UHD installation
UHD-3.15-LTS version is required work with USRP N310 and USRP B210

sudo apt-get install libboost-all-dev libusb-1.0-0-dev doxygen python3-docutils python3-mako python3-numpy python3-requests python3-ruamel.yaml python3-setuptools cmake build-essential

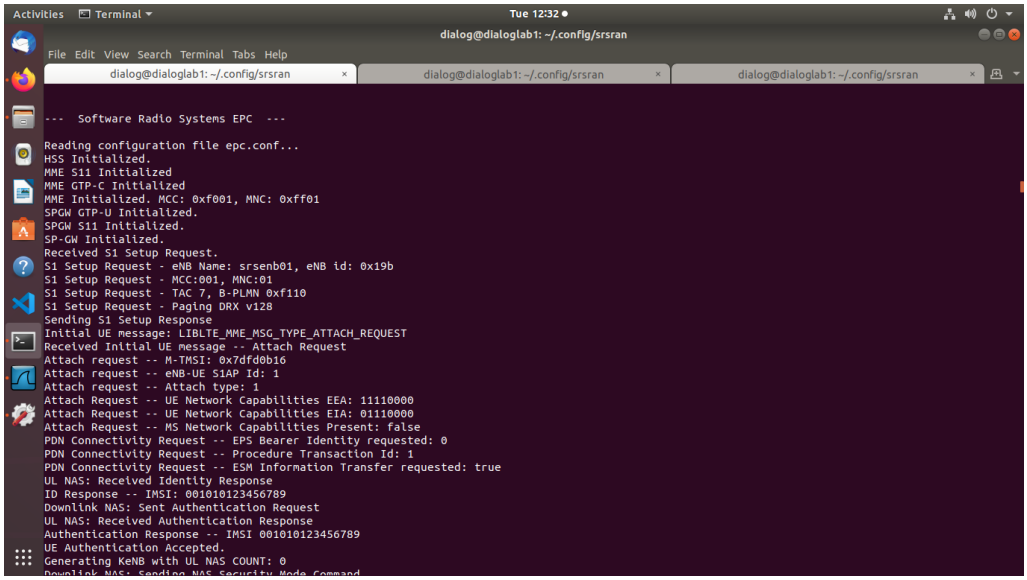
git clone https://github.com/EttusResearch/uhd.git
cd uhd
git checkout -f UHD-3.15-LTS
cd host
mkdir build
cd build
cmake ../
make
make test
sudo make install
sudo ldconfig

SRSRAN Installation from Source

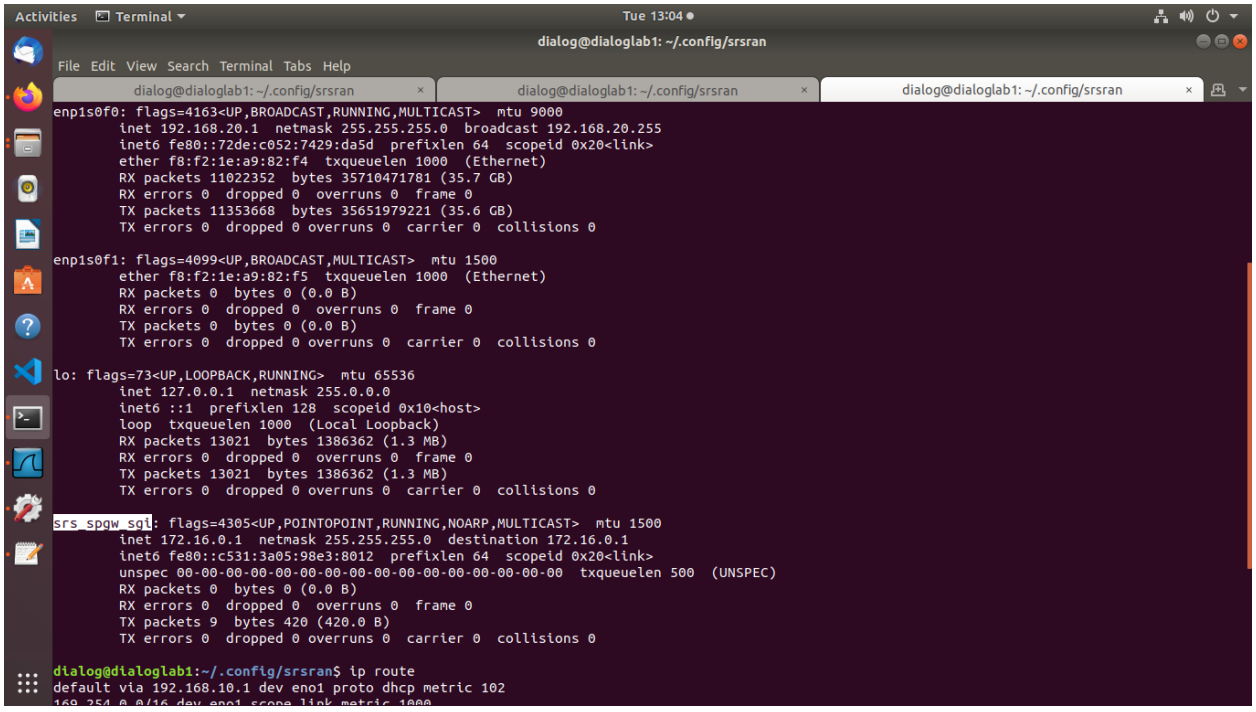
Refer section 3.1.3 Installation from Source to install latest version of SRSRAN from source.

