

Лабораторная работа №5

Управление системными службами

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Цель работы

Основная цель

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

Ход выполнения работы

Управление сервисами

```
raliev@raliev:~$ su
Password:
root@raliev:/home/raliev# systemctl status vsftpd
Unit vsftpd.service could not be found.

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

Управление сервисами

```
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

Управление сервисами

```
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

Управление сервисами

```
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

Управление сервисами

```
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    vmtoolsd.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    vmtoolsd.service  
crond.service    mcelog.service   smartd.service  
cups.path        mdmonitor.service sshd.service  
root@raliev:/home/raliev#
```

Рис. 5: Символические ссылки сервисов

Управление сервисами

```
└─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

Конфликты юнитов

```
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

Конфликты юнитов

```
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

Конфликты юнитов

```
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=0/0)
       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

Конфликты юнитов

```
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 ebttables.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
# supress to log debug and error output also to /var/log/messages
StandardOutput=null
StandardError=null
Type=dbus
BusName=org.fedoraproject.FirewallD1
KillMode=mived
```

Рис. 10: Конфликты в firewalld.service

Конфликты юнитов

```
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=CONSOLETEYPE=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#
```

Изолируемые цели

```
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

Цель по умолчанию

```
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

Цель по умолчанию

```
Rocky Linux 8.0 (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

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.