

# Лабораторная работа №11

Управление загрузкой системы

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## Информация

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## Вводная часть

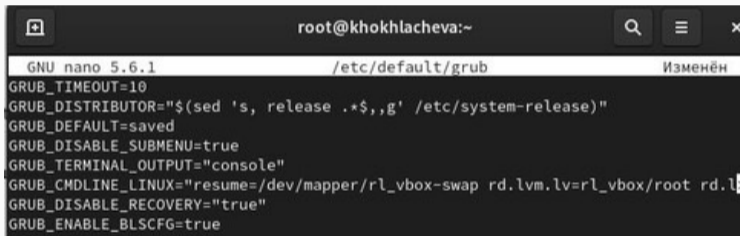
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Получить навыки работы с загрузчиком системы GRUB2

## Выполнение лабораторной работы

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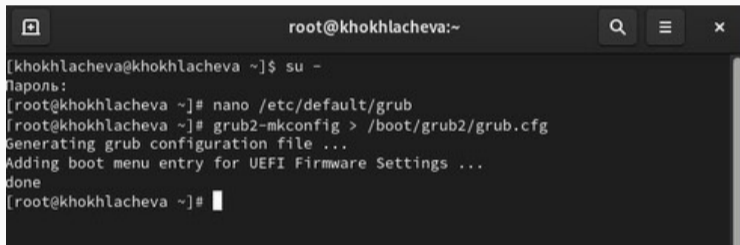
В файле меняем параметры(рис. (fig:001?)).



```
root@khokhlacheva:~
GNU nano 5.6.1 /etc/default/grub Изменён
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=/dev/mapper/rl_vbox-swap rd.lvm.lv=rl_vbox/root rd.l"
GRUB_DISABLE_RECOVERY="true"
GRUB_ENABLE_BLSCFG=true
```

Рис. 1: Параметры

Запускаем терминал, получаем полномочия администратора, открываем файл, записываем изменения, перезагрузка системы (рис. (fig:002?)).



```
root@khokhlacheva:~  
[khokhlacheva@khokhlacheva ~]$ su -  
Пароль:  
[root@khokhlacheva ~]# nano /etc/default/grub  
[root@khokhlacheva ~]# grub2-mkconfig > /boot/grub2/grub.cfg  
Generating grub configuration file ...  
Adding boot menu entry for UEFI Firmware Settings ...  
done  
[root@khokhlacheva ~]#
```

Рис. 2: Файл

Удаляем опции rhgb и quit, загружаем ядро системы(рис. (fig:003?)).



```
GRUB version 2.06

load_video
set gfxpayload=keep
insmod gzio
linux ($root)/vmlinuz-5.14.0-570.58.1.el9_6.x86_64 root=/dev/mapper/r1_vbox\
-root ro resume=/dev/mapper/r1_vbox-swap rd.lvm.lv=r1_vbox/root rd.lvm.lv=r\
l_vbox/swap crashkernel=1G-4G:192M,4G-64G:256M,64G-:512M systemd.unit=rescu\
e.target
initrd ($root)/initramfs-5.14.0-570.58.1.el9_6.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. 3: Ядро

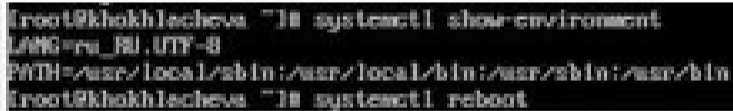
# Выполнение лабораторной работы

С помощью команды `systemctl list-units`, смотрим список всех файлов модулей(рис. (fig:004?)).

