

Отчёт по лабораторной работе №11

Управление загрузкой системы

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Цель работы

Цель

Получить навыки настройки загрузчика GRUB2, изменения параметров загрузки ядра и устранения неполадок системы через различные режимы загрузки.

Выполнение лабораторной работы

Настройка параметров загрузчика

```
grub      [----]  0 L:[ 1+ 6   7/  9] *(274 / 327b) 0071 0x047  [*][X]
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=3c0695d5-327b-4526-a357-1608fc50250f rd.lvm.lv=rl_vbox/root rd.lvm.l
GRUB_DISABLE_RECOVERY="true"
GRUB_ENABLE_BLSCFG=true
```

Рис. 1: Редактирование /etc/default/grub

Обновление конфигурации GRUB2

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

Рис. 2: Выполнение grub2-mkconfig

Проверка меню загрузчика

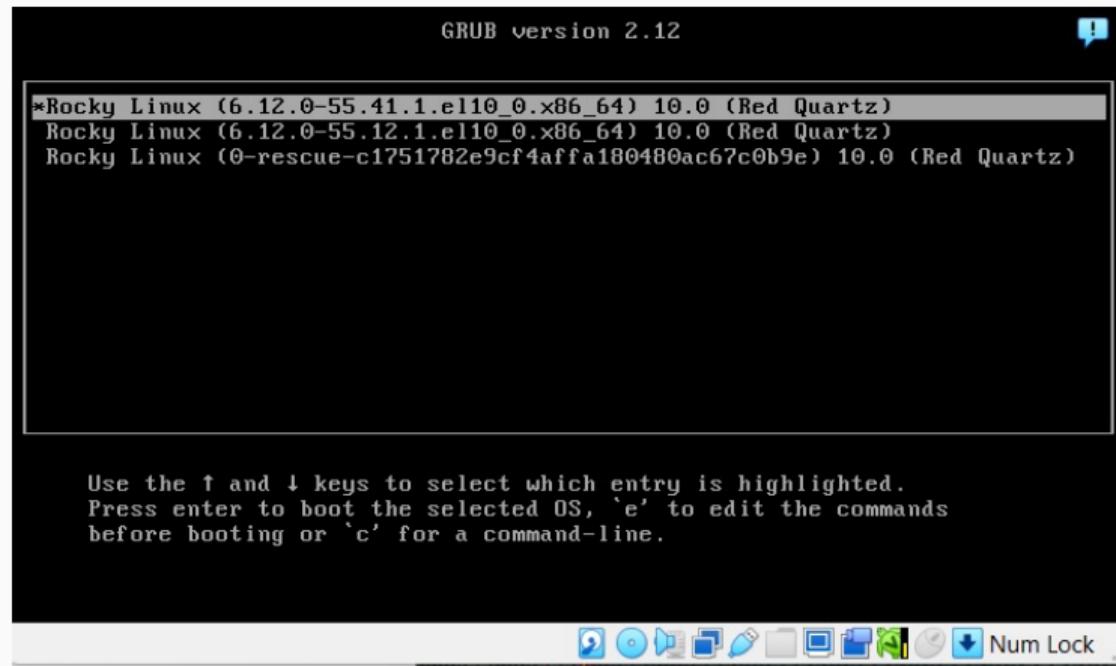


Рис. 3: Меню GRUB после изменений

Загрузка в режим rescue.target

```
load_video
set gfxpayload=keep
insmod gzio
linux ($root)/vmlinuz-6.12.0-55.41.1.el10_0.x86_64 root=/dev/mapper/r1_vbox\
-root ro resume=UUID=3c0695d5-327b-4526-a357-1608fc50250f rd.lvm.lv=r1_vbox\
/root rd.lvm.lv=r1_vbox/swap crashkernel=2G-64G:256M,64G-:512M systemd.unit\
=rescue.target_
initrd ($root)/initramfs-6.12.0-55.41.1.el10_0.x86_64.img $tuned_initrd
```

