

Linux ЛР4 | Гаджиев Саид М3304

Часть 1. Получение информации о времени загрузки

1. Вывод общей информации о времени загрузки.

`systemd-analyze`

Покажет суммарное время загрузки системы, разделённое на время ядра, загрузчика и пользовательских процессов.

```
[said@archlinux ~]$ systemd-analyze
Startup finished in 3.853s (kernel) + 5.009s (userspace) = 8.863s
graphical.target reached after 5.001s in userspace.
```

2. Список сервисов в порядке уменьшения времени запуска.

`systemd-analyze blame`

Увидим список юнитов-сервисов с указанием времени, затраченного на их запуск.

```
tsaid@archlinux ~$ systemd-analyze blame
1.227s dev-sda2.device
900ms NetworkManager.service
443ms systemd-tmpfiles-setup.service
350ms user@1000.service
333ms systemd-udev-trigger.service
261ms systemd-tmpfiles-setup-dev-early.service
248ms systemd-logind.service
221ms dev-zram0.swap
211ms systemd-zram-setup@zram0.service
210ms systemd-vconsole-setup.service
204ms systemd-journal-flush.service
197ms vboxservice.service
191ms systemd-journald.service
174ms boot.mount
171ms user-runtime-dir@1000.service
167ms systemd-udev.service
161ms systemd-update-utmp.service
145ms sshd.service
138ms systemd-hostnamed.service
127ms systemd-timesyncd.service
123ms systemd-tmpfiles-setup-dev.service
117ms dev-hugepages.mount
116ms dev-mqueue.mount
114ms dbus-broker.service
112ms sys-kernel-debug.mount
109ms sys-kernel-tracing.mount
106ms tmp.mount
105ms kmod-static-nodes.service
104ms modprobe@configfs.service
100ms modprobe@dm_mod.service
93ms modprobe@drm.service
89ms modprobe@fuse.service
73ms modprobe@loop.service
71ms systemd-remount-fs.service
65ms systemd-userdbd.service
64ms systemd-udev-load-credentials.service
61ms systemd-random-seed.service
60ms systemd-modules-load.service
52ms systemd-sysctl.service
47ms systemd-user-sessions.service
46ms sys-fs-fuse-connections.mount
43ms sys-kernel-config.mount
```

3. Вывод списка зависимостей для сервиса sshd.

```
systemctl list-dependencies sshd.service
```

В выводе будут показаны все юниты, от которых зависит sshd.

```
sshd.service
├─sshdgenkeys.service
├─system.slice
├─sysinit.target
│   ├──dev-hugepages.mount
│   ├──dev-mqueue.mount
│   ├──kmod-static-nodes.service
│   └─ldconfig.service
├─proc-sys-fs-binfmt_misc.automount
├─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-firstboot.service
├─systemd-hibernate-clear.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-pcrmachine.service
├─systemd-pcrphase-sysinit.service
├─systemd-pcrphase.service
├─systemd-random-seed.service
├─systemd-repart.service
├─systemd-sysctl.service
├─systemd-sysusers.service
├─systemd-timesyncd.service
├─systemd-tmpfiles-setup-dev-early.service
├─systemd-tmpfiles-setup-dev.service
├─systemd-tmpfiles-setup.service
├─systemd-tpm2-setup-early.service
├─systemd-tpm2-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-fsck-root.service
├─systemd-remount-fs.service
└─tmp.mount
```

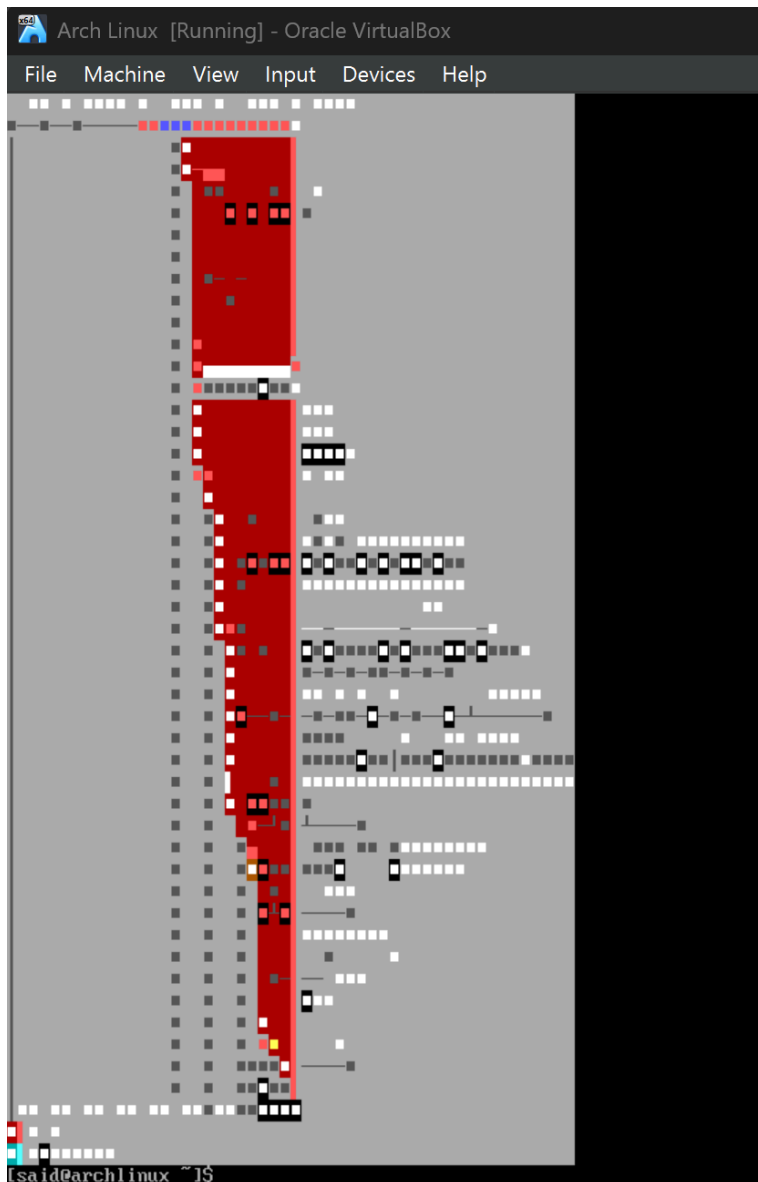
More

4. Построение графика загрузки в формате SVG.

```
systemd-analyze plot > boot.svg
```

Файл `boot.svg` можно открыть в браузере или графическом просмотрщике.

