

Лабораторная работа №4

Работа с программными пакетами

Анастасия Мазуркевич

18 сентября 2025

Российский университет дружбы народов, Москва, Россия

Цель работы

Получить навыки работы с репозиториями и менеджерами пакетов в Linux.

Ход выполнения

```
admazurkevich@admazurkevich:~$ cd /etc/yum.repos.d/
admazurkevich@admazurkevich:/etc/yum.repos.d$ ls
rocky-addons.repo  rocky-devel.repo  rocky-extras.repo  rocky.repo
admazurkevich@admazurkevich:/etc/yum.repos.d$ cat rocky.repo
# rocky.repo
#
# The mirrorlist system uses the connecting IP address of the client and the
# update status of each mirror to pick current mirrors that are geographically
# close to the client.  You should use this for Rocky updates unless you are
# manually picking other mirrors.
#
# If the mirrorlist does not work for you, you can try the commented out
# baseurl line instead.

[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
```

Рис. 1: Содержимое конфигурации репозитория

```
admazurkevich@admazurkevich:/etc/yum.repos.d$ dnf repolist
repo id                                repo name
appstream                              Rocky Linux 10 - AppStream
baseos                                 Rocky Linux 10 - BaseOS
extras                                 Rocky Linux 10 - Extras
admazurkevich@admazurkevich:/etc/yum.repos.d$ dnf search user
Rocky Linux 10 - BaseOS                27 MB/s | 16 MB    00:00
Rocky Linux 10 - AppStream              3.3 MB/s | 2.1 MB  00:00
Rocky Linux 10 - Extras                 394 B/s | 4.9 kB   00:12
===== 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-transport.noarch : Cockpit user interface for transport services
```

Рис. 2: Поиск пакетов по ключевому слову user

Установка пакета nmap

```
admazurkevich@admazurkevich:/etc/yum.repos.d$
admazurkevich@admazurkevich:/etc/yum.repos.d$ dnf search nmap
Last metadata expiration check: 0:00:28 ago on Tue 16 Sep 2025 04:18:09 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
admazurkevich@admazurkevich:/etc/yum.repos.d$ dnf info nmap
Last metadata expiration check: 0:00:39 ago on Tue 16 Sep 2025 04:18:09 PM MSK.
Available Packages
Name       : nmap
Epoch     : 4
Version    : 7.92
Release    : 3.el10
Architecture : x86_64
Size       : 5.6 M
Source     : nmap-7.92-3.el10.src.rpm
Repository : appstream
Summary    : Network exploration tool and security scanner
URL        : http://nmap.org/
License    : LicenseRef-Nmap
Description : Nmap is a utility for network exploration or security auditing. It supports
            : ping scanning (determine which hosts are up), many port scanning techniques
            : (determine what services the hosts are offering), and TCP/IP fingerprinting
            : (remote host operating system identification). Nmap also offers flexible target
            : and port specification, decoy scanning, determination of TCP sequence
            : predictability characteristics, reverse-identd scanning, and more. In addition
            : to the classic command-line nmap executable, the Nmap suite includes a flexible
            : data transfer, redirection, and debugging tool (netcat utility ncat), a utility
            : for comparing scan results (ndiff), and a packet generation and response
            : analysis tool (nping).

admazurkevich@admazurkevich:/etc/yum.repos.d$
```

Рис. 3: Информация о пакете nmap

Установка пакета nmap

```
Total                                                                 7.3 MB/s | 5.6 MB    00:00
Rocky Linux 10 - AppStream                                           1.6 MB/s | 1.6 kB    00:00
Importing GPG key 0x6FEDFC85:
  Userid      : "Release Engineering (Rocky Linux 10) <releng@rockylinux.org>"
  Fingerprint: FC22 6859 C086 0BF0 DDB9 5B08 5B10 6C73 6FED FC85
  From        : /etc/pki/rpm-gpg/RPM-GPG-KEY-Rocky-10
Is this ok [y/N]: y
Key imported successfully
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing      :                                                    1/1
  Installing     : nmap-4:7.92-3.el10.x86_64                          1/1
  Running scriptlet: nmap-4:7.92-3.el10.x86_64                        1/1

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

Complete!
root@admazurkevich:~# dnf install nmap\*
Last metadata expiration check: 0:00:11 ago on Tue 16 Sep 2025 04:19:33 PM MSK.
Package nmap-4:7.92-3.el10.x86_64 is already installed.
Package nmap-ncat-4:7.92-3.el10.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
root@admazurkevich:~# █
```