Running EPC

sudo srsepc ~/.config/srsran/epc.conf
After running this command, the output of the terminal should be as follows.



The network interface of SPGW will appead as srs_spgw_sgi



Then we have to share the internet access to the interface. For that copy the following script to a sh file.

```
#! /bin/bash

IPTABLES=/sbin/iptables

WANIF='eno1'
LANIF='srs_spgw_sgi'

# enable ip forwarding in the kernel
echo 'Enabling Kernel IP forwarding...'
/bin/echo 1 > /proc/sys/net/ipv4/ip_forward

# flush rules and delete chains
echo 'Flushing rules and deleting existing chains...'
$IPTABLES -F
$IPTABLES -X

# enable masquerading to allow LAN internet access
echo 'Enabling IP Masquerading and other rules...'
$IPTABLES -t nat -A POSTROUTING -o $LANIF -j MASQUERADE
$IPTABLES -A FORWARD -i $LANIF -o $WANIF -m state --state RELATED,ESTABLISHED -j ACCEPT
$IPTABLES -A FORWARD -i $WANIF -o $LANIF -j ACCEPT

$IPTABLES -t nat -A POSTROUTING -o $WANIF -j MASQUERADE
$IPTABLES -A FORWARD -i $WANIF -o $LANIF -m state --state RELATED,ESTABLISHED -j ACCEPT
$IPTABLES -A FORWARD -i $LANIF -o $WANIF -j ACCEPT

echo 'Done.'
```

Running ENB

sudo sysctl -w net.core.wmem_max=62500000
sudo sysctl -w net.core.rmem_max=62500000

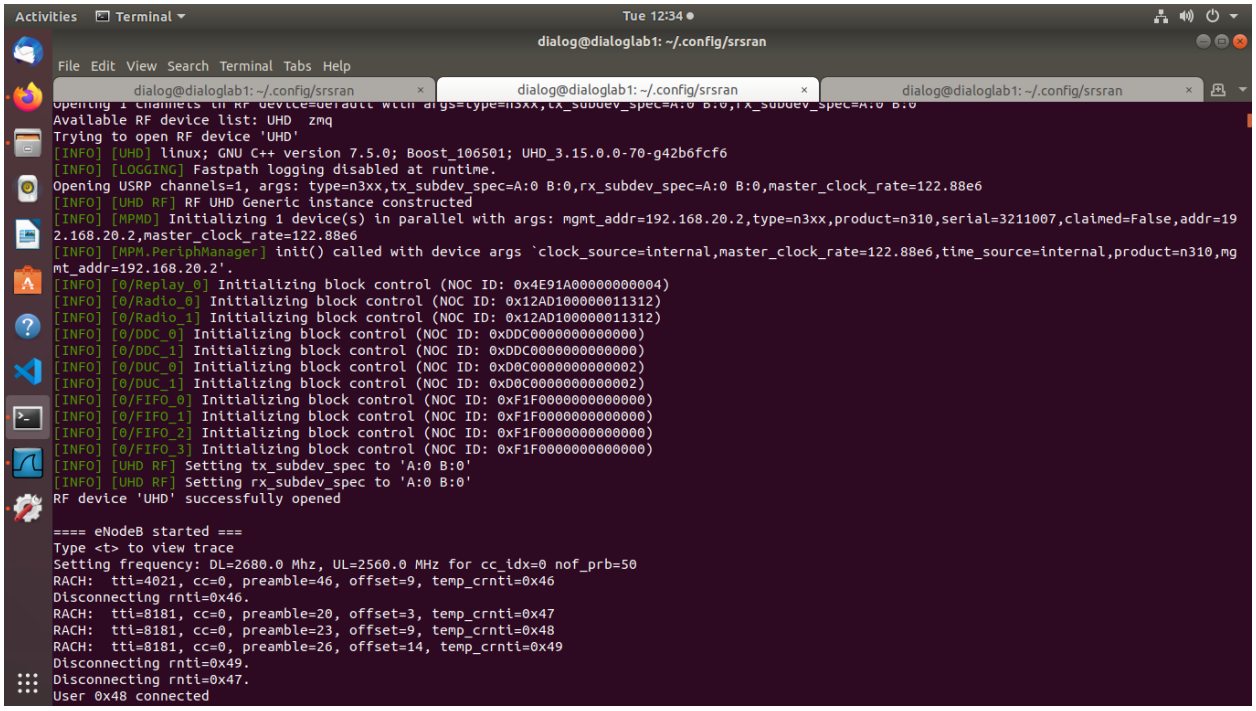
Since we are using USRP N310 as the ENB, we have to change enb.conf as follows.

