

Лабораторная работа 12

Управление загрузкой системы (GRUB2)

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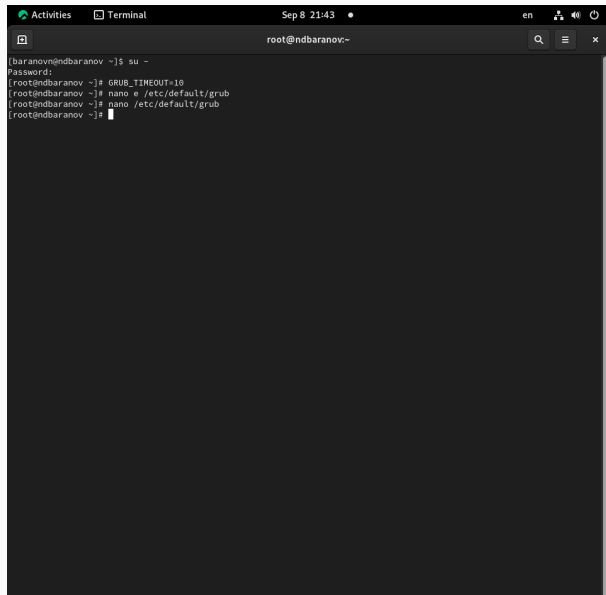
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Получить навыки работы с загрузчиком системы **GRUB2**.

1. Изменение параметров GRUB и запись изменений
2. Устранение неполадок при работе с GRUB
3. Работа с GRUB без root

Настройка GRUB2



A terminal window titled 'Terminal' with a search bar and window controls. The prompt is 'root@ndbaranov:~'. The user has executed the following commands:

```
[baranov@ndbaranov ~]$ su -  
Password:  
[root@ndbaranov ~]# GRUB_TIMEOUT=10  
[root@ndbaranov ~]# nano /etc/default/grub  
[root@ndbaranov ~]# nano /etc/default/grub  
[root@ndbaranov ~]#
```

Файл /etc/default/grub



```
GNU nano 5.6.1 /etc/default/grub
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/r1-swap rd.lvm.lv=r1/root rd.lvm.lv=r1/swap rhgb quiet"
GRUB_DISABLE_RECOVERY="true"
GRUB_ENABLE_BLSCFG=true
```

Read 8 lines

Ctrl+H Help Ctrl+W Write Out Ctrl+M Where Is Ctrl+K Cut Ctrl+J Execute Ctrl+C Location Ctrl+U Undo
Ctrl+X Exit Ctrl+R Read File Ctrl+N Replace Ctrl+V Paste Ctrl+D Justify Ctrl+G Go To Line Ctrl+E Redo

Применение изменений

```
Activities Terminal Sep 8 21:43 en
root@ndbaranov:~
[baranov@ndbaranov ~]$ su -
Password:
[root@ndbaranov ~]# GRUB_TIMEOUT=10
[root@ndbaranov ~]# nano e /etc/default/grub
[root@ndbaranov ~]# nano /etc/default/grub
[root@ndbaranov ~]# nano /etc/default/grub
[root@ndbaranov ~]# grub2-mkconfig > /boot/grub2/grub.cfg
Generating grub configuration file ...
Adding boot menu entry for UEFI Firmware Settings ...
done
[root@ndbaranov ~]#
```

Загрузка системы

GRUB version 2.06

```
load_video
set gfxpayload=keep
insmod gzio
linux ($root)/vmlinuz-5.14.0-570.37.1.el9_6.x86_64 root=/dev/mapper/rl-root\
ro resume=/dev/mapper/rl-swap rd.lvm.lv=rl/root rd.lvm.lv=rl/swap rhgb qui\
et crashkernel=1G-4G:192M,4G-64G:256M,64G-:512M systemd.unit=rescue.target_
initrd ($root)/initramfs-5.14.0-570.37.1.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.

Переход в rescue mode

GRUB version 2.06

```
load_video
set gfxpayload=keep
insmod gzio
linux ($root)/vmlinuz-5.14.0-570.37.1.el9_6.x86_64 root=/dev/mapper/rl-root\
ro resume=/dev/mapper/rl-swap rd.lvm.lv=rl/root rd.lvm.lv=rl/swap rhgb qui\
et crashkernel=1G-4G:192M,4G-64G:256M,64G-:512M systemd.unit=rescue.target_
initrd ($root)/initramfs-5.14.0-570.37.1.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.

