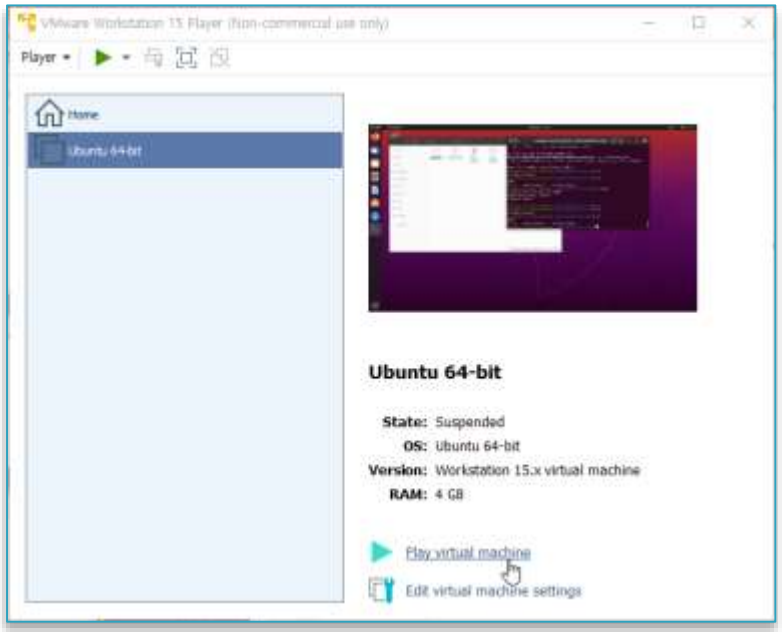
네트워크프로그래밍-3주
Linux 실습 환경 구축
Vmware 네트워크 환경 설정

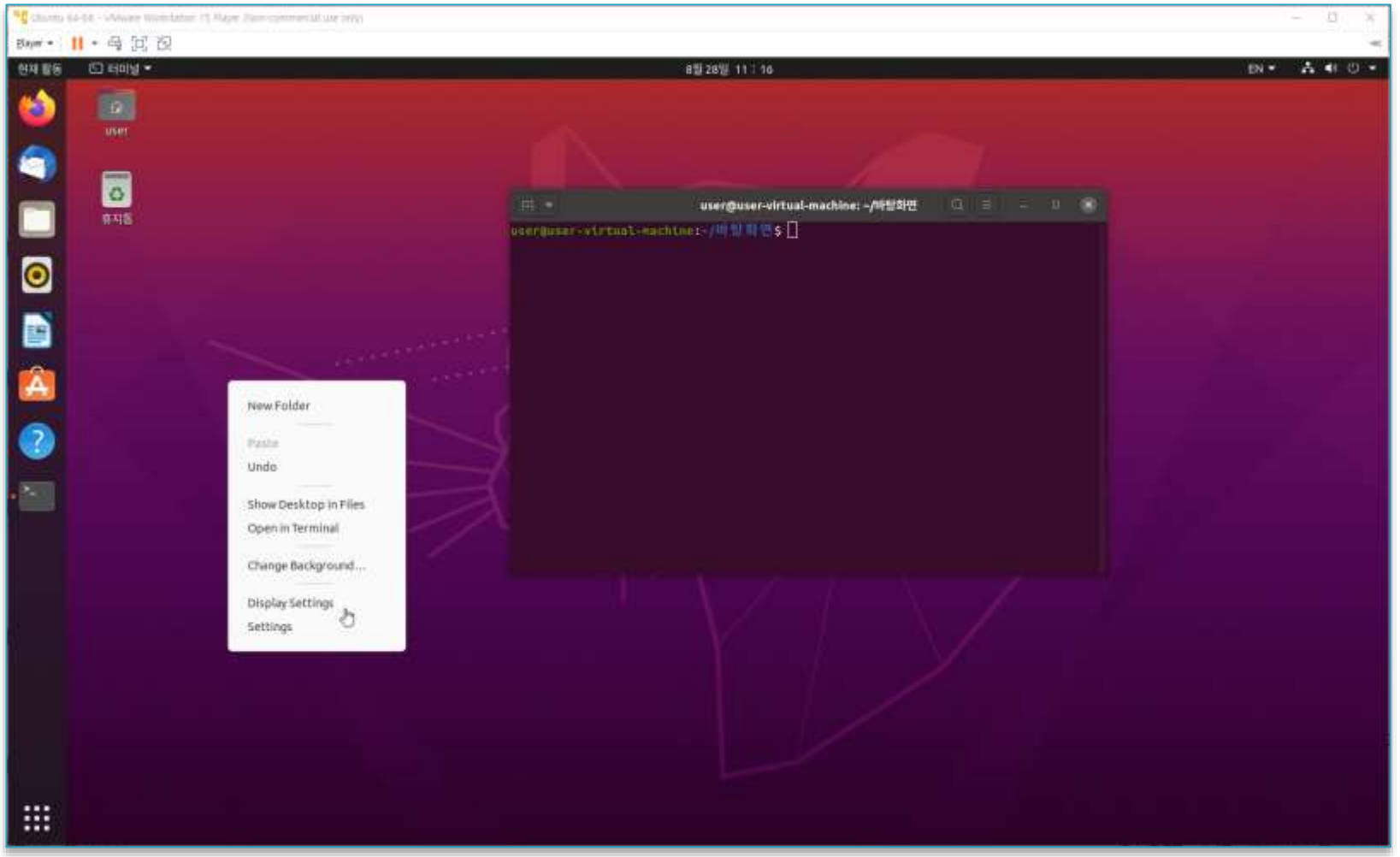
정인환교수

Vmware + Ubuntu Linux 설치

- Ubuntu 다운
  - https://ubuntu.com/#download
  - ubuntu-20.04.3-desktop-amd64.iso
- Vmware 다운 설치, 실행
  - https://www.vmware.com/kr/products/workstation-player/workstation-player-evaluation.html
  - VMware-player-16.1.2-17966106.exe
  - Vmware 실행
    - Create New Virtual Machine
      - ubuntu-20.04.3-desktop-amd64.iso 설정
    - Ubuntu Virtual Machine 실행
      - Ubuntu 설치 진행

