

Отчёт о лабораторной работе

Лабораторная работа 4

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Содержание

1. Цель работы

Получить навыки работы с репозиториями и менеджерами пакетов.

2. Задание

1. Изучить работу с репозиториями и пакетами с помощью утилиты `dnf`.
2. Получить навыки установки, удаления и получения информации о пакетах.
3. Освоить работу с группами пакетов.
4. Изучить истории операций `dnf` и научиться отменять действия.
5. Получить навыки ручной установки пакетов из RPM-файлов с помощью утилиты `rpm`.
6. Изучить возможности утилиты `rpm` для получения информации о установленных пакетах, их файлах и скриптах.

3. Выполнение лабораторной работы

3.1 Работа с репозиториями и пакетами через DNF

В консоли был выполнен переход в режим суперпользователя и осуществлён переход в каталог `/etc/yum.repos.d` для изучения репозитория системы (рис. [fig:001?]).

```
Activities Terminal Sep 6 13:01 en
root@ndbaranov:/etc/yum.repos.d

[baranov@ndbaranov ~]$ su -
Password:
[root@ndbaranov ~]# cd /etc/yum.repos.d
[root@ndbaranov yum.repos.d]# ls
gh-cli.repo rocky-addons.repo rocky-devel.repo rocky-extras.repo rocky.repo
[root@ndbaranov yum.repos.d]# cat rocky-addons.repo
# rocky-addons.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.
#
[highavailability]
name=Rocky Linux $releasever - High Availability
mirrorlist=https://mirrors.rockylinux.org/mirrorlist?arch=$basearch&repo=HighAvailability-$releasever$rltype
#baseurl=http://dl.rockylinux.org/$contentdir/$releasever/HighAvailability/$basearch/os/
gpgcheck=1
enabled=0
countme=1
metadata_expire=6h
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-Rocky-9

[highavailability-debuginfo]
name=Rocky Linux $releasever - High Availability - Debug
mirrorlist=https://mirrors.rockylinux.org/mirrorlist?arch=$basearch&repo=HighAvailability-$releasever-debug$rltype
#baseurl=http://dl.rockylinux.org/$contentdir/$releasever/HighAvailability/$basearch/debug/tree/
gpgcheck=1
enabled=0
metadata_expire=6h
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-Rocky-9

[highavailability-source]
name=Rocky Linux $releasever - High Availability - Source
mirrorlist=https://mirrors.rockylinux.org/mirrorlist?arch=source&repo=HighAvailability-$releasever-source$rltype
#baseurl=http://dl.rockylinux.org/$contentdir/$releasever/HighAvailability/source/tree/
gpgcheck=1
enabled=0
metadata_expire=6h
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-Rocky-9

[resilientstorage]
name=Rocky Linux $releasever - Resilient Storage
mirrorlist=https://mirrors.rockylinux.org/mirrorlist?arch=$basearch&repo=ResilientStorage-$releasever$rltype
#baseurl=http://dl.rockylinux.org/$contentdir/$releasever/ResilientStorage/$basearch/os/
gpgcheck=1
enabled=0
countme=1
```

Переход в каталог с репозиториями и просмотр их содержимого

Был выведен список активных репозиторийев с помощью команды `dnf repolist` (рис. [fig:002?]). На экран выведены репозитории `appstream`, `baseos`, `extras` (стандартные репозитории Rocky Linux 9) и `gh-cli` (дополнительный репозиторий для GitHub CLI). Это означает, что система настроена для получения пакетов из этих источников.

```
Activities Terminal Sep 6 13:02 en
root@ndbaranov:/etc/yum.repos.d

metadata_expire=6h
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-Rocky-9
[root@ndbaranov yum.repos.d]# dnf repolist
repo id                                repo name
appstream                              Rocky Linux 9 - AppStream
baseos                                 Rocky Linux 9 - BaseOS
extras                                 Rocky Linux 9 - Extras
gh-cli                                 packages for the GitHub CLI

[root@ndbaranov yum.repos.d]# dnf search user
Last metadata expiration check: 18:16:13 ago on Fri 05 Sep 2025 06:45:55 PM MSK.
===== Name & Summary Matched: user =====
gnome-user-docs.noarch : GNOME User Documentation
libuser.x86_64 : A user and group account administration library
libuser.i686 : 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
usermode-gtk.x86_64 : Graphical tools for certain user account management tasks
userspace-rcu.x86_64 : RCU (read-copy-update) implementation in user-space
userspace-rcu.i686 : RCU (read-copy-update) implementation in user-space
util-linux-user.x86_64 : libuser based util-linux utilities
xdg-user-dirs.x86_64 : Handles user special directories
===== Name Matched: user =====
anaconda-user-help.noarch : Content for the Anaconda built-in help system
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
clutter.x86_64 : Open Source software library for creating rich graphical user interfaces
clutter.i686 : Open Source software library for creating rich graphical user interfaces
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-storage.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
criu.x86_64 : Tool for Checkpoint/Restore in User-space
environment-modules.x86_64 : Provides dynamic modification of a user's environment
exfatprogs.x86_64 : Userspace utilities for exFAT filesystems
flatpak-session-helper.x86_64 : User D-Bus service used by flatpak and others
fltk.i686 : C++ user interface toolkit
fltk.x86_64 : C++ user interface toolkit
fuse.x86_64 : File System in Userspace (FUSE) v2 utilities
fuse-common.x86_64 : Common Files for File System in Userspace (FUSE) v2 and v3
fuse-libs.x86_64 : File System in Userspace (FUSE) v2 libraries
```

