

# **отчёт по лабораторной работе №13**

**Фильтр пакетов**

Кхари Жекка Кализая Арсе

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# 1 Цель работы

Получить навыки настройки пакетного фильтра в Linux.

## 2 Задание

1. Используя `firewall-cmd`: – определить текущую зону по умолчанию; – определить доступные для настройки зоны; – определить службы, включённые в текущую зону; – добавить сервер VNC в конфигурацию брандмауэра.
2. Используя `firewall-config`: – добавьте службы `http` и `ssh` в зону `public`; – добавьте порт 2022 протокола UDP в зону `public`; – добавьте службу `ftp`.
3. Выполните задание для самостоятельной работы

## 3 Выполнение лабораторной работы

### 3.1 Управление брандмауэром с помощью firewall-cmd

сначала я открыл терминал и выполнил команду su (рис. 3.1).

su -

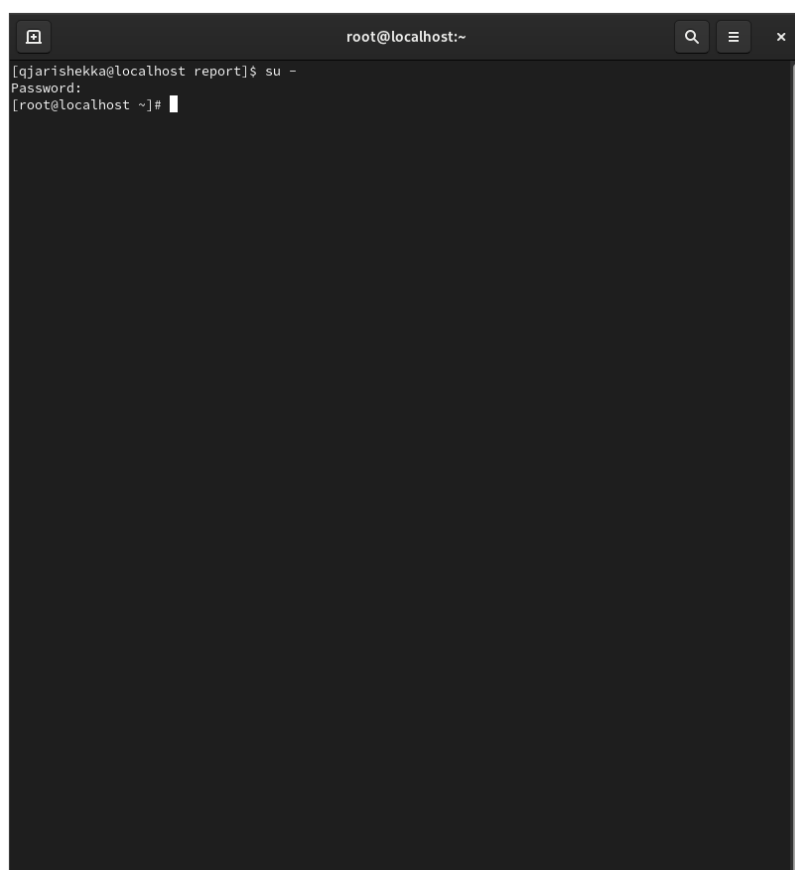
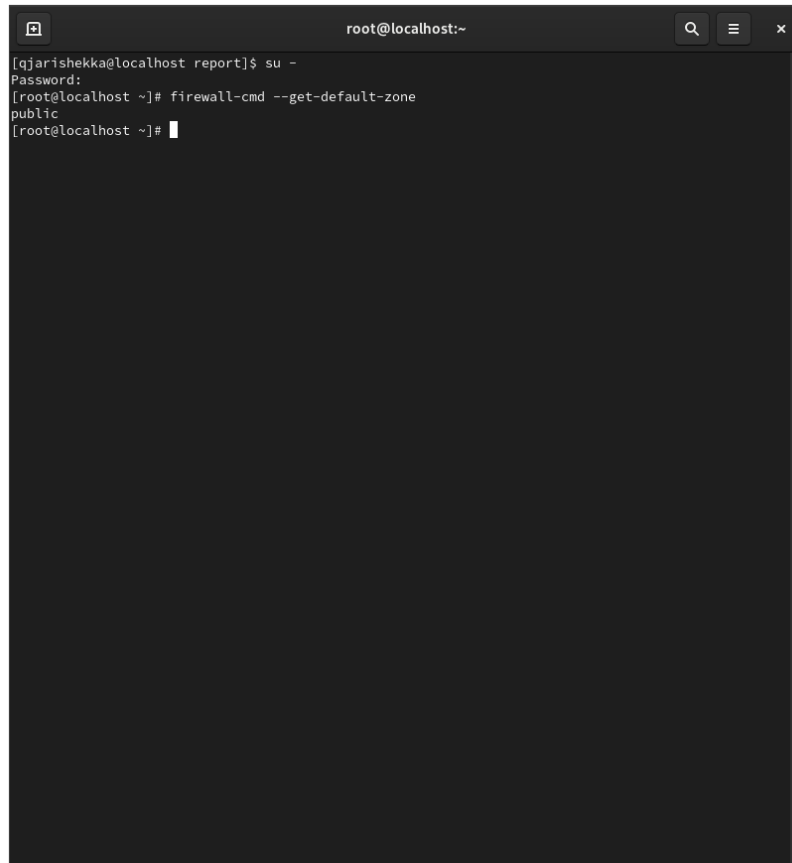


Рис. 3.1: терминал

Потом я определил текущую зону по умолчанию (рис. 3.2).

```
firewall-cmd --get-default-zone
```

A terminal window titled 'root@localhost:~' with search, menu, and close icons. The terminal shows a user switching to root via 'su -', entering a password, and then running the command 'firewall-cmd --get-default-zone'. The output of the command is 'public'.

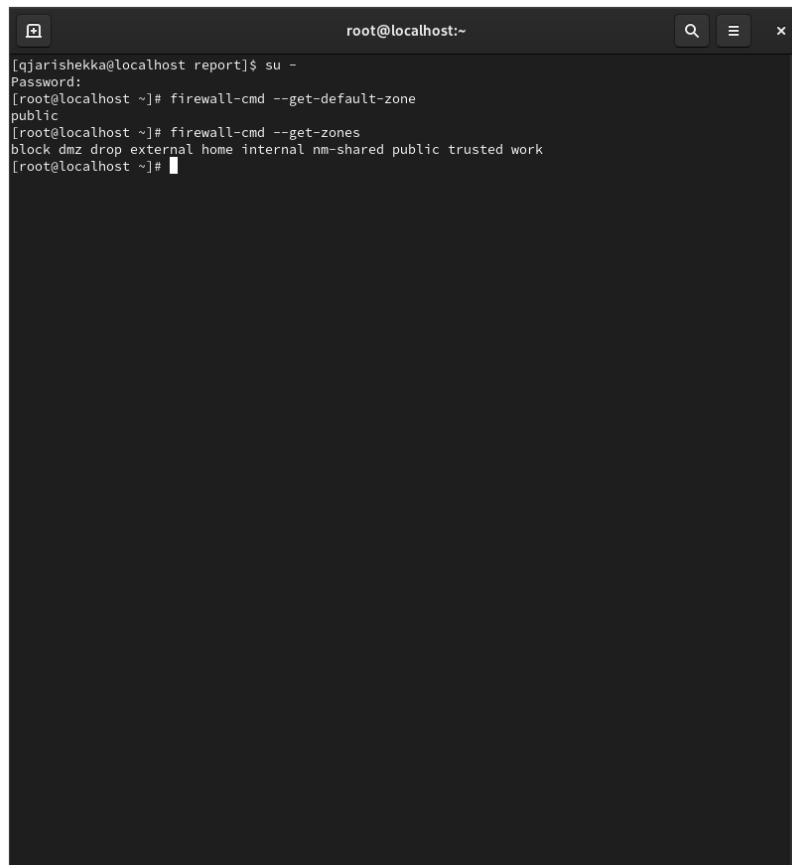
```
root@localhost:~  
[qjarishekk@localhost report]$ su -  
Password:  
[root@localhost ~]# firewall-cmd --get-default-zone  
public  
[root@localhost ~]#
```

Рис. 3.2: текущая зона

Дальше я определил доступные зоны (рис. 3.3).

```
firewall-cmd --get-zones
```



A terminal window titled 'root@localhost:~' with search, menu, and close icons in the title bar. The terminal shows a user switching to root with 'su -', then running 'firewall-cmd --get-default-zone' which outputs 'public', and finally 'firewall-cmd --get-zones' which outputs a list of zones: 'block dmz drop external home internal nm-shared public trusted work'.

```
[qjarishekk@localhost report]$ su -  
Password:  
[root@localhost ~]# firewall-cmd --get-default-zone  
public  
[root@localhost ~]# firewall-cmd --get-zones  
block dmz drop external home internal nm-shared public trusted work  
[root@localhost ~]#
```

Рис. 3.3: доступные зоны

потом я смотрел службы, доступные на моем компьютере (рис. 3.4).

