

How to set up your testing environment

Location for your programs

Client:

```
$ /tmp/hw2/client
```

Server:

```
$ /tmp/hw2/server
```

File for transmission

Input:

```
$ /tmp/a_big_file
```

※You can use the command to create the input file for testing.

```
$ dd if=/dev/urandom of=a_big_file bs=<File Size> count=1
```

Output:

Receiver should output the file on the directory “/tmp”.

The name of the output file should be “output_file”.

Packet loss rate

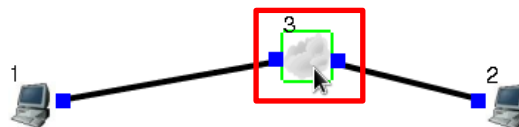


Fig.1 Double click the WAN icon.

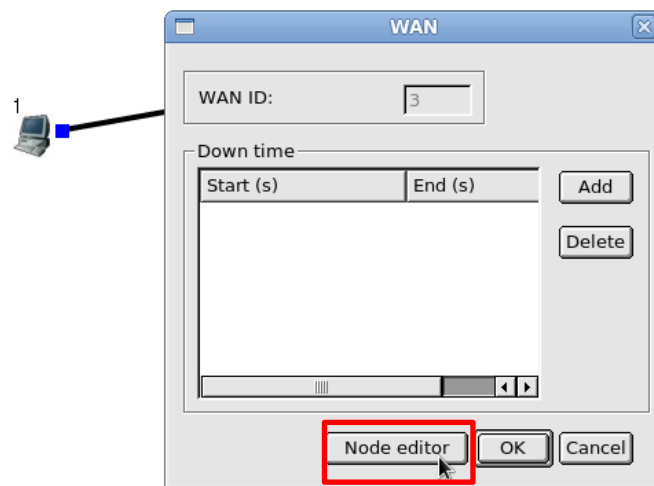


Fig.2 Click the “Node editor”.

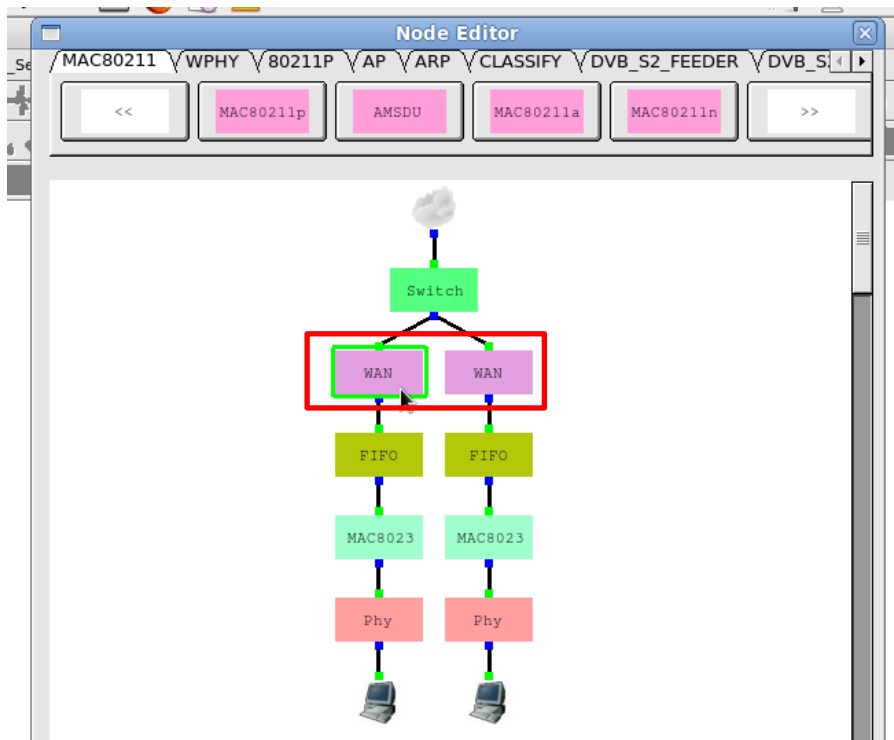


Fig.3 Double click the WAN protocol stack.

