

# Лабораторная работа №11

## Управление загрузкой системы

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## Цель работы

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## Основная цель

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Получение навыков работы с загрузчиком **GRUB2** в операционной системе Linux.

## Ход выполнения работы

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## Изменение конфигурации GRUB2



The screenshot shows a terminal window titled "mtursunov@mtursunov: /home/mtursunov – nano /etc/default/grub". The window has a red header bar. The main area contains the following text:

```
GNU nano 8.1                               /etc/default/grub                                Modified
GRUB_TIMEOUT=10
GRUB_DISTRIBUTOR="$(sed 's, release .*$,,g' /etc/system-release)"
GRUB_DEFAULT=saved
GRUB_DISABLE_SUBMENU=true
GRUB_TERMINAL_OUTPUT="console"
GRUB_CMDLINE_LINUX="resume=UUID=2b15f0da-ec83-45cf-94b8-04fe12c60ecd rd.lvm.lv=rl_vbox/root rd.lvm.lv=rl_vbox/recovery root=UUID=2b15f0da-ec83-45cf-94b8-04fe12c60ecd ro"
GRUB_DISABLE_RECOVERY="true"
GRUB_ENABLE_BLSCFG=true
```

Рис. 1: Редактирование файла /etc/default/grub

## Применение изменений в GRUB2



Рис. 2: Меню загрузчика GRUB

## Вход в режим восстановления (rescue)



Рис. 3: Редактирование параметров загрузки (режим rescue)

## Работа в режиме rescue.target

```
.slice
system-modprobe.slice
system.slice
dm-event.socket
lvm2-lvmpid.socket
systemd-journalctl-dev-log.socket
systemd-journald.socket
systemd-udevd-control.socket
systemd-udevd-kernel.socket
dev-disk-by\x2duuid\x2b15f8da\x2dec83\x2d45cf\x2d94bb\x2d84fc12c68ec6.swap
cryptsetup.target
integritysetup.target
local-fs-pre.target
local-fs.target
network-pre.target
rescue.target
sound.target
swap.target
sysinit.target
veritysetup.target

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.

69 loaded units listed. Pass --all to see loaded but inactive units, too.
To show all installed unit files use 'systemctl list-unit-files'.
root@rescue000: # systemctl show-environment
LANG=en_US.UTF-8
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin
XDG_DATA_DIRS=/usr/lib/flatpak/exports/share:/usr/local/share:/usr/share/
XDG_RUNTIME_DIR=/tmp/tmpfjwz4441

```

	loaded	active	active	Root Slice
system-modprobe.slice	loaded	active	active	Slice /system/modprobe
system.slice	loaded	active	active	System Slice
dm-event.socket	loaded	active	active	Device-mapper event daemon FIFOs
lvm2-lvmpid.socket	loaded	active	listening	LVM2 poll daemon socket
systemd-journalctl-dev-log.socket	loaded	active	listening	Journal Socket (/dev/log)
systemd-journald.socket	loaded	active	running	Journal Sockets
systemd-udevd-control.socket	loaded	active	running	udev Control Socket
systemd-udevd-kernel.socket	loaded	active	running	udev Kernel Socket
dev-disk-by\x2duuid\x2b15f8da\x2dec83\x2d45cf\x2d94bb\x2d84fc12c68ec6.swap	loaded	active	active	/dev/disk/by-uuid/2b15f8da-ec83-45cf-94bb-
cryptsetup.target	loaded	active	active	Local Encrypted Volumes
integritysetup.target	loaded	active	active	Local Integrity Protected Volumes
local-fs-pre.target	loaded	active	active	Preparation for Local File Systems
local-fs.target	loaded	active	active	Local File Systems
network-pre.target	loaded	active	active	Preparation for Network
rescue.target	loaded	active	active	Rescue Mode
sound.target	loaded	active	active	Sound Card
swap.target	loaded	active	active	Swaps
sysinit.target	loaded	active	active	System Initialization
veritysetup.target	loaded	active	active	Local Verity Protected Volumes

Рис. 4: Вывод systemctl list-units в режиме rescue

# Проверка переменных среды

```
.slice
system-modprobe.slice
system.slice
dm-event.socket
lvm2-lvmpid.socket
systemd-journal-dev-log.socket
systemd-journald.socket
systemd-udevd-control.socket
systemd-udevd-kernel.socket
dev-disk-by\x2duuid\x2b15f8da\x2dec83\x2d45cf\x2d94b8\x2d84fc12c68ecf.swap
cryptsetup.target
integritysetup.target
local-fs-pre.target
local-fs.target
network-pre.target
rescue.target
sound.target
swap.target
sysinit.target
veritysetup.target

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.

69 loaded units listed. Pass --all to see loaded but inactive units, too.
To show all installed unit files use 'systemctl list-unit-files'.
root@eternalnow: ~# systemctl show-environment
LANG=en_US.UTF-8
PATH=/usr/local/sbin:/usr/bin:/usr/sbin:/usr/bin
XDG_DATA_DIRS=/usr/lib/flatpak/exports/share:/usr/local/share:/usr/share/
XDG_RUNTIME_DIRS=/run/user/1000/flatpak/exports/share:/run/user/1000/share/
xdg долги сервера! #
```

