



### Setting up the interfaces

1. How many subnets are there in your topology?

4

2. As with the routing exercise, list all the subnets and the interface addresses.

Interface	IP Address
1	121.7.0.1/18
2	121.7.0.2/18
3	121.7.64.1/18
4	121.7.64.2/18
5	121.7.128.1/18
6	121.7.128.2/18
7	121.7.192.1/18
8	121.7.192.2/18

### Setting up routing

1. What commands did you use to configure RIP on the Cisco router? Include the running-config of the router. Call the file B.conf.

```
!  
version 12.1  
no service single-slot-reload-enable  
service timestamps debug uptime  
service timestamps log uptime  
no service password-encryption  
!  
hostname Router  
!  
!  
!
```

```
!  
!  
ip subnet-zero  
!  
!  
!  
!  
interface Ethernet0  
  ip address 121.7.0.1 255.255.192.0  
  media-type 10BaseT  
!  
interface Ethernet1  
  ip address 121.7.64.1 255.255.192.0  
  media-type 10BaseT  
!  
interface Ethernet2  
  ip address 121.7.128.1 255.255.192.0  
  media-type 10BaseT  
!  
interface Ethernet3  
  ip address 121.7.192.1 255.255.192.0  
  media-type 10BaseT  
!  
router rip  
  network 121.7.0.0  
  network 121.7.64.0  
  network 121.7.128.0  
  network 121.7.192.0  
  neighbor 121.7.0.2  
  neighbor 121.7.64.2  
  neighbor 121.7.128.2  
  neighbor 121.7.192.2  
!  
ip classless  
no ip http server  
!  
!  
!  
line con 0  
line aux 0  
line vty 0 4  
!  
end
```

**2. What commands did you use to configure ripd in zebra?**

**Router A**

```
!  
! Zebra configuration saved from vty  
!   2008/10/14 11:52:31  
!  
hostname A  
password zebra  
enable password zebra
```

```
!  
router rip  
  network 121.7.0.0/18  
  neighbor 121.7.0.1  
!  
line vty  
!
```

### **Router C**

```
!  
! Zebra configuration saved from vty  
!   2008/10/14 11:52:31  
!  
hostname C  
password zebra  
enable password zebra  
!  
router rip  
  network 121.7.64.0/18  
  neighbor 121.7.64.1  
!  
line vty  
!
```

### **Router D**

```
!  
! Zebra configuration saved from vty  
!   2008/10/14 11:52:31  
!  
hostname D  
password zebra  
enable password zebra  
!  
router rip  
  network 121.7.128.0/18  
  neighbor 121.7.128.1  
!  
line vty  
!
```

### **Router E**

```
!  
! Zebra configuration saved from vty  
!   2008/10/14 11:52:31  
!  
hostname E  
password zebra  
enable password zebra  
!  
router rip  
  network 121.7.192.0/18
```

```
neighbor 121.7.192.1
!  
line vty
!
```

## Setting up a Web server

### 1. What commands did you use to configure httpd (the web server) to do this?

```
/etc/init.d/httpd start
```

### 2. Instead of a browser, find a Linux command line tool that allows you to download web pages. Show me that your setup works by including in your submission a script of a Unix session where you actually download the two files on machine A (see the man page for the script command) using this command line tool.

```
Script started on Sun 26 Oct 2008 05:58:23 PM EDT  
]0;root@machine1:[?1034h[root@machine1 /]# wget  
http://121.7.64.2/tcpexpt/xorp-1/[K.O.tar.gz
```

```
--17:59:02-- http://121.7.64.2/tcpexpt/xorp-1.0.tar.gz  
=> `xorp-1.0.tar.gz'
```

```
Connecting to 121.7.64.2:80... connected.
```

```
HTTP request sent, awaiting response... 200 OK
```

```
Length: 7,240,796 (6.9M) [application/x-gzip]
```

```
0% [ ] 0 --.-K/s  
2% [ ] 195,210 954.71K/s  
5% [> ] 380,554 929.62K/s  
7% [=> ] 574,586 935.70K/s  
10% [==> ] 736,762 891.47K/s  
12% [====> ] 936,586 908.00K/s  
15% [=====> ] 1,156,768 935.70K/s  
18% [=====> ] 1,356,592 941.03K/s  
21% [=====> ] 1,570,896 953.80K/s  
24% [=====> ] 1,777,960 960.30K/s  
27% [=====> ] 1,987,920 966.70K/s  
29% [=====> ] 2,157,336 952.88K/s  
32% [=====> ] 2,356,440 954.52K/s  
35% [=====> ] 2,579,400 964.95K/s  
38% [=====> ] 2,785,776 968.04K/s  
41% [=====> ] 2,978,280 966.25K/s  
ETA 00:04  
44% [=====> ] 3,207,328 977.65K/s  
ETA 00:04  
47% [=====> ] 3,427,936 982.51K/s  
ETA 00:04
```