Рис. 4: Установка nmap и nmap-ncat

Удаление пакета nmap

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

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

Complete!
root@admazurkevich:~# dnf remove nmap\*
Dependencies resolved.
=====
Package                Architecture      Version           Repository        Size
=====
Removing:
  nmap-ncat             x86_64            4:7.92-3.el10    @AppStream        470 k

Transaction Summary
=====
Remove 1 Package

Freed space: 470 k
Is this ok [y/N]: y
```

Рис. 5: Удаление пакета nmap

```
root@admazurkevich:~# dnf groups list
Last metadata expiration check: 0:01:13 ago on Tue 16 Sep 2025 04:19:33 PM MSK.
Available Environment Groups:
  Server
  Minimal Install
  Workstation
  Custom Operating System
  Virtualization Host
Installed Environment Groups:
  Server with GUI
Installed Groups:
  Container Management
  Development Tools
  Headless Management
Available Groups:
  Legacy UNIX Compatibility
  Smart Card Support
  Console Internet Tools
  .NET Development
  Graphical Administration Tools
  Network Servers
  RPM Development Tools
  Scientific Support
  Security Tools
  System Tools
root@admazurkevich:~# █
```

```
root@admazurkevich:~# dnf groups info "RPM Development Tools"
Last metadata expiration check: 0:02:09 ago on Tue 16 Sep 2025 04:19:33 PM MSK.
Group: RPM Development Tools
Description: Tools used for building RPMs, such as rpmbuild.
Mandatory Packages:
  redhat-rpm-config
  rpm-build
Default Packages:
  rpmdevtools
```

```
root@admazurkevich:~# dnf groupinstall "RPM Development Tools"
Last metadata expiration check: 0:02:23 ago on Tue 16 Sep 2025 04:19:33 PM MSK.
Dependencies resolved.
```

Package	Architecture	Version	Repository	Size
Installing group/module packages:				
rpmdevtools	noarch	9.6-9.el10	appstream	87 k
Installing dependencies:				
python3-argcomplete	noarch	3.2.2-4.el10	appstream	88 k
Installing Groups:				
RPM Development Tools				
Transaction Summary				

Install 2 Packages				

Рис. 7: Информация о группе RPM Development Tools

```
root@admazurkevich:~# dnf groupremove "RPM Development Tools"
Dependencies resolved.
=====
Package                        Architecture      Version           Repository        Size
=====
Removing:
  rpmddevtools                 noarch            9.6-9.el10        @appstream        198 k
Removing unused dependencies:
  python3-argcomplete          noarch            3.2.2-4.el10      @appstream        274 k
Removing Groups:
  RPM Development Tools

Transaction Summary
=====
Remove 2 Packages

Freed space: 472 k
Is this ok [y/N]: y
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing      :                                1/1
  Erasing       : rpmddevtools-9.6-9.el10.noarch  1/2
  Erasing       : python3-argcomplete-3.2.2-4.el10.noarch  2/2
  Running scriptlet: python3-argcomplete-3.2.2-4.el10.noarch  2/2

Removed:
  python3-argcomplete-3.2.2-4.el10.noarch          rpmddevtools-9.6-9.el10.noarch

Complete!
root@admazurkevich:~#
```

Рис. 8: Установка и удаление группы пакетов

История команд dnf