Список активных репозиториев системы

Далее был выполнен поиск пакетов, связанных со словом “user”, с помощью команды `dnf search user` (рис. [fig:002?], [fig:003?]). Команда вывела обширный список пакетов, в именах или описаниях которых встречается указанное слово. В списке присутствуют пакеты для управления пользователями (`libuser`, `usermode`), документации (`gnome-user-docs`), сервисов (`accountsservice`), а также множество других пакетов, так или иначе связанных с концепцией пользователя в системе.

```
Activities Terminal Sep 6 13:02 en
root@ndbaranov:/etc/yum.repos.d

metadata_expire=6h
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-Rocky-9
[root@ndbaranov yum.repos.d]# dnf repolist
repo id repo name
appstream Rocky Linux 9 - AppStream
baseos Rocky Linux 9 - BaseOS
extras Rocky Linux 9 - Extras
gh-cli packages for the GitHub CLI
[root@ndbaranov yum.repos.d]# dnf search user
Last metadata expiration check: 18:16:13 ago on Fri 05 Sep 2025 06:45:55 PM MSK.
===== Name & Summary Matched: user =====
gnome-user-docs.noarch : GNOME User Documentation
libuser.x86_64 : A user and group account administration library
libuser.i686 : 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
usermode-gtk.x86_64 : Graphical tools for certain user account management tasks
userspace-rcu.x86_64 : RCU (read-copy-update) implementation in user-space
userspace-rcu.i686 : RCU (read-copy-update) implementation in user-space
util-linux-user.x86_64 : libuser based util-linux utilities
xdg-user-dirs.x86_64 : Handles user special directories
===== Name Matched: user =====
anaconda-user-help.noarch : Content for the Anaconda built-in help system
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
accounts-service.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
clutter.x86_64 : Open Source software library for creating rich graphical user interfaces
clutter.i686 : Open Source software library for creating rich graphical user interfaces
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-storage.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
criu.x86_64 : Tool for Checkpoint/Restore in User-space
environment-modules.x86_64 : Provides dynamic modification of a user's environment
exfatprogs.x86_64 : Userspace utilities for exFAT filesystems
flatpak-session-helper.x86_64 : User D-Bus service used by flatpak and others
fltk.i686 : C++ user interface toolkit
fltk.x86_64 : C++ user interface toolkit
fuse.x86_64 : File System in Userspace (FUSE) v2 utilities
fuse-common.x86_64 : Common files for File System in Userspace (FUSE) v2 and v3
fuse-libs.x86_64 : File System in Userspace (FUSE) v2 libraries
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-oomd.x86_64 : A userspace out-of-memory (OOM) killer
texlive-listofitems.noarch : Grab items in lists using user-specified sep char
texlive-xtlextra.noarch : "Extras" for LaTeX users of XeTeX
trace-cmd.x86_64 : A user interface to Ftrace
udftools.x86_64 : Linux UDF Filesystem userspace utilities
uresourced.x86_64 : Dynamically allocate resources to the active user
virtiofsd.x86_64 : Virtio-fs vhost-user device daemon (Rust version)
[root@ndbaranov yum.repos.d]# dnf search nmap
Last metadata expiration check: 18:17:11 ago on Fri 05 Sep 2025 06:45:19 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@ndbaranov yum.repos.d]# dnf info nmap
Rocky Linux 9 - BaseOS 386 B/s | 4.1 kB 00:10
Rocky Linux 9 - AppStream 427 B/s | 4.5 kB 00:10
Rocky Linux 9 - Extras 280 B/s | 2.9 kB 00:10
Available Packages
Name : nmap
Epoch : 3
Version : 7.92
Release : 3.el9
Architecture : x86_64
Size : 5.4 M
Source : nmap-7.92-3.el9.src.rpm
Repository : appstream
Summary : Network exploration tool and security scanner
URL : http://nmap.org/
License : 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).

[root@ndbaranov yum.repos.d]# dnf install nmap
Last metadata expiration check: 0:00:24 ago on Sat 06 Sep 2025 01:04:23 PM MSK.
Dependencies resolved.
```

Был выполнен поиск, получение информации и установка пакета nmap (сетевого сканера) (рис. [fig:004?]). Команда `dnf search nmap` показала, что доступны два пакета: `nmap` и `nmap-ncat`. Команда `dnf info nmap` вывела подробную информацию о основном пакете. Разница между командами

`dnf install nmap` и `dnf install nmap*` заключается в том, что первая устанавливает только указанный пакет (nmap), а вторая, благодаря использованию wildcard (*), пытается установить все пакеты, имена которых начинаются с nmap (в данном случае это nmap и nmap-ncat).

```
Activities Terminal Sep 6 13:07 en
root@ndbaranov:/etc/yum.repos.d

: (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).

[root@ndbaranov yum.repos.d]# dnf install nmap
Last metadata expiration check: 0:00:24 ago on Sat 06 Sep 2025 01:04:23 PM MSK.
Dependencies resolved.
=====
Package      Architecture Version      Repository      Size
=====
Installing:
nmap         x86_64      3:7.92-3.el9 appstream       5.4 M
=====
Transaction Summary
=====
Install 1 Package

Total download size: 5.4 M
Installed size: 24 M
Is this ok [y/N]: y
Downloading Packages:
nmap-7.92-3.el9.x86_64.rpm                                823 kB/s | 5.4 MB  00:06
-----
Total                                                    453 kB/s | 5.4 MB  00:12
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing      : nmap-3:7.92-3.el9.x86_64                1/1
  Installing     : nmap-3:7.92-3.el9.x86_64                1/1
  Running scriptlet: nmap-3:7.92-3.el9.x86_64                1/1
  Verifying      : nmap-3:7.92-3.el9.x86_64                1/1

Installed:
nmap-3:7.92-3.el9.x86_64

Complete!
[root@ndbaranov yum.repos.d]# dnf install nmap\*
Last metadata expiration check: 0:00:59 ago on Sat 06 Sep 2025 01:04:23 PM MSK.
Package nmap-3:7.92-3.el9.x86_64 is already installed.
Package nmap-ncat-3:7.92-3.el9.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
[root@ndbaranov yum.repos.d]#
```

