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

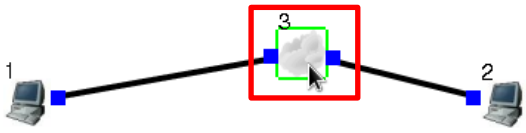

Fig.1 Double click the WAN icon.

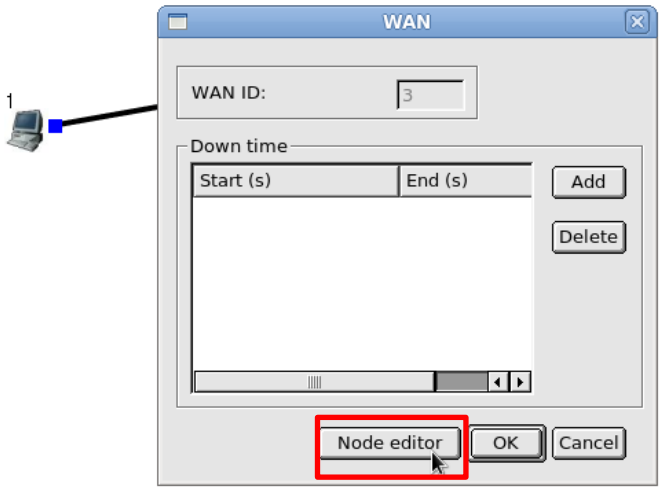

Fig.2 Click the "Node editor".

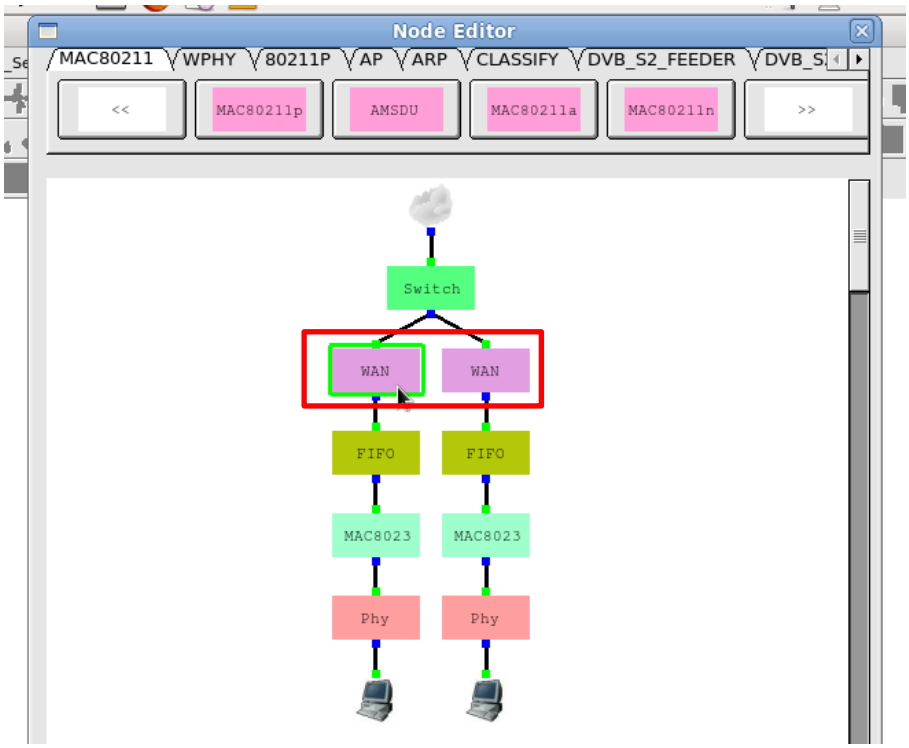

Fig.3 Double click the WAN protocol stack.

