

# Лабораторная работа №13

## Фильтр пакетов (firewalld)

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Руслан Алиев

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Российский университет дружбы народов, Москва, Россия

## Цель работы

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## Основная цель

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Получить навыки настройки фильтрации пакетов и межсетевого экрана с помощью **firewalld** и утилиты **firewall-cmd**.

## Ход выполнения работы

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# Получение зоны по умолчанию

```
raliev@raliev:~$ su
Password:
root@raliev:/home/raliev# firewall-cmd --get-default-zone
public
root@raliev:/home/raliev# firewall-cmd --get-zones
block dmz drop external home internal nm-shared public trusted work
root@raliev:/home/raliev# firewall-cmd --get-services
0-AD RH-Satellite-6 RH-Satellite-6-capsule afp alrm amanda-client amanda-k5-client amqp amqps anno-1602 anno-1800 apcupsd aseqnet
audit ausweisapp2 bacula bacula-client bareos-director bareos-filedaemon bareos-storage bb bgp bitcoin bitcoin-rpc bitcoin-testn
et bitcoin-testnet-rpc bittorrent-lsd ceph ceph-exporter ceph-mon cfengine checkmk-agent civilization-iv civilization-v cockpit c
ollectd condor-collector cratedb ctdb dds dds-multicast dds-unicast dhcp dhcpcv6 dhcpcv6-client distcc dns dns-over-quic dns-over-t
ls docker-registry docker-swarm dropbox-lansync elasticsearch etcd-client etcd-server factorio finger foreman foreman-proxy freei
pa-4 freeipa-ldap freeipa-ldaps freeipa-replication freeipa-trust ftp galera ganglia-client ganglia-master git gpsd grafana gre h
igh-availability http http3 https ident imap imaps iperf2 iperf3 ipfs ipp ipp-client ipsec irc ircs iscsi-target isns jenkins kad
min kdeconnect kerberos kibana klogin kpasswd kprop kshell kube-api kube-apiserver kube-control-plane kube-control-plane-secure k
ube-controller-manager kube-controller-manager-secure kube-nodeport-services kube-scheduler kube-scheduler-secure kube-worker kub
elet kubelet-readonly kubelet-worker ldap ldaps libvirt libvirt-tls lightning-network llmnr llmnr-client llmnr-tcp llmnr-udp mana
gesieve matrix mdns memcache minecraft minidlna mndp mongodb mosh mounted mpd mqtt mqtt-tls ms-wbt mssql murmur mysql nbd nebul
a need-for-speed-most-wanted netbios-ns netdata-dashboard nfs nfs3 nmea-0183 nrpe ntp nut opentelemetry openvpn ovirt-imageio ovirt-
storageconsole ovirt-vmconsole plex pmcd pmproxy pmwebapi pop3 pop3s postgresql privoxy prometheus prometheus-node-expo
rter proxy-dhcp ps2link ps3netsrv pptp pulseaudio puppetmaster quassel radius radsec rdp redis redis-sentinel rootd rpc-bind rquot
ad rsb rsyncd rtsp salt-master samba samba-client samba-dc sane settlers-history-collection sip sips slimevr slp smtp smpt submis
sion smtpts snmps snmplts snmplts-trap snmptrap spideroak-lansync spotify-sync squid ssdp ssh statsrv steam-lan-transfer steam-stre
aming stellaris stronghold-crusader sun stuns submission supertuxkart svdrp svn syncthing syncthing-gui syncthing-relay synergy
syscomlan syslog syslog-tls telnet tentacle terraria tftp tile38 tiny tor-socks transmission-client turn turns upnp-client vdsm v
nc-server vrpp warpinator wbem-http wbem-https wireguard ws-discovery ws-discovery-client ws-discovery-host ws-discovery-tcp ws-d
iscovery-udp wsdd wsdd-https wsman wsmans xmpp xmpp-bosh xmpp-client xmpp-local xmpp-server zabbix-agent zabbix-java-gateway zabb
ix-server zabbix-trapper zabbix-web-service zero-k zerotier
root@raliev:/home/raliev# firewall-cmd --list-services
cockpit dhcpcv6-client ssh
root@raliev:/home/raliev#
```

