

# Лабораторная работа №13

Тема «Настройка NFS»

по дисциплине «Администрирование сетевых подсистем»

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## **Цель работы:**

Приобретение навыков настройки сервера NFS для удалённого доступа к ресурсам.

## Задание

1. Установить и настроить сервер NFSv4.
2. Подмонтировать удалённый ресурс на клиенте.
3. Подключить каталог с контентом веб-сервера к дереву NFS.
4. Подключить каталог для удалённой работы пользователя к дереву NFS.
5. Написать скрипты для Vagrant, фиксирующие действия по установке и настройке сервера NFSv4 во внутреннем окружении виртуальных машин server и client. Соответствующим образом внести изменения в Vagrantfile.

# Выполнение работы

## Настройка сервера NFSv4

```
root@server:~  
[mrshcherbak@server.mrshcherbak.net ~]$ sudo -i  
[sudo] password for mrshcherbak:  
[root@server.mrshcherbak.net ~]# dnf -y install nfs-utils  
Rocky Linux 9 - BaseOS                               4.9 kB/s | 4.1 kB    00:00  
Rocky Linux 9 - AppStream                             7.6 kB/s | 4.5 kB    00:00  
Rocky Linux 9 - Extras                               4.8 kB/s | 2.9 kB    00:00  
Dependencies resolved.  
=====
```

Package	Architecture	Version	Repository	Size
Installing:				
nfs-utils	x86_64	1:2.5.4-20.el9	baseos	425 k
Installing dependencies:				
python3-dnf-plugins-core	x86_64	0.8.4-6.el9	baseos	108 k

```
=====
```

```
[root@server.mrshcherbak.net ~]# mkdir -p /srv/nfs  
[root@server.mrshcherbak.net ~]# /srv/nfs *(ro)  
-bash: /srv/nfs: Is a directory  
[root@server.mrshcherbak.net ~]# cd /etc  
[root@server.mrshcherbak.net etc]# mc  
  
[root@server.mrshcherbak.net etc]# semanage fcontext -a -t nfs_t "/srv/nfs(/.*)?"  
[root@server.mrshcherbak.net etc]# restorecon -vR /srv/nfs  
Relabeled /srv/nfs from unconfined_u:object_r:var_t:s0 to unconfined_u:object_r:nfs_t:s0  
[root@server.mrshcherbak.net etc]# systemctl start nfs-server.service  
[root@server.mrshcherbak.net etc]# systemctl enable nfs-server.service  
Created symlink /etc/systemd/system/multi-user.target.wants/nfs-server.service → /usr/lib/sy  
stemd/system/nfs-server.service.  
[root@server.mrshcherbak.net etc]# firewall-cmd --add-service=nfs  
success  
[root@server.mrshcherbak.net etc]# firewall-cmd --add-service=nfs --permanent  
success  
[root@server.mrshcherbak.net etc]# firewall-cmd --reload  
success  
[root@server.mrshcherbak.net etc]#
```

```
mc [root@server.mrshcherbak.net]:/etc  
/etc/exports 15/15 100%  
/srv/nfs *(ro)
```

```
root@client:~  
[mrshcherbak@client.mrshcherbak.net ~]$ sudo -i  
[sudo] password for mrshcherbak:  
[root@client.mrshcherbak.net ~]# dnf -y install nfs-utils  
Rocky Linux 9 - BaseOS                2.5 kB/s | 4.1 kB    00:01  
Rocky Linux 9 - AppStream              2.6 kB/s | 4.5 kB    00:01  
Rocky Linux 9 - Extras                 6.9 kB/s | 2.9 kB    00:00  
Dependencies resolved.  
=====
```

Package	Architecture	Version	Repository	Size
=====				

```
=====
```

```
[root@client.mrshcherbak.net ~]# showmount -e server.mrshcherbak.net  
clnt_create: RPC: Unable to receive  
[root@client.mrshcherbak.net ~]#
```

```
[root@client.mrshcherbak.net ~]# showmount -e server.mrshcherbak.net  
Export list for server.mrshcherbak.net:  
/srv/nfs *  
[root@client.mrshcherbak.net ~]#
```