Состояние системы в rescue

Booting a command list

```
[ 3.161927] Warning: Unmaintained driver is detected: e1000
[ 3.858884] vmwgfx 0000:00:02.0: [drm] *ERROR* vmwgfx seems to be running on
an unsupported hypervisor.
[ 3.858892] vmwgfx 0000:00:02.0: [drm] *ERROR* This configuration is likely b
roken.
[ 3.858898] vmwgfx 0000:00:02.0: [drm] *ERROR* Please switch to a supported g
raphics device to avoid problems.
You are in rescue mode. After logging in, type "journalctl -xb" to view
system logs, "systemctl reboot" to reboot, "systemctl default" or "exit"
to boot into default mode.
Give root password for maintenance
(or press Control-D to continue): _
```

Просмотр модулей и окружения

UNIT	LOAD	ACTIVE	SUB	DESCR
proc-sys-fs-binfmt_misc.automount	loaded	active	waiting	Arbit
sys-devices-pci0000:00-0000:00:01.1-ata2-host2-target2:0:0-2:0:0:0-block-sr0.device	loaded	active	plugged	UBOX
sys-devices-pci0000:00-0000:00:03.0-net-ens3.device	loaded	active	plugged	8254E
sys-devices-pci0000:00-0000:00:05.0-sound-card0-controlC0.device	loaded	active	plugged	/sys/
sys-devices-pci0000:00-0000:00:0d.0-ata3-host1-target1:0:0-1:0:0:0-block-sda-sda1.device	loaded	active	plugged	UBOX
sys-devices-pci0000:00-0000:00:0d.0-ata3-host1-target1:0:0-1:0:0:0-block-sda-sda2.device	loaded	active	plugged	UBOX
sys-devices-pci0000:00-0000:00:0d.0-ata3-host1-target1:0:0-1:0:0:0-block-sda.device	loaded	active	plugged	UBOX
sys-devices-platform-serial18250-tty-ttyS0.device	loaded	active	plugged	/sys/
sys-devices-platform-serial18250-tty-ttyS1.device	loaded	active	plugged	/sys/
sys-devices-platform-serial18250-tty-ttyS2.device	loaded	active	plugged	/sys/
sys-devices-platform-serial18250-tty-ttyS3.device	loaded	active	plugged	/sys/
sys-devices-virtual-block-dm\x2d0.device	loaded	active	plugged	/sys/
sys-devices-virtual-block-dm\x2d1.device	loaded	active	plugged	/sys/
sys-module-configfs.device	loaded	active	plugged	/sys/
sys-module-fuse.device	loaded	active	plugged	/sys/
sys-subsystem-net-devices-ens3.device	loaded	active	plugged	8254E
-.mount	loaded	active	mounted	Root
boot.mount	loaded	active	mounted	/boot
dev-hugepages.mount	loaded	active	mounted	Huge
dev-mqueue.mount	loaded	active	mounted	POSIX
run-credentials-systemd\x2dsysctl.service.mount	loaded	active	mounted	/run/
run-credentials-systemd\x2dtmpfiles\x2dsetup.service.mount	loaded	active	mounted	/run/
run-credentials-systemd\x2dtmpfiles\x2dsetup\x2ddev.service.mount	loaded	active	mounted	/run/
sys-fs-fuse-connections.mount	loaded	active	mounted	FUSE
sys-kernel-config.mount	loaded	active	mounted	Kerne
sys-kernel-debug.mount	loaded	active	mounted	Kerne
sys-kernel-tracing.mount	loaded	active	mounted	Kerne
systemd-ask-password-plymouth.path	loaded	active	waiting	Forwa
init.scope	loaded	active	running	Syste
alsa-state.service	loaded	active	running	Manag
dracut-shutdown.service	loaded	active	exited	Resti
kmod-static-nodes.service	loaded	active	exited	Creat
lvm2-monitor.service	loaded	active	exited	Monit
nls-domainname.service	loaded	active	exited	Read
plymouth-read-write.service	loaded	active	exited	Tell
plymouth-start.service	loaded	active	exited	Show
rescue.service	loaded	active	running	Rescu
systemd-boot-update.service	loaded	active	exited	Autom
systemd-journal-flush.service	loaded	active	exited	Flush
systemd-journald.service	loaded	active	running	Journ
systemd-modules-load.service	loaded	active	exited	Load
systemd-network-generator.service	loaded	active	exited	Gener
systemd-random-seed.service	loaded	active	exited	Load/
systemd-remount-fs.service	loaded	active	exited	Remou
systemd-sysctl.service	loaded	active	exited	Apply
systemd-tmpfiles-setup-dev.service	loaded	active	exited	Creat
systemd-tmpfiles-setup.service	loaded	active	exited	Creat
systemd-udev-settle.service	loaded	active	exited	Wait

```
[root@ndbaranov ~]# systemctl show-environment  
LANG=en_US.UTF-8  
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin  
[root@ndbaranov ~]# _
```