Тут я немного заковылял, ибо работал в Arch Linux с `minimal template`, пришлось схитрить и использовать `rsvg-convert` из пакета `librsvg`, чтобы конвертировать `.svg` в ASCII-графику. Затем вывел PNG в консоли с помощью `chafa`. Если не устроит, на сдаче сделаю общую папку в ВМ, чтобы вытянуть картинку (пометка для себя =))



Часть 2. Управление юнитами

1. Получение списка запущенных юнитов сервисов.

```
systemctl list-units --type=service --state=running
```

```
[said@archlinux ~]$ systemctl list-units --type=service --state=running
UNIT                                LOAD    ACTIVE SUB    DESCRIPTION
dbus-broker.service                loaded active running D-Bus System Message Bus
getty@tty1.service                 loaded active running Getty on tty1
NetworkManager.service             loaded active running Network Manager
sshd.service                        loaded active running OpenSSH Daemon
systemd-journald.service            loaded active running Journal Service
systemd-logind.service              loaded active running User Login Management
systemd-timesyncd.service           loaded active running Network Time Synchronization
systemd-udevd.service               loaded active running Rule-based Manager for Device Events and Files
systemd-userdbd.service             loaded active running User Database Manager
user@1000.service                  loaded active running User Manager for UID 1000
vboxdrmlclient.service              loaded active running VirtualBox Guest VMSVGA resize client
vboxservice.service                loaded active running VirtualBox Guest Service

Legend: LOAD    → Reflects whether the unit definition was properly loaded.
          ACTIVE → The high-level unit activation state, i.e. generalization of SUB.
          SUB    → The low-level unit activation state, values depend on unit type.

12 loaded units listed.
```

2. Перечень юнитов с автозапуском.

```
systemctl list-unit-files --type=service | grep enabled
```

```
[said@archlinux ~]$ systemctl list-unit-files --type=service | grep enabled
getty@.service                enabled          enabled
NetworkManager-dispatcher.service enabled          disabled
NetworkManager-wait-online.service enabled          disabled
NetworkManager.service       enabled          disabled
sshd.service                  enabled          disabled
systemd-boot-update.service   disabled         enabled
systemd-confext.service       disabled         enabled
systemd-fsck-root.service     enabled-runtime disabled
systemd-homed-activate.service disabled         enabled
systemd-homed.service         disabled         enabled
systemd-network-generator.service disabled         enabled
systemd-networkd-wait-online.service disabled         enabled
systemd-networkd.service      disabled         enabled
systemd-pstore.service        disabled         enabled
systemd-remount-fs.service    enabled-runtime disabled
systemd-resolved.service      disabled         enabled
systemd-sysext.service        disabled         enabled
systemd-timesyncd.service     enabled         enabled
vboxservice.service           enabled          disabled
```

3. Определение зависимостей сервиса sshd.

```
systemctl list-dependencies sshd.service
```

Вывод список юнитов, от которых зависит сервис sshd.

```
sshd.service
├─sshdgenkeys.service
├─system.slice
├─sysinit.target
│   ├──dev-hugepages.mount
│   ├──dev-mqueue.mount
│   ├──kmod-static-nodes.service
│   ├──ldconfig.service
│   ├──proc-sys-fs-binfmt_misc.automount
│   ├──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-firstboot.service
│   ├──systemd-hibernate-clear.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-pcrmachine.service
│   ├──systemd-pcrphase-sysinit.service
│   ├──systemd-pcrphase.service
│   ├──systemd-random-seed.service
│   ├──systemd-repart.service
│   ├──systemd-sysctl.service
│   ├──systemd-sysusers.service
│   ├──systemd-timesyncd.service
│   ├──systemd-tmpfiles-setup-dev-early.service
│   ├──systemd-tmpfiles-setup-dev.service
│   ├──systemd-tmpfiles-setup.service
│   ├──systemd-tpm2-setup-early.service
│   ├──systemd-tpm2-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-fsck-root.service
│   │   ├──systemd-remount-fs.service
│   │   └─tmp.mount
└─More--
```

4. Проверка и запуск сервиса cron.

```
systemctl status cronie.service
```

Если сервис не запущен, его можно запустить:

```
systemctl start cronie.service
```

```
[said@archlinux ~]$ systemctl start cronie.service
==== AUTHENTICATING FOR org.freedesktop.systemd1.manage-units ====
Authentication is required to start 'cronie.service'.
Authenticating as: said
Password:
==== AUTHENTICATION COMPLETE ====
[said@archlinux ~]$ systemctl status cronie.service
■ cronie.service - Command Scheduler
   Loaded: loaded (/usr/lib/systemd/system/cronie.service; disabled; preset:
disabled)
   Active: active (running) since Mon 2025-03-10 21:57:07 MSK; 6s ago
  Invocation: 51061ce4cf554d9282ea4e2999ffe14c
    Main PID: 584 (crond)
      Tasks: 1 (limit: 9507)
     Memory: 896K (peak: 1.6M)
        CPU: 17ms
    CGroup: /system.slice/cronie.service
            └─584 /usr/sbin/crond -n

Mar 10 21:57:07 archlinux systemd[1]: Started Command Scheduler.
Mar 10 21:57:07 archlinux crond[584]: (CRON) STARTUP (1.7.2)
Mar 10 21:57:07 archlinux crond[584]: (CRON) INFO (Syslog will be used instead of sendmail.)
Mar 10 21:57:07 archlinux crond[584]: (CRON) INFO (RANDOM_DELAY will be scaled with factor 90% if used.)
Mar 10 21:57:07 archlinux crond[584]: (CRON) INFO (running with inotify support)
```

