Лабораторная работа №4

Работа с программными пакетами (DNF и RPM)

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9 декабря 2025

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Цель работы

Получить практические навыки работы с репозиториями, пакетами и группами пакетов в Linux с использованием менеджеров `dnf` и **rpm**.

Ход выполнения работы

```
root@titukaev:/home/titukaev# cd /etc/yum.repos.d/
root@titukaev:/etc/yum.repos.d# ls
rocky-addons.repo  rocky-devel.repo  rocky-extras.repo  rocky.repo  Rocky-SIG-Core-Common.repo  Rocky-SIG-Core-Infra.repo
root@titukaev:/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: Просмотр содержания репозитория

Переход в каталог /etc/yum.repos.d и анализ конфигурации репозиториев

Рис. 2: Список репозиториев

Определение активных репозиториев (AppStream, BaseOS, Extras и др.).

```
root@titukaev:/etc/yum.repos.d# dnf search nmap
Last metadata expiration check: 0:32:05 ago on Tue 09 Dec 2025 11:39:55 AM 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@titukaev:/etc/yum.repos.d# dnf info nmap
Last metadata expiration check: 0:32:12 ago on Tue 09 Dec 2025 11:39:55 AM 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).

root@titukaev:/etc/yum.repos.d#
```

Рис. 3: Поиск пакетов по слову user

Рис. 4: Информация о пакете nmap

Получение детальной информации (`dnf info nmap`).

Рис. 5: Установка nmap

Сравнение команд `dnf install nmap` и `dnf install nmap*`.

```
root@titukaev:/etc/yum.repos.d# LANG=C dnf groups list
Last metadata expiration check: 0:36:07 ago on Tue Dec  9 11:39:55 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
   Smart Card Support
   Console Internet Tools
   .NET Development
   Graphical Administration Tools
   Network Servers
   RPM Development Tools
   Scientific Support
   Security Tools
   System Tools
root@titukaev:/etc/yum.repos.d#
root@titukaev:/etc/yum.repos.d# dnf groups info "RPM Development Tools"
Last metadata expiration check: 0:36:42 ago on Tue 09 Dec 2025 11:39:55 AM 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@titukaev:/etc/yum.repos.d#
```

Рис. 7: Список групп пакетов

Определение и установка группы *RPM Development Tools.*

Рис. 8: Удаление группы RPM Development Tools

Использование `dnf groupremove`.

Рис. 9: История dnf и отмена транзакции

Анализ выполненных операций и использование `dnf history undo`.

Загрузка и установка rpm-пакета

Рис. 10: Загрузка пакета lynx

Установка через `rpm -Uhv` после загрузки через `dnf`.

```
root@titukaev:/var/cache/dnf/appstream-8f18e4146890fdfc/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
```

Рис. 11: Информация о пакете lynx

```
root@titukaev:/var/cache/dnf/appstream-8f18e4146890fdfc/packages#
root@titukaev:/var/cache/dnf/appstream-8f18e4146890fdfc/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
```

Рис. 12: Список файлов lynx

Просмотр документации man

Рис. 13: man lynx

Открытие справочной страницы.

Рис. 14: Установка dnsmasq

Установка сервера DNS/DHCP/TFTP.

```
root@titukaev:/var/cache/dnf/appstream-8f18e4146890fdfc/packages# which dnsmasq
/usr/sbin/dnsmasq
root@titukaev:/var/cache/dnf/appstream-8f18e4146890fdfc/packages# rpm -qf $(which dnsmasq)
dnsmasq-2.90-4.el10.x86_64
root@titukaev:/var/cache/dnf/appstream-8f18e4146890fdfc/packages# rpm -qi dnsmasq
Name        : dnsmasq
Version     : 2.90
Release     : 4.el10
Architecture: x86_64
Install Date: Tue 09 Dec 2025 12:28:12 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/
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 disk-less
machines.
root@titukaev:/var/cache/dnf/appstream-8f18e4146890fdfc/packages# 
```

```
root@titukaev:/var/cache/dnf/appstream-8f18e4146890fdfc/packages#
root@titukaev:/var/cache/dnf/appstream-8f18e4146890fdfc/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@titukaev:/var/cache/dnf/appstream-8f18e4146890fdfc/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@titukaev:/var/cache/dnf/appstream-8f18e4146890fdfc/packages#
```

Просмотр man-страницы dnsmasq

Рис. 17: man dnsmasq

Рис. 18: Конфигурационные файлы dnsmasq

Заключение

Итог

Освоены операции установки, удаления, анализа и аудита пакетов с использованием `dnf` и `rpm`.

Изучены:

- репозитории и группы пакетов;
- установка и удаление пакетов;
- работа с rpm-файлами, документами и конфигурациями;
- служебные скрипты rpm;
- история транзакций.