```
dracut-shutdown.service loaded active exited Restore /usr/initramf
load-static-nodes.service loaded active exited Create List of Static
lvm2-monitor.service loaded active exited Monitoring of LVM2 m
nis-domainname.service loaded active exited Read and set NIS doma
plymouth-read-write.service loaded active exited Tell Plymouth To Write
plymouth-start.service loaded active exited Show Plymouth Root Sc
rescue.service loaded active running Rescue Shell
systemd-boot-update.service loaded active exited Automatic Boot Loader
systemd-journal-flush.service loaded active exited Flush Journal to Pers
systemd-journald.service loaded active running Journal Service
systemd-modules-load.service loaded active exited Load Kernel Modules
systemd-network-generator.service loaded active exited Generate network unit
systemd-random-seed.service loaded active exited Load/Save OS Random S
systemd-remount-fs.service loaded active exited Remount Root and Kern
systemd-sysctl.service loaded active exited Apply Kernel Variables
systemd-tmpfiles-setup-dev.service loaded active exited Create Static Device i
systemd-tmpfiles-setup.service loaded active exited Create Volatile Files
systemd-udev-settle.service loaded active exited Wait for udev To Comp
systemd-udev-trigger.service loaded active exited Coldplug All udev Dev
systemd-udevl.service loaded active running Rule-based Manager fo
systemd-update-utmp.service loaded active exited Record System Boot/Sh
systemd-vconsole-setup.service loaded active exited Setup Virtual Console
-.slice loaded active active Root Slice
system-modprobe.slice loaded active active Slice /system/modprobe
system-sysrctl.slice loaded active active Slice /system/systemd
system.slice loaded active active System Slice
dmesd.socket loaded active listening Device-mapper event d
lvm2-lvmpolld.socket loaded active listening LVM2 poll daemon sock
systemd-journald-dev-log.socket loaded active running Journal Socket (/dev/
systemd-journald.socket loaded active running Journal Socket
systemd-udev-control.socket loaded active running udev Control Sock
systemd-udev-kernel.socket loaded active running udev Kernel Socket
dev-mapper-r1_xobx2dswap.swap loaded active active /dev/mapper/r1_xobx-2
cryptsetup.target loaded active active Local Encrypted Volum
integritysetup.target loaded active active Local Integrity Prote
local-fs-pre.target loaded active active Preparation for Local
local-fs.target loaded active active Local File Systems
network-pre.target loaded active active Preparation for Networ
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 Protecte
```

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.  
23 loaded units listed. Pass --all to see loaded but inactive units, too.

Смотрим задействованные переменные среды оболочки и перезагружаем систему(рис. (fig:005?)).

A terminal window with a black background and white text. The prompt is [root@khokhlacheva ~]#. The first command is systemctl show-environment, which outputs LANG=ru\_RU.UTF-8 and PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin. The second command is systemctl reboot.

```
[root@khokhlacheva ~]# systemctl show-environment
LANG=ru_RU.UTF-8
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin
[root@khokhlacheva ~]# systemctl reboot
```

Рис. 5: Среда

Заходим в режим редактора(рис. (fig:006?)).



```
GRUB version 2.06

load_video
set gfxpayload=keep
insmod gzio
linux ($root)/vmlinuz-5.14.0-570.58.1.el9_6.x86_64 root=/dev/mapper/r1_vbox\
-root ro resume=/dev/mapper/r1_vbox-swap rd.lvm.lv=r1_vbox/root rd.lvm.lv=r\
l_vbox/swap_crashkernel=16-4G:192M,4G-64G:256M,64G-:512M systemd.unit=emerg\
ency.target
initrd ($root)/initramfs-5.14.0-570.58.1.el9_6.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: Редактор

## Выполнение лабораторной работы

С помощью команды `systemctl list-units` смотрим список всех загруженных файлов модулей и убеждаемся, что их количество уменьшилось (рис. (fig:007?)).