Length: 38,975 (38K) [text/html]

```
0% [ ] 0 --.--K/s
100%[=====>] 38,975 --.--K/s
```

17:59:45 (1003.56 KB/s) - `XEmacs.htm' saved [38975/38975]

```
]0;root@machine1:[root@machine1 /]# exit
```

exit

Script done on Sun 26 Oct 2008 06:01:54 PM EDT

## Of Mice and Elephants

### Part A

1. Include the shell script along with your submission. Name the file `tcp_fair.sh`.

```
#!/bin/bash

cd /C
wget http://121.7.64.2/tcpexpt/xorp-1.0.tar.gz &
l1=$!

cd /D

wget http://121.7.128.2/tcpexpt/xorp-1.0.tar.gz &
l2=$!

cd /E
wget http://121.7.192.2/tcpexpt/xorp-1.0.tar.gz &
l3=$!

cd /C
wget http://121.7.64.2/tcpexpt/XEmacs.htm &
s1=$!

wget http://121.7.64.2/tcpexpt/XEmacs.htm &
s2=$!

wget http://121.7.64.2/tcpexpt/XEmacs.htm &
s3=$!
```

```
cd /D
wget http://121.7.128.2/tcpexpt/XEmacs.htm &
s4=$!

wget http://121.7.128.2/tcpexpt/XEmacs.htm &
s5=$!

wget http://121.7.128.2/tcpexpt/XEmacs.htm &
s6=$!

cd /E
wget http://121.7.192.2/tcpexpt/XEmacs.htm &
s7=$!

wget http://121.7.192.2/tcpexpt/XEmacs.htm &
s8=$!

wget http://121.7.192.2/tcpexpt/XEmacs.htm &
s9=$!

while true
do

var1=`ps ax | grep $s1 | grep -v grep -c`
if [ $var1 -eq 0 ]
then
cd /C
wget http://121.7.64.2/tcpexpt/XEmacs.htm &
s1=$!
fi

var2=`ps ax | grep $s2 | grep -v grep -c`
if [ $var2 -eq 0 ]
then
cd /C
wget http://121.7.64.2/tcpexpt/XEmacs.htm &
s2=$!var10=`ps ax | grep $l1 | grep -v grep -c`
fi

var3=`ps ax | grep $s3 | grep -v grep -c`
if [ $var3 -eq 0 ]
then
cd /C
wget http://121.7.64.2/tcpexpt/XEmacs.htm &
s3=$!
fi

var4=`ps ax | grep $s4 | grep -v grep -c`
if [ $var4 -eq 0 ]
then
cd /D
wget http://121.7.128.2/tcpexpt/XEmacs.htm &
s4=$!
fi
```

```
var5=`ps ax | grep $s5 | grep -v grep -c`  
if [ $var5 -eq 0 ]  
then  
cd /D  
wget http://121.7.128.2/tcpexpt/XEmacs.htm &  
s5=$!  
fi
```

```
var6=`ps ax | grep $s6 | grep -v grep -c`  
if [ $var6 -eq 0 ]  
then  
cd /D  
wget http://121.7.128.2/tcpexpt/XEmacs.htm &  
s6=$!  
fi
```

```
var7=`ps ax | grep $s7 | grep -v grep -c`  
if [ $var7 -eq 0 ]  
then  
cd /E  
wget http://121.7.192.2/tcpexpt/XEmacs.htm &  
s7=$!  
fi
```

```
var8=`ps ax | grep $s8 | grep -v grep -c`  
if [ $var8 -eq 0 ]  
then  
cd /E  
wget http://121.7.192.2/tcpexpt/XEmacs.htm &  
s8=$!  
fi
```

```
var9=`ps ax | grep $s9 | grep -v grep -c`  
if [ $var9 -eq 0 ]  
then  
cd /E  
wget http://121.7.192.2/tcpexpt/XEmacs.htm &  
s9=$!  
fi
```

```
var10=`ps ax | grep $l1 | grep -v grep -c`  
var11=`ps ax | grep $l2 | grep -v grep -c`  
var12=`ps ax | grep $l3 | grep -v grep -c`
```

```
if [ $var10 -eq 0 ] && [ $var11 -eq 0 ] && [ $var12 -eq 0 ]  
then  
kill $s1  
kill $s2  
kill $s3  
kill $s4  
kill $s5  
kill $s6
```



```
kill $s7
kill $s8
kill $s9
kill $l1
kill $l2
kill $l3
exit 0
fi
done
exit 0
```