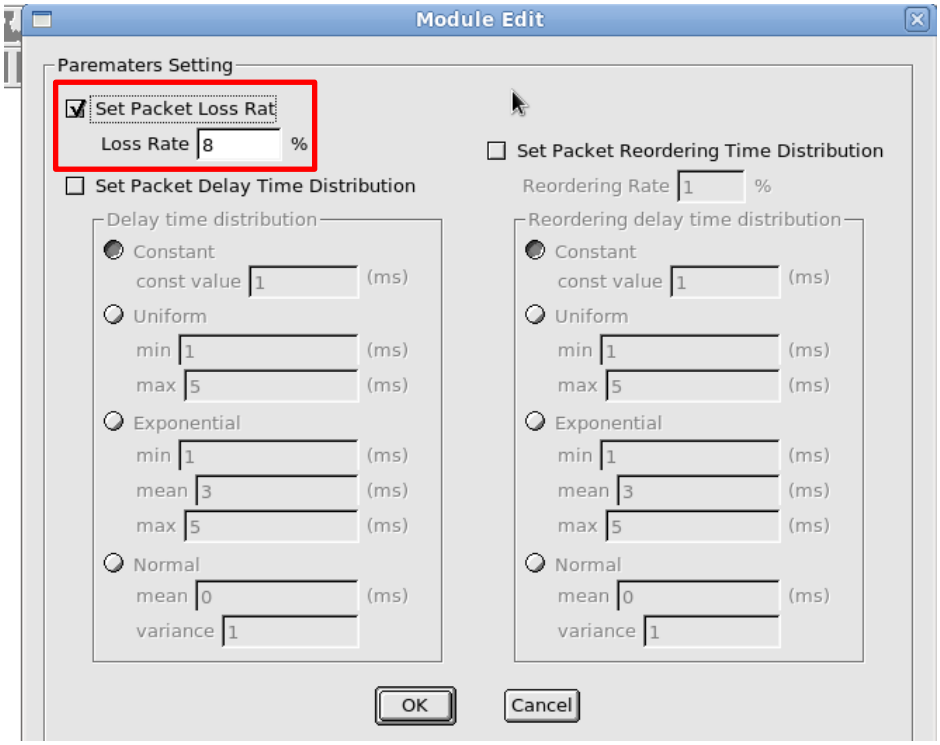

Fig.4 Mark "Set Packet Loss Rate" and edit the value of the blank.

Packet reordering

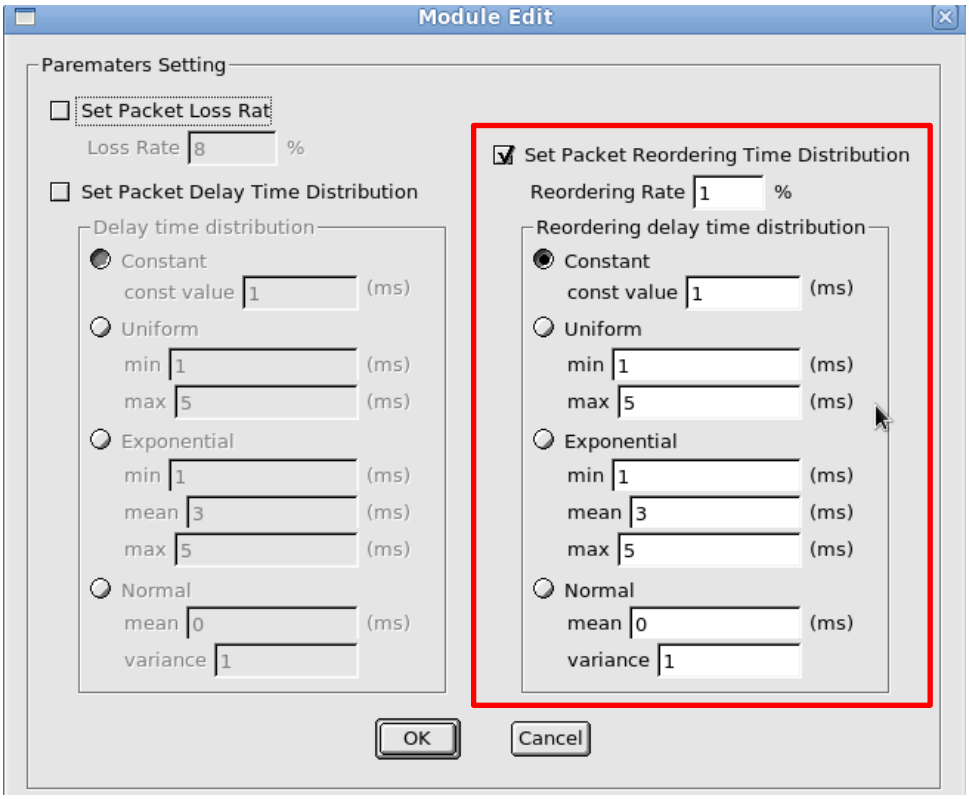

Fig.5 Mark "Set Packet Reordering Time Distribution" and edit the value of blanks.