<code>dev-disk-by\x2dpath-pts\x2d00000:00:01.1\x2data\x2d2.device</code>	<code>loaded</code>	<code>activating</code>	<code>tentative</code>	<code>/dev/disk/by-path</code>
<code>dev-disk-by\x2dpath-pts\x2d00000:00:04.0\x2data\x2d1.0.device</code>	<code>loaded</code>	<code>activating</code>	<code>tentative</code>	<code>/dev/disk/by-path</code>
<code>dev-disk-by\x2dpath-pts\x2d00000:00:04.0\x2data\x2d1.0\x2dpart1.device</code>	<code>loaded</code>	<code>activating</code>	<code>tentative</code>	<code>/dev/disk/by-path</code>
<code>dev-disk-by\x2dpath-pts\x2d00000:00:04.0\x2data\x2d1.0\x2dpart2.device</code>	<code>loaded</code>	<code>activating</code>	<code>tentative</code>	<code>/dev/disk/by-path</code>
<code>dev-disk-by\x2dpath-pts\x2d00000:00:04.0\x2data\x2d1.device</code>	<code>loaded</code>	<code>activating</code>	<code>tentative</code>	<code>/dev/disk/by-path</code>
<code>dev-disk-by\x2dpath-pts\x2d00000:00:04.0\x2data\x2d1\x2dpart1.device</code>	<code>loaded</code>	<code>activating</code>	<code>tentative</code>	<code>/dev/disk/by-path</code>
<code>dev-disk-by\x2dpath-pts\x2d00000:00:04.0\x2data\x2d1\x2dpart2.device</code>	<code>loaded</code>	<code>activating</code>	<code>tentative</code>	<code>/dev/disk/by-path</code>
<code>dev-disk-by\x2duuid-2825\x2d401\x2d2421\x2d2413\x2d2410\x2d2427\x2d2490.device</code>	<code>loaded</code>	<code>activating</code>	<code>tentative</code>	<code>/dev/disk/by-uuid</code>
<code>dev-disk-by\x2duuid-2904e647\x2d249c5\x2d2473e\x2d24b4f\x2d2493fc8240327.device</code>	<code>loaded</code>	<code>activating</code>	<code>tentative</code>	<code>/dev/disk/by-uuid</code>
<code>dev-sda.device</code>	<code>loaded</code>	<code>activating</code>	<code>tentative</code>	<code>/dev/sda</code>
<code>dev-sda1.device</code>	<code>loaded</code>	<code>activating</code>	<code>tentative</code>	<code>/dev/sda1</code>
<code>dev-sda2.device</code>	<code>loaded</code>	<code>activating</code>	<code>tentative</code>	<code>/dev/sda2</code>
<code>dev-sr0.device</code>	<code>loaded</code>	<code>activating</code>	<code>tentative</code>	<code>/dev/sr0</code>
<code>dev-tytS0.device</code>	<code>loaded</code>	<code>activating</code>	<code>tentative</code>	<code>/dev/ttyS0</code>
<code>dev-tytS1.device</code>	<code>loaded</code>	<code>activating</code>	<code>tentative</code>	<code>/dev/ttyS1</code>
<code>dev-tytS2.device</code>	<code>loaded</code>	<code>activating</code>	<code>tentative</code>	<code>/dev/ttyS2</code>
<code>dev-tytS3.device</code>	<code>loaded</code>	<code>activating</code>	<code>tentative</code>	<code>/dev/ttyS3</code>
<code>sys-devices-pts\x2d00000:00:00:00:01.1-ata3-host2-target2:0:0:2:0:0:0-block-sr0.device</code>	<code>loaded</code>	<code>activating</code>	<code>tentative</code>	<code>/sys/devices/pts</code>
<code>sys-devices-pts\x2d00000:00:00:00:03.0-net-emp0s3.device</code>	<code>loaded</code>	<code>activating</code>	<code>tentative</code>	<code>/sys/devices/pts</code>
<code>sys-devices-pts\x2d00000:00:00:00:04.0-ata1-host1-target1:0:0:1:0:0:0-block-sda-sda1.device</code>	<code>loaded</code>	<code>activating</code>	<code>tentative</code>	<code>/sys/devices/pts</code>
<code>sys-devices-pts\x2d00000:00:00:00:04.0-ata1-host1-target1:0:0:1:0:0:0-block-sda-sda2.device</code>	<code>loaded</code>	<code>activating</code>	<code>tentative</code>	<code>/sys/devices/pts</code>
<code>sys-devices-pts\x2d00000:00:00:00:04.0-ata1-host1-target1:0:0:1:0:0:0-block-sda.device</code>	<code>loaded</code>	<code>activating</code>	<code>tentative</code>	<code>/sys/devices/pts</code>
<code>sys-devices-platform-serial18250-tyt-tytS0.device</code>	<code>loaded</code>	<code>activating</code>	<code>tentative</code>	<code>/sys/devices/platform</code>
<code>sys-devices-platform-serial18250-tyt-tytS1.device</code>	<code>loaded</code>	<code>activating</code>	<code>tentative</code>	<code>/sys/devices/platform</code>
<code>sys-devices-platform-serial18250-tyt-tytS2.device</code>	<code>loaded</code>	<code>activating</code>	<code>tentative</code>	<code>/sys/devices/platform</code>
<code>sys-devices-platform-serial18250-tyt-tytS3.device</code>	<code>loaded</code>	<code>activating</code>	<code>tentative</code>	<code>/sys/devices/platform</code>
<code>sys-devices-virtual-block-dev\x2d00.device</code>	<code>loaded</code>	<code>active</code>	<code>plugged</code>	<code>/sys/devices/virtual</code>
<code>sys-devices-virtual-block-dev\x2d01.device</code>	<code>loaded</code>	<code>active</code>	<code>plugged</code>	<code>/sys/devices/virtual</code>
<code>sys-module-configs.device</code>	<code>loaded</code>	<code>activating</code>	<code>tentative</code>	<code>/sys/module/configs</code>
<code>sys-module-fuse.device</code>	<code>loaded</code>	<code>activating</code>	<code>tentative</code>	<code>/sys/module/fuse</code>
<code>sys-subsystem-net-devices-emp0s3.device</code>	<code>loaded</code>	<code>activating</code>	<code>tentative</code>	<code>/sys/subsystem/net</code>
<code>~.mount</code>	<code>loaded</code>	<code>active</code>	<code>mounted</code>	<code>Root Mount</code>
<code>init.scope</code>	<code>loaded</code>	<code>active</code>	<code>running</code>	<code>System and Service</code>
<code>emergency.service</code>	<code>loaded</code>	<code>active</code>	<code>running</code>	<code>Emergency Shell</code>
<code>plymouth-start.service</code>	<code>loaded</code>	<code>active</code>	<code>exited</code>	<code>Show Plymouth Boot</code>
<code>systemd-journald.service</code>	<code>loaded</code>	<code>active</code>	<code>running</code>	<code>Journal Service</code>
<code>~.slice</code>	<code>loaded</code>	<code>active</code>	<code>active</code>	<code>Root Slice</code>
<code>system-systemd\x2dhibernate\x2dresume.slice</code>	<code>loaded</code>	<code>active</code>	<code>active</code>	<code>Slice /system/systemd</code>
<code>system.slice</code>	<code>loaded</code>	<code>active</code>	<code>active</code>	<code>System Slice</code>
<code>systemd-journald-dev-log.socket</code>	<code>loaded</code>	<code>active</code>	<code>running</code>	<code>Journal Socket (/dev</code>
<code>systemd-journald.socket</code>	<code>loaded</code>	<code>active</code>	<code>running</code>	<code>Journal Socket</code>
<code>emergency.target</code>	<code>loaded</code>	<code>active</code>	<code>active</code>	<code>Emergency Mode</code>