Unit	Load State	Active State	Description
slice	loaded	active	Root Slice
system-modprobe.slice	loaded	active	Slice /system/modprobe
system.slice	loaded	active	System Slice
dm-event.socket	loaded	active	Device-mapper event daemon FIFOs
lvm2-lvmpid.socket	loaded	active listening	LVM2 poll daemon socket
systemd-journal-dev-log.socket	loaded	active listening	Journal Socket (/dev/log)
systemd-journald.socket	loaded	active running	Journal Sockets
systemd-udevd-control.socket	loaded	active running	udev Control Socket
systemd-udevd-kernel.socket	loaded	active running	udev Kernel Socket
dev-disk-by\x2duuid\x2b15f8da\x2dec83\x2d45cf\x2d94b8\x2d84fc12c68ecf.swap	loaded	active	/dev/disk/by-uuid/2b15f8da-ec83-45cf-94b8-
cryptsetup.target	loaded	active	Local Encrypted Volumes
integritysetup.target	loaded	active	Local Integrity Protected Volumes
local-fs-pre.target	loaded	active	Preparation for Local File Systems
local-fs.target	loaded	active	Local File Systems
network-pre.target	loaded	active	Preparation for Network
rescue.target	loaded	active	Rescue Mode
sound.target	loaded	active	Sound Card
swap.target	loaded	active	Swaps
sysinit.target	loaded	active	System Initialization
veritysetup.target	loaded	active	Local Verity Protected Volumes

Рис. 5: Переменные среды systemctl show-environment

## Переход в аварийный режим (emergency)

```
GRUB version 2.12

load_video
set gfxpayload=keep
insmod gzio
linux ($root)/vmlinuz-6.12.0-55.39.1.el10_0.x86_64 root=/dev/mapper/r1_vbox\
-root ro resume=UUID=2b15f0da-ec83-45cf-94b8-04fe12c60ecd rd.lvm.lv=r1_vbox\
/root rd.lvm.lv=r1_vbox/swap systemd.unit=emergency.target
initrd ($root)/initramfs-6.12.0-55.39.1.el10_0.x86_64.img $tuned_initrd

Minimum Emacs-like screen editing is supported. TAB lists
completions. Press Ctrl-x or F10 to boot, Ctrl-c or F2 for
a command-line or ESC to discard edits and return to the GRUB menu.
```

Рис. 6: Редактирование параметров загрузки (режим emergency)

# Работа в emergency.target

```
* sys-devices:pci0000:00:000:00:00:00-ata3-host2:8:8:2:8:8:8:block-sda-sd1.device loaded activating tentat
* sys-devices:pci0000:00:000:00:00:00-ata3-host2-target2:8:8:2:8:8:8:block-sda-sd2.device loaded activating tentat
* sys-devices:pci0000:00:000:00:00:00-ata3-host2-target2:8:8:2:8:8:8:block-sda-sd3.device loaded activating tentat
* sys-devices:pci0000:00:000:00:00:00-ata3-host2-target2:8:8:2:8:8:8:block-sda-device loaded activating tentat
sys-devices:platform-serial18258:serial18258:0:0-tty-ttys0.device loaded activating tentat
sys-devices:platform-serial18258:serial18258:0:0-tty-ttys1.device loaded activating tentat
sys-devices:platform-serial18258:serial18258:0:2-tty-ttys2.device loaded activating tentat
sys-devices:platform-serial18258:serial18258:0:3-tty-ttys3.device loaded activating tentat
sys-devices:virtual-block-dmxx20.device loaded active plugin
sys-devices:virtual-block-dmxx21.device loaded active plugin
* sys-module-configs.device loaded activating tentat
* sys-module-fuse.device loaded activating tentat
-.mount loaded active mounts
sys-kernel-config.mount loaded active mounts
init.scope loaded active running
emergency.service loaded active running
plymouth-start.service loaded active exited
systemd-journald.service loaded active running
-.slice loaded active active
system-modprobe.slice loaded active active
system.slice loaded active active
systemd-journald-dev-log.socket loaded active running
systemd-journald.socket loaded active running
emergency.target loaded active active

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.

68 loaded units listed. Pass --all to see loaded but inactive units, too.
To show all installed unit files use 'systemctl list-unit-files'.
Lines 28-76 (END)
```

Рис. 7: Вывод systemctl list-units в аварийном режиме

## Восстановление пароля root



Рис. 8: Загрузка с параметром rd.break

## Итоги работы

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## Вывод

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В ходе лабораторной работы были изучены принципы управления загрузчиком **GRUB2**. Рассмотрены методы изменения конфигурации, настройка параметров загрузки, переход в режимы **rescue.target** и **emergency.target**, а также процесс восстановления пароля **root**. Полученные знания позволяют администратору эффективно управлять процессом загрузки и устранять ошибки при инициализации системы.