2. **Compress the traces from each of C, D, and E and include them in your submission. These traces must be named C.tcp\_fair.trace.gz, D.tcp\_fair.trace.gz etc.**

The files have been attached in submission.

3. **Include three summaries of these traces (i.e run tcptrace -b on them). These files must be text files and must be named: C.tcp\_fair.summary, D.tcp\_fair.summary etc.**

#### **C.tcp\_fair.summary**

1 arg remaining, starting with 'C.tcp\_fair.trace'

Ostermann's tcptrace -- version 6.6.7 -- Thu Nov 4, 2004

10932 packets seen, 10910 TCP packets traced

elapsed wallclock time: 0:00:00.459422, 23795 pkts/sec analyzed

trace file elapsed time: 0:04:38.105056

TCP connection info:

1: bb121-7-0-2.singnet.com.sg:52957 - bb121-7-64-2.singnet.com.sg:80 (a2b) 2906>  
5056< (complete)

2: bb121-7-0-2.singnet.com.sg:52959 - bb121-7-64-2.singnet.com.sg:80 (c2d) 10>  
8< (reset)

3: bb121-7-0-2.singnet.com.sg:52960 - bb121-7-64-2.singnet.com.sg:80 (e2f) 28>  
31< (complete)

4: bb121-7-0-2.singnet.com.sg:52961 - bb121-7-64-2.singnet.com.sg:80 (g2h) 10>  
8< (reset)

5: bb121-7-0-2.singnet.com.sg:52969 - bb121-7-64-2.singnet.com.sg:80 (i2j) 32>  
37< (complete)

6: bb121-7-0-2.singnet.com.sg:52970 - bb121-7-64-2.singnet.com.sg:80 (k2l) 27>  
32< (complete)

7: bb121-7-0-2.singnet.com.sg:52975 - bb121-7-64-2.singnet.com.sg:80 (m2n) 11>  
9< (reset)

8: bb121-7-0-2.singnet.com.sg:52976 - bb121-7-64-2.singnet.com.sg:80 (o2p) 9>  
7< (reset)

9: bb121-7-0-2.singnet.com.sg:52980 - bb121-7-64-2.singnet.com.sg:80 (q2r) 29>  
32< (complete)

10: bb121-7-0-2.singnet.com.sg:52983 - bb121-7-64-2.singnet.com.sg:80 (s2t) 31>  
34< (complete)

11: bb121-7-0-2.singnet.com.sg:52986 - bb121-7-64-2.singnet.com.sg:80 (u2v) 31>  
34< (complete)

12: bb121-7-0-2.singnet.com.sg:52989 - bb121-7-64-2.singnet.com.sg:80 (w2x) 33>  
35< (complete)

13: bb121-7-0-2.singnet.com.sg:52990 - bb121-7-64-2.singnet.com.sg:80 (y2z) 13>  
11< (reset)

14: bb121-7-0-2.singnet.com.sg:52991 - bb121-7-64-2.singnet.com.sg:80 (aa2ab) 13>  
11< (reset)

15: bb121-7-0-2.singnet.com.sg:52996 - bb121-7-64-2.singnet.com.sg:80 (ac2ad) 31>  
35< (complete)

16: bb121-7-0-2.singnet.com.sg:52998 - bb121-7-64-2.singnet.com.sg:80 (ae2af) 31>  
33< (complete)

17: bb121-7-0-2.singnet.com.sg:53000 - bb121-7-64-2.singnet.com.sg:80 (ag2ah) 28>  
32< (complete)

18: bb121-7-0-2.singnet.com.sg:53001 - bb121-7-64-2.singnet.com.sg:80 (ai2aj) 31>  
34< (complete)

19: bb121-7-0-2.singnet.com.sg:53003 - bb121-7-64-2.singnet.com.sg:80 (ak2al) 29>  
32< (complete)