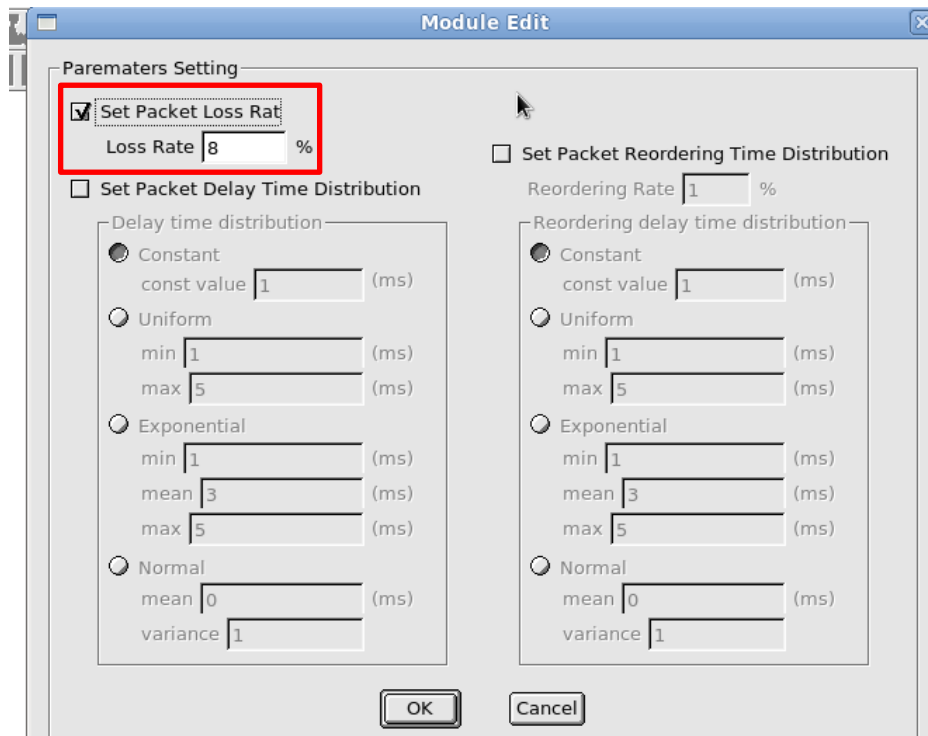


Fig.4 Mark "Set Packet Loss Rate" and edit the value of the blank.

