

# Лабораторная работа №5

Управление системными службами

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## Цель работы

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Получить навыки управления системными службами операционной системы посредством `systemd`.

## Ход выполнения работы

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```
raliev@raliev:~$ su
Password:
root@raliev:/home/raliev# systemctl status vsftpd
Unit vsftpd.service could not be found.
root@raliev:/home/raliev#
root@raliev:/home/raliev# dnf -y install vsftpd
Rocky Linux 10 - BaseOS                               16 MB/s | 19 MB      00:01
Rocky Linux 10 - AppStream                             4.0 MB/s | 2.1 MB    00:00
Rocky Linux 10 - Extras                               3.0 kB/s | 5.4 kB    00:01
Dependencies resolved.
=====
Package                Architecture      Version           Repository        Size
=====
Installing:
vsftpd                 x86_64            3.0.5-9.el10     appstream         170 k
Transaction Summary
=====
Install 1 Package

Total download size: 170 k
Installed size: 348 k
Downloading Packages:
vsftpd-3.0.5-9.el10.x86_64.rpm                        4.4 MB/s | 170 kB    00:00
-----
Total                                                    442 kB/s | 170 kB    00:00
Rocky Linux 10 - AppStream                             1.6 MB/s | 1.6 kB    00:00
```

Рис. 1: Проверка статуса службы vsftpd

```
root@raliev:/home/raliev#  
root@raliev:/home/raliev# systemctl start vsftpd  
root@raliev:/home/raliev# systemctl status vsftpd  
● vsftpd.service - Vsftpd ftp daemon  
   Loaded: loaded (/usr/lib/systemd/system/vsftpd.service; disabled; preset: disabled)  
   Active: active (running) since Fri 2025-10-03 16:18:03 MSK; 9s ago  
     Invocation: 4331515c40d64a3b8d0567a7118e1b04  
       Process: 5048 ExecStart=/usr/sbin/vsftpd /etc/vsftpd/vsftpd.conf (code=exited, status=0/SUCCESS)  
     Main PID: 5052 (vsftpd)  
       Tasks: 1 (limit: 24779)  
      Memory: 752K (peak: 1.2M)  
         CPU: 2ms  
       CGroup: /system.slice/vsftpd.service  
               └─5052 /usr/sbin/vsftpd /etc/vsftpd/vsftpd.conf  
  
Oct 03 16:18:03 raliev.localdomain systemd[1]: Starting vsftpd.service - Vsftpd ftp daemon...  
Oct 03 16:18:03 raliev.localdomain systemd[1]: Started vsftpd.service - Vsftpd ftp daemon.  
root@raliev:/home/raliev#
```

Рис. 2: Запуск и проверка статуса vsftpd

```
root@raliev:/home/raliev# systemctl enable vsftpd
Created symlink '/etc/systemd/system/multi-user.target.wants/vsftpd.service' → '/usr/lib/systemd/system/vsftpd.service'.
root@raliev:/home/raliev# systemctl status vsftpd
● vsftpd.service - Vsftpd ftp daemon
   Loaded: loaded (/usr/lib/systemd/system/vsftpd.service; enabled; preset: disabled)
   Active: active (running) since Fri 2025-10-03 16:18:03 MSK; 3min 59s ago
 Invocation: 4331515c40d64a3b8d0567a7118e1b04
    Main PID: 5052 (vsftpd)
      Tasks: 1 (limit: 24779)
     Memory: 752K (peak: 1.2M)
        CPU: 2ms
    CGroup: /system.slice/vsftpd.service
            └─5052 /usr/sbin/vsftpd /etc/vsftpd/vsftpd.conf

Oct 03 16:18:03 raliev.localdomain systemd[1]: Starting vsftpd.service - Vsftpd ftp daemon...
Oct 03 16:18:03 raliev.localdomain systemd[1]: Started vsftpd.service - Vsftpd ftp daemon.
root@raliev:/home/raliev#
```

Рис. 3: Добавление службы vsftpd в автозапуск

```
root@raliev:/home/raliev# systemctl disable vsftpd
Removed '/etc/systemd/system/multi-user.target.wants/vsftpd.service'.
root@raliev:/home/raliev#
root@raliev:/home/raliev# systemctl status vsftpd
● vsftpd.service - Vsftpd ftp daemon
   Loaded: loaded (/usr/lib/systemd/system/vsftpd.service; disabled; preset: disabled)
   Active: active (running) since Fri 2025-10-03 16:18:03 MSK; 4min 51s ago
  Invocation: 4331515c40d64a3b8d0567a7118e1b04
    Main PID: 5052 (vsftpd)
      Tasks: 1 (limit: 24779)
     Memory: 752K (peak: 1.2M)
        CPU: 2ms
    CGroup: /system.slice/vsftpd.service
            └─5052 /usr/sbin/vsftpd /etc/vsftpd/vsftpd.conf