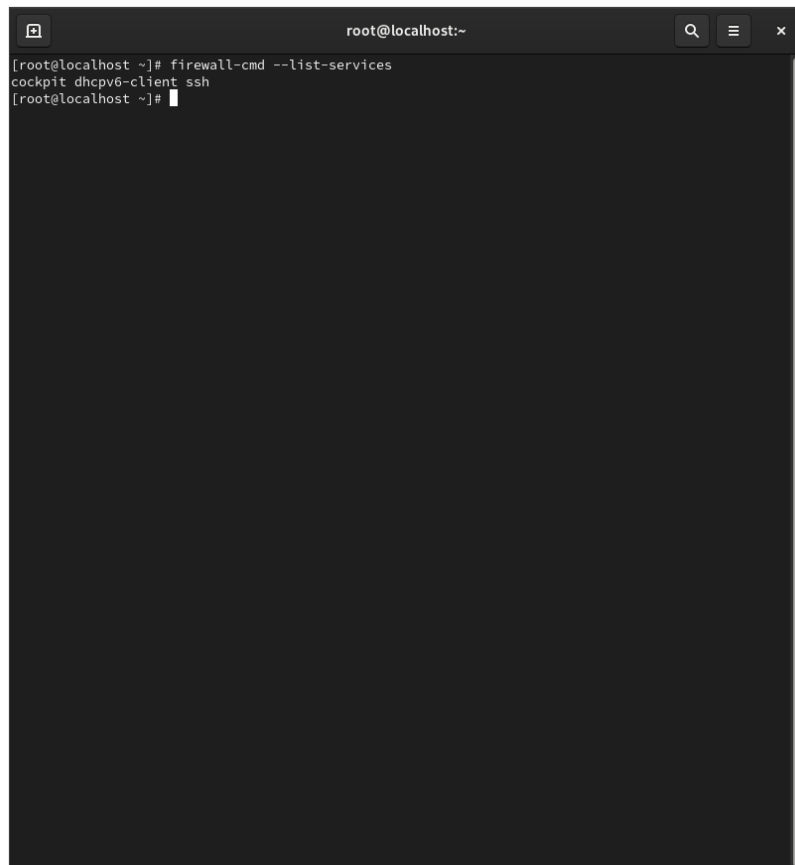
```
firewall-cmd --get-services
```

```
root@localhost:~  
[qjarishekk@localhost report]$ su -  
Password:  
[root@localhost ~]# firewall-cmd --get-default-zone  
public  
[root@localhost ~]# firewall-cmd --get-zones  
block dmz drop external home internal nm-shared public trusted work  
[root@localhost ~]# firewall-cmd --get-services  
RH-Satellite-6 RH-Satellite-6-capsule afp amanda-client amanda-k5-client amqp amqps apcupsd audit  
ausweisapp2 bacula bacula-client bareos-director bareos-filedaemon bareos-storage bb bgp bitcoin b  
itcoin-rpc bitcoin-testnet bitcoin-testnet-rpc bittorrent-lsd ceph ceph-exporter ceph-mon cfengine  
checkmk-agent cockpit collectd condor-collector cratedb etdb dds dds-multicast dds-unicast dhcp d  
hcpv6 dhcpv6-client distcc dns dns-over-tls docker-registry docker-swarm dropbox-lansync elasticse  
arch etcd-client etcd-server finger foreman foreman-proxy freeipa-4 freeipa-ldap freeipa-ldaps fre  
eipa-replication freeipa-trust ftp galera ganglia-client ganglia-master git gpsd grafana gre high-  
availability http http3 https ident imap imaps ipfs ipp ipp-client ipsec irc ircs iscsi-target isn  
s jenkins kadmin kdeconnect kerberos kibana klogin kpasswd kprop kshell kube-api kube-apiserver ku  
be-control-plane kube-control-plane-secure kube-controller-manager kube-controller-manager-secure  
kube-nodeport-services kube-scheduler kube-scheduler-secure kube-worker kubelet kubelet-readonly k  
ubelet-worker ldap ldaps libvirt libvirt-tls lightning-network llmnr llmnr-client llmnr-tcp llmnr-  
udp managiesieve matrix mdns memcache minidlna mongodb mosh mountd mqtt mqtt-tls ms-wbt mssql murmu  
r mysql nbd nebula netbios-ns netdata-dashboard nfs nfs3 nmea-0183 nrpe ntp nut opentelemetry open  
vpn ovirt-imageio ovirt-storageconsole ovirt-vmconsole plex pmcd pmproxy pmwebapi pmwebapis pop3 p  
op3s postgresql privoxy prometheus prometheus-node-exporter proxy-dhcp ps2link ps3netstrv ptp pulse  
audio puppetmaster quassel radius rdp redis redis-sentinel rpc-bind rquotad rsh rsyncd rtsp salt-m  
aster samba samba-client samba-dc sane sip sips slp smtp smtp-submission smtps snmp snmptls snmptl  
s-trap snmptrap spideroak-lansync spotify-sync squid ssdp ssh steam-streaming svdrp svn syncthing  
syncthing-gui syncthing-relay synergy syslog syslog-tls telnet tentacle tftp tile38 tinc tor-socks  
transmission-client upnp-client vdsim vnc-server warpinator wbem-http wbem-https wireguard ws-disc  
overy ws-discovery-client ws-discovery-tcp ws-discovery-udp wsman wsmans xdmcp xmpp-bosh xmpp-clie  
nt xmpp-local xmpp-server zabbix-agent zabbix-server zerotier  
[root@localhost ~]#
```

Рис. 3.4: службы

Затем я определил доступные службы (рис. 3.5).

```
firewall-cmd --list-services
```

A terminal window titled 'root@localhost:~' with search, menu, and close icons. It shows the command 'firewall-cmd --list-services' being executed, with the output 'cockpit dhcpv6-client ssh' displayed on the next line.

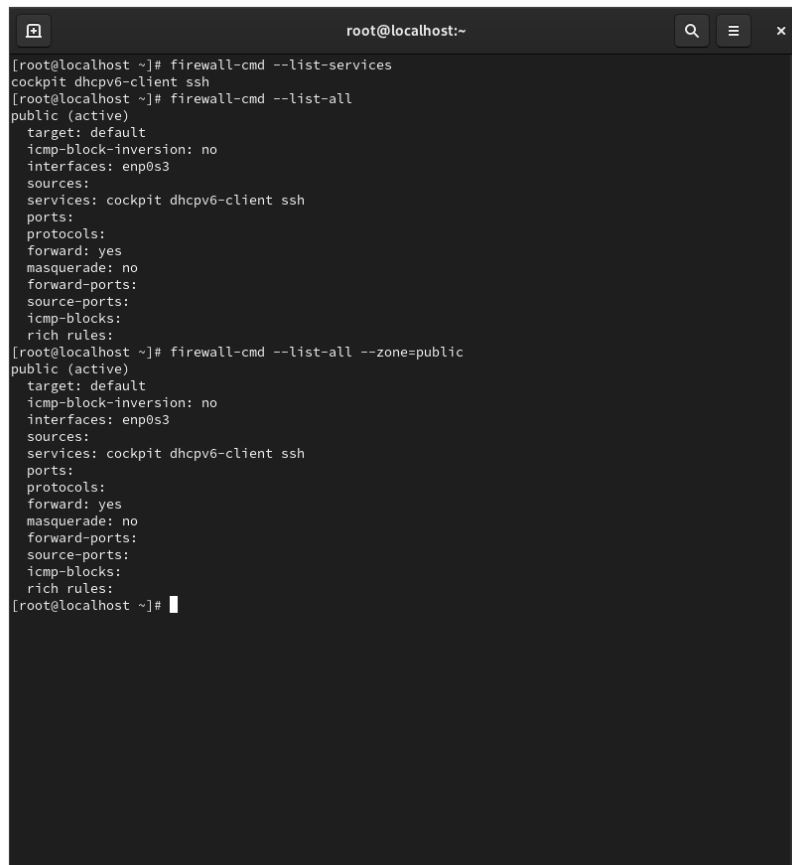
```
root@localhost:~  
[root@localhost ~]# firewall-cmd --list-services  
cockpit dhcpv6-client ssh  
[root@localhost ~]#
```

Рис. 3.5: службы

Потом я сравнил результаты двух разных команд (рис. 3.6).

```
firewall-cmd --list-all  
firewall-cmd --list-all --zone=public
```