Packet reordering

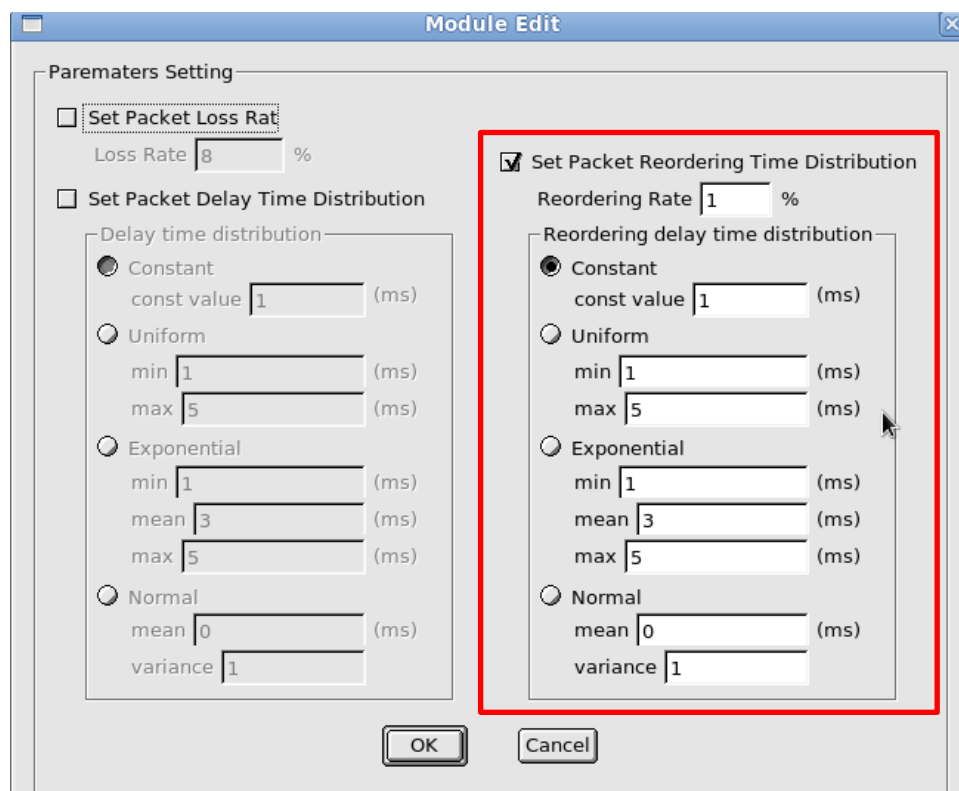


Fig.5 Mark "Set Packet Reordering Time Distribution" and edit the value of blanks.

Link delay

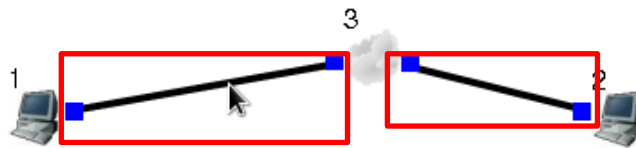


Fig.6 Double click the link.

LINK

From Host1 to WAN3

Delay : 15000.0 (us) C.T.A.L C.T.A.C

Bandwidth: 100.00 (Mbps) C.T.A.L C.T.A.C

BER : 0.0000000000 C.T.A.L C.T.A.C

Down time

Start (s)	End (s)
-----------	---------

Add

Delete

C.T.A.L

From WAN3 to Host1

Delay: 15000.0 (us) C.T.A.L C.T.A.C

Bandwidth: 100.00 (Mbps) C.T.A.L C.T.A.C

BER : 0.0000000000 C.T.A.L C.T.A.C

Down time

Start (s)	End (s)
-----------	---------

Add

Delete

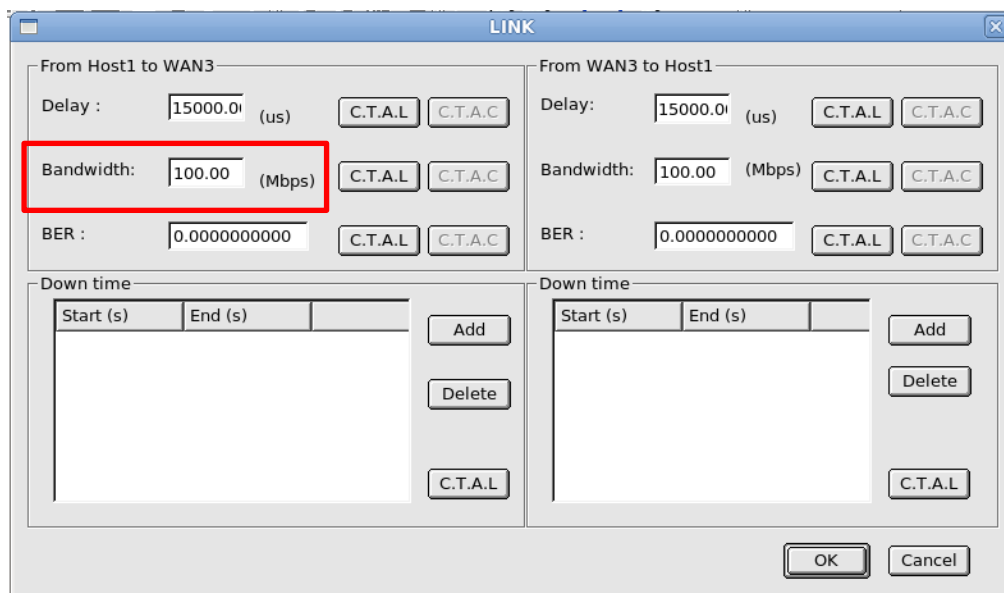
C.T.A.L

OK Cancel

Fig.7 Edit the Delay value.