```
root@admazurkevich:~# dnf history
ID      | Command line                                | Date and time   | Action(s)      | Altered
-----|-----|-----|-----|-----
 6 | groupremove RPM Development Tools          | 2025-09-16 16:22 | Removed        | 3
 5 | groupinstall RPM Development Tools          | 2025-09-16 16:21 | Install        | 3
 4 | remove nmap*                               | 2025-09-16 16:20 | Removed        | 1
 3 | remove nmap                                | 2025-09-16 16:20 | Removed        | 1
 2 | install nmap                               | 2025-09-16 16:19 | Install        | 1
 1 |                                             | 2025-09-09 20:21 | Install        | 1373 >E

root@admazurkevich:~# dnf history undo 6
Last metadata expiration check: 0:03:50 ago on Tue 16 Sep 2025 04:19:33 PM MSK.
Dependencies resolved.
=====
Package                        Architecture      Version           Repository        Size
=====
Installing group/module packages:
  xpmdevtools                noarch            9.6-9.el10        appstream         87 k
Installing dependencies:
  python3-argcomplete         noarch            3.2.2-4.el10      appstream         88 k
Installing Groups:
  RPM Development Tools

Transaction Summary
=====
Install 2 Packages

Total download size: 175 k
Installed size: 472 k
Is this ok [y/N]: y
Downloading Packages:
```

Рис. 9: История dnf и откат изменений

```
root@admazurkevich:~# dnf list lynx
Last metadata expiration check: 0:05:21 ago on Tue 16 Sep 2025 04:19:33 PM MSK.
Available Packages
lynx.x86_64                                2.9.0-6.el10                                appstream
root@admazurkevich:~# dnf install lynx --downloadonly
Last metadata expiration check: 0:05:36 ago on Tue 16 Sep 2025 04:19:33 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                5.3 MB/s | 1.6 MB    00:00
-----
Total                                         1.8 MB/s | 1.6 MB    00:00
Complete!
The downloaded packages were saved in cache until the next successful transaction.
You can remove cached packages by executing 'dnf clean packages'.
root@admazurkevich:~#
```

Рис. 10: Загрузка пакета lynx

Использование rpm

```
root@admazurkevich:~# find /var/cache/dnf -name lynx*
/var/cache/dnf/appstream-8f18e4146890fdcf/packages/lynx-2.9.0-6.el10.x86_64.rpm
root@admazurkevich:~# cd /var/cache/dnf/appstream-8f18e4146890fdcf/packages/
root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fdcf/packages# rpm -Uvh lynx-2.9.0-6.el10.x86_64.rpm
Verifying... ##### [100%]
Preparing... ##### [100%]
Updating / installing...
 1:lynx-2.9.0-6.el10 ##### [100%]
root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fdcf/packages# which lynx
/bin/lynx
root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fdcf/packages# rpm -qf $(which lynx)
`lynx-2.9.0-6.el10.x86_64
root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fdcf/packages# rpm -qi lynx
Name       : lynx
Version    : 2.9.0
Release    : 6.el10
Architecture: x86_64
Install Date: Tue 16 Sep 2025 04:26:35 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,
```

Рис. 11: Установка lynx через rpm

Использование rpm

```
root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fdcf/packages# rpm -ql lynx
/etc/lynx-site.cfg
/etc/lynx.cfg
/etc/lynx.lss
/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/FM.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/README.defines
/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
```



```
root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fdcf/packages#  
root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fdcf/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/FM.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/README.defines  
/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/VMSWAIS.announce  
/usr/share/doc/lynx/docs/djgpp.key  
/usr/share/doc/lynx/docs/pdcurses.key  
/usr/share/doc/lynx/docs/slang.key
```

```
root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fdcf/packages -- sudo -i
/etc/yum.repos.d

LYNX(1)                                Lynx - the text web browser                                LYNX(1)

NAME
    lynx - a general purpose distributed information browser for the World Wide Web

SYNOPSIS
    lynx [options] [optional paths or URLs]

    lynx [options] [path or URL] -get_data
    data
    --

    lynx [options] [path or URL] -post_data
    data
    --

    Use "lynx -help" to display a complete list of current options.