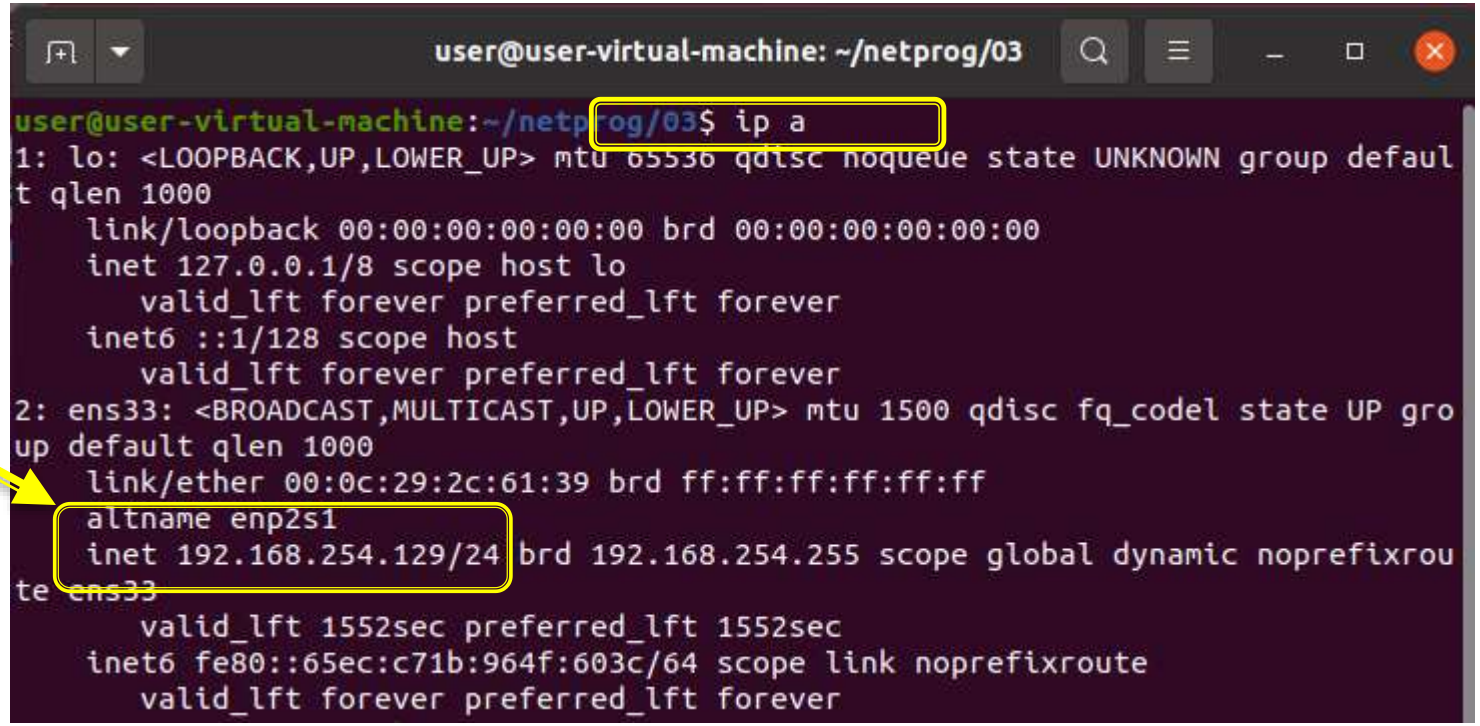
Vmware Linux 실행



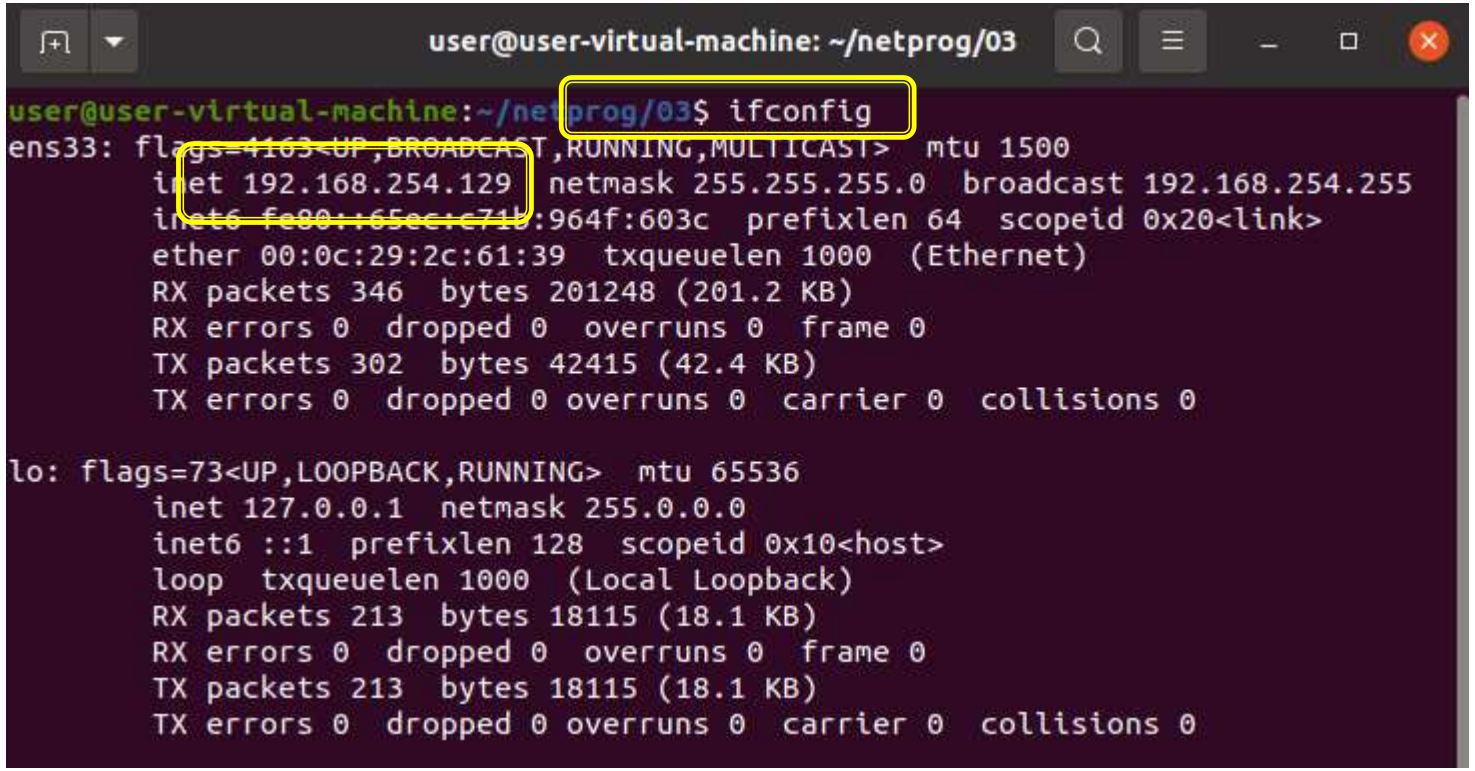


Ubuntu 개발 환경 설정

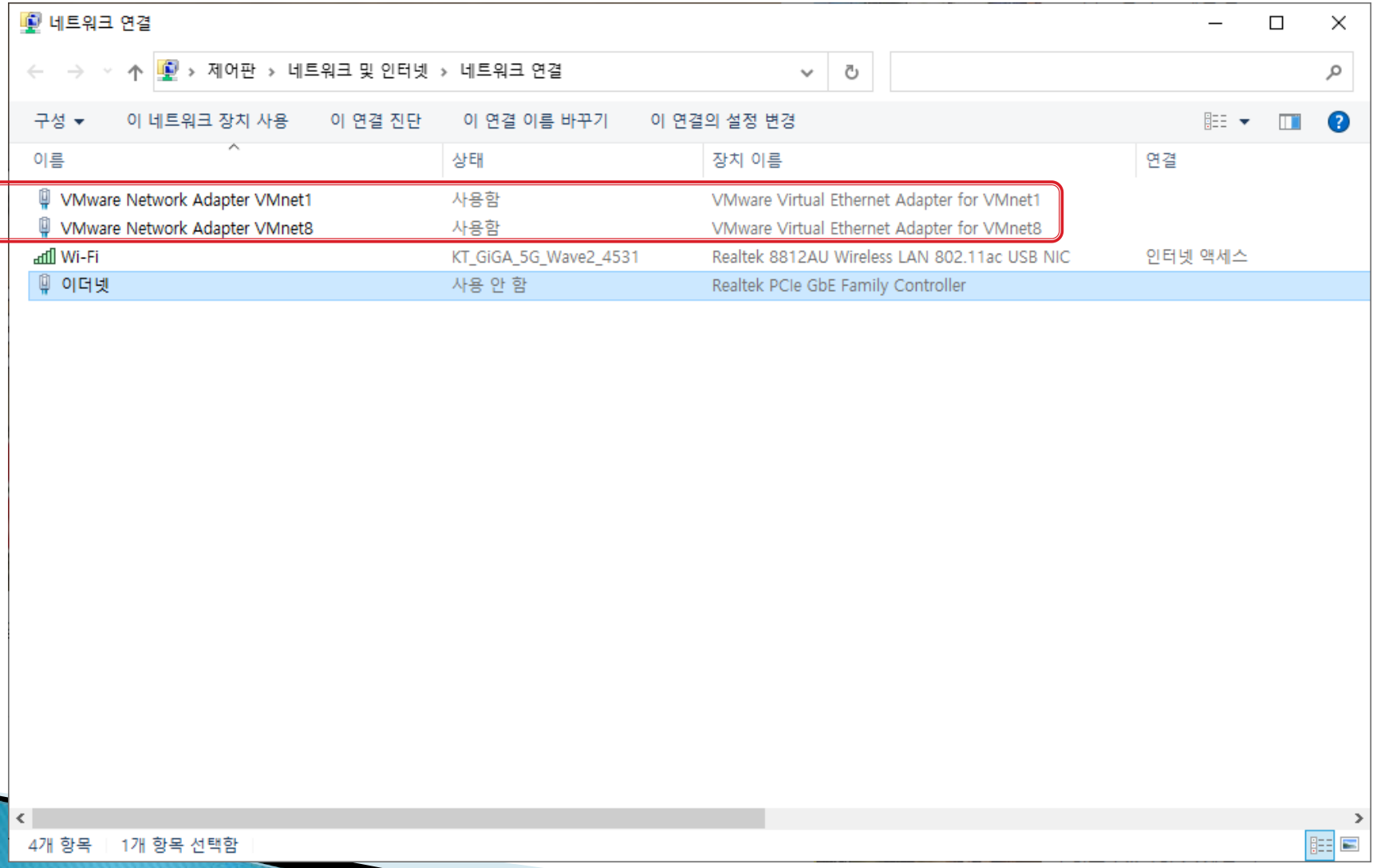
- gcc, make
  - sudo apt install gcc
  - sudo apt install make
- Network tools (ifconfig, netstat ..)
  - sudo apt install net-tools
- Network 환경 확인
  - ip a 로 확인
  - 192.168.254.129



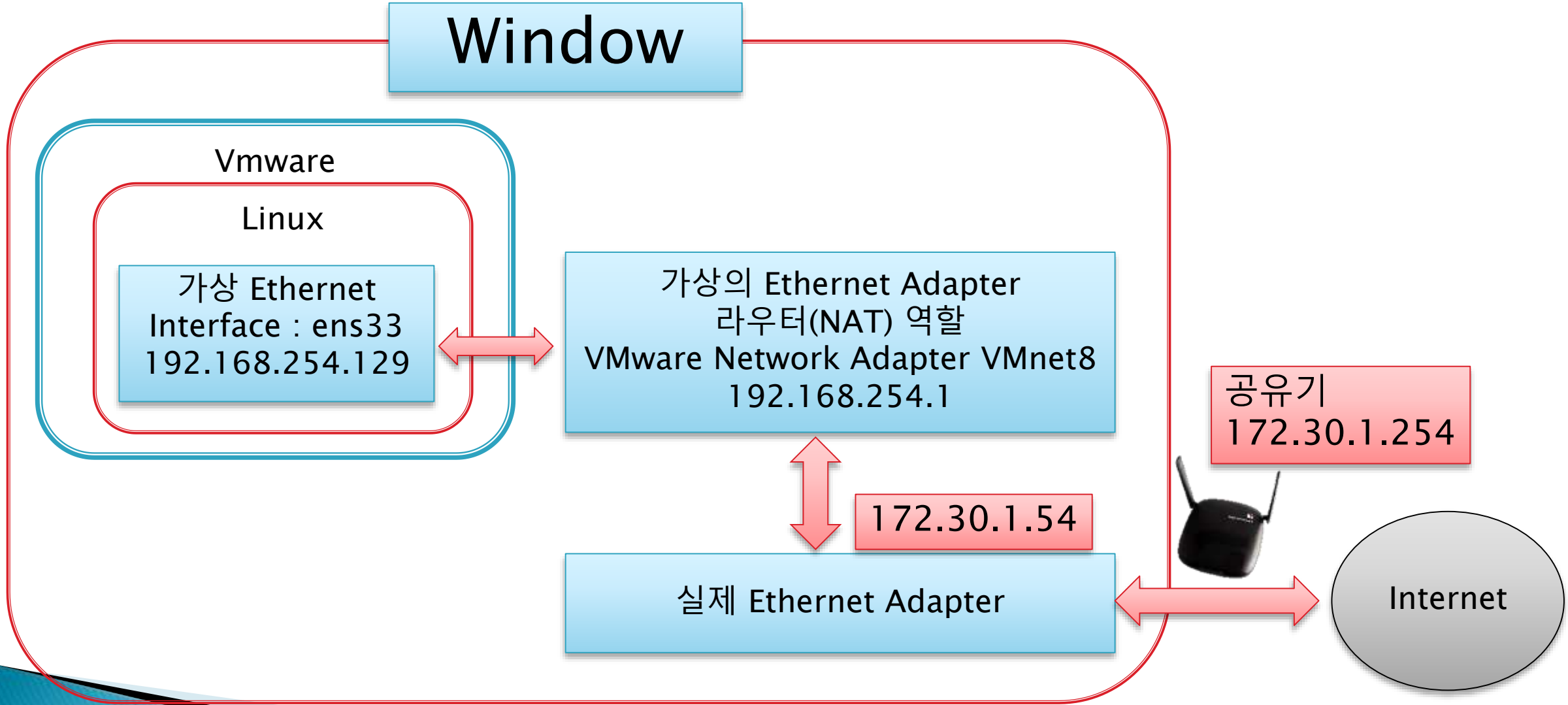
ifconfig 로 IP 확인



Vmware 설치되면 Virtual Ethernet Adapter 생성됨

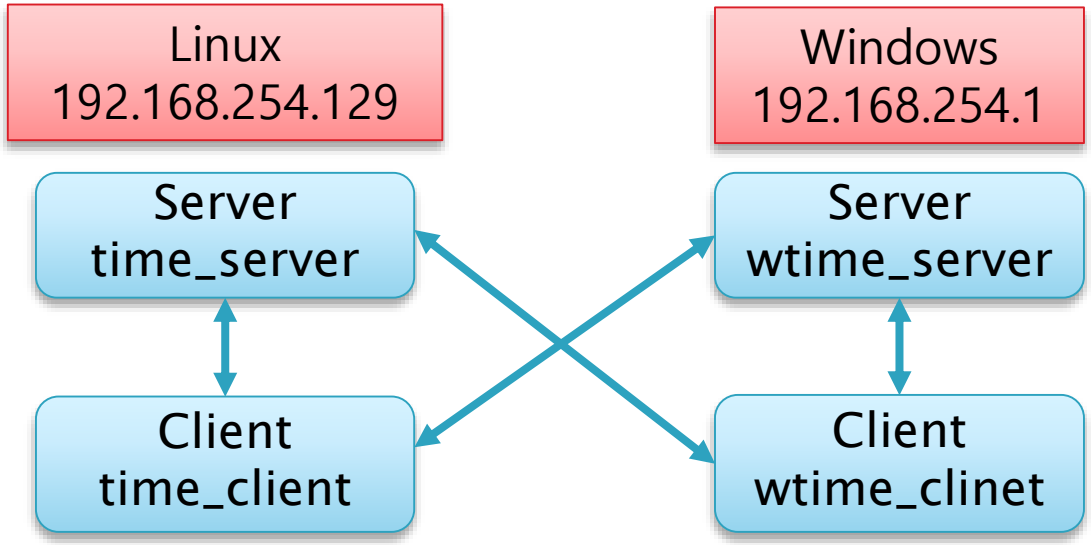


Linux / Windows Network 원리 (기본 NAT 모드)