Поиск, получение информации и установка пакета nmap

После установки пакеты nmap и nmap-ncat были удалены (рис. [fig:005?]). Команда `dnf remove nmap` удалила основной пакет, а команда `dnf remove nmap*` удалила оставшийся пакет nmap-ncat.

```
Activities Terminal Sep 6 13:07 en
root@ndbaranov:/etc/yum.repos.d

Nothing to do.
Complete!
[root@ndbaranov yum.repos.d]# dnf remove nmap
Dependencies resolved.
=====
Package Architecture Version Repository Size
=====
Removing:
nmap x86_64 3:7.92-3.el9 @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 : nmap-3:7.92-3.el9.x86_64 1/1
Erasing : nmap-3:7.92-3.el9.x86_64 1/1
Running scriptlet: nmap-3:7.92-3.el9.x86_64 1/1
Verifying : nmap-3:7.92-3.el9.x86_64 1/1
Removed:
nmap-3:7.92-3.el9.x86_64

Complete!
[root@ndbaranov yum.repos.d]# dnf remove nmap-*
Dependencies resolved.
=====
Package Architecture Version Repository Size
=====
Removing:
nmap-ncat x86_64 3:7.92-3.el9 @AppStream 469 k
=====
Transaction Summary
=====
Remove 1 Package

Freed space: 469 k
Is this ok [y/N]: y
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
Preparing : nmap-ncat-3:7.92-3.el9.x86_64 1/1
Running scriptlet: nmap-ncat-3:7.92-3.el9.x86_64 1/1
```

Удаление пакетов nmap и nmap-ncat

3.2 Работа с группами пакетов

Был получен список групп пакетов, доступных в системе, с помощью команды `dnf groups list` (рис. [fig:006?]). Для получения вывода на английском языке (во избежание проблем с локализацией) была использована команда `LANG=C dnf groups list`. Была получена информация о группе “RPM Development Tools” с помощью `dnf groups info`, а затем эта группа была установлена (рис. [fig:007?]). В процессе установки были добавлены пакеты `rpmdevtools` и его зависимость `python3-argcomplete`.

```
Activities Terminal Sep 6 13:08 en
root@ndbaranov:/etc/yum.repos.d

Removed:
nmap-ncat-3:7.92-3.el9.x86_64

Complete!
[root@ndbaranov yum.repos.d]# dnf groups list
Last metadata expiration check: 0:03:48 ago on Sat 06 Sep 2025 01:04:23 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
  Console Internet Tools
  .NET Development
  Graphical Administration Tools
  Network Servers
  RPM Development Tools
  Scientific Support
  Security Tools
  Smart Card Support
  System Tools
[root@ndbaranov yum.repos.d]# LANG=C dnf groups list
Last metadata expiration check: 0:04:19 ago on Sat Sep 6 13:04:23 2025.
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
  Console Internet Tools
  .NET Development
  Graphical Administration Tools
  Network Servers
  RPM Development Tools
  Scientific Support

Activities Terminal Sep 6 13:09 en
root@ndbaranov:/etc/yum.repos.d

Server with GUI
Installed Groups:
  Container Management
  Development Tools
  Headless Management
Available Groups:
  Legacy UNIX Compatibility
  Console Internet Tools
  .NET Development
  Graphical Administration Tools
  Network Servers
  RPM Development Tools
  Scientific Support
  Security Tools
  Smart Card Support
  System Tools
[root@ndbaranov yum.repos.d]# dnf groups info "RPM Development Tools"
Last metadata expiration check: 0:04:41 ago on Sat 06 Sep 2025 01:04:23 PM MSK.
Group: RPM Development Tools
Description: Tools used for building RPMs, such as rpmbuild.
Mandatory Packages:
  redhat-rpm-config
  rpm-build
Default Packages:
  rpmddevtools
Optional Packages:
  rpmlint
[root@ndbaranov yum.repos.d]# dnf groupsinstall "RPM Development Tools"
No such command: groupsinstall. Please use /usr/bin/dnf --help
It could be a DNF plugin command, try: "dnf install 'dnf-command(groupsinstall)'"
[root@ndbaranov yum.repos.d]# dnf groupinstall "RPM Development Tools"
Last metadata expiration check: 0:05:15 ago on Sat 06 Sep 2025 01:04:23 PM MSK.
Dependencies resolved.
=====
Package                Architecture    Version          Repository      Size
=====
Installing group/module packages:
rpmddevtools           noarch         9.5-1.el9        appstream       75 k
Installing dependencies:
python3-argcomplete     noarch         1.12.0-5.el9     appstream       61 k
Installing Groups:
RPM Development Tools

Transaction Summary
=====
Install 2 Packages

Total download size: 135 k
Installed size: 414 k
Is this ok [y/N]:
```

3.3 История операций DNF и отмена действий

Была просмотрена история операций dnf (рис. [fig:008?]). Команда `dnf history` вывела таблицу с ID, командной строкой, датой, действием и