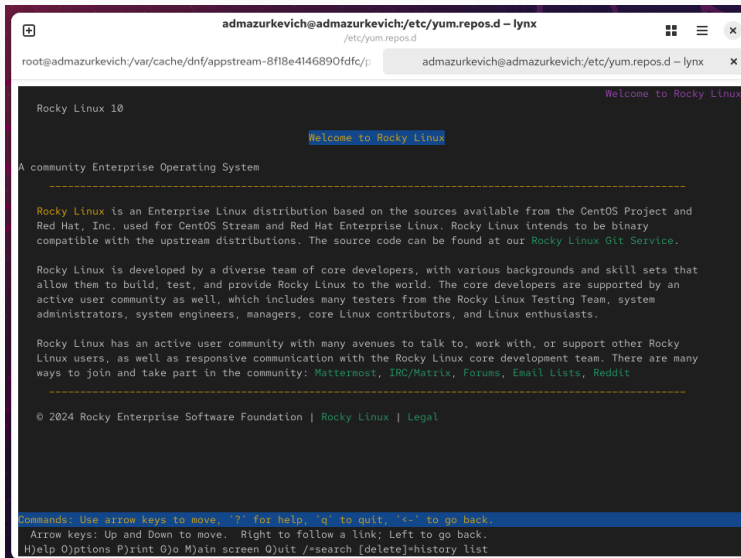
DESCRIPTION
    Lynx is a fully-featured World Wide Web (WWW) client for users running cursor-addressable, character-cell display devices (e.g., vt100 terminals, vt100 emulators running on Windows or any POSIX platform, or any other "curses-oriented" display). It will display hypertext markup language (HTML) documents containing links to files residing on the local system, as well as files residing on remote systems running Gopher, HTTP, FTP, WAIS, and NNTP servers.

    Lynx has been ported to many systems, including all variants of Unix, Windows (since Windows 95), DOS DJGPP and OS/2, as well as VMS and OS/390.

    Lynx can be used to access information on the World Wide Web, or to build information systems intended primarily for local access. For example, Lynx has been used to build several Campus Wide Information Systems (CWIS). In addition, Lynx can be used to build systems isolated within a single LAN.

OPTIONS
    Manual page lynx(1) line 1 (press h for help or q to quit)
```

Использование rpm



```
admazurkevich@admazurkevich:/etc/yum.repos.d - lynx
/etc/yum.repos.d
root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fdcf/p admazurkevich@admazurkevich:/etc/yum.repos.d - lynx x

Rocky Linux 10
Welcome to Rocky Linux

A community Enterprise Operating System

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Rocky Linux is an Enterprise Linux distribution based on the sources available from the CentOS Project and Red Hat, Inc. used for CentOS Stream and Red Hat Enterprise Linux. Rocky Linux intends to be binary compatible with the upstream distributions. The source code can be found at our Rocky Linux Git Service.

Rocky Linux is developed by a diverse team of core developers, with various backgrounds and skill sets that allow them to build, test, and provide Rocky Linux to the world. The core developers are supported by an active user community as well, which includes many testers from the Rocky Linux Testing Team, system administrators, system engineers, managers, core Linux contributors, and Linux enthusiasts.

Rocky Linux has an active user community with many avenues to talk to, work with, or support other Rocky Linux users, as well as responsive communication with the Rocky Linux core development team. There are many ways to join and take part in the community: Mattermost, IRC/Matrix, Forums, Email Lists, Reddit

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Commands: Use arrow keys to move, '?' for help, 'q' to quit, '<-' to go back.
Arrow keys: Up and Down to move. Right to follow a link; Left to go back.
H)elp O)ptions P)rint G)o M)ain screen Q)uit /s=search [delete]-history list
```

