

Лабораторная работа 5

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Задача

1. Выполните основные операции по запуску (останову), определению статуса, добавлению (удалению) в автозапуск и пр. службы Very Secure FTP (раздел 5.4.1).

1. Выполните основные операции по запуску (останову), определению статуса, добавлению (удалению) в автозапуск и пр. службы Very Secure FTP (раздел 5.4.1).
2. Продемонстрируйте навыки по разрешению конфликтов юнитов для служб firewalld и iptables (раздел 5.4.2).

1. Выполните основные операции по запуску (останову), определению статуса, добавлению (удалению) в автозапуск и пр. службы Very Secure FTP (раздел 5.4.1).
2. Продемонстрируйте навыки по разрешению конфликтов юнитов для служб firewalld и iptables (раздел 5.4.2).
3. Продемонстрируйте навыки работы с изолированными целями (разделы 5.4.3, 5.4.4).

Выполнение

Запуск, включение и отключение службы

```
[root@dmgeneralov ~]# systemctl status vsftpd.service
● vsftpd.service - Vsftpd ftp daemon
   Loaded: loaded (/usr/lib/systemd/system/vsftpd.service; disabled; vendor preset: disabled)
   Active: inactive (dead)
[root@dmgeneralov ~]# dnf install -y vsftpd
Last metadata expiration check: 0:22:51 ago on Fri 25 Nov 2022 12:47:21 AM MSK.
Package vsftpd-3.0.3-49.el9.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
[root@dmgeneralov ~]# systemctl start vsftpd.service
[root@dmgeneralov ~]# systemctl status vsftpd.service
● vsftpd.service - Vsftpd ftp daemon
   Loaded: loaded (/usr/lib/systemd/system/vsftpd.service; disabled; vendor preset: disabled)
   Active: active (running) since Fri 2022-11-25 01:10:25 MSK; 4s ago
   Process: 1307 ExecStart=/usr/sbin/vsftpd /etc/vsftpd/vsftpd.conf (code=exited, status=0/SUCCESS)
   Main PID: 1308 (vsftpd)
     Tasks: 1 (limit: 11184)
    Memory: 896.0K
         CPU: 7ms
    CGroup: /system.slice/vsftpd.service
            └─1308 /usr/sbin/vsftpd /etc/vsftpd/vsftpd.conf

Nov 25 01:10:25 dmgeneralov systemd[1]: Starting Vsftpd ftp daemon...
Nov 25 01:10:25 dmgeneralov systemd[1]: Started Vsftpd ftp daemon.
[root@dmgeneralov ~]# systemctl enable vsftpd.service
Created symlink /etc/systemd/system/multi-user.target.wants/vsftpd.service + /usr/lib/systemd/system/vsftpd.service.
[ 3344.410647] systemd-rc-local-generator[1324]: /etc/rc.d/rc.local is not marked executable, skipping.
[root@dmgeneralov ~]# systemctl status vsftpd.service
● vsftpd.service - Vsftpd ftp daemon
   Loaded: loaded (/usr/lib/systemd/system/vsftpd.service; enabled; vendor preset: disabled)
   Active: active (running) since Fri 2022-11-25 01:10:25 MSK; 36s ago
   Main PID: 1308 (vsftpd)
     Tasks: 1 (limit: 11184)
    Memory: 896.0K
         CPU: 7ms
    CGroup: /system.slice/vsftpd.service
            └─1308 /usr/sbin/vsftpd /etc/vsftpd/vsftpd.conf

Nov 25 01:10:25 dmgeneralov systemd[1]: Starting Vsftpd ftp daemon...
Nov 25 01:10:25 dmgeneralov systemd[1]: Started Vsftpd ftp daemon.
[root@dmgeneralov ~]# systemctl disable vsftpd.service
Removed /etc/systemd/system/multi-user.target.wants/vsftpd.service.
[ 3362.668575] systemd-rc-local-generator[13541]: /etc/rc.d/rc.local is not marked executable, skipping
```

```
[root@dmgeneralov ~]# ls /etc/systemd/system/multi-user.target.wants/
auditd.service  crond.service  irqbalance.service  NetworkManager.service  rsyslog.service  sssd.service
chronpd.service  firewallld.service  kdump.service  remote-fs.target  sshd.service
[root@dmgeneralov ~]# systemctl status vsftpd.service
● vsftpd.service - Vsftpd ftp daemon
   Loaded: loaded (/usr/lib/systemd/system/vsftpd.service; disabled; vendor preset: disabled)
   Active: active (running) since Fri 2022-11-25 01:10:25 MSK; 3min 32s ago
     Main PID: 1308 (vsftpd)
       Tasks: 1 (limit: 11104)
      Memory: 896.0K
         CPU: 7ms
      CGroup: /system.slice/vsftpd.service
              └─1308 /usr/sbin/vsftpd /etc/vsftpd/vsftpd.conf

Nov 25 01:10:25 dmgeneralov systemd[1]: Starting Vsftpd ftp daemon...
Nov 25 01:10:25 dmgeneralov systemd[1]: Started Vsftpd ftp daemon.
[root@dmgeneralov ~]# systemctl enable vsftpd.service
Created symlink /etc/systemd/system/multi-user.target.wants/vsftpd.service → /usr/lib/systemd/system/vsftpd.service.
[ 3536.854549] systemd-rc-local-generator[1445]: /etc/rc.d/rc.local is not marked executable, skipping.
[root@dmgeneralov ~]# systemctl status vsftpd.service
● vsftpd.service - Vsftpd ftp daemon
   Loaded: loaded (/usr/lib/systemd/system/vsftpd.service; enabled; vendor preset: disabled)
   Active: active (running) since Fri 2022-11-25 01:10:25 MSK; 3min 48s ago
     Main PID: 1308 (vsftpd)
       Tasks: 1 (limit: 11104)
      Memory: 896.0K
         CPU: 7ms
      CGroup: /system.slice/vsftpd.service
              └─1308 /usr/sbin/vsftpd /etc/vsftpd/vsftpd.conf

Nov 25 01:10:25 dmgeneralov systemd[1]: Starting Vsftpd ftp daemon...
Nov 25 01:10:25 dmgeneralov systemd[1]: Started Vsftpd ftp daemon.
[root@dmgeneralov ~]# ls /etc/systemd/system/multi-user.target.wants/
auditd.service  crond.service  irqbalance.service  NetworkManager.service  rsyslog.service  sssd.service
chronpd.service  firewallld.service  kdump.service  remote-fs.target  sshd.service  vsftpd.service
[root@dmgeneralov ~]#
```


