

Лабораторная работа №11

Управление загрузкой системы

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Цель работы

Получение практических навыков работы с загрузчиком GRUB2, изменение его параметров и восстановление системы при неполадках загрузки.

Ход выполнения

Модификация параметров GRUB2



```
amnauruzova@amnauruzova:/home/amnauruzova - nano /etc/default/grub
GNU nano 8.1 /etc/default/grub Modified
GRUB_TIMEOUT=20
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=774abe3d-c83f-4c4f-90c6-404f43a900ee rd.lvm.lv=rl_vbox/root rd.lvm.lv=rl_vbox/swap"
GRUB_DISABLE_RECOVERY="true"
GRUB_ENABLE_BLSCFG=true

^G Help      ^O Write Out  ^F Where Is  ^K Cut       ^T Execute   ^C Location  ^U Undo      ^M-A Set Mark
^X Exit      ^R Read File  ^\ Replace   ^V Paste     ^J Justify   ^_ Go To Line ^M-E Redo    ^M-G Copy
```

```
amnauruzova@amnauruzova:~$ su
Password:
root@amnauruzova:/home/amnauruzova# nano /etc/default/grub
root@amnauruzova:/home/amnauruzova# grub2-mkconfig > /boot/grub2/grub.cfg
Generating grub configuration file ...
Adding boot menu entry for UEFI Firmware Settings ...
done
root@amnauruzova:/home/amnauruzova# █
```

Рис. 2: Создание новой конфигурации GRUB2

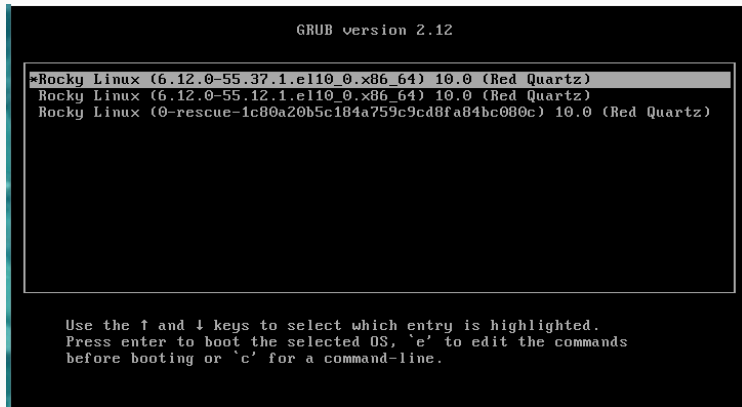


Рис. 3: Меню загрузки GRUB после изменений

```
GRUB version 2.12

load_video
set gfxpayload=keep
insmod gzio
linux ($root)/vmlinuz-6.12.0-55.37.1.el10_0.x86_64 root=/dev/mapper/rl_vbox\
-root ro resume=UUID=774abe3d-c83f-4c4f-90c6-404f43a900ee rd.lvm.lv=rl_vbox\
/root rd.lvm.lv=rl_vbox/swap systemd.unit=rescue.target
initrd ($root)/initramfs-6.12.0-55.37.1.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. 4: Редактирование параметров загрузки — режим восстановления

Проверка активных модулей в rescue

```
integritysetup.target      loaded
local-fs-pre.target       loaded
local-fs.target           loaded
network-pre.target        loaded
rescue.target             loaded
sound.target              loaded
swap.target               loaded
sysinit.target            loaded
veritysetup.target        loaded

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@amnauruzova:~# systemctl show-environment
LANG=en_US.UTF-8
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin
XDG_DATA_DIRS=/var/lib/flatpak/exports/share:/usr/local/share/:/usr/share/
root@amnauruzova:~#
```

Рис. 5: Вывод активных модулей в режиме rescue

```
integritysetup.target      loaded
local-fs-pre.target       loaded
local-fs.target           loaded
network-pre.target        loaded
rescue.target             loaded
sound.target              loaded
swap.target               loaded
sysinit.target            loaded
veritysetup.target        loaded

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@amnauruzova:~# systemctl show-environment
LANG=en_US.UTF-8
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin
XDG_DATA_DIRS=/var/lib/flatpak/exports/share:/usr/local/share/:/usr/share/
root@amnauruzova:~#
```

Рис. 6: Переменные среды в режиме rescue

Аварийный режим (emergency.target)

```
GRUB version 2.12

load_video
set gfxpayload=keep
insmod gzio
linux ($root)/vmlinuz-6.12.0-55.37.1.el10_0.x86_64 root=/dev/mapper/rl_vbox\
-root ro resume=UUID=774abe3d-c83f-4c4f-90c6-404f43a900ee rd.lvm.lv=rl_vbox\
/root rd.lvm.lv=rl_vbox/swap systemd.unit=emergency.target_
initrd ($root)/initramfs-6.12.0-55.37.1.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. 7: Редактирование строки для аварийного режима

```
sys-devices-virtual-block-dm\x2d0.device
sys-devices-virtual-block-dm\x2d1.device
• sys-module-configfs.device
• sys-module-fuse.device
-.mount
sys-kernel-config.mount
init.scope
emergency.service
plymouth-start.service
systemd-journald.service
-.slice
system-modprobe.slice
system.slice
systemd-journald-dev-log.socket
systemd-journald.socket
emergency.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.

68 loaded units listed. Pass --all to see loaded but inactive units, too.
To show all installed unit files use 'systemctl list-unit-files'.
root@ammanuruzova:~#
```

Рис. 8: Список активных модулей в emergency.target

```
GRUB version 2.12

load_video
set gfxpayload=keep
insmod gzio
linux ($root)/vmlinuz-6.12.0-55.37.1.el10_0.x86_64 root=/dev/mapper/rl_vbox\
-root ro resume=UUID=774abc3d-c83f-4c4f-90c6-404f43a900ee rd.lvm.lv=rl_vbox\
/root rd.lvm.lv=rl_vbox/swap rd.break_
initrd ($root)/initramfs-6.12.0-55.37.1.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. 9: Редактирование строки загрузки с параметром rd.break

```
Generating "/run/initramfs/rdsosreport.txt"

Entering emergency mode. Exit the shell to continue.
Type "journalctl" to view system logs.
You might want to save "/run/initramfs/rdsosreport.txt" to a USB stick or /boot
after mounting them and attach it to a bug report.

Give root password for maintenance
(or press Control-D to continue):
sh-5.2# mount -o remount,rw /sysroot/
sh-5.2# chroot /sysroot/
sh: chroot: command not found
sh-5.2#
```

Рис. 10: Режим rd.break — монтирование и попытка chroot

Итоги работы

В ходе работы были изучены принципы настройки и модификации параметров загрузчика GRUB2.

Отработаны действия по изменению таймаута меню, переходу в режимы восстановления и аварийной загрузки, а также выполнены шаги по сбросу пароля root.

Полученные навыки позволяют администратору эффективно управлять процессом загрузки и устранять ошибки при запуске системы.