`LOAD` = Reflects whether the unit definition was properly loaded.

`ACTIVE` = The high-level unit activation state, i.e. operational or not.

Входим в режим редактора для сброса пароля(рис. (fig:008?)).



```
GRUB version 2.06

load_video
set gfxpayload=keep
insmod gzio
linux ($root)/vmlinuz-5.14.0-570.58.1.el9_6.x86_64 root=/dev/mapper/r1_vbox\
-root ro resume=/dev/mapper/r1_vbox-swap rd.lvm.lv=r1_vbox/root rd.lvm.lv=r\
l_vbox/swap crashkernel=1G-4G:192M,4G-64G:256M,64G-:512M rd.break
initrd ($root)/initramfs-5.14.0-570.58.1.el9_6.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.
```

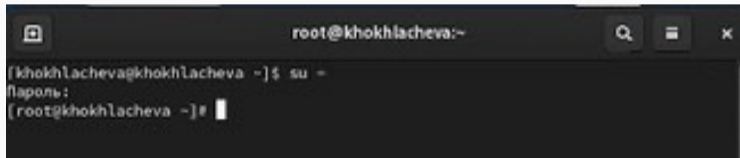
Рис. 8: Сброс пароля

Получаем доступ к системному образу для чтения и записи, делаем содержимое каталога новым корневым каталогом, устанавливаем новый пароль, загружаем политику SELinux, устанавливаем вручную правильный тип контекста(рис. (fig:009?)).

```
switch_root:/# mount -o remount,rw /sysroot
switch_root:/# chroot /sysroot
sh-5.1# passwd
Изменение пароля пользователя root.
Новый пароль:
Повторите ввод нового пароля:
passwd: данные аутентификации успешно обновлены.
sh-5.1# load_policy -f
( 288.583888) SELinux: https://github.com/SELinuxProject/selinux-kernel/wiki/REPLICATE-runtime-disable
( 288.583248) SELinux: Runtime disable is not supported, use selinux=0 on the kernel cmdline.
load_policy: не удалось загрузить политику: Нет такого файла или каталога.
sh-5.1# chcon -t shadow_t /etc/shadow
chcon: невозможно получить доступ к 't': Нет такого файла или каталога
chcon: невозможно получить доступ к '/etc/shadow': Нет такого файла или каталога.
sh-5.1# chcon -t shadow_t /etc/shadow
chcon: не удалось применить частичный контекст к не помеченному файлу '/etc/shadow'
sh-5.1# reboot -f
```

Рис. 9: Пароль

Входим в систему с изменённым паролем(рис. (fig:009?)).

A terminal window with a dark background. The title bar shows a window icon, the text 'root@khokhlacheva:~', and standard window controls (search, list, close). The terminal content shows a user at the 'khokhlacheva@khokhlacheva ~' prompt typing 'su -'. The prompt changes to '[root@khokhlacheva ~]#', indicating a successful switch to root. There is a small white cursor at the end of the root prompt.

```
root@khokhlacheva:~  
[khokhlacheva@khokhlacheva ~]$ su -  
Пароль:  
[root@khokhlacheva ~]#
```

Рис. 10: Пароль

## Выводы

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Мы получили навыки работы с загрузчиком системы GRUB2