20: bb121-7-0-2.singnet.com.sg:53006 - bb121-7-64-2.singnet.com.sg:80 (am2an) 33>  
38< (complete)

21: bb121-7-0-2.singnet.com.sg:53007 - bb121-7-64-2.singnet.com.sg:80 (ao2ap) 13>  
11< (reset)

22: bb121-7-0-2.singnet.com.sg:53008 - bb121-7-64-2.singnet.com.sg:80 (aq2ar) 7>  
7< (reset)

23: bb121-7-0-2.singnet.com.sg:53012 - bb121-7-64-2.singnet.com.sg:80 (as2at) 31>  
34< (complete)

24: bb121-7-0-2.singnet.com.sg:53015 - bb121-7-64-2.singnet.com.sg:80 (au2av) 31>  
34< (complete)

25: bb121-7-0-2.singnet.com.sg:53018 - bb121-7-64-2.singnet.com.sg:80 (aw2ax) 31>  
34< (complete)

26: bb121-7-0-2.singnet.com.sg:53021 - bb121-7-64-2.singnet.com.sg:80 (ay2az) 30>  
33< (complete)

27: bb121-7-0-2.singnet.com.sg:53023 - bb121-7-64-2.singnet.com.sg:80 (ba2bb) 31>  
33< (complete)

28: bb121-7-0-2.singnet.com.sg:53026 - bb121-7-64-2.singnet.com.sg:80 (bc2bd) 31>  
32< (complete)

29: bb121-7-0-2.singnet.com.sg:53030 - bb121-7-64-2.singnet.com.sg:80 (be2bf) 32>  
32< (complete)

30: bb121-7-0-2.singnet.com.sg:53031 - bb121-7-64-2.singnet.com.sg:80 (bg2bh) 9>  
7< (reset)

31: bb121-7-0-2.singnet.com.sg:53032 - bb121-7-64-2.singnet.com.sg:80 (bi2bj) 9>  
8< (reset)

32: bb121-7-0-2.singnet.com.sg:53037 - bb121-7-64-2.singnet.com.sg:80 (bk2bl) 30>  
31< (complete)

33: bb121-7-0-2.singnet.com.sg:53039 - bb121-7-64-2.singnet.com.sg:80 (bm2bn) 29>  
31< (complete)

34: bb121-7-0-2.singnet.com.sg:53041 - bb121-7-64-2.singnet.com.sg:80 (bo2bp) 30>  
32< (complete)

35: bb121-7-0-2.singnet.com.sg:53042 - bb121-7-64-2.singnet.com.sg:80 (bq2br) 31>  
32< (complete)

36: bb121-7-0-2.singnet.com.sg:53044 - bb121-7-64-2.singnet.com.sg:80 (bs2bt) 30>  
31< (complete)

37: bb121-7-0-2.singnet.com.sg:53045 - bb121-7-64-2.singnet.com.sg:80 (bu2bv) 31>  
34< (complete)

38: bb121-7-0-2.singnet.com.sg:53047 - bb121-7-64-2.singnet.com.sg:80 (bw2bx) 32>  
33< (complete)

39: bb121-7-0-2.singnet.com.sg:53049 - bb121-7-64-2.singnet.com.sg:80 (by2bz) 30>  
31< (complete)

40: bb121-7-0-2.singnet.com.sg:53050 - bb121-7-64-2.singnet.com.sg:80 (ca2cb) 29>  
31< (complete)

41: bb121-7-0-2.singnet.com.sg:53054 - bb121-7-64-2.singnet.com.sg:80 (cc2cd) 10>  
8< (reset)

42: bb121-7-0-2.singnet.com.sg:53055 - bb121-7-64-2.singnet.com.sg:80 (ce2cf) 7>  
8< (reset)

43: bb121-7-0-2.singnet.com.sg:53056 - bb121-7-64-2.singnet.com.sg:80 (cg2ch) 30>  
31< (complete)

44: bb121-7-0-2.singnet.com.sg:53060 - bb121-7-64-2.singnet.com.sg:80 (ci2cj) 29>  
31< (complete)

45: bb121-7-0-2.singnet.com.sg:53061 - bb121-7-64-2.singnet.com.sg:80 (ck2cl) 31>  
32< (complete)

46: bb121-7-0-2.singnet.com.sg:53063 - bb121-7-64-2.singnet.com.sg:80 (cm2cn) 29>  
31< (complete)

47: bb121-7-0-2.singnet.com.sg:53066 - bb121-7-64-2.singnet.com.sg:80 (co2cp) 29>  
32< (complete)

