

# Отчёт по лабораторной работе №11

## Управление загрузкой системы

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## Цель работы

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## Цель

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

## Выполнение лабораторной работы

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# Настройка параметров загрузчика

```
GNU nano 8.1
[baseos]
name=Rocky Linux $releasever - BaseOS
mirrorlist=https://mirrors.rockylinux.org/mirrorlist?arch=$basearch&repo=BaseOS-$releasever$rltype
#baseurl=http://dl.rockylinux.org/$contentdir/$releasever/BaseOS/$basearch/os/
gpgcheck=1
enabled=1
countme=1
metadata_expire=6h
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-Rocky-10

[baseos-debuginfo]
name=Rocky Linux $releasever - BaseOS - Debug
mirrorlist=https://mirrors.rockylinux.org/mirrorlist?arch=$basearch&repo=BaseOS-$releasever-debug$rltype
#baseurl=http://dl.rockylinux.org/$contentdir/$releasever/BaseOS/$basearch/debug/tree/
gpgcheck=1
enabled=0
metadata_expire=6h
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-Rocky-10

[basesos-source]
name=Rocky Linux $releasever - BaseOS - Source
mirrorlist=https://mirrors.rockylinux.org/mirrorlist?arch=source&repo=BaseOS-$releasever-source$rltype
#baseurl=http://dl.rockylinux.org/$contentdir/$releasever/BaseOS/source/tree/
gpgcheck=1
enabled=0
metadata_expire=6h
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-Rocky-10

[appstream]
name=Rocky Linux $releasever - AppStream
mirrorlist=https://mirrors.rockylinux.org/mirrorlist?arch=$basearch&repo=AppStream-$releasever$rltype
```

