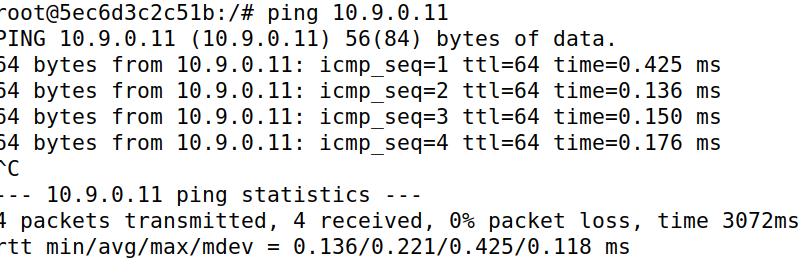
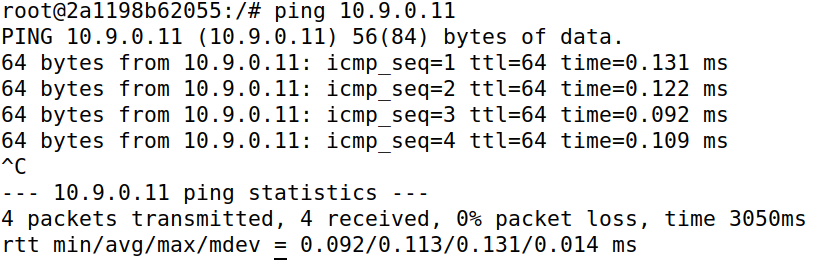
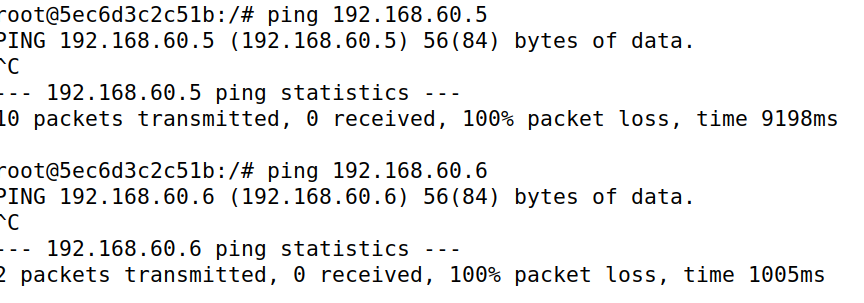
Task1:

client可以ping VPN服务器：  


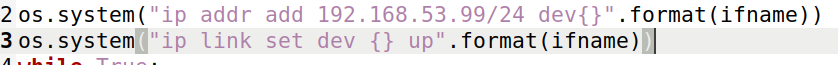
sever router也可以ping VPN服务器：  


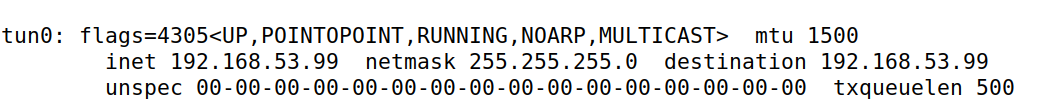
Client和server route之间无法ping：

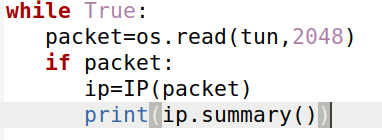


Task2：  
显示端口名字：  

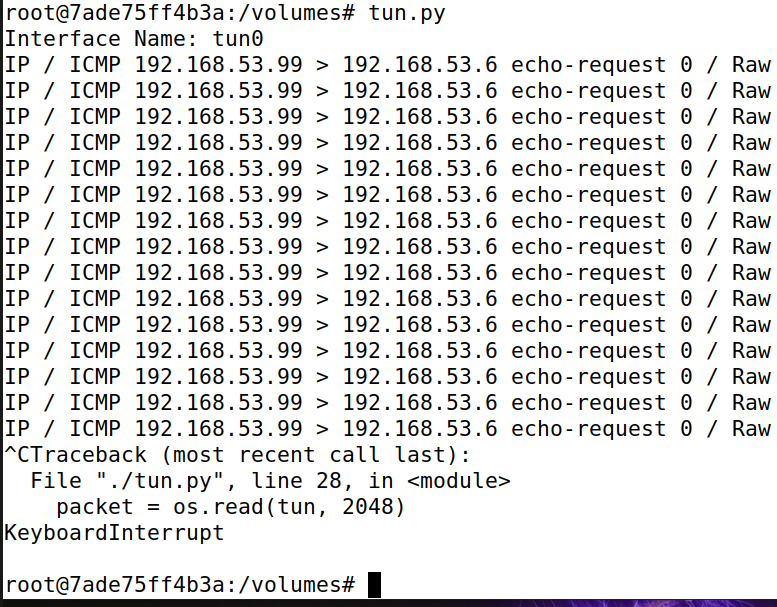

添加程序后运行tun.py,并ifconfig查看信息：



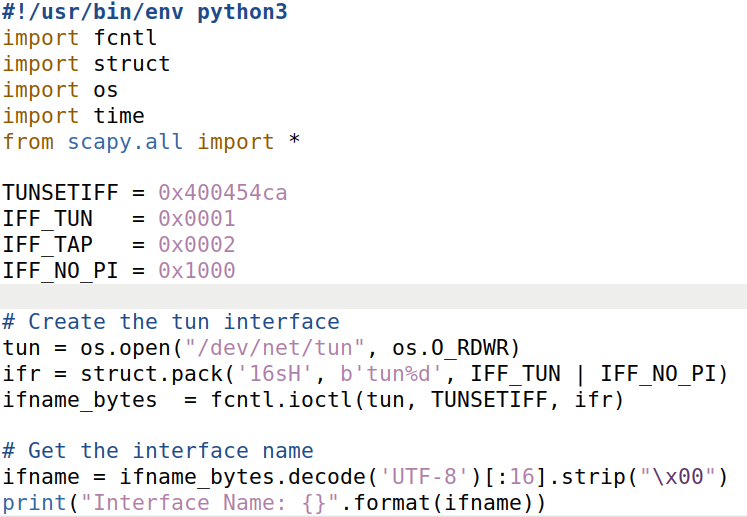


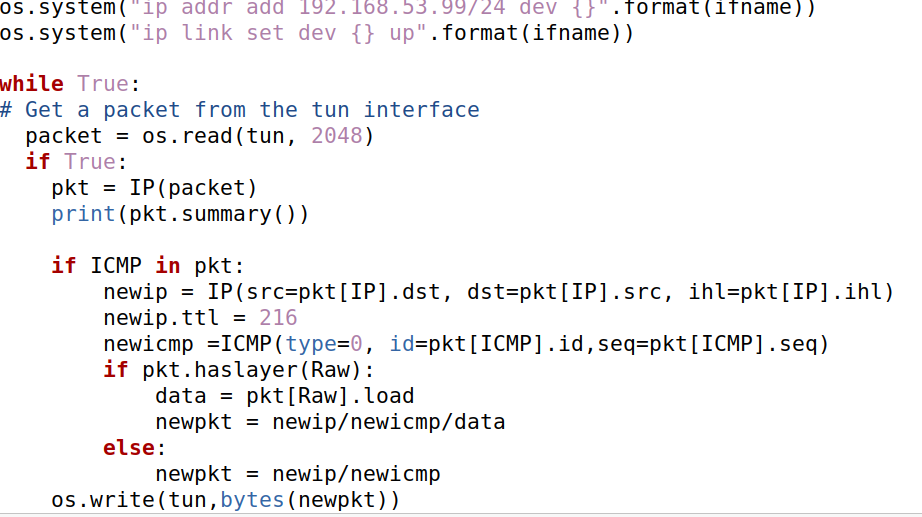
修改tun.py：  


运行结果：

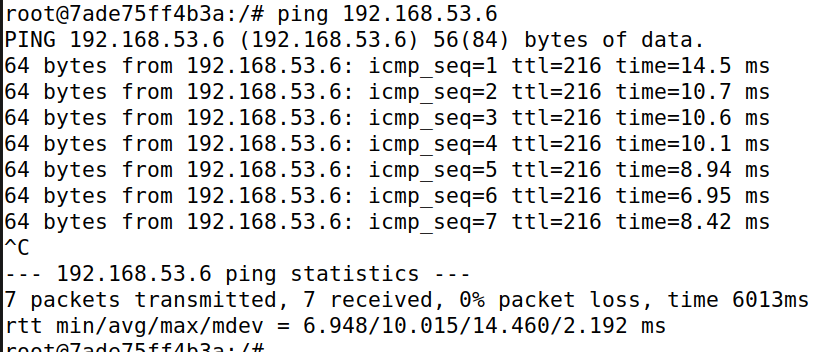


此时ping不同网段内主机

编写脚本：  




运行后可以ping连接：



Task3：

修改客户端代码：  
#!/usr/bin/env python3

import fcntl

import struct

import os

import time

from scapy.all import \*

TUNSETIFF = 0x400454ca

IFF\_TUN = 0x0001

IFF\_TAP = 0x0002

IFF\_NO\_PI = 0x1000

# Create the tun interface

tun = os.open("/dev/net/tun", os.O\_RDWR)

ifr = struct.pack('16sH', b'tun%d', IFF\_TUN | IFF\_NO\_PI)

ifname\_bytes = fcntl.ioctl(tun, TUNSETIFF, ifr)

# Get the interface name

ifname = ifname\_bytes.decode('UTF-8')[:16].strip("\x00")

print("Interface Name: {}".format(ifname))

os.system("ip addr add 192.168.53.11/24 dev {}".format(ifname))

os.system("ip link set dev {} up".format(ifname))

server = socket.socket(socket.AF\_INET, socket.SOCK\_DGRAM)