You may use C.T.A.L (Copy To All Link) button applying the value to all links.

Bandwidth



The screenshot shows a window titled "LINK" with a close button in the top right corner. It is divided into two main sections: "From Host1 to WAN3" on the left and "From WAN3 to Host1" on the right. Each section contains three input fields: "Delay:" with a value of "15000.0" and unit "(us)", "Bandwidth:" with a value of "100.00" and unit "(Mbps)", and "BER:" with a value of "0.0000000000". Each input field has two buttons to its right: "C.T.A.L" and "C.T.A.C". The "Bandwidth:" field in the left section is highlighted with a red rectangle. Below these sections are two "Down time" tables, each with columns for "Start (s)" and "End (s)", and buttons for "Add", "Delete", and "C.T.A.L". At the bottom right are "OK" and "Cancel" buttons.

Fig.8 Edit the Bandwidth value.

How to measure you performance

Correctness

Use "diff" to verify if they are identical.

Speed

You should use gettimeofday() to examine how long is the transfer time.

Use gettimeofday() before and after the receiving data loop.

```
struct timeval start_timeval, end_timeval;
//get start time
if(gettimeofday(&start_timeval, NULL) != 0)
{
    printf("gettimeofday failed\n");
    exit(1);
}
```

Fig.9 Use this code segment to record the start time.

```

//get end time
if(gettimeofday(&end_timeval, NULL) != 0)
{
    printf("gettimeofday failed\n");
    exit(1);
}
timecost = (end_timeval.tv_sec - start_timeval.tv_sec) * 1000;
timecost += (end_timeval.tv_usec - start_timeval.tv_usec) / 1000;

printf("*****\n");
printf("*****\nTotal time cost: %f ms\n *****\n", timecost);
printf("*****\n");

```

Fig.10 Use this code segment to record the end time and show it.

Your program output will be shown on the coordinator window.

You should check coordinator window to understand your time consumed.

Traffic

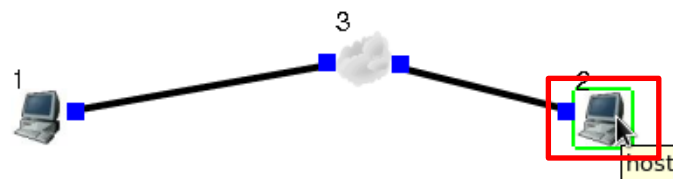


Fig.11 Double click the receiver host.

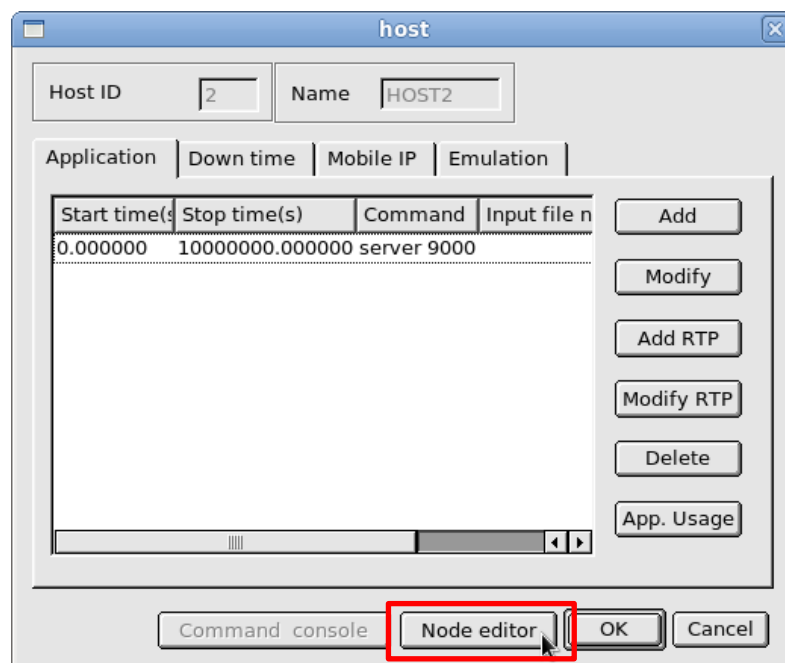


Fig.12 Click the "node editor".

