

Администрирование сетевых подсистем

Настройка NFS (Лабораторная работа №13)

Заур Мустафаев

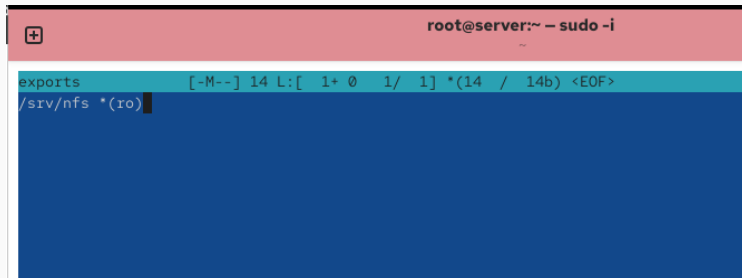
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Российский университет дружбы народов, Москва, Россия

Цели и задачи работы

Освоение практических навыков настройки сервера NFS и подключения удалённых каталогов.

Выполнение лабораторной работы

A terminal window with a pink title bar containing a plus icon and the text 'root@server:~ - sudo -i'. The terminal has a light blue background. The first line shows the command 'exports' followed by a status bar '[-M--] 14 L: [1+ 0 1/ 1] *(14 / 14b) <EOF>'. The second line shows the file path '/srv/nfs *(ro)' with a black cursor at the end.

```
root@server:~ - sudo -i
exports [ -M-- ] 14 L: [ 1+ 0 1/ 1 ] *(14 / 14b) <EOF>
/srv/nfs *(ro)
```

Рис. 1: Редактирование /etc/exports

Настройка SELinux и запуск сервиса

```
Installed:
  gssproxy-0.9.2-10.el10.x86_64      libev-4.33-14.el10.x86_64      libnfsidmap-1:2.8.2-3.el10.x86_64
  libverto-libev-0.3.2-10.el10.x86_64  nfs-utils-1:2.8.2-3.el10.x86_64  rpcbind-1.2.7-3.el10.x86_64
  sssd-nfs-idmap-2.10.2-3.el10_0.2.x86_64

Complete!
[root@server.zmustafaev.net ~]#
[root@server.zmustafaev.net ~]# mkdir -p /srv/nfs
[root@server.zmustafaev.net ~]# mcedit /etc/exports

[root@server.zmustafaev.net ~]# semanage fcontext -a -t nfs_t "/srv/nfs(/.*)?"
[root@server.zmustafaev.net ~]# 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.zmustafaev.net ~]# systemctl start nfs-server.service
[root@server.zmustafaev.net ~]# systemctl enable nfs-server.service
Created symlink '/etc/systemd/system/multi-user.target.wants/nfs-server.service' → '/usr/lib/systemd/system/nfs-server.service'.
[root@server.zmustafaev.net ~]# firewall-cmd --add-service=nfs
success
[root@server.zmustafaev.net ~]# firewall-cmd --add-service=nfs --permanent
success
[root@server.zmustafaev.net ~]# firewall-cmd --reload
success
[root@server.zmustafaev.net ~]# █
```

Рис. 2: Настройка SELinux для каталога NFS

```
Installed:
gssproxy-0.9.2-10.el10.x86_64          libev-4.33-14.el10.x86_64
libnfsidmap-1:2.8.2-3.el10.x86_64     libverto-libev-0.3.2-10.el10.x86_64
nfs-utils-1:2.8.2-3.el10.x86_64      rpcbind-1.2.7-3.el10.x86_64
sssd-nfs-idmap-2.10.2-3.el10_0.2.x86_64

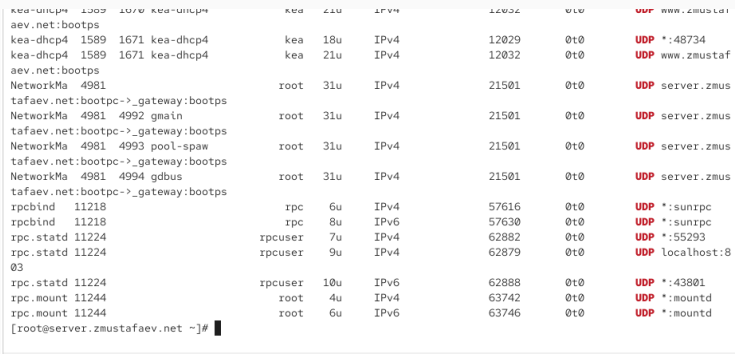
Complete!
[root@client.zmustafaev.net ~]#
[root@client.zmustafaev.net ~]# showmount -e server.zmustafaev.net
clnt_create: RPC: Unable to receive
[root@client.zmustafaev.net ~]#
```