SERVER\_IP="0.0.0.0"

SERVER\_PORT=9090

server.bind((SERVER\_IP,SERVER\_PORT))

while True:

data,(ip,port) = server.recvfrom(2048)

print("{}:{}-->{}:{}".format(ip,port,SERVER\_IP,SERVER\_PORT))

pkt=IP(data)

print("Inside : {}:{}".format(pkt.src,pkt.dst))

os.write(tun,data)

用户端：

#!/usr/bin/env python3

import fcntl

import struct

import os

import time

from scapy.all import \*

TUNSETIFF = 0x400454ca

IFF\_TUN = 0x0001

IFF\_TAP = 0x0002

IFF\_NO\_PI = 0x1000

# Create the tun interface

tun = os.open("/dev/net/tun", os.O\_RDWR)

ifr = struct.pack('16sH', b'tun%d', IFF\_TUN | IFF\_NO\_PI)

ifname\_bytes = fcntl.ioctl(tun, TUNSETIFF, ifr)

# Get the interface name

ifname = ifname\_bytes.decode('UTF-8')[:16].strip("\x00")

print("Interface Name: {}".format(ifname))

os.system("ip addr add 192.168.53.99/24 dev {}".format(ifname))

os.system("ip link set dev {} up".format(ifname))

os.system("ip addr add 192.168.60.0/24 dev {}".format(ifname))

sock = socket.socket(socket.AF\_INET, socket.SOCK\_DGRAM)

SERVER\_IP="10.9.0.11"

SERVER\_PORT=9090

while True:

# Get a packet from the tun interface

packet = os.read(tun, 2048)