количеством изменённых пакетов для каждой операции. Была предпринята попытка отменить действие с ID 6 (установка gh) и действие с ID 16 (установка nmap). Отмена установки gh была прервана ([y/N]: n), а отмена установки nmap не выполнила никаких действий, так как пакет уже был удалён ранее, о чём система выдала предупреждение.

```
Activities Terminal Sep 6 13:11 • en
root@ndbaranov:/etc/yum.repos.d

Installed:
python3-argcomplete-1.12.0-5.el9.noarch rpmdevtools-9.5-1.el9.noarch

Complete!
[root@ndbaranov yum.repos.d]# dnf history
ID | Command line | Date and time | Action(s) | Altered
-----
19 | groupinstall RPM Development Tools | 2025-09-06 13:10 | Install | 3
18 | remove nmap* | 2025-09-06 13:07 | Removed | 1
17 | remove nmap | 2025-09-06 13:07 | Removed | 1
16 | install nmap | 2025-09-06 13:05 | Install | 1
15 | install google-noto-fonts-common google-noto-sans-fonts google | 2025-09-03 21:11 | Install | 2
14 | install evince | 2025-09-03 19:50 | Install | 5
13 | | 2025-09-03 19:46 | Install | 10
12 | install texlive-ctablestack | 2025-09-03 19:29 | Install | 1
11 | install texlive | 2025-09-03 19:25 | Install | 268
10 | remove texlive-* | 2025-09-03 18:10 | Removed | 276 EE
9 | install texlive-ctablestack | 2025-09-03 17:52 | Install | 1
8 | install texlive | 2025-09-03 17:11 | Install | 267
7 | | 2025-09-03 16:31 | Install | 53
6 | install gh -y | 2025-09-03 15:07 | Install | 1 <
5 | update | 2025-09-03 14:51 | Upgrade | 180 >
4 | remove kernel-devel-5.14.0-570.17.1.el9_6.x86_64 | 2025-09-03 12:45 | C, E | 2
3 | install kernel-5.14.0-570.37.1.el9_6.x86_64 | 2025-09-03 12:37 | Install | 4 EE
2 | install -y kernel-devel kernel-headers gcc make perl elfutils- | 2025-09-02 21:17 | I, U | 169 <
1 | | 2025-09-02 20:32 | Install | 1308 >E

[root@ndbaranov yum.repos.d]# dnf history undo 6
Last metadata expiration check: 0:06:29 ago on Sat 06 Sep 2025 01:04:23 PM MSK.
Dependencies resolved.
=====
Package Architecture Version Repository Size
=====
Removing:
gh x86_64 2.78.0-1 @gh-cli 52 M
=====
Transaction Summary
=====
Remove 1 Package

Freed space: 52 M
Is this ok [y/N]: n
Operation aborted.
[root@ndbaranov yum.repos.d]# dnf history undo 16
Last metadata expiration check: 0:07:15 ago on Sat 06 Sep 2025 01:04:23 PM MSK.
Dependencies resolved.
Nothing to do.
Complete!
Warning, the following problems occurred while running a transaction:
Package nevra "nmap-3:7.92-3.el9.x86_64" not installed for action "Removed".
[root@ndbaranov yum.repos.d]#
```

Просмотр истории DNF и попытка отмены действий

3.4 Установка и анализ пакета Lynx вручную

Был выполнен поиск пакета lynx (текстовый браузер) и он был загружен в кэш без установки с помощью команды `dnf install lynx --downloadonly` (рис. [fig:009?]).


```
Activities Terminal Sep 6 13:15 en
root@ndbaranov:/var/cache/dnf/appstream-25485261a76941d3/packages

Freed space: 52 M
Is this ok [y/N]: n
Operation aborted.
[root@ndbaranov yum.repos.d]# dnf history undo 16
Last metadata expiration check: 0:07:15 ago on Sat 06 Sep 2025 01:04:23 PM MSK.
Dependencies resolved.
Nothing to do.
Complete!
Warning, the following problems occurred while running a transaction:
  Package nevra "nmap-3:7.92-3.el9.x86_64" not installed for action "Removed".
[root@ndbaranov yum.repos.d]# dnf list lynx
Last metadata expiration check: 0:08:09 ago on Sat 06 Sep 2025 01:04:23 PM MSK.
Available Packages
lynx.x86_64                                2.8.9-20.el9                                appstream
[root@ndbaranov yum.repos.d]# dnf install lynx --downloadonly
Last metadata expiration check: 0:08:33 ago on Sat 06 Sep 2025 01:04:23 PM MSK.
Dependencies resolved.
=====
Package      Architecture      Version      Repository      Size
=====
Installing:
lynx         x86_64            2.8.9-20.el9      appstream        1.5 M
Transaction Summary
=====
Install 1 Package

Total download size: 1.5 M
Installed size: 6.1 M
DNF will only download packages for the transaction.
Is this ok [y/N]: y
Downloading Packages:
lynx-2.8.9-20.el9.x86_64.rpm                275 kB/s | 1.5 MB  00:05
-----
Total                                       139 kB/s | 1.5 MB  00:11
Complete!
The downloaded packages were saved in cache until the next successful transaction.
You can remove cached packages by executing 'dnf clean packages'.
[root@ndbaranov yum.repos.d]# find /var/cache/dnf/ -name lynx*
/var/cache/dnf/appstream-25485261a76941d3/packages/lynx-2.8.9-20.el9.x86_64.rpm
[root@ndbaranov yum.repos.d]# cd /var/cache/dnf/appstream-25485261a76941d3/packages/
[root@ndbaranov packages]# ls
lynx-2.8.9-20.el9.x86_64.rpm
[root@ndbaranov packages]# rpm -Uvh lynx-2.8.9-20.el9.x86_64.rpm
Verifying... ##### [100%]
Preparing... ##### [100%]
Updating / installing...
 1:lynx-2.8.9-20.el9 ##### [100%]
[root@ndbaranov packages]#
```