Link delay

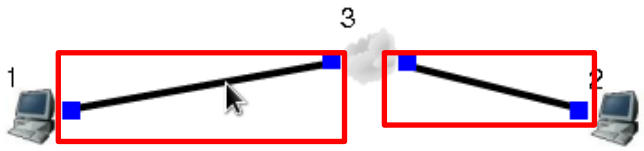

Fig.6 Double click the link.

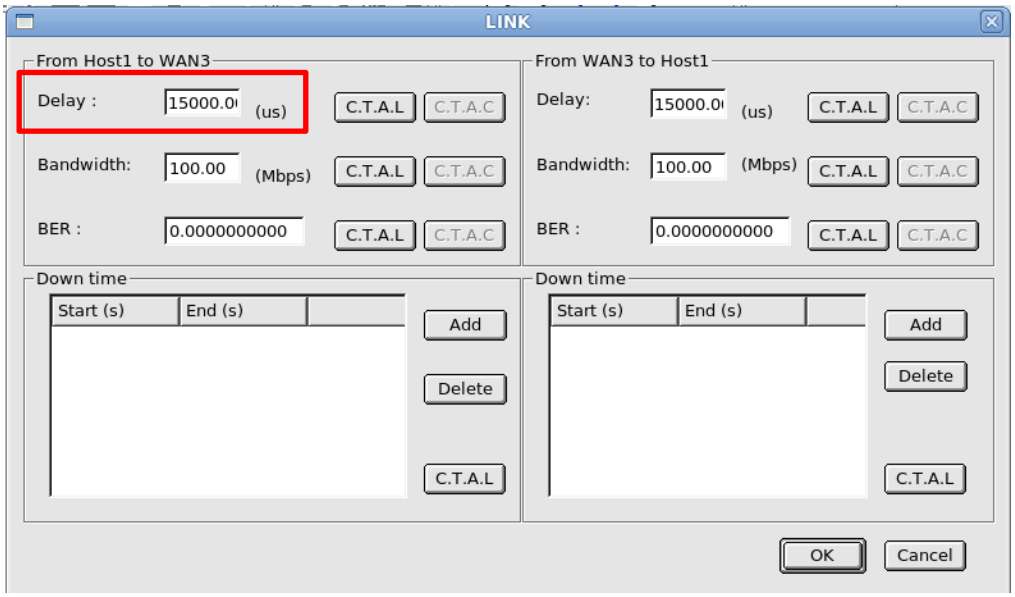

Fig.7 Edit the Delay value.

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

Bandwidth

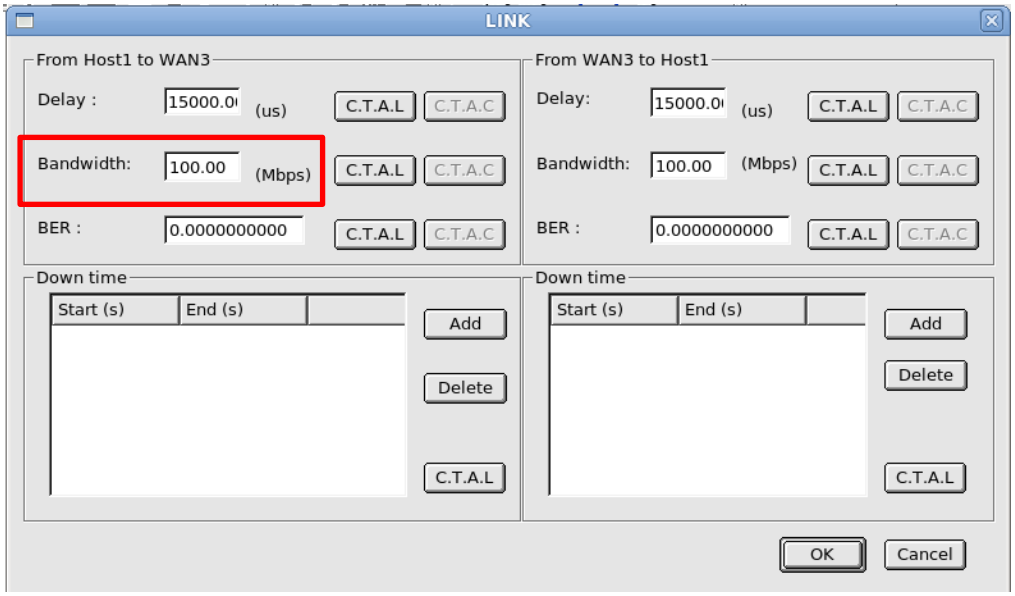

Fig.8 Edit the Bandwidth value.