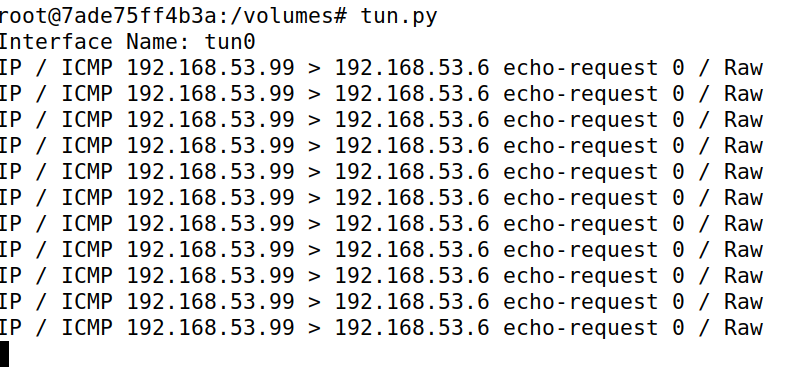
if packet:

pkt = IP(packet)

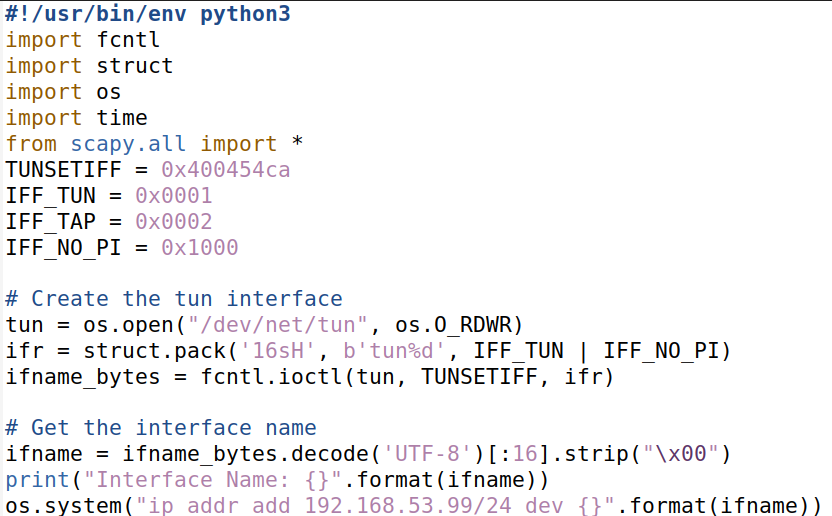
print(pkt.summary())

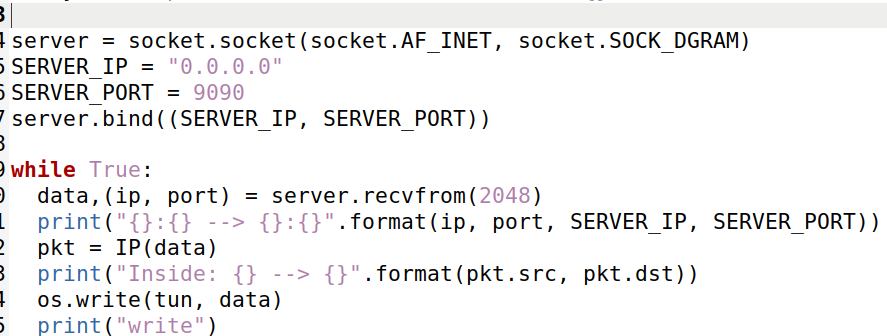
sock.sendto(packet, (SERVER\_IP, SERVER\_PORT))

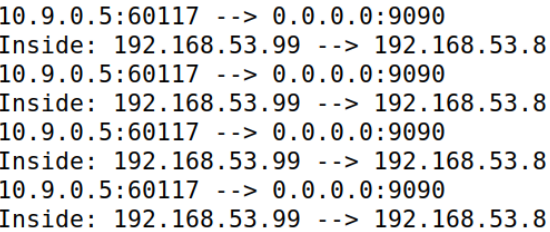
运行后可以连接到目的主机：

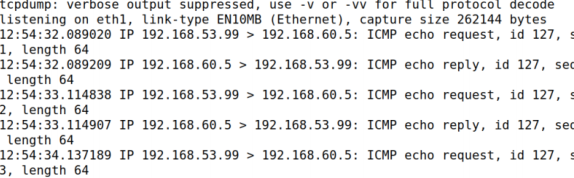


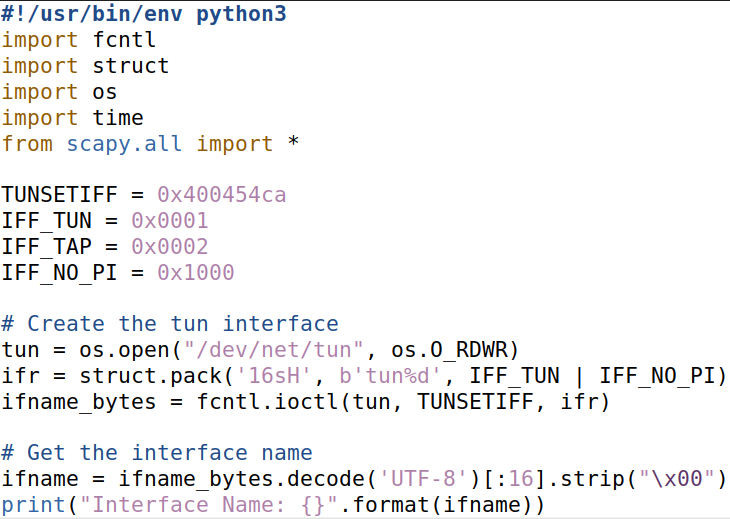
Task4：

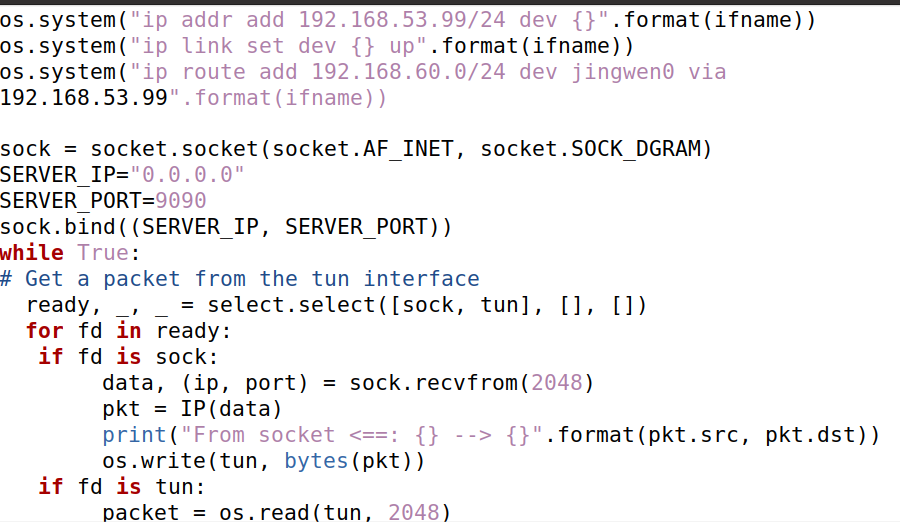


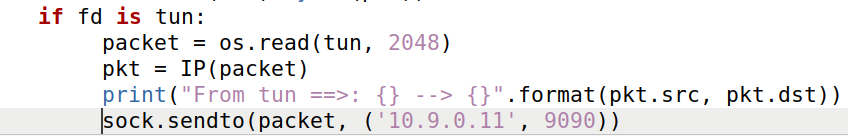


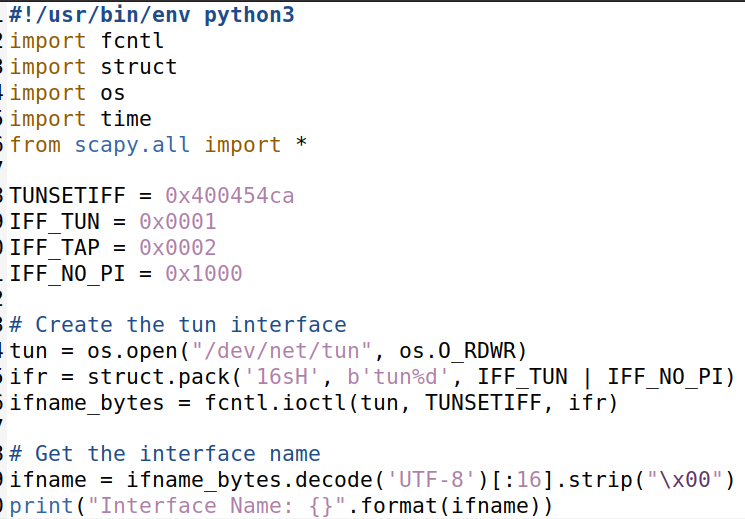
运行结果：  


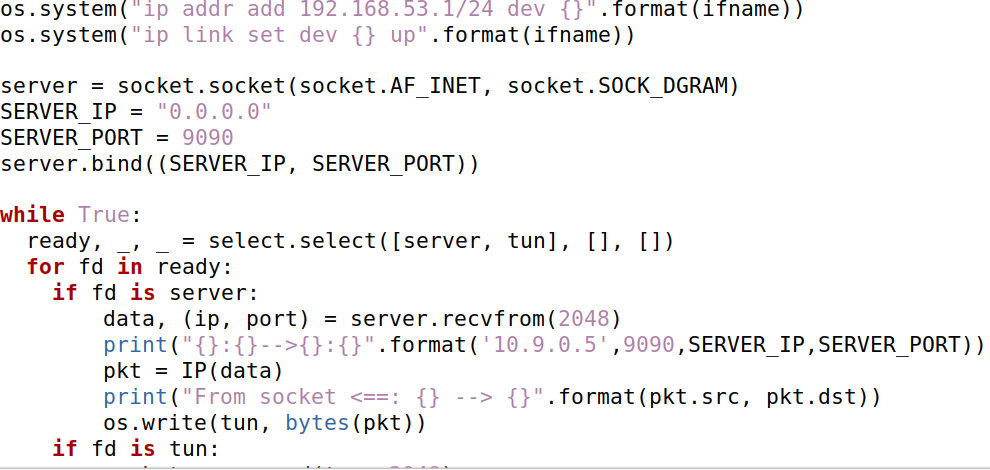
  
有报文返回

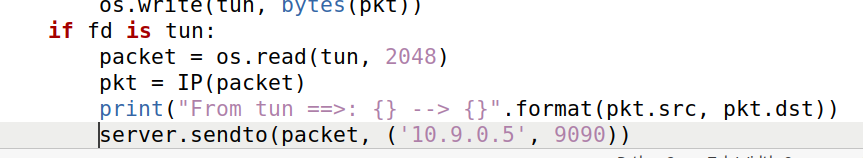
Task5：  
客户端：  


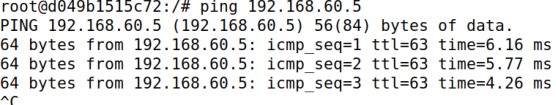


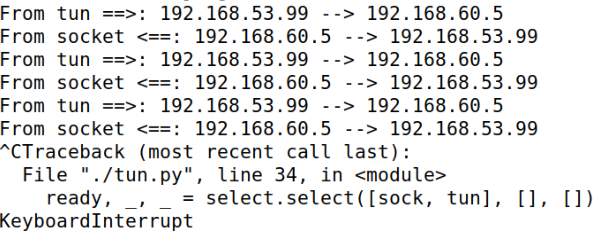


服务器端：  






运行后测试结果：  




使用wireshark抓包可见连接成功

Telnet连接也成功：

