

가상머신 네트워크

[19반] 정민석_7000

실습 내용

UTM 환경에서 Ubuntu2가 8.8.8.8로 요청을 전송하면, 이를 Ubuntu1에서 이 요청을 NAT으로 연결하는 가상머신 환경을 구현하고자 하였습니다. 다음의 명령어를 통하여 실습을 진행하였습니다.

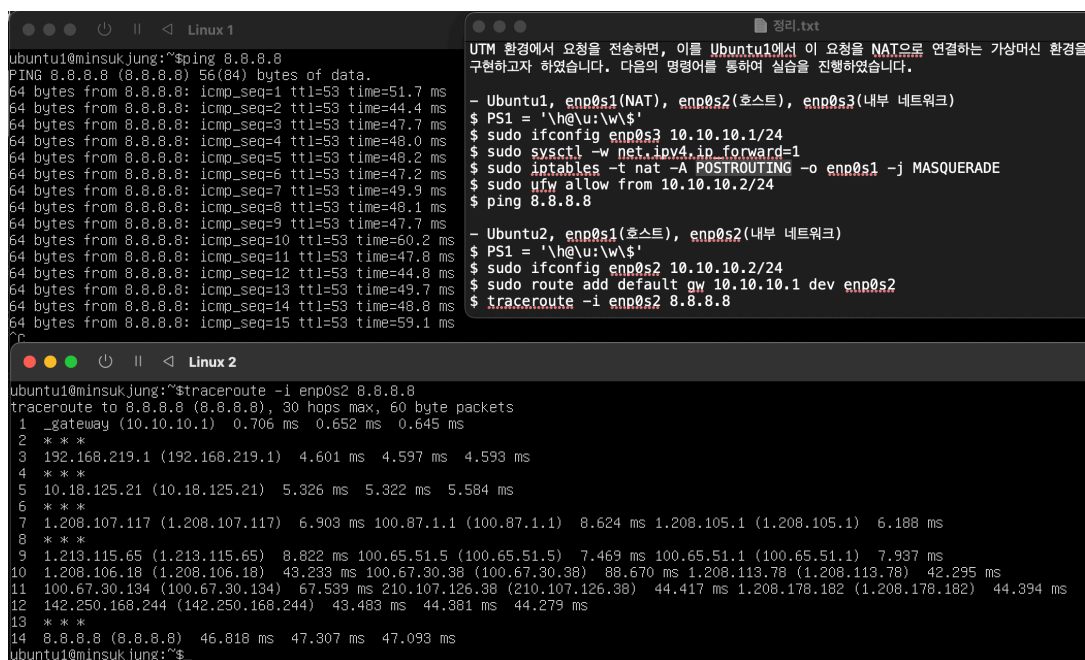
- Ubuntu1, enp0s1(NAT), enp0s2(호스트), enp0s3(내부 네트워크)

```
$ PS1 = '\h@\u:w\$'
$ sudo ifconfig enp0s3 10.10.10.1/24
$ sudo sysctl -w net.ipv4.ip_forward=1
$ sudo iptables -t nat -A POSTROUTING -o enp0s1 -j MASQUERADE
$ sudo ufw allow from 10.10.10.2/24
$ ping 8.8.8.8
```

- Ubuntu2, enp0s1(호스트), enp0s2(내부 네트워크)

```
$ PS1 = '\h@\u:w\$'
$ sudo ifconfig enp0s2 10.10.10.2/24
$ sudo route add default gw 10.10.10.1 dev enp0s2
$ traceroute -i enp0s2 8.8.8.8
```