Рис. 1: Получение зоны по умолчанию

## Просмотр зон и служб

```
root@raliev:/home/raliev# firewall-cmd --list-all
public (default, active)
  target: default
  ingress-priority: 0
  egress-priority: 0
  icmp-block-inversion: no
  interfaces: enp0s3
  sources:
    services: cockpit dhcpcv6-client ssh
    ports:
    protocols:
    forward: yes
    masquerade: no
    forward-ports:
    source-ports:
    icmp-blocks:
    rich rules:
root@raliev:/home/raliev# firewall-cmd --list-all --zone=public
public (default, active)
  target: default
  ingress-priority: 0
  egress-priority: 0
  icmp-block-inversion: no
  interfaces: enp0s3
  sources:
    services: cockpit dhcpcv6-client ssh
    ports:
    protocols:
    forward: yes
    masquerade: no
    forward-ports:
    source-ports:
    icmp-blocks:
    rich rules:
root@raliev:/home/raliev#
```

## Добавление vnc-server (временно)

```
root@raliev:/home/raliev#  
root@raliev:/home/raliev# firewall-cmd --add-service=vnc-server  
success  
root@raliev:/home/raliev# firewall-cmd --list-all  
public (default, active)  
    target: default  
    ingress-priority: 0  
    egress-priority: 0  
    icmp-block-inversion: no  
    interfaces: enp0s3  
    sources:  
        services: cockpit dhcpcv6-client ssh vnc-server  
    ports:  
    protocols:  
        forward: yes  
        masquerade: no  
    forward-ports:  
    source-ports:  
    icmp-blocks:  
    rich rules:  
root@raliev:/home/raliev# systemctl restart firewalld.service  
root@raliev:/home/raliev# firewall-cmd --list-all  
public (default, active)  
    target: default  
    ingress-priority: 0  
    egress-priority: 0  
    icmp-block-inversion: no  
    interfaces: enp0s3  
    sources:  
        services: cockpit dhcpcv6-client ssh  
    ports:  
    protocols:  
        forward: yes  
        masquerade: no  
    forward-ports:
```

## Добавление vnc-server (постоянно)

```
root@raliev:/home/raliev# firewall-cmd --add-service=vnc-server --permanent
success
root@raliev:/home/raliev# firewall-cmd --list-all
public (default, active)
    target: default
    ingress-priority: 0
    egress-priority: 0
    icmp-block-inversion: no
    interfaces: enp0s3
    sources:
    services: cockpit dhcpcv6-client ssh
    ports:
    protocols:
    forward: yes
    masquerade: no
    forward-ports:
    source-ports:
    icmp-blocks:
    rich rules:
root@raliev:/home/raliev# firewall-cmd --reload
success
root@raliev:/home/raliev# firewall-cmd --list-all
public (default, active)
    target: default
    ingress-priority: 0
    egress-priority: 0
    icmp-block-inversion: no
    interfaces: enp0s3
    sources:
    services: cockpit dhcpcv6-client ssh vnc-server
    ports:
    protocols:
    forward: yes
    masquerade: no
    forward-ports:
```

## Добавление порта 2022/tcp

```
root@raliev:/home/raliev# firewall-cmd --add-port=2022/tcp --permanent
success
root@raliev:/home/raliev# firewall-cmd --reload
success
root@raliev:/home/raliev# firewall-cmd --list-all
public (default, active)
  target: default
  ingress-priority: 0
  egress-priority: 0
  icmp-block-inversion: no
  interfaces: enp0s3
  sources:
  services: cockpit dhcpcv6-client ssh vnc-server
  ports: 2022/tcp
  protocols:
  forward: yes
  masquerade: no
  forward-ports:
  source-ports:
  icmp-blocks:
  rich rules:
root@raliev:/home/raliev#
```