Список экспортированных ресурсов на сервере server.mrshcherbak.net

```
[root@server.mrshcherbak.net etc]# lsof | grep TCP  
lsof: WARNING: can't stat() fuse.gvfsd-fuse file system /run/user/1001/gvfs  
Output information may be incomplete.  
systemd      1      root    52u    IPv4        43759      0t0      TCP *:sunrpc (LISTEN)  
systemd      1      root    60u    IPv6        43777      0t0      TCP *:sunrpc (LISTEN)  
systemd      1      root   100u    IPv6       19222      0t0      TCP *:websock (LISTEN)  
cupsd       897      root     6u    IPv6       20805      0t0      TCP localhost:ipp (LISTEN)  
cupsd       897      root     7u    IPv4       20806      0t0      TCP localhost:ipp (LISTEN)  
sshd        913      root     3u    IPv4       20869      0t0      TCP *:down (LISTEN)  
sshd        913      root     4u    IPv6       20878      0t0      TCP *:down (LISTEN)  
sshd        913      root     5u    IPv4       20880      0t0      TCP *:ssh (LISTEN)  
sshd        913      root     6u    IPv6       20882      0t0      TCP *:ssh (LISTEN)  
named       976      named    17u    IPv4       21065      0t0      TCP localhost:domain (LISTEN)  
named       976      named    21u    IPv6       21070      0t0      TCP localhost:domain (LISTEN)  
named       976      named    22u    IPv4       21137      0t0      TCP localhost:rndc (LISTEN)  
named       976      named    23u    IPv6       21138      0t0      TCP localhost:rndc (LISTEN)  
named       976      named    24u    IPv4       22019      0t0      TCP server.mrshcherbak.net:domain (LISTEN)  
named       976      named    26u    IPv4       32687      0t0      TCP mail.mrshcherbak.net:domain (LISTEN)  
named       976      977 isc-net-0 17u    IPv4       21065      0t0      TCP localhost:domain (LISTEN)
```

```
mrshcherbak@server:/etc

httpd      1303  1523  httpd      apache    6u    IPv6      22801      0t0      TCP *:https (LISTEN)
httpd      1303  1523  httpd      apache    23u    sock     0,8        0t0      22955 protocol: TCP
httpd      1303  1524  httpd      apache    3u    sock     0,8        0t0      22788 protocol: TCP
httpd      1303  1524  httpd      apache    4u    IPv6     22789      0t0      TCP *:http (LISTEN)
httpd      1303  1524  httpd      apache    5u    sock     0,8        0t0      22800 protocol: TCP
httpd      1303  1524  httpd      apache    6u    IPv6     22801      0t0      TCP *:https (LISTEN)
httpd      1303  1524  httpd      apache    23u    sock     0,8        0t0      22955 protocol: TCP
rpcbind    12862  12862  rpcbind    rpc        4u    IPv4     43759      0t0      TCP *:sunrpc (LISTEN)
rpcbind    12862  12862  rpcbind    rpc        6u    IPv6     43777      0t0      TCP *:sunrpc (LISTEN)
rpc.statd  12867  12867  rpc.statd  rpcuser    8u    IPv4     50396      0t0      TCP *:36673 (LISTEN)
rpc.statd  12867  12867  rpc.statd  rpcuser   10u    IPv6     50404      0t0      TCP *:39269 (LISTEN)
rpc.mount  12871  12871  rpc.mount  root        5u    IPv4     51177      0t0      TCP *:mountd (LISTEN)
rpc.mount  12871  12871  rpc.mount  root        7u    IPv6     51183      0t0      TCP *:mountd (LISTEN)

[root@server.mrshcherbak.net etc]# lsof | grep UDP
lsof: WARNING: can't stat() fuse.gvfsd-fuse file system /run/user/1001/gvfs
Output information may be incomplete.
systemd    1        root    53u    IPv4     43768      0t0      UDP *:sunrpc
systemd    1        root    61u    IPv6     43786      0t0      UDP *:sunrpc
avahi-daemon 600     avahi   12u    IPv4     19648      0t0      UDP *:mdns
avahi-daemon 600     avahi   13u    IPv6     19649      0t0      UDP *:mdns
avahi-daemon 600     avahi   14u    IPv4     19650      0t0      UDP *:59236
avahi-daemon 600     avahi   15u    IPv6     19651      0t0      UDP *:59480
chronyd    631     chrony   5u    IPv4     19575      0t0      UDP localhost:323
chronyd    631     chrony   6u    IPv6     19576      0t0      UDP localhost:323
chronyd    631     chrony   7u    IPv4     19577      0t0      UDP *:ntp
named      976     named    6u    IPv4     22018      0t0      UDP server.mrshcherbak.net:domain
named      976     named   16u    IPv4     21064      0t0      UDP localhost:domain
named      976     named   19u    IPv6     21069      0t0      UDP localhost:domain
named      976     named   25u    IPv4     32686      0t0      UDP ns.mrshcherbak.net:domain
named      976     named    6u    IPv4     22018      0t0      UDP server.mrshcherbak.net:domain
```