결과



The image displays three terminal windows from a Linux environment. The top-left window shows the configuration of Ubuntu1's enp0s3 interface with IP 10.10.10.1/24, enabling IP forwarding, setting up NAT with iptables, and allowing traffic from 10.10.10.2/24. The top-right window shows the configuration of Ubuntu2's enp0s2 interface with IP 10.10.10.2/24 and setting the default gateway to 10.10.10.1. The bottom window shows the output of a traceroute from Ubuntu2 to 8.8.8.8, indicating a successful path through several hops, including the NAT interface enp0s1 of Ubuntu1.

```
ubuntu1@minsukjung:~$ ping 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_seq=1 ttl=53 time=51.7 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=53 time=44.4 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=53 time=47.7 ms
64 bytes from 8.8.8.8: icmp_seq=4 ttl=53 time=48.0 ms
64 bytes from 8.8.8.8: icmp_seq=5 ttl=53 time=48.2 ms
64 bytes from 8.8.8.8: icmp_seq=6 ttl=53 time=47.2 ms
64 bytes from 8.8.8.8: icmp_seq=7 ttl=53 time=49.9 ms
64 bytes from 8.8.8.8: icmp_seq=8 ttl=53 time=48.1 ms
64 bytes from 8.8.8.8: icmp_seq=9 ttl=53 time=47.7 ms
64 bytes from 8.8.8.8: icmp_seq=10 ttl=53 time=60.2 ms
64 bytes from 8.8.8.8: icmp_seq=11 ttl=53 time=47.8 ms
64 bytes from 8.8.8.8: icmp_seq=12 ttl=53 time=44.8 ms
64 bytes from 8.8.8.8: icmp_seq=13 ttl=53 time=49.7 ms
64 bytes from 8.8.8.8: icmp_seq=14 ttl=53 time=48.8 ms
64 bytes from 8.8.8.8: icmp_seq=15 ttl=53 time=59.1 ms
^C
```

```
- Ubuntu1, enp0s1(NAT), enp0s2(호스트), enp0s3(내부 네트워크)
$ PS1 = '\h@\u:w\$'
$ sudo ifconfig enp0s3 10.10.10.1/24
$ sudo sysctl -w net.ipv4.ip_forward=1
$ sudo iptables -t nat -A POSTROUTING -o enp0s1 -j MASQUERADE
$ sudo ufw allow from 10.10.10.2/24
$ ping 8.8.8.8
```

```
- Ubuntu2, enp0s1(호스트), enp0s2(내부 네트워크)
$ PS1 = '\h@\u:w\$'
$ sudo ifconfig enp0s2 10.10.10.2/24
$ sudo route add default gw 10.10.10.1 dev enp0s2
$ traceroute -i enp0s2 8.8.8.8
```

```
ubuntu1@minsukjung:~$ traceroute -i enp0s2 8.8.8.8
traceroute to 8.8.8.8 (8.8.8.8), 30 hops max, 60 byte packets
 1 _gateway (10.10.10.1)  0.706 ms  0.652 ms  0.645 ms
 2 * * *
 3 192.168.219.1 (192.168.219.1)  4.601 ms  4.597 ms  4.593 ms
 4 * * *
 5 10.18.125.21 (10.18.125.21)  5.326 ms  5.322 ms  5.584 ms
 6 * * *
 7 1.208.107.117 (1.208.107.117)  6.903 ms  100.87.1.1 (100.87.1.1)  8.624 ms  1.208.105.1 (1.208.105.1)  6.188 ms
 8 * * *
 9 1.213.115.65 (1.213.115.65)  8.822 ms  100.65.51.5 (100.65.51.5)  7.469 ms  100.65.51.1 (100.65.51.1)  7.937 ms
10 1.208.106.18 (1.208.106.18)  43.233 ms  100.67.30.38 (100.67.30.38)  88.670 ms  1.208.113.78 (1.208.113.78)  42.295 ms
11 100.67.30.134 (100.67.30.134)  67.539 ms  210.107.126.38 (210.107.126.38)  44.417 ms  1.208.178.182 (1.208.178.182)  44.394 ms
12 142.250.168.244 (142.250.168.244)  43.483 ms  44.381 ms  44.279 ms
13 * * *
14 8.8.8.8 (8.8.8.8)  46.818 ms  47.307 ms  47.093 ms
ubuntu1@minsukjung:~$
```