[enb_files]
sib_config = sib.conf
rr_config = rr.conf
rb_config = rb.conf

[rf]
#dl_earfcn = 3350
tx_gain = 80
rx_gain = 40
device_args = type=n3xx,tx_subdev_spec=A:0 B:0,rx_subdev_spec=A:0 B:0

[expert]
lte_sample_rates = true

sudo srsenb ~/.config/srsran/enb.conf



Running UE

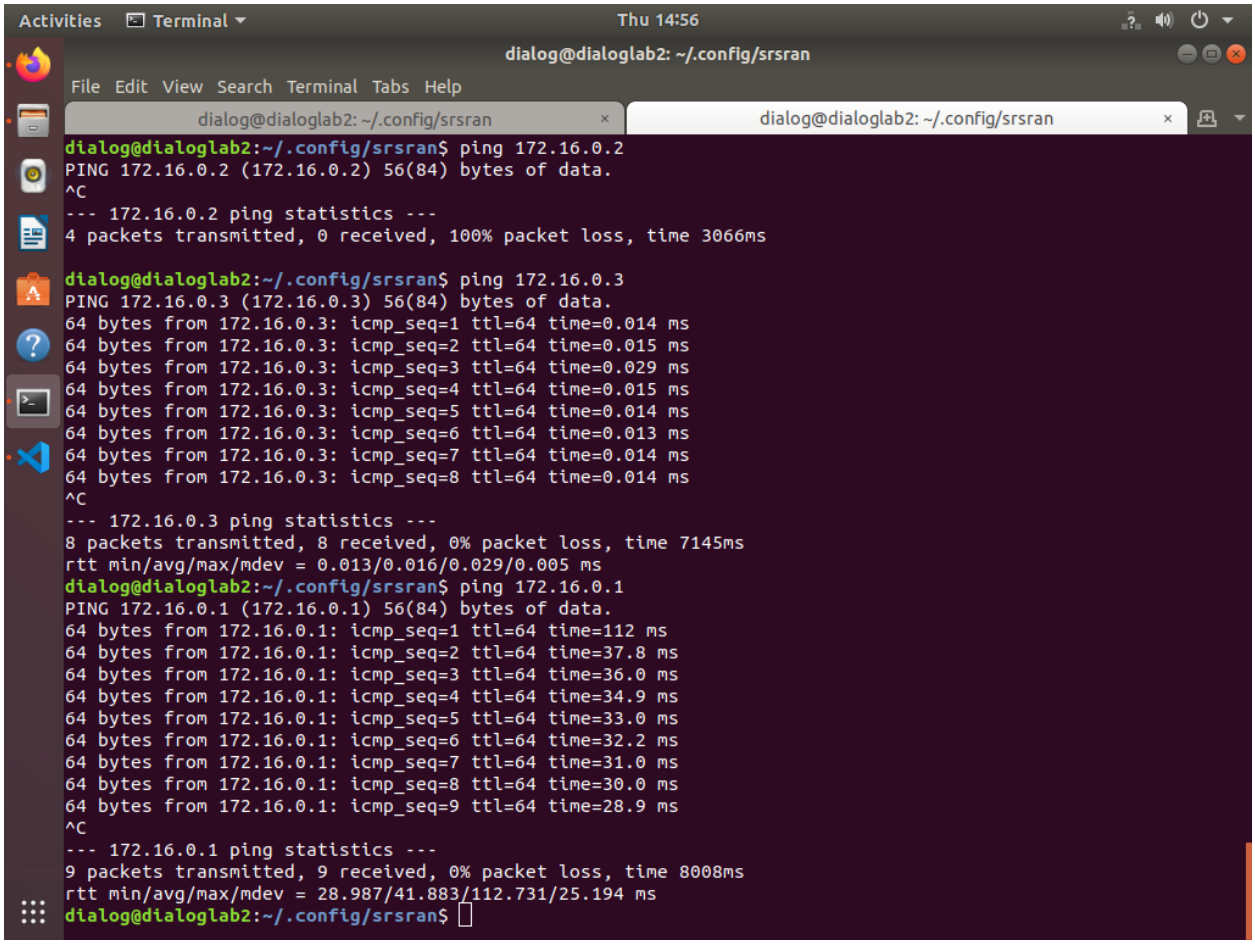
sudo srsue ~/.config/srsran/ue.conf

sudo ip route del default
sudo ip route del 172.16.0.0/24
sudo ip route add default via {ue tunnel ip} dev tun_srsue proto dhcp metric 100
sudo ip route add 172.16.0.0/24 dev tun_srsue proto kernel scope link src {ue tunnel ip} metric 100

