

CYBER SECURITY INTERNSHIP

Task 4: Firewall Configuration using UFW on Kali Linux

Prepared By: Kommuri Chaitanya

Date: 08-08-2025

Objective

The objective of this task is to configure and manage basic firewall rules on a Linux-based system using the Uncomplicated Firewall (UFW). The task helps build practical knowledge of network traffic filtering, port management, and Linux-based system hardening.

Introduction

Firewalls play a crucial role in securing systems by filtering network traffic based on rules. In this task, the Uncomplicated Firewall (UFW), a user-friendly command-line interface for managing iptables in Linux, was used to configure basic allow and deny rules on Kali Linux. The goal was to block a vulnerable port (Telnet) and ensure secure ports like SSH are allowed.

Tools and Environment

Tool Used: UFW (Uncomplicated Firewall)

OS: Kali Linux

Port Blocked: 23 (Telnet)

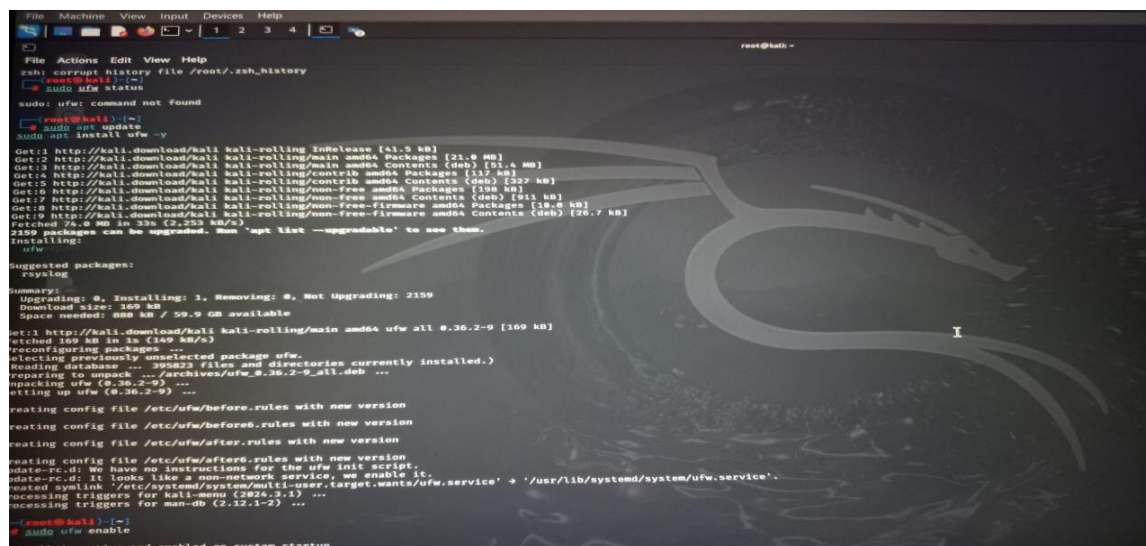
Port Allowed: 22 (SSH)

Test Tool: Telnet

Steps Followed (Clear and Detailed)

Step 1: Update System Repositories.

`sudo apt update`



```
File Machine View Input Devices Help
File Actions Edit View Help
zsh: corrupt history file /root/.zsh_history
root@kali: ~#
root@kali: ~# sudo ufw status
sudo: ufw: command not found
root@kali: ~#
root@kali: ~# sudo apt update
sudo apt install ufw -y
Get:1 http://kali.download/kali kali-rolling InRelease [51.5 kB]
Get:2 http://kali.download/kali kali-rolling/main amd64 Packages [31.6 MB]
Get:3 http://kali.download/kali kali-rolling/main amd64 Contents (deb) [51.4 MB]
Get:4 http://kali.download/kali kali-rolling/contrib amd64 Packages [11.7 kB]
Get:5 http://kali.download/kali kali-rolling/contrib amd64 Contents (deb) [22.7 kB]
Get:6 http://kali.download/kali kali-rolling/non-free amd64 Packages [190 kB]
Get:7 http://kali.download/kali kali-rolling/non-free amd64 Contents (deb) [11.1 kB]
Get:8 http://kali.download/kali kali-rolling/non-free-firmware amd64 Packages [18.6 kB]
Get:9 http://kali.download/kali kali-rolling/non-free-firmware amd64 Contents (deb) [20.7 kB]
Fetched 76.6 MB in 33s (2,253 kB/s)
2159 packages can be upgraded. Run 'apt list --upgradable' to see them.
Installing:
 ufw
Suggested packages:
  nftables
Summary:
  Upgrading: 0, Installing: 1, Removing: 0, Not Upgrading: 2159
  Download size: 169 kB
  Space needed: 888 kB / 59.9 GB available
Get:1 http://kali.download/kali kali-rolling/main amd64 ufw all 0.36.2-9 [169 kB]
Fetched 169 kB in 1s (149 kB/s)
reconfiguring packages ...
Selecting previously unselected package ufw.
Reading database ... 395823 files and directories currently installed.)
Preparing to unpack .../archives/ufw_0.36.2-9_all.deb ...
Unpacking ufw (0.36.2-9) ...
Setting up ufw (0.36.2-9) ...
reloading config file /etc/ufw/before.rules with new version
reloading config file /etc/ufw/before.rules with new version
reloading config file /etc/ufw/after.rules with new version
date-rs.d: It looks like a non-network service, we enable it.
reloading /etc/systemd/system/multi-user.target.wants/ufw.service + /usr/lib/systemd/system/ufw.service'.
Processing triggers for kali-menu (2024.3.1) ...
Processing triggers for man-db (2.12.1-2) ...
root@kali: ~#
root@kali: ~# sudo ufw enable
ufw is active and enabled on system startup
```

Step 2: Install UFW (Uncomplicated Firewall)

`sudo apt install ufw -y`

```
File Machine View Input Devices Help
root@kali ~
File Actions Edit View Help
root@kali ~$ sudo apt install ufw -y
sudo: ufw: command not found
root@kali ~$ sudo apt install ufw -y
Get:1 http://kali.download/kali kali-rolling InRelease [41.5 kB]
Get:2 http://kali.download/kali kali-rolling/main amd64 Packages [21.6 MB]
Get:3 http://kali.download/kali kali-rolling/main amd64 Contents [51.4 MB]
Get:4 http://kali.download/kali kali-rolling/contrib amd64 Packages [12.1 kB]
Get:5 http://kali.download/kali kali-rolling/contrib amd64 Contents [22.7 kB]
Get:6 http://kali.download/kali kali-rolling/non-free amd64 Packages [196 kB]
Get:7 http://kali.download/kali kali-rolling/non-free-firmware amd64 Packages [18.6 kB]
Get:8 http://kali.download/kali kali-rolling/non-free-firmware Contents [20.7 kB]
Fetched 76.6 MB in 33s (2,253 kB/s)
2169 packages can be upgraded. Run 'apt list --upgradable' to see them.
Installing:
ufw
Suggested packages:
nftables
Summary:
Upgrading: 0, Installing: 1, Removing: 0, Not Upgrading: 2169
Download Size: 169 kB
Space needed: 888 kB / 59.9 GB available
Get:1 http://kali.download/kali kali-rolling/main amd64 ufw all 0.36.2-9 [169 kB]
Fetched 169 kB in 1s (149 kB/s)
Preparing to unpack .../archives/ufw_0.36.2-9_all.deb ...
Unpacking ufw (0.36.2-9) ...
Setting up ufw (0.36.2-9) ...
Creating config file /etc/ufw/before.rules with new version
Creating config file /etc/ufw/before.rules with new version
Creating config file /etc/ufw/after.rules with new version
Creating config file /etc/ufw/after.rules with new version
update-rc.d: It looks like a non-systemd service, so enable it.
Created symlink /etc/systemd/system/multi-user.target.wants/ufw.service → /usr/lib/systemd/system/ufw.service'.
Processing triggers for man-db (2.12.1-2) ...
ufw is active and enabled on system startup
```

Step 3: Enable UFW

`sudo ufw enable`

```
(root@kali)~# sudo ufw enable
Firewall is active and enabled on system startup
```

Firewall is active and enabled on system startup

Step 4: Check Firewall Status

`sudo ufw status numbered`

```
(root@kali)~# sudo ufw status numbered
Status: active
```

Step 5: Block Inbound Traffic on Port 23 (Telnet)

`sudo ufw deny 23`

```
(root@kali)~# sudo ufw deny 23
Rule added
Rule added (v6)
```

Step 6: Allow Inbound SSH (Port 22)

`sudo ufw allow 22`

```
(root@kali)-[~]
# sudo ufw allow 22

Rule added
Rule added (v6)
```

Step 7: Install Telnet for Testing

`sudo apt install telnet -y`

```
(root@kali)-[~]
# sudo apt install telnet -y
telnet localhost 23
exp.txt
Upgrading:
  inetutils-telnet
Installing:
  telnet
Summary:
  Upgrading: 1, Installing: 1, Removing: 0, Not Upgrading: 2158
  Download size: 174 kB
  Space needed: 73.7 kB / 59.9 GB available

Get:1 http://kali.download/kali kali-rolling/main amd64 inetutils-telnet amd64 2:2.6-3 [130 kB]
Get:2 http://http.kali.org/kali kali-rolling/main amd64 telnet all 0.17+2.6-3 [43.3 kB]
Fetched 174 kB in 2s (89.1 kB/s)
(Reading database ... 395936 files and directories currently installed.)
Preparing to unpack .../inetutils-telnet_2%3a2.6-3_amd64.deb ...
Unpacking inetutils-telnet (2:2.6-3) over (2:2.5-5) ...
Selecting previously unselected package telnet.
Preparing to unpack .../telnet_0.17+2.6-3_all.deb ...
Unpacking telnet (0.17+2.6-3) ...
Setting up inetutils-telnet (2:2.6-3) ...
Setting up telnet (0.17+2.6-3) ...
Processing triggers for kali-menu (2024.3.1) ...
Processing triggers for man-db (2.12.1-2) ...
Trying ::1...
Connection failed: Connection refused
Trying 127.0.0.1...
telnet: Unable to connect to remote host: Connection refused
```

Step 8: Remove the Test Rule (Cleanup)

`sudo ufw delete deny 23`

```
(root@kali)-[~]
# sudo ufw delete deny 23

Rule deleted
Rule deleted (v6)
```

Rule deleted and Rule deleted (v6)

Step 9: Final Status Check

`sudo ufw status numbered`

```
(root@kali)-[~]
# sudo ufw status numbered

Status: active

   To Action From
--
[ 1] 22 ALLOW IN Anywhere
[ 2] 22 (v6) ALLOW IN Anywhere (v6)
```

Test Output Summary

After blocking port 23, the system was tested using telnet. The result showed 'connection refused', confirming that the firewall rule was working. The SSH port (22) remained accessible, ensuring remote management was still possible.

Learning Outcomes

- Learned to install and use UFW on a Linux system.
- Understood how to apply, list, and delete firewall rules.
- Identified the importance of blocking insecure ports like Telnet.
- Gained confidence in using command-line tools for system hardening.

Conclusion

This task provided practical experience with Linux-based firewall management. By configuring and testing rules using UFW, I gained a deeper understanding of how network ports can be controlled to protect systems from unauthorized access. This skill is essential for cybersecurity professionals in both offensive and defensive roles.