Добавила службы rpc-bind и mountd в настройки межсетевого экрана на сервере

```
mrshcherbak@server:/etc

named      976  6527  tcp-net-0  named      19u    IPv6      21069      0t0      UDP localhost:domain
named      976  6527  tcp-net-0  named      25u    IPv4      32686      0t0      UDP ns.mrshcherbak.net:domain
dhcpd      1197  1197  dhcpd      dhcpd       7u    IPv4      22186      0t0      UDP *:bootps
dhcpd      1197  1197  dhcpd      dhcpd      20u    IPv4      22126      0t0      UDP *:41921
dhcpd      1197  1197  dhcpd      dhcpd      21u    IPv6      22127      0t0      UDP *:54334
NetworkMa  7004  7004  NetworkMa  root       27u    IPv4      32639      0t0      UDP server.mrshcherbak.net:bootpc->_gateway:bootps
NetworkMa  7004  7011  NetworkMa  root       27u    IPv4      32639      0t0      UDP server.mrshcherbak.net:bootpc->_gateway:bootps
NetworkMa  7004  7012  NetworkMa  root       27u    IPv4      32639      0t0      UDP server.mrshcherbak.net:bootpc->_gateway:bootps
rpcbind    12862  12862  rpcbind    rpc        5u    IPv4      43768      0t0      UDP *:sunrpc
rpcbind    12862  12862  rpcbind    rpc        7u    IPv6      43786      0t0      UDP *:sunrpc
rpc.statd  12867  12867  rpc.statd  rpcuser    7u    IPv4      50392      0t0      UDP *:38085
rpc.statd  12867  12867  rpc.statd  rpcuser    9u    IPv6      50400      0t0      UDP *:45130
rpc.statd  12867  12867  rpc.statd  rpcuser   13u    IPv4      50385      0t0      UDP localhost:755
rpc.mount  12871  12871  rpc.mount  root        4u    IPv4      51174      0t0      UDP *:mountd
rpc.mount  12871  12871  rpc.mount  root        6u    IPv6      51180      0t0      UDP *:mountd

[root@server.mrshcherbak.net etc]# firewall-cmd --get-services
RH-Satellite-6 RH-Satellite-6-capsule afp amanda-client amanda-k5-client amqp amqps apcupsd audit ausweisapp2 bacula bacula-client bb bgp bitcoin bitcoin-rpc bitcoin-testnet bitcoin-testnet-rp
c bittorrent-lsd ceph ceph-mon cfengine checkmk-agent cockpit collectd condor-collector cratedb ctddb dhcp dhcpv6 dhcpv6-client distcc dns dns-over-tls docker-registry docker-swarm dropbox-lans
ync elasticsearch etcd-client etcd-server finger foreman foreman-proxy freeipa-4 freeipa-ldap freeipa-ldaps freeipa-replication freeipa-trust ftp galera ganglia-client ganglia-master git gpsd
grafana gre high-availability http http3 https ident imap imaps ipfs ipp ipp-client ipsec irc ircs ircs1-target isns jellyfin jenkins kadmim kdeconnect kerberos kibana klogon kpasswd kprop ksh
ell kube-api kube-apiserver kube-control-plane kube-control-plane-secure kube-controller-manager kube-controller-manager-secure kube-scheduler kube-scheduler-secure kube
-worker kubelet kubelet-readonly kubelet-worker ldap ldaps libvirt libvirt-tls lightning-network llmnr llmnr-tcp llmnr-udp managessieve matrix mdns memcache minidlna mongodb mosh mountd mqtt mq
tt-tls ms-wbt mssql murmur mysql nbd netbios-ns netdata-dashboard nfs nfs3 nmap-0183 nrpe ntp nut openvpn ovirt-imageto ovirt-storageconsole ovirt-vmconsole plex pmcd pmproxy pmwebapi pmwebapi
s pop3 pop3s postgresql privoxy prometheus prometheus-node-exporter proxy-dhcp ps3netsrv ptp pulseaudio puppetmaster quassel radius rdp redis redis-sentinel rpc-bind rquotad rsh rsyncd rtsp sa
lt-master samba samba-client samba-dc sane sip sips slp smtp smtp-submission smtps snmp snmptls snmptls-trap snmptrap spideroak-lansync spotify-sync squid ssdp ssh ssh-custom steam-streaming s
vdrp svn syncthing-gui synergy syslog syslog-tls telnet tentacle tftp tile38 tinc tor-socks transmission-client upnp-client vdsim vnc-server wbem-http wbem-https wireguard ws-discover
y ws-discovery-client ws-discovery-tcp ws-discovery-udp wsmn wsmans xdmcp xmpp-bosh xmpp-client xmpp-local xmpp-server zabbix-agent zabbix-server zerotier

[root@server.mrshcherbak.net etc]# firewall-cmd --add-service=mountd --add-service=rpc-bind
success
[root@server.mrshcherbak.net etc]# firewall-cmd --add-service=mountd --add-service=rpc-bind --permanent
success
[root@server.mrshcherbak.net etc]# firewall-cmd --reload
success
```

```
[root@client.mrshcherbak.net ~]# showmount -e server.mrshcherbak.net
Export list for server.mrshcherbak.net:
/srv/nfs *
```

