vertical scale from 1 to 1.

```
#!/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
```