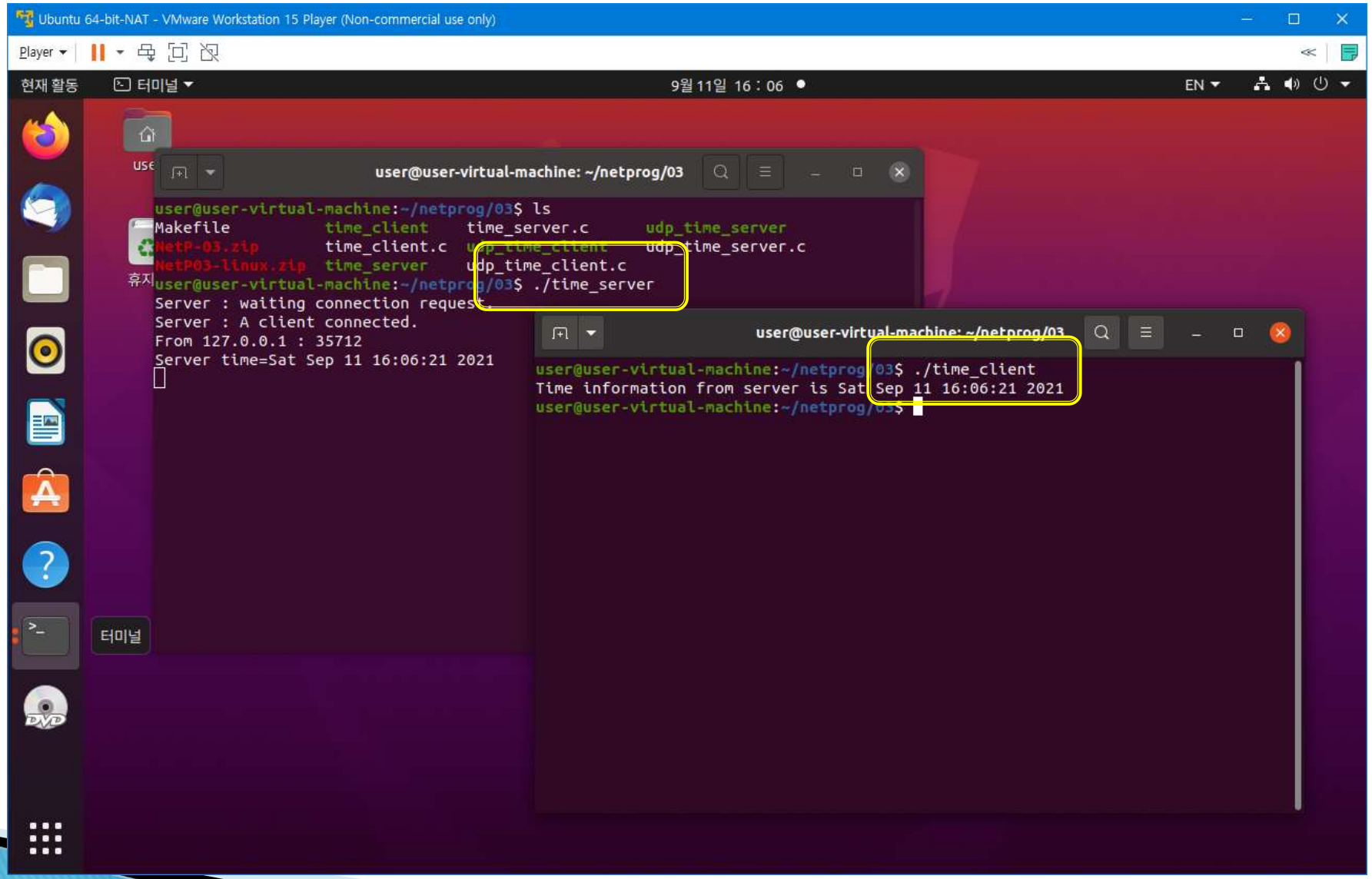


소켓프로그래밍 테스트 (NAT 모드)

(1) Linux Client / Linux Server
(2) Windows Client / Windows Server
(3) Windows Client / Linux Server
(4) Linux Client / Windows Server

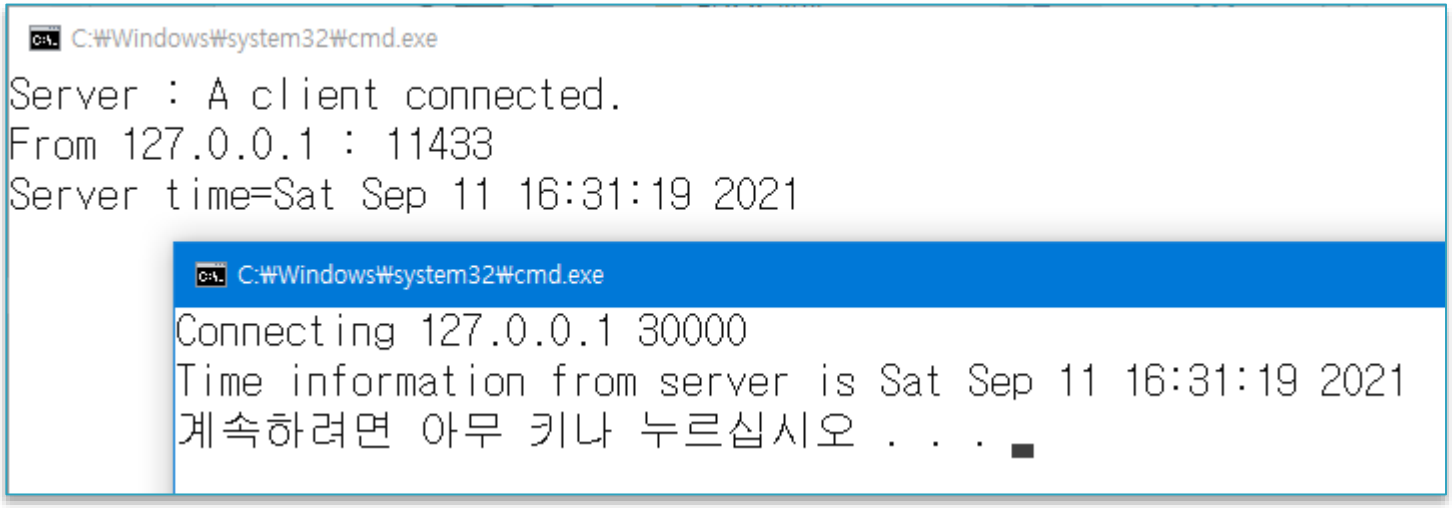


(1) Linux Client / Linux Server



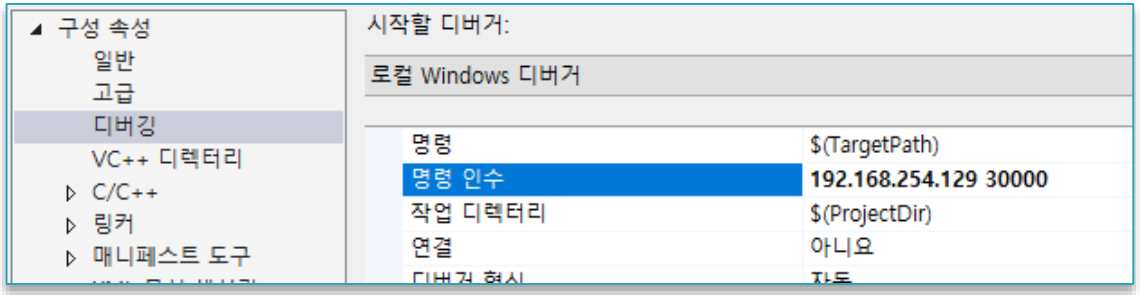
(2) Windows Client / Windows Server

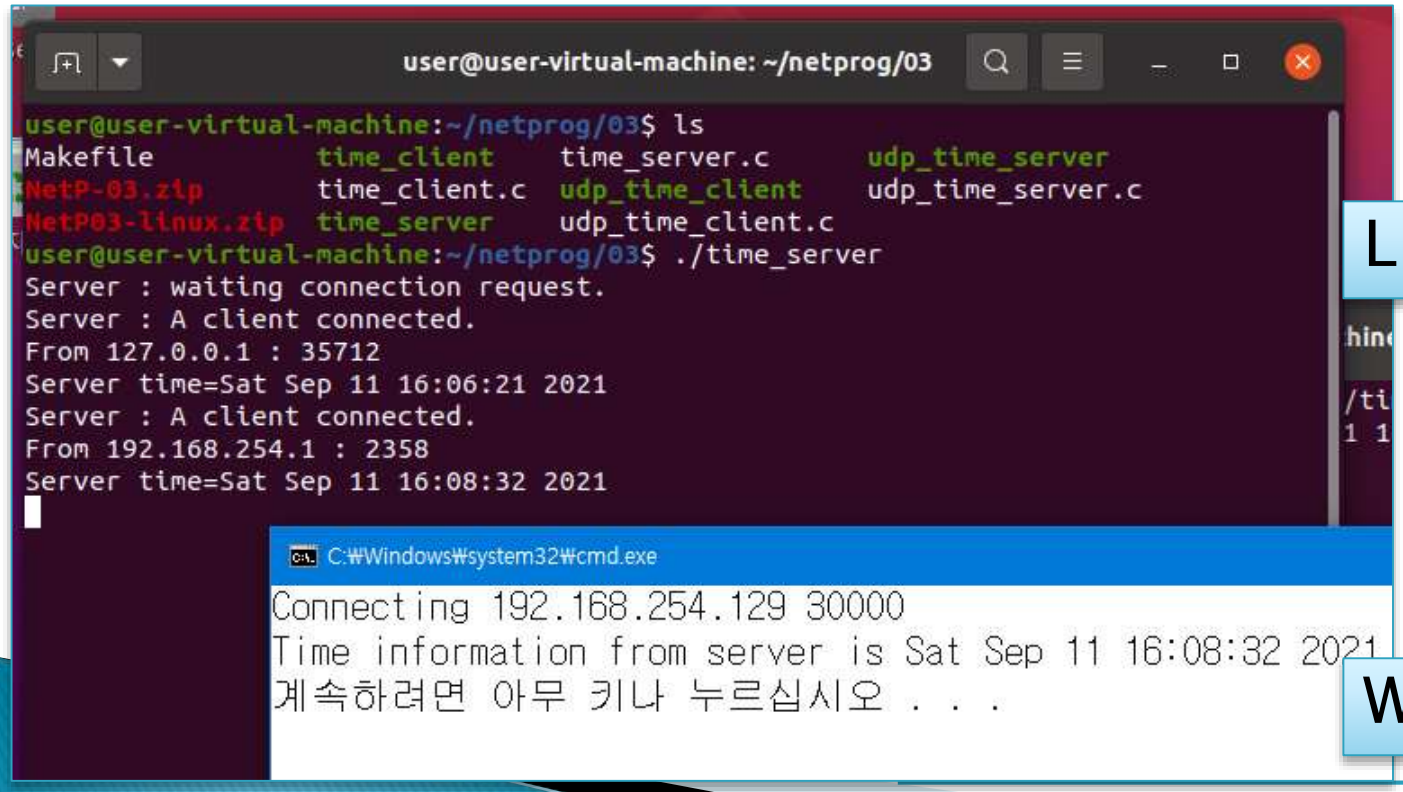
- wtime_server [30000]
- wtime_client [127.0.0.1] [30000]