5. Вывод всех параметров юнита cron.

```
systemctl show cronie.service
```

```
Type=simple
ExitType=main
Restart=on-failure
RestartMode=normal
NotifyAccess=none
RestartUSec=30s
RestartSteps=0
RestartMaxDelayUSec=infinity
RestartUSecNext=30s
TimeoutStartUSec=1min 30s
TimeoutStopUSec=1min 30s
TimeoutAbortUSec=1min 30s
TimeoutStartFailureMode=terminate
TimeoutStopFailureMode=terminate
RuntimeMaxUSec=infinity
RuntimeRandomizedExtraUSec=0
WatchdogUSec=0
WatchdogTimestampMonotonic=0
RootDirectoryStartOnly=no
RemainAfterExit=no
GuessMainPID=yes
MainPID=584
ControlPID=0
FileDescriptorStoreMax=0
FileDescriptorStore=0
FileDescriptorStorePreserve=restart
StatusErrno=0
Result=success
ReloadResult=success
CleanResult=success
LiveMountResult=success
UID=(not set)
GID=(not set)
NRestarts=0
OOMPolicy=stop
ReloadSignal=1
ExecMainStartTimestamp=Mon 2025-03-10 21:57:07 MSK
ExecMainStartTimestampMonotonic=160660162
ExecMainExitTimestampMonotonic=0
ExecMainHandoffTimestamp=Mon 2025-03-10 21:57:07 MSK
ExecMainHandoffTimestampMonotonic=160689212
ExecMainPID=584
ExecMainCode=0
ExecMainCode=0
ExecMainStart={ path=/usr/sbin/crond ; argv[]=/usr/sbin/crond -n $CRONDARGS ; ignore_errors=no ; start_time=[Mon 2025-03-10 21:57:07 MSK] ; stop_time=[n/a] ; pid=584 ; code=(null) ; status=0/0 }
ExecStartEx={ path=/usr/sbin/crond ; argv[]=/usr/sbin/crond -n $CRONDARGS ; flags= ; start_time=[Mon 2025-03-10 21:57:07 MSK] ; stop_time=[n/a] ; pid=584 ; code=(null) ; status=0/0 }
ExecReload={ path=/bin/kill ; argv[]=/bin/kill -URG $MAINPID ; ignore_errors=no ; start_time=[n/a] ; stop_time=[n/a] ; pid=0 ; code=(null) ; status=0/0 }
--More--
```

```
ExecStart={ path=/usr/sbin/crond ; argv[]=/usr/sbin/crond -n $CRONDARGS ; ignore_errors=no ; start_time=[Mon 2025-03-10 21:57:07 MSK] ; stop_time=[n/a] ; pid=584 ; code=(null) ; status=0/0 }
ExecStartEx={ path=/usr/sbin/crond ; argv[]=/usr/sbin/crond -n $CRONDARGS ; flags= ; start_time=[Mon 2025-03-10 21:57:07 MSK] ; stop_time=[n/a] ; pid=584 ; code=(null) ; status=0/0 }
ExecReload={ path=/bin/kill ; argv[]=/bin/kill -URG $MAINPID ; ignore_errors=no ; start_time=[n/a] ; stop_time=[n/a] ; pid=0 ; code=(null) ; status=0/0 }
ExecReloadEx={ path=/bin/kill ; argv[]=/bin/kill -URG $MAINPID ; flags= ; start_time=[n/a] ; stop_time=[n/a] ; pid=0 ; code=(null) ; status=0/0 }
Slice=system.slice
ControlGroup=/system.slice/cronie.service
ControlGroupID=3102
MemoryCurrent=917504
MemoryPeak=1683456
MemorySwapCurrent=0
MemorySwapPeak=0
Memory2SwapCurrent=0
MemoryAvailable=7939215360
EffectiveMemoryMax=8325648384
EffectiveMemoryHigh=8325648384
CPUUsageNSec=17881000
TasksCurrent=1
EffectiveTasksMax=9507
IPIngressBytes=[no data]
IPIngressPackets=[no data]
IPEgressBytes=[no data]
IPEgressPackets=[no data]
IOReadBytes=[not set]
IOReadOperations=[not set]
IOWriteBytes=[not set]
IOWriteOperations=[not set]
Delegate=no
CPUAccounting=yes
CPUWeight=[not set]
StartupCPUWeight=[not set]
CPUShares=[not set]
StartupCPUShares=[not set]
CPUQuotaPerSecUSec=infinity
CPUQuotaPeriodUSec=infinity
IOAccounting=no
IOWeight=[not set]
StartupIOWeight=[not set]
BlockIOAccounting=no
BlockIOWeight=[not set]
StartupBlockIOWeight=[not set]
MemoryAccounting=yes
DefaultMemoryLow=0
DefaultMemoryMin=0
MemoryMin=0
MemoryLow=0
StartupMemoryLow=0
--More--
```



```

StartupMemoryLow=0
MemoryHigh=infinity
StartupMemoryHigh=infinity
MemoryMax=infinity
StartupMemoryMax=infinity
MemorySwapMax=infinity
StartupMemorySwapMax=infinity
Memory2SwapMax=infinity
StartupMemory2SwapMax=infinity
Memory2SwapWriteback=yes
MemoryLimit=infinity
DevicePolicy=auto
TasksAccounting=yes
TasksMax=9507
IPAccounting=no
ManagedOOMSwap=auto
ManagedOOMMemoryPressure=auto
ManagedOOMMemoryPressureLimit=0
ManagedOOMMemoryPressureDurationUSec={not set}
ManagedOOMPreference=none
MemoryPressureWatch=auto
MemoryPressureThresholdUSec=200ms
CoreDumpReceive=no
EnvironmentFiles=/etc/sysconfig/crond (ignore_errors=yes)
UMask=0022
LimitCPU=infinity
LimitCPUSoft=infinity
LimitFSIZE=infinity
LimitFSIZESoft=infinity
LimitDATA=infinity
LimitDATASoft=infinity
LimitSTACK=infinity
LimitSTACKSoft=8388608
LimitCORE=infinity
LimitCORESoft=infinity
LimitRSS=infinity
LimitRSSSoft=infinity
LimitNOFILE=524288
LimitNOFILESoft=1024
LimitAS=infinity
LimitASSoft=infinity
LimitNPROC=31691
LimitNPROCSoft=31691
LimitMEMLOCK=8388608
LimitMEMLOCKSoft=8388608
LimitLOCKS=infinity
LimitLOCKSSoft=infinity
LimitSIGPENDING=31691
LimitSIGPENDINGSoft=31691
--More--

