

Презентация по лабораторной работе №5

Управление системными службами

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Цели и задачи работы

Получить навыки управления системными службами операционной системы посредством systemd.

- 1 Установить и запустить службу vsftpd, настроить её автозапуск
- 2 Изучить конфликты юнитов на примере iptables и firewalld
- 3 Научиться маскировать службы для предотвращения запуска
- 4 Изучить изолируемые цели systemd и их использование
- 5 Изменить цели загрузки по умолчанию между текстовым и графическим режимами

Ход выполнения работы

Управление службой vsftpd

```
aasaenko@aasaenko:~$ su
Password:
root@aasaenko:/home/aasaenko# systemctl status fsftpd
Unit fsftpd.service could not be found.
root@aasaenko:/home/aasaenko# systemctl status vsftpd
Unit vsftpd.service could not be found.
root@aasaenko:/home/aasaenko# dnf -y install vsftpd
Rocky Linux 10 - BaseOS                               12 kB/s | 3.9 kB    00:00
Rocky Linux 10 - BaseOS                               28 MB/s | 18 MB    00:00
Rocky Linux 10 - AppStream                             12 kB/s | 3.9 kB    00:00
Rocky Linux 10 - AppStream                           137 kB/s | 2.1 MB   00:15
Rocky Linux 10 - Extras                               9.3 kB/s | 3.1 kB   00:00
Rocky Linux 10 - Extras                               16 kB/s | 4.9 kB    00:00
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                        2.9 MB/s | 170 kB    00:00
-----
Total                                                    565 kB/s | 170 kB    00:00
Running transaction check
Transaction check succeeded.
```

Рис. 1: Проверка отсутствия службы и установка

```
root@aasaenko:/home/aasaenko#
root@aasaenko:/home/aasaenko# systemctl start vsftpd
root@aasaenko:/home/aasaenko# systemctl status vsftpd
● vsftpd.service - Vsftpd ftp daemon
   Loaded: loaded (/usr/lib/systemd/system/vsftpd.service; disabled; preset: disabled)
   Active: active (running) since Sun 2025-09-21 12:28:31 MSK; 2s ago
     Invocation: 965e197976c44a7398868b56a3dda6bb
   Process: 3904 ExecStart=/usr/sbin/vsftpd /etc/vsftpd/vsftpd.conf (code=exited, status=0/SUCCESS)
    Main PID: 3905 (vsftpd)
      Tasks: 1 (limit: 24779)
     Memory: 752K (peak: 1.1M)
        CPU: 2ms
      CGroup: /system.slice/vsftpd.service
              └─3905 /usr/sbin/vsftpd /etc/vsftpd/vsftpd.conf

Sep 21 12:28:31 aasaenko.localdomain systemd[1]: Starting vsftpd.service - Vsftpd ftp daemon...
Sep 21 12:28:31 aasaenko.localdomain systemd[1]: Started vsftpd.service - Vsftpd ftp daemon.
root@aasaenko:/home/aasaenko#
```

Рис. 2: Запуск и проверка работы службы

```
root@aasaenko:/home/aasaenko# systemctl status vsftpd
● vsftpd.service - Vsftpd ftp daemon
   Loaded: loaded (/usr/lib/systemd/system/vsftpd.service; enabled; preset: disabled)
   Active: active (running) since Sun 2025-09-21 12:28:31 MSK; 1min 33s ago
 Invocation: 965e197976c44a7398868b56a3dda6bb
    Main PID: 3905 (vsftpd)
      Tasks: 1 (limit: 24779)
     Memory: 752K (peak: 1.1M)
        CPU: 2ms
    CGroup: /system.slice/vsftpd.service
            └─3905 /usr/sbin/vsftpd /etc/vsftpd/vsftpd.conf

Sep 21 12:28:31 aasaenko.localdomain systemd[1]: Starting vsftpd.service - Vsftpd ftp daemon...
Sep 21 12:28:31 aasaenko.localdomain systemd[1]: Started vsftpd.service - Vsftpd ftp daemon.
root@aasaenko:/home/aasaenko# █
```

Рис. 3: Добавление и удаление службы из автозапуска


```
root@aasaenko:/home/aasaenko# 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@aasaenko:/home/aasaenko# systemctl enable vsftpd
Created symlink '/etc/systemd/system/multi-user.target.wants/vsftpd.service' → '/usr/lib/systemd/system/vsftpd.service'.

root@aasaenko:/home/aasaenko# 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         vsftpd.service
cups.path         mdmonitor.service  sshd.service
```

Рис. 4: Работа с каталогом multi-user.target.wants

```
root@aasaenko:/home/aasaenko# dnf -y install iptables*
Last metadata expiration check: 0:06:27 ago on Sun 21 Sep 2025 12:27:09 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          1.8.11-8.el10_0  appstream        17 k
iptables-nft-services                noarch          1.8.11-8.el10_0  appstream        24 k
iptables-utils                        x86_64          1.8.11-8.el10_0  appstream        42 k
=====

Transaction Summary
=====
Install 3 Packages

Total download size: 82 k
Installed size: 142 k
Downloading Packages:
(1/3): iptables-devel-1.8.11-8.el10_0.x86_64.rpm                15 kB/s | 17 kB    00:01
(2/3): iptables-nft-services-1.8.11-8.el10_0.noarch.rpm        21 kB/s | 24 kB    00:01
(3/3): iptables-utils-1.8.11-8.el10_0.x86_64.rpm               37 kB/s | 42 kB    00:01
-----
Total                                                                52 kB/s | 82 kB    00:01
Running transaction check
Transaction check succeeded.
Running transaction test
```