Загруженные модули

UNIT	LOAD	ACTIVE	SUB	D
dev-cdrom.device	loaded	activating	tentative	/
dev-disk-by\x2ddiskseq-2.device	loaded	activating	tentative	/
dev-disk-by\x2ddiskseq-3.device	loaded	activating	tentative	/
dev-disk-by\x2ddid-ata\x2dUBOX_CD\x2dROM_UB2\x2d01700376.device	loaded	activating	tentative	/
dev-disk-by\x2ddid-ata\x2dUBOX_HARDDISK_UBce502156\x2d3af60502.device	loaded	activating	tentative	/
dev-disk-by\x2ddid-ata\x2dUBOX_HARDDISK_UBce502156\x2d3af60502\x2dpart1.device	loaded	activating	tentative	/
dev-disk-by\x2ddid-ata\x2dUBOX_HARDDISK_UBce502156\x2d3af60502\x2dpart2.device	loaded	activating	tentative	/
dev-disk-by\x2dlabel-UBox_GAs_7.2.0.device	loaded	activating	tentative	/
dev-disk-by\x2dpartuuid-ae7338c\x2d01.device	loaded	activating	tentative	/
dev-disk-by\x2dpartuuid-ae7338c\x2d02.device	loaded	activating	tentative	/
dev-disk-by\x2dpath-pci\x2d0000:00:01.1\x2data\x2d2.0.device	loaded	activating	tentative	/
dev-disk-by\x2dpath-pci\x2d0000:00:01.1\x2data\x2d22.device	loaded	activating	tentative	/
dev-disk-by\x2dpath-pci\x2d0000:00:0d.0\x2data\x2d1.0.device	loaded	activating	tentative	/
dev-disk-by\x2dpath-pci\x2d0000:00:0d.0\x2data\x2d1.0\x2dpart1.device	loaded	activating	tentative	/
dev-disk-by\x2dpath-pci\x2d0000:00:0d.0\x2data\x2d1.0\x2dpart2.device	loaded	activating	tentative	/
dev-disk-by\x2dpath-pci\x2d0000:00:0d.0\x2data\x2d1.device	loaded	activating	tentative	/
dev-disk-by\x2dpath-pci\x2d0000:00:0d.0\x2data\x2d1\x2dpart1.device	loaded	activating	tentative	/
dev-disk-by\x2dpath-pci\x2d0000:00:0d.0\x2data\x2d1\x2dpart2.device	loaded	activating	tentative	/
dev-disk-by\x2duuid-2825\x2d2d00\x2d13\x2d2d20\x2d2d40\x2d09\x2d2d62.device	loaded	activating	tentative	/
dev-disk-by\x2duuid-55e3f8a0\x2d2d49d0\x2d2d4cc0\x2d2da4f0\x2d2d7e555152edf4.device	loaded	activating	tentative	/
dev-sda.device	loaded	activating	tentative	/
dev-sda1.device	loaded	activating	tentative	/
dev-sda2.device	loaded	activating	tentative	/
dev-sr0.device	loaded	activating	tentative	/
dev-ttyS0.device	loaded	activating	tentative	/
dev-ttyS1.device	loaded	activating	tentative	/
dev-ttyS2.device	loaded	activating	tentative	/
dev-ttyS3.device	loaded	activating	tentative	/
sys-devices-pci0000:00-0000:00:01.1-ata-host1-target1:0:0-1:0:0:0-block-sr0.device	loaded	activating	tentative	/
sys-devices-pci0000:00-0000:00:03.0-net-emp0s3.device	loaded	activating	tentative	/
sys-devices-pci0000:00-0000:00:0d.0-ata3-host2-target2:0:0-2:0:0:0-block-sda-sda1.device	loaded	activating	tentative	/
sys-devices-pci0000:00-0000:00:0d.0-ata3-host2-target2:0:0-2:0:0:0-block-sda-sda2.device	loaded	activating	tentative	/
sys-devices-pci0000:00-0000:00:0d.0-ata3-host2-target2:0:0-2:0:0:0-block-sda.device	loaded	activating	tentative	/
sys-devices-platform-serial0250-tty-ttyS0.device	loaded	activating	tentative	/
sys-devices-platform-serial0250-tty-ttyS1.device	loaded	activating	tentative	/
sys-devices-platform-serial0250-tty-ttyS2.device	loaded	activating	tentative	/
sys-devices-platform-serial0250-tty-ttyS3.device	loaded	activating	tentative	/
sys-devices-virtual-block-dm\x2d0.device	loaded	active	plugged	/
sys-devices-virtual-block-dm\x2d1.device	loaded	active	plugged	/
sys-module-configfs.device	loaded	activating	tentative	/
sys-module-fuse.device	loaded	activating	tentative	/
sys-subsystem-net-devices-emp0s3.device	loaded	activating	tentative	/
-.mount	loaded	active	mounted	/
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	/