Поиск и загрузка пакета lynx

С помощью команды `find` был найден путь к загруженному RPM-файлу. После перехода в соответствующий каталог пакет был установлен вручную с помощью команды `rpm -Uvh` (рис. [fig:010?]).

```
Activities Terminal Sep 6 13:15 en
root@ndbaranov:/var/cache/dnf/appstream-25485261a76941d3/packages

Freed space: 52 M
Is this ok [y/N]: n
Operation aborted.
[root@ndbaranov yum.repos.d]# dnf history undo 16
Last metadata expiration check: 0:07:15 ago on Sat 06 Sep 2025 01:04:23 PM MSK.
Dependencies resolved.
Nothing to do.
Complete!
Warning, the following problems occurred while running a transaction:
  Package nevra "nmap-3:7.92-3.el9.x86_64" not installed for action "Removed".
[root@ndbaranov yum.repos.d]# dnf list lynx
Last metadata expiration check: 0:08:09 ago on Sat 06 Sep 2025 01:04:23 PM MSK.
Available Packages
lynx.x86_64                                2.8.9-20.el9                                appstream
[root@ndbaranov yum.repos.d]# dnf install lynx --downloadonly
Last metadata expiration check: 0:08:33 ago on Sat 06 Sep 2025 01:04:23 PM MSK.
Dependencies resolved.
=====
Package                Architecture      Version           Repository      Size
=====
Installing:
lynx                   x86_64            2.8.9-20.el9      appstream        1.5 M

Transaction Summary
=====
Install 1 Package

Total download size: 1.5 M
Installed size: 6.1 M
DNF will only download packages for the transaction.
Is this ok [y/N]: y
Downloading Packages:
lynx-2.8.9-20.el9.x86_64.rpm                275 kB/s | 1.5 MB  00:05
-----
Total                                       139 kB/s | 1.5 MB  00:11
Complete!
The downloaded packages were saved in cache until the next successful transaction.
You can remove cached packages by executing 'dnf clean packages'.
[root@ndbaranov yum.repos.d]# find /var/cache/dnf/ -name lynx*
/var/cache/dnf/appstream-25485261a76941d3/packages/lynx-2.8.9-20.el9.x86_64.rpm
[root@ndbaranov yum.repos.d]# cd /var/cache/dnf/appstream-25485261a76941d3/packages/
[root@ndbaranov packages]# ls
lynx-2.8.9-20.el9.x86_64.rpm
[root@ndbaranov packages]# rpm -Uhv lynx-2.8.9-20.el9.x86_64.rpm
Verifying...
Preparing...
Updating / installing...
 1:lynx-2.8.9-20.el9
[root@ndbaranov packages]#

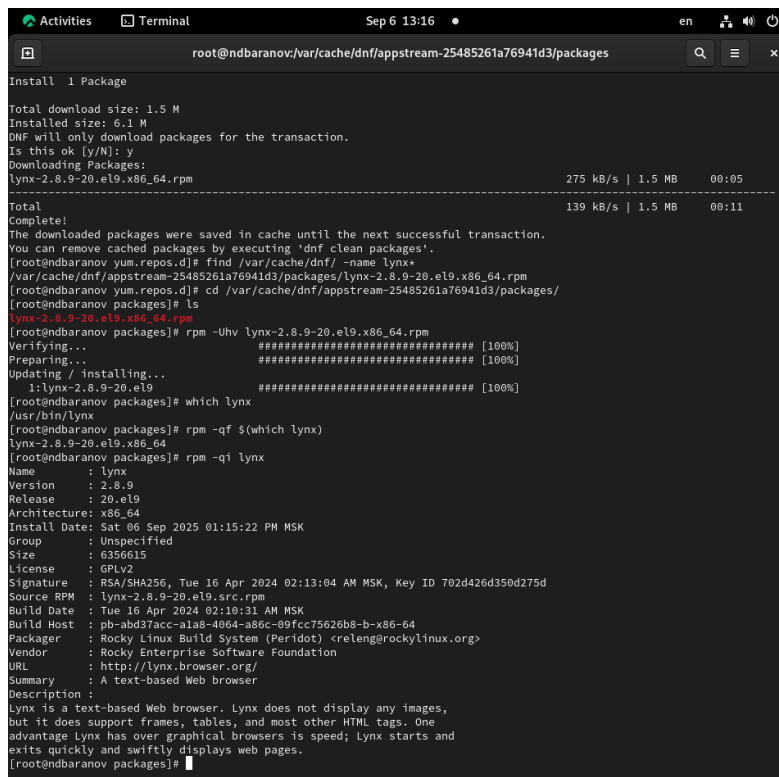
Activities Terminal Sep 6 13:16 en
root@ndbaranov:/var/cache/dnf/appstream-25485261a76941d3/packages

Install 1 Package

Total download size: 1.5 M
Installed size: 6.1 M
DNF will only download packages for the transaction.
Is this ok [y/N]: y
Downloading Packages:
lynx-2.8.9-20.el9.x86_64.rpm                275 kB/s | 1.5 MB  00:05
-----
Total                                       139 kB/s | 1.5 MB  00:11
Complete!
The downloaded packages were saved in cache until the next successful transaction.
You can remove cached packages by executing 'dnf clean packages'.
[root@ndbaranov yum.repos.d]# find /var/cache/dnf/ -name lynx*
/var/cache/dnf/appstream-25485261a76941d3/packages/lynx-2.8.9-20.el9.x86_64.rpm
[root@ndbaranov yum.repos.d]# cd /var/cache/dnf/appstream-25485261a76941d3/packages/
[root@ndbaranov packages]# ls
lynx-2.8.9-20.el9.x86_64.rpm
[root@ndbaranov packages]# rpm -Uhv lynx-2.8.9-20.el9.x86_64.rpm
Verifying...
Preparing...
Updating / installing...
 1:lynx-2.8.9-20.el9
[root@ndbaranov packages]# which lynx
/usr/bin/lynx
[root@ndbaranov packages]# rpm -qf $(which lynx)
lynx-2.8.9-20.el9.x86_64
[root@ndbaranov packages]# rpm -qi lynx
Name       : lynx
Version    : 2.8.9
Release    : 20.el9
Architecture: x86_64
Install Date: Sat 06 Sep 2025 01:15:22 PM MSK
Group      : Unspecified
Size       : 6356615
License    : GPLv2
Signature  : RSA/SHA256, Tue 16 Apr 2024 02:13:04 AM MSK, Key ID 702d426d358d275d
Source RPM : lynx-2.8.9-20.el9.src.rpm
Build Date : Tue 16 Apr 2024 02:10:33 AM MSK
Build Host : pb-abd37acc-ala8-4864-a86c-89fcc75626b8-b-x86-64
Packager   : Rocky Linux Build System (Peridot) <releng@rockylinux.org>
Vendor     : Rocky Enterprise Software Foundation
URL        : http://lynx.browser.org/
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@ndbaranov packages]#
```

Было определено расположение исполняемого файла lynx с помощью `which lynx`. Команда `rpm -qf $(which lynx)` подтвердила, что файл принадлежит только что установленному пакету. Команда `rpm -qi lynx`