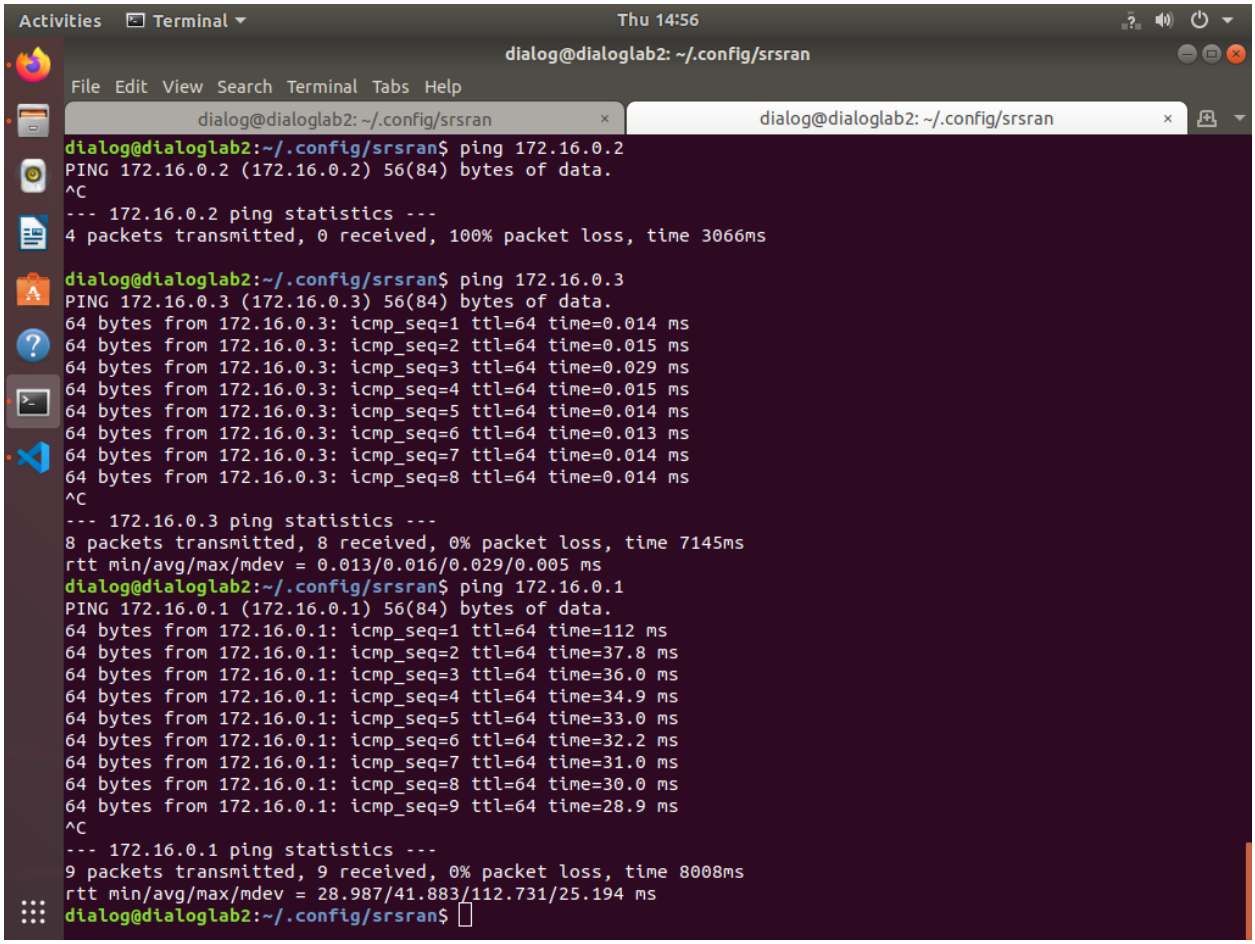
ping 8.8.8.8

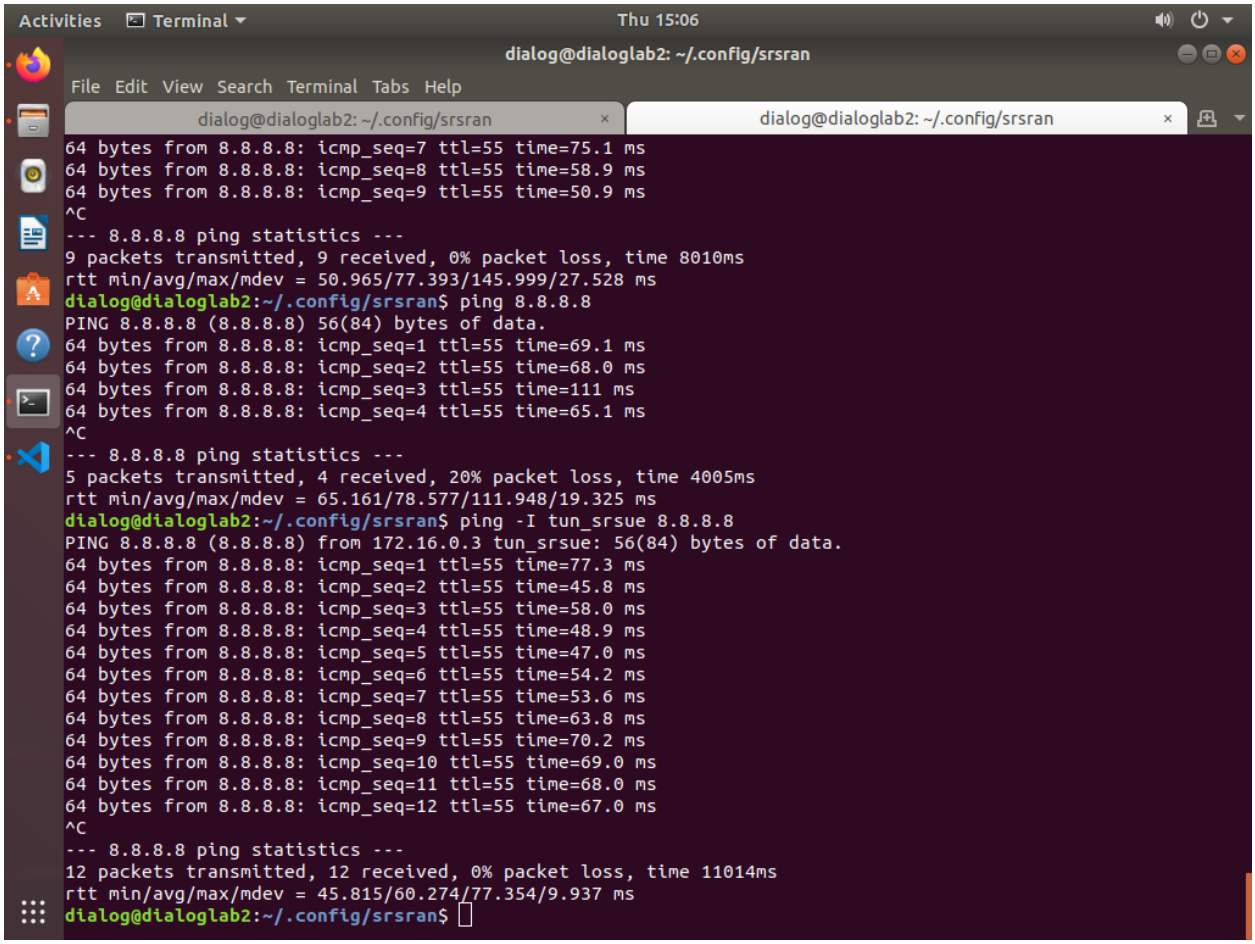
Sudo cp /etc/resolv.conf /etc/resolv.orig

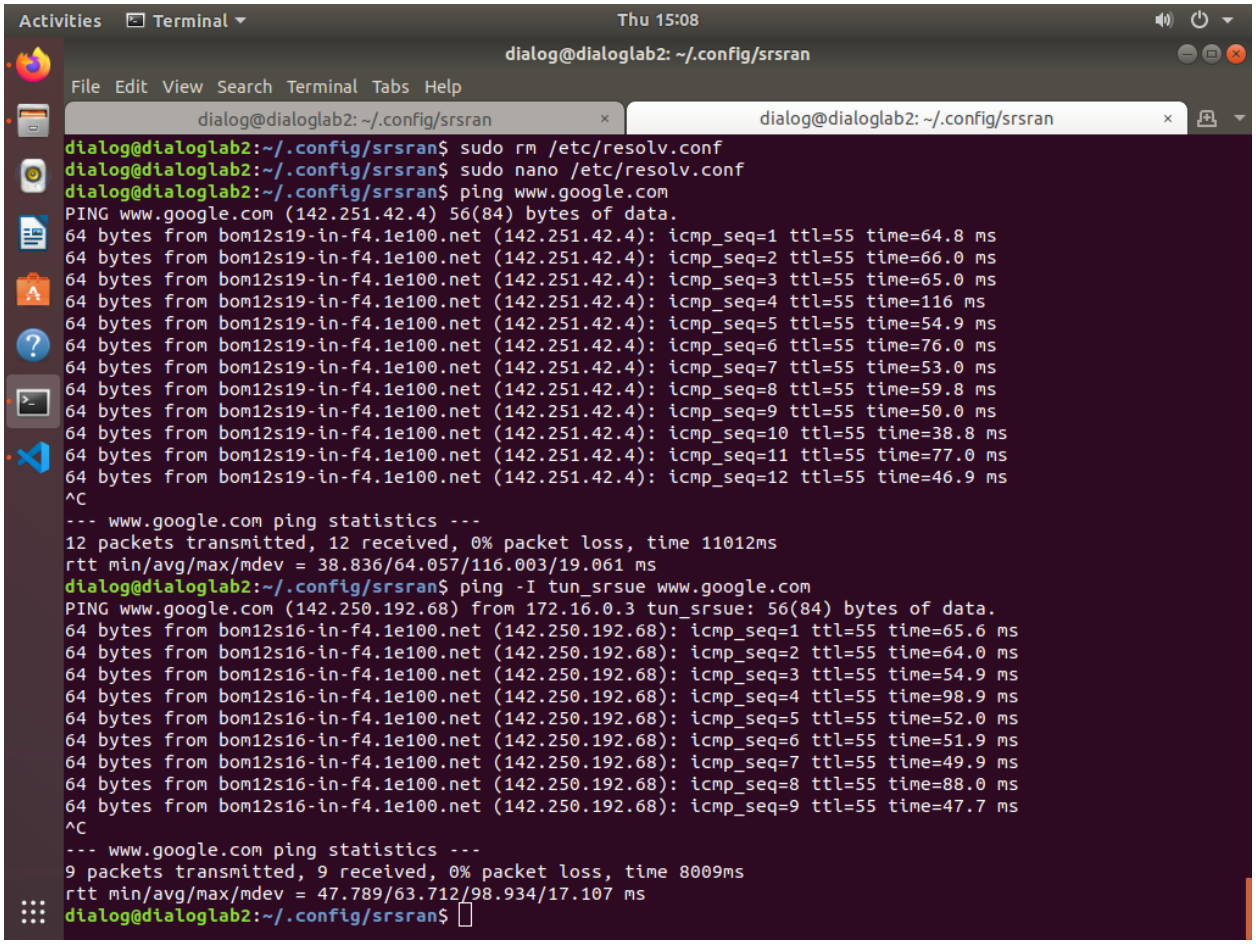
```
Sudo rm /etc/resolv.conf
Sudo nano /etc/resolv.conf

Add following line,
     nameserver 8.8.8.8

cat /etc/resolv.conf

Ping www.google.com
```