На клиенте проверила подключение удалённого ресурса

## Монтирование NFS на клиенте

```
[root@client.mrshcherbak.net ~]#
[root@client.mrshcherbak.net ~]# mkdir -p /mnt/nfs
[root@client.mrshcherbak.net ~]# mount server.mrshcherbak.net:/srv/nfs /mnt/nfs
[root@client.mrshcherbak.net ~]#
```

```
[root@client.mrshcherbak.net ~]# mount
proc on /proc type proc (rw,nosuid,nodev,noexec,relatime)
sysfs on /sys type sysfs (rw,nosuid,nodev,noexec,relatime,seclabel)
devtmpfs on /dev type devtmpfs (rw,nosuid,seclabel,size=4096k,nr_inodes=114494,mode=755,inode64)
securityfs on /sys/kernel/security type securityfs (rw,nosuid,nodev,noexec,relatime)
tmpfs on /dev/shm type tmpfs (rw,nosuid,nodev,seclabel,inode64)
devpts on /dev/pts type devpts (rw,nosuid,noexec,relatime,seclabel,gid=5,mode=620,ptmxmode=000)
tmpfs on /run type tmpfs (rw,nosuid,nodev,seclabel,size=194916k,nr_inodes=819200,mode=755,inode64)
cgroupt2 on /sys/fs/cgroup type cgroup2 (rw,nosuid,nodev,noexec,relatime,seclabel,nsdelegate,memory_recursiveprot)
pstore on /sys/fs/pstore type pstore (rw,nosuid,nodev,noexec,relatime,seclabel)
bpf on /sys/fs/bpf type bpf (rw,nosuid,nodev,noexec,relatime,mode=700)
/dev/sdal on / type xfs (rw,relatime,seclabel,attr2,inode64,logbufs=8,logbsize=32k,noquota)
selinuxfs on /sys/fs/selinux type selinuxfs (rw,nosuid,noexec,relatime)
systemd-1 on /proc/sys/fs/binfmt_misc type autofs (rw,relatime,fd=29,pgrp=1,timeout=0,minproto=5,maxproto=5,direct,pipe_ino=17480)
hugetlbfs on /dev/hugepages type hugetlbfs (rw,relatime,seclabel,pagesize=2M)
mqueue on /dev/mqueue type mqueue (rw,nosuid,nodev,noexec,relatime,seclabel)
debugfs on /sys/kernel/debug type debugfs (rw,nosuid,nodev,noexec,relatime,seclabel)
tracefs on /sys/kernel/tracing type tracefs (rw,nosuid,nodev,noexec,relatime,seclabel)
fusectl on /sys/fs/fuse/connections type fusectl (rw,nosuid,nodev,noexec,relatime)
configfs on /sys/kernel/config type configfs (rw,nosuid,nodev,noexec,relatime)
none on /run/credentials/systemd-sysctl.service type ramfs (ro,nosuid,nodev,noexec,relatime,seclabel,mode=700)
none on /run/credentials/systemd-tmpfiles-setup-dev.service type ramfs (ro,nosuid,nodev,noexec,relatime,seclabel,mode=700)
none on /run/credentials/systemd-tmpfiles-setup.service type ramfs (ro,nosuid,nodev,noexec,relatime,seclabel,mode=700)
vagrant on /vagrant type vboxsf (rw,nodev,relatime,ioccharset=utf8,uid=1000,gid=1000)
vagrant on /vagrant type vboxsf (rw,nodev,relatime,ioccharset=utf8,uid=1000,gid=1000,_netdev)
tmpfs on /run/user/1001 type tmpfs (rw,nosuid,nodev,relatime,seclabel,size=97456k,nr_inodes=24364,mode=700,uid=1001,gid=1001,inode64)
gvfsd-fuse on /run/user/1001/gvfs type fuse.gvfsd-fuse (rw,nosuid,nodev,relatime,user_id=1001,group_id=1001)
sunrpc on /var/lib/nfs/rpc_pipefs type rpc_pipefs (rw,relatime)
server.mrshcherbak.net:/srv/nfs on /mnt/nfs type nfs4 (rw,relatime,vers=4.2,rsize=131072,wsiz=131072,namlen=255,hard,proto=tcp,timeo=600,retrans=2,sec=sys,clientaddr=192.168.1.193,local_lock=none,addr=192.168.1.1)
[root@client.mrshcherbak.net ~]#
```

Общий ресурс NFS подключён правильно



```
mc [root@client.mrshcherbak.net]:/etc
/etc/fstab
#
# /etc/fstab
# Created by anaconda on Tue Oct 10 14:23:22 2023
#
# Accessible filesystems, by reference, are maintained under '/dev/disk/'.
# See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info.
#
# After editing this file, run 'systemctl daemon-reload' to update systemd
# units generated from this file.
#
UUID=84c25f24-8084-4b27-b4f2-24350066c776 / xfs defaults 0 0
/swapfile none swap defaults 0 0
#VAGRANT-BEGIN
# The contents below are automatically generated by Vagrant. Do not modify.
vagrant /vagrant vboxsf uid=1000,gid=1000,_netdev 0 0
#VAGRANT-END
server.mrshcherbak.net:/srv/nfs /mnt/nfs nfs _netdev 0 0
```