вывела подробную информацию о пакете: версию, релиз, архитектуру, дату сборки, описание и другую метainформацию (рис. [fig:010?]).



```
root@ndbaranov:/var/cache/dnf/appstream-25485261a76941d3/packages
Install 1 Package
Total download size: 1.5 M
Installed size: 6.1 M
DNF will only download packages for the transaction.
Is this ok [y/N]: y
Downloading Packages:
lynx-2.8.9-20.el9.x86_64.rpm                                275 kB/s | 1.5 MB  00:05
-----
Total                                                    139 kB/s | 1.5 MB  00:11
Complete!
The downloaded packages were saved in cache until the next successful transaction.
You can remove cached packages by executing 'dnf clean packages'.
[root@ndbaranov yum.repos.d]# find /var/cache/dnf/ -name lynx+
/var/cache/dnf/appstream-25485261a76941d3/packages/lynx-2.8.9-20.el9.x86_64.rpm
[root@ndbaranov yum.repos.d]# cd /var/cache/dnf/appstream-25485261a76941d3/packages/
[root@ndbaranov packages]# ls
lynx-2.8.9-20.el9.x86_64.rpm
[root@ndbaranov packages]# rpm -Uvh lynx-2.8.9-20.el9.x86_64.rpm
Verifying...
Preparing...
Updating / installing...
  1:lynx-2.8.9-20.el9
[root@ndbaranov packages]# which lynx
/usr/bin/lynx
[root@ndbaranov packages]# rpm -qf $(which lynx)
lynx-2.8.9-20.el9.x86_64
[root@ndbaranov packages]# rpm -qi lynx
Name       : lynx
Version    : 2.8.9
Release    : 20.el9
Architecture: x86_64
Install Date: Sat 06 Sep 2025 01:15:22 PM MSK
Group      : Unspecified
Size       : 6356615
License    : GPLv2
Signature  : RSA/SHA256, Tue 16 Apr 2024 02:13:04 AM MSK, Key ID 702d426d350d275d
Source RPM : lynx-2.8.9-20.el9.src.rpm
Build Date : Tue 16 Apr 2024 02:10:31 AM MSK
Build Host : pb-abd37acc-ala8-4064-a86c-09fcc75626b8-b-x86-64
Packager   : Rocky Linux Build System (Peridot) <releng@rockylinux.org>
Vendor     : Rocky Enterprise Software Foundation
URL        : http://lynx.browser.org/
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@ndbaranov packages]#
```

Определение принадлежности файла и информация о пакете

Команда `rpm -ql lynx` вывела список всех файлов, установленных пакетом `lynx` (рис. [fig:011?], [fig:014?]). Команда `rpm -qd lynx` вывела список только файлов документации пакета. Попытка просмотреть документацию с помощью `man lynx /usr/share/doc/lynx/INSTALLATION` завершилась ошибкой, так как синтаксис команды `man` предполагает указание только имени страницы, а не пути к файлу. Просмотр руководства `man lynx` был выполнен успешно (рис. [fig:013?]).

```
Activities Terminal Sep 6 13:17 en
root@ndbaranov:/var/cache/dnf/appstream-25485261a76941d3/packages

[root@ndbaranov 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/5a
/usr/lib/.build-id/5a/06d3c4e1a8f4e4a2a1a5305737084bab728b85
/usr/share/doc/lynx
/usr/share/doc/lynx/INSTALLATION
/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/FW.announce
/usr/share/doc/lynx/docs/IBWPC-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/README.SOCKETSHR.announce
/usr/share/doc/lynx/docs/TCPWARE.announce
/usr/share/doc/lynx/docs/VMSWAIS.announce
/usr/share/doc/lynx/docs/djppp.key
/usr/share/doc/lynx/docs/pdurses.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
/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
/usr/share/doc/lynx/lynx_help/keystrokes/alt_edit_help.html
/usr/share/doc/lynx/lynx_help/keystrokes/bashlike_edit_help.html
/usr/share/doc/lynx/lynx_help/keystrokes/bookmark_help.html
/usr/share/doc/lynx/lynx_help/keystrokes/cookie_help.html
/usr/share/doc/lynx/lynx_help/keystrokes/dired_help.html
/usr/share/doc/lynx/lynx_help/keystrokes/edit_help.html
/usr/share/doc/lynx/lynx_help/keystrokes/environments.html
/usr/share/doc/lynx/samples/mailto-form.pl
/usr/share/doc/lynx/samples/midnight.lss
/usr/share/doc/lynx/samples/mild-colors.lss
/usr/share/doc/lynx
Welcome to Rocky Linux (pl of 2)
Rocky Linux 9
Welcome to Rocky Linux
community Enterprise Operating System
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.
-- press space for next page --
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 /=search [delete]=history list
/usr/share/doc/lynx/test/triangle.html
/usr/share/doc/lynx/test/unicode.html
/usr/share/doc/lynx/test/utf-8-demo.html
/usr/share/man/man1/lynx.1.gz
[root@ndbaranov packages]# man lynx /usr/share/doc/lynx/INSTALLATION
man: lynx-/usr/share/doc/lynx/INSTALLATION: No such file or directory
man: lynx-/usr/share/doc/lynx/INSTALLATION: No such file or directory
--Man-- next: INSTALLATION [ view (return) | skip (Ctrl-D) | quit (Ctrl-C) ]
^C
[root@ndbaranov packages]# man lynx /usr/share/doc/lynx/INSTALLATION
man: lynx-/usr/share/doc/lynx/INSTALLATION: No such file or directory
man: lynx-/usr/share/doc/lynx/INSTALLATION: No such file or directory
--Man-- next: INSTALLATION [ view (return) | skip (Ctrl-D) | quit (Ctrl-C) ]
^C
[root@ndbaranov packages]# rpm -qc lynx
/etc/lynx-site.cfg
/etc/lynx.cfg
/etc/lynx.lss
[root@ndbaranov packages]# rpm -q --scripts lynx
[root@ndbaranov packages]#
```

```
Activities Terminal Sep 6 13:19 en
root@ndbaranov:/var/cache/dnf/appstream-25485261a76941d3/packages
LYNX(1) General Commands Manual 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 95/NT/XP/7/8 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. Current versions of Lynx run on Unix, VMS, Windows 95/NT/XP/7/8, DOS DJGPP and OS/2.

  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
  At start up, Lynx will load any local file or remote URL specified at the command line. For help with URLs, press "?" or "H" while running Lynx. Then follow the link titled, "Help on URLs."

  If more than one local file or remote URL is listed on the command line, Lynx will open only the last interactively. All of the names (local files and remote URLs) are added to the Goto history.

  Lynx uses only long option names. Option names can begin with double dash "--" as well, underscores and dashes can be intermixed in option names (in the reference below, options are shown with one dash "-" before them, and with underscores "_").

  Lynx provides many command-line options. Some options require a value (string, number or keyword). These are noted in the reference below. The other options set boolean values in the program. There are three types of boolean options: set, unset and toggle. If no option value is given, these have the obvious meaning: set (to true), unset (to false), or toggle (between true/false). For any of these, an explicit value can be given in different forms to allow for operating system constraints, e.g.,

    -center:off
    -center=off
Manual page lynx(1) line 1 (press h for help or q to quit)
```