Рис. 3: Ошибка RPC при showmount

```
Installed:
  gssproxy-0.9.2-10.el10.x86_64      libev-4.33-14.el10.x86_64
  libnfsidmap-1:2.8.2-3.el10.x86_64  libverto-libev-0.3.2-10.el10.x86_64
  nfs-utils-1:2.8.2-3.el10.x86_64    rpcbind-1.2.7-3.el10.x86_64
  sssd-nfs-idmap-2.10.2-3.el10_0.2.x86_64

Complete!
[root@client.zmustafaev.net ~]#
[root@client.zmustafaev.net ~]# showmount -e server.zmustafaev.net
clnt_create: RPC: Unable to receive
[root@client.zmustafaev.net ~]# showmount -e server.zmustafaev.net
Export list for server.zmustafaev.net:
/srv/nfs *
[root@client.zmustafaev.net ~]#
```

Рис. 4: Успешный вывод showmount



kea-dhcp4	1589	1671	kea-dhcp4	kea	21u	IPv4	12032	0t0	UDP	www.zmustafaev.net:48734
aeve.net:bootps										
kea-dhcp4	1589	1671	kea-dhcp4	kea	18u	IPv4	12029	0t0	UDP	*:48734
kea-dhcp4	1589	1671	kea-dhcp4	kea	21u	IPv4	12032	0t0	UDP	www.zmustafaev.net:48734
aeve.net:bootps										
NetworkManager	4981			root	31u	IPv4	21501	0t0	UDP	server.zmustafaev.net:48734
tafaev.net:bootpc->_gateway:bootps										
NetworkManager	4981	4992	gmain	root	31u	IPv4	21501	0t0	UDP	server.zmustafaev.net:48734
tafaev.net:bootpc->_gateway:bootps										
NetworkManager	4981	4993	pool-spaw	root	31u	IPv4	21501	0t0	UDP	server.zmustafaev.net:48734
tafaev.net:bootpc->_gateway:bootps										
NetworkManager	4981	4994	gdbus	root	31u	IPv4	21501	0t0	UDP	server.zmustafaev.net:48734
tafaev.net:bootpc->_gateway:bootps										
rpcbind	11218			rpc	6u	IPv4	57616	0t0	UDP	*:sunrpc
rpcbind	11218			rpc	8u	IPv6	57630	0t0	UDP	*:sunrpc
rpc.statd	11224			rpcuser	7u	IPv4	62882	0t0	UDP	*:55293
rpc.statd	11224			rpcuser	9u	IPv4	62879	0t0	UDP	localhost:803
rpc.statd	11224			rpcuser	10u	IPv6	62888	0t0	UDP	*:43801
rpc.mount	11244			root	4u	IPv4	63742	0t0	UDP	*:mountd
rpc.mount	11244			root	6u	IPv6	63746	0t0	UDP	*:mountd

[root@server.zmustafaev.net ~]#

Рис. 5: Процессы NFS в lsof

```
Installed:
gssproxy-0.9.2-10.el10.x86_64          libev-4.33-14.el10.x86_64
libnfsidmap-1:2.8.2-3.el10.x86_64      libverto-libev-0.3.2-10.el10.x86_64
nfs-utils-1:2.8.2-3.el10.x86_64        rpcbind-1.2.7-3.el10.x86_64
sssd-nfs-idmap-2.10.2-3.el10_0.2.x86_64

Complete!
[root@client.zmustafaev.net ~]#
[root@client.zmustafaev.net ~]# showmount -e server.zmustafaev.net
clnt_create: RPC: Unable to receive
[root@client.zmustafaev.net ~]# showmount -e server.zmustafaev.net
Export list for server.zmustafaev.net:
/srv/nfs *
[root@client.zmustafaev.net ~]#
[root@client.zmustafaev.net ~]# showmount -e server.zmustafaev.net
Export list for server.zmustafaev.net:
/srv/nfs *
[root@client.zmustafaev.net ~]#
```