и не было разницы

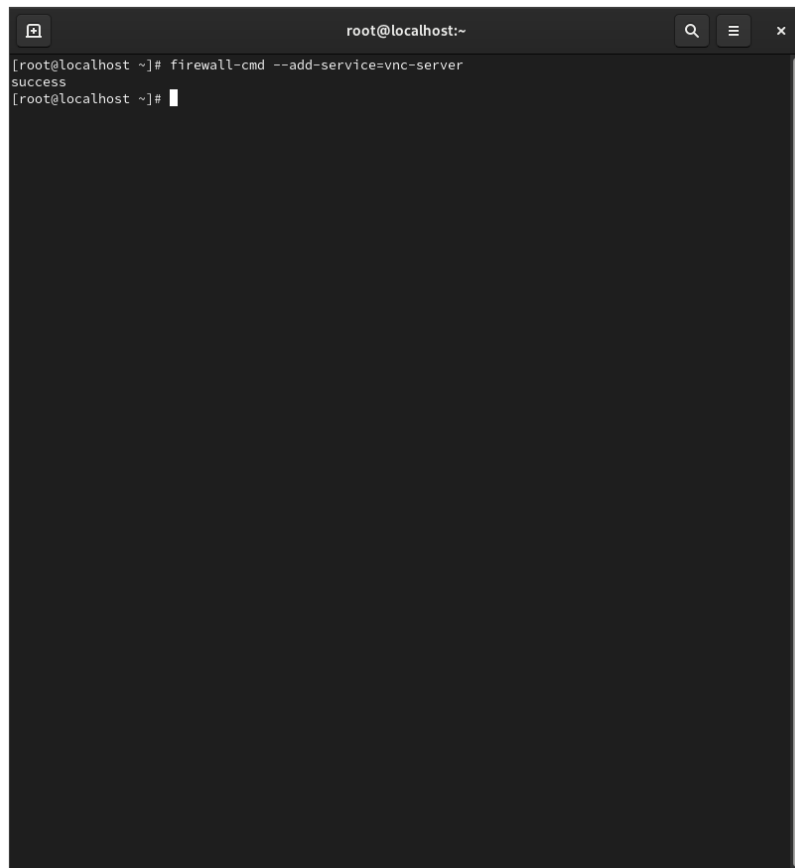
A terminal window titled 'root@localhost:~' with search, menu, and close icons in the title bar. The terminal shows the following commands and output:

```
[root@localhost ~]# firewall-cmd --list-services
cockpit dhcpv6-client ssh
[root@localhost ~]# firewall-cmd --list-all
public (active)
  target: default
  icmp-block-inversion: no
  interfaces: enp0s3
  sources:
  services: cockpit dhcpv6-client ssh
  ports:
  protocols:
  forward: yes
  masquerade: no
  forward-ports:
  source-ports:
  icmp-blocks:
  rich rules:
[root@localhost ~]# firewall-cmd --list-all --zone=public
public (active)
  target: default
  icmp-block-inversion: no
  interfaces: enp0s3
  sources:
  services: cockpit dhcpv6-client ssh
  ports:
  protocols:
  forward: yes
  masquerade: no
  forward-ports:
  source-ports:
  icmp-blocks:
  rich rules:
[root@localhost ~]#
```

Рис. 3.6: сравнение результатов

Потом я добавил сервер VNC (рис. 3.7).

```
firewall-cmd --add-service=vnc-server
```

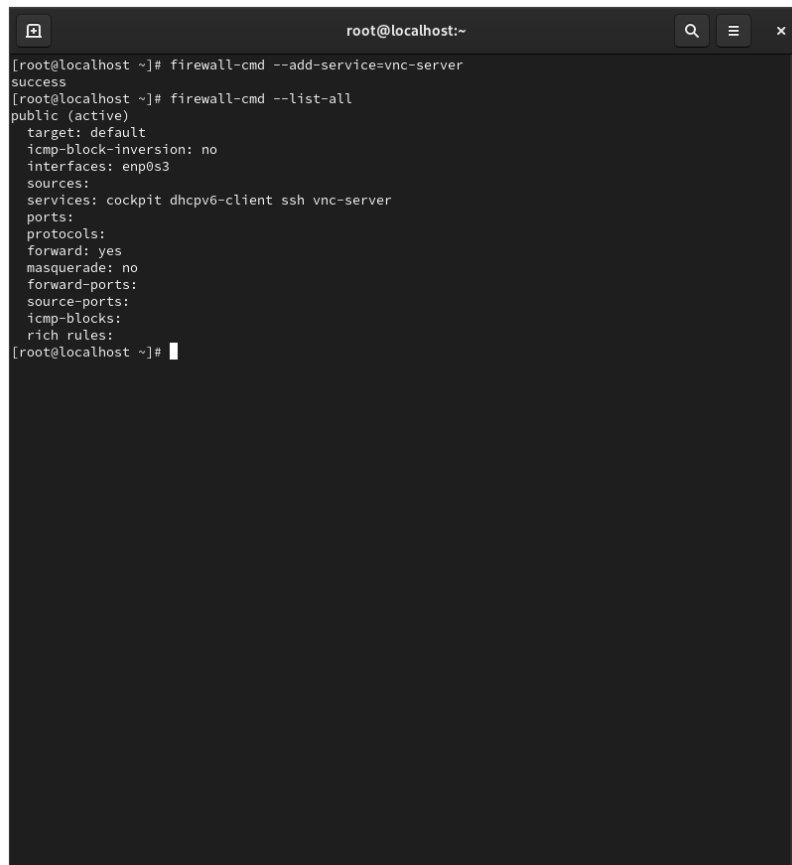
A terminal window with a dark background and light text. The title bar at the top reads 'root@localhost:~'. The terminal content shows a command being executed: '[root@localhost ~]# firewall-cmd --add-service=vnc-server', followed by the output 'success' on the next line. The prompt '[root@localhost ~]#' is visible again on the third line, with a cursor at the end. The window has standard OS controls (minimize, maximize, close) in the top right corner.

```
root@localhost:~  
[root@localhost ~]# firewall-cmd --add-service=vnc-server  
success  
[root@localhost ~]#
```

Рис. 3.7: новый сервер

Потом я проверил сервер (рис. 3.8).

```
firewall-cmd --list-all
```

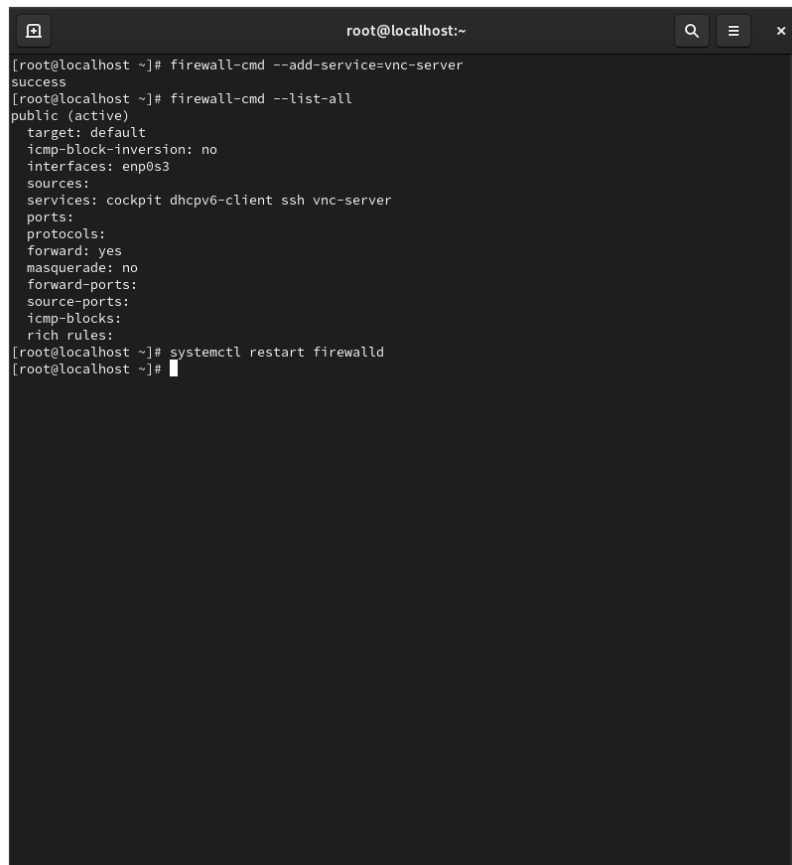
A terminal window titled 'root@localhost:~' with search, menu, and close icons in the title bar. The terminal shows the following commands and output:

```
[root@localhost ~]# firewall-cmd --add-service=vnc-server
success
[root@localhost ~]# firewall-cmd --list-all
public (active)
  target: default
  icmp-block-inversion: no
  interfaces: enp0s3
  sources:
  services: cockpit dhcpv6-client ssh vnc-server
  ports:
  protocols:
  forward: yes
  masquerade: no
  forward-ports:
  source-ports:
  icmp-blocks:
  rich rules:
[root@localhost ~]#
```

Рис. 3.8: проверка

Потом я перезапустил службу firewalld (рис. 3.9).

```
systemctl restart firewalld
```