(3) Windows Client / Linux Server

- Linux time_server
  - ./time_server 30000
- Window wtime_client
  - wtime_client 192.168.254.129 30000



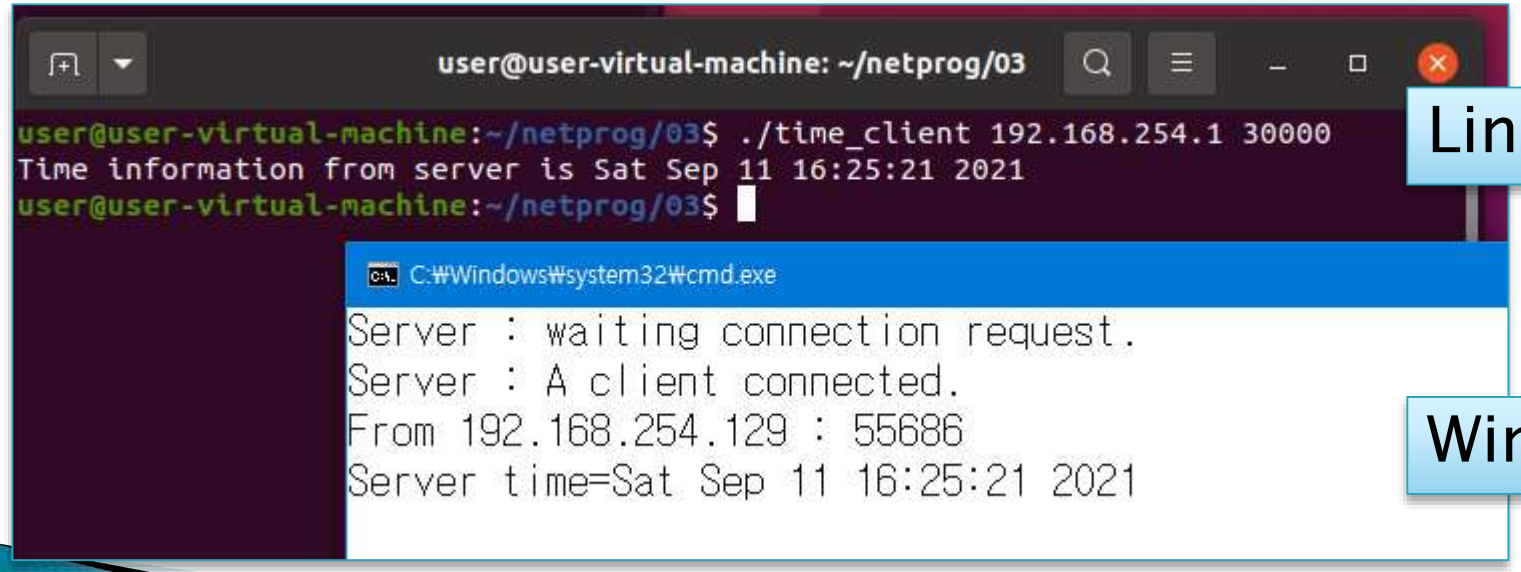


Linux Server

Window Client

(4) Linux Client / Windows Server

- Linux time_client
  - ./time_client 192.168.254.1 30000
- Window wtime_server
  - wtime_server

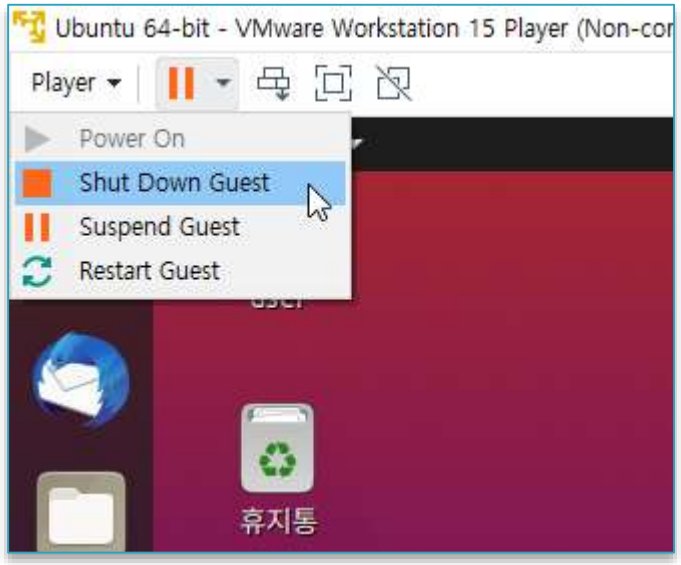


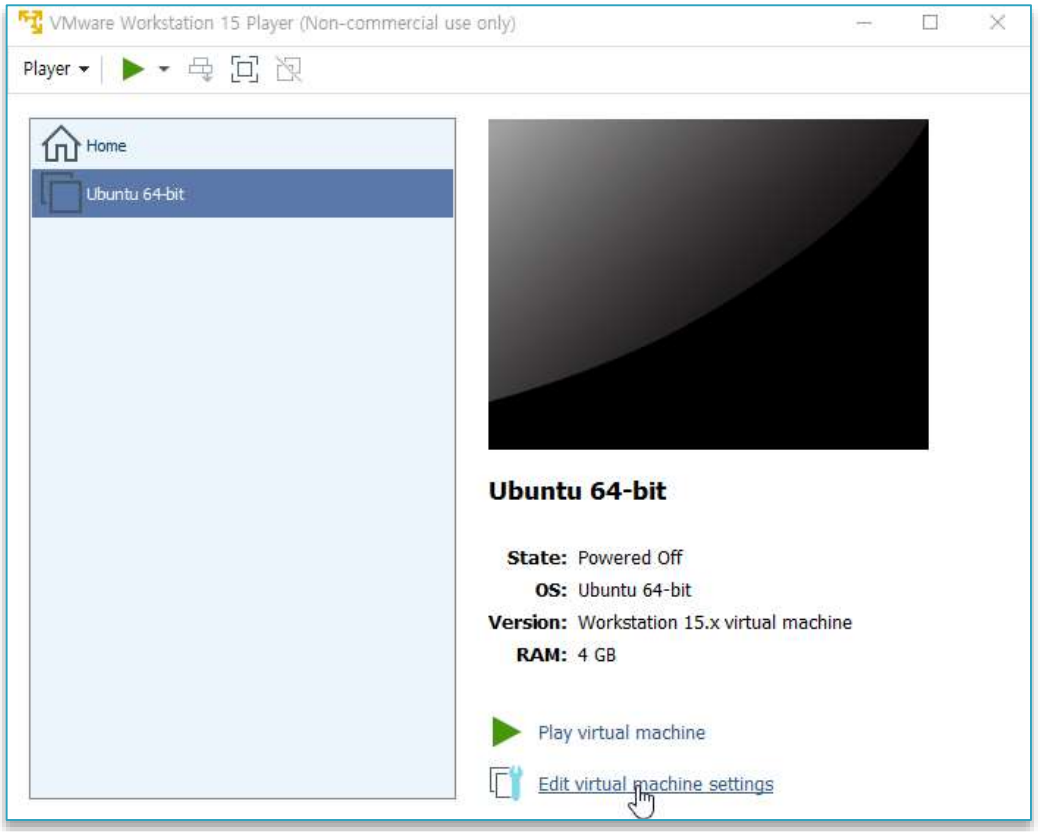
Linux Client

Window Server

Vmware Linux Bridge 모드설정

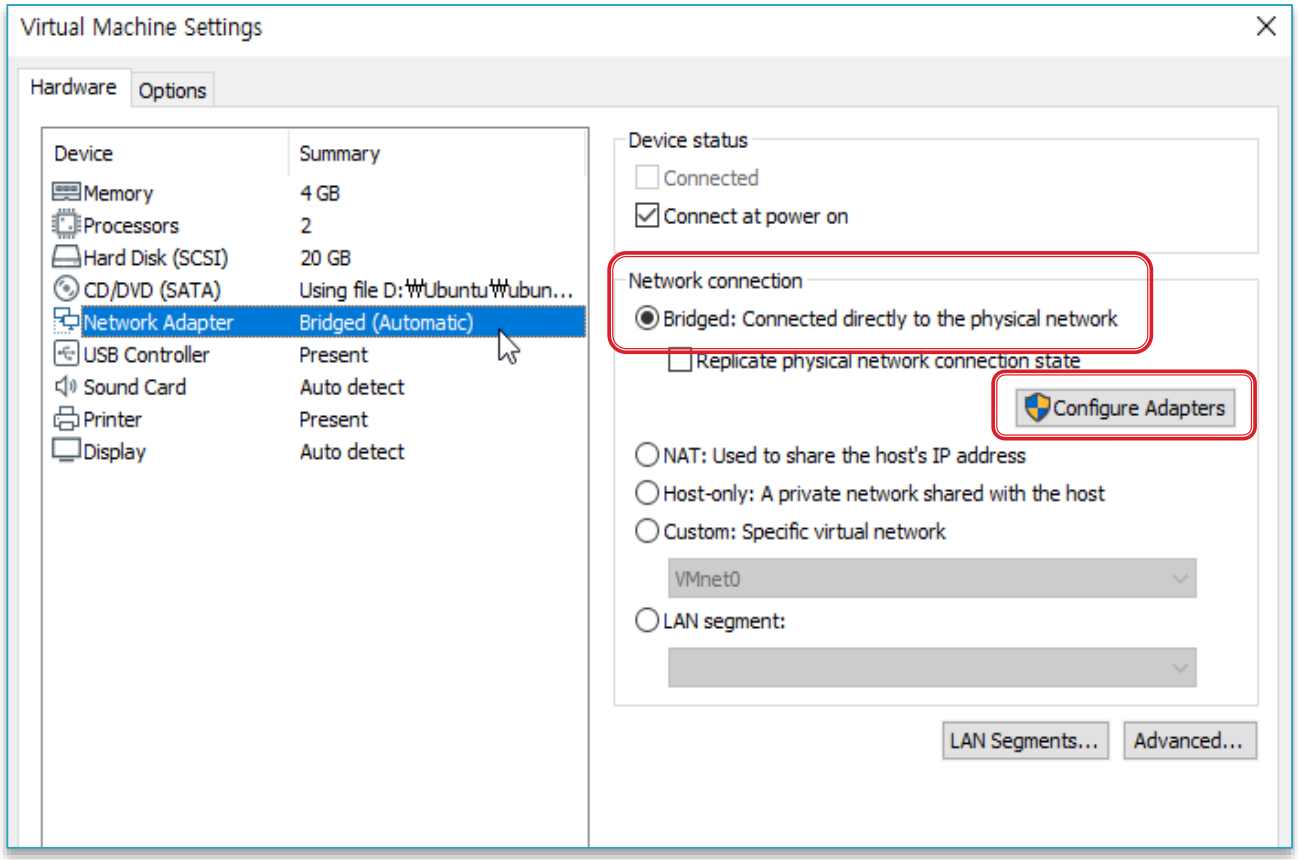
- Vmware Linux를 Shut Down
- Vmware Edit virtual machine settings