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.

```c
//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

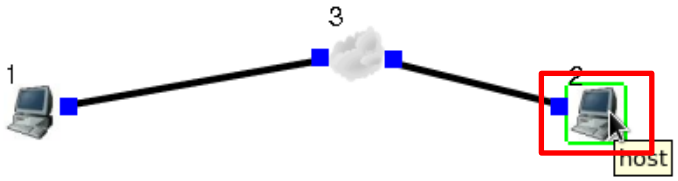

Fig.11 Double click the receiver host.

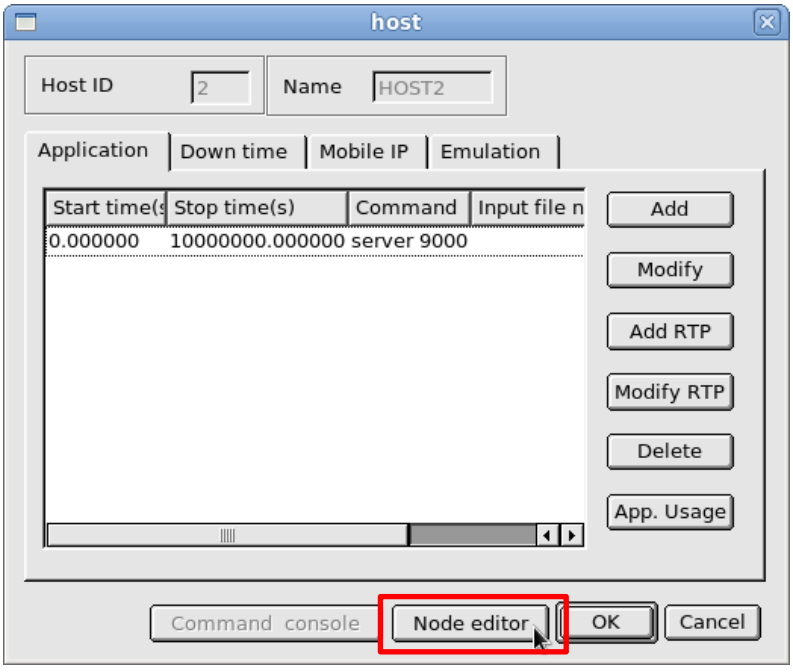

Fig.12 Click the “node editor”.

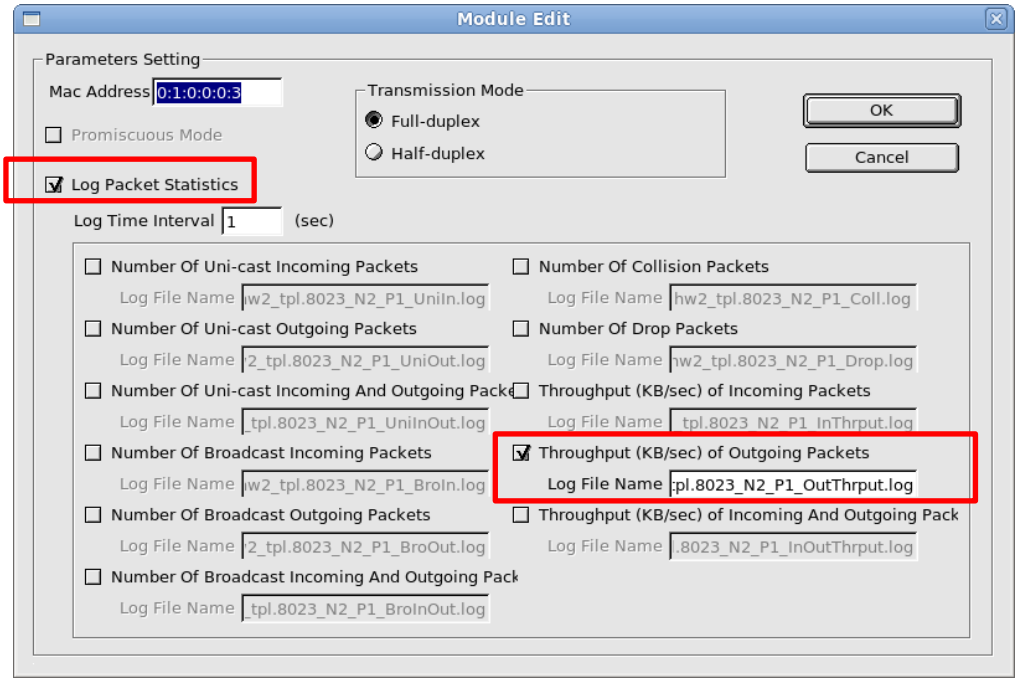