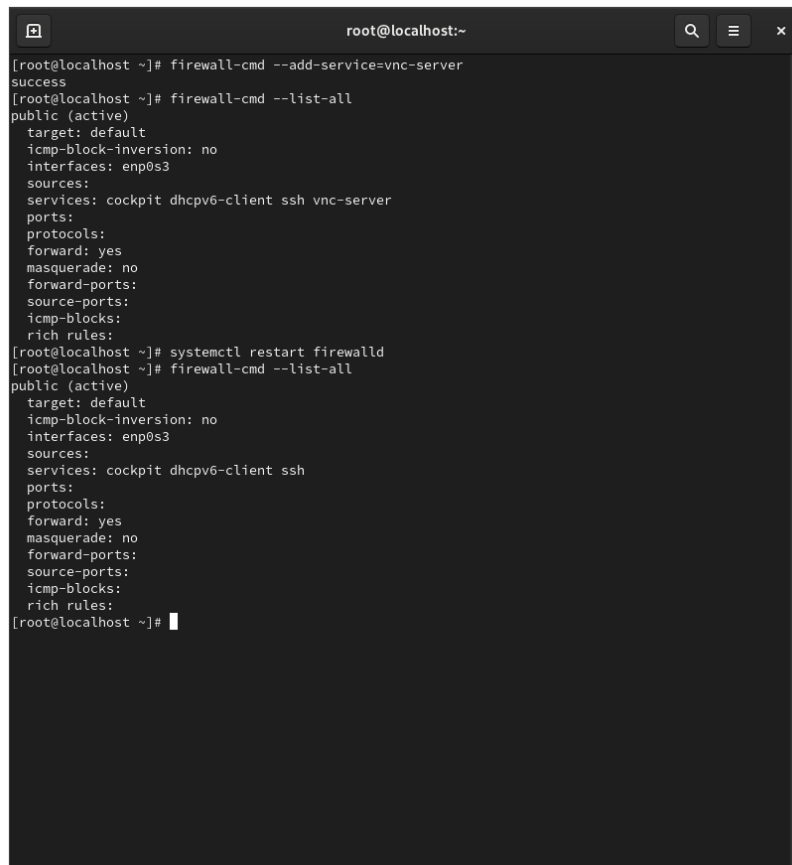
A terminal window titled 'root@localhost:~' with search, menu, and close icons in the title bar. The terminal shows the following commands and output:

```
[root@localhost ~]# firewall-cmd --add-service=vnc-server
success
[root@localhost ~]# firewall-cmd --list-all
public (active)
  target: default
  icmp-block-inversion: no
  interfaces: enp0s3
  sources:
  services: cockpit dhcpv6-client ssh vnc-server
  ports:
  protocols:
  forward: yes
  masquerade: no
  forward-ports:
  source-ports:
  icmp-blocks:
  rich rules:
[root@localhost ~]# systemctl restart firewalld
[root@localhost ~]#
```

Рис. 3.9: перезапуск службы

Затем я проверил добавление сервера и осознал что он больше не был там и это произошло потому что я не настроил его чтобы он будет постоянным (рис. 3.10).

```
firewall-cmd --list-all
```

A terminal window titled 'root@localhost:~' with search, menu, and close icons in the title bar. The terminal shows the following commands and output:

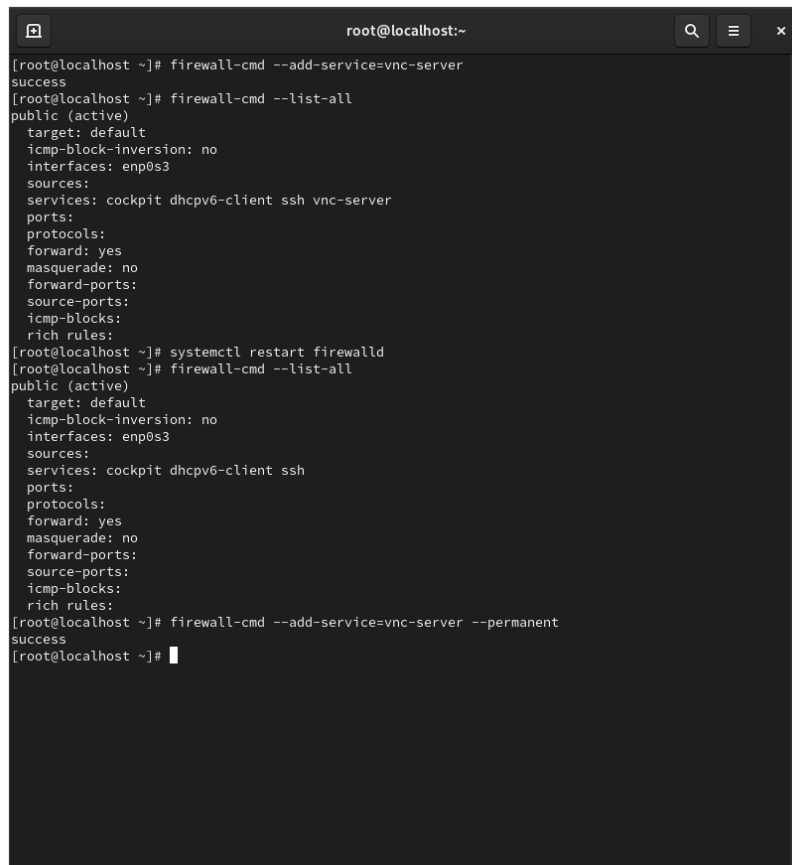
```
[root@localhost ~]# firewall-cmd --add-service=vnc-server
success
[root@localhost ~]# firewall-cmd --list-all
public (active)
  target: default
  icmp-block-inversion: no
  interfaces: enp0s3
  sources:
  services: cockpit dhcpv6-client ssh vnc-server
  ports:
  protocols:
  forward: yes
  masquerade: no
  forward-ports:
  source-ports:
  icmp-blocks:
  rich rules:
[root@localhost ~]# systemctl restart firewalld
[root@localhost ~]# firewall-cmd --list-all
public (active)
  target: default
  icmp-block-inversion: no
  interfaces: enp0s3
  sources:
  services: cockpit dhcpv6-client ssh
  ports:
  protocols:
  forward: yes
  masquerade: no
  forward-ports:
  source-ports:
  icmp-blocks:
  rich rules:
[root@localhost ~]#
```

Рис. 3.10: проверка сервера

Потом я еще раз добавил сервер но с меткой `--permanent` чтобы делать его постоянный (рис. 3.11).

```
firewall-cmd --add-service=vnc-server --permanent
```





```
root@localhost:~  
[root@localhost ~]# firewall-cmd --add-service=vnc-server  
success  
[root@localhost ~]# firewall-cmd --list-all  
public (active)  
  target: default  
  icmp-block-inversion: no  
  interfaces: enp0s3  
  sources:  
  services: cockpit dhcpv6-client ssh vnc-server  
  ports:  
  protocols:  
  forward: yes  
  masquerade: no  
  forward-ports:  
  source-ports:  
  icmp-blocks:  
  rich rules:  
[root@localhost ~]# systemctl restart firewalld  
[root@localhost ~]# firewall-cmd --list-all  
public (active)  
  target: default  
  icmp-block-inversion: no  
  interfaces: enp0s3  
  sources:  
  services: cockpit dhcpv6-client ssh  
  ports:  
  protocols:  
  forward: yes  
  masquerade: no  
  forward-ports:  
  source-ports:  
  icmp-blocks:  
  rich rules:  
[root@localhost ~]# firewall-cmd --add-service=vnc-server --permanent  
success  
[root@localhost ~]#
```

Рис. 3.11: добавление сервера

и еще раз проверил сервер (рис. 3.12).

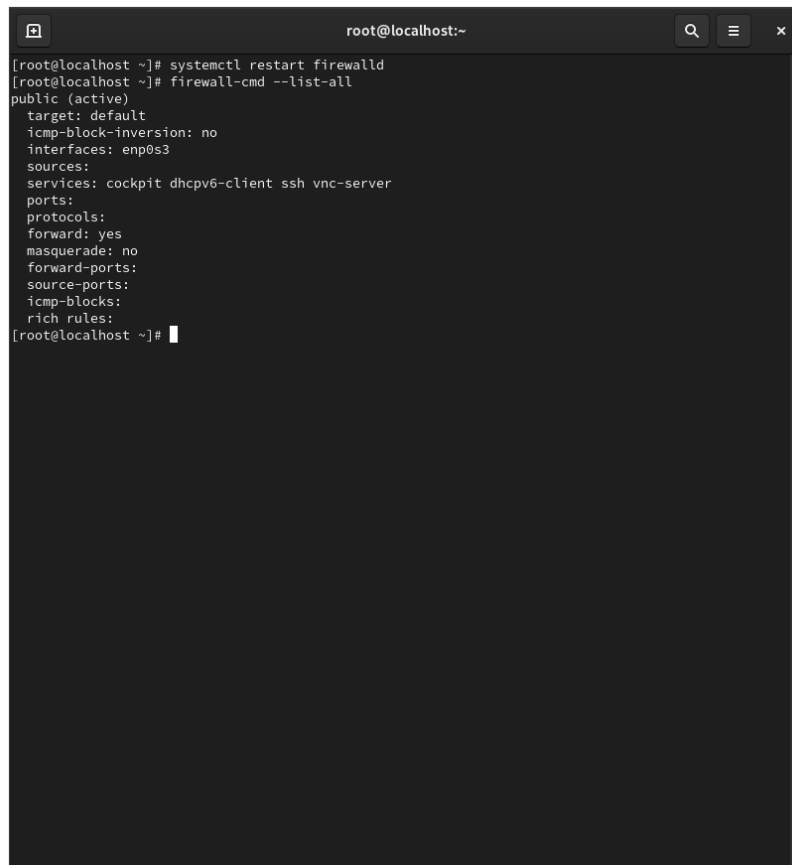
```
systemctl restart firewalld  
firewall-cmd --list-all
```

```
root@localhost:~  
public (active)  
  target: default  
  icmp-block-inversion: no  
  interfaces: enp0s3  
  sources:  
    services: cockpit dhcpv6-client ssh vnc-server  
  ports:  
  protocols:  
  forward: yes  
  masquerade: no  
  forward-ports:  
  source-ports:  
  icmp-blocks:  
  rich rules:  
[root@localhost ~]# systemctl restart firewalld  
[root@localhost ~]# firewall-cmd --list-all  
public (active)  
  target: default  
  icmp-block-inversion: no  
  interfaces: enp0s3  
  sources:  
    services: cockpit dhcpv6-client ssh  
  ports:  
  protocols:  
  forward: yes  
  masquerade: no  
  forward-ports:  
  source-ports:  
  icmp-blocks:  
  rich rules:  
[root@localhost ~]# firewall-cmd --add-service=vnc-server --permanent  
success  
[root@localhost ~]# firewall-cmd --list-all  
public (active)  
  target: default  
  icmp-block-inversion: no  
  interfaces: enp0s3  
  sources:  
    services: cockpit dhcpv6-client ssh  
  ports:  
  protocols:  
  forward: yes  
  masquerade: no  
  forward-ports:  
  source-ports:  
  icmp-blocks:  
  rich rules:  
[root@localhost ~]#
```

