Отчёт по лабораторной работе №5

Управление системными службами

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Цель работы

Цель

Получить навыки управления системными службами операционной системы посредством systemd.

Выполнение лабораторной работы

Управление сервисом vsftpd

```
dsyakovleva@dsyakovleva:~$ su
Password:
su: Authentication failure
dsyakovleva@dsyakovleva:~$ su
Password:
root@dsyakovleva:/home/dsyakovleva# systemctl status vsftpd
Unit vsftpd.service could not be found.
root@dsyakovleva:/home/dsyakovleva# dnf -y install vsftpd
Rocky Linux 10 - BaseOS                                          8.9 kB/s | 3.9 kB     00:00
Rocky Linux 10 - BaseOS                                          2.5 MB/s |  18 MB     00:06
Rocky Linux 10 - AppStream                                       3.6 kB/s | 3.9 kB     00:01
Rocky Linux 10 - AppStream                                       3.8 MB/s | 2.1 MB     00:00
Rocky Linux 10 - Extras                                          8.1 kB/s | 3.1 kB     00:00
Rocky Linux 10 - Extras                                          8.6 kB/s | 4.9 kB     00:00
Last metadata expiration check: 0:00:01 ago on Thu 18 Sep 2025 04:15:02 PM MSK.
Dependencies resolved.
================================================================================================
 Package              Architecture         Version                      Repository              Size
================================================================================================
Installing:
 vsftpd               x86_64               3.0.5-9.el10                 appstream              170 k

Transaction Summary
================================================================================================
```

Рис. 1: Установка vsftpd

Управление сервисом vsftpd

```
root@dsyakovleva:/home/dsyakovleva#
root@dsyakovleva:/home/dsyakovleva# systemctl start vsftpd
root@dsyakovleva:/home/dsyakovleva# systemctl status vsftpd
● vsftpd.service - Vsftpd ftp daemon
     Loaded: loaded (/usr/lib/systemd/system/vsftpd.service; disabled; preset: disabled)
     Active: active (running) since Thu 2025-09-18 16:16:04 MSK; 5s ago
 Invocation: 1cdebab77275435ca1a9e8de4aca190a
    Process: 4015 ExecStart=/usr/sbin/vsftpd /etc/vsftpd/vsftpd.conf (code=exited, status=0/SUCCESS)
   Main PID: 4021 (vsftpd)
      Tasks: 1 (limit: 24776)
     Memory: 756K (peak: 1.2M)
        CPU: 14ms
     CGroup: /system.slice/vsftpd.service
             └─4021 /usr/sbin/vsftpd /etc/vsftpd/vsftpd.conf

Sep 18 16:16:04 dsyakovleva.localdomain systemd[1]: Starting vsftpd.service - Vsftpd ftp daemon...
Sep 18 16:16:04 dsyakovleva.localdomain systemd[1]: Started vsftpd.service - Vsftpd ftp daemon.
root@dsyakovleva:/home/dsyakovleva# systemctl enable vsftpd
Created symlink '/etc/systemd/system/multi-user.target.wants/vsftpd.service' → '/usr/lib/systemd/system/vsftpd.service'.
root@dsyakovleva:/home/dsyakovleva# systemctl status vsftpd
● vsftpd.service - Vsftpd ftp daemon
     Loaded: loaded (/usr/lib/systemd/system/vsftpd.service; enabled; preset: disabled)
     Active: active (running) since Thu 2025-09-18 16:16:04 MSK; 31s ago
 Invocation: 1cdebab77275435ca1a9e8de4aca190a
   Main PID: 4021 (vsftpd)
      Tasks: 1 (limit: 24776)
     Memory: 756K (peak: 1.2M)
        CPU: 14ms
     CGroup: /system.slice/vsftpd.service
             └─4021 /usr/sbin/vsftpd /etc/vsftpd/vsftpd.conf

Sep 18 16:16:04 dsyakovleva.localdomain systemd[1]: Starting vsftpd.service - Vsftpd ftp daemon...
Sep 18 16:16:04 dsyakovleva.localdomain systemd[1]: Started vsftpd.service - Vsftpd ftp daemon.
root@dsyakovleva:/home/dsyakovleva#
```