Fig.13 Mark "Log Packet Statistics" and "Throughput (KB/sec) of Outgoing Packets"

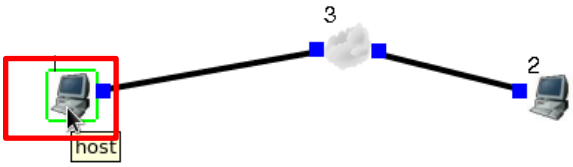

Fig.14 Double click the sender host.

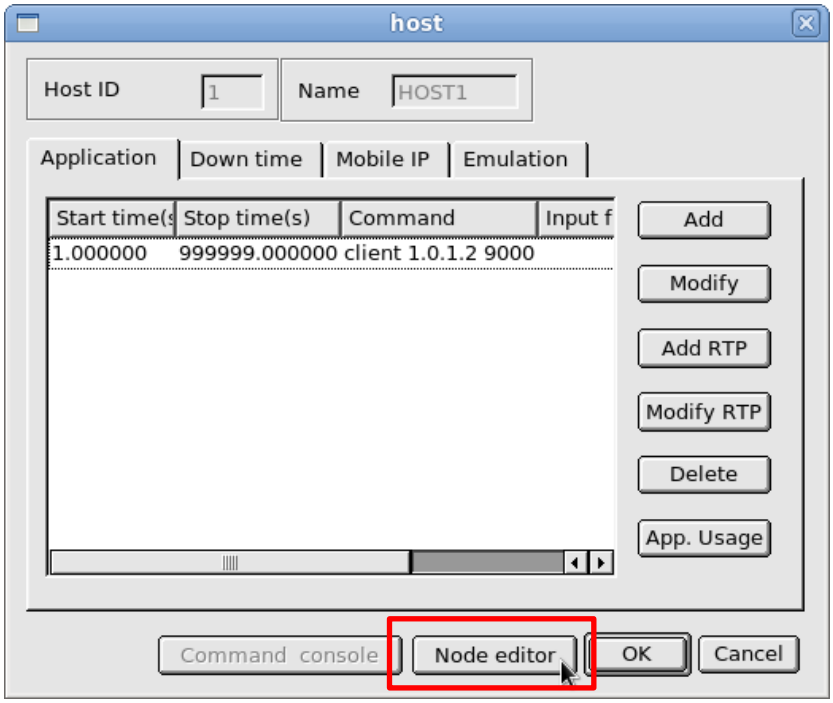

Fig.15 Click the "Node editor".

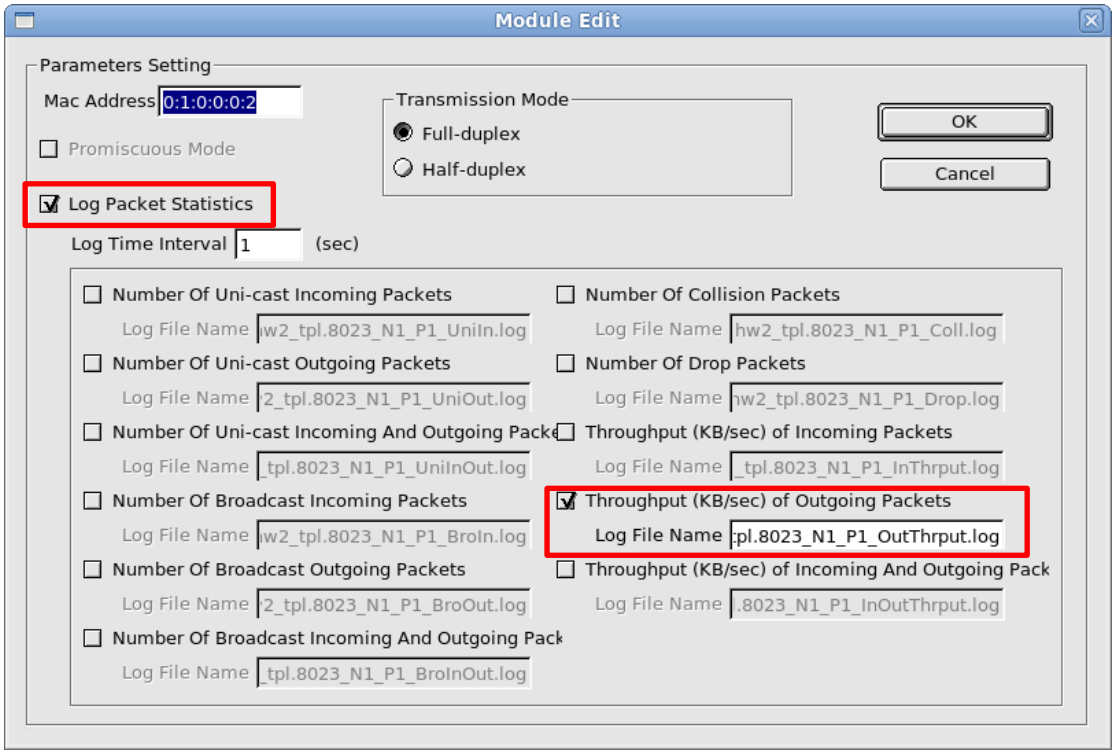

Fig.16 Mark "Log Packet Statistics" and "Throughput (KB/sec) of Outgoing Packets".

