

# Set Up a Jump Server in our Local Networks

## Step 1: Blocking everything from WAN to the Web Server (i.e., the WebGoat VM)

– Start/Restart your OpenWrt Router VM a

General Settings Port Forwards Traffic Rules Custom Rules

### Firewall - Port Forwards

Port forwarding allows remote computers on the Internet to connect to a specific computer or service within the private LAN.

#### Port Forwards

Name	Match	Forward to	Enable	
WebGoat	IPv4-tcp, udp From <i>any host</i> in <i>wan</i> Via <i>any router IP</i> at port <i>8000</i>	IP <i>192.168.56.101</i> , port <i>8000</i> in <i>lan</i>	<input checked="" type="checkbox"/>	<span>Up</span> <span>Down</span> <span>Edit</span> <span>Delete</span>
SSH	IPv4-tcp, udp From <i>any host</i> in <i>wan</i> Via <i>any router IP</i> at port <i>2222</i>	IP <i>192.168.56.101</i> , port <i>22</i> in <i>lan</i>	<input checked="" type="checkbox"/>	<span>Up</span> <span>Down</span> <span>Edit</span> <span>Delete</span>
Database	IPv4-tcp, udp From <i>any host</i> in <i>wan</i> Via <i>any router IP</i> at port <i>9001</i>	IP <i>192.168.56.101</i> , port <i>9001</i> in <i>lan</i>	<input checked="" type="checkbox"/>	<span>Up</span> <span>Down</span> <span>Edit</span> <span>Delete</span>
VPNweb	IPv4-tcp, udp From <i>any host</i> in <i>wan</i> Via <i>any router IP</i> at port <i>943</i>	IP <i>192.168.56.104</i> , port <i>943</i> in <i>lan</i>	<input checked="" type="checkbox"/>	<span>Up</span> <span>Down</span> <span>Edit</span> <span>Delete</span>
VPN443	IPv4-tcp, udp From <i>any host</i> in <i>wan</i> Via <i>any router IP</i> at port <i>4443</i>	IP <i>192.168.56.104</i> , port <i>443</i> in <i>lan</i>	<input checked="" type="checkbox"/>	<span>Up</span> <span>Down</span> <span>Edit</span> <span>Delete</span>
1194VPN	IPv4-udp From <i>any host</i> in <i>wan</i> Via <i>any router IP</i> at port <i>1194</i>	IP <i>192.168.56.104</i> , port <i>1194</i> in <i>lan</i>	<input checked="" type="checkbox"/>	<span>Up</span> <span>Down</span> <span>Edit</span> <span>Delete</span>
1193VPN	IPv4-tcp, udp From <i>any host</i> in <i>wan</i> Via <i>any router IP</i> at port <i>1193</i>	IP <i>192.168.56.104</i> , port <i>1193</i> in <i>lan</i>	<input checked="" type="checkbox"/>	<span>Up</span> <span>Down</span> <span>Edit</span> <span>Delete</span>

nd enable

all the port forwarding we have setup in previous assignments or practices. Basically, you will have something like this (if you indeed do not like the port forwarding for the VPN server, you can ignore them):

– Start/Restart your Kali Linux VM

– Start/Restart the WebGoat VM and add the OpenWrt as the router by running:

```
sudo ip route add default via 192.168.56.10
```

**Test 1:** Open a terminal on your **host** machine (i.e., your laptop), try to run: `ssh webgoat@192.168.56.101`

**Requirement:** Screenshot the result

**Note:** Please replace 192.168.56.101 with the IP address of your WebGoat VM (if different)

**Expected results:** You can ssh into the WebGoat VM [not a required part, but think why]

**Test 2:** Open a terminal on your **kali Linux**, try to run: `ssh webgoat@192.168.56.101`

**Requirement:** Screenshot the result

**Note:** Please replace 192.168.56.101 with the IP address of your WebGoat VM (if different)

**Expected results:** You can ssh into the WebGoat VM [not a required part, but think why]

**Test 3:** Open a terminal on your **kali Linux**, try to run: `ssh webgoat@10.0.2.4 -p 2222`

**Requirement:** Screenshot the result

**Note:** Please replace 10.0.2.4 with the WAN IP address of your OpenWrt VM (if different)

**Expected results:** You can ssh into the WebGoat VM [not a required part, but think why]

## Operations continue below:

– Block access from your host to the WebGoat VM by running the following command **in your WebGoat VM** (assuming the IP address of your host in the LAN is 192.168.56.1, which should be the case):

```
sudo iptables -A INPUT -s 192.168.56.1 -j DROP
```

**Test 4:** Open a terminal on your **host** machine (i.e., your laptop), try to run: `ssh webgoat@192.168.56.101`

**Requirement:** Screenshot the result

**Note:** Please replace 192.168.56.101 with the IP address of your WebGoat VM (if different)

**Expected results:** You **cannot** ssh into the WebGoat VM [not a required part, but think why]

**Test 5:** Open a terminal on your **kali Linux**, try to run: `ssh webgoat@192.168.56.101`

**Requirement:** Screenshot the result

**Note:** Please replace 192.168.56.101 with the IP address of your WebGoat VM (if different)

**Expected results:** You **cannot** ssh into the WebGoat VM [not a required part, but think why]

**Test 6:** Open a terminal on your **kali Linux**, try to run: `ssh webgoat@10.0.2.4 -p 2222`

**Requirement:** Screenshot the result

**Note:** Please replace 10.0.2.4 with the WAN IP address of your OpenWrt VM (if different)

**Expected results:** You **still can** ssh into the WebGoat VM [not a required part, but think why]

### Operations continue below:

– Block access from WAN to SSH on the WebGoat VM by running the following command on the OpenWrt VM:

```
iptables -I FORWARD 1 -s 10.0.2.0/24 -d 192.168.56.101 -p tcp --dport 22 -j DROP
```

**Note:** Please replace 192.168.56.101 with the IP address of your WebGoat VM (if different)

**Test 7:** Open a terminal on your **kali Linux**, try to run: `ssh webgoat@10.0.2.4 -p 2222`

**Requirement:** Screenshot the result

**Note:** Please replace 10.0.2.4 with the WAN IP address of your OpenWrt VM (if different)

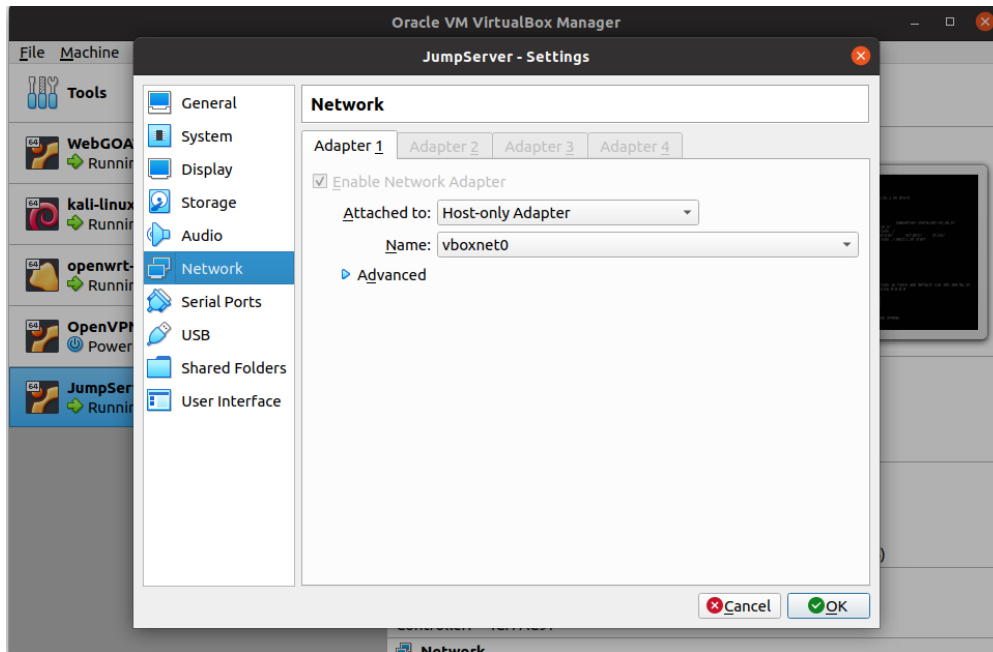
**Expected results:** You **cannot** ssh into the WebGoat VM [not a required part, but think why]

## Step 2: Building the VM for the Jump Server

– Download the VM image for our jump server at (you need to log into gcloud with your Utah account): <https://drive.google.com/file/d/1iY2NSxXCt8JtzkxXnfgVr5Uc9aK-2wJP/view>

– Import the downloaded VM into Virtualbox (you have done this many times)

– Configure the VM to use the Host-only Adapter



– Start the jump server VM with [username: **ubuntu**] and [password: **ubuntu**]

**Test 8:** check the IP address of the VM; Screenshot the results

**Expected results:** It should have something like 192.168.56.\*

– Add the OpenWrt as the router by running the following command in the **Jump Server VM**:

```
sudo ip route add default via 192.168.56.10
```

And also run the following command to start the jump service

```
cd /opt/jumpserver-installer-v2.26.0
```

```
sudo ./jmsctl.sh start
```

– Open the browser on your **host machine**, log into the web interface of the OpenWrt Router and add a port forwarding rule like the following:

JumpServer	IPv4-tcp, udp	From <i>any host</i> in <i>wan</i>	IP <i>192.168.56.105</i> , port <i>80</i> in <i>lan</i>	<input checked="" type="checkbox"/>	Up	Down	Edit	Delete
		Via <i>any router IP</i> at port <i>8800</i>						

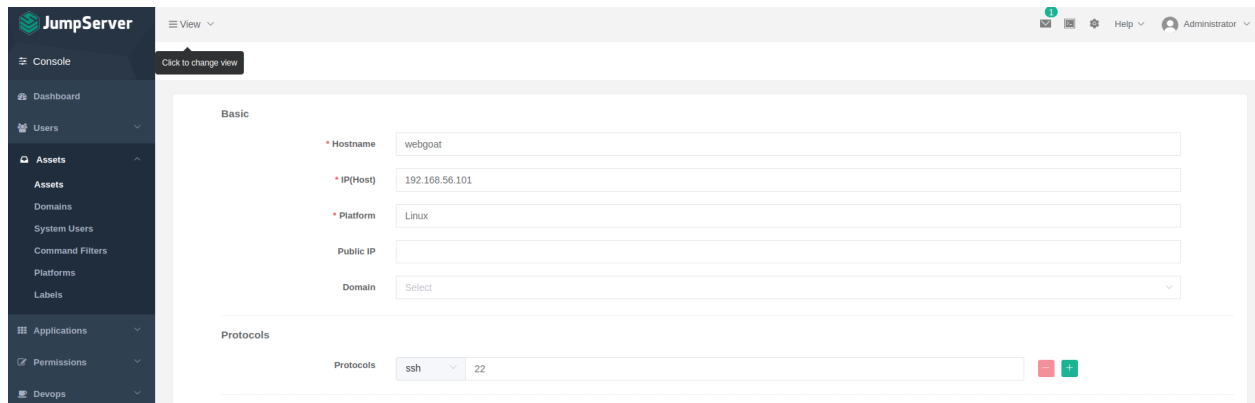
**Note:** Please replace 192.168.56.105 with the IP address of your Jump Server VM (if different)

– Open the browser on your **host machine**, visit 192.168.56.105

**Note:** Please replace 192.168.56.105 with the IP address of your Jump Server VM (if different)

**Expected results:** you are going to see the log-in page for the Jump Server

- Log into the log-in page for the Jump Server by using [Username: admin] [Password: ut@Hut@H]
- Go to “Assets” → “Assets” → “webgoat” → “Update”. If the IP address of your WebGoat VM is not “192.168.56.101”, replace the value in “IP(Host)” with the IP address of your WebGoat VM and then click “submit”



– Open the browser on your **Kali Linux**, visit 10.0.2.4:8800

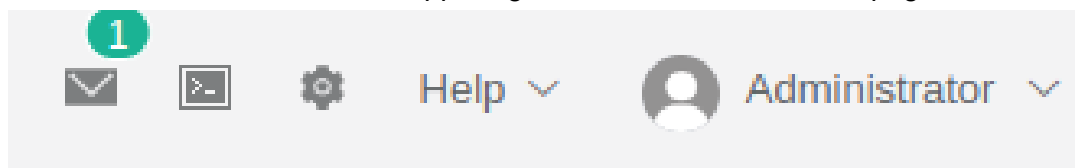
**Note:** Please replace 10.0.2.4 with the WAN IP address of your OpenWrt VM (if different)

**Expected results:** you are going to see the log-in page for the Jump Server

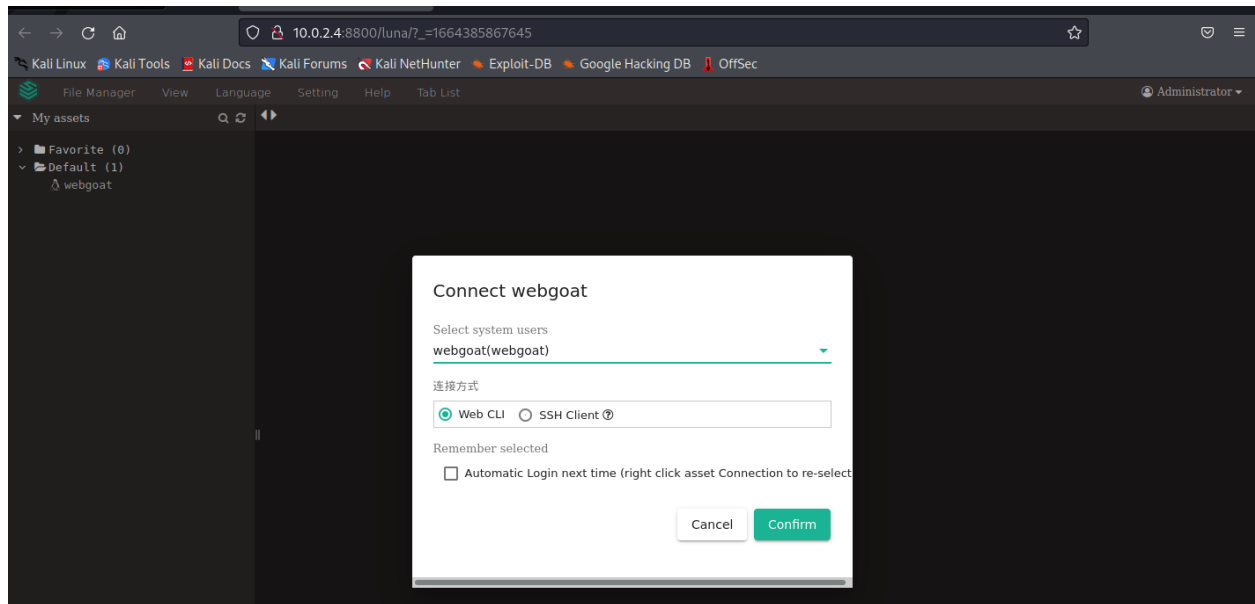
- Log into the log-in page for the Jump Server by using [Username: admin] [Password: ut@Hut@H]

**Test 9:** Connect to SSH on the WebGoat server via the Jump Server

Click the “terminal” icon on the upper right corner of the above webpage



**Expected results:** you are going to see a webpage like the following:



Click “webgoat” under “Default (1)” and then click “confirm”

**Requirement:** Screenshot the result

**Note:** The web page will automatically SSH you to the WebGoat VM

**Expected results:** You sshed into the WebGoat VM

## Submission:

Please create a PDF document to include the results of **Test 1** - **Test 9**, and submit the PDF document to GradeScope: <https://www.gradescope.com/courses/411636/assignments/2302733/>