Рис. 6: Успешный showmount

```
[root@client.zmustafaev.net ~]#  
[root@client.zmustafaev.net ~]# mkdir -p /mnt/nfs  
[root@client.zmustafaev.net ~]# mount server.zmustafaev.net:/srv/nfs /mnt/nfs/  
[root@client.zmustafaev.net ~]# mount | grep nfs  
server.zmustafaev.net:/srv/nfs on /mnt/nfs type nfs4 (rw,relatime,vers=4.2,rsz=26214  
4,wsz=262144,namlen=255,hard,proto=tcp,timeo=600,retrans=2,sec=sys,clientaddr=192.16  
8.1.30,local_lock=none,addr=192.168.1.1)  
[root@client.zmustafaev.net ~]#
```

Рис. 7: Вывод mount | grep nfs

Автомонтирование через fstab

```
fstab      [-M--]  5 L:[ 1+17 18/ 22] *(857 /1010b) 0065 0x041      [*][X]

#
# /etc/fstab
# Created by anaconda on Wed Sep  3 08:53:23 2025
#
# 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=908334c5-81ab-40aa-ad89-1bd296275208 /                xfs      defaults
UUID=964b6a41-d718-411a-a362-f90f740c04d8 /boot             xfs      defaults
UUID=2000-E25B      /boot/efi          vfat     umask=0077,shortname=winnt 0 2
UUID=7e0ea0d4-0dbc-4e9b-bcd8-a0b4c565de96 /home             xfs      defaults
UUID=3c01d968-53fe-4cb3-8a7c-cc0f286d9e58 none              swap     defaults
server.zmustafaev.net:/srv/nfs /mnt/nfs nfs _netdev 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

1Help  2Save  3Mark  4Replac  5Copy  6Move  7Search  8Delete  9PullDn 10Quit
```

```
[root@client.zmustafaev.net ~]# systemctl status remote-fs.target
● remote-fs.target - Remote File Systems
   Loaded: loaded (/usr/lib/systemd/system/remote-fs.target; enabled; preset: enabl>
   Active: active since Mon 2025-11-24 09:11:45 UTC; 16min ago
   Invocation: b6c7492e52b741e9b74f83e8870679a8
   Docs: man:systemd.special(7)

Nov 24 09:11:45 client.zmustafaev.net systemd[1]: Reached target remote-fs.target - R>
[root@client.zmustafaev.net ~]#
[root@client.zmustafaev.net ~]# mount -a
[root@client.zmustafaev.net ~]# mount | grep nfs
server.zmustafaev.net:/srv/nfs on /mnt/nfs type nfs4 (rw,relatime,vers=4.2,rsiz=26214
4,wsiz=262144,namlen=255,hard,proto=tcp,timeo=600,retrans=2,sec=sys,clientaddr=192.16
8.1.30,local_lock=none,addr=192.168.1.1)
[root@client.zmustafaev.net ~]#
```

Рис. 9: remote-fs.target активен

```
[root@server.zmustafaev.net ~]#  
[root@server.zmustafaev.net ~]# mkdir -p /srv/nfs/www  
[root@server.zmustafaev.net ~]# mount -o bind /var/www/ /srv/nfs/www/  
[root@server.zmustafaev.net ~]# ls /srv/nfs/  
www  
[root@server.zmustafaev.net ~]# mcedit /etc/exports  
  
[root@server.zmustafaev.net ~]# exportfs -r  
[root@server.zmustafaev.net ~]# mcedit /etc/fstab  
  
[root@server.zmustafaev.net ~]# exportfs -r  
[root@server.zmustafaev.net ~]# mount -a  
[root@server.zmustafaev.net ~]#
```