list-dependencies

```
[root@dmgeneralov ~]# systemctl list-dependencies vsftpd.service
```

```
vsftpd.service
```

```
● └─system.slice
● └─sysinit.target
●   └─dev-hugepages.mount
●   └─dev-mqueue.mount
●   └─dracut-shutdown.service
●   └─kmod-static-nodes.service
■   └─ldconfig.service
●   └─lvm2-lvmpolld.socket
●   └─lvm2-monitor.service
●   └─nis-domainname.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-firstboot.service
■   └─systemd-hwdb-update.service
■   └─systemd-journal-catalog-update.service
●   └─systemd-journal-flush.service
●   └─systemd-journald.service
■   └─systemd-machine-id-commit.service
■   └─systemd-modules-load.service
●   └─systemd-network-generator.service
●   └─systemd-random-seed.service
■   └─systemd-repart.service
●   └─systemd-sysctl.service
■   └─systemd-sysusers.service
●   └─systemd-tmpfiles-setup-dev.service
●   └─systemd-tmpfiles-setup.service
●   └─systemd-udev-trigger.service
●   └─systemd-udevd.service
■   └─systemd-update-done.service
●   └─systemd-update-utmp.service
●   └─cryptsetup.target
●   └─integritysetup.target
●   └─local-fs.target
●   └─└─.mount
●   └─└─boot.mount
●   └─└─systemd-remount-fs.service
●   └─swap.target
●   └─└─dev-mapper-rlnx2dswap.swap
●   └─veritysetup.target
```

```
[root@dmgeneralov ~]#
```

```
[root@dmgeneralov ~]# systemctl list-dependencies --reverse vsftpd.service
vsftpd.service
● └─multi-user.target
■   └─graphical.target
[root@dmgeneralov ~]#
```