48: bb121-7-0-2.singnet.com.sg:53069 - bb121-7-64-2.singnet.com.sg:80 (cq2cr) 31>  
3a3< (complete)

49: bb121-7-0-2.singnet.com.sg:53070 - bb121-7-64-2.singnet.com.sg:80 (cs2ct) 30>  
31< (complete)

50: bb121-7-0-2.singnet.com.sg:53073 - bb121-7-64-2.singnet.com.sg:80 (cu2cv) 28>  
31< (complete)

51: bb121-7-0-2.singnet.com.sg:53074 - bb121-7-64-2.singnet.com.sg:80 (cw2cx) 29>  
31< (complete)

52: bb121-7-0-2.singnet.com.sg:53077 - bb121-7-64-2.singnet.com.sg:80 (cy2cz) 29>  
31< (complete)

53: bb121-7-0-2.singnet.com.sg:53080 - bb121-7-64-2.singnet.com.sg:80 (da2db) 29>  
31< (complete)

54: bb121-7-0-2.singnet.com.sg:53085 - bb121-7-64-2.singnet.com.sg:80 (dc2dd) 9>  
7< (reset)

55: bb121-7-0-2.singnet.com.sg:53086 - bb121-7-64-2.singnet.com.sg:80 (de2df) 29>  
31< (complete)

56: bb121-7-0-2.singnet.com.sg:53087 - bb121-7-64-2.singnet.com.sg:80 (dg2dh) 11>  
9< (reset)

57: bb121-7-0-2.singnet.com.sg:53091 - bb121-7-64-2.singnet.com.sg:80 (di2dj) 29>  
31< (complete)

58: bb121-7-0-2.singnet.com.sg:53094 - bb121-7-64-2.singnet.com.sg:80 (dk2dl) 28>  
31< (complete)

#### **D.tcp\_fair.summary**

1 arg remaining, starting with 'D.tcp\_fair.trace'

Ostermann's tcptrace -- version 6.6.7 -- Thu Nov 4, 2004

9538 packets seen, 9522 TCP packets traced

elapsed wallclock time: 0:00:00.459225, 20769 pkts/sec analyzed

trace file elapsed time: 0:03:14.029508

TCP connection info:

1: bb121-7-0-2.singnet.com.sg:59878 - bb121-7-128-2.singnet.com.sg:80 (a2b) 10>  
8< (reset)

2: bb121-7-0-2.singnet.com.sg:59884 - bb121-7-128-2.singnet.com.sg:80 (c2d) 9>  
8< (reset)

3: bb121-7-0-2.singnet.com.sg:59885 - bb121-7-128-2.singnet.com.sg:80 (e2f) 10>  
8< (reset)

4: bb121-7-0-2.singnet.com.sg:59886 - bb121-7-128-2.singnet.com.sg:80 (g2h) 31>  
35< (complete)

5: bb121-7-0-2.singnet.com.sg:59895 - bb121-7-128-2.singnet.com.sg:80 (i2j) 30>  
31< (complete)

6: bb121-7-0-2.singnet.com.sg:59899 - bb121-7-128-2.singnet.com.sg:80 (k2l) 2769>  
5037< (complete)

7: bb121-7-0-2.singnet.com.sg:59900 - bb121-7-128-2.singnet.com.sg:80 (m2n) 9>  
7< (reset)

8: bb121-7-0-2.singnet.com.sg:59901 - bb121-7-128-2.singnet.com.sg:80 (o2p) 9>  
7< (reset)

9: bb121-7-0-2.singnet.com.sg:59903 - bb121-7-128-2.singnet.com.sg:80 (q2r) 30>  
31< (complete)

10: bb121-7-0-2.singnet.com.sg:59906 - bb121-7-128-2.singnet.com.sg:80 (s2t) 31>  
33< (complete)

11: bb121-7-0-2.singnet.com.sg:59914 - bb121-7-128-2.singnet.com.sg:80 (u2v) 31>  
32< (complete)

12: bb121-7-0-2.singnet.com.sg:59916 - bb121-7-128-2.singnet.com.sg:80 (w2x) 9>  
7< (reset)

13: bb121-7-0-2.singnet.com.sg:59917 - bb121-7-128-2.singnet.com.sg:80 (y2z) 9>  
7< (reset)

14: bb121-7-0-2.singnet.com.sg:59931 - bb121-7-128-2.singnet.com.sg:80 (aa2ab) 9>  
7< (reset)