```
root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fd9c/packages# man lynx
root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fd9c/packages#
root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fd9c/packages# rpm -qc lynx
/etc/lynx-site.cfg
/etc/lynx.cfg
/etc/lynx.lss
root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fd9c/packages# rpm -q --scripts lynx
root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fd9c/packages#
root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fd9c/packages# rpm -e lynx
root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fd9c/packages# ls
lynx-2.9.0-6.el10.x86_64.rpm
root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fd9c/packages#
```

Рис. 16: Удаление пакета lynx

Установка пакета dnsmasq

```
root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fdcf/packages# dnf list dnsmasq
Last metadata expiration check: 0:04:11 ago on Tue 16 Sep 2025 04:29:22 PM MSK.
Installed Packages
dnsmasq.x86_64                                2.90-4.el10                                @AppStream
root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fdcf/packages# dnf install dnsmasq
Last metadata expiration check: 0:04:18 ago on Tue 16 Sep 2025 04:29:22 PM MSK.
Package dnsmasq-2.90-4.el10.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fdcf/packages# which dnsmasq
/sbin/dnsmasq
root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fdcf/packages# rpm -qf $(which dnsmasq)
dnsmasq-2.90-4.el10.x86_64
root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fdcf/packages# rpm -qi dnsmasq
Name       : dnsmasq
Version    : 2.90
Release    : 4.el10
Architecture: x86_64
Install Date: Tue 09 Sep 2025 08:23:09 PM MSK
Group      : Unspecified
Size       : 794976
License    : GPL-2.0-only OR GPL-3.0-only
Signature  : RSA/SHA256, Thu 22 May 2025 03:17:11 AM MSK, Key ID 5b106c736fedfc85
Source RPM : dnsmasq-2.90-4.el10.src.rpm
Build Date : Thu 31 Oct 2024 02:46:28 PM MSK
Build Host : pb-6df20f45-04b4-477b-bded-5a041ce1b59d-b-x86-64
Packager   : Rocky Linux Build System (Peridot) <releng@rockylinux.org>
Vendor     : Rocky Enterprise Software Foundation
VCS        : git:git://thekelleys.org.uk/dnsmasq.git
URL        : http://www.thekelleys.org.uk/dnsmasq/
```

Рис. 17: Информация о пакете dnsmasq

Установка пакета dnsmasq

```
root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fdcf/packages# rpm -ql dnsmasq
/etc/dbus-1/system.d/dnsmasq.conf
/etc/dnsmasq.conf
/etc/dnsmasq.d
/usr/lib/.build-id
/usr/lib/.build-id/c9
/usr/lib/.build-id/c9/a4bb4576977dbef150b40955510f869d246b34
/usr/lib/systemd/system/dnsmasq.service
/usr/lib/sysusers.d/dnsmasq.conf
/usr/sbin/dnsmasq
/usr/share/dnsmasq
/usr/share/dnsmasq/trust-anchors.conf
/usr/share/doc/dnsmasq
/usr/share/doc/dnsmasq/CHANGELOG
/usr/share/doc/dnsmasq/DBus-interface
/usr/share/doc/dnsmasq/FAQ
/usr/share/doc/dnsmasq/doc.html
/usr/share/doc/dnsmasq/setup.html
/usr/share/licenses/dnsmasq
/usr/share/licenses/dnsmasq/COPYING
/usr/share/licenses/dnsmasq/COPYING-v3
/usr/share/man/man8/dnsmasq.8.gz
/var/lib/dnsmasq
root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fdcf/packages#
```

Рис. 18: Список файлов пакета dnsmasq

```
root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fdcf/packages#  
root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fdcf/packages# rpm -qd dnsmasq  
/usr/share/doc/dnsmasq/CHANGELOG  
/usr/share/doc/dnsmasq/DBus-interface  
/usr/share/doc/dnsmasq/FAQ  
/usr/share/doc/dnsmasq/doc.html  
/usr/share/doc/dnsmasq/setup.html  
/usr/share/man/man8/dnsmasq.8.gz  
root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fdcf/packages#
```

Рис. 19: Документация пакета dnsmasq

Установка пакета dnsmasq

```
root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fdc/packages -- sudo -i
/etc/yum.repos.d

root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fdc x admazurkevich@admazurkevich:/etc/yum.repos.d

DNsmASQ(8)                                     System Manager's Manual                                DNsmASQ(8)

NAME
    dnsmasq - A lightweight DHCP and caching DNS server.