File menu icon

Help

Exit

Write Out

Read File

Where Is

Replace

Cut

Paste

Execute

Justify

Location

Go To Line

Undo

Redo

Set Mark

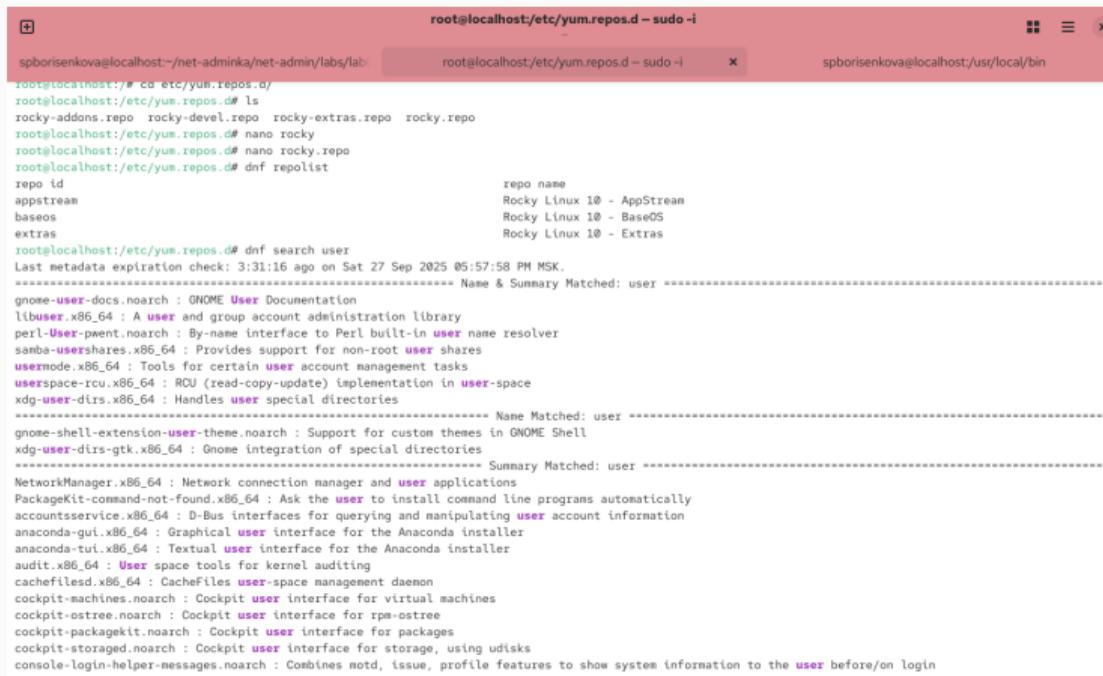
To Bracket

Copy

Where Was

Рис. 1: Редактирование /etc/default/grub

# Обновление конфигурации GRUB2



The screenshot shows a terminal window titled "root@localhost:/etc/yum.repos.d - sudo -i". The terminal is running on a Rocky Linux 8 system. The user has run the command "dnf repolist" and is then searching for "user" using "dnf search user". The search results show various packages related to users and user management, such as libuser, perl-User-pwent.noarch, samba-usershares.x86\_64, usermode.x86\_64, userspace-rcu.x86\_64, xdg-user-dirs.x86\_64, gnome-shell-extension-user-theme.noarch, NetworkManager.x86\_64, PackageKit-command-not-found.x86\_64, accountsservice.x86\_64, anaconda-gui.x86\_64, anaconda-tui.x86\_64, audit.x86\_64, cachefilesd.x86\_64, cockpit-machines.noarch, cockpit-ostree.noarch, cockpit-packagekit.noarch, cockpit-storaged.noarch, and console-login-helper-messages.noarch.

```
root@localhost:/etc/yum.repos.d - sudo -i
spborisenkova@localhost:~/net-adminka/net-admin/labs/lab1
root@localhost:/etc/yum.repos.d# ls
rocky-addons.repo  rocky-devel.repo  rocky-extras.repo  rocky.repo
root@localhost:/etc/yum.repos.d# nano rocky
root@localhost:/etc/yum.repos.d# nano rocky.repo
root@localhost:/etc/yum.repos.d# dnf repolist
repo id                                repo name
appstream                               Rocky Linux 8 - AppStream
baseos                                  Rocky Linux 8 - BaseOS
extras                                   Rocky Linux 8 - Extras
root@localhost:/etc/yum.repos.d# dnf search user
Last metadata expiration check: 3:31:16 ago on Sat 27 Sep 2025 05:57:58 PM MSK.
=====
Name & Summary Matched: user
=====
gnome-user-docs.noarch : GNOME User Documentation
libuser.x86_64 : A user and group account administration library
perl-User-pwent.noarch : By-name interface to Perl built-in user name resolver
samba-usershares.x86_64 : Provides support for non-root user shares
usermode.x86_64 : Tools for certain user account management tasks
userspace-rcu.x86_64 : RCU (read-copy-update) implementation in user-space
xdg-user-dirs.x86_64 : Handles user special directories
=====
Name Matched: user
=====
gnome-shell-extension-user-theme.noarch : Support for custom themes in GNOME Shell
xdg-user-dirs-gtk.x86_64 : Gnome integration of special directories
=====
Summary Matched: user
=====
NetworkManager.x86_64 : Network connection manager and user applications
PackageKit-command-not-found.x86_64 : Ask the user to install command line programs automatically
accountsservice.x86_64 : D-Bus interfaces for querying and manipulating user account information
anaconda-gui.x86_64 : Graphical user interface for the Anaconda installer
anaconda-tui.x86_64 : Textual user interface for the Anaconda installer
audit.x86_64 : User space tools for kernel auditing
cachefilesd.x86_64 : CacheFiles user-space management daemon
cockpit-machines.noarch : Cockpit user interface for virtual machines
cockpit-ostree.noarch : Cockpit user interface for rpm-ostree
cockpit-packagekit.noarch : Cockpit user interface for packages
cockpit-storaged.noarch : Cockpit user interface for storage, using udisks
console-login-helper-messages.noarch : Combines motd, issue, profile features to show system information to the user before/on login
```