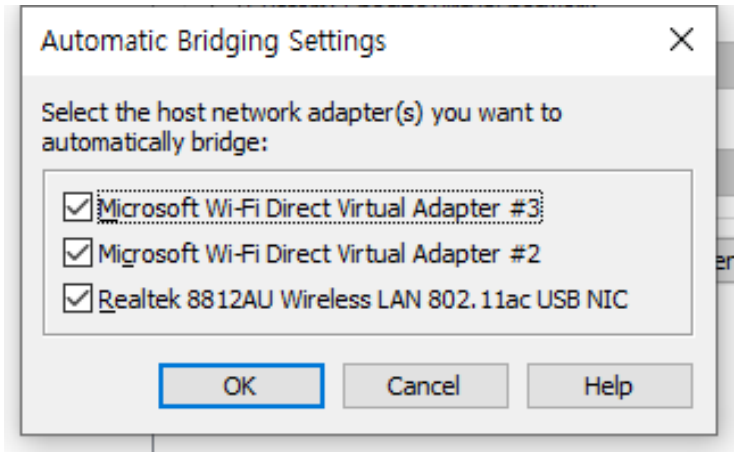




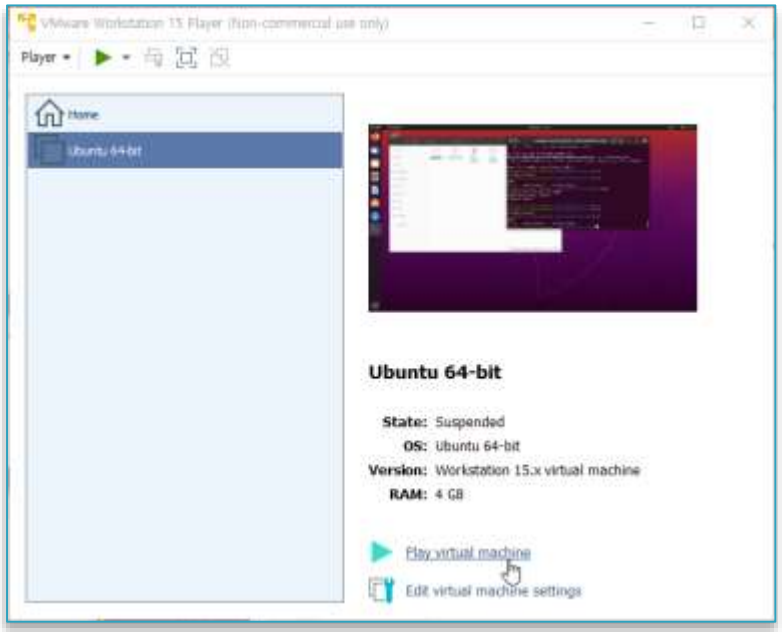
Vmware Linux 설정 변경 (IPTIME 공유기 환경)