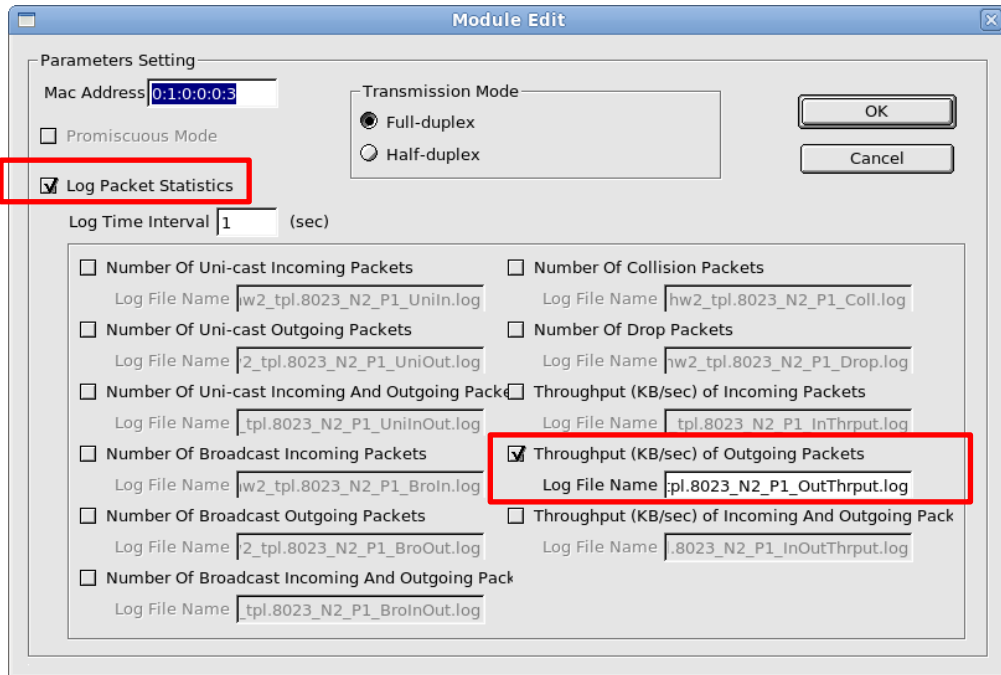


Fig.13 Mark “Log Packet Statistics” and “Throughput (KB/sec) of Outgoing Packets”

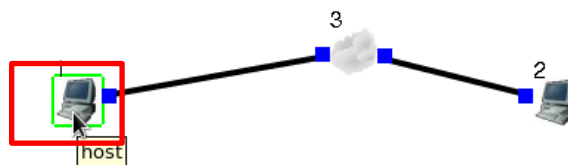


Fig.14 Double click the sender host.