Рис. 2: Выполнение grub2-mkconfig

## Проверка меню загрузчика



root@localhost:/etc/yum.repos.d - sudo -i  
spborisenkova@localhost:~/net-adminka/net-admin/labs/lab1  
nunad.x86\_64 : NMU **user** daemon  
open-vm-tools-desktop.x86\_64 : **User** experience components for Open Virtual Machine Tools  
passt.x86\_64 : **User**-mode networking daemons for virtual machines and namespaces  
perl-LWP-Protocol-https.noarch : Provide HTTPS support for LWP::UserAgent  
perl-Tk.x86\_64 : Perl Graphical **User** Interface ToolKit  
php-pecl-apcu.x86\_64 : APC **User** Cache  
prefixxdevname.x86\_64 : Udev helper utility that provides network interface naming using **user** defined prefix  
python3-meh-qml.noarch : Graphical **user** interface for the python3-meh library  
python3-urwid.x86\_64 : Console **user** interface library  
qatlib.x86\_64 : Intel QuickAssist **user** space library  
quota.x86\_64 : System administration tools for monitoring **users'** disk usage  
quota-warnquota.x86\_64 : Send e-mail to **users** over quota  
rdma-core.x86\_64 : RDMA core **userspace** libraries and daemons  
rootfiles.noarch : The basic required files for the root **user**'s directory  
rshim.x86\_64 : **User**-space driver for Mellanox Bluefield SoC  
rsync-rsync.noarch : A script to setup restricted rsync **users** via ssh logins  
sssd-tools.x86\_64 : **Userspace** tools for use with the SSSD  
sudo.x86\_64 : Allows restricted root access for specified **users**  
systemd-comd.x86\_64 : A **userspace** out-of-memory (OOM) killer  
texlive-listofitems.noarch : Grab items in lists using **user**-specified sep char  
texlive-vltxtra.noarch : "Extras" for LaTeX **users** of XeTeX  
trace-cmd.x86\_64 : A **user** interface to Ftrace  
uresourced.x86\_64 : Dynamically allocate resources to the active **user**  
virtiofsd.x86\_64 : Virtio-fs vhost-<b>user</b> device daemon (Rust version)  
xhost.x86\_64 : Manage hosts or **users** allowed to connect to the X server  
root@localhost:/etc/yum.repos.d# dnf search nmap  
No such command: search. Please use /bin/dnf --help  
It could be a DNF plugin command, try: "dnf install 'dnf-command(search)'"  
root@localhost:/etc/yum.repos.d# dnf search nmap  
Last metadata expiration check: 3:31:52 ago on Sat 27 Sep 2025 05:57:58 PM MSK.  
\*\*\*\*\* Name Exactly Matched: nmap \*\*\*\*\*  
nmap.x86\_64 : Network exploration tool and security scanner  
\*\*\*\*\* Name & Summary Matched: nmap \*\*\*\*\*  
nmap-ncat.x86\_64 : Nmap's Netcat replacement  
root@localhost:/etc/yum.repos.d#

Рис. 3: Меню GRUB после изменений

## Загрузка в режим rescue.target

The screenshot shows a terminal window with the following content:

```
root@localhost:/etc/yum.repos.d - sudo -i
spborisenkova@localhost:~/net-adminka/net-admin/labs/lab1
nmap-ncat.x86_64 : Nmap's Netcat replacement
root@localhost:/etc/yum.repos.d# dnf install nmap
Last metadata expiration check: 3:32:11 ago on Sat 27 Sep 2025 05:57:58 PM MSK.
Dependencies resolved.
=====
Package           Architecture      Version       Repository      Size
=====
Installing:
  nmap            x86_64          4:7.92-3.el10    appstream     5.6 M
Transaction Summary
=====
Install 1 Package
Total download size: 5.6 M
Installed size: 24 M
Is this ok [y/N]: y
Downloading Packages:
nmap-7.92-3.el10.x86_64.rpm          16 MB/s | 5.6 MB   00:00
Total                                         6.0 MB/s | 5.6 MB   00:00
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing           :
  Installing         : nmap-4:7.92-3.el10.x86_64          1/1
  Running scriptlet: nmap-4:7.92-3.el10.x86_64          1/1
  1/1
Installed:
  nmap-4:7.92-3.el10.x86_64
Complete!
root@localhost:/etc/yum.repos.d#
```

Рис. 4: Добавление параметра rescue.target

# Просмотр системных модулей и среды

```
root@localhost:/etc/yum.repos.d - sudo -i
spborisenkova@localhost:~/net-adminka/net-admin/labs/lab1
root@localhost:/etc/yum.repos.d - sudo -i
spborisenkova@localhost:/usr/local/bin

Installing      : nmap-4:7.92-3.el10.x86_64
Running scriptlet: nmap-4:7.92-3.el10.x86_64

1/1
1/1

Installed:
  nmap-4:7.92-3.el10.x86_64

Complete!
root@localhost:/etc/yum.repos.d# dnf remove nmap
Dependencies resolved.
=====
Package          Architecture Version       Repository      Size
Removing:
  nmap           x86_64      4:7.92-3.el10 @appstream   24 M

Transaction Summary
=====
Remove 1 Package

Freed space: 24 M
Is this ok [y/N]: y
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing        :
  Erasing         : nmap-4:7.92-3.el10.x86_64
  Running scriptlet: nmap-4:7.92-3.el10.x86_64

1/1
1/1
1/1

Removed:
  nmap-4:7.92-3.el10.x86_64

Complete!
root@localhost:/etc/yum.repos.d#
```