Содержимое файла /etc/fstab

```
[mrshcherbak@client.mrshcherbak.net ~]$ sudo -i
[sudo] password for mrshcherbak:
[root@client.mrshcherbak.net ~]# systemctl status remote-fs.target
• remote-fs.target - Remote File Systems
  Loaded: loaded (/usr/lib/systemd/system/remote-fs.target; enabled; preset:
  Active: active since Sat 2023-12-09 13:37:01 MSK; 2min 13s ago
  Until: Sat 2023-12-09 13:37:01 MSK; 2min 13s ago
  Docs: man:systemd.special(7)
Dec 09 13:37:01 client.mrshcherbak.net systemd[1]: Reached target Remote File S
lines 1-7/7 (END)
```

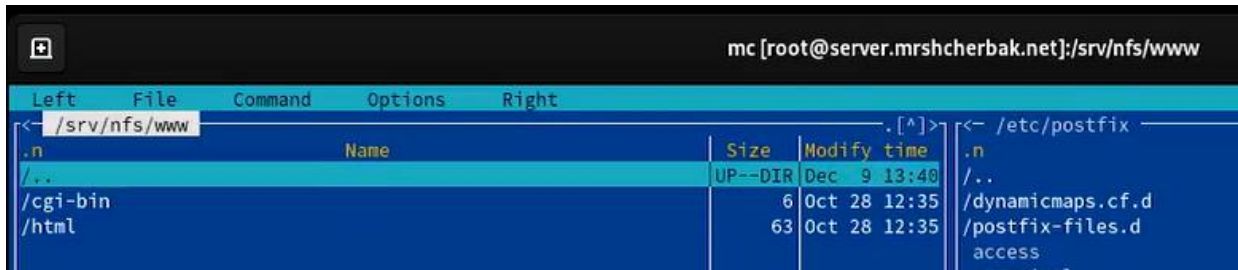
Удалённый ресурс  
подключается автоматически



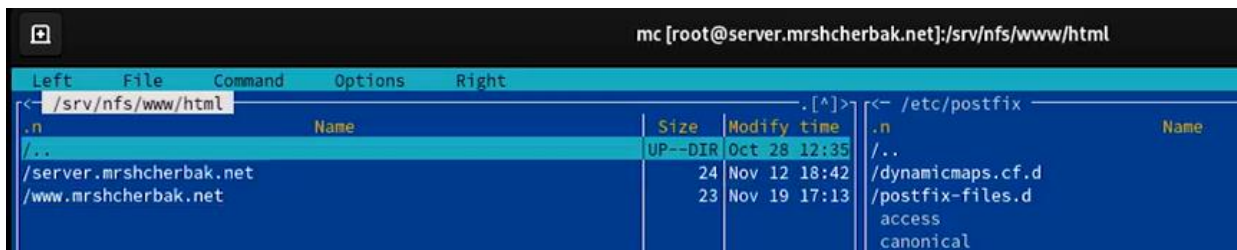
## Подключение каталогов к дереву NFS

```
[root@server.mrshcherbak.net etc]# mkdir -p /srv/nfs/www  
[root@server.mrshcherbak.net etc]# mount -o bind /var/www/ /srv/nfs/www/
```

На сервере проверила, что отображается в каталоге /srv/nfs

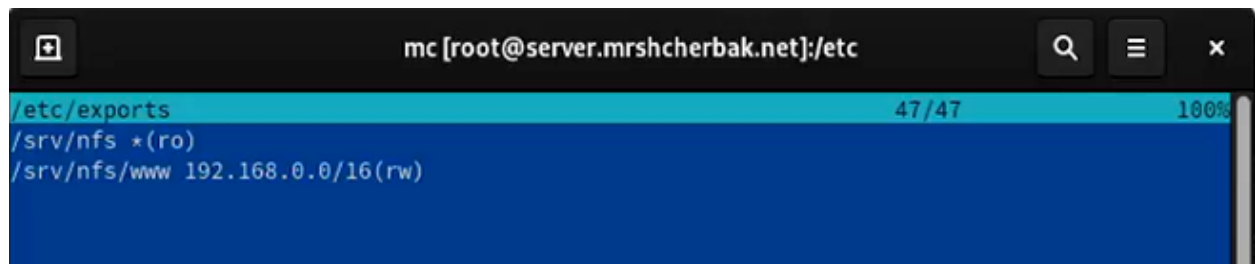


Left	File	Command	Options	Right
<- /srv/nfs/www				>- /etc/postfix
	Name	Size	Modify time	
.n				.n
UP--DIR			Dec 9 13:40	UP--DIR
/cgi-bin		6	Oct 28 12:35	/dynamicmaps.cf.d
/html		63	Oct 28 12:35	/postfix-files.d
				access