SYNOPSIS
    dnsmasq [OPTION]...

DESCRIPTION
    dnsmasq is a lightweight DNS, TFTP, PXE, router advertisement and DHCP server. It is intended to provide coupled DNS and DHCP service to a LAN.

    Dnsmasq accepts DNS queries and either answers them from a small, local, cache or forwards them to a real, recursive, DNS server. It loads the contents of /etc/hosts so that local hostnames which do not appear in the global DNS can be resolved and also answers DNS queries for DHCP configured hosts. It can also act as the authoritative DNS server for one or more domains, allowing local names to appear in the global DNS. It can be configured to do DNSSEC validation.

    The dnsmasq DHCP server supports static address assignments and multiple networks. It automatically sends a sensible default set of DHCP options, and can be configured to send any desired set of DHCP options, including vendor-encapsulated options. It includes a secure, read-only, TFTP server to allow net/PXE boot of DHCP hosts and also supports BOOTP. The PXE support is full featured, and includes a proxy mode which supplies PXE information to clients whilst DHCP address allocation is done by another server.

    The dnsmasq DHCPv6 server provides the same set of features as the DHCPv4 server, and in addition, it includes router advertisements and a neat feature which allows naming for clients which use DHCPv4 and stateless autoconfiguration only for IPv6 configuration. There is support for doing address allocation (both DHCPv6 and RA) from subnets which are dynamically delegated via DHCPv6 prefix delegation.

    Dnsmasq is coded with small embedded systems in mind. It aims for the smallest possible memory footprint compatible with the supported functions, and allows unneeded functions to be omitted from the compiled binary.

Manual page dnsmasq(8) line 1 (press h for help or q to quit)
```


Установка пакета dnsmasq

```
root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fdcf/packages# rpm -qc dnsmasq
/etc/dbus-1/system.d/dnsmasq.conf
/etc/dnsmasq.conf
root@admazurkevich:/var/cache/dnf/appstream-8f18e4146890fdcf/packages# rpm -q --scripts dnsmasq
preinstall scriptlet (using /bin/sh):
#precreate users so that rpm can install files owned by that user

# generated from dnsmasq-systemd-sysusers.conf
getent group 'dnsmasq' >/dev/null || groupadd -r 'dnsmasq' || :
getent passwd 'dnsmasq' >/dev/null || \
    useradd -r -g 'dnsmasq' -d '/var/lib/dnsmasq' -s '/usr/sbin/nologin' -c 'Dnsmasq DHCP and DNS server' 'dnsmasq' |
| :
postinstall scriptlet (using /bin/sh):

if [ $1 -eq 1 ] && [ -x "/usr/lib/systemd/systemd-update-helper" ]; then
    # Initial installation
    /usr/lib/systemd/systemd-update-helper install-system-units dnsmasq.service || :
fi
preuninstall scriptlet (using /bin/sh):

if [ $1 -eq 0 ] && [ -x "/usr/lib/systemd/systemd-update-helper" ]; then
    # Package removal, not upgrade
    /usr/lib/systemd/systemd-update-helper remove-system-units dnsmasq.service || :
fi
postuninstall scriptlet (using /bin/sh):
```

Рис. 21: Конфигурационные файлы пакета dnsmasq

Выводы по проделанной работе

В ходе работы были освоены:

- поиск, установка и удаление пакетов с помощью `dnf` и `rpm`;
- работа с группами пакетов и история команд;
- анализ содержимого rpm-пакетов (файлы, документация, конфигурация, скрипты).

Полученные навыки позволяют уверенно администрировать программные пакеты в Linux.