Рис. 2: Запуск и включение автозагрузки

Управление сервисом vsftpd

```
root@dsyakovleva:/home/dsyakovleva#
root@dsyakovleva:/home/dsyakovleva# systemctl disable vsftpd
Removed '/etc/systemd/system/multi-user.target.wants/vsftpd.service'.
root@dsyakovleva:/home/dsyakovleva# systemctl status vsftpd
● vsftpd.service - Vsftpd ftp daemon
     Loaded: loaded (/usr/lib/systemd/system/vsftpd.service; disabled; preset: disabled)
     Active: active (running) since Thu 2025-09-18 16:16:04 MSK; 1min 21s ago
 Invocation: 1cdebab77275435ca1a9e8de4aca190a
   Main PID: 4021 (vsftpd)
      Tasks: 1 (limit: 24776)
     Memory: 756K (peak: 1.2M)
        CPU: 14ms
     CGroup: /system.slice/vsftpd.service
             └─4021 /usr/sbin/vsftpd /etc/vsftpd/vsftpd.conf

Sep 18 16:16:04 dsyakovleva.localdomain systemd[1]: Starting vsftpd.service - Vsftpd ftp daemon...
Sep 18 16:16:04 dsyakovleva.localdomain systemd[1]: Started vsftpd.service - Vsftpd ftp daemon.
root@dsyakovleva:/home/dsyakovleva#
```

Рис. 3: Отключение автозапуска

Управление сервисом vsftpd

Рис. 4: Символические ссылки

Управление сервисом vsftpd

```
root@dsyakovleva:/home/dsyakovleva# systemctl list-dependencies vsftpd
vsftpd.service
● ├─system.slice
● └─sysinit.target
●   ├─dev-hugepages.mount
●   ├─dev-mqueue.mount
●   ├─dracut-shutdown.service
○   ├─fips-crypto-policy-overlay.service
○   ├─iscsi-onboot.service
○   ├─iscsi-starter.service
●   ├─kmod-static-nodes.service
○   ├─ldconfig.service
●   ├─lvm2-lvmpolld.socket
●   ├─lvm2-monitor.service
○   ├─multipathd.service
●   ├─plymouth-read-write.service
●   ├─plymouth-start.service
●   ├─proc-sys-fs-binfmt_misc.automount
○   ├─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
```

Управление сервисом vsftpd

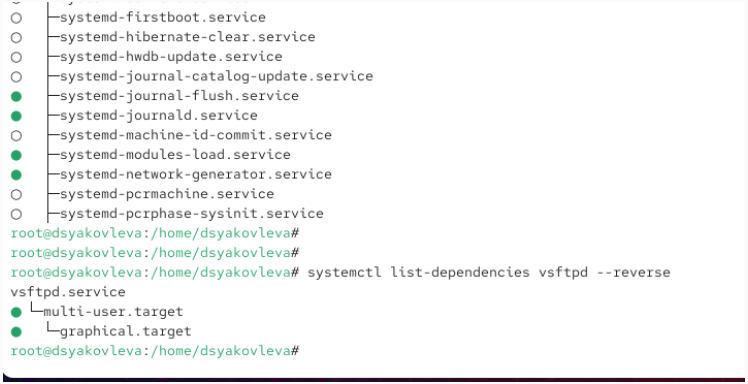

Рис. 6: Зависимости vsftpd

Конфликты юнитов

```
Transaction test succeeded.
Running transaction
  Preparing        :                                                                                                1/1
  Installing       : iptables-utils-1.8.11-8.el10_0.x86_64                                                          1/3
  Installing       : iptables-nft-services-1.8.11-8.el10_0.noarch                                                   2/3
  Running scriptlet: iptables-nft-services-1.8.11-8.el10_0.noarch                                                   2/3
  Installing       : iptables-devel-1.8.11-8.el10_0.x86_64                                                          3/3
  Running scriptlet: iptables-devel-1.8.11-8.el10_0.x86_64                                                          3/3

Installed:
  iptables-devel-1.8.11-8.el10_0.x86_64      iptables-nft-services-1.8.11-8.el10_0.noarch      iptables-utils-1.8.11-8.el10_0.x86_64

Complete!
root@dsyakovleva:/home/dsyakovleva# 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 Thu 2025-09-18 16:10:35 MSK; 11min ago
 Invocation: e379e3b2d8394ed0ba98df035cf88e00
       Docs: man:firewalld(1)
   Main PID: 1013 (firewalld)
      Tasks: 2 (limit: 24776)
     Memory: 49.5M (peak: 50M)
        CPU: 1.422s
     CGroup: /system.slice/firewalld.service
             └─1013 /usr/bin/python3 -sP /usr/sbin/firewalld --nofork --nopid

Sep 18 16:10:31 dsyakovleva.localdomain systemd[1]: Starting firewalld.service - firewalld - dynamic firewall daemon...
Sep 18 16:10:35 dsyakovleva.localdomain systemd[1]: Started firewalld.service - firewalld - dynamic firewall daemon.
root@dsyakovleva:/home/dsyakovleva# 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@dsyakovleva:/home/dsyakovleva#
```

