NASA 2016 HW2 NA Part

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1.

References:

http://searchnetworking.techtarget.com/definition/10-Gigabit-Ethernet

http://www.cs.nthu.edu.tw/~nfhuang/chap04.htm

http://www.networking-forum.com/viewtopic.php?t=23208

First, the network will be pretty slow if the load is too high, causing frame collisions to happen quite often, and thus decreases the throughput. Next, CSMA/CD is not necessary for star network topology, while old types of Internet using bus topology needed it. Finally, since 10GbE disables half-duplex and only uses full-duplex, there is no need to use CSMA/CD to detect collision.

2.

References:

http://oilcut123.pixnet.net/blog/post/354490151-%5B%E6%95%B4%E7%90%86%5D-hi

http://www.codealias.info/technotes/the_hidden_and_exposed_terminal_problem_in_wireless_csma/ca

https://en.wikipedia.org/wiki/Exposed_node_problem

https://en.wikipedia.org/wiki/IEEE_802.11_RTS/CTS

(a)

The hidden terminal problem happens when two or more nodes, say A and B, are to send data to another third node C, but A and B might know nothing about each other, causing collisions. Another problem, the exposed terminal problem, happens when some node, say A, heard that another node B, is about to send data, and thus A postpones its own data, even if B isn't sending to A and won't affect A.

(b)

In order to solve these two problems, RTS/CTS is used. For the first problem, if A is going to send data to C, then it first sends an RTS packet to C, and then C sends back a CTS packet to A. After this, C doesn't accept any other node until A finishes its task, avoiding this type of collision.

For the second problem, A listens if B sends an RTS packet. But it seems that this doesn't completely solve this problem.

3.

References:

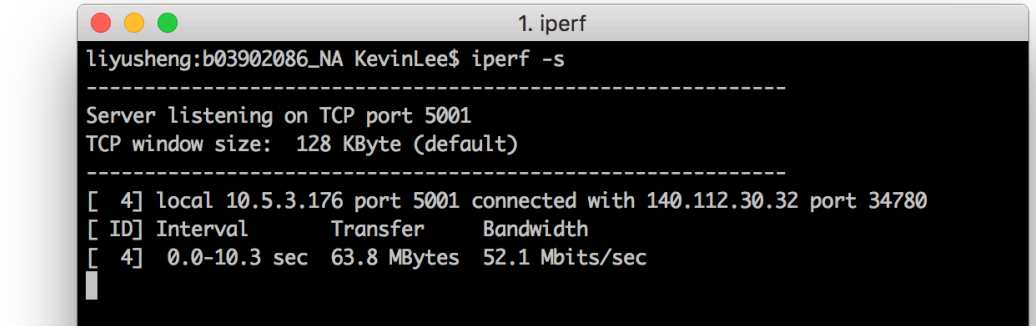
https://prasadlinuxblog.wordpress.com/2012/08/15/step-by-step-guide-installation-of-iperf-benchmarking-tool/

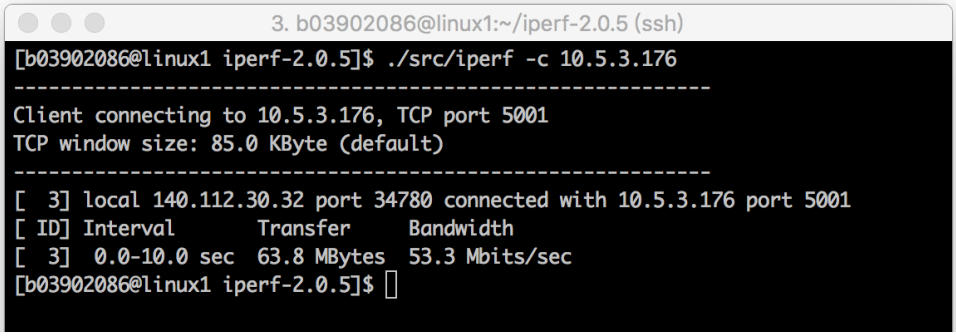
I installed iperf by the below commands:

```
wget http://sourceforge.net/projects/iperf/files/iperf-2.0.5.tar.gz
tar zxvf iperf-2.0.5.tar.gz
cd iperf-2.0.5/
./configure
make
make install
```

Surely the last step fails since I don't have the right privilege on the workstation. But I can still run the iperf program.

The media I used for this is WiFi ethernet (en0). The results are as follows:





This reminds me of the in-class test in R204, when the bandwidth is quite fast, even up to many Gbits/sec! And I think it's due to the difference between wireless WiFi and the wired net, or maybe the local host.