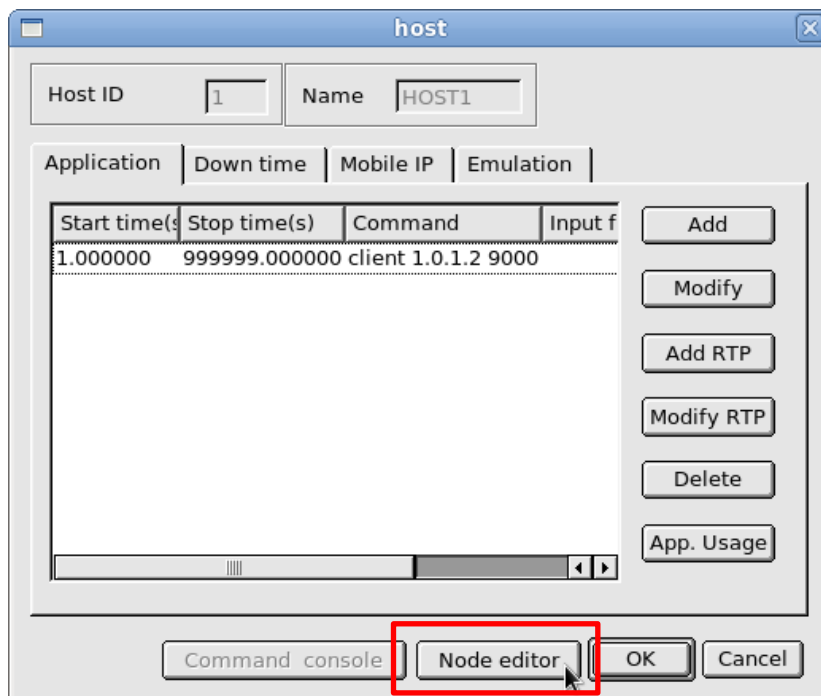


Fig.15 Click the “Node editor”.

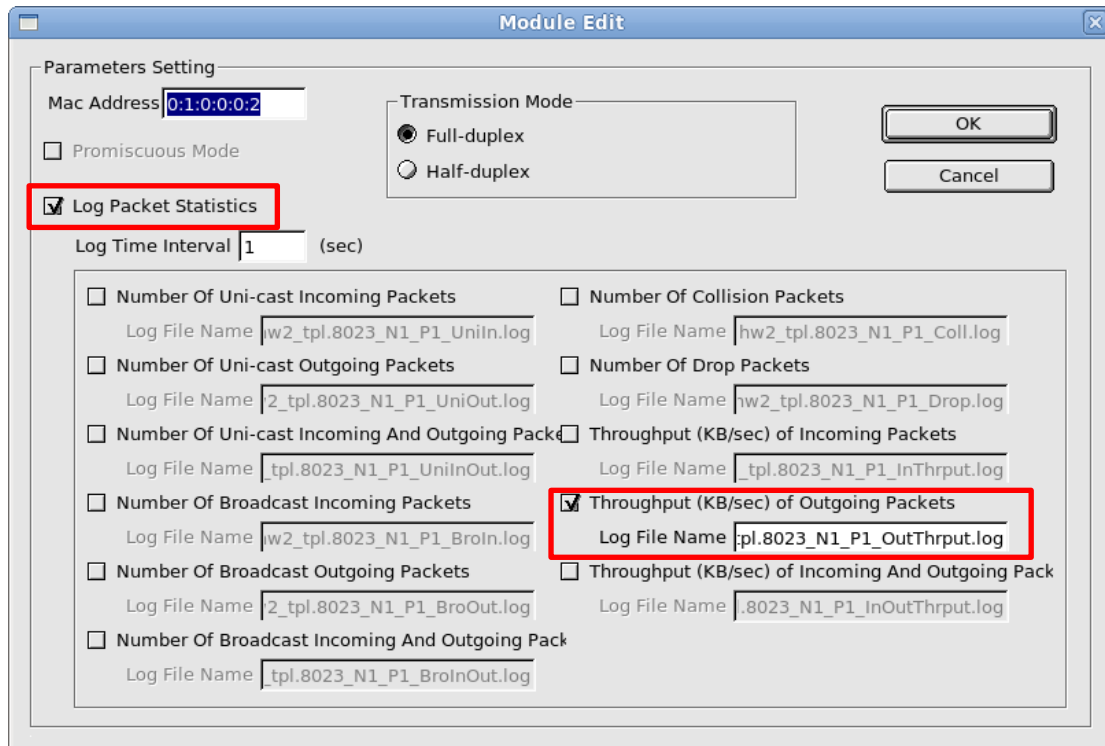


Fig.16 Mark “Log Packet Statistics” and “Throughput (KB/sec) of Outgoing Packets”.

