University of Utah
School of Computing
CS 6967: Security Operations

Lab 6 Response Outline

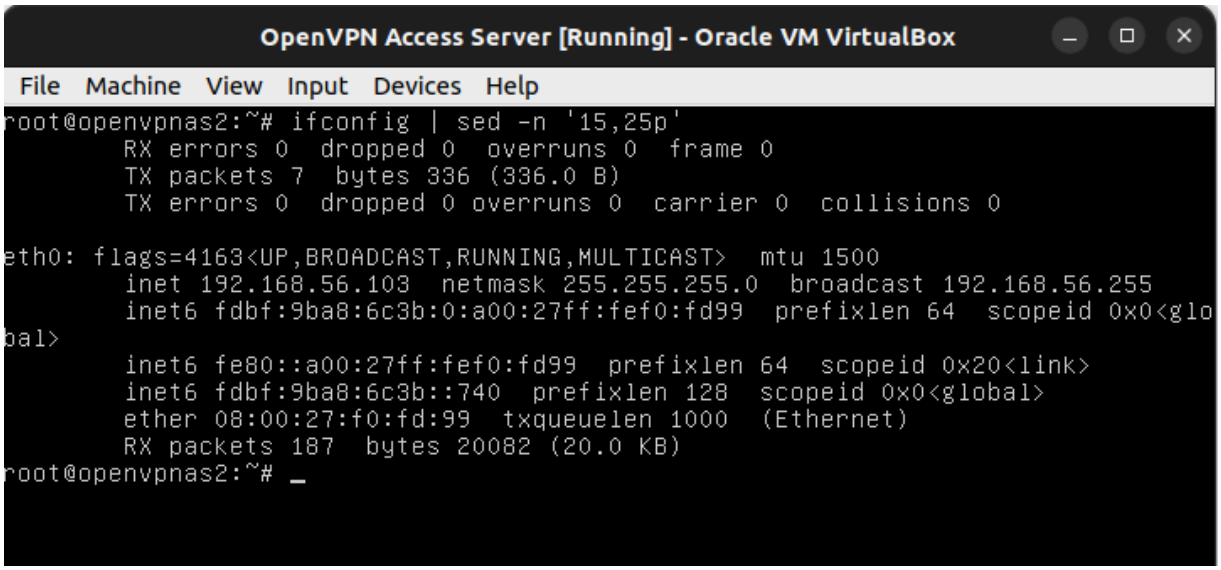
Lab 6: Virtual Private Network (VPN)

Test 1: VPN Server Running Inside the LAN

Summary of test experience:

In this test, after installing a VPN server inside the LAN, we must check if the VPN server is running inside the LAN. For this, I imported the vbox instance of the VPN and configured it to run inside the LAN by setting its network adapter to the host network. Later, the OpenWrt router was designated as the VPN's static route in its routing table. Finally, I checked the current network interface configuration to see if an IP address was assigned to the VPN server.

Screenshot of test results:



Provide a brief (1–2 sentences) explanation of the results answering the question: How does the image demonstrate that you completed the test?

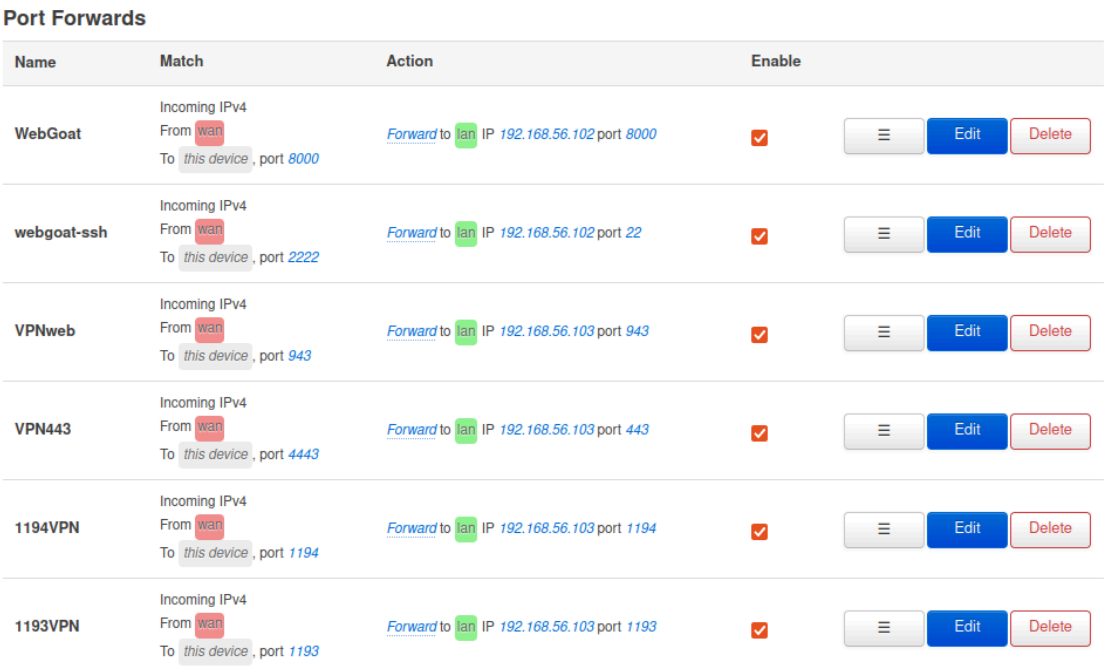
From the above screenshot, we can see that the IP address of the VPN server is 192.168.56.103, thus fulfilling the completeness of the test.

Test 2: Port Forwarding Rules

Summary of test experience:

Despite the router having two port forwarding rules, we must add some rules in the router so that the VPN does its work. Test 2 requires reporting all port forwarding rules active in the router. I added 4 rules(VPNweb, VPN443, 1194VPN, and 1193VPN), which would be used in configuring the VPN client side. Interestingly, I made a mistake here while adding the 'VPN443' rule. I mistakenly set the port as '443' in the incoming IPv4 section. I realized this mistake while setting up the client VPN configuration file.

Screenshot of test results:



Provide a brief (1–2 sentences) explanation of the results answering the question: How does the image demonstrate that you completed the test?

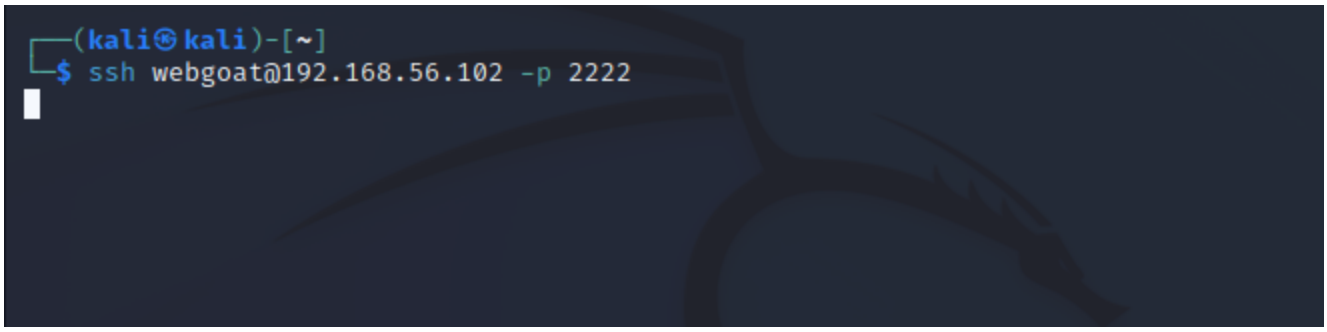
The above image comprises the new and old port forwarding rules. Here, WebGoat and webgoat-ssh rules are from the previous labs.

Test 3: Kali Linux SSH Into WebGoat

Summary of test experience:

Task 3 requires us to check if the internal connection channel between Kali Linux and the web server is working. We can do so by just ssh-ing from Kali Linux's terminal to the web server. The ssh connection should not be established as in the pre-work of this module, we blocked this connection by configuring the WebGoat server's firewall.

Screenshot of test results:



Provide a brief (1–2 sentences) explanation of the results answering the question: How does the image demonstrate that you completed the test?

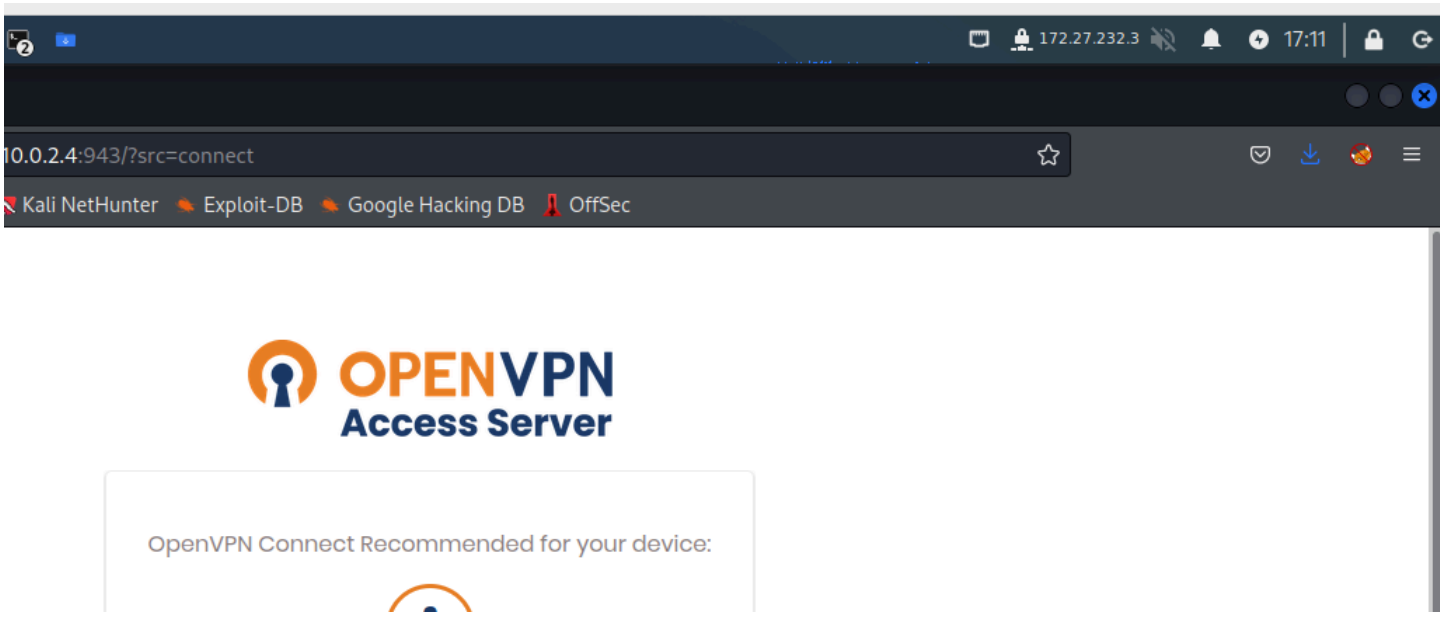
It can be seen from the above screenshot that the ssh command from Kali Linux didn't work.

Test 4: Kali Linux Connected to VPN Server

Summary of test experience:

The goal of Test 4 is to examine if Kali Linux has established a connection to the VPN server. Here, I needed to configure the client VPN configuration file of Kali Linux based on the latest port forwarding rules. Then, I started the openvpn service with the configuration file to establish a connection from Kali to the VPN.

Screenshot of test results:



Provide a brief (1–2 sentences) explanation of the results answering the question: How does the image demonstrate that you completed the test?

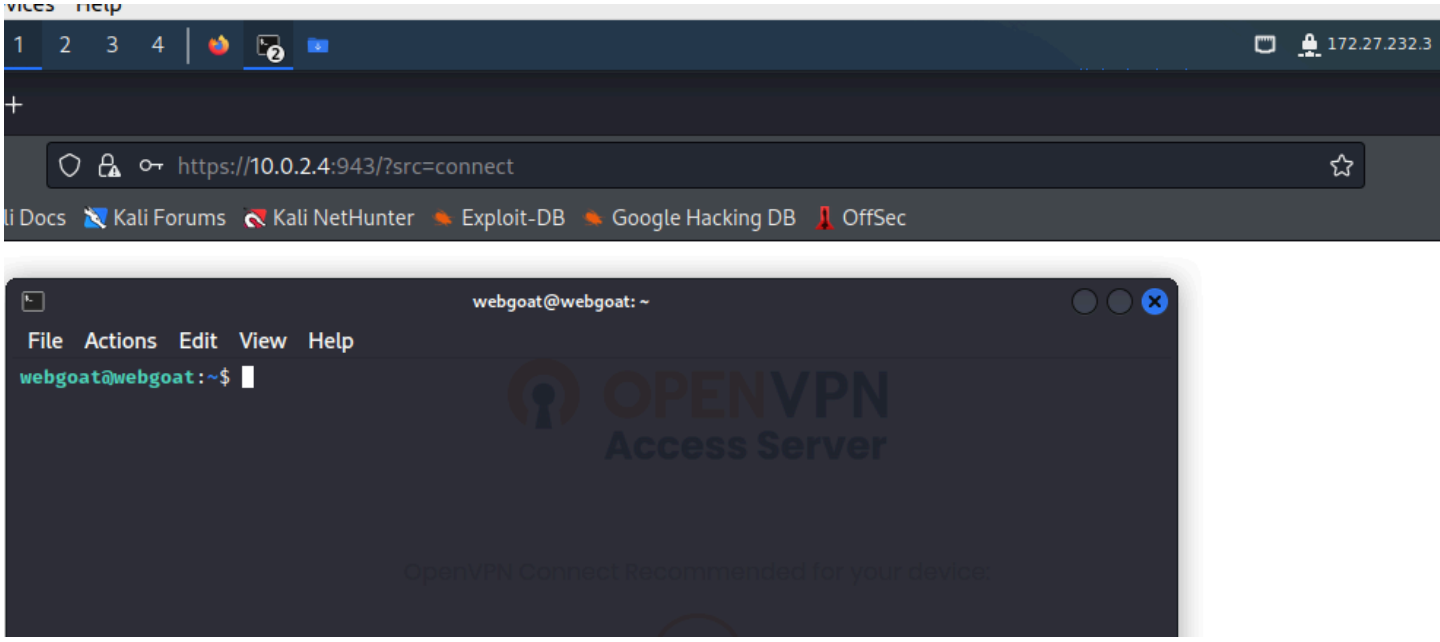
The above image shows that Kali Linux is connected to the VPN server, and the IP address is 172.27.232.3.

Test 5: Kali Linux SSH Into WeGoat

Summary of test experience:

This task requires you to check if SSH-ing into WebGoat from Kali Linux works correctly.

Screenshot of test results:



Provide a brief (1–2 sentences) explanation of the results answering the question: How does the image demonstrate that you completed the test?

The screenshot above shows that after a successful SSH, Kali Linux could access the WebGoat server through the VPN channel, implying the completeness of this test.