Oct 03 16:18:03 raliev.localdomain systemd[1]: Starting vsftpd.service - Vsftpd ftp daemon...
Oct 03 16:18:03 raliev.localdomain systemd[1]: Started vsftpd.service - Vsftpd ftp daemon.
root@raliev:/home/raliev# █
```

Рис. 4: Отключение автозапуска vsftpd



```
root@raliev:/home/raliev#  
root@raliev:/home/raliev# ls /etc/systemd/system/multi-user.target.wants/  
atd.service cups.service ModemManager.service sssd.service  
auditd.service firewalld.service NetworkManager.service tuned.service  
audit-rules.service irqbalance.service remote-cryptsetup.target vboxadd.service  
avahi-daemon.service kdump.service remote-fs.target vboxadd-service.service  
chronyd.service libstoragemgmt.service rsyslog.service vmtologd.service  
crond.service mcelog.service smartd.service  
cups.path mdmonitor.service sshd.service  
root@raliev:/home/raliev# systemctl enable vsftpd  
Created symlink '/etc/systemd/system/multi-user.target.wants/vsftpd.service' → '/usr/lib/systemd/system/  
vsftpd.service'.  
root@raliev:/home/raliev# ls /etc/systemd/system/multi-user.target.wants/  
atd.service cups.service ModemManager.service sssd.service  
auditd.service firewalld.service NetworkManager.service tuned.service  
audit-rules.service irqbalance.service remote-cryptsetup.target vboxadd.service  
avahi-daemon.service kdump.service remote-fs.target vboxadd-service.service  
chronyd.service libstoragemgmt.service rsyslog.service vmtologd.service  
crond.service mcelog.service smartd.service vsftpd.service  
cups.path mdmonitor.service sshd.service  
root@raliev:/home/raliev#
```

Рис. 5: Символические ссылки сервисов

```
○ |—selinux-autorelabel-mark.service
● |—sys-fs-fuse-connections.mount
● |—sys-kernel-config.mount
● |—sys-kernel-debug.mount
● |—sys-kernel-tracing.mount
○ |—systemd-ask-password-console.path
○ |—systemd-binfmt.service
○ |—systemd-boot-random-seed.service
○ |—systemd-confext.service
○ |—systemd-firstboot.service
○ |—systemd-hibernate-clear.service
○ |—systemd-hwdb-update.service
○ |—systemd-journal-catalog-update.service
● |—systemd-journal-flush.service
root@raliev:/home/raliev#
root@raliev:/home/raliev# systemctl list-dependencies vsftpd --reverse
vsftpd.service
● |—multi-user.target
● |—graphical.target
root@raliev:/home/raliev#
```

Рис. 6: Обратные зависимости vsftpd

```
root@raliev:/home/raliev# dnf -y install iptables\*
Last metadata expiration check: 0:09:13 ago on Fri 03 Oct 2025 04:16:54 PM MSK.
Package iptables-libs-1.8.11-8.el10_0.x86_64 is already installed.
Package iptables-nft-1.8.11-8.el10_0.x86_64 is already installed.
Dependencies resolved.
=====
Package                                Architecture    Version          Repository       Size
=====
Installing:
iptables-devel                        x86_64          1.8.11-9.el10_0  appstream        17 k
iptables-nft-services                noarch          1.8.11-9.el10_0  appstream        24 k
iptables-utils                        x86_64          1.8.11-9.el10_0  appstream        42 k
Upgrading:
iptables-libs                        x86_64          1.8.11-9.el10_0  baseos           408 k
iptables-nft                         x86_64          1.8.11-9.el10_0  appstream        189 k

Transaction Summary
=====
Install  3 Packages
Upgrade  2 Packages

Total download size: 680 k
```

Рис. 7: Установка iptables

```
root@raliev:/home/raliev# systemctl status firewalld
● firewalld.service - firewalld - dynamic firewall daemon
   Loaded: loaded (/usr/lib/systemd/system/firewalld.service; enabled; preset: enabled)
   Active: active (running) since Fri 2025-10-03 16:04:49 MSK; 21min ago
     Invocation: 7a5dc2e467d64610928811d111bf51c8
       Docs: man:firewalld(1)
    Main PID: 965 (firewalld)
      Tasks: 2 (limit: 24779)
     Memory: 48.8M (peak: 50.9M)
        CPU: 269ms
    CGroup: /system.slice/firewalld.service
            └─965 /usr/bin/python3 -sP /usr/sbin/firewalld --nofork --nopid