Activities
Terminal
Thu 14:56
dialog@dialoglab2: ~/.config/srsran
File Edit View Search Terminal Tabs Help
dialog@dialoglab2: ~/.config/srsran
dialog@dialoglab2: ~/.config/srsran
dialog@dialoglab2:~/.config/srsran$ ping 172.16.0.2
PING 172.16.0.2 (172.16.0.2) 56(84) bytes of data.
^C
--- 172.16.0.2 ping statistics ---
4 packets transmitted, 0 received, 100% packet loss, time 3066ms
dialog@dialoglab2:~/.config/srsran$ ping 172.16.0.3
PING 172.16.0.3 (172.16.0.3) 56(84) bytes of data.
64 bytes from 172.16.0.3: icmp_seq=1 ttl=64 time=0.014 ms
64 bytes from 172.16.0.3: icmp_seq=2 ttl=64 time=0.015 ms
64 bytes from 172.16.0.3: icmp_seq=3 ttl=64 time=0.029 ms
64 bytes from 172.16.0.3: icmp_seq=4 ttl=64 time=0.015 ms
64 bytes from 172.16.0.3: icmp_seq=5 ttl=64 time=0.014 ms
64 bytes from 172.16.0.3: icmp_seq=6 ttl=64 time=0.013 ms
64 bytes from 172.16.0.3: icmp_seq=7 ttl=64 time=0.014 ms
64 bytes from 172.16.0.3: icmp_seq=8 ttl=64 time=0.014 ms
^C
--- 172.16.0.3 ping statistics ---
8 packets transmitted, 8 received, 0% packet loss, time 7145ms
rtt min/avg/max/mdev = 0.013/0.016/0.029/0.005 ms
dialog@dialoglab2:~/.config/srsran$ ping 172.16.0.1
PING 172.16.0.1 (172.16.0.1) 56(84) bytes of data.
64 bytes from 172.16.0.1: icmp_seq=1 ttl=64 time=112 ms
64 bytes from 172.16.0.1: icmp_seq=2 ttl=64 time=37.8 ms
64 bytes from 172.16.0.1: icmp_seq=3 ttl=64 time=36.0 ms
64 bytes from 172.16.0.1: icmp_seq=4 ttl=64 time=34.9 ms
64 bytes from 172.16.0.1: icmp_seq=5 ttl=64 time=33.0 ms
64 bytes from 172.16.0.1: icmp_seq=6 ttl=64 time=32.2 ms
64 bytes from 172.16.0.1: icmp_seq=7 ttl=64 time=31.0 ms
64 bytes from 172.16.0.1: icmp_seq=8 ttl=64 time=30.0 ms
64 bytes from 172.16.0.1: icmp_seq=9 ttl=64 time=28.9 ms
^C
--- 172.16.0.1 ping statistics ---
9 packets transmitted, 9 received, 0% packet loss, time 8008ms
rtt min/avg/max/mdev = 28.987/41.883/112.731/25.194 ms
dialog@dialoglab2:~/.config/srsran$

Dialog
11:21
Network selection
Wash Hands - Dialog 4G
Dialog 3G
Dialog 2G
41304 4G
Mobitel 4G
00101 4G
Airtel 4G
41311 4G
Mobitel 3G
Airtel 3G
Hutch 3G
Hutch 2G
Mobitel 2G
Airtel 2G
41312 4G


