

B04902103 資工二 蔡昀達

1. Performance degrades exponentially as devices are added. Collisions degrade network performance.
2. $\text{Random}(0 \sim 2^5 - 1) = 1 / 32$
 $(4 * 512) / (10 * 1024 * 1024) = 1 / 5120$
3. 26.6 Mbits/sec

The screenshot shows two windows. The left window is a Windows command prompt with the following commands and output:

```
C:\Users\admin1114\Desktop\DSA\2017>cd ..
C:\Users\admin1114\Desktop\DSA>cd ..
C:\Users\admin1114\Desktop>cd nasa
C:\Users\admin1114\Desktop\nasa>cd iperf-2.0.8b-win64
C:\Users\admin1114\Desktop\nasa\iperf-2.0.8b-win64>ls
'ls' 不是内部或外部命令，可执行的程式或批次檔。
C:\Users\admin1114\Desktop\nasa\iperf-2.0.8b-win64>dir
磁碟區 C 中的磁碟是 Acer
磁碟區序號: A06C-C5E6
C:\Users\admin1114\Desktop\nasa\iperf-2.0.8b-win64 的目錄
2017/03/25 下午 06:00 <DIR> .
2017/03/25 下午 06:00 <DIR> ..
2016/02/27 上午 08:37 71,187 cyggcc_s-seh-1.0
2016/02/27 上午 08:38 1,371,155 cygstde++-6.dll
2016/01/24 上午 11:27 3,406,908 cygwin1.dll
2016/03/23 下午 02:21 179,559 iperf.exe
4 個檔案 5,028,809 位元組
2 個目錄 1,936,379,904 位元組可用
C:\Users\admin1114\Desktop\nasa\iperf-2.0.8b-win64>iperf.exe
Usage: iperf [-s|-c host] [options]
Try 'iperf --help' for more information.
C:\Users\admin1114\Desktop\nasa\iperf-2.0.8b-win64>iperf.exe -s
Server listening on TCP port 5001
TCP window size: 208 KByte (default)
[ 4] local 10.5.4.159 port 5001 connected with 140.112.30.32 port 55164
[ ID] Interval Transfer Bandwidth
[ 4] 0.0-10.3 sec 31.9 MBytes 26.6 Mbits/sec
```

The right window is a Linux terminal with the following output:

```
b04902103@linux1 [/tmp2/b04902103] ./iperf-static -c 10.5.4.159
Client connecting to 10.5.4.159, TCP port 5001
TCP window size: 85.0 KByte (default)
[ 3] local 140.112.30.32 port 55164 connected with 10.5.4.159 port 5001
[ ID] Interval Transfer Bandwidth
[ 3] 0.0-10.0 sec 31.9 MBytes 26.6 Mbits/sec
b04902103@linux1 [/tmp2/b04902103] ^C
b04902103@linux1 [/tmp2/b04902103]
```

Network statistics for the Linux interface:

```
RX packets 23378200090 bytes 5375259073869 (4.8 TiB)
RX errors 92589516 dropped 2188676548 overruns 0 frame 92589516
TX packets 1773043571 bytes 2147543140174 (1.9 TiB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

Interface details:

```
net1: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
inet 10.217.44.32 netmask 255.255.255.0 broadcast 10.217.44.255
inet6 fe80::baac:6fff:fe85:c953 prefixlen 64 scopeid 0x20<link>
ether b8:ac:6f:85:c9:53 txqueuelen 1000 (Ethernet)
RX packets 214910445 bytes 203173981552 (189.2 GiB)
RX errors 0 dropped 4474193 overruns 0 frame 0
TX packets 238583836 bytes 276708914428 (257.7 GiB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```