Рис. 7: Установка и проверка статуса сервисов

Конфликты юнитов

```
root@dsyakovleva:/home/dsyakovleva#
root@dsyakovleva:/home/dsyakovleva# systemctl start firewalld
root@dsyakovleva:/home/dsyakovleva# systemctl start iptables.service
root@dsyakovleva:/home/dsyakovleva# cat /usr/lib/systemd/system/fir
firewalld.service           first-boot-complete.target
root@dsyakovleva:/home/dsyakovleva# 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
# supress to log debug and error output also to /var/log/messages
StandardOutput=null
StandardError=null
Type=dbus
BusName=org.fedoraproject.FirewallD1
KillMode=mixed
DevicePolicy=closed
KeyringMode=private
LockPersonality=yes
MemoryDenyWriteExecute=yes
PrivateDevices=yes
ProtectClock=yes
ProtectControlGroups=yes
ProtectHome=yes
ProtectHostname=yes
ProtectKernelLogs=yes
ProtectKernelModules=no
ProtectKernelTunables=no
ProtectSystem=yes
```

Конфликты юнитов

```
root@dsyakovleva:/home/dsyakovleva#
root@dsyakovleva:/home/dsyakovleva# 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@dsyakovleva:/home/dsyakovleva#
```

Рис. 9: Маскирование iptables

Конфликты юнитов

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

Рис. 10: Попытка запуска masked-сервиса

Изолируемые цели

```
root@dsyakovleva:/home/dsyakovleva#
root@dsyakovleva:/home/dsyakovleva# cd /usr/lib/systemd/system
root@dsyakovleva:/usr/lib/systemd/system# grep Isolate *.raget
grep: *.raget: No such file or directory
root@dsyakovleva:/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@dsyakovleva:/usr/lib/systemd/system#
```

Изолируемые цели

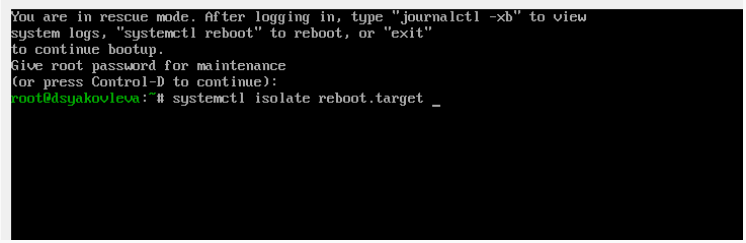

Рис. 12: Переключение в режим восстановления

Цель по умолчанию

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

Рис. 13: Изменение цели по умолчанию

Цель по умолчанию

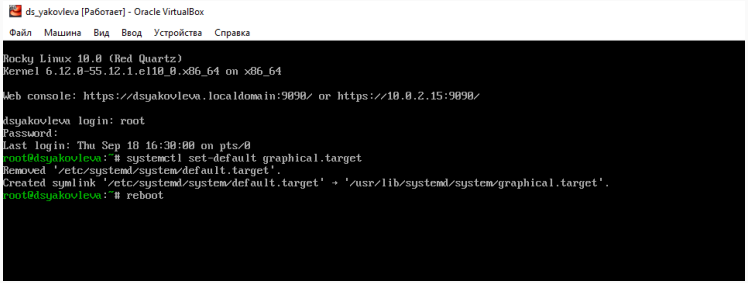

Рис. 14: Установка graphical.target

Итоги работы

Управление сервисом vsftpd

- Проверка статуса: `systemctl status vsftpd`
- Установка пакета: `dnf -y install vsftpd`
- Запуск службы: `systemctl start vsftpd`
- Добавление в автозагрузку: `systemctl enable vsftpd`
- Удаление из автозагрузки: `systemctl disable vsftpd`
- Просмотр зависимостей: `systemctl list-dependencies vsftpd`

Изолируемые цели

- Список активных целей: `systemctl --type=target`
- Список всех целей: `systemctl --type=target --all`
- Поиск изолируемых: `grep Isolate *.target`
- Переключение в режим восстановления: `systemctl isolate rescue.target`
- Перезагрузка системы: `systemctl isolate reboot.target`

Вывод

Были изучены принципы управления юнитами в systemd.

Продемонстрированы установка и настройка сервисов, работа с автозагрузкой, разрешение конфликтов и использование изолируемых целей.