Команда `rpm -qc lynx` вывела список конфигурационных файлов пакета: `/etc/lynx-site.cfg`, `/etc/lynx.cfg`, `/etc/lynx.lss` (рис. [fig:015?]). Команда `rpm -q --scripts lynx` не вывела никакой информации, что означает отсутствие скриптов пред-/пост-установки в данном пакете.

```
Activities Terminal Sep 6 13:21 en
root@ndbaranov:var/cache/dnf/appstream-25485261a76941d3/packages

/usr/share/doc/lynx/samples/mime.types
/usr/share/doc/lynx/samples/oldlynx
/usr/share/doc/lynx/samples/opaue.lss
/usr/share/doc/lynx/test/AL88592.html
/usr/share/doc/lynx/test/ISO_LATIN1_test.html
/usr/share/doc/lynx/test/README.txt
/usr/share/doc/lynx/test/TestComment.html
/usr/share/doc/lynx/test/bad-html.html
/usr/share/doc/lynx/test/c1.html
/usr/share/doc/lynx/test/circle.html
/usr/share/doc/lynx/test/cp-1252.html
/usr/share/doc/lynx/test/cp-1252a.html
/usr/share/doc/lynx/test/image.jpg
/usr/share/doc/lynx/test/iso-8859-1.html
/usr/share/doc/lynx/test/iso-8859-1a.html
/usr/share/doc/lynx/test/iso-8859-2.html
/usr/share/doc/lynx/test/iso-8859-2a.html
/usr/share/doc/lynx/test/koi8-r.html
/usr/share/doc/lynx/test/quickbrown.html
/usr/share/doc/lynx/test/raw08t.html
/usr/share/doc/lynx/test/sgml.html
/usr/share/doc/lynx/test/spaces.html
/usr/share/doc/lynx/test/special_urls.html
/usr/share/doc/lynx/test/square.html
/usr/share/doc/lynx/test/tabtest.html
/usr/share/doc/lynx/test/tags.html
/usr/share/doc/lynx/test/test-styles.html
/usr/share/doc/lynx/test/triangle.html
/usr/share/doc/lynx/test/unicode.html
/usr/share/doc/lynx/test/utf-8-demo.html
/usr/share/man/man1/lynx.1.gz
[root@ndbaranov packages]# man lynx /usr/share/doc/lynx/INSTALLATION
man: lynx-/usr/share/doc/lynx/INSTALLATION: No such file or directory
man: lynx-/usr/share/doc/lynx/INSTALLATION: No such file or directory
--Man-- next: INSTALLATION [ view (return) | skip (Ctrl-D) | quit (Ctrl-C) ]
^C
[root@ndbaranov packages]# man lynx /usr/share/doc/lynx/INSTALLATION
man: lynx-/usr/share/doc/lynx/INSTALLATION: No such file or directory
man: lynx-/usr/share/doc/lynx/INSTALLATION: No such file or directory
--Man-- next: INSTALLATION [ view (return) | skip (Ctrl-D) | quit (Ctrl-C) ]
^C
[root@ndbaranov packages]# rpm -qc lynx
/etc/lynx-site.cfg
/etc/lynx.cfg
/etc/lynx.lss
[root@ndbaranov packages]# rpm -q --scripts lynx
[root@ndbaranov packages]# rpm -e lynx
[root@ndbaranov packages]# ls
lynx-2.8.9-20.el9.x86_64.rpm
[root@ndbaranov packages]#
```

Конфигурационные файлы пакета lynx и проверка скриптов

После проверки пакет lynx был удалён с помощью команды `rpm -e lynx` (рис. [fig:015?]).