```

```

LimitSIGPENDINGSoft=31691
LimitMSGQUEUE=819200
LimitMSGQUEUESoft=819200
LimitNICE=0
LimitNICESoft=0
LimitRTPRIO=0
LimitRTPRIOSoft=0
LimitRTTIME=infinity
LimitRTTIMESoft=infinity
RootEphemeral=no
OOMScoreAdj=0
CoreDumpFilter=0x33
Nice=0
IOSchedulingClass=2
IOSchedulingPriority=4
CPUSchedulingPolicy=0
CPUSchedulingPriority=0
CPUAffinityFromNUMA=no
NUMAPolicy=n/a
TimerSlackNSec=50000
CPUSchedulingResetOnFork=no
NonBlocking=no
StandardInput=null
StandardOutput=journal
StandardError=inherit
TTYReset=no
TTYHangup=no
TTYVDisallocate=no
SyslogPriority=30
SyslogLevelPrefix=yes
SyslogLevel=6
SyslogFacility=3
LogLevelMax=-1
LogRateLimitIntervalUSec=0
LogRateLimitBurst=0
SecureBits=0
CapabilityBoundingSet=cap_chown cap_dac_override cap_dac_read_search cap_fowner cap_fsetid cap_kill cap_setgid cap_setuid cap_setpcap cap_linux_immutable cap_net_bind_service cap_net_broadcast cap_net_admin cap_net_raw cap_ipc_lock cap_ipc_owner cap_sys_module cap_sys_rawio cap_sys_chroot cap_sys_ptrace cap_sys_pacct cap_sys_admin cap_sys_boot cap_sys_nice cap_sys_resource cap_sys_time cap_sys_tty_config cap_mknod cap_lease cap_audit_write cap_audit_control cap_setfcap cap_mlock cap_override cap_mac_admin cap_syslog cap_wake_alarm cap_block_suspend cap_audit_read cap_perfmon cap_bpf cap_checkpoint_restore
DynamicUser=no
SetLogInEnvironment=no
RemoveIPC=no
PrivateTmp=no
PrivateTmpEx=no
PrivateDevices=no
ProtectClock=no
ProtectKernelTunables=no
ProtectKernelModules=no
--More--

```

Дальше не вижу смысла делать скрины, слишком много инфы.

6. Отключение автозапуска для cron.

```
systemctl stop crond.service
systemctl disable crond.service
```

```
[said@archlinux ~]$ systemctl status crond.service
○ crond.service - Command Scheduler
   Loaded: loaded (/usr/lib/systemd/system/crond.service; disabled; preset:
disabled)
   Active: inactive (dead)

Mar 10 21:57:07 archlinux crond[584]: (CRON) STARTUP (1.7.2)
Mar 10 21:57:07 archlinux crond[584]: (CRON) INFO (Syslog will be used instead of sendmail.)
Mar 10 21:57:07 archlinux crond[584]: (CRON) INFO (RANDOM_DELAY will be scaled with factor 90% if used.)
Mar 10 21:57:07 archlinux crond[584]: (CRON) INFO (running with inotify support)
Mar 10 22:01:00 archlinux CROND[607]: (root) CMD (run-parts /etc/cron.hourly)
Mar 10 22:01:00 archlinux CROND[606]: (root) CMDEND (run-parts /etc/cron.hourly)
Mar 10 22:02:26 archlinux systemd[1]: Stopping Command Scheduler...
Mar 10 22:02:26 archlinux crond[584]: (CRON) INFO (Shutting down)
Mar 10 22:02:26 archlinux systemd[1]: crond.service: Deactivated successfully.
Mar 10 22:02:26 archlinux systemd[1]: Stopped Command Scheduler.
[said@archlinux ~]$ _
```

Часть 3. Создание собственного сервиса mymsg

1. Подготовка скрипта

Создадим исполняемый скрипт, который при запуске запишет в системный журнал текущие дату и время. Например в `/usr/local/bin/mymsg.sh`:

```
#!/bin/bash
/usr/bin/logger "System boot at $(date)"
```

И исполняемым его сделаем:

```
chmod +x /usr/local/bin/mymsg.sh
```

```
[root@archlinux bin]# journalctl | grep "System boot"
Mar 10 22:07:12 archlinux root[865]: System boot at Mon Mar 10 10:07:12 PM MSK 2025
```

2. Создание файла юнита

Файл `/etc/systemd/system/mymsg.service`:

```
[Unit]
Description=My Message Service: writes date and time to the system log
After=network-online.target
Wants=network-online.target

[Service]
Type=oneshot
ExecStart=/usr/local/bin/mymsg.sh
RemainAfterExit=yes

[Install]
WantedBy=multi-user.target
```

Пояснения:

- **After=network-online.target** и **Wants=network-online.target** – гарантируют, что сервис запустится только после того, как сеть будет доступна.
- **Type=oneshot** используется для разового выполнения команды.
- **RemainAfterExit=yes** позволяет считать сервис запущенным даже после завершения скрипта.

Проверка корректности файла:

```
systemd-analyze verify /etc/systemd/system/mymsg.service
```

```
[root@archlinux system]# systemd-analyze verify /etc/systemd/system/mymsg.service
[root@archlinux system]#
```

3. Автоматизация и запуск

```
systemctl enable mymsg.service
```

```
systemctl start mymsg.service
```

```
[root@archlinux system]# systemctl enable mymsg.service
Created symlink '/etc/systemd/system/multi-user.target.wants/mymsg.service' → '/etc/systemd/system/mymsg.service'.
[root@archlinux system]# systemctl start mymsg.service
[root@archlinux system]# systemctl status mymsg.service
■ mymsg.service - My Message Service: writes date and time to the system log
   Loaded: loaded (/etc/systemd/system/mymsg.service; enabled; preset: disabled)
   Active: active (exited) since Mon 2025-03-10 22:14:44 MSK; 4s ago
  Invocation: b971a125b21f4de99002eeda861a5e38
    Process: 955 ExecStart=/usr/local/bin/mymsg.sh (code=exited, status=0/SUCCESS)
   Main PID: 955 (code=exited, status=0/SUCCESS)
    Mem peak: 1.6M
       CPU: 26ms

Mar 10 22:14:44 archlinux systemd[1]: Starting My Message Service: writes date and time to the system log...
Mar 10 22:14:44 archlinux root[958]: System boot at Mon Mar 10 10:14:44 PM MSK 2025
Mar 10 22:14:44 archlinux systemd[1]: Finished My Message Service: writes date and time to the system log.
[root@archlinux system]#
```

Часть 4. Работа с системным журналом

1. Вывод всего системного журнала.