Activities
Terminal
Thu 14:56
dialog@dialoglab2: ~/.config/srsran
File Edit View Search Terminal Tabs Help
dialog@dialoglab2: ~/.config/srsran
dialog@dialoglab2: ~/.config/srsran
dialog@dialoglab2:~/.config/srsran$ ping 172.16.0.2
PING 172.16.0.2 (172.16.0.2) 56(84) bytes of data.
^C
--- 172.16.0.2 ping statistics ---
4 packets transmitted, 0 received, 100% packet loss, time 3066ms
dialog@dialoglab2:~/.config/srsran$ ping 172.16.0.3
PING 172.16.0.3 (172.16.0.3) 56(84) bytes of data.
64 bytes from 172.16.0.3: icmp_seq=1 ttl=64 time=0.014 ms
64 bytes from 172.16.0.3: icmp_seq=2 ttl=64 time=0.015 ms
64 bytes from 172.16.0.3: icmp_seq=3 ttl=64 time=0.029 ms
64 bytes from 172.16.0.3: icmp_seq=4 ttl=64 time=0.015 ms
64 bytes from 172.16.0.3: icmp_seq=5 ttl=64 time=0.014 ms
64 bytes from 172.16.0.3: icmp_seq=6 ttl=64 time=0.013 ms
64 bytes from 172.16.0.3: icmp_seq=7 ttl=64 time=0.014 ms
64 bytes from 172.16.0.3: icmp_seq=8 ttl=64 time=0.014 ms
^C
--- 172.16.0.3 ping statistics ---
8 packets transmitted, 8 received, 0% packet loss, time 7145ms
rtt min/avg/max/mdev = 0.013/0.016/0.029/0.005 ms
dialog@dialoglab2:~/.config/srsran$ ping 172.16.0.1
PING 172.16.0.1 (172.16.0.1) 56(84) bytes of data.
64 bytes from 172.16.0.1: icmp_seq=1 ttl=64 time=112 ms
64 bytes from 172.16.0.1: icmp_seq=2 ttl=64 time=37.8 ms
64 bytes from 172.16.0.1: icmp_seq=3 ttl=64 time=36.0 ms
64 bytes from 172.16.0.1: icmp_seq=4 ttl=64 time=34.9 ms
64 bytes from 172.16.0.1: icmp_seq=5 ttl=64 time=33.0 ms
64 bytes from 172.16.0.1: icmp_seq=6 ttl=64 time=32.2 ms
64 bytes from 172.16.0.1: icmp_seq=7 ttl=64 time=31.0 ms
64 bytes from 172.16.0.1: icmp_seq=8 ttl=64 time=30.0 ms
64 bytes from 172.16.0.1: icmp_seq=9 ttl=64 time=28.9 ms
^C
--- 172.16.0.1 ping statistics ---
9 packets transmitted, 9 received, 0% packet loss, time 8008ms
rtt min/avg/max/mdev = 28.987/41.883/112.731/25.194 ms
dialog@dialoglab2:~/.config/srsran$


Activities
Terminal
Thu 15:06
dialog@dialoglab2: ~/.config/srsran
File Edit View Search Terminal Tabs Help
dialog@dialoglab2: ~/.config/srsran
dialog@dialoglab2: ~/.config/srsran
64 bytes from 8.8.8.8: icmp_seq=7 ttl=55 time=75.1 ms
64 bytes from 8.8.8.8: icmp_seq=8 ttl=55 time=58.9 ms
64 bytes from 8.8.8.8: icmp_seq=9 ttl=55 time=50.9 ms
^C
--- 8.8.8.8 ping statistics ---
9 packets transmitted, 9 received, 0% packet loss, time 8010ms
rtt min/avg/max/mdev = 50.965/77.393/145.999/27.528 ms
dialog@dialoglab2:~/.config/srsran$ 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=55 time=69.1 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=55 time=68.0 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=55 time=111 ms
64 bytes from 8.8.8.8: icmp_seq=4 ttl=55 time=65.1 ms
^C
--- 8.8.8.8 ping statistics ---
5 packets transmitted, 4 received, 20% packet loss, time 4005ms
rtt min/avg/max/mdev = 65.161/78.577/111.948/19.325 ms
dialog@dialoglab2:~/.config/srsran$ ping -I tun_srsue 8.8.8.8
PING 8.8.8.8 (8.8.8.8) from 172.16.0.3 tun_srsue: 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_seq=1 ttl=55 time=77.3 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=55 time=45.8 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=55 time=58.0 ms
64 bytes from 8.8.8.8: icmp_seq=4 ttl=55 time=48.9 ms
64 bytes from 8.8.8.8: icmp_seq=5 ttl=55 time=47.0 ms
64 bytes from 8.8.8.8: icmp_seq=6 ttl=55 time=54.2 ms
64 bytes from 8.8.8.8: icmp_seq=7 ttl=55 time=53.6 ms
64 bytes from 8.8.8.8: icmp_seq=8 ttl=55 time=63.8 ms
64 bytes from 8.8.8.8: icmp_seq=9 ttl=55 time=70.2 ms
64 bytes from 8.8.8.8: icmp_seq=10 ttl=55 time=69.0 ms
64 bytes from 8.8.8.8: icmp_seq=11 ttl=55 time=68.0 ms
64 bytes from 8.8.8.8: icmp_seq=12 ttl=55 time=67.0 ms
^C
--- 8.8.8.8 ping statistics ---
12 packets transmitted, 12 received, 0% packet loss, time 11014ms
rtt min/avg/max/mdev = 45.815/60.274/77.354/9.937 ms
dialog@dialoglab2:~/.config/srsran$