Рис. 4: --reverse

dnf install iptables

```
pkgconf                               x86_64                               1.7.3-9.el9                               baseos                                48 k
pkgconf-mt                            x86_64                               1.7.3-9.el9                               baseos                                14 k
pkgconf-pkg-config                    x86_64                               1.7.3-9.el9                               baseos                                9.9 k

Transaction Summary
-----
Install 7 Packages

Total download size: 184 k
Installed size: 387 k
Downloading Packages:
(1/7): pkgconf-pkg-config-1.7.3-9.el9.x86_64.rpm                23 kB/s | 9.9 kB | 00:00
(2/7): pkgconf-mt-1.7.3-9.el9.noarch.rpm                        32 kB/s | 14 kB | 00:00
(3/7): iptables-utils-1.8.7-28.el9.x86_64.rpm                  97 kB/s | 44 kB | 00:00
(4/7): pkgconf-1.7.3-9.el9.x86_64.rpm                          733 kB/s | 48 kB | 00:00
(5/7): libpkgconf-1.7.3-9.el9.x86_64.rpm                       481 kB/s | 35 kB | 00:00
(6/7): iptables-devel-1.8.7-28.el9.x86_64.rpm                 333 kB/s | 19 kB | 00:00
(7/7): iptables-nft-services-1.8.7-28.el9.noarch.rpm          164 kB/s | 22 kB | 00:00
-----
Total                                                                139 kB/s | 184 kB | 00:01
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing :
  Installing : libpkgconf-1.7.3-9.el9.x86_64                    1/1
  Installing : pkgconf-1.7.3-9.el9.x86_64                      1/7
  Installing : pkgconf-mt-1.7.3-9.el9.noarch                    2/7
  Installing : pkgconf-pkg-config-1.7.3-9.el9.x86_64            3/7
  Installing : iptables-devel-1.8.7-28.el9.x86_64              4/7
  Installing : iptables-nft-services-1.8.7-28.el9.noarch        5/7
  Running scriptlet: iptables-nft-services-1.8.7-28.el9.noarch 6/7
  Installing : iptables-utils-1.8.7-28.el9.x86_64              6/7
  Running scriptlet: iptables-utils-1.8.7-28.el9.x86_64        7/7
(3/752.058816) systemd-rc-local-generator[1586]: /etc/rc.d/rc.local is not marked executable, skipping.
  Verifying : iptables-utils-1.8.7-28.el9.x86_64               1/7
  Verifying : pkgconf-pkg-config-1.7.3-9.el9.x86_64            2/7
  Verifying : pkgconf-mt-1.7.3-9.el9.noarch                     3/7
  Verifying : pkgconf-1.7.3-9.el9.x86_64                       4/7
  Verifying : libpkgconf-1.7.3-9.el9.x86_64                    5/7
  Verifying : iptables-nft-services-1.8.7-28.el9.noarch        6/7
  Verifying : iptables-devel-1.8.7-28.el9.x86_64              7/7

Installed:
  iptables-devel-1.8.7-28.el9.x86_64      iptables-nft-services-1.8.7-28.el9.noarch      iptables-utils-1.8.7-28.el9.x86_64      libpkgconf-1.7.3-9.el9.x86_64
  pkgconf-1.7.3-9.el9.x86_64              pkgconf-mt-1.7.3-9.el9.noarch                  pkgconf-pkg-config-1.7.3-9.el9.x86_64

Complete!
[root@dggeneralov ~]#
```