Рис. 3.12: проверка сервера

Потом я добавил конфигурацию межсетевого экрана порт 2022 протокола TCP (рис. 3.13).

```
firewall-cmd --add-port=2022/tcp --permanent
```

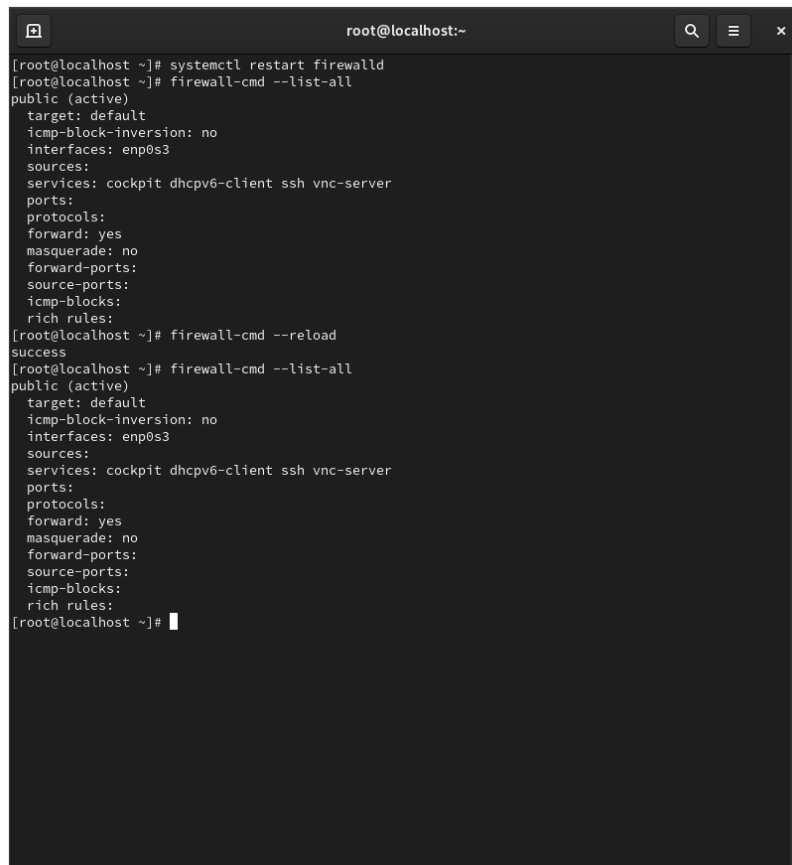
A terminal window titled 'root@localhost:~' with search, menu, and close icons in the title bar. The terminal shows the following commands and output:

```
[root@localhost ~]# systemctl restart firewalld
[root@localhost ~]# firewall-cmd --list-all
public (active)
  target: default
  icmp-block-inversion: no
  interfaces: enp0s3
  sources:
  services: cockpit dhcpv6-client ssh vnc-server
  ports:
  protocols:
  forward: yes
  masquerade: no
  forward-ports:
  source-ports:
  icmp-blocks:
  rich rules:
[root@localhost ~]#
```

Рис. 3.13: конфигурация

Затем я перезагрузил конфигурацию firewalld (рис. 3.14).

```
firewall-cmd --reload
```

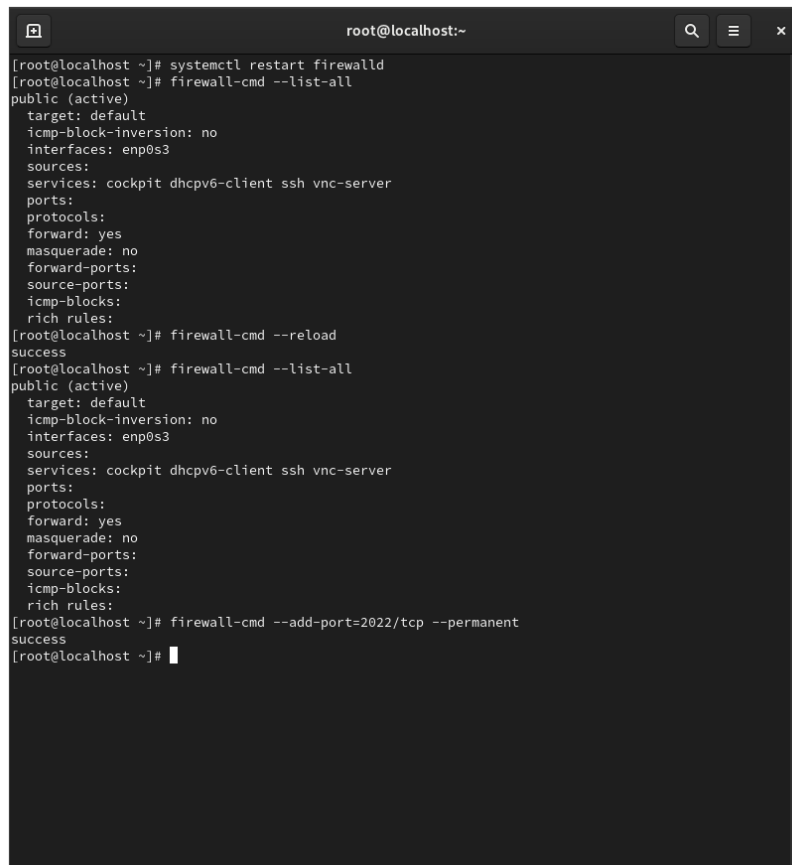
A terminal window titled 'root@localhost:~' with search, menu, and close icons in the title bar. The terminal shows the following commands and output:

```
[root@localhost ~]# systemctl restart firewalld
[root@localhost ~]# firewall-cmd --list-all
public (active)
  target: default
  icmp-block-inversion: no
  interfaces: enp0s3
  sources:
  services: cockpit dhcpv6-client ssh vnc-server
  ports:
  protocols:
  forward: yes
  masquerade: no
  forward-ports:
  source-ports:
  icmp-blocks:
  rich rules:
[root@localhost ~]# firewall-cmd --reload
success
[root@localhost ~]# firewall-cmd --list-all
public (active)
  target: default
  icmp-block-inversion: no
  interfaces: enp0s3
  sources:
  services: cockpit dhcpv6-client ssh vnc-server
  ports:
  protocols:
  forward: yes
  masquerade: no
  forward-ports:
  source-ports:
  icmp-blocks:
  rich rules:
[root@localhost ~]#
```

Рис. 3.14: перезагрузка конфигурации

Потом я проверил что порт добавлен в конфигурацию (рис. 3.15).

```
firewall-cmd --list-all
```

A terminal window titled 'root@localhost:~' with search, menu, and close buttons. It shows the following commands and output:

```
[root@localhost ~]# systemctl restart firewalld
[root@localhost ~]# firewall-cmd --list-all
public (active)
  target: default
  icmp-block-inversion: no
  interfaces: enp0s3
  sources:
  services: cockpit dhcpv6-client ssh vnc-server
  ports:
  protocols:
  forward: yes
  masquerade: no
  forward-ports:
  source-ports:
  icmp-blocks:
  rich rules:
[root@localhost ~]# firewall-cmd --reload
success
[root@localhost ~]# firewall-cmd --list-all
public (active)
  target: default
  icmp-block-inversion: no
  interfaces: enp0s3
  sources:
  services: cockpit dhcpv6-client ssh vnc-server
  ports:
  protocols:
  forward: yes
  masquerade: no
  forward-ports:
  source-ports:
  icmp-blocks:
  rich rules:
[root@localhost ~]# firewall-cmd --add-port=2022/tcp --permanent
success
[root@localhost ~]#
```

Рис. 3.15: проверка

## 3.2 Управление брандмауэром с помощью firewall-config

В этой части я запустил интерфейс GUI firewall и для этого сначала я установил его и потом он сам запустил (рис. 3.16).