`journalctl`

```
Mar 10 22:02:32 archlinux sudo[792]: pam_unix(sudo:session): session opened for user root(uid=0) by said(uid=1000)
Mar 10 22:02:32 archlinux systemd[1]: Reload requested from client PID 795 ('systemctl') (unit session-1.scope)...
Mar 10 22:02:32 archlinux systemd[1]: Reloading...
Mar 10 22:02:33 archlinux systemd[1]: Reloading finished in 282 ms.
Mar 10 22:02:33 archlinux sudo[792]: pam_unix(sudo:session): session closed for user root
Mar 10 22:04:37 archlinux NetworkManager[381]: <info> [1741633477.38471] dhcp4 (enp0s3): error parsing DHCP option 15 (domain_name): '.' is not a
in
Mar 10 22:04:37 archlinux NetworkManager[381]: <info> [1741633477.41111] dhcp4 (enp0s3): state changed new lease, address=10.0.2.5
Mar 10 22:04:37 archlinux systemd[1]: Starting Network Manager Script Dispatcher Service...
Mar 10 22:04:37 archlinux systemd[1]: Started Network Manager Script Dispatcher Service.
Mar 10 22:04:47 archlinux systemd[1]: NetworkManager-dispatcher.service: Deactivated successfully.
Mar 10 22:05:07 archlinux sudo[854]: said : TTY=ttty1 ; PWD=/usr/local/bin ; USER=root ; COMMAND=/usr/bin/su
Mar 10 22:05:07 archlinux sudo[854]: pam_unix(sudo:session): session opened for user root(uid=0) by said(uid=1000)
Mar 10 22:05:07 archlinux su[857]: (to root) root on pts/0
Mar 10 22:05:07 archlinux su[857]: pam_unix(su:session): session opened for user root(uid=0) by said(uid=0)
Mar 10 22:07:12 archlinux root[865]: System boot at Mon Mar 10 10:07:12 PM MSK 2025
Mar 10 22:09:36 archlinux systemd[1]: Starting Cleanup of Temporary Directories...
Mar 10 22:09:36 archlinux systemd[1]: systemd-tmpfiles-clean.service: Deactivated successfully.
Mar 10 22:09:36 archlinux systemd[1]: Finished Cleanup of Temporary Directories.
Mar 10 22:09:38 archlinux NetworkManager[381]: <info> [1741633778.01151] dhcp4 (enp0s3): error parsing DHCP option 15 (domain_name): '.' is not a
in
Mar 10 22:09:38 archlinux NetworkManager[381]: <info> [1741633778.03081] dhcp4 (enp0s3): state changed new lease, address=10.0.2.5
Mar 10 22:09:38 archlinux systemd[1]: Starting Network Manager Script Dispatcher Service...
Mar 10 22:09:38 archlinux systemd[1]: Started Network Manager Script Dispatcher Service.
Mar 10 22:09:48 archlinux systemd[1]: NetworkManager-dispatcher.service: Deactivated successfully.
Mar 10 22:14:37 archlinux systemd[1]: Reload requested from client PID 903 ('systemctl') (unit session-1.scope)...
Mar 10 22:14:37 archlinux systemd[1]: Reloading...
Mar 10 22:14:37 archlinux systemd[1]: Reloading finished in 277 ms.
Mar 10 22:14:38 archlinux NetworkManager[381]: <info> [1741634078.01751] dhcp4 (enp0s3): error parsing DHCP option 15 (domain_name): '.' is not a
in
Mar 10 22:14:38 archlinux NetworkManager[381]: <info> [1741634078.04391] dhcp4 (enp0s3): state changed new lease, address=10.0.2.5
Mar 10 22:14:38 archlinux systemd[1]: Starting Network Manager Script Dispatcher Service...
Mar 10 22:14:38 archlinux systemd[1]: Started Network Manager Script Dispatcher Service.
Mar 10 22:14:43 archlinux systemd[1]: Starting Network Manager Wait Online...
Mar 10 22:14:44 archlinux systemd[1]: Finished Network Manager Wait Online.
Mar 10 22:14:44 archlinux systemd[1]: Reached target Network is Online.
Mar 10 22:14:44 archlinux systemd[1]: Starting My Message Service: writes date and time to the system log...
Mar 10 22:14:44 archlinux root[958]: System boot at Mon Mar 10 10:14:44 PM MSK 2025
Mar 10 22:14:48 archlinux systemd[1]: Finished My Message Service: writes date and time to the system log.
Mar 10 22:14:48 archlinux systemd[1]: NetworkManager-dispatcher.service: Deactivated successfully.
Mar 10 22:19:38 archlinux NetworkManager[381]: <info> [1741634378.03001] dhcp4 (enp0s3): error parsing DHCP option 15 (domain_name): '.' is not a
in
Mar 10 22:19:38 archlinux NetworkManager[381]: <info> [1741634378.04421] dhcp4 (enp0s3): state changed new lease, address=10.0.2.5
Mar 10 22:19:38 archlinux systemd[1]: Starting Network Manager Script Dispatcher Service...
Mar 10 22:19:38 archlinux systemd[1]: Started Network Manager Script Dispatcher Service.
Mar 10 22:19:48 archlinux systemd[1]: NetworkManager-dispatcher.service: Deactivated successfully.
Mar 10 22:20:46 archlinux kernel: 18:58:13.900034 Timer UBoxDRMClient: push screen layout data of 1 display(s) to DRM stack, fPartialLayout=fa
c
Mar 10 22:20:46 archlinux kernel: hrtimer: interrupt took 4741953 ns
[root@archlinux system]#
```