Рис. 5: Установка пакетов iptables

```
root@aasaenko:/home/aasaenko# systemctl status firewalld.service
● firewalld.service - firewalld - dynamic firewall daemon
   Loaded: loaded (/usr/lib/systemd/system/firewalld.service; enabled; preset: enabled)
   Active: active (running) since Sun 2025-09-21 12:24:22 MSK; 9min ago
 Invocation: 594eba0b524e49e58c0b8fc7ff53604b
    Docs: man:firewalld(1)
   Main PID: 953 (firewalld)
     Tasks: 2 (limit: 24779)
    Memory: 49.1M (peak: 51.1M)
       CPU: 176ms
    CGroup: /system.slice/firewalld.service
            └─953 /usr/bin/python3 -sP /usr/sbin/firewalld --nofork --nopid

Sep 21 12:24:22 aasaenko.localdomain systemd[1]: Starting firewalld.service - firewalld - dynamic firewall d
Sep 21 12:24:22 aasaenko.localdomain systemd[1]: Started firewalld.service - firewalld - dynamic firewall da
root@aasaenko:/home/aasaenko# systemctl status iptables.service
○ iptables.service - IPv4 firewall with iptables
   Loaded: loaded (/usr/lib/systemd/system/iptables.service; disabled; preset: disabled)
   Active: inactive (dead)
root@aasaenko:/home/aasaenko#
```

Рис. 6: Проверка состояния служб firewalld и iptables

```
root@aasaenko:/home/aasaenko# systemctl start firewalld
root@aasaenko:/home/aasaenko# systemctl start iptables
root@aasaenko:/home/aasaenko# systemctl status firewalld.service
○ firewalld.service - firewalld - dynamic firewall daemon
   Loaded: loaded (/usr/lib/systemd/system/firewalld.service; enabled; preset: enabled)
   Active: inactive (dead) since Sun 2025-09-21 12:35:34 MSK; 4s ago
     Duration: 11min 11.673s
  Invocation: 594eba0b524e49e58c0b8fc7ff53604b
       Docs: man:firewalld(1)
    Process: 953 ExecStart=/usr/sbin/firewalld --nofork --nopid $FIREWALLD_ARGS (code=exited, status=0/SUCCESS)
   Main PID: 953 (code=exited, status=0/SUCCESS)
    Mem peak: 51.1M
       CPU: 190ms

Sep 21 12:24:22 aasaenko.localdomain systemd[1]: Starting firewalld.service - firewalld - dynamic firewall daemon:
Sep 21 12:24:22 aasaenko.localdomain systemd[1]: Started firewalld.service - firewalld - dynamic firewall daemon:
Sep 21 12:35:34 aasaenko.localdomain systemd[1]: Stopping firewalld.service - firewalld - dynamic firewall daemon:
Sep 21 12:35:34 aasaenko.localdomain systemd[1]: firewalld.service: Deactivated successfully.
Sep 21 12:35:34 aasaenko.localdomain systemd[1]: Stopped firewalld.service - firewalld - dynamic firewall daemon:
root@aasaenko:/home/aasaenko# systemctl status iptables.service
● iptables.service - IPv4 firewall with iptables
   Loaded: loaded (/usr/lib/systemd/system/iptables.service; disabled; preset: disabled)
   Active: active (exited) since Sun 2025-09-21 12:35:34 MSK; 8s ago
     Invocation: b7d47641b60f4b228f7b8dfff9a7a5d0
    Process: 5560 ExecStart=/usr/libexec/iptables/iptables.init start (code=exited, status=0/SUCCESS)
   Main PID: 5560 (code=exited, status=0/SUCCESS)
    Mem peak: 1.9M
       CPU: 7ms
```

Рис. 7: Запуск служб и проявление конфликта

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

Рис. 8: Маскирование iptables и проверка

Изолируемые цели

```
----- /usr/lib/systemd/system
root@aasaenko:/home/aasaenko# cd /usr/lib/systemd/system
root@aasaenko:/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@aasaenko:/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):
Login incorrect

Give root password for maintenance
(or press Control-D to continue):
root@aasaenko:~# systemctl isolate reboot.target
```

Рис. 10: Переход в режим восстановления и перезагрузка

```
aasaenko@aasaenko:~$ su
Password:
root@aasaenko:/home/aasaenko# systemctl get-default
graphical.target
root@aasaenko:/home/aasaenko# 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@aasaenko:/home/aasaenko#
```

Рис. 11: Проверка цели 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://aasaenko.localdomain:9090/ or https://10.0.2.15:9090/

aasaenko login: root
Password:
Last login: Sun Sep 21 12:42:57 on pts/0
root@aasaenko:~# 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@aasaenko:~#
```

Рис. 12: Изменение цели загрузки по умолчанию

Выводы по проделанной работе

В ходе лабораторной работы были освоены:

- управление службами в systemd (установка, запуск, автозапуск);
- работа с зависимостями и конфликтами юнитов;
- маскирование сервисов для предотвращения их запуска;
- использование изолируемых целей и их назначение;
- настройка цели загрузки по умолчанию (multi-user и graphical).