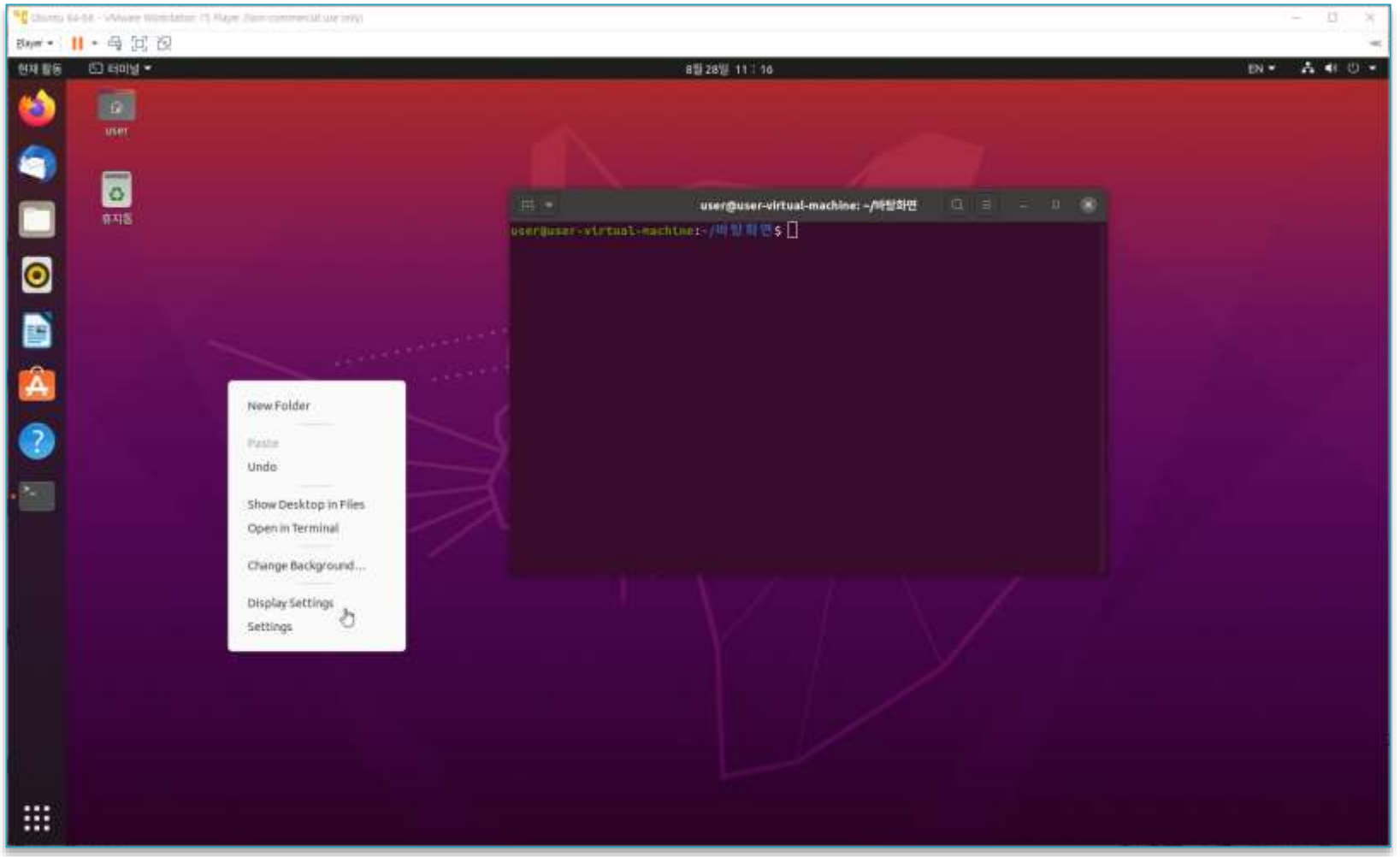
- Network Adapter 를 Bridged 로 변경





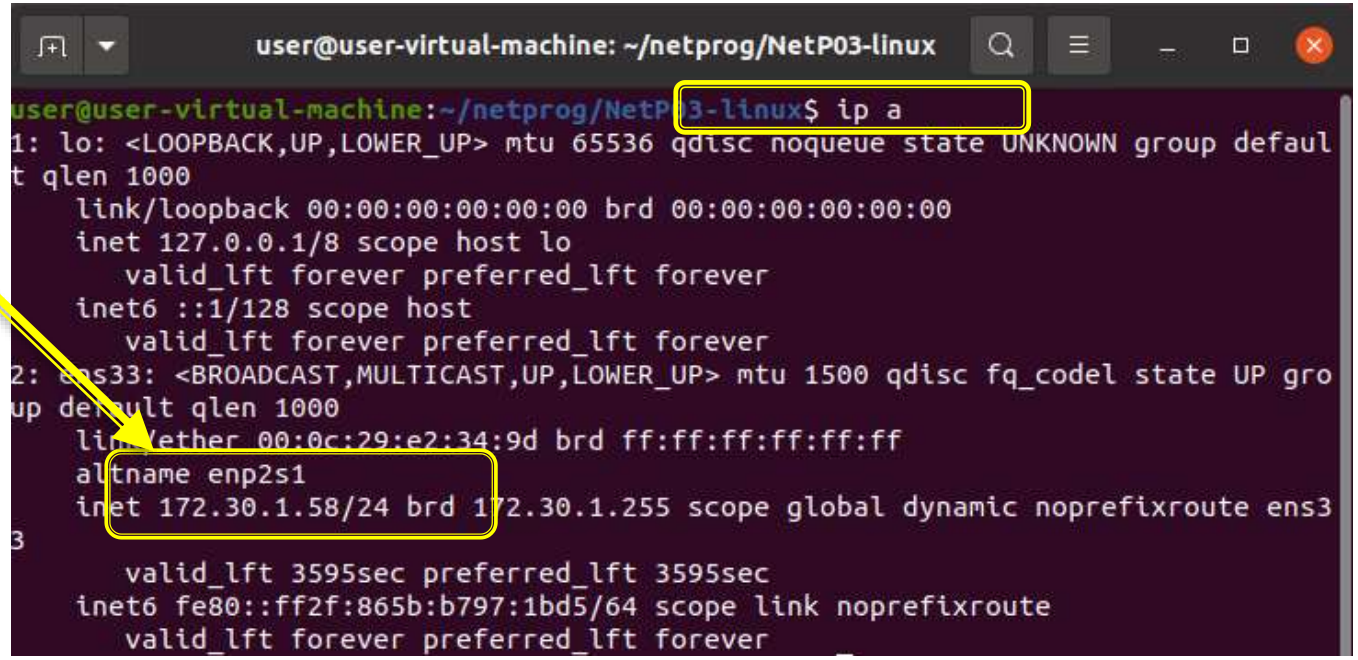
Vmware Linux 실행



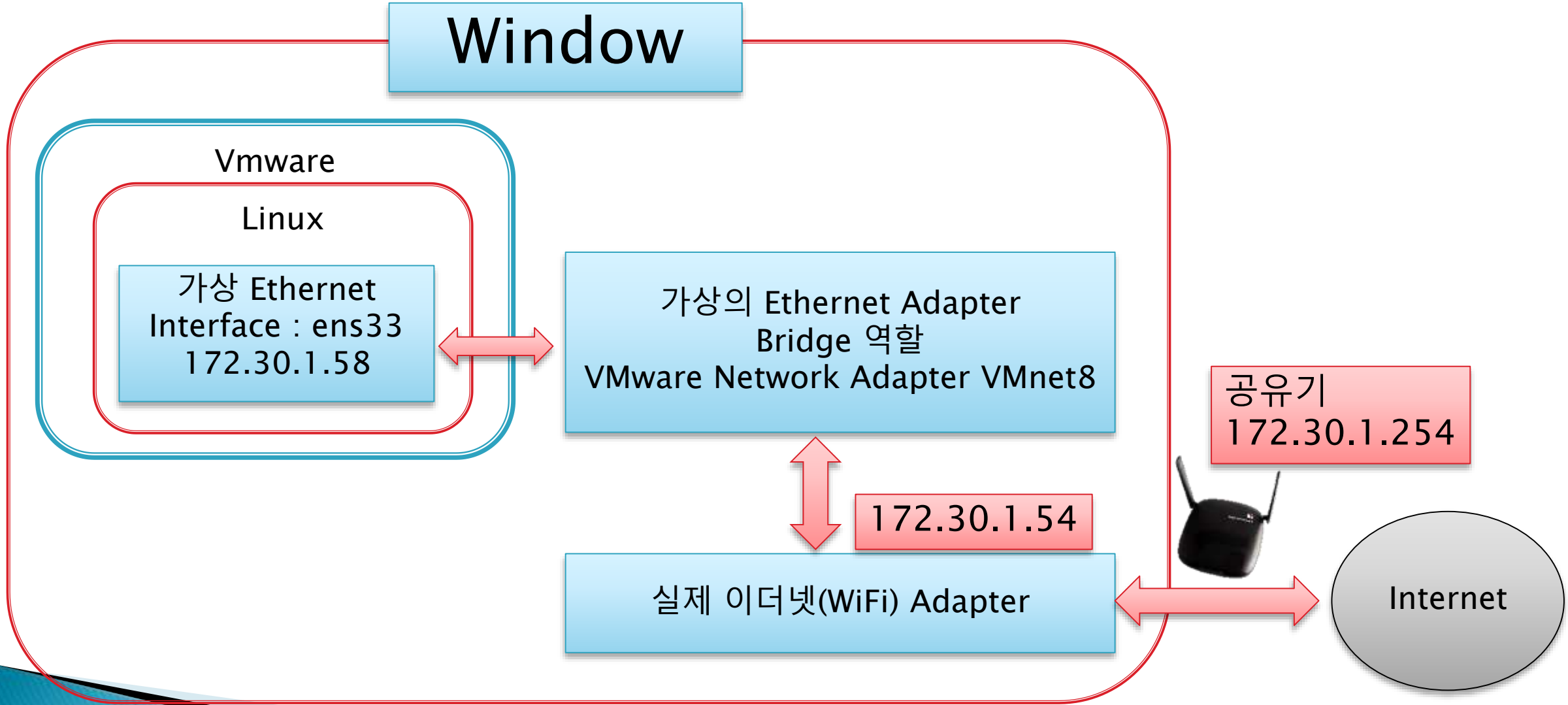


Network 환경 확인 (Bridge 모드)

- ip a 로 확인
  - 172.30.1.58

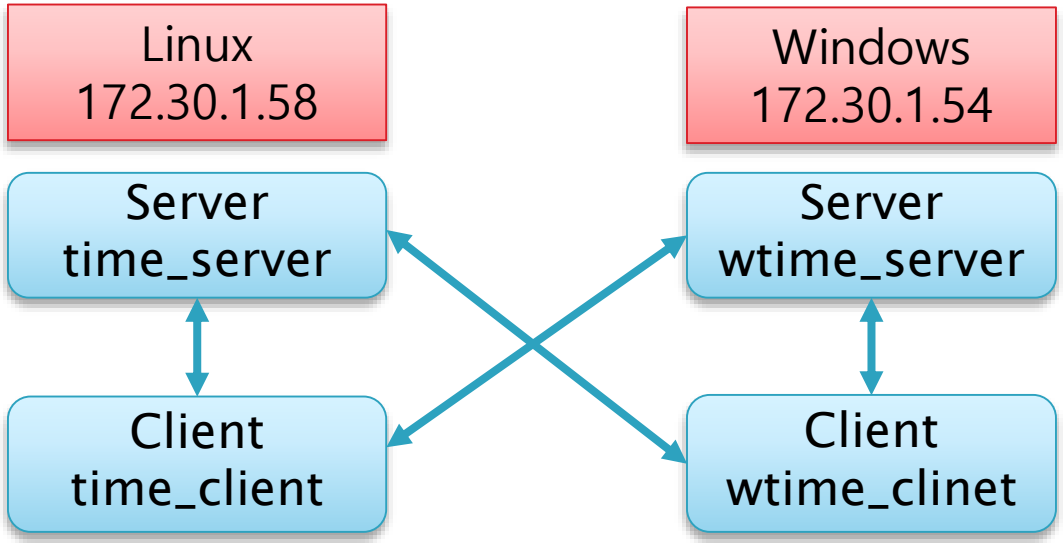


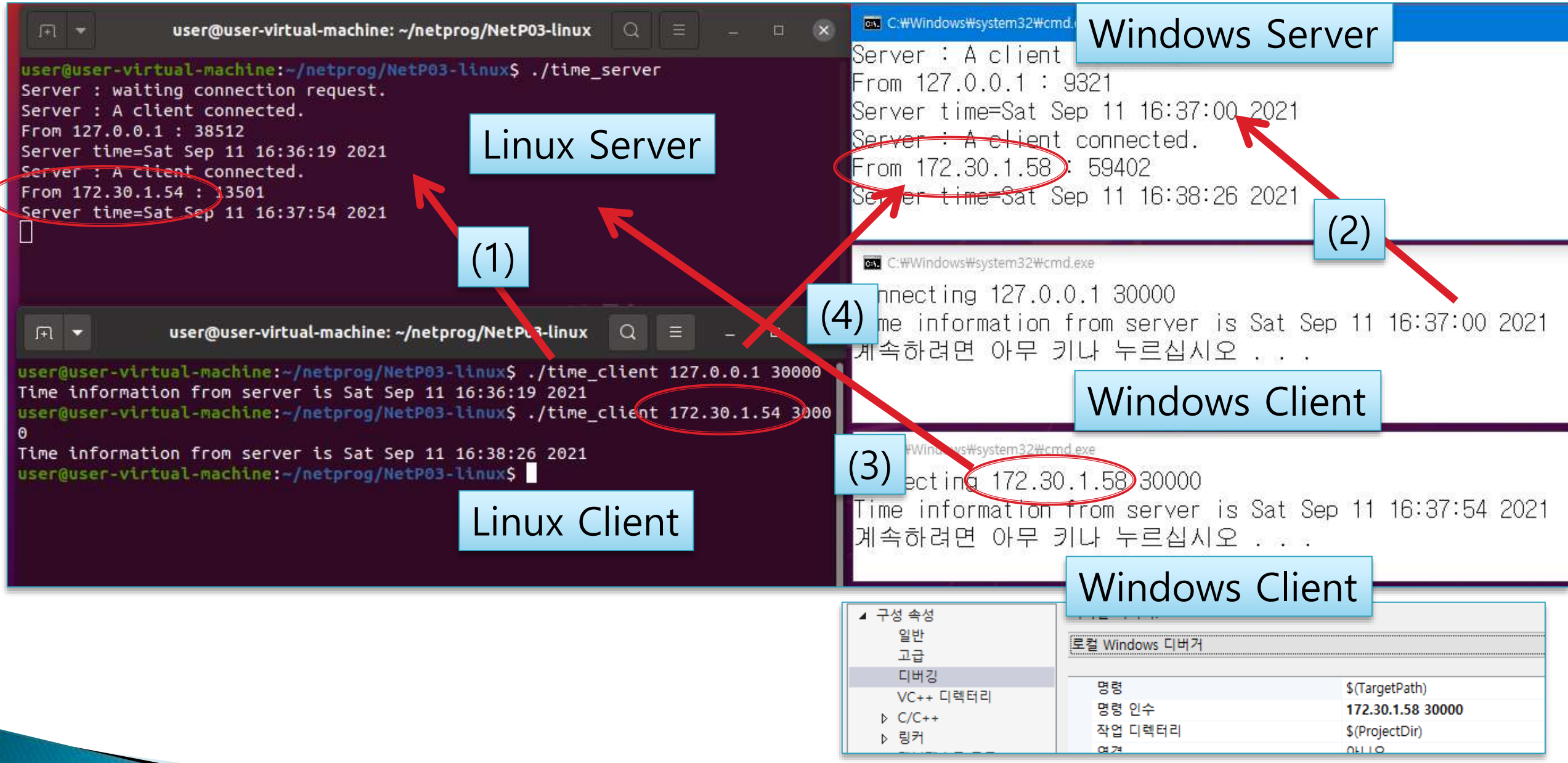
Linux / Windows Network 설정 결과 (Bridge 모드)



Bridge 모드 후 소켓프로그래밍 테스트

(1) Linux Client / Linux Server
(2) Windows Client / Windows Server
(3) Windows Client / Linux Server
(4) Linux Client / Windows Server




user@user-virtual-machine: ~/netprog/NetP03-linux
user@user-virtual-machine:~/netprog/NetP03-linux$ ./time_server
Server : waiting connection request.
Server : A client connected.
From 127.0.0.1 : 38512
Server time=Sat Sep 11 16:36:19 2021
Server : A client connected.
From 172.30.1.54 : 13501
Server time=Sat Sep 11 16:37:54 2021
Linux Server
(1)
user@user-virtual-machine: ~/netprog/NetP03-linux
user@user-virtual-machine:~/netprog/NetP03-linux$ ./time_client 127.0.0.1 30000
Time information from server is Sat Sep 11 16:36:19 2021
user@user-virtual-machine:~/netprog/NetP03-linux$ ./time_client 172.30.1.54 30000
Time information from server is Sat Sep 11 16:38:26 2021
user@user-virtual-machine:~/netprog/NetP03-linux$
Linux Client
C:₩Windows₩system32₩cmd.
Server : A client
From 127.0.0.1 : 9321
Server time=Sat Sep 11 16:37:00 2021
Server : A client connected.
From 172.30.1.58 : 59402
Server time=Sat Sep 11 16:38:26 2021
Windows Server
(2)
C:₩Windows₩system32₩cmd.exe
nnecting 127.0.0.1 30000
me information from server is Sat Sep 11 16:37:00 2021
계속하려면 아무 키나 누르십시오 . . .
(4)
Windows Client
(3)
ecting 172.30.1.58 30000
Time information from server is Sat Sep 11 16:37:54 2021
계속하려면 아무 키나 누르십시오 . . .
Windows Client
구성 속성
일반
고급
디버깅
VC++ 디렉터리
C/C++
링커
로컬 Windows 디버거
명령 $(TargetPath)
명령 인수 172.30.1.58 30000
작업 디렉터리 $(ProjectDir)