Для просмотра сообщений текущей загрузки можно добавить параметр `-b`.

```

Mar 10 22:02:32 archlinux sudo[792]: pam_unix(sudo:session): session opened for user root(uid=0) by said(uid=1000)
Mar 10 22:02:32 archlinux systemd[1]: Reload requested from client PID 795 ('systemctl') (unit session-1.scope)...
Mar 10 22:02:32 archlinux systemd[1]: Reloading...
Mar 10 22:02:33 archlinux systemd[1]: Reloading finished in 282 ms.
Mar 10 22:02:33 archlinux sudo[792]: pam_unix(sudo:session): session closed for user root
Mar 10 22:04:37 archlinux NetworkManager[381]: <info> [1741633477.3847] dhcp4 (enp0s3): error parsing DHCP option 15 (domain_name): '.' is not a
in
Mar 10 22:04:37 archlinux NetworkManager[381]: <info> [1741633477.4111] dhcp4 (enp0s3): state changed new lease, address=10.0.2.5
Mar 10 22:04:37 archlinux systemd[1]: Starting Network Manager Script Dispatcher Service...
Mar 10 22:04:37 archlinux systemd[1]: Started Network Manager Script Dispatcher Service.
Mar 10 22:04:47 archlinux systemd[1]: NetworkManager-dispatcher.service: Deactivated successfully.
Mar 10 22:05:07 archlinux sudo[854]: said : TTY=tty1 ; PWD=/usr/local/bin ; USER=root ; COMMAND=/usr/bin/su
Mar 10 22:05:07 archlinux sudo[854]: pam_unix(sudo:session): session opened for user root(uid=0) by said(uid=1000)
Mar 10 22:05:07 archlinux su[857]: (to root) root on pts/0
Mar 10 22:05:07 archlinux su[857]: pam_unix(su:session): session opened for user root(uid=0) by said(uid=0)
Mar 10 22:07:12 archlinux root[865]: System boot at Mon Mar 10 10:07:12 PM MSK 2025
Mar 10 22:09:36 archlinux systemd[1]: Starting Cleanup of Temporary Directories...
Mar 10 22:09:36 archlinux systemd[1]: systemd-tmpfiles-clean.service: Deactivated successfully.
Mar 10 22:09:36 archlinux systemd[1]: Finished Cleanup of Temporary Directories.
Mar 10 22:09:38 archlinux NetworkManager[381]: <info> [1741633778.0115] dhcp4 (enp0s3): error parsing DHCP option 15 (domain_name): '.' is not a
in
Mar 10 22:09:38 archlinux NetworkManager[381]: <info> [1741633778.0308] dhcp4 (enp0s3): state changed new lease, address=10.0.2.5
Mar 10 22:09:38 archlinux systemd[1]: Starting Network Manager Script Dispatcher Service...
Mar 10 22:09:38 archlinux systemd[1]: Started Network Manager Script Dispatcher Service.
Mar 10 22:09:48 archlinux systemd[1]: NetworkManager-dispatcher.service: Deactivated successfully.
Mar 10 22:14:37 archlinux systemd[1]: Reload requested from client PID 903 ('systemctl') (unit session-1.scope)...
Mar 10 22:14:37 archlinux systemd[1]: Reloading...
Mar 10 22:14:37 archlinux systemd[1]: Reloading finished in 277 ms.
Mar 10 22:14:38 archlinux NetworkManager[381]: <info> [1741634078.0175] dhcp4 (enp0s3): error parsing DHCP option 15 (domain_name): '.' is not a
in
Mar 10 22:14:38 archlinux NetworkManager[381]: <info> [1741634078.0439] dhcp4 (enp0s3): state changed new lease, address=10.0.2.5
Mar 10 22:14:38 archlinux systemd[1]: Starting Network Manager Script Dispatcher Service...
Mar 10 22:14:38 archlinux systemd[1]: Started Network Manager Script Dispatcher Service.
Mar 10 22:14:43 archlinux systemd[1]: Starting Network Manager Wait Online...
Mar 10 22:14:44 archlinux systemd[1]: Finished Network Manager Wait Online.
Mar 10 22:14:44 archlinux systemd[1]: Reached target Network is Online.
Mar 10 22:14:44 archlinux systemd[1]: Starting My Message Service: writes date and time to the system log...
Mar 10 22:14:44 archlinux root[958]: System boot at Mon Mar 10 10:14:44 PM MSK 2025
Mar 10 22:14:44 archlinux systemd[1]: Finished My Message Service: writes date and time to the system log.
Mar 10 22:14:48 archlinux systemd[1]: NetworkManager-dispatcher.service: Deactivated successfully.
Mar 10 22:19:38 archlinux NetworkManager[381]: <info> [1741634378.0300] dhcp4 (enp0s3): error parsing DHCP option 15 (domain_name): '.' is not a
in
Mar 10 22:19:38 archlinux NetworkManager[381]: <info> [1741634378.0442] dhcp4 (enp0s3): state changed new lease, address=10.0.2.5
Mar 10 22:19:38 archlinux systemd[1]: Starting Network Manager Script Dispatcher Service...
Mar 10 22:19:38 archlinux systemd[1]: Started Network Manager Script Dispatcher Service.
Mar 10 22:19:48 archlinux systemd[1]: NetworkManager-dispatcher.service: Deactivated successfully.
Mar 10 22:20:46 archlinux kernel: 18:58:13.900034 Timer VBoxDRMClient: push screen layout data of 1 display(s) to DRM stack, fPartialLayout=fa
C
Mar 10 22:20:46 archlinux kernel: hrtimer: interrupt took 4741953 ns

```

2. Просмотр сообщений, касающихся сервиса mymsg.

`journalctl -u mymsg.service`

```

[root@archlinux system]# journalctl -u mymsg.service
Mar 10 22:14:44 archlinux systemd[1]: Starting My Message Service: writes date and time to the system log...
Mar 10 22:14:44 archlinux root[958]: System boot at Mon Mar 10 10:14:44 PM MSK 2025
Mar 10 22:14:44 archlinux systemd[1]: Finished My Message Service: writes date and time to the system log.
[root@archlinux system]#

```

3. Вывод сообщений об ошибках.