After simulation is done, the log file is in your result directory.

If your topology (.tpl) is saved in hw2_tpl, you should see the result as below.

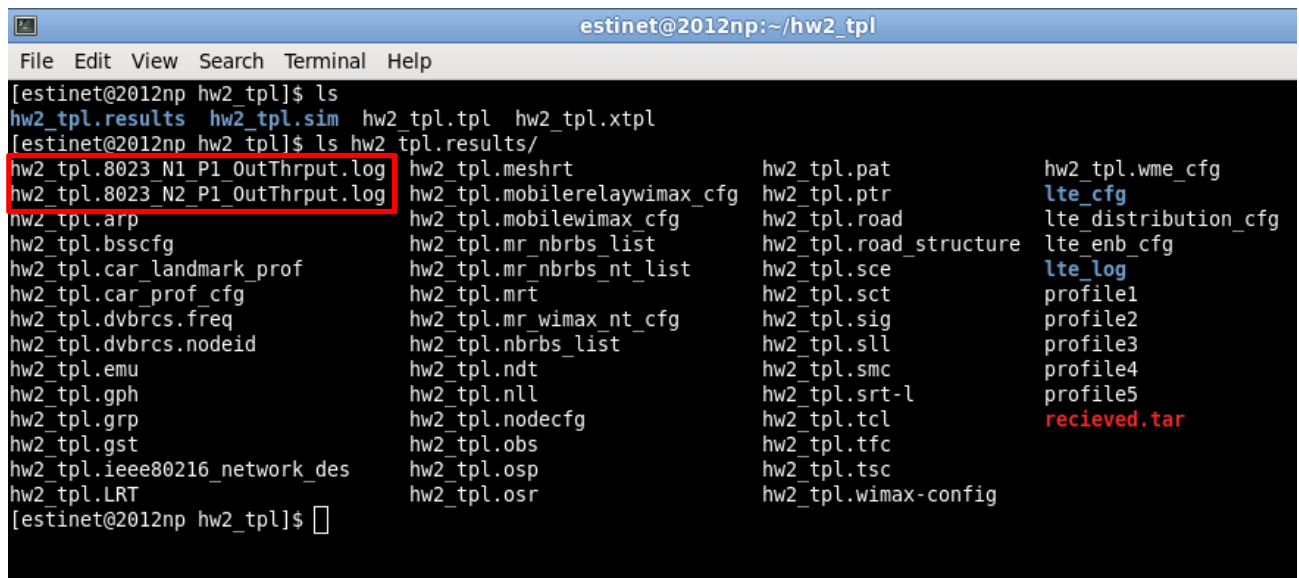


Fig.17 The files marked is the log files of sender and receiver.

To sum the total traffic, use the command below.

```
$ awk '{ sum += $2 } END { print sum }' hw2_tpl.8023_N1_P1_OutThrput.log  
hw2_tpl.8023_N2_P1_OutThrput.log
```

```
[estinet@2012np hw2_tpl]$ cd hw2_tpl.results/  
[estinet@2012np hw2_tpl.results]$ awk '{ sum += $2 } END { print sum }' hw2_tpl.8023_N1_P1_OutThrput.log hw2_tpl.8023_N2_P1_OutThrput.log  
8092.99  
[estinet@2012np hw2_tpl.results]$
```

Fig.18 Use awk to sum the total traffic.

- Log file names may differ from here; adjust your command to fit your settings.

Caution

1. Due date is 2013/1/18 23:59.
2. Tar your source code, name it as <Student ID>_<Version>.tar, and upload it.
3. The input file is “/tmp/a_big_file” and the output file is “/tmp/output_file”.
4. Every configuration value shown in these figures **DOES NOT** stand for the values being used in formal demonstration.
5. The receiver **SHOULD NOT** read the source file (a_big_file) locally. That is, the following code segment should not appear in the receiver’s code.

```
$ fp = fopen(“a_big_file”, “rb”);
```