Activities
Terminal
Thu 15:08
dialog@dialoglab2: ~/.config/srsran
File Edit View Search Terminal Tabs Help
dialog@dialoglab2: ~/.config/srsran
dialog@dialoglab2: ~/.config/srsran
dialog@dialoglab2:~/.config/srsran$ sudo rm /etc/resolv.conf
dialog@dialoglab2:~/.config/srsran$ sudo nano /etc/resolv.conf
dialog@dialoglab2:~/.config/srsran$ ping www.google.com
PING www.google.com (142.251.42.4) 56(84) bytes of data.
64 bytes from bom12s19-in-f4.1e100.net (142.251.42.4): icmp_seq=1 ttl=55 time=64.8 ms
64 bytes from bom12s19-in-f4.1e100.net (142.251.42.4): icmp_seq=2 ttl=55 time=66.0 ms
64 bytes from bom12s19-in-f4.1e100.net (142.251.42.4): icmp_seq=3 ttl=55 time=65.0 ms
64 bytes from bom12s19-in-f4.1e100.net (142.251.42.4): icmp_seq=4 ttl=55 time=116 ms
64 bytes from bom12s19-in-f4.1e100.net (142.251.42.4): icmp_seq=5 ttl=55 time=54.9 ms
64 bytes from bom12s19-in-f4.1e100.net (142.251.42.4): icmp_seq=6 ttl=55 time=76.0 ms
64 bytes from bom12s19-in-f4.1e100.net (142.251.42.4): icmp_seq=7 ttl=55 time=53.0 ms
64 bytes from bom12s19-in-f4.1e100.net (142.251.42.4): icmp_seq=8 ttl=55 time=59.8 ms
64 bytes from bom12s19-in-f4.1e100.net (142.251.42.4): icmp_seq=9 ttl=55 time=50.0 ms
64 bytes from bom12s19-in-f4.1e100.net (142.251.42.4): icmp_seq=10 ttl=55 time=38.8 ms
64 bytes from bom12s19-in-f4.1e100.net (142.251.42.4): icmp_seq=11 ttl=55 time=77.0 ms
64 bytes from bom12s19-in-f4.1e100.net (142.251.42.4): icmp_seq=12 ttl=55 time=46.9 ms
^C
--- www.google.com ping statistics ---
12 packets transmitted, 12 received, 0% packet loss, time 11012ms
rtt min/avg/max/mdev = 38.836/64.057/116.003/19.061 ms
dialog@dialoglab2:~/.config/srsran$ ping -I tun_srsue www.google.com
PING www.google.com (142.250.192.68) from 172.16.0.3 tun_srsue: 56(84) bytes of data.
64 bytes from bom12s16-in-f4.1e100.net (142.250.192.68): icmp_seq=1 ttl=55 time=65.6 ms
64 bytes from bom12s16-in-f4.1e100.net (142.250.192.68): icmp_seq=2 ttl=55 time=64.0 ms
64 bytes from bom12s16-in-f4.1e100.net (142.250.192.68): icmp_seq=3 ttl=55 time=54.9 ms
64 bytes from bom12s16-in-f4.1e100.net (142.250.192.68): icmp_seq=4 ttl=55 time=98.9 ms
64 bytes from bom12s16-in-f4.1e100.net (142.250.192.68): icmp_seq=5 ttl=55 time=52.0 ms
64 bytes from bom12s16-in-f4.1e100.net (142.250.192.68): icmp_seq=6 ttl=55 time=51.9 ms
64 bytes from bom12s16-in-f4.1e100.net (142.250.192.68): icmp_seq=7 ttl=55 time=49.9 ms
64 bytes from bom12s16-in-f4.1e100.net (142.250.192.68): icmp_seq=8 ttl=55 time=88.0 ms
64 bytes from bom12s16-in-f4.1e100.net (142.250.192.68): icmp_seq=9 ttl=55 time=47.7 ms
^C
--- www.google.com ping statistics ---
9 packets transmitted, 9 received, 0% packet loss, time 8009ms
rtt min/avg/max/mdev = 47.789/63.712/98.934/17.107 ms
dialog@dialoglab2:~/.config/srsran$