Network Simulation is done in ns-3 in this lab.

In first.cc file, two nodes are set to transfer data at a rate of 8Mbps, and transmission delay is 4ms. So, I set
pointToPoint.SetDeviceAttribute("DataRate", StringValue ("8Mbps"));
pointToPoint.SetChannelAttribute("Delay", StringValue ("4ms"));

IP addresses are 192.168.40.0 and 192.168.40.24.
Address.SetBase ("192.168.40.0", "192.168.40.24");

UdpEchoServer is on port 93. The packet size is 256 Bytes.
UdpEchoServerHelper echoServer (93);
echoClient.SetAttribute ("PacketSize", UintegerValue(256));

To output the .xml file for NetAnim, the codes as the following are added to first.cc:
AnimationInterface anim ("chen-5718second.xml");
Anim.SetConstantPosition (nodes.Get(0), 1.0, 2.0);
Anim.SetConstantPosition (nodes.Get(1), 2.0, 3.0);

The coordinates of the two nodes are set. One is 1.0 on x, 2.0 on y. The other is 2.0 on x, 3.0 on y.

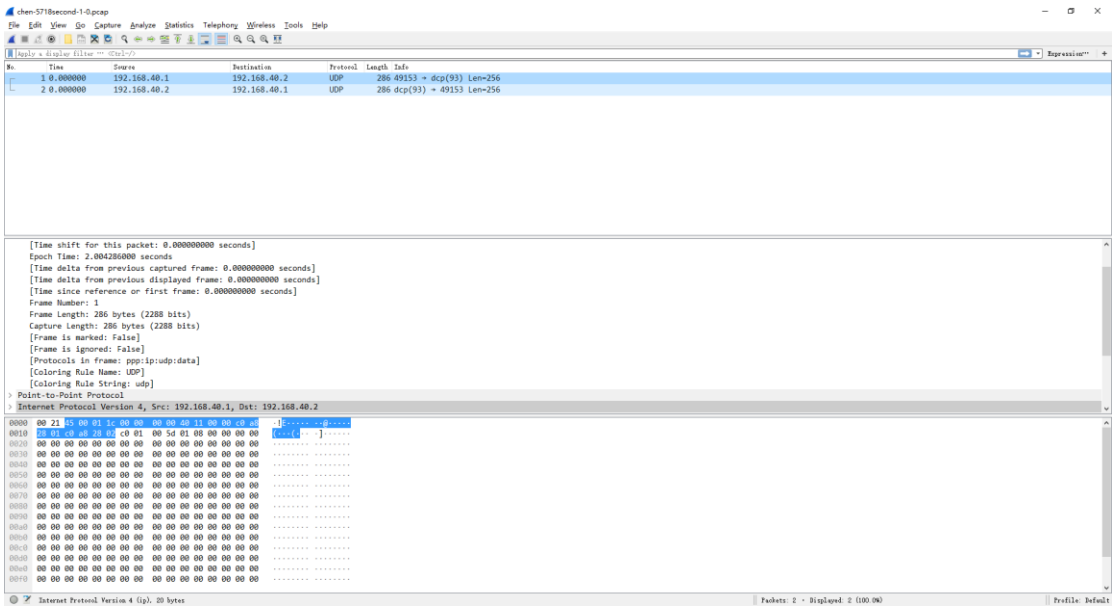
To enable ASCII and pcap tracing, the codes as the following are added to create .tr file and pcap file:
AsciiTraceHelper ascii;
pointToPoint.EnableAsciiAll (ascii.CreateFileStream("chen-5718second.tr"));
pointToPoint.EnablePcapAll("chen-5718second");

Then to simulate first.cc, the command ./waf –run scratch/first is implemented in Ubuntu. The result is shown as the following:

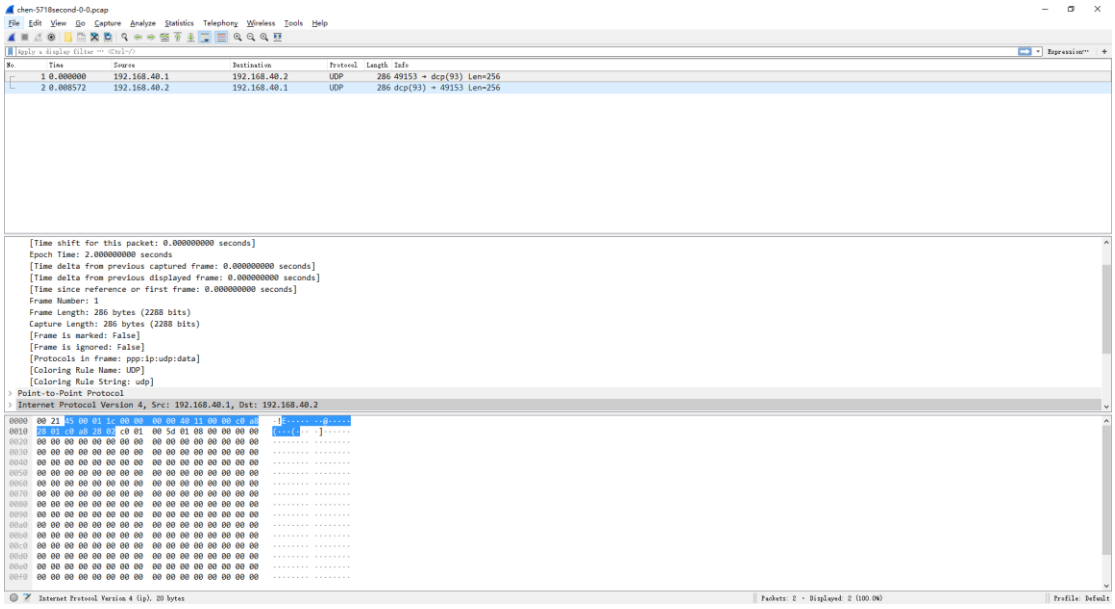
```
cyxcc@cyxcc-VirtualBox:~/Desktop/tarballs/ns-allinone-3.20/ns-3.20$ ./waf --run
scratch/chen-5718second
Waf: Entering directory `/home/cyxcc/Desktop/tarballs/ns-allinone-3.20/ns-3.20/b
uild'
[ 822/2312] cxx: scratch/chen-5718second.cc -> build/scratch/chen-5718second.cc.
3.o
[2254/2312] cxxprogram: build/scratch/chen-5718second.cc.3.o -> build/scratch/ch
en-5718second
Waf: Leaving directory `/home/cyxcc/Desktop/tarballs/ns-allinone-3.20/ns-3.20/bu
ild'
'build' finished successfully (10.883s)
AnimationInterface WARNING:Node:0 Does not have a mobility model. Use SetConstan
tPosition if it is stationary
AnimationInterface WARNING:Node:1 Does not have a mobility model. Use SetConstan
tPosition if it is stationary
At time 2s client sent 256 bytes to 192.168.40.2 port 93
At time 2.00429s server received 256 bytes from 192.168.40.1 port 49153
At time 2.00429s server sent 256 bytes to 192.168.40.1 port 49153
At time 2.00857s client received 256 bytes from 192.168.40.2 port 93
```

The screenshots of pcap tracing in WireShark of the two nodes are shown as:

Node 1:



Node 0:



Other files such as flow diagrams, output files are in the corresponding folders.