Left	File	Command	Options	Right
<- /srv/nfs/www/html				>- /etc/postfix
	Name	Size	Modify time	
.n				.n
UP--DIR			Oct 28 12:35	UP--DIR
/server.mrshcherbak.net		24	Nov 12 18:42	/dynamicmaps.cf.d
/www.mrshcherbak.net		23	Nov 19 17:13	/postfix-files.d
				access
				canonical

На сервере в файле /etc/exports добавила экспорт каталога веб-сервера с удалённого ресурса



Left	File	Command	Options	Right
<- /etc/exports				>- /etc/exports
		47/47	100%	
/srv/nfs *(ro)				
/srv/nfs/www 192.168.0.0/16(rw)				

```
mc [root@server.mrshcherbak.net]:/etc
fstab  [-M--] 35 L: [ 1+17 18/ 18] *(653 / 653b) <EOF> [*] [X]
#
# /etc/fstab
# Created by anaconda on Tue Oct 10 14:23:22 2023
#
# Accessible filesystems, by reference, are maintained under '/dev/disk/'.
# See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info.
#
# After editing this file, run 'systemctl daemon-reload' to update systemd
# units generated from this file.
#
UUID=84c25f24-8084-4b27-b4f2-24350066c776 / xfs defaults 0
/swapfile none swap defaults 0 0
#VAGRANT-BEGIN
# The contents below are automatically generated by Vagrant. Do not modify.
vagrant /vagrant vboxsf uid=1000,gid=1000,_netdev 0 0
#VAGRANT-END
/var/www /srv/nfs/www none bind 0 0
```

## Подключение каталогов для работы пользователей

```
[mrshcherbak@server.mrshcherbak.net ~]$ mkdir -p -m 700 ~/common
[mrshcherbak@server.mrshcherbak.net ~]$ cd ~/common
[mrshcherbak@server.mrshcherbak.net common]$ touch mrshcherbak@server.txt
[mrshcherbak@server.mrshcherbak.net common]$ ls
mrshcherbak@server.txt
```

```
[mrshcherbak@server.mrshcherbak.net common]$ mkdir -p /srv/nfs/home/mrshcherbak
```

Подмонтирование каталога common пользователя mrshcherbak в NFS и просмотр прав доступа

```
[root@server.mrshcherbak.net common]# mount -o bind /home/mrshcherbak/common /srv/nfs/home/mrshcherbak
[root@server.mrshcherbak.net common]# ls -l /srv/nfs/home/mrshcherbak
total 0
-rw-r--r--. 1 mrshcherbak mrshcherbak 0 Dec 9 13:56 mrshcherbak@server.txt
[root@server.mrshcherbak.net common]#
```

```
mc [mrshcherbak@server.mrshcherbak.net]:/etc
exports [-M--] 44 L:[ 1+ 2 3/ 3] *(91 / 91b) <EOF>
/srv/nfs *(ro)
/srv/nfs/www 192.168.0.0/16(rw)
/srv/nfs/home/mrshcherbak 192.168.0.0/16(rw)
```

Подключила каталог  
пользователя в файле  
/etc/exports

```
mc [root@server.mrshcherbak.net]:/etc
/etc/fstab
#
# /etc/fstab
# Created by anaconda on Tue Oct 10 14:23:22 2023
#
# Accessible filesystems, by reference, are maintained under '/dev/disk/'.
# See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info.
#
# After editing this file, run 'systemctl daemon-reload' to update systemd
# units generated from this file.
#
UUID=84c25f24-8084-4b27-b4f2-24350066c776 / xfs defaults 0 0
/swapfile none swap defaults 0 0
#VAGRANT-BEGIN
# The contents below are automatically generated by Vagrant. Do not modify.
vagrant /vagrant vboxsf uid=1000,gid=1000,_netdev 0 0
#VAGRANT-END
/var/www /srv/nfs/www none bind 0 0
/home/mrshcherbak/common /srv/nfs/home/mrshcherbak none bind 0 0
```

Содержимое файла  
/etc/fstab на сервере

```
[mrshcherbak@client.mrshcherbak.net ~]$ cd /mnt/nfs/home/mrshcherbak
[mrshcherbak@client.mrshcherbak.net mrshcherbak]$ touch mrshcherbak@client.txt
[mrshcherbak@client.mrshcherbak.net mrshcherbak]$ ls
mrshcherbak@client.txt mrshcherbak@server.txt
[mrshcherbak@client.mrshcherbak.net mrshcherbak]$
```

```
[root@server.mrshcherbak.net etc]# cd /home/mrshcherbak
[root@server.mrshcherbak.net mrshcherbak]# ls
common  Documents  Mailsdir  Pictures  shared    Videos
Desktop Downloads Music     Public   Templates
[root@server.mrshcherbak.net mrshcherbak]# cd common
[root@server.mrshcherbak.net common]# ls
mrshcherbak@client.txt  mrshcherbak@server.txt
[root@server.mrshcherbak.net common]#
```