lines 1-49

Переход в emergency mode

Booting a command list

```
[ 3.211260] Warning: Unmaintained driver is detected: e1000
[ 4.177042] vmwgfx 0000:00:02.0: [drm] *ERROR* vmwgfx seems to be running on
an unsupported hypervisor.
[ 4.177050] vmwgfx 0000:00:02.0: [drm] *ERROR* This configuration is likely b
roken.
[ 4.177056] vmwgfx 0000:00:02.0: [drm] *ERROR* Please switch to a supported g
raphics device to avoid problems.
```

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.

```
switch_root:/# mount -o remount,rw /sysroot
```

```
switch_root:/# chroot /sysroot
```

```
sh-5.1# passwd
```

Changing password for user root.

New password:

BAD PASSWORD: The password is shorter than 8 characters

Retype new password:

passwd: all authentication tokens updated successfully.

```
sh-5.1# load_policy -i
```

```
sh-5.1# load_policy -i
```

```
sh-5.1# chcon -t shadow_t /etc/shadow
```

```
sh-5.1#
```

Восстановление системы (emergency)

Booting a command list

```
[ 3.211260] Warning: Unmaintained driver is detected: e1000
[ 4.177042] vmwgfx 0000:00:02.0: [drm] *ERROR* vmwgfx seems to be running on
an unsupported hypervisor.
[ 4.177050] vmwgfx 0000:00:02.0: [drm] *ERROR* This configuration is likely b
roken.
[ 4.177056] vmwgfx 0000:00:02.0: [drm] *ERROR* Please switch to a supported g
raphics device to avoid problems.
```

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.

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switch_root:/# mount -o remount,rw /sysroot
```

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switch_root:/# chroot /sysroot
```

```
sh-5.1# passwd
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Retype new password:

passwd: all authentication tokens updated successfully.

```
sh-5.1# load_policy -i
```

```
sh-5.1# load_policy -i
```

```
sh-5.1# chcon -t shadow_t /etc/shadow
```

```
sh-5.1#
```

Восстановление root (rd.break)

Booting a command list

```
[ 3.211260] Warning: Unmaintained driver is detected: e1000
[ 4.177042] vmwgfx 0000:00:02.0: [drm] *ERROR* vmwgfx seems to be running on
an unsupported hypervisor.
[ 4.177050] vmwgfx 0000:00:02.0: [drm] *ERROR* This configuration is likely b
roken.
[ 4.177056] vmwgfx 0000:00:02.0: [drm] *ERROR* Please switch to a supported g
raphics device to avoid problems.
```

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.

```
switch_root:/# mount -o remount,rw /sysroot
```

```
switch_root:/# chroot /sysroot
```

```
sh-5.1# passwd
```

Changing password for user root.

New password:

BAD PASSWORD: The password is shorter than 8 characters

Retype new password:

passwd: all authentication tokens updated successfully.

```
sh-5.1# load_policy -i
```

```
sh-5.1# load_policy -i
```

```
sh-5.1# chcon -t shadow_t /etc/shadow
```

```
sh-5.1#
```


- Получены навыки работы с загрузчиком **GRUB2**
- Отработана работа в режимах **rescue** и **emergency**
- Изучен процесс восстановления пароля `root`
- Освоена практика редактирования параметров ядра при загрузке