Linux 용 wireshark 설치

1. sudo add-apt-repository ppa:pi-rho/security
2. sudo apt-get update
3. sudo apt-get install wireshark
4. sudo dpkg-reconfigure wireshark-common (YES 선택)
5. sudo usermod -a -G wireshark $USER
6. gnome-session-quit -logout -no-prompt
7. 시스템 재시작 Vmware Linux Restart
8. sudo setcap ‘CAP_NET_RAW+eip CAP_NET_ADMIN+eip’ /usr/bin/dumpcap
9. 시스템 재시작 Vmware Linux Restart

Linux Wireshark 설치 (1)

linux mint(ubuntu)에 wireshark 설치 (ppa) | Mint / Linux

2014. 3. 31. 20:00

https://blog.naver.com/undersky03/207279210 복사

번역하기

민트에 내장 되어 있는 소프트웨어 센터에도 wireshark가 있으나.. 버전이 낮은 이유로...
ppa를 찾았다.

wireshark 홈페이지에 있는 걸 설치하려면.. 의존성 문제로 매우 귀찮고.. (사실 잘 알아 보지도 않았다.)

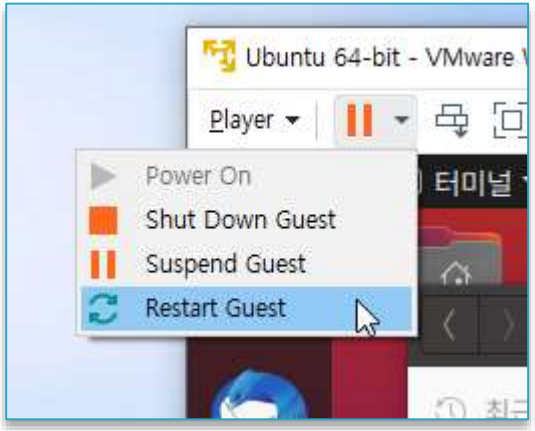
```
sudo add-apt-repository ppa:pi-rho/security

sudo apt-get update

sudo apt-get install wireshark
```

적힌대로 실행하면 wireshark가 설치 된다.

추가적으로 linux에서는 wireshark를 그냥 실행 할 경우에 네트워크 인터페이스를 찾지 못해 캡쳐가 되지 않는다.
권한 문제로써.. 일반 user에서 실행이 가능 하도록 하려면 다음과 같이 입력한다.

```
$ sudo apt-get install wireshark
$ sudo dpkg-reconfigure wireshark-common
$ sudo usermod -a -G wireshark $USER
$ gnome-session-quit --logout --no-prompt ( 혹은 재로그인 )
```

gnome-sesseion-quit 실행시 모든 창 꺼진 후 재기동 되므로 조심하자.



설치 후 Vmware Linux Restart

Wireshark 설치 (2)

- (1) 까지 해도 안되는 경우 아래 내용을 추가하고 Vmware Restart

2010. 8. 20. 16:10

리눅스에서 Wireshark 실행시 인터페이스가 나타나지 않는 문제는, Wireshark 가 인터페이스에 직접 Access할 수 없기 때문이라고 합니다.

보안상의 문제로 Root로 작업하는 것을 권장하지 않는다고 하며,

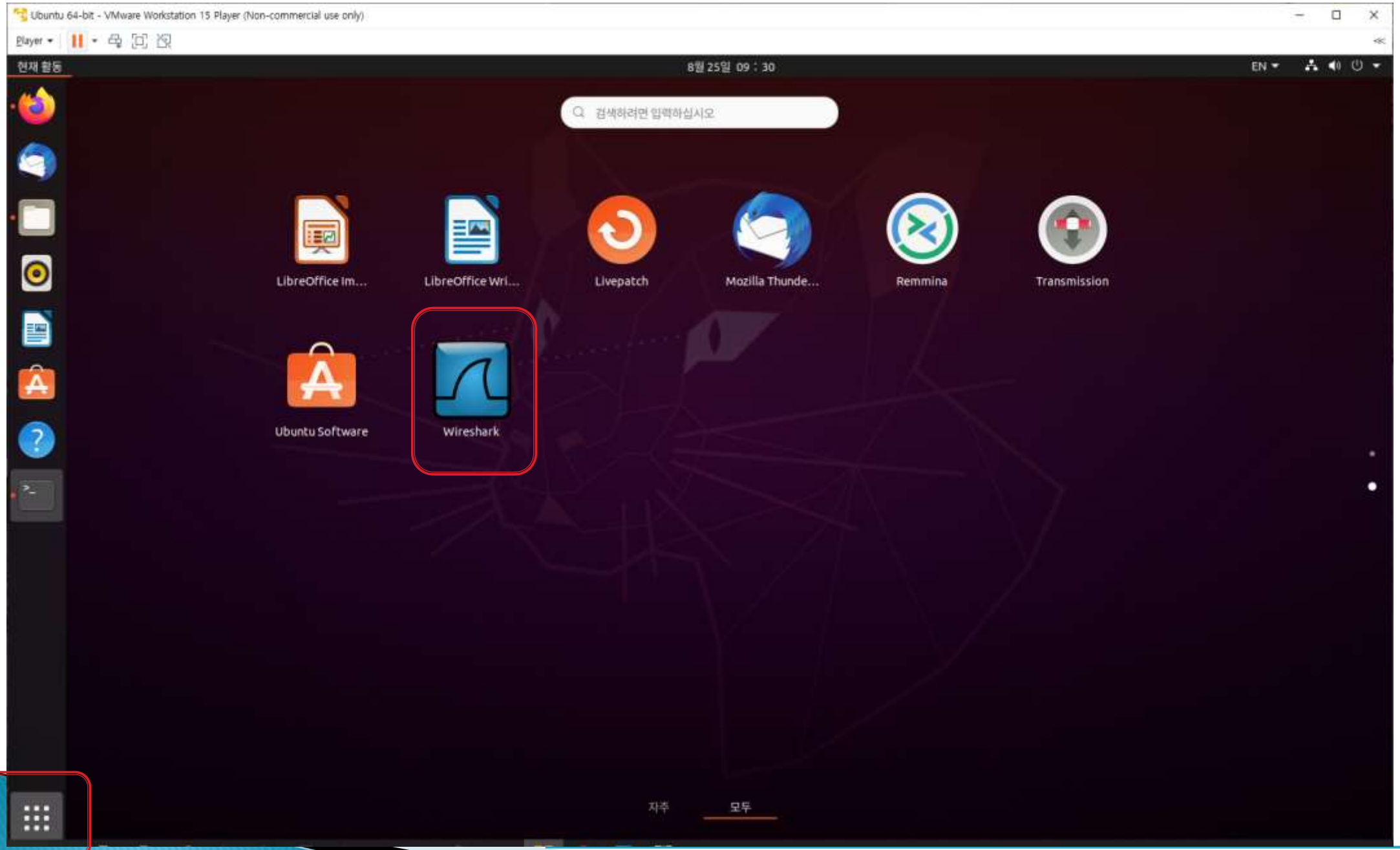
dumpcap 에 대하여 네트워크 권한을 지정해주면 해결할 수 있다고 하네요.

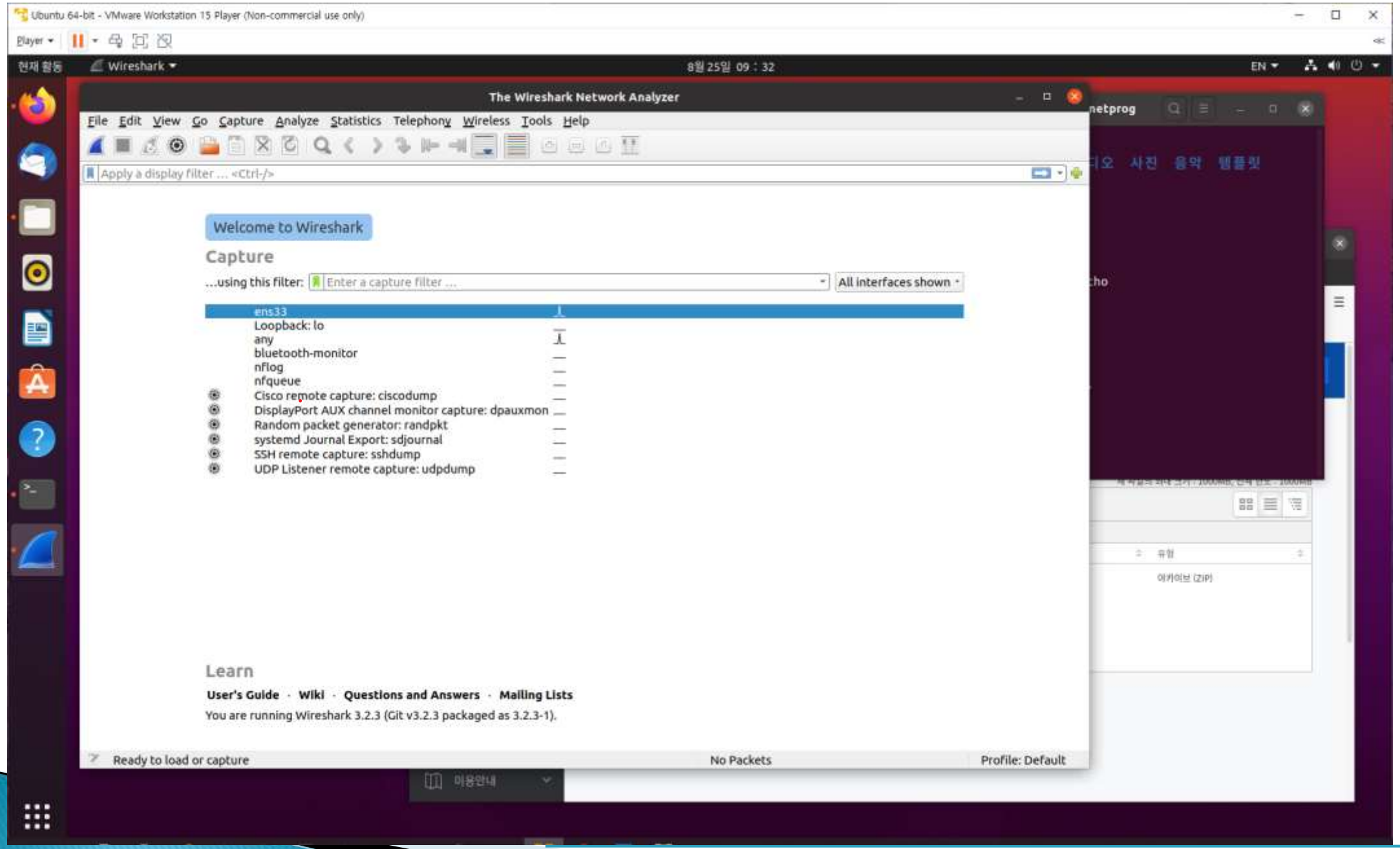
http://wiki.wireshark.org/CaptureSetup/CapturePrivileges