Изменения на сервере в каталоге  
/home/mrshcherbak/common

## Внесение изменений в настройки внутреннего окружения виртуальных машин

```
[root@server.mrshcherbak.net etc]# cd /vagrant/provision/server
[root@server.mrshcherbak.net server]# mkdir -p /vagrant/provision/server/nfs/etc
[root@server.mrshcherbak.net server]# cp -R /etc/exports /vagrant/provision/server/nfs/etc/
[root@server.mrshcherbak.net server]# cd /vagrant/provision/server
[root@server.mrshcherbak.net server]# touch nfs.sh
[root@server.mrshcherbak.net server]# chmod +x nfs.sh
[root@server.mrshcherbak.net server]# mc

[root@server.mrshcherbak.net server]#
```

```
[mrshcherbak@client.mrshcherbak.net etc]$ cd /vagrant/provision/client
[mrshcherbak@client.mrshcherbak.net client]$ cd /vagrant/provision/client
[mrshcherbak@client.mrshcherbak.net client]$ touch nfs.sh
[mrshcherbak@client.mrshcherbak.net client]$ chmod +x nfs.sh
[mrshcherbak@client.mrshcherbak.net client]$ mc

[mrshcherbak@client.mrshcherbak.net client]$
```

```
mc [root@server.mrshcherbak.net]:/vagrant/provision/server
/vagrant/provision/server/nfs.sh
#!/bin/bash

echo "Provisioning script $0"

echo "Install needed packages"
dnf -y install nfs-utils

echo "Copy configuration files"
cp -R /vagrant/provision/server/nfs/etc/* /etc

restorecon -vR /etc

echo "Configure firewall"
firewall-cmd --add-service nfs --permanent
firewall-cmd --add-service mountd --add-service rpc-bind --permanent
firewall-cmd --reload

echo "Tuning SELinux"
mkdir -p /srv/nfs
semanage fcontext -a -t nfs_t "/srv/nfs(/.*)?"
restorecon -vR /srv/nfs

echo "Mounting dirs"
mkdir -p /srv/nfs/www
mount -o bind /var/www /srv/nfs/www

echo "/var/www /srv/nfs/www none bind 0 0" >> /etc/fstab
mkdir -p /srv/nfs/home/mrshcherbak
mkdir -p -m 700 /home/mrshcherbak/common
chown mrshcherbak:mrshcherbak /home/mrshcherbak/common
mount -o bind /home/mrshcherbak/common /srv/nfs/home/mrshcherbak

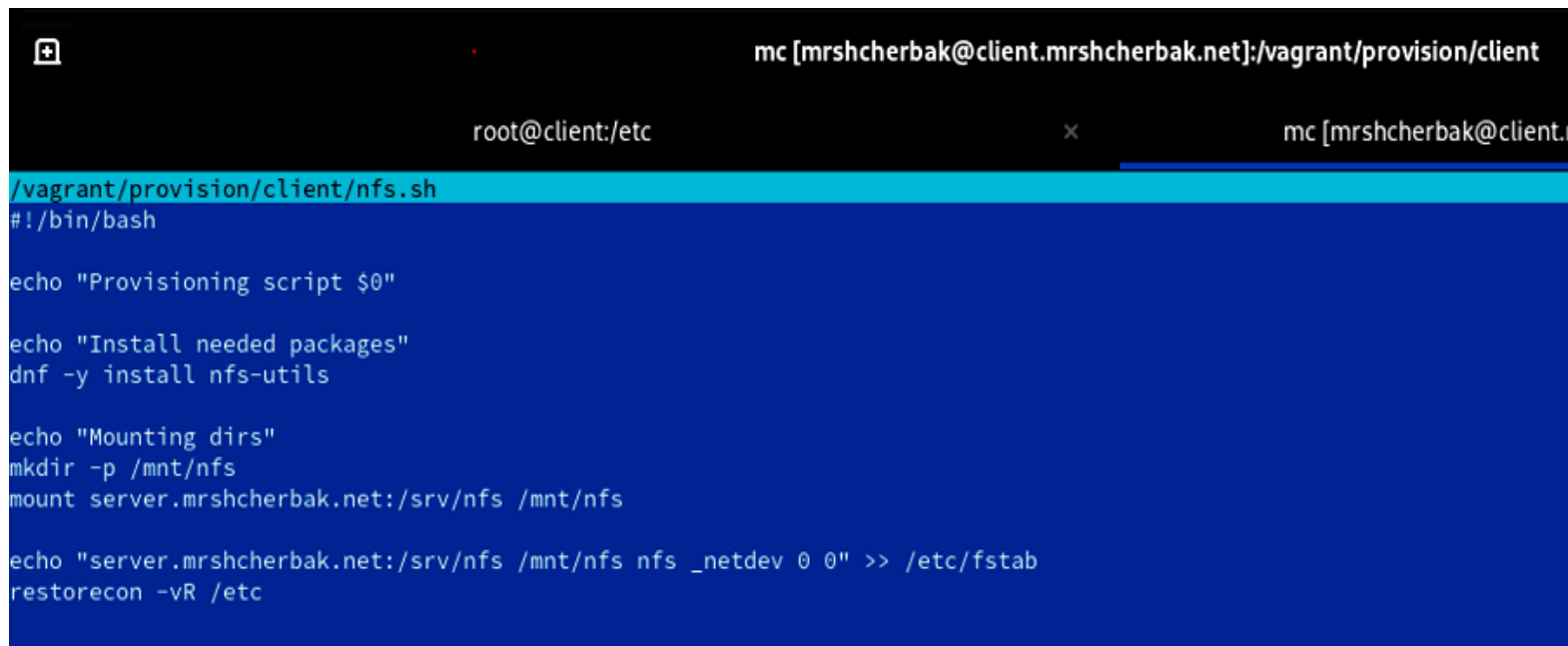
echo "/home/mrshcherbak/common /srv/nfs/home/mrshcherbak none bind 0 0" >> /etc/fstab

echo "Start nfs service"
systemctl enable nfs-server
systemctl start nfs-server

systemctl restart firewallld

1 | help      2 | UnWrap    3 | Quit      4 | Hex      5 | Goto
```