firewall-config

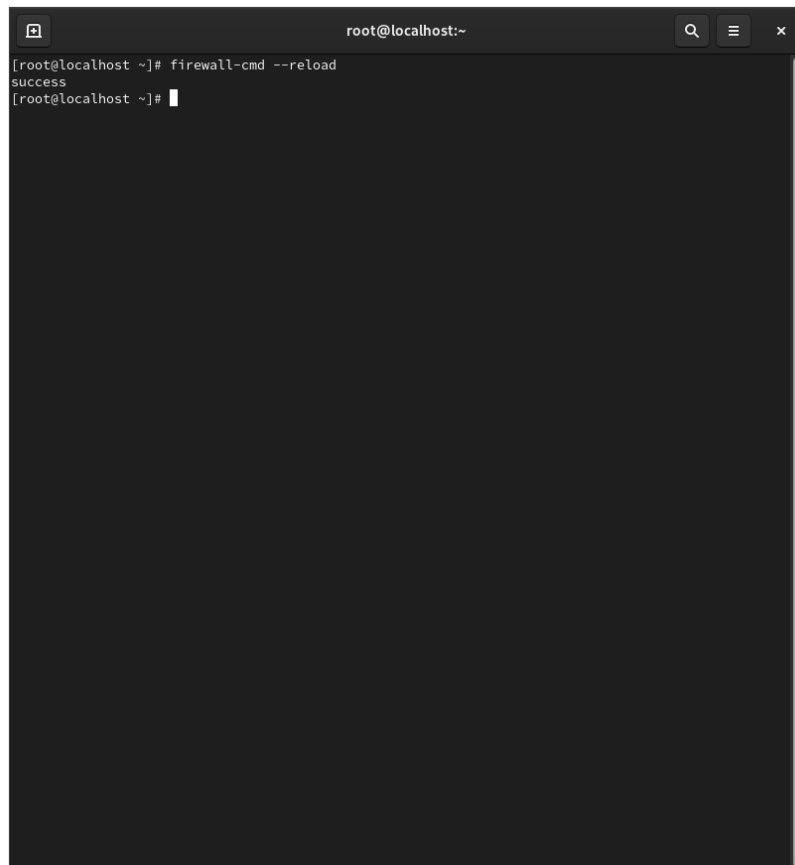


Рис. 3.16: GUI firewall

Потом я изменил параметр в configuration на permanent. потом я выбрал зону public и отметил службы http, https, ftp. потом я выбрал вкладку port и нажал add 2022 и протокол udr чтобы добавить другой порт (рис. 3.17 - рис. 3.21).

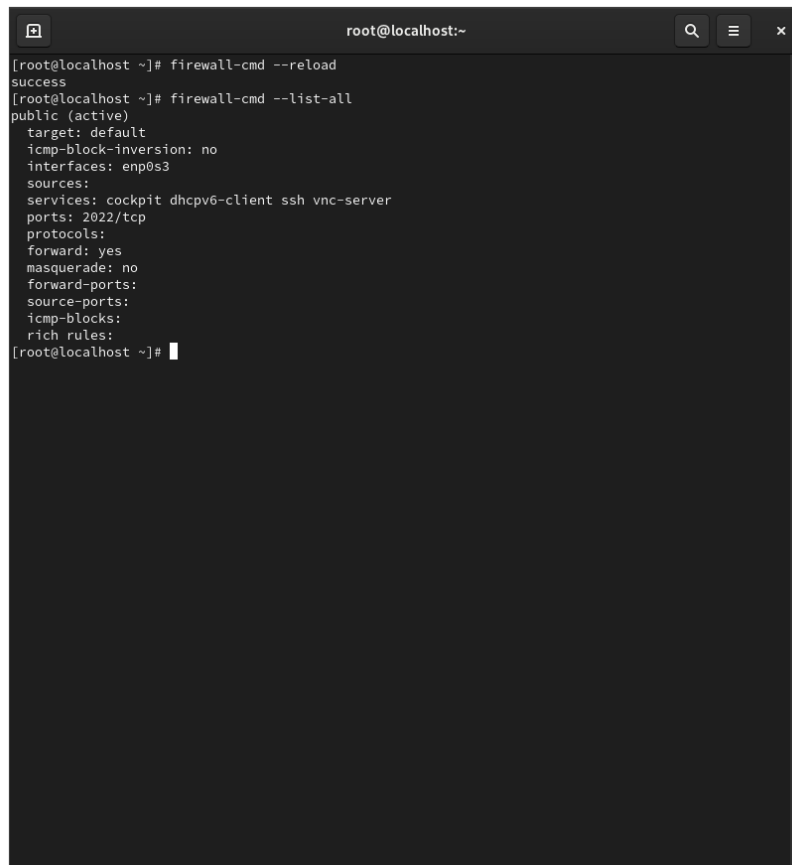


Рис. 3.17: интерфейс настройки

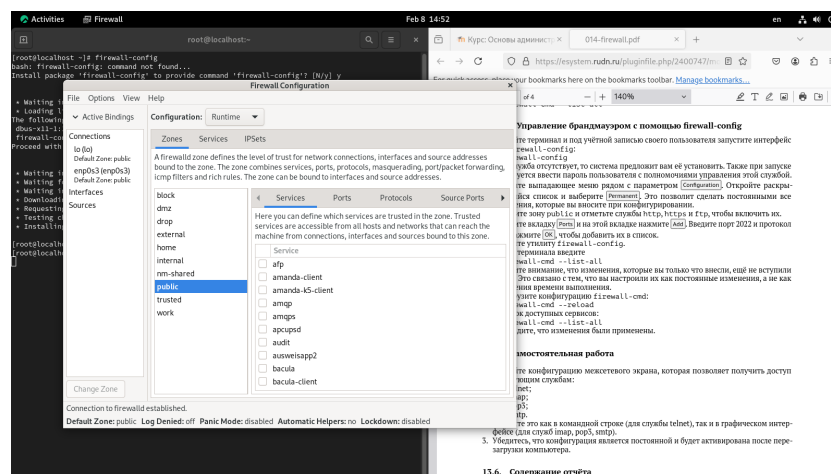


Рис. 3.18: интерфейс настройки

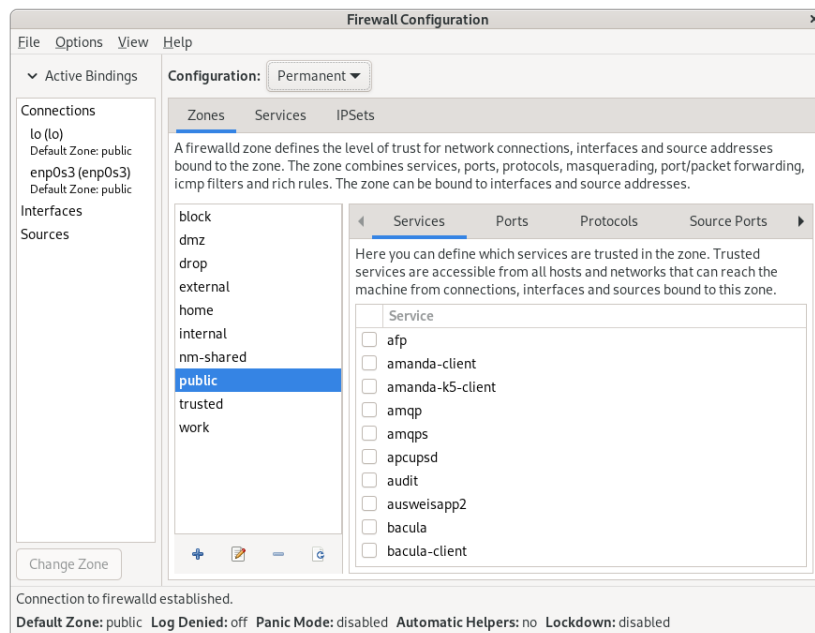


Рис. 3.19: интерфейс настройки

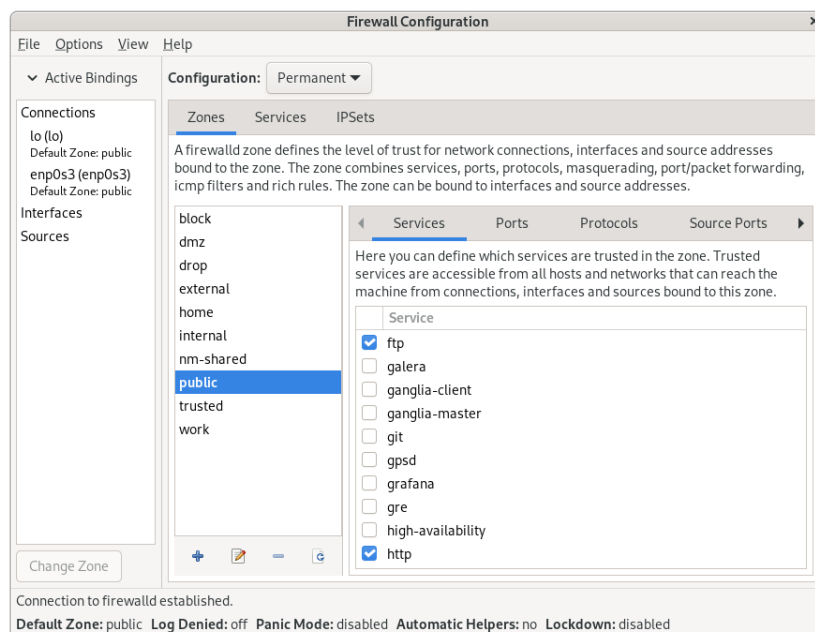


Рис. 3.20: интерфейс настройки



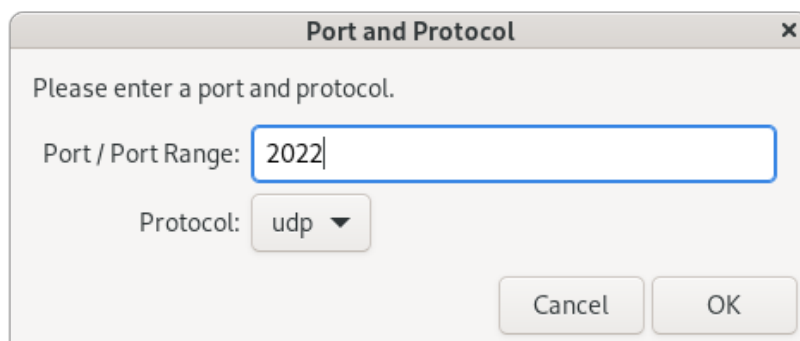


Рис. 3.21: интерфейс настройки

Потом я закрыл утилиту `firewall-config` и в терминале я смотрел изменения (рис. 3.22).

```
firewall-cmd --list-all
```

```

root@localhost:~
[root@localhost ~]# firewall-config
bash: firewall-config: command not found...
Install package 'firewall-config' to provide command 'firewall-config'? [N/y] y

* Waiting in queue...
* Loading list of packages...
The following packages have to be installed:
dbus-x11-1:1.12.20-8.el9.x86_64      X11-requiring add-ons for D-BUS
firewall-config-1.3.4-7.el9.noarch   Firewall configuration application
Proceed with changes? [N/y] y

* Waiting in queue...
* Waiting for authentication...
* Waiting in queue...
* Downloading packages...
* Requesting data...
* Testing changes...
* Installing packages...

[root@localhost ~]# firewall-config
[root@localhost ~]# firewall-config
[root@localhost ~]# firewall-cmd --list-all
public (active)
target: default
icmp-block-inversion: no
interfaces: enp0s3
sources:
services: cockpit dhcpv6-client ssh vnc-server
ports: 2022/tcp
protocols:
forward: yes
masquerade: no
forward-ports:
source-ports:
icmp-blocks:
rich rules:
[root@localhost ~]#

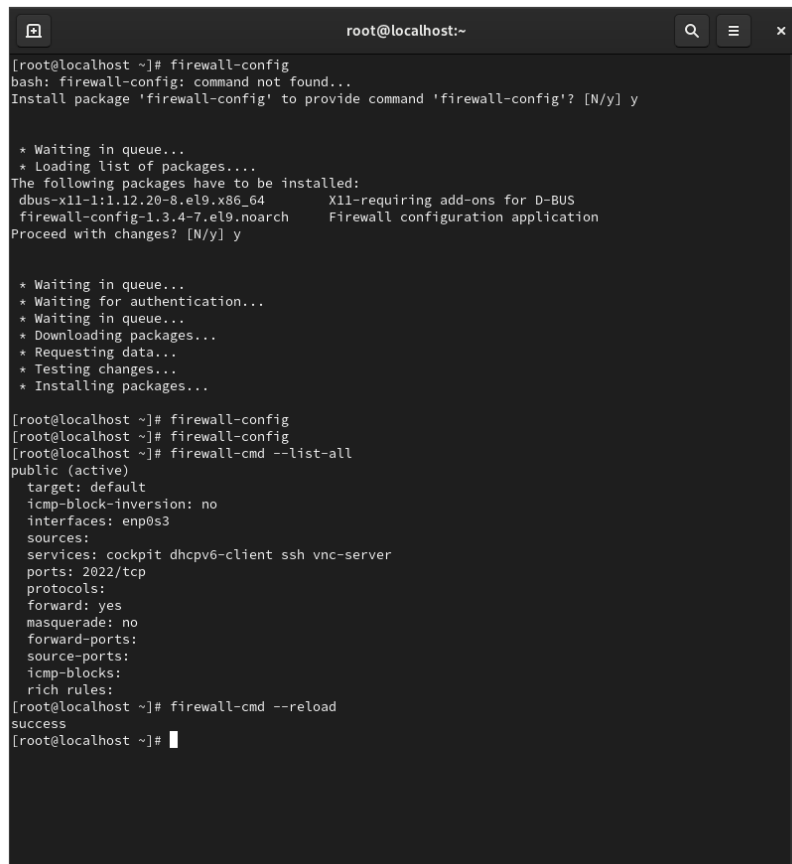
```

Рис. 3.22: проверка изменений

потом я перезагрузил конфигурацию firewall-cmd (рис. 3.23).

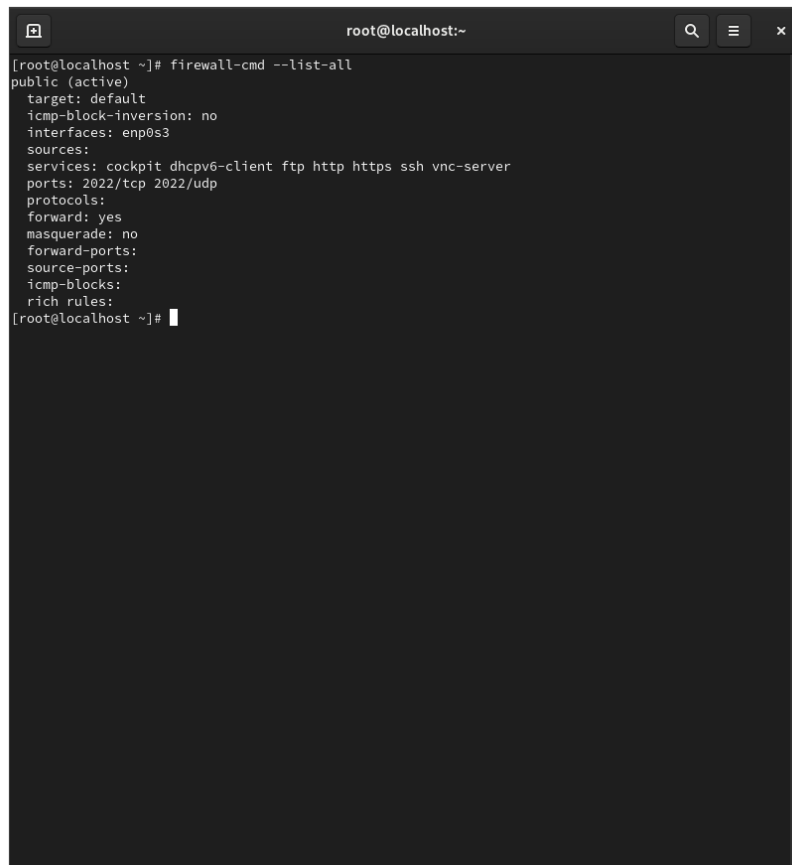
```
firewall-cmd --reload
```

```
firewall-cmd --list-all
```



```
root@localhost:~  
[root@localhost ~]# firewall-config  
bash: firewall-config: command not found...  
Install package 'firewall-config' to provide command 'firewall-config'? [N/y] y  
  
* Waiting in queue...  
* Loading list of packages....  
The following packages have to be installed:  
dbus-x11-1:1.12.20-8.el9.x86_64      X11-requiring add-ons for D-BUS  
firewall-config-1.3.4-7.el9.noarch   Firewall configuration application  
Proceed with changes? [N/y] y  
  
* Waiting in queue...  
* Waiting for authentication...  
* Waiting in queue...  
* Downloading packages...  
* Requesting data...  
* Testing changes...  
* Installing packages...  
  
[root@localhost ~]# firewall-config  
[root@localhost ~]# firewall-config  
[root@localhost ~]# firewall-cmd --list-all  
public (active)  
  target: default  
  icmp-block-inversion: no  
  interfaces: enp0s3  
  sources:  
  services: cockpit dhcpv6-client ssh vnc-server  
  ports: 2022/tcp  
  protocols:  
  forward: yes  
  masquerade: no  
  forward-ports:  
  source-ports:  
  icmp-blocks:  
  rich rules:  
[root@localhost ~]# firewall-cmd --reload  
success  
[root@localhost ~]#
```

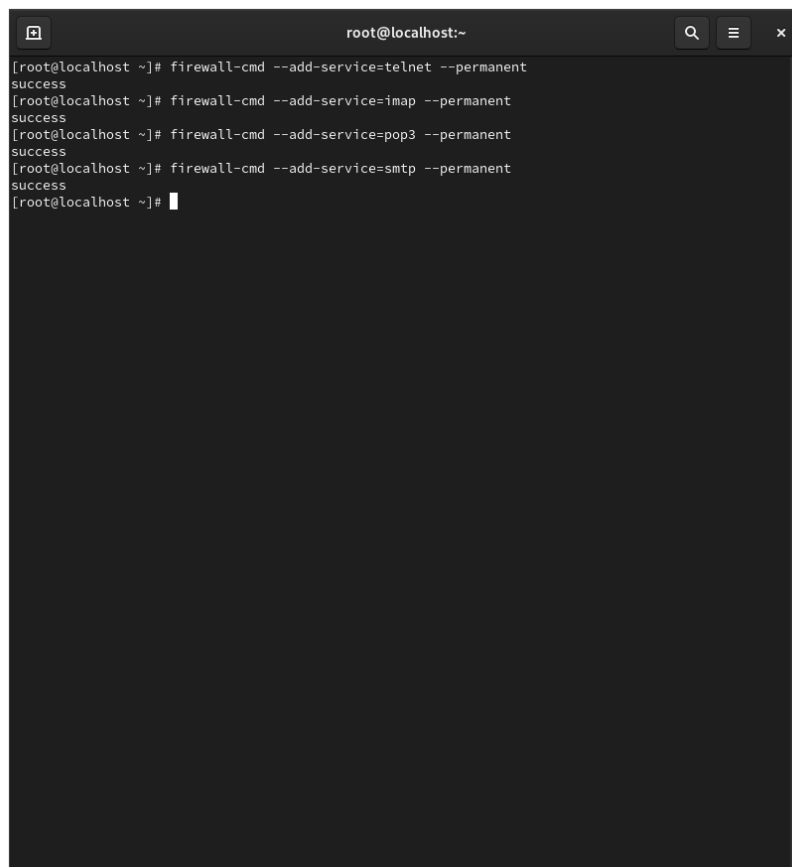
Рис. 3.23: перезагрузка

A terminal window titled 'root@localhost:~' with search, menu, and close icons in the title bar. The terminal shows the command 'firewall-cmd --list-all' and its output. The output lists various firewall settings for the 'public' zone, including target, icmp-block-inversion, interfaces, sources, services, ports, protocols, forward, masquerade, forward-ports, source-ports, icmp-blocks, and rich rules. The prompt '[root@localhost ~]#' is visible at the bottom.

```
[root@localhost ~]# firewall-cmd --list-all
public (active)
  target: default
  icmp-block-inversion: no
  interfaces: enp0s3
  sources:
  services: cockpit dhcpv6-client ftp http https ssh vnc-server
  ports: 2022/tcp 2022/udp
  protocols:
  forward: yes
  masquerade: no
  forward-ports:
  source-ports:
  icmp-blocks:
  rich rules:
[root@localhost ~]#
```