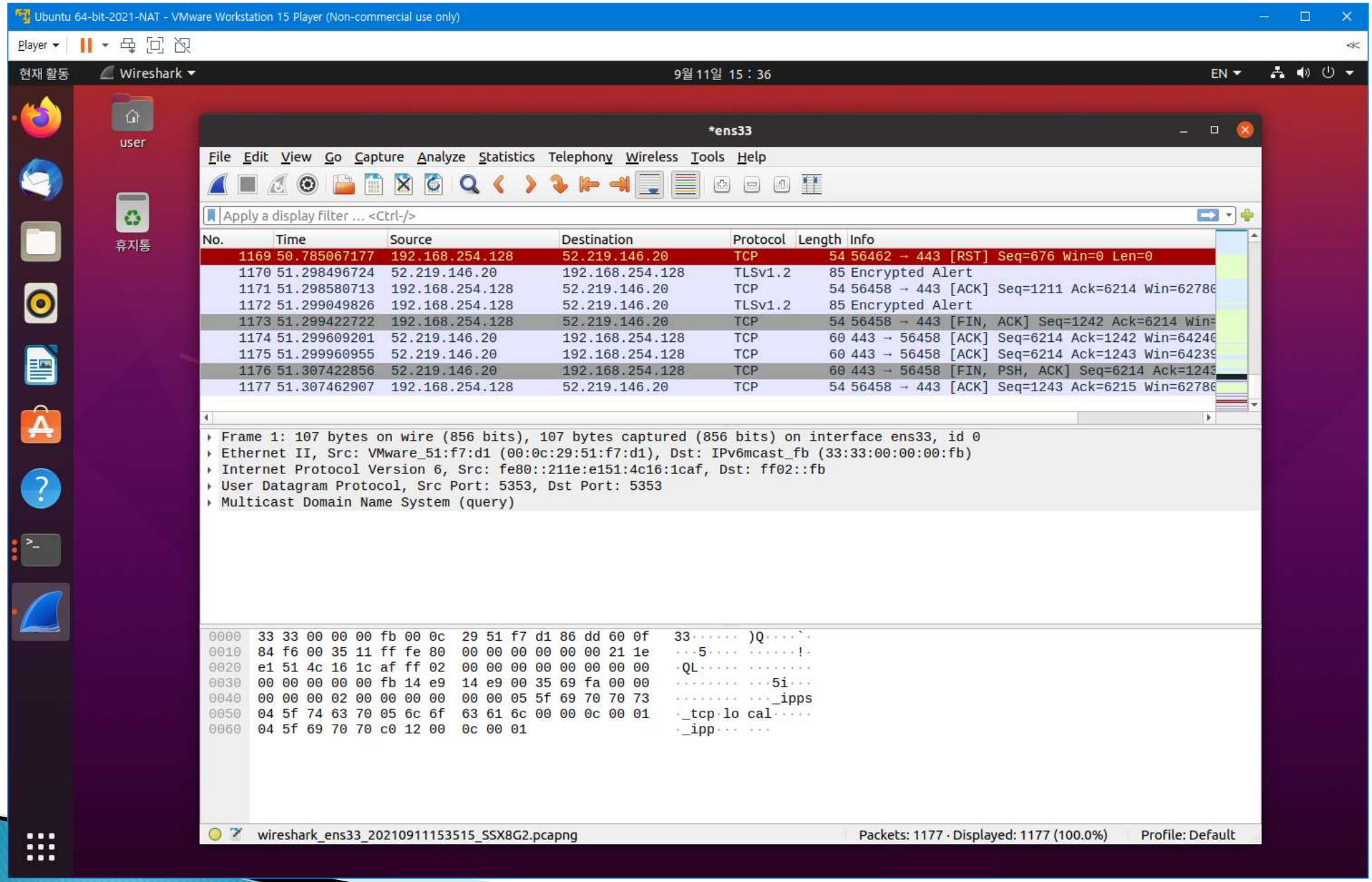
간단하게 리눅스에서

아래 명령만 실행시키면 된다고 합니다. ^^

```
user@ubuntu:~$ sudo setcap 'CAP_NET_RAW+eip CAP_NET_ADMIN+eip' /usr/bin/dumpcap
```

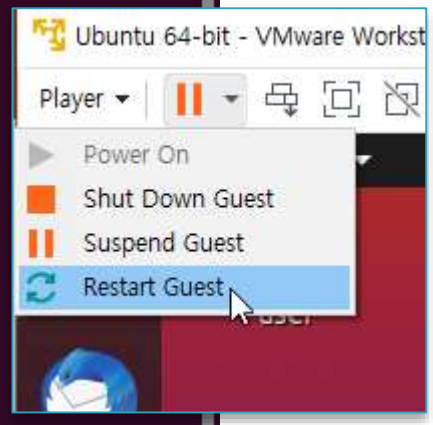

Ubuntu 64-bit - VMware Workstation 15 Player (Non-commercial use only)
Player
현재 활동
8월 25일 09 : 30
EN
검색하려면 입력하십시오
LibreOffice Im...
LibreOffice Wri...
Livepatch
Mozilla Thunde...
Remmina
Transmission
Ubuntu Software
Wireshark
자주
모두


Ubuntu 64-bit - VMware Workstation 15 Player (Non-commercial use only)
Player
현재 활동
Wireshark
8월 25일 09 : 32
EN
The Wireshark Network Analyzer
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
Apply a display filter ... <Ctrl-/>
Welcome to Wireshark
Capture
...using this filter: Enter a capture filter ...
All interfaces shown
ens33
Loopback: lo
any
bluetooth-monitor
nflog
nfqueue
Cisco remote capture: ciscodump
DisplayPort AUX channel monitor capture: dpauxmon
Random packet generator: randpkt
systemd Journal Export: sdjournal
SSH remote capture: sshdump
UDP Listener remote capture: udpdump
Learn
User's Guide · Wiki · Questions and Answers · Mailing Lists
You are running Wireshark 3.2.3 (Git v3.2.3 packaged as 3.2.3-1).
Ready to load or capture
No Packets
Profile: Default
netprog
이용안내


Ubuntu 64-bit-2021-NAT - VMware Workstation 15 Player (Non-commercial use only)
Player
현재 활동
Wireshark
9월 11일 15 : 36
EN
user
휴지통
*ens33
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
Apply a display filter ... <Ctrl-/>
No. Time Source Destination Protocol Length Info
1169 50.785067177 192.168.254.128 52.219.146.20 TCP 54 56462 → 443 [RST] Seq=676 Win=0 Len=0
1170 51.298496724 52.219.146.20 192.168.254.128 TLSv1.2 85 Encrypted Alert
1171 51.298580713 192.168.254.128 52.219.146.20 TCP 54 56458 → 443 [ACK] Seq=1211 Ack=6214 Win=62786
1172 51.299049826 192.168.254.128 52.219.146.20 TLSv1.2 85 Encrypted Alert
1173 51.299422722 192.168.254.128 52.219.146.20 TCP 54 56458 → 443 [FIN, ACK] Seq=1242 Ack=6214 Win=
1174 51.299609201 52.219.146.20 192.168.254.128 TCP 60 443 → 56458 [ACK] Seq=6214 Ack=1242 Win=64240
1175 51.299960955 52.219.146.20 192.168.254.128 TCP 60 443 → 56458 [ACK] Seq=6214 Ack=1243 Win=64239
1176 51.307422856 52.219.146.20 192.168.254.128 TCP 60 443 → 56458 [FIN, PSH, ACK] Seq=6214 Ack=1243
1177 51.307462907 192.168.254.128 52.219.146.20 TCP 54 56458 → 443 [ACK] Seq=1243 Ack=6215 Win=62786
Frame 1: 107 bytes on wire (856 bits), 107 bytes captured (856 bits) on interface ens33, id 0
Ethernet II, Src: VMware_51:f7:d1 (00:0c:29:51:f7:d1), Dst: IPv6mcast_fb (33:33:00:00:00:fb)
Internet Protocol Version 6, Src: fe80::211e:e151:4c16:1caf, Dst: ff02::fb
User Datagram Protocol, Src Port: 5353, Dst Port: 5353
Multicast Domain Name System (query)
0000 33 33 00 00 00 fb 00 0c 29 51 f7 d1 86 dd 60 0f 33)Q `
0010 84 f6 00 35 11 ff fe 80 00 00 00 00 00 00 21 1e 5 !
0020 e1 51 4c 16 1c af ff 02 00 00 00 00 00 00 00 00 QL
0030 00 00 00 00 00 fb 14 e9 14 e9 00 35 69 fa 00 00 5i
0040 00 00 00 02 00 00 00 00 00 00 05 5f 69 70 70 73 _ipps
0050 04 5f 74 63 70 05 6c 6f 63 61 6c 00 00 0c 00 01 _tcp lo cal
0060 04 5f 69 70 70 c0 12 00 0c 00 01 _ipp
wireshark_ens33_20210911153515_SSX8G2.pcapng
Packets: 1177 · Displayed: 1177 (100.0%)
Profile: Default

Linux 방화벽 설정 / Restart

```
user@user-virtual-machine: ~/바탕화면
user@user-virtual-machine:~/바탕화면$ sudo ufw status verbose
[sudo] user의 암호:
상태: 비활성
user@user-virtual-machine:~/바탕화면$ sudo ufw allow 30000
규칙이 업데이트됐습니다
규칙이 업데이트됐습니다(v6)
user@user-virtual-machine:~/바탕화면$
user@user-virtual-machine:~/바탕화면$
user@user-virtual-machine:~/바탕화면$ sudo ufw status verbose
상태: 비활성
user@user-virtual-machine:~/바탕화면$ sudo ufw enable
방화벽이 활성 상태이며 시스템이 시작할 때 사용됩니다
user@user-virtual-machine:~/바탕화면$ sudo ufw status verbose
상태: 활성
로깅: on (low)
기본 설정: deny (내부로 들어옴), allow (외부로 나감), disabled (라우팅 된)
새 프로필: skip

목적                         동작         출발
--                         --          --
30000                      ALLOW IN    Anywhere
30000 (v6)                 ALLOW IN    Anywhere (v6)

user@user-virtual-machine:~/바탕화면$
```



Windows 방화벽 설정 추가

- 인바운드 규칙
- TCP 30000 을 허용으로 변경