Рис. 5: dnf install iptables

Конфликт с firewalld

```
[root@dmgeneralov ~]# systemctl status firewalld
● firewalld.service - firewalld - dynamic firewall daemon
   Loaded: loaded (/usr/lib/systemd/system/firewalld.service; enabled; vendor preset: enabled)
   Active: active (running) since Fri 2022-11-25 00:15:14 MSK; 1h 4min ago
     Docs: man:firewalld(1)
  Main PID: 704 (firewalld)
    Tasks: 2 (limit: 11184)
   Memory: 40.6M
      CPU: 654ms
  CGroup: /system.slice/firewalld.service
          └─704 /usr/bin/python3 -s /usr/sbin/firewalld --nofork --nopid

Nov 25 00:15:13 dmgeneralov systemd[1]: Starting firewalld - dynamic firewall daemon...
Nov 25 00:15:14 dmgeneralov systemd[1]: Started firewalld - dynamic firewall daemon.
[root@dmgeneralov ~]# systemctl status iptables
● iptables.service - IPv4 firewall with iptables
   Loaded: loaded (/usr/lib/systemd/system/iptables.service; disabled; vendor preset: disabled)
   Active: inactive (dead)
[root@dmgeneralov ~]# systemctl start firewalld
[root@dmgeneralov ~]# systemctl start iptables
[ 3898.621486] Warning: Deprecated Driver is detected: nft_compat will not be maintained in a future major release and may be disabled
[root@dmgeneralov ~]# systemctl status iptables
● iptables.service - IPv4 firewall with iptables
   Loaded: loaded (/usr/lib/systemd/system/iptables.service; enabled; vendor preset: enabled)
   Active: inactive (dead) since Fri 2022-11-25 01:20:06 MSK; 8s ago
     Docs: man:firewalld(1)
  Process: 704 ExecStart=/usr/sbin/firewalld --nofork --nopid $FIREWALLD_ARGS (code=exited, status=0/SUCCESS)
 Main PID: 704 (code=exited, status=0/SUCCESS)
      CPU: 813ms

Nov 25 00:15:13 dmgeneralov systemd[1]: Starting firewalld - dynamic firewall daemon...
Nov 25 00:15:14 dmgeneralov systemd[1]: Started firewalld - dynamic firewall daemon...
Nov 25 01:20:06 dmgeneralov systemd[1]: Stopping firewalld - dynamic firewall daemon...
Nov 25 01:20:06 dmgeneralov systemd[1]: firewalld.service: Deactivated successfully.
Nov 25 01:20:06 dmgeneralov systemd[1]: Stopped firewalld - dynamic firewall daemon.
[root@dmgeneralov ~]# systemctl status iptables
● iptables.service - IPv4 firewall with iptables
   Loaded: loaded (/usr/lib/systemd/system/iptables.service; disabled; vendor preset: disabled)
   Active: active (exited) since Fri 2022-11-25 01:20:06 MSK; 13s ago
  Process: 1776 ExecStart=/usr/libexec/iptables/iptables.init start (code=exited, status=0/SUCCESS)
 Main PID: 1776 (code=exited, status=0/SUCCESS)
      CPU: 44ms

Nov 25 01:20:06 dmgeneralov systemd[1]: Starting IPv4 firewall with iptables...
Nov 25 01:20:06 dmgeneralov iptables.init[1776]: iptables: Applying firewall rules: [ OK ]
Nov 25 01:20:06 dmgeneralov systemd[1]: Finished IPv4 firewall with iptables.
[root@dmgeneralov ~]#
```

```
[root@dmgeneralov ~]# 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 nftables.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

[Install]
WantedBy=multi-user.target
Alias=dbus-org.fedoraproject.FirewallD1.service
[root@dmgeneralov ~]# 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@dmgeneralov ~]#
```

```
[root@dmgeneralov ~]# systemctl stop iptables
[root@dmgeneralov ~]# systemctl start firewallld
[root@dmgeneralov ~]# systemctl mask iptables
Created symlink /etc/systemd/system/iptables.service + /dev/null.
[ 4162.122889] systemd-rc-local-generator[1897]: /etc/rc.d/rc.local is not marked executable, skipping.
[root@dmgeneralov ~]# systemctl start iptables
Failed to start iptables.service: Unit iptables.service is masked.
[root@dmgeneralov ~]# systemctl enable iptables
Failed to enable unit: Unit file /etc/systemd/system/iptables.service is masked.
[root@dmgeneralov ~]# systemctl status iptables
■ iptables.service
   Loaded: masked (Reason: Unit iptables.service is masked.)
   Active: inactive (dead) since Fri 2022-11-25 01:24:18 MSK; 51s ago
 Main PID: 1776 (code=exited, status=0/SUCCESS)
    CPU: 116ms

Nov 25 01:20:06 dmgeneralov systemd[1]: Starting IPv4 firewall with iptables...
Nov 25 01:20:06 dmgeneralov iptables.init[1776]: iptables: Applying firewall rules: [ OK ]
Nov 25 01:20:06 dmgeneralov systemd[1]: Finished IPv4 firewall with iptables.
Nov 25 01:24:18 dmgeneralov systemd[1]: Stopping IPv4 firewall with iptables...
Nov 25 01:24:18 dmgeneralov iptables.init[1889]: iptables: Setting chains to policy ACCEPT: raw mangle filter nat [ OK ]
Nov 25 01:24:18 dmgeneralov iptables.init[1889]: iptables: Flushing firewall rules: [ OK ]
Nov 25 01:24:18 dmgeneralov systemd[1]: iptables.service: Deactivated successfully.
Nov 25 01:24:18 dmgeneralov systemd[1]: Stopped IPv4 firewall with iptables.
[root@dmgeneralov ~]#
```

Рис. 8: systemctl

AllowIsolate

```
Rocky Linux 9.0 (Blue Onyx)
Kernel 5.14.0-70.13.1.el9_0.x86_64 on an x86_64

dmgeneralov login: root
Password:
Last login: Fri Nov 25 00:41:02 on tty1
[root@dmgeneralov ~]# cd /usr/lib/systemd/system
[root@dmgeneralov 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
system-update.target:AllowIsolate=yes
[root@dmgeneralov system]# _
```

systemctl isolate

```
[ 4521.911828] kauditd_printk_skb: 17 callbacks suppressed
[ 4521.911832] audit: type=1385 audit(1669329829.971:417): op=set audit_pid=0 old=1996 auid=4294967295 ses=4294967295 subj=system_u:system_r:auditd_t:s0 res=1
[ 4521.911165] audit: type=1388 audit(1669329829.971:417): arch=c000083e syscall=44 success=yes exit=60 a0=3 a1=7fff438fd3690 a2=3c a3=0 items=0 ppid=1 pid=1996 auid=4294967295 uid=0 gid=0 euid=0 suid=0 fsuid=0 egid=0 syid=0 fsgid=0 tty=(none) ses=4294967295 comm="auditd" exe="/usr/sbin/auditd" subj=system_u:system_r:auditd_t:s0 key=(null)
[ 4521.911255] audit: type=1327 audit(1669329829.971:417): proctitles="/sbin/auditd"
[ 4521.916421] audit: type=1131 audit(1669329829.970:418): pid=1 uid=0 auid=4294967295 ses=4294967295 subj=system_u:system_r:init_t:s0 msg='unit=auditd comm="systemd" exe="/usr/lib/systemd/systemd" hostname=? addr=? terminal=? res=success'
[ 4521.951173] audit: type=1131 audit(1669329830.813:419): pid=1 uid=0 auid=4294967295 ses=4294967295 subj=system_u:system_r:init_t:s0 msg='unit=NetworkManager comm="systemd" exe="/usr/lib/systemd/systemd" hostname=? addr=? terminal=? res=success'
[ 4521.957358] audit: type=1131 audit(1669329830.819:420): pid=1 uid=0 auid=4294967295 ses=4294967295 subj=system_u:system_r:init_t:s0 msg='unit=rsyslog comm="systemd" exe="/usr/lib/systemd/systemd" hostname=? addr=? terminal=? res=success'
[ 4522.082428] audit: type=1131 audit(1669329830.864:421): pid=1 uid=0 auid=4294967295 ses=4294967295 subj=system_u:system_r:init_t:s0 msg='unit=firewalld comm="systemd" exe="/usr/lib/systemd/systemd" hostname=? addr=? terminal=? res=success'
[ 4522.012133] audit: type=1131 audit(1669329830.874:422): pid=1 uid=0 auid=4294967295 ses=4294967295 subj=system_u:system_r:init_t:s0 msg='unit=dbus-broker comm="systemd" exe="/usr/lib/systemd/systemd" hostname=? addr=? terminal=? res=success'
[ 4522.022666] audit: type=1334 audit(1669329830.886:423): prog-id=125 op=LOO0
[ 4522.051747] audit: type=1130 audit(1669329830.113:424): pid=1 uid=0 auid=4294967295 ses=4294967295 subj=system_u:system_r:init_t:s0 msg='unit=dbus-broker comm="systemd" exe="/usr/lib/systemd/systemd" hostname=? addr=? terminal=? res=success'
You are in rescue mode. After logging in, type "journalctl -xb" to view
system logs, "systemctl reboot" to reboot, "systemctl default" or "exit"
to boot into default mode.
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@dmgeneralov ~]# systemctl printk_skb: 3 callbacks suppressed
[ 4532.871833] audit: type=1131 audit(1669329840.134:428): pid=1 uid=0 auid=4294967295 ses=4294967295 subj=system_u:system_r:init_t:s0 msg='unit=NetworkManager-dispatcher comm="systemd" exe="/usr/lib/systemd/systemd" hostname=? addr=? terminal=? res=success'

[root@dmgeneralov ~]# systemctl isolate reboot.target_
```

Рис. 10: systemctl

Я получил опыт работы с `systemd` и научился управлять сервисами.