3.5 Установка и анализ пакета Dnsmasq

Была проверена информация о пакете dnsmasq и он был установлен с помощью `dnf install dnsmasq` (рис. [fig:016?]). Пакет уже был установлен в системе ранее.

```
Activities Terminal Sep 6 13:22 en
root@ndbaranov:/var/cache/dnf/appstream-25485261a76941d3/packages
AC
[root@ndbaranov packages]# rpm -qc lynx
/etc/lynx-site.cfg
/etc/lynx.cfg
/etc/lynx.lss
[root@ndbaranov packages]# rpm -q --scripts lynx
[root@ndbaranov packages]# rpm -e lynx
[root@ndbaranov packages]# ls
lynx-2.8.9-20.el9.x86_64.rpm
[root@ndbaranov packages]# dnf list dnsmasq
Last metadata expiration check: 0:16:50 ago on Sat 06 Sep 2025 01:04:23 PM MSK.
Installed Packages
dnsmasq.x86_64                2.85-16.el9_4 @AppStream
[root@ndbaranov packages]# dnf install dnsmasq
Last metadata expiration check: 0:16:59 ago on Sat 06 Sep 2025 01:04:23 PM MSK.
Package dnsmasq-2.85-16.el9_4.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
[root@ndbaranov packages]# which dnsmasq
/usr/sbin/dnsmasq
[root@ndbaranov packages]# rpm -qf $(which dnsmasq)
dnsmasq-2.85-16.el9_4.x86_64
[root@ndbaranov packages]# rpm -qi dnsmasq
Name       : dnsmasq
Version    : 2.85
Release    : 16.el9_4
Architecture: x86_64
Install Date: Tue 02 Sep 2025 08:44:44 PM MSK
Group      : Unspecified
Size       : 718654
License    : GPLv2 or GPLv3
Signature  : RSA/SHA256, Wed 24 Apr 2024 08:07:47 AM MSK, Key ID 702d426d350d275d
Source RPM : dnsmasq-2.85-16.el9_4.src.rpm
Build Date : Wed 24 Apr 2024 08:00:41 AM MSK
Build Host : ph-2b53df02-b46e-4235-9e27-8fc7c2aded81-b-x86-64
Packager   : Rocky Linux Build System (Peridot) <releng@rockylinux.org>
Vendor     : Rocky Enterprise Software Foundation
URL        : http://www.thekelleys.org.uk/dnsmasq/
Summary    : A lightweight DHCP/caching DNS server
Description:
Dnsmasq is lightweight, easy to configure DNS forwarder and DHCP server.
It is designed to provide DNS and, optionally, DHCP, to a small network.
It can serve the names of local machines which are not in the global
DNS. The DHCP server integrates with the DNS server and allows machines
with DHCP-allocated addresses to appear in the DNS with names configured
either in each host or in a central configuration file. Dnsmasq supports
static and dynamic DHCP leases and BOOTP for network booting of diskless
machines.
[root@ndbaranov packages]#
```

Информация и установка пакета dnsmasq

Было определено расположение исполняемого файла (`which dnsmasq`) и подтверждена его принадлежность пакету `dnsmasq` (`rpm -qf`). Команда `rpm -qi dnsmasq` вывела подробную информацию о пакете: это легковесный DNS-, DHCP- и TFTP-сервер версии 2.85 (рис. [fig:016?]).

Команда `rpm -ql dnsmasq` вывела список всех файлов пакета, а `rpm -qd dnsmasq` — список файлов документации (рис. [fig:017?], [fig:019?]). Команда `rpm -qc dnsmasq` показала конфигурационные файлы пакета: `/etc/dbus-1/system.d/dnsmasq.conf` и `/etc/dnsmasq.conf`.

```
Build Host : pb-2b53df02-b46e-4235-9c27-8fc7c2aded81-b-x86-64
Packager : Rocky Linux Build System (Peridot) <relog@rockylinux.org>
Vendor : Rocky Enterprise Software Foundation
URL : http://www.thekeleleys.org.uk/dnsmasq/
Summary : A lightweight DHCP/caching DNS server
Description :
Dnsmasq is lightweight, easy to configure DNS forwarder and DHCP server.
It is designed to provide DNS and, optionally, DHCP, to a small network.
It can serve the names of local machines which are not in the global
DNS. The DHCP server integrates with the DNS server and allows machines
with DHCP-allocated addresses to appear in the DNS with names configured
either in each host or in a central configuration file. Dnsmasq supports
static and dynamic DHCP leases and BOOTP for network booting or diskless
machines.
[root@ndbaranov 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/f0
/usr/lib/.build-id/f0/9a26532944eaa77f523aeea8b091bb7c5ae67
/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@ndbaranov 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@ndbaranov packages]# man dnsmasq /etc/dbus-1/system.d/dnsmasq.conf
man: dnsmasq /etc/dbus-1/system.d/dnsmasq.conf: No such file or directory
man: dnsmasq /etc/dbus-1/system.d/dnsmasq.conf: No such file or directory
--Man-- next: dnsmasq.conf [ view (return) | skip (Ctrl-D) | quit (Ctrl-C) ]
^C
[root@ndbaranov packages]#
```

Список файлов и документации пакета 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@ndbaranov packages]# man dnsmasq /etc/dbus-1/system.d/dnsmasq.conf
man: dnsmasq /etc/dbus-1/system.d/dnsmasq.conf: No such file or directory
man: dnsmasq /etc/dbus-1/system.d/dnsmasq.conf: No such file or directory
--Man-- next: dnsmasq.conf [ view (return) | skip (Ctrl-D) | quit (Ctrl-C) ]
^C
[root@ndbaranov packages]# man dnsmasq /etc/dbus-1/system.d/dnsmasq.conf
man: dnsmasq /etc/dbus-1/system.d/dnsmasq.conf: No such file or directory
man: dnsmasq /etc/dbus-1/system.d/dnsmasq.conf: No such file or directory
--Man-- next: dnsmasq.conf [ view (return) | skip (Ctrl-D) | quit (Ctrl-C) ]
^C
[root@ndbaranov packages]# rpm -qc dnsmasq
/etc/dbus-1/system.d/dnsmasq.conf
/etc/dnsmasq.conf
[root@ndbaranov 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):

if [ $1 -ge 1 ] && [ -x "/usr/lib/systemd/systemd-update-helper" ]; then
    # Package upgrade, not uninstall
    /usr/lib/systemd/systemd-update-helper mark-restart-system-units dnsmasq.service || :
fi
[root@ndbaranov packages]#
```

Документация и конфигурационные файлы пакета dnsmasq

В отличие от `lynx`, пакет `dnsmasq` содержит скрипты, которые выполняются при его установке и удалении (рис. [fig:019?]). Команда `rpm -q --scripts dnsmasq` вывела эти скрипты: * **preinstall**: Создаёт системного пользователя и группу `dnsmasq` перед установкой, если они не существуют. * **postinstall**: Если это первоначальная установка, уведомляет `systemd` о необходимости загрузить юнит-файл службы. * **preuninstall**: Если это полное удаление (а не обновление), уведомляет `systemd` о необходимости выгрузить юнит-файл службы. * **postuninstall**: Если это обновление, уведомляет `systemd` о необходимости перезапустить службу.

Эти скрипты обеспечивают правильную интеграцию серверного пакета `dnsmasq` с системой (создание учётной записи, регистрация службы).

4. Выводы

Мы получили навыки работы с репозиториями и менеджерами пакетов.