`journalctl -p err`

или

`journalctl -p 3`

```

Mar 09 20:26:59 archlinux kernel: umwgfx 0000:00:02.0: [drm] *ERROR* This configuration is likely broken.
Mar 09 20:26:59 archlinux kernel: umwgfx 0000:00:02.0: [drm] *ERROR* Please switch to a supported graphics device to avoid problems.
Mar 09 20:45:05 archlinux dbus-broker-launch[381]: Activation request for 'org.freedesktop.nm_dispatcher' failed.
-- Boot 063bb159958a4602a717ad7323e849ab --
Mar 09 20:46:05 archlinux kernel: umwgfx 0000:00:02.0: [drm] *ERROR* umwgfx seems to be running on an unsupported hypervisor.
Mar 09 20:46:05 archlinux kernel: umwgfx 0000:00:02.0: [drm] *ERROR* This configuration is likely broken.
Mar 09 20:46:05 archlinux kernel: umwgfx 0000:00:02.0: [drm] *ERROR* Please switch to a supported graphics device to avoid problems.
Mar 09 20:54:47 archlinux dbus-broker-launch[384]: Activation request for 'org.freedesktop.nm_dispatcher' failed.
-- Boot 3c4a9faa1fea49b98dee037cb08121a9 --
Mar 09 20:55:49 archlinux kernel: umwgfx 0000:00:02.0: [drm] *ERROR* umwgfx seems to be running on an unsupported hypervisor.
Mar 09 20:55:49 archlinux kernel: umwgfx 0000:00:02.0: [drm] *ERROR* This configuration is likely broken.
Mar 09 20:55:49 archlinux kernel: umwgfx 0000:00:02.0: [drm] *ERROR* Please switch to a supported graphics device to avoid problems.
Mar 09 20:56:33 archlinux dbus-broker-launch[379]: Activation request for 'org.freedesktop.nm_dispatcher' failed.
-- Boot 9ecad3db177b49d3a458e479d33b9ee4 --
Mar 09 20:57:32 archlinux kernel: umwgfx 0000:00:02.0: [drm] *ERROR* umwgfx seems to be running on an unsupported hypervisor.
Mar 09 20:57:32 archlinux kernel: umwgfx 0000:00:02.0: [drm] *ERROR* This configuration is likely broken.
Mar 09 20:57:32 archlinux kernel: umwgfx 0000:00:02.0: [drm] *ERROR* Please switch to a supported graphics device to avoid problems.
Mar 09 21:02:42 archlinux dbus-broker-launch[373]: Activation request for 'org.freedesktop.nm_dispatcher' failed.
-- Boot a890660258d24f31aaa1da75c725049d --
Mar 09 21:04:35 archlinux kernel: umwgfx 0000:00:02.0: [drm] *ERROR* umwgfx seems to be running on an unsupported hypervisor.
Mar 09 21:04:35 archlinux kernel: umwgfx 0000:00:02.0: [drm] *ERROR* This configuration is likely broken.
Mar 09 21:04:35 archlinux kernel: umwgfx 0000:00:02.0: [drm] *ERROR* Please switch to a supported graphics device to avoid problems.
Mar 09 21:04:37 archlinux kernel: vboxsf: Unknown parameter 'tag'
Mar 09 21:05:43 archlinux kernel: vboxsf: Host rejected mount of 'shared' with error -2
Mar 09 21:13:53 archlinux dbus-broker-launch[369]: Activation request for 'org.freedesktop.nm_dispatcher' failed.
-- Boot 05547d164ee9441088fc0f7d9123aa6b --
Mar 09 21:14:01 archlinux kernel: umwgfx 0000:00:02.0: [drm] *ERROR* umwgfx seems to be running on an unsupported hypervisor.
Mar 09 21:14:01 archlinux kernel: umwgfx 0000:00:02.0: [drm] *ERROR* This configuration is likely broken.
Mar 09 21:14:01 archlinux kernel: umwgfx 0000:00:02.0: [drm] *ERROR* Please switch to a supported graphics device to avoid problems.
Mar 09 21:14:04 archlinux kernel: vboxsf: Unknown parameter 'tag'
Mar 09 22:43:12 archlinux kernel: watchdog: BUG: soft lockup - CPU#3 stuck for 1019s! [swapper/3:0]
Mar 09 22:43:12 archlinux kernel: CPU#3 Utilization every 4s during lockup:
Mar 09 22:43:12 archlinux kernel: #1: 1% system, 1% softirq, 0% hardirq, 95% idle
Mar 09 22:43:13 archlinux kernel: #2: 0% system, 2% softirq, 0% hardirq, 90% idle
Mar 09 22:43:13 archlinux kernel: #3: 0% system, 2% softirq, 0% hardirq, 47% idle
Mar 09 22:43:13 archlinux kernel: #4: 0% system, 1% softirq, 0% hardirq, 32% idle
Mar 09 22:43:13 archlinux kernel: #5: 1% system, 3% softirq, 0% hardirq, 75% idle
Mar 10 12:16:13 archlinux dbus-broker-launch[370]: Activation request for 'org.freedesktop.nm_dispatcher' failed.
-- Boot 9bb936b1542040bc953600a0d976f187 --
Mar 10 21:31:28 archlinux kernel: umwgfx 0000:00:02.0: [drm] *ERROR* umwgfx seems to be running on an unsupported hypervisor.
Mar 10 21:31:28 archlinux kernel: umwgfx 0000:00:02.0: [drm] *ERROR* This configuration is likely broken.
Mar 10 21:31:28 archlinux kernel: umwgfx 0000:00:02.0: [drm] *ERROR* Please switch to a supported graphics device to avoid problems.
Mar 10 21:31:31 archlinux kernel: vboxsf: Unknown parameter 'tag'
Mar 10 21:54:07 archlinux dbus-broker-launch[370]: Activation request for 'org.freedesktop.nm_dispatcher' failed.
-- Boot 4ef9e7e16b9a4a229bc8ae7dc6fcdcd3 --
Mar 10 21:54:31 archlinux kernel: umwgfx 0000:00:02.0: [drm] *ERROR* umwgfx seems to be running on an unsupported hypervisor.
Mar 10 21:54:31 archlinux kernel: umwgfx 0000:00:02.0: [drm] *ERROR* This configuration is likely broken.
Mar 10 21:54:31 archlinux kernel: umwgfx 0000:00:02.0: [drm] *ERROR* Please switch to a supported graphics device to avoid problems.
Mar 10 21:54:33 archlinux kernel: vboxsf: Unknown parameter 'tag'
[root@archlinux system]#

```

4. Определение размера журнала.

`journalctl --disk-usage`

```

[root@archlinux system]# journalctl --disk-usage
Archived and active journals take up 16M in the file system.
[root@archlinux system]#

```

Часть 5. Создание и настройка .mount юнита

1. Подготовка файловой системы

1.1 Раздел/устройство:

Если ещё нет выделенного раздела, создайте его (например, с помощью утилит `fdisk/parted`). Пусть устройство будет `/dev/sdb1`.

```
[root@archlinux said]# lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sda          8:0    0   8G  0 disk
├─sda1       8:1    0   1G  0 part /boot
└─sda2       8:2    0   7G  0 part /
sdb          8:16   0   4G  0 disk
└─sdb1       8:17   0   4G  0 part
zram0       254:0    0  3.9G  0 disk [SWAP]
```

1.2 Форматирование в ext4:

```
mkfs.ext4 /dev/sdb1
```

```
[root@archlinux said]# mkfs.ext4 /dev/sdb1
mke2fs 1.47.2 (1-Jan-2025)
Creating filesystem with 1048320 4k blocks and 262144 inodes
Filesystem UUID: 447af993-76e4-4c70-a36e-523edd9de307
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376, 294912, 819200, 884736

Allocating group tables: done
Writing inode tables: done
Creating journal (16384 blocks): done
Writing superblocks and filesystem accounting information: done
```

1.3 Создание точки монтирования:

```
mkdir -p /mnt/mydata
```

2. Создание файла .mount юнита

Файл /etc/systemd/system/mnt-mydata.mount:

```
[Unit]
```

```
Description=Mounting a partition /mnt/mydata
```

```
[Mount]
```

```
What=/dev/sdb1
```


Where=/mnt/mydata
Type=ext4
Options=defaults

[Install]
WantedBy=multi-user.target

3. Запуск и проверка

3.1 Включение юнита:

```
systemctl enable mnt-mydata.mount
```

```
[root@archlinux said]# systemctl enable mnt-mydata.mount  
Created symlink '/etc/systemd/system/multi-user.target.wants/mnt-mydata.mount' → '/etc/systemd/system/mnt-mydata.mount'.  
[root@archlinux said]# _
```

