

Лабораторная работа №11

Управление загрузкой системы

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Цель работы

Получить навыки работы с загрузчиком системы **GRUB2** и освоить режимы восстановления Linux.

Ход выполнения

```
grub [----] 23 L:[ 1+ 7 8/ 9] *(326 / 327b) 0010 0x00A
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=bfed141b-af25-4a45-8f41-0eb8866bcfd3 rd.lvm.lv=rl_vbox/root rd.lvm.lv=rl_vbox/swap"
GRUB_DISABLE_RECOVERY="true"
GRUB_ENABLE_BLSCFG=true
```

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

Генерация нового конфигурационного файла

```
root@admazurkevich:/home/admazurkevich#  
root@admazurkevich:/home/admazurkevich# mcedit /etc/default/grub  
  
root@admazurkevich:/home/admazurkevich# grub2-mkconfig > /boot/grub2/grub.cfg  
Generating grub configuration file ...  
Adding boot menu entry for UEFI Firmware Settings ...  
done  
root@admazurkevich:/home/admazurkevich# █
```

Рис. 2: Генерация нового конфигурационного файла GRUB2



Рис. 3: Отображение меню загрузчика GRUB2

Вход в режим восстановления (rescue.target)

```
GRUB version 2.12

load_video
set gfxpayload=keep
insmod gzio
linux ($root)/vmlinuz-6.12.0-55.37.1.el10_0.x86_64 root=/dev/mapper/rl_vbox\
-root ro resume=UUID=bfed141b-af25-4a45-8f41-0eb8866bcfd3 rd.lvm.lv=rl_vbox\
/root rd.lvm.lv=rl_vbox/swap systemd.unit=rescue.target_
initrd ($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 ядра для входа в rescue mode

Работа системы в режиме восстановления

```
lvm2-lvmpolld.socket                                loaded active listen
systemd-journald-dev-log.socket                     loaded active running
systemd-journald.socket                             loaded active running
systemd-udevd-control.socket                       loaded active running
systemd-udevd-kernel.socket                         loaded active running
dev-disk-by\x2duuid-bfed141b\x2daf25\x2d4a45\x2d8f41\x2d8eb8866bcfd3.swap loaded active active
cryptsetup.target                                   loaded active active
integritysetup.target                              loaded active active
local-fs-pre.target                                loaded active active
local-fs.target                                     loaded active active
network-pre.target                                 loaded active active
rescue.target                                       loaded active active
sound.target                                        loaded active active
swap.target                                         loaded active active
sysinit.target                                     loaded active active
veritysetup.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.

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@admazurkevich:~# 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@admazurkevich:~#
```

Рис. 5: Работа системы в режиме восстановления

Проверка аварийного режима (emergency.target)

```
GRUB version 2.12

load_video
set gfxpayload=keep
insmod gzio
linux ($root)/vmlinuz-6.12.0-55.37.1.el10_0.x86_64 root=/dev/mapper/rl_vbox\
-root ro resume=UUID=bfed141b-af25-4a45-8f41-0eb8866bcfd3 rd.lvm.lv=rl_vbox\
/root rd.lvm.lv=rl_vbox/swap systemd.unit=emergency.target_
initrd ($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. 6: Настройка параметра emergency.target

```
• sys-devices-pci0000:00-0000:00:01.1-ata2-host1-target1:0:0-1:0:0:0-block-sda.device
• sys-devices-pci0000:00-0000:00:0d.0-ata3-host2-target2:0:0-2:0:0:0-block-sda-sda1.device
• sys-devices-pci0000:00-0000:00:0d.0-ata3-host2-target2:0:0-2:0:0:0-block-sda-sda2.device
• sys-devices-pci0000:00-0000:00:0d.0-ata3-host2-target2:0:0-2:0:0:0-block-sda-sda3.device
• sys-devices-pci0000:00-0000:00:0d.0-ata3-host2-target2:0:0-2:0:0:0-block-sda.device
• sys-devices-platform-serial18250-serial18250:0-serial18250:0.0-tty-ttyS0.device
• sys-devices-platform-serial18250-serial18250:0-serial18250:0.1-tty-ttyS1.device
• sys-devices-platform-serial18250-serial18250:0-serial18250:0.2-tty-ttyS2.device
• sys-devices-platform-serial18250-serial18250:0-serial18250:0.3-tty-ttyS3.device
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@radarzero:~#
```

Рис. 7: Минимальный набор загруженных модулей в emergency mode

```
GRUB version 2.12

load_video
set gfxpayload=keep
insmod gzio
linux ($root)/vmlinuz-6.12.0-55.37.1.el10_0.x86_64 root=/dev/mapper/rl_vbox\
-root ro resume=UUID=bfed141b-af25-4a45-8f41-0eb8866bcfd3 rd.lvm.lv=rl_vbox\
/root rd.lvm.lv=rl_vbox/swap rd.break
initrd ($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. 8: Добавление параметра rd.break

Попытка сброса пароля в initramfs

```
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# passwd
sh: passwd: command not found
sh-5.2#
```

Рис. 9: Попытка сброса пароля root в initramfs

Альтернативный способ сброса пароля root через GRUB

```
GRUB version 2.12

load_video
set gfxpayload=keep
insmod gzio
linux ($root)/vmlinuz-6.12.0-55.37.1.el10_0.x86_64 root=/dev/mapper/rl_vbox\
-root ro resume=UUID=bfed141b-af25-4a45-8f41-0eb8866bcfd3 rd.lvm.lv=rl_vbox\
/root rd.lvm.lv=rl_vbox/swap crashkernel=2G-64G:256M,64G-:512M rw init=/bin\
/bash_
initrd ($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. 10: Изменение параметров загрузки ядра через GRUB

```
bash-5.2#  
bash-5.2# touch /.autorelabel  
bash-5.2# passwd  
New password:  
BAD PASSWORD: The password is shorter than 8 characters  
Retype new password:  
passwd: password updated successfully  
bash-5.2#
```

Рис. 11: Успешное выполнение команды passwd и переустановка SELinux контекстов

Выводы по проделанной работе

В ходе лабораторной работы:

- изучены принципы настройки загрузчика **GRUB2**;
- выполнено редактирование параметров `/etc/default/grub`;
- исследованы режимы **rescue** и **emergency**;
- рассмотрен механизм сброса пароля суперпользователя с параметром **rd.break**.

Полученные навыки позволяют администратору управлять процессом загрузки Linux и выполнять восстановление системы при сбоях.