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.

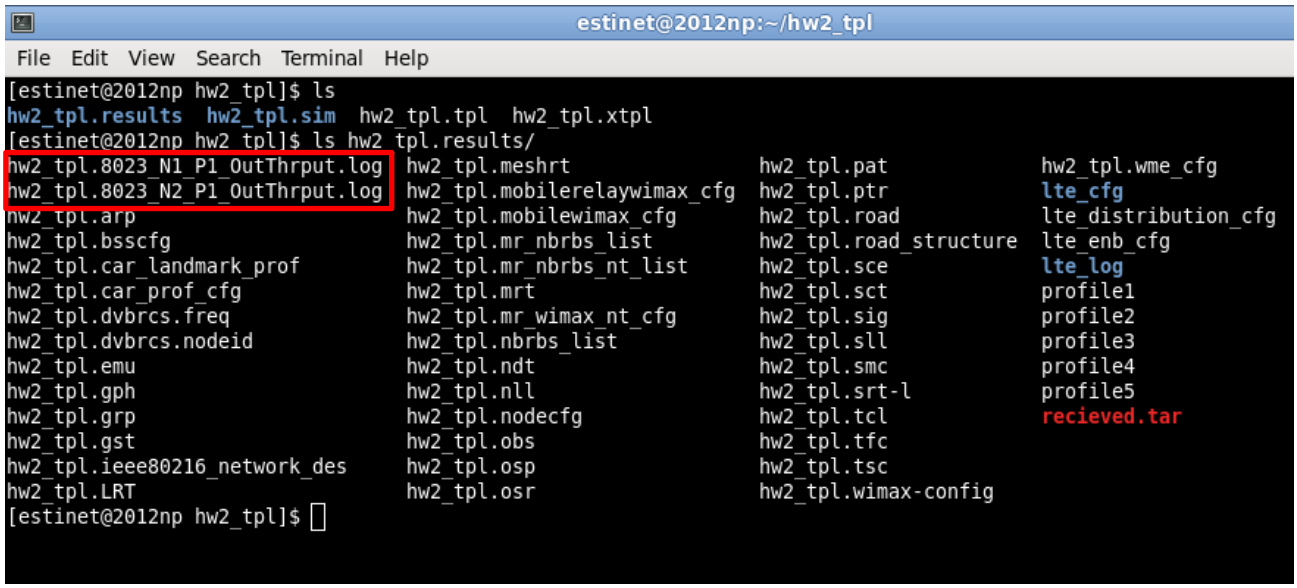

Fig.17 The files marked is the log files of sender and receiver.

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
```

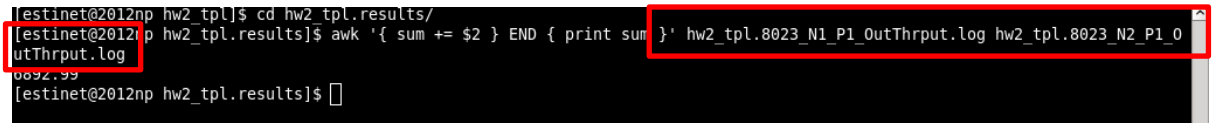

Fig.18 Use awk to sum the total traffic.

- 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");
```