Рис. 5: Добавление порта 2022/tcp

## Firewall-config: службы

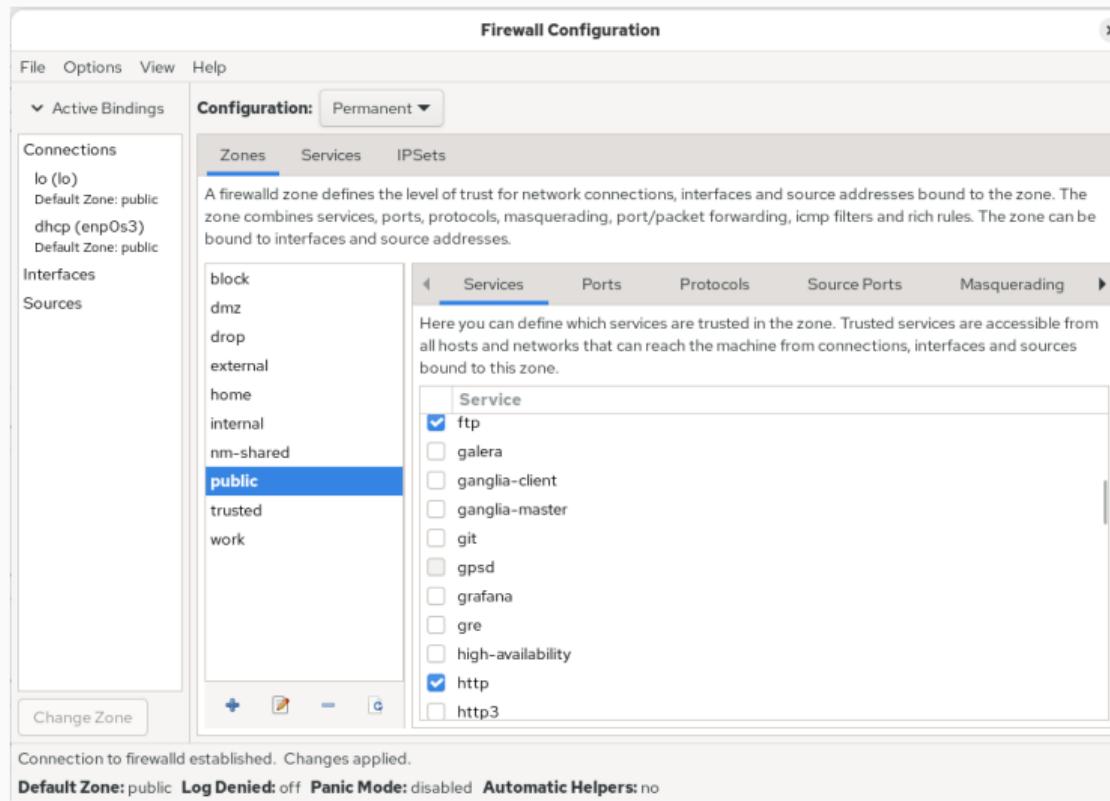


Рис. 6: Включение служб в графическом интерфейсе

## Firewall-config: порты

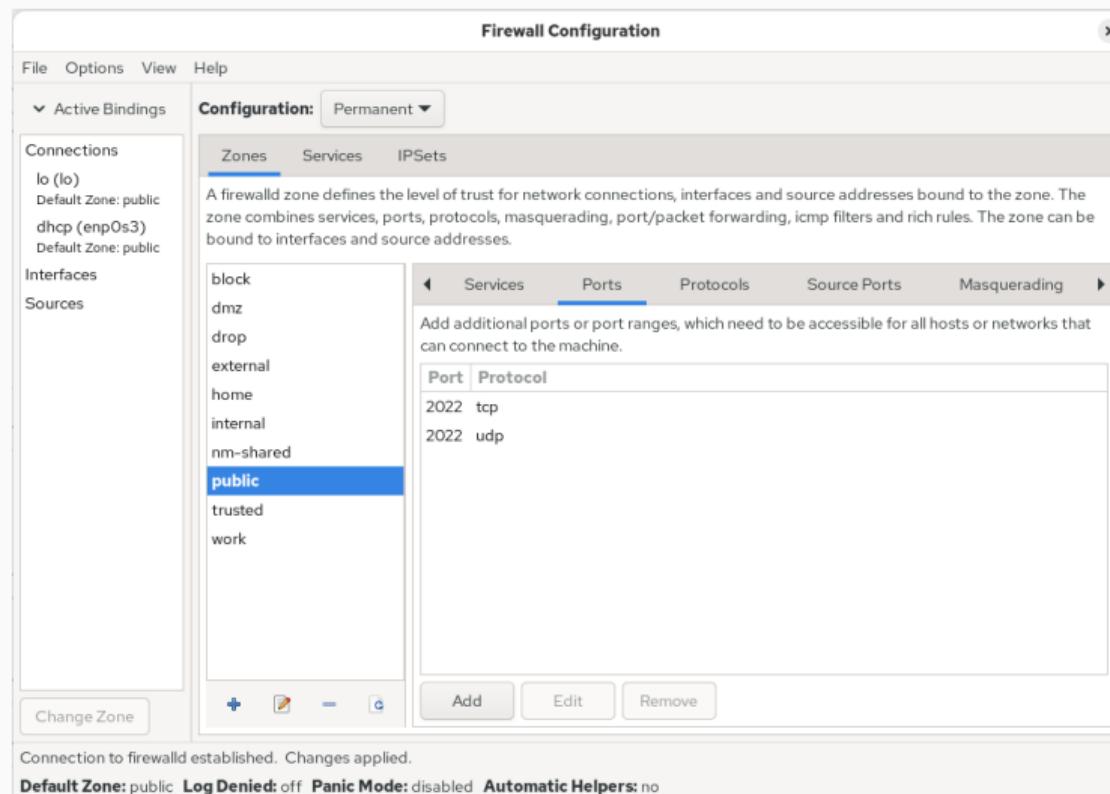


Рис. 7: Добавление портов 2022/tcp и 2022/udp

## Применение изменений

```
root@raliev:/home/raliev# firewall-cmd --list-all
public (default, active)
  target: default
  ingress-priority: 0
  egress-priority: 0
  icmp-block-inversion: no
  interfaces: enp0s3
  sources:
  services: cockpit dhcpcv6-client ssh vnc-server
  ports: 2022/tcp
  protocols:
  forward: yes
  masquerade: no
  forward-ports:
  source-ports:
  icmp-blocks:
  rich rules:
root@raliev:/home/raliev# firewall-cmd --reload
success
root@raliev:/home/raliev# firewall-cmd --list-all
public (default, active)
  target: default
  ingress-priority: 0
  egress-priority: 0
  icmp-block-inversion: no
  interfaces: enp0s3
  sources:
  services: cockpit dhcpcv6-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@raliev:/home/raliev#
```

## Итоговая конфигурация зоны

```
root@raliev:/home/raliev# firewall-cmd --add-service=telnet --permanent
success
root@raliev:/home/raliev# firewall-cmd --reload
success
root@raliev:/home/raliev# firewall-cmd --list-all
public (default, active)
  target: default
  ingress-priority: 0
  egress-priority: 0
  icmp-block-inversion: no
  interfaces: enp0s3
  sources:
    services: cockpit dhcpcv6-client ftp http https imap pop3 smtp ssh telnet vnc-server
    ports: 2022/tcp 2022/udp
    protocols:
    forward: yes
    masquerade: no
    forward-ports:
    source-ports:
    icmp-blocks:
    rich rules:
root@raliev:/home/raliev#
```

Рис. 9: Итоговая конфигурация зоны public

## Итоги работы

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В ходе лабораторной работы были изучены механизмы настройки брандмауэра в Linux с помощью **firewalld** и **firewall-cmd**.

Проверены методы управления службами и портами, а также работа с зонами безопасности как в терминале, так и через GUI-интерфейс **firewall-config**.

Полученные навыки важны для обеспечения базовой сетевой безопасности в Linux-средах.