Рис. 10: Появление каталога www в /srv/nfs

```
0.1.100, root_look none, add 10.100.1.1,  
[root@client.zmustafaev.net ~]#  
[root@client.zmustafaev.net ~]# ls /mnt/nfs/  
www  
[root@client.zmustafaev.net ~]# ls /mnt/nfs/  
www  
[root@client.zmustafaev.net ~]# ls /mnt/nfs/  
www  
[root@client.zmustafaev.net ~]#
```

Рис. 11: Каталог www виден на клиенте

```
exports          [----] 0 L:[ 1+ 2  3/  3] *(47 / 47b) <EOF>  
/srv/nfs *(ro)  
/srv/nfs/www 192.168.0.0/16(rw)  
█
```

Рис. 12: Добавление экспорта для /srv/nfs/www


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

Рис. 13: Создание каталога common и файла пользователя

```
exports          [----] 0 L:[ 1+ 3  4/ 4] *(91 / 91b) <EOF>  
/srv/nfs *(ro)  
/srv/nfs/www 192.168.0.0/16(rw)  
/srv/nfs/home/zmustafaev 192.168.0.0/16(rw)  
█
```

Рис. 14: Добавление каталога home в дереве NFS

```
[zmustafaev@client.zmustafaev.net ~]#  
[zmustafaev@client.zmustafaev.net ~]$ ls /mnt/nfs/  
home  www  
[zmustafaev@client.zmustafaev.net ~]$ cd /mnt/nfs/home/zmustafaev/  
[zmustafaev@client.zmustafaev.net zmustafaev]$ ls  
zmustafaev@server.txt  
[zmustafaev@client.zmustafaev.net zmustafaev]$ touch zmustafaev@client.txt  
[zmustafaev@client.zmustafaev.net zmustafaev]$ ls -l  
total 0  
-rw-r--r--. 1 zmustafaev zmustafaev 0 Nov 24 09:35 zmustafaev@client.txt  
-rw-r--r--. 1 zmustafaev zmustafaev 0 Nov 24 09:32 zmustafaev@server.txt  
[zmustafaev@client.zmustafaev.net zmustafaev]$ sudo -i  
[sudo] password for zmustafaev:  
[root@client.zmustafaev.net ~]# cd /mnt/nfs/home/zmustafaev/  
-bash: cd: /mnt/nfs/home/zmustafaev/: Permission denied  
[root@client.zmustafaev.net ~]#  
logout  
[zmustafaev@client.zmustafaev.net zmustafaev]$
```

Рис. 15: Структура /mnt/nfs на клиенте

```
[zmustafaev@server.zmustafaev.net ~]$  
[zmustafaev@server.zmustafaev.net ~]$ mkdir -p -m 700 ~/common  
[zmustafaev@server.zmustafaev.net ~]$ cd ~/common/  
[zmustafaev@server.zmustafaev.net common]$ touch zmustafaev@server.txt  
[zmustafaev@server.zmustafaev.net common]$ ls  
zmustafaev@server.txt  
[zmustafaev@server.zmustafaev.net common]$  
[zmustafaev@server.zmustafaev.net common]$ ls  
zmustafaev@client.txt  zmustafaev@server.txt  
[zmustafaev@server.zmustafaev.net common]$ ls -l  
total 0  
-rw-r--r--. 1 zmustafaev zmustafaev 0 Nov 24 09:35 zmustafaev@client.txt  
-rw-r--r--. 1 zmustafaev zmustafaev 0 Nov 24 09:32 zmustafaev@server.txt  
[zmustafaev@server.zmustafaev.net common]$ █
```

Рис. 16: Файлы с клиента отобразились на сервере

Итоги работы

- Настроен сервер NFSv4
- Создано дерево экспортируемых каталогов
- Настроены SELinux, firewall, bind-монтирование
- Реализовано автоподключение через `/etc/fstab`
- Настроены личные каталоги пользователей
- Созданы скрипты автоматизации для server/client