Рис. 3.24: перезагрузка

### 3.3 Самостоятельная работа

A terminal window titled 'root@localhost:~' with search, menu, and close icons in the title bar. The terminal shows four successful firewall configuration commands: adding telnet, imap, pop3, and smtp services permanently. Each command is followed by 'success' on the next line. The prompt '[root@localhost ~]#' is visible at the end of the last line.

```
[root@localhost ~]# firewall-cmd --add-service=telnet --permanent
success
[root@localhost ~]# firewall-cmd --add-service=imap --permanent
success
[root@localhost ~]# firewall-cmd --add-service=pop3 --permanent
success
[root@localhost ~]# firewall-cmd --add-service=smtp --permanent
success
[root@localhost ~]#
```

Рис. 3.25: Самостоятельная работа

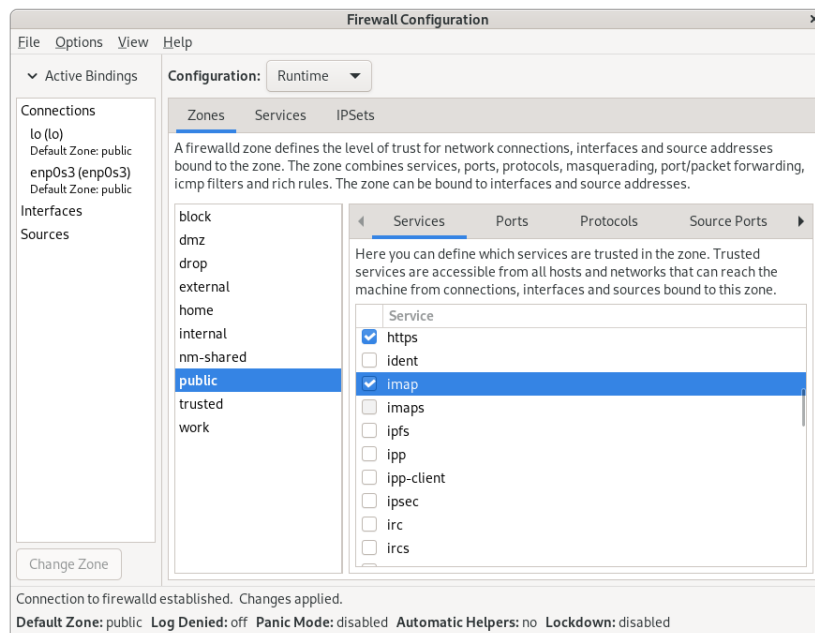


Рис. 3.26: Самостоятельная работа

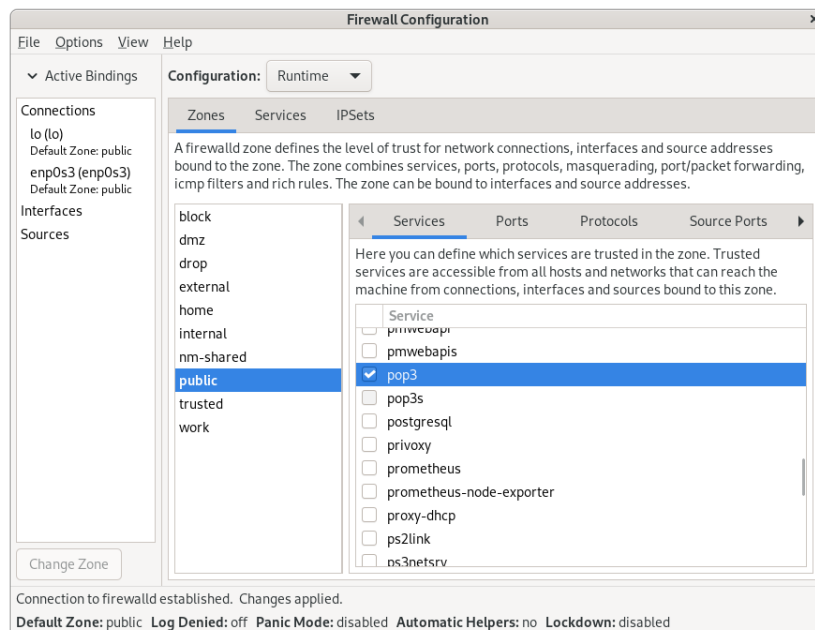


Рис. 3.27: Самостоятельная работа

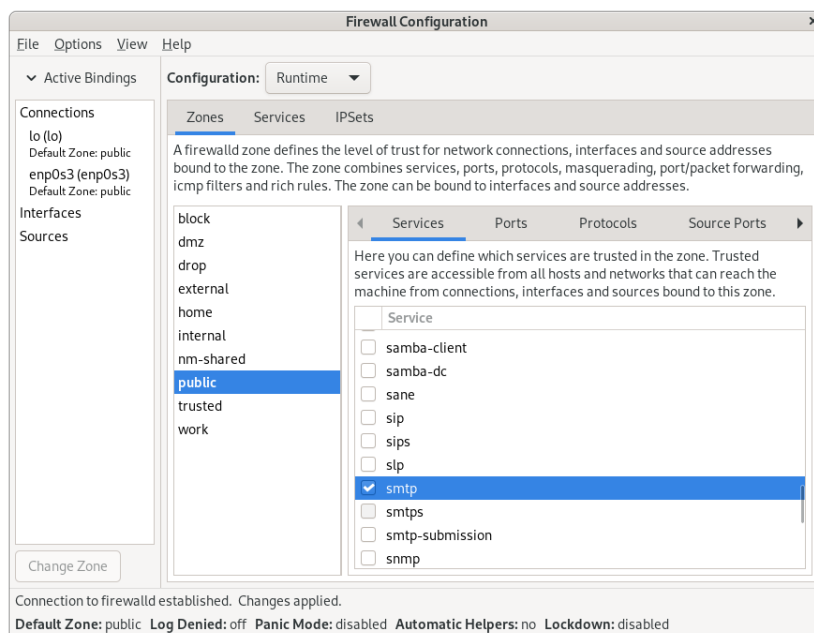


Рис. 3.28: Самостоятельная работа

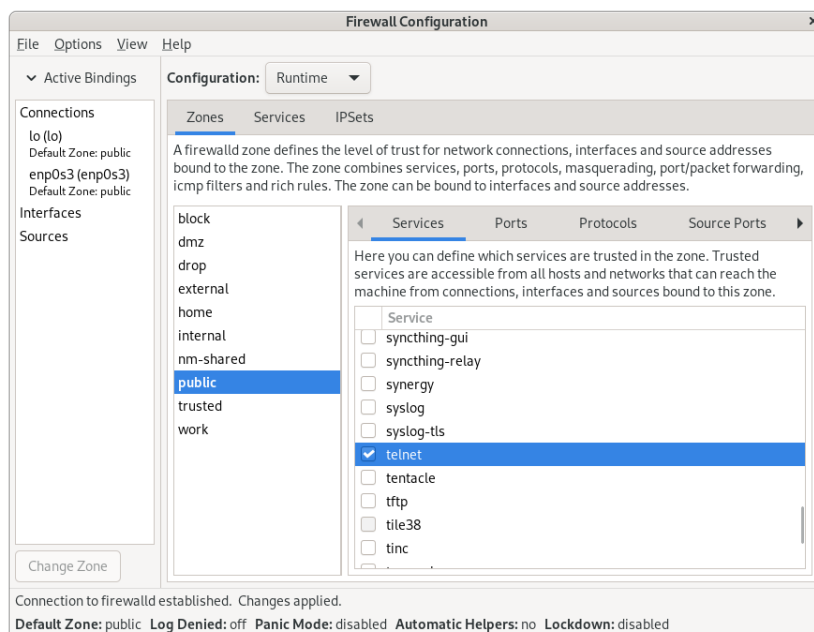


Рис. 3.29: Самостоятельная работа

## 4 Выводы

в этой лабораторной работе я смотрел как работать с утилитой firewall в linux

## **Список литературы**