15: bb121-7-0-2.singnet.com.sg:59932 - bb121-7-128-2.singnet.com.sg:80 (ac2ad) 11>  
9< (reset)

16: bb121-7-0-2.singnet.com.sg:59935 - bb121-7-128-2.singnet.com.sg:80 (ae2af) 29>  
31< (complete)

17: bb121-7-0-2.singnet.com.sg:59938 - bb121-7-128-2.singnet.com.sg:80 (ag2ah) 30>  
31< (complete)

18: bb121-7-0-2.singnet.com.sg:59941 - bb121-7-128-2.singnet.com.sg:80 (ai2aj) 31>  
32< (complete)

19: bb121-7-0-2.singnet.com.sg:59944 - bb121-7-128-2.singnet.com.sg:80 (ak2al) 30>  
31< (complete)

20: bb121-7-0-2.singnet.com.sg:59946 - bb121-7-128-2.singnet.com.sg:80 (am2an)  
29> 32< (complete)

21: bb121-7-0-2.singnet.com.sg:59955 - bb121-7-128-2.singnet.com.sg:80 (ao2ap) 29>  
31< (complete)

22: bb121-7-0-2.singnet.com.sg:59956 - bb121-7-128-2.singnet.com.sg:80 (aq2ar) 9>  
7< (reset)

23: bb121-7-0-2.singnet.com.sg:59957 - bb121-7-128-2.singnet.com.sg:80 (as2at) 8>  
7< (reset)

24: bb121-7-0-2.singnet.com.sg:59960 - bb121-7-128-2.singnet.com.sg:80 (au2av) 29>  
31< (complete)

25: bb121-7-0-2.singnet.com.sg:59962 - bb121-7-128-2.singnet.com.sg:80 (aw2ax) 29>  
32< (complete)

26: bb121-7-0-2.singnet.com.sg:59965 - bb121-7-128-2.singnet.com.sg:80 (ay2az) 31>  
32< (complete)

27: bb121-7-0-2.singnet.com.sg:59968 - bb121-7-128-2.singnet.com.sg:80 (ba2bb) 32>  
33< (complete)

28: bb121-7-0-2.singnet.com.sg:59979 - bb121-7-128-2.singnet.com.sg:80 (bc2bd) 9>  
8< (reset)

29: bb121-7-0-2.singnet.com.sg:59980 - bb121-7-128-2.singnet.com.sg:80 (be2bf) 11>  
9< (reset)

30: bb121-7-0-2.singnet.com.sg:59986 - bb121-7-128-2.singnet.com.sg:80 (bg2bh) 29>  
31< (complete)

31: bb121-7-0-2.singnet.com.sg:59989 - bb121-7-128-2.singnet.com.sg:80 (bi2bj) 29>  
32< (complete)

32: bb121-7-0-2.singnet.com.sg:59993 - bb121-7-128-2.singnet.com.sg:80 (bk2bl) 31>  
33< (complete)

33: bb121-7-0-2.singnet.com.sg:59997 - bb121-7-128-2.singnet.com.sg:80 (bm2bn)  
30> 31< (complete)

34: bb121-7-0-2.singnet.com.sg:60000 - bb121-7-128-2.singnet.com.sg:80 (bo2bp) 29>  
31< (complete)

35: bb121-7-0-2.singnet.com.sg:60005 - bb121-7-128-2.singnet.com.sg:80 (bq2br) 29>  
31< (complete)

36: bb121-7-0-2.singnet.com.sg:60010 - bb121-7-128-2.singnet.com.sg:80 (bs2bt) 9>  
7< (reset)

37: bb121-7-0-2.singnet.com.sg:60011 - bb121-7-128-2.singnet.com.sg:80 (bu2bv) 29>  
31< (complete)

38: bb121-7-0-2.singnet.com.sg:60014 - bb121-7-128-2.singnet.com.sg:80 (bw2bx)  
29> 31< (complete)

39: bb121-7-0-2.singnet.com.sg:60017 - bb121-7-128-2.singnet.com.sg:80 (by2bz) 31>  
32< (complete)

### **E.tcp\_fair.summary**

1 arg remaining, starting with 'E.tcp\_fair.trace'  
Ostermann's tcptrace -- version 6.6.7 -- Thu Nov 4, 2004

10062 packets seen, 10050 TCP packets traced  
elapsed wallclock time: 0:00:00.337887, 29779 pkