Assignment-1 Firewalls

Description:

In this assignment, you will need to configure a LAN and a WAN connected via a Router. Also, you will need to configure firewall traffic rules on the Router to provide security protection for the local network

Part 1: Configure the networks

Please follow the instructions at https://docs.google.com/document/d/1biyhfXKVQPwrda2q5VCUwmCtlUrJzWo2iab3X96yW_0/edit?usp=sharing to set up the networks. Make sure that, after the configuration, you understand what is "LAN", what is "Router", and what is "WAN" in the networks.

In the above document, there are six tests labeled from **Test 1** to **Test 6**. **You need to complete all six tests and take a screenshot after completing each test.**

Part 2: Configure Firewall traffic rules

Business needs of the Web Server in the LAN:

- Only traffic to port numbers 22/8000/9001 is needed
  - 22: SSH
  - 8000: HTTP
  - 9001: Database
- Any traffic from anywhere to port number 8000 in the Web Server should be allowed
- Only traffic from the LAN to port numbers 22/9001 is allowed

Please set up iptables rules in the OpenWrt to ensure:

- The above business needs are **supported**
- Anything else is **disallowed**

Hints for this part:

- As the router is doing forwarding for the web server, all the iptables rules should be applied to the "FORWARD" chain (rules applied to the "INPUT" chains **WON'T** work anymore)
- The "FORWARD" chain already contains many rules set up by OpenWrt. You can check them with the command "iptables -L INPUT --line-numbers", but please DO NOT change those!!! For your rules to become active, you will need to insert your rule before the first rule already in the FORWARD chain. Specifically, you are suggested to create rules like "iptables -I FORWARD 1 other_parts_of_your_rule"
- To delete a rule you inserted (say you made a mistake), you need to first figure out the number of your rule ("iptables -L INPUT --line-numbers" can display all the rules in the FORWARD chain

with numbers). Then you can run “iptables -D FORWARD number_of_your_rule” to delete the target rule

- All the rules you inserted via the command line are only valid for the current session, meaning that if you restart the OpenWrt Router VM, all those rules will disappear

Part 3: Submission

Please create a PDF document to include the following:

- The screenshots for the six tests in **Part 1**
- The iptables rules you created for **Part 2**, please include
    - The rules themselves
    - Explanation of each rule: what it intends to do
    - How each rule is tested (please describe how the test is designed and add screenshots for the testing results)
- **Due date: Sep 25, 11:59PM** (no late submissions will be accepted unless approval is obtained in advance)
- Submission: https://www.gradescope.com/courses/411636/assignments/2248247/submissions