Рис. 4: Добавление параметра rescue.target

Просмотр системных модулей и среды

```
boot.mount
dev-hugepages.mount
dev-queueue.mount
sys-fs-fuse-connections.mount
sys-kernel-config.mount
sys-kernel-debug.mount
sys-kernel-tracing.mount
systemd-ask-password-plymouth.path
init.scope
alsa-state.service
dracut-shutdown.service
kmod-static-nodes.service
lvm2-monitor.service
plymouth-read-write.service
plymouth-start.service
rescue.service
system-journal-flush.service
system-journald.service
system-modules-load.service
system-network-generator.service
system-random-seed.service
system-remount-fs.service
system-syctl.service
system-tmpfiles-setup-dev-early.service
system-tmpfiles-setup-dev.service
system-tmpfiles-setup.service
system-udev-load-credentials.service
system-udev-trigger.service
system-udevd.service
system-update-utmp.service
out@dsyakovenko:~$ systemctl show-environment
LANG=en_US.UTF-8
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin
DG_DATA_DIRS=/var/lib/flatpak/exports/share:/usr/local/share:/usr/share/
out@dsyakovenko:~$
```

Системный модуль	Статус	Описание
boot	loaded active mounted	Huge Pages File System
hugepages	loaded active mounted	POSIX Message Queue File System
queueue	loaded active mounted	FUSE Control File System
sys-fs-fuse-connections	loaded active mounted	Kernel Configuration File System
sys-kernel-config	loaded active mounted	Kernel Debug File System
sys-kernel-debug	loaded active mounted	Kernel Trace File System
sys-kernel-tracing	loaded active mounted	Forward Password Requests to Plymouth Directory and Service Manager
systemd-ask-password-plymouth	loaded active running	Manage Sound Card State (restore and store)
init.scope	loaded active exited	Restore /run/initramfs on shutdown
alsa-state	loaded active exited	Create List of Static Device Nodes
dracut-shutdown	loaded active exited	Monitoring of LVM2 mirrors, snapshots etc.
kmod-static-nodes	loaded active exited	Tell Plymouth To Write Out Runtime Data
lvm2-monitor	loaded active exited	Show Plymouth Boot Screen
plymouth-read-write	loaded active exited	Rescue Shell
plymouth-start	loaded active running	Flush Journal to Persistent Storage
rescue	loaded active exited	Journal Service
system-journal-flush	loaded active running	Load Kernel Modules
system-journald	loaded active exited	Generate network units from Kernel command-line
system-modules-load	loaded active exited	Load/Save OS Random Seed
system-network-generator	loaded active exited	Remount Root and Kernel File Systems
system-random-seed	loaded active exited	Apply Kernel Variables
system-remount-fs	loaded active exited	Create Static Device Nodes in /dev/grabcf
system-syctl	loaded active exited	Create Static Device Nodes in /dev
system-tmpfiles-setup-dev-early	loaded active exited	Create System Files and Directories
system-tmpfiles-setup-dev	loaded active exited	Load udev Rules From Credentials
system-tmpfiles-setup	loaded active exited	Coldplug All udev Devices
system-udev-trigger	loaded active exited	Rule-based Manager for Device Events and
system-udevd	loaded active running	Record System Boot/Shutdown in UTMP

Рис. 5: Переменные среды

Загрузка в режим emergency.target



Рис. 6: emergency.target

Минимальный набор модулей

Рис. 7: Минимальные модули

Попытка сброса через rd.break (неудачно)

```
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# 1
sh: 1: command not found
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. 8: Ошибки initramfs

Рабочий способ: init=/bin/bash



Рис. 9: init=/bin/bash

Успешная смена пароля

```
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# exec /sbin/bash
bash: /sbin/bash: No such file or directory
bash-5.2# exec /sbin/init
```

Рис. 10: Смена пароля root

Успешная загрузка после сброса

```
dsyakovleva@dsyakovleva:~$ su  
Password:  
su: Authentication failure  
dsyakovleva@dsyakovleva:~$ su  
Password:  
root@dsyakovleva:/home/dsyakovleva# █
```

Рис. 11: Аутентификация root

Контрольные вопросы

Основные файлы GRUB2

- /etc/default/grub
- /boot/grub2/grub.cfg

Команда для применения изменений

- `grub2-mkconfig -o /boot/grub2/grub.cfg`

Итоги работы

Вывод

В ходе работы были изучены методы настройки GRUB2, способы загрузки в режимы rescue и emergency, а также выполнен успешный сброс пароля root с использованием параметра `init=/bin/bash`. Получены навыки диагностики проблем загрузки и временной модификации параметров запуска ядра.