3.2 Запуск:

```
systemctl start mnt-mydata.mount
```

```
[root@archlinux said]# systemctl start mnt-mydata.mount  
[root@archlinux said]#
```

3.3 Проверка статус:

```
systemctl status mnt-mydata.mount
```

```
[root@archlinux said]# systemctl status mnt-mydata.mount  
■ mnt-mydata.mount - Mounting a partition /mnt/mydata  
   Loaded: loaded (/etc/systemd/system/mnt-mydata.mount; enabled; preset: disabled)  
   Active: active (mounted) since Mon 2025-03-10 22:37:07 MSK; 29s ago  
 Invocation: c282eb81ae734a288d0fe266044a457c  
    Where: /mnt/mydata  
    What: /dev/sdb1  
   Tasks: 0 (limit: 9507)  
  Memory: 1M (peak: 1.6M)  
     CPU: 52ms  
   CGroup: /system.slice/mnt-mydata.mount  
  
Mar 10 22:37:07 archlinux systemd[1]: Mounting Mounting a partition /mnt/mydata...  
Mar 10 22:37:07 archlinux systemd[1]: Mounted Mounting a partition /mnt/mydata.  
[root@archlinux said]#
```

3.4 Убедимся, что раздел смонтирован:

```
mount | grep /mnt/mydata
```

```
[root@archlinux said]# mount | grep /mnt/mydata  
/dev/sdb1 on /mnt/mydata type ext4 (rw,relatime)  
[root@archlinux said]# _
```

Часть 6. Использование .automount для отложенного монтирования

1. Подготовка

Предполагается, что после части 5 уже настроен .mount юнит для `/mnt/mydata`.

2. Создание файла .automount юнита

Файл `/etc/systemd/system/mnt-mydata.automount`:

```
[Unit]
Description=Automount for /mnt/mydata

[Automount]
Where=/mnt/mydata
TimeoutIdleSec=30

[Install]
WantedBy=multi-user.target
```

3. Запуск и проверка

3.1 Включаем юнит:

```
systemctl enable mnt-mydata.automount
```

```
[root@archlinux said]# systemctl enable mnt-mydata.automount
Created symlink '/etc/systemd/system/multi-user.target.wants/mnt-mydata.automount' → '/etc/systemd/system/mnt-mydata.automount'.
[root@archlinux said]# _
```

3.2 Запуск:

```
systemctl start mnt-mydata.automount
```

```
[root@archlinux said]# sudo umount -l /mnt/mydata
[root@archlinux said]# systemctl start mnt-mydata.automount
[root@archlinux said]# _
```

3.3 Проверка статуса:

```
systemctl status mnt-mydata.automount
```

```
[root@archlinux said]# systemctl status mnt-mydata.automount
■ mnt-mydata.automount - Automount for /mnt/mydata
   Loaded: loaded (/etc/systemd/system/mnt-mydata.automount; enabled; preset: disabled)
   Active: active (waiting) since Mon 2025-03-10 22:46:14 MSK; 26s ago
  Invocation: 2adc6f0c329141728da53efaf1ffeafc
    Triggers: ■ mnt-mydata.mount
       Where: /mnt/mydata

Mar 10 22:46:14 archlinux systemd[1]: Set up automount Automount for /mnt/mydata.
[root@archlinux said]# _
```

3.4 Проверка автоматического монтирования, обратившись к точке:

```
ls /mnt/mydata
```

```
[root@archlinux said]# ls /mnt/mydata
lost+found
```

3.5 После периода бездействия (30 секунд) проверяем, что раздел отмонтировался:

```
mount | grep /mnt/mydata
```

```
[root@archlinux said]# mount | grep /mnt/mydata
systemd-1 on /mnt/mydata type autofs (rw,relatime,fd=88,pgrp=1,timeout=30,minproto=5,maxproto=5,direct,pipe_ino=5899)
```

Вопросы и задания

1. Чем отличаются команды `systemctl restart` и `systemctl try-restart`?

systemctl restart:

Останавливает запущенный сервис (если он работает) и запускает его заново. При этом, если сервис не запущен, он будет запущен.

systemctl try-restart:

Перезапускает сервис только если он уже работает. Если сервис не запущен, то команда ничего не делает.

Таким образом, `try-restart` используется для «мягкого» перезапуска, когда не нужно запускать сервис, который и так не активен.

2. Как с помощью `systemctl` запустить Linux в однопользовательском режиме?

Для перехода в однопользовательский режим (режим спасения) можно выполнить:

```
systemctl isolate rescue.target
```

Либо, если требуется более минимальная среда,

```
systemctl isolate emergency.target
```

3. Создание сервиса `mysrv` с условиями:

Требования:

- Сервис **mysrv** не должен запускаться автоматически.
- Его запуск возможен только после того, как сервис **mymsg** был принудительно остановлен уже после старта системы.

Реализация:

В файле юнита `mymsg.service`:

(подразумевается что уже создан ранее)

```
[Service]
Type=oneshot
ExecStart=/usr/local/bin/mymsg.sh
RemainAfterExit=yes
```

Здесь параметр **RemainAfterExit=yes** гарантирует, что даже после завершения работы сервиса он будет считаться активным.

Создадим юнит для `mysrv`, например `/etc/systemd/system/mysrv.service`:

```
[Unit]
Description=My SRV Service – запуск возможен только если mymsg
остановлен
# Опция Conflicts гарантирует, что если mymsg активен, запуск
mysrv приведёт к конфликту:
Conflicts=mymsg.service
After=mymsg.service

[Service]
Type=simple
ExecStart=/usr/bin/echo "mysrv запущен, mymsg остановлен"

# В разделе [Install] не указываем WantedBy, чтобы юнит не
стартовал автоматически.
```

Пояснения:

- **Conflicts=mymsg.service** – данный параметр не позволяет запускать `mysrv` одновременно с `mymsg`. Если `mymsg` активен, запуск `mysrv` приведёт к остановке `mymsg`.
- Отсутствие секции **[Install]** (или отсутствие её включения через `systemctl enable`) гарантирует, что `mysrv` не будет запускаться автоматически при загрузке.
- Таким образом, сервис `mysrv` можно запустить вручную (или по зависимости других юнитов) только после того, как сервис `mymsg` будет остановлен (например, командой `systemctl stop mymsg.service`).