Рис. 5: Переменные среды

## Загрузка в режим emergency.target



```
root@localhost:/etc/yum.repos.d - sudo -i
spborisenkova@localhost:~/net-adminka/net-admin/labs/lab1
root@localhost:/etc/yum.repos.d - sudo -i
spborisenkova@localhost:/usr/local/bin

Running transaction
Preparing : 
Erasing   : nmap-4:7.92-3.el10.x86_64
Running scriptlet: nmap-4:7.92-3.el10.x86_64
1/1
1/1
1/1

Removed:
nmap-4:7.92-3.el10.x86_64
1/1

Complete!
root@localhost:/etc/yum.repos.d# dnf groups list
Last metadata expiration check: 3:34:01 ago on Sat 27 Sep 2025 05:57:58 PM MSK.
Available Environment Groups:
  Server
  Minimal Install
  Workstation
  Custom Operating System
  Virtualization Host
Installed Environment Groups:
  Server with GUI
Installed Groups:
  Container Management
  Headless Management
Available Groups:
  Legacy UNIX Compatibility
  Smart Card Support
  Console Internet Tools
  Development Tools
  .NET Development
  Graphical Administration Tools
  Network Servers
  RPM Development Tools
  Scientific Support
  Security Tools
  System Tools
root@localhost:/etc/yum.repos.d# 
```

Рис. 6: emergency.target

# Минимальный набор модулей



The screenshot shows a terminal window with three tabs. The active tab is titled "root@localhost:/etc/yum.repos.d - sudo -i". It displays the output of a command to list available environment groups:

```
Complete!
root@localhost:/etc/yum.repos.d# dnf groups list
Last metadata expiration check: 3:35:18 ago on Sat 27 Sep 2025 05:57:58 PM MSK.
Available Environment Groups:
  Server
  Minimal Install
  Workstation
  Custom Operating System
  Virtualization Host
Installed Environment Groups:
  Server with GUI
Installed Groups:
  Container Management
  Headless Management
Available Groups:
  Legacy UNIX Compatibility
  Smart Card Support
  Console Internet Tools
  Development Tools
  .NET Development
  Graphical Administration Tools
  Network Servers
  RPM Development Tools
  Scientific Support
  Security Tools
  System Tools
root@localhost:/etc/yum.repos.d# dnf groupremove "RPM Development Tools"
Warning: Module or Group 'RPM Development Tools' is not installed.
Dependencies resolved.
Nothing to do.
Complete!
```

Then, it shows the history command being run:

```
root@localhost:/etc/yum.repos.d# dnf history undo
No transaction ID or package name given.
Error: No transaction ID or package name given.
root@localhost:/etc/yum.repos.d# 
```

Рис. 7: Минимальные модули

# Попытка сброса через rd.break (неудачно)

The screenshot shows a terminal window with three tabs:

- spborisenkova@localhost:~/net-adminka/net-admin/labs/lab1
- root@localhost:/etc/yum.repos.d - sudo -i
- spborisenkova@localhost:/usr/local/bin

The main pane displays the following command output:

```
Dependencies resolved.
Nothing to do.
Complete!
root@localhost:/etc/yum.repos.d# dnf history undo
No transaction ID or package name given.
Error: No transaction ID or package name given.
root@localhost:/etc/yum.repos.d# dnf list lynx
Last metadata expiration check: 3:35:58 ago on Sat 27 Sep 2025 05:57:58 PM MSK.
Available Packages
lynx.x86_64                                2.9.0-6.el10                               appstream
root@localhost:/etc/yum.repos.d# dnf install lynx --downloadonly
Last metadata expiration check: 3:36:10 ago on Sat 27 Sep 2025 05:57:58 PM MSK.
Dependencies resolved.
-----
Package          Architecture      Version       Repository      Size
-----
Installing:
lynx            x86_64          2.9.0-6.el10   appstream      1.6 M
-----
Transaction Summary
-----
Install 1 Package

Total download size: 1.6 M
Installed size: 6.0 M
DNF will only download packages for the transaction.
Is this ok [y/N]: y
Downloading Packages:
lynx-2.9.0-6.el10.x86_64.rpm                3.6 MB/s | 1.6 MB  00:00
-----
Total
Complete!
The downloaded packages were saved in cache until the next successful transaction.
You can remove cached packages by executing 'dnf clean packages'.
root@localhost:/etc/yum.repos.d#
```

Рис. 8: Ошибки initramfs

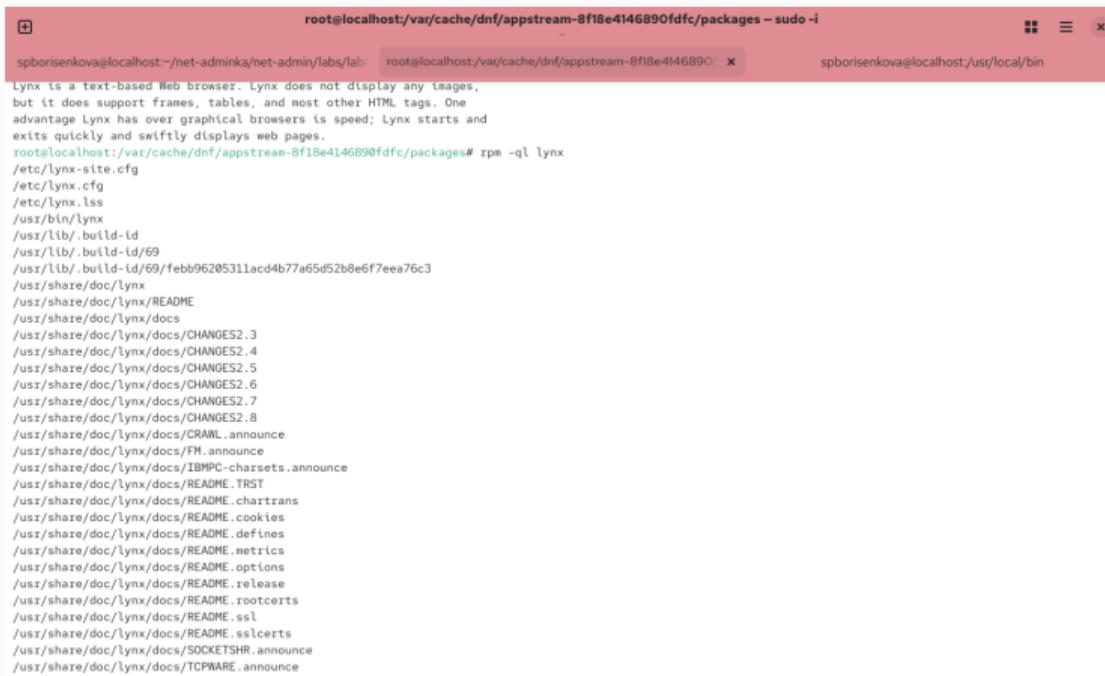
## Рабочий способ: init=/bin/bash



```
root@localhost:~/net-adminka/net-admin/labs/lab1 root@localhost:/var/cache/dnf/appstream-8f18e4146890fdfc/packages - sudo -i
spborisenkova@localhost:~/net-adminka/net-admin/labs/lab1 root@localhost:/var/cache/dnf/appstream-8f18e4146890fdfc/packages# cd packages/
root@localhost:/var/cache/dnf/appstream-8f18e4146890fdfc/packages# ls
lynx-2.9.0-6.el10.x86_64.rpm
root@localhost:/var/cache/dnf/appstream-8f18e4146890fdfc/packages# rpm -Uhv lynx-2.9.0-6.el10.x86_64.rpm
Verifying...
Preparing... ################################################ [100%]
Preparing... ################################################ [100%]
Updating / installing...
  1:lynx-2.9.0-6.el10 ################################################ [100%]
root@localhost:/var/cache/dnf/appstream-8f18e4146890fdfc/packages# which lynx
/bin/lynx
root@localhost:/var/cache/dnf/appstream-8f18e4146890fdfc/packages# rpm -qf $(which lynx)
lynx-2.9.0-6.el10.x86_64
root@localhost:/var/cache/dnf/appstream-8f18e4146890fdfc/packages# rpm -qi lynx
Name        : lynx
Version     : 2.9.0
Release     : 6.el10
Architecture: x86_64
Install Date: Sat 27 Sep 2025 09:36:08 PM MSK
Group       : Unspecified
Size        : 6283241
License     : GPL-2.0-only
Signature   : RSA/SHA256, Thu 22 May 2025 11:34:29 PM MSK, Key ID 5b106c736fedfc85
Source RPM  : lynx-2.9.0-6.el10.src.rpm
Build Date  : Fri 01 Nov 2024 01:03:33 PM MSK
Build Host  : pb-913aa2bb-e2a2-4928-a48c-b613e15933c9-b-x86-64
Packager   : Rocky Linux Build System (Peridot) <releng@rockylinux.org>
Vendor     : Rocky Enterprise Software Foundation
URL        : https://lynx.invisible-island.net/
Summary    : A text-based Web browser
Description :
Lynx is a text-based Web browser. Lynx does not display any images,
but it does support frames, tables, and most other HTML tags. One
advantage Lynx has over graphical browsers is speed; Lynx starts and
exits quickly and swiftly displays web pages.
root@localhost:/var/cache/dnf/appstream-8f18e4146890fdfc/packages# 
```

Рис. 9: init=/bin/bash

# Успешная смена пароля



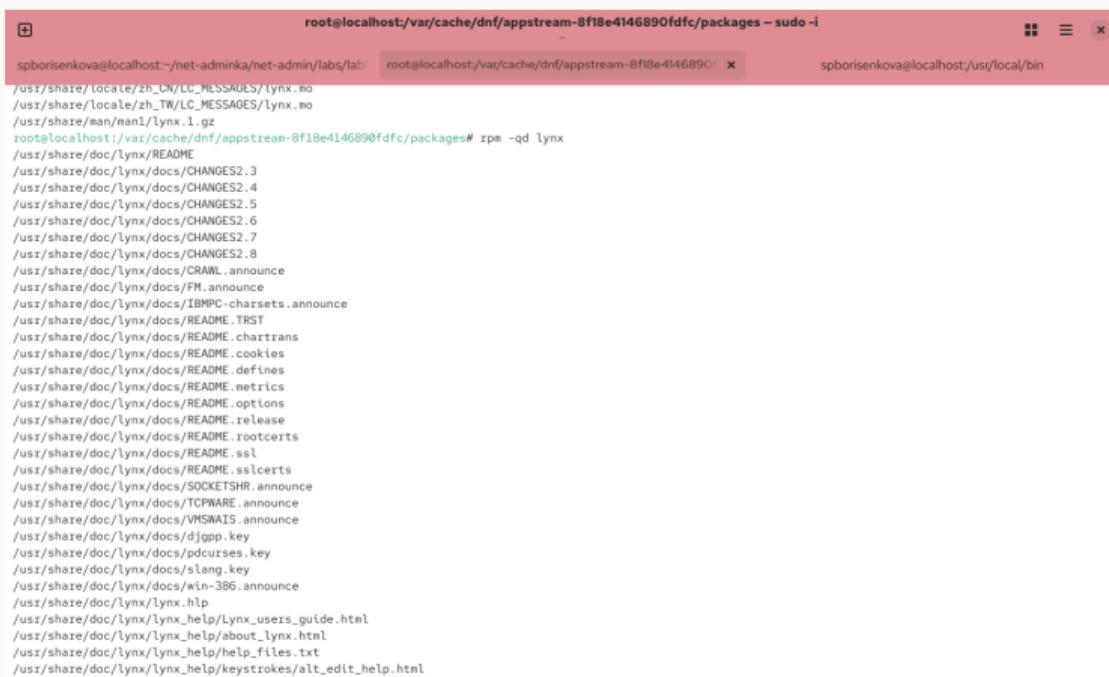
The screenshot shows a terminal window with the following details:

- Terminal title: root@localhost:/var/cache/dnf/appstream-8f18e4146890fdc/packages – sudo -i
- User: spborisenkova
- Host: localhost
- Session: net-adminika/net-admin/labs/lab
- Terminal icon: A small square with a plus sign.
- Background: Light grey.
- Text color: Black.
- Code:

```
Lynx is a text-based Web browser. Lynx does not display any images,
but it does support frames, tables, and most other HTML tags. One
advantage Lynx has over graphical browsers is speed; Lynx starts and
exits quickly and swiftly displays web pages.
root@localhost:/var/cache/dnf/appstream-8f18e4146890fdc/packages# rpm -ql lynx
/etc/lynx-site.cfg
/etc/lynx.cfg
/etc/lynx.1ss
/usr/bin/lynx
/usr/lib/.build-id
/usr/lib/.build-id/69
/usr/lib/.build-id/69/febb96205311acd4b77a65d52b8e6f7eea76c3
/usr/share/doc/lynx
/usr/share/doc/lynx/README
/usr/share/doc/lynx/docs
/usr/share/doc/lynx/docs/CHANGES2.3
/usr/share/doc/lynx/docs/CHANGES2.4
/usr/share/doc/lynx/docs/CHANGES2.5
/usr/share/doc/lynx/docs/CHANGES2.6
/usr/share/doc/lynx/docs/CHANGES2.7
/usr/share/doc/lynx/docs/CHANGES2.8
/usr/share/doc/lynx/docs/CRAWL_announce
/usr/share/doc/lynx/docs/FN_announce
/usr/share/doc/lynx/docs/IBMPC-Charsets.announce
/usr/share/doc/lynx/docs/README_TRST
/usr/share/doc/lynx/docs/README_chartrans
/usr/share/doc/lynx/docs/README_cookies
/usr/share/doc/lynx/docs/READMEDefines
/usr/share/doc/lynx/docs/README_metrics
/usr/share/doc/lynx/docs/README_options
/usr/share/doc/lynx/docs/README_release
/usr/share/doc/lynx/docs/README_rootcerts
/usr/share/doc/lynx/docs/README_ssl
/usr/share/doc/lynx/docs/README_sslcerts
/usr/share/doc/lynx/docs/SOCKETSHR.announce
/usr/share/doc/lynx/docs/TCPWARE.announce
```

Рис. 10: Смена пароля root

# Успешная загрузка после сброса



The screenshot shows a terminal window with two tabs. The left tab is titled 'spborisenkova@localhost:~/.net-adminika/net-admin/labs/lab' and the right tab is titled 'root@localhost:/var/cache/dnf/appstream-8f18e4146890fd0c/packages - sudo -i'. The terminal content is as follows:

```
spborisenkova@localhost:~/.net-adminika/net-admin/labs/lab: ~
root@localhost:/var/cache/dnf/appstream-8f18e4146890fd0c/packages - sudo -i
spborisenkova@localhost:/usr/local/bin

/usr/share/locale/zh_CN/LC_MESSAGES/lynx.mo
/usr/share/locale/zh_TW/LC_MESSAGES/lynx.mo
/usr/share/man/man1/lynx.1.gz
root@localhost:/var/cache/dnf/appstream-8f18e4146890fd0c/packages# rpm -qd lynx
/usr/share/doc/lynx/README
/usr/share/doc/lynx/docs/CHANGES2.3
/usr/share/doc/lynx/docs/CHANGES2.4
/usr/share/doc/lynx/docs/CHANGES2.5
/usr/share/doc/lynx/docs/CHANGES2.6
/usr/share/doc/lynx/docs/CHANGES2.7
/usr/share/doc/lynx/docs/CHANGES2.8
/usr/share/doc/lynx/docs/CRAWL_announce
/usr/share/doc/lynx/docs/FN_announce
/usr/share/doc/lynx/docs/IBMPCCharsets.announce
/usr/share/doc/lynx/docs/README_TRST
/usr/share/doc/lynx/docs/README_chartrans
/usr/share/doc/lynx/docs/README_cookies
/usr/share/doc/lynx/docs/READMEDefines
/usr/share/doc/lynx/docs/README_metrics
/usr/share/doc/lynx/docs/README_options
/usr/share/doc/lynx/docs/README_release
/usr/share/doc/lynx/docs/README_rootcerts
/usr/share/doc/lynx/docs/README_ssl
/usr/share/doc/lynx/docs/README_sslcerts
/usr/share/doc/lynx/docs/SOCKETSHR.announce
/usr/share/doc/lynx/docs/TCPWARE.announce
/usr/share/doc/lynx/docs/VMSNAIS.announce
/usr/share/doc/lynx/docs/dijgpp.key
/usr/share/doc/lynx/docs/pdcurses.key
/usr/share/doc/lynx/docs/slang.key
/usr/share/doc/lynx/docs/win-386.announce
/usr/share/doc/lynx/lynx.hlp
/usr/share/doc/lynx/lynx_help/Lynx_users_guide.html
/usr/share/doc/lynx/lynx_help/about_lynx.html
/usr/share/doc/lynx/lynx_help/help_files.txt
/usr/share/doc/lynx/lynx_help/keystrokes/alt_edit_help.html
```

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.