Содержимое файла nfs.sh на сервере



```
mc [mrshcherbak@client.mrshcherbak.net]:/vagrant/provision/client
root@client:/etc
mc [mrshcherbak@client.
/vagrant/provision/client/nfs.sh
#!/bin/bash

echo "Provisioning script $0"

echo "Install needed packages"
dnf -y install nfs-utils

echo "Mounting dirs"
mkdir -p /mnt/nfs
mount server.mrshcherbak.net:/srv/nfs /mnt/nfs

echo "server.mrshcherbak.net:/srv/nfs /mnt/nfs nfs _netdev 0 0" >> /etc/fstab
restorecon -vR /etc
```

Содержимое файла nfs.sh на клиенте



```
*C:\Work\mrshcherbak\vagrant\Vagrantfile - Notepad++
Файл Правка Поиск Вид Кодировки Синтаксисы Опции Инструменты Макросы Запуск Г
PPO.py Vagrantfile
61 path: "provision/server/mysql.sh"
62
63 server.vm.provision "server firewall",
64 type: "shell",
65 preserve_order: true,
66 path: "provision/server/firewall.sh"
67
68 server.vm.provision "server mail",
69 type: "shell",
70 preserve_order: true,
71 path: "provision/server/mail.sh"
72
73 server.vm.provision "server ssh",
74 type: "shell",
75 preserve_order: true,
76 path: "provision/server/ssh.sh"
77
78 server.vm.provision "server ntp",
79 type: "shell",
80 preserve_order: true,
81 path: "provision/server/ntp.sh"
82
83 server.vm.provision "server nfs",
84 type: "shell",
85 preserve_order: true,
86 path: "provision/server/nfs.sh"
87
88
89 server.vm.provider :virtualbox do |v|
90 v.linked_clone = true
91 # Customize the amount of memory on the VM
92 v.memory = 1024
93 v.cpus = 1
```

```
*C:\Work\mrshcherbak\vagrant\Vagrantfile - Notepad++
Файл Правка Поиск Вид Кодировки Синтаксисы Опции Инструменты Макросы Запуск Плагин
PPO.py Vagrantfile
124 path: "provision/client/01-dummy.sh"
125
126 client.vm.provision "client routing",
127 type: "shell",
128 preserve_order: true,
129 run: "always",
130 path: "provision/client/01-routing.sh"
131
132 client.vm.provision "client mail",
133 type: "shell",
134 preserve_order: true,
135 path: "provision/client/mail.sh"
136
137 client.vm.provision "client ntp",
138 type: "shell",
139 preserve_order: true,
140 path: "provision/client/ntp.sh"
141
142 client.vm.provision "client nfs",
143 type: "shell",
144 preserve_order: true,
145 path: "provision/client/nfs.sh"
146
147
148 client.vm.provider :virtualbox do |v|
149 v.linked_clone = true
150 # Customize the amount of memory on the VM
151 v.memory = 1024
152 v.cpus = 1
153 v.name = "client"
154 # Display the VirtualBox GUI when booting the machine
155 v.gui = true
156 # Set the video memory to 12Mb
```

**Вывод:** таким образом, в ходе выполнения л/р №13 я приобрела навыки настройки сервера NFS для удалённого доступа к ресурсам.