Oct 03 16:04:48 raliev.localdomain systemd[1]: Starting firewalld.service - firewalld - dynamic firewall>
Oct 03 16:04:49 raliev.localdomain systemd[1]: Started firewalld.service - firewalld - dynamic firewall>
root@raliev:/home/raliev# systemctl status iptables
○ iptables.service - IPv4 firewall with iptables
   Loaded: loaded (/usr/lib/systemd/system/iptables.service; disabled; preset: disabled)
   Active: inactive (dead)
root@raliev:/home/raliev#
```

Рис. 8: Статус firewalld и iptables

```
root@raliev:/home/raliev# systemctl status firewalld
○ firewalld.service - firewalld - dynamic firewall daemon
  Loaded: loaded (/usr/lib/systemd/system/firewalld.service; enabled; preset: enabled)
  Active: inactive (dead) since Fri 2025-10-03 16:28:09 MSK; 4s ago
  Duration: 23min 19.410s
  Invocation: 7a5dc2e467d64610928811d111bf51c8
  Docs: man:firewalld(1)
  Process: 965 ExecStart=/usr/sbin/firewalld --nofork --nopid $FIREWALLD_ARGS (code=exited, status=0/SUCCESS)
  Main PID: 965 (code=exited, status=0/SUCCESS)
  Mem peak: 50.9M
  CPU: 283ms

Oct 03 16:04:48 raliev.localdomain systemd[1]: Starting firewalld.service - firewalld - dynamic firewall>
Oct 03 16:04:49 raliev.localdomain systemd[1]: Started firewalld.service - firewalld - dynamic firewall>
Oct 03 16:28:09 raliev.localdomain systemd[1]: Stopping firewalld.service - firewalld - dynamic firewall>
Oct 03 16:28:09 raliev.localdomain systemd[1]: firewalld.service: Deactivated successfully.
Oct 03 16:28:09 raliev.localdomain systemd[1]: Stopped firewalld.service - firewalld - dynamic firewall>
root@raliev:/home/raliev# systemctl status iptables
● iptables.service - IPv4 firewall with iptables
  Loaded: loaded (/usr/lib/systemd/system/iptables.service; disabled; preset: disabled)
  Active: active (exited) since Fri 2025-10-03 16:28:09 MSK; 7s ago
  Invocation: 01cf42fda7424b5290d5aaffe78afbef
  Process: 7095 ExecStart=/usr/libexec/iptables/iptables.init start (code=exited, status=0/SUCCESS)
  Main PID: 7095 (code=exited, status=0/SUCCESS)
  Mem peak: 1.5M
  CPU: 7ms

Oct 03 16:28:09 raliev.localdomain systemd[1]: Starting iptables.service - IPv4 firewall with iptables.>
Oct 03 16:28:09 raliev.localdomain iptables.init[7095]: iptables: Applying firewall rules: [ OK ]
Oct 03 16:28:09 raliev.localdomain systemd[1]: Finished iptables.service - IPv4 firewall with iptables.
root@raliev:/home/raliev#
```

Рис. 9: Конфликт запуска firewalld и iptables

```
root@raliev:/home/raliev#  
root@raliev:/home/raliev# cat /usr/lib/systemd/system/firewalld.service  
[Unit]  
Description=firewalld - dynamic firewall daemon  
Before=network-pre.target  
Wants=network-pre.target  
After=dbus.service  
After=polkit.service  
Conflicts=iptables.service ip6tables.service ebtables.service ipset.service  
Documentation=man:firewalld(1)  
  
[Service]  
EnvironmentFile=-/etc/sysconfig/firewalld  
ExecStart=/usr/sbin/firewalld --nofork --nopid $FIREWALLD_ARGS  
ExecReload=/bin/kill -HUP $MAINPID  
# suppress to log debug and error output also to /var/log/messages  
StandardOutput=null  
StandardError=null  
Type=dbus  
BusName=org.fedoraproject.FirewallD1  
KillMode=mixed
```

Рис. 10: Конфликты в firewalld.service

```
root@raliev:~# cat /usr/lib/systemd/system/iptables.service
[Unit]
Description=IPv4 firewall with iptables
AssertPathExists=/etc/sysconfig/iptables
Before=network-pre.target
Wants=network-pre.target

[Service]
Type=oneshot
RemainAfterExit=yes
ExecStart=/usr/libexec/iptables/iptables.init start
ExecReload=/usr/libexec/iptables/iptables.init reload
ExecStop=/usr/libexec/iptables/iptables.init stop
Environment=BOOTUP=serial
Environment=CONSOLETYPE=serial

[Install]
WantedBy=multi-user.target
root@raliev:~#
```

Рис. 11: Содержимое iptables.service

```
root@raliev:/home/raliev#  
root@raliev:/home/raliev# systemctl stop iptables  
root@raliev:/home/raliev# systemctl start firewalld  
root@raliev:/home/raliev# systemctl mask iptables  
Created symlink '/etc/systemd/system/iptables.service' → '/dev/null'.  
root@raliev:/home/raliev# systemctl start iptables  
Failed to start iptables.service: Unit iptables.service is masked.  
root@raliev:/home/raliev# systemctl enable iptables  
Failed to enable unit: Unit /etc/systemd/system/iptables.service is masked  
root@raliev:/home/raliev#
```

Рис. 12: Маскирование iptables



## Изолируемые цели

```
root@raliev:/home/raliev#  
root@raliev:/home/raliev# cd /usr/lib/systemd/system  
root@raliev:/usr/lib/systemd/system# grep Isolate *.target  
ctrl-alt-del.target:AllowIsolate=yes  
default.target:AllowIsolate=yes  
emergency.target:AllowIsolate=yes  
exit.target:AllowIsolate=yes  
graphical.target:AllowIsolate=yes  
halt.target:AllowIsolate=yes  
initrd-switch-root.target:AllowIsolate=yes  
initrd.target:AllowIsolate=yes  
kexec.target:AllowIsolate=yes  
multi-user.target:AllowIsolate=yes  
poweroff.target:AllowIsolate=yes  
reboot.target:AllowIsolate=yes  
rescue.target:AllowIsolate=yes  
runlevel0.target:AllowIsolate=yes  
runlevel1.target:AllowIsolate=yes  
runlevel2.target:AllowIsolate=yes  
runlevel3.target:AllowIsolate=yes  
runlevel4.target:AllowIsolate=yes  
runlevel5.target:AllowIsolate=yes  
runlevel6.target:AllowIsolate=yes  
soft-reboot.target:AllowIsolate=yes  
system-update.target:AllowIsolate=yes  
root@raliev:/usr/lib/systemd/system#
```

```
You are in rescue mode. After logging in, type "journalctl -xb" to view
system logs, "systemctl reboot" to reboot, or "exit"
to continue bootup.
Give root password for maintenance
(or press Control-D to continue):
root@raliev:~# systemctl isolate reboot.target
```

Рис. 14: Перевод системы в rescue.target

```
raliev@raliev:~$ su
Password:
root@raliev:/home/raliev# systemctl get-default
graphical.target
root@raliev:/home/raliev# systemctl set-default multi-user.target
Removed '/etc/systemd/system/default.target'.
Created symlink '/etc/systemd/system/default.target' → '/usr/lib/systemd/system/multi-user.target'.
root@raliev:/home/raliev# █
```

Рис. 15: Текущая цель по умолчанию

```
Rocky Linux 10.0 (Red Quartz)
Kernel 6.12.0-55.12.1.el10_0.x86_64 on x86_64

Web console: https://raliev.localdomain:9090/ or https://10.0.2.15:9090/

raliev login: root
Password:
Last login: Fri Oct  3 16:33:56 on pts/0
root@raliev:~# systemctl set-default graphical.target
Removed '/etc/systemd/system/default.target'.
Created symlink '/etc/systemd/system/default.target' → '/usr/lib/systemd/system/graphical.target'.
root@raliev:~# _
```

Рис. 16: Возврат графического режима

## Итоги работы

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В ходе работы были изучены основные приёмы управления службами и целями в **systemd**. Было рассмотрено, как запускать и останавливать сервисы, включать и отключать их из автозагрузки, а также анализировать зависимости между юнитами.

Особое внимание уделялось работе с изолируемыми целями и настройке цели по умолчанию при загрузке системы.

Кроме того, были исследованы конфликты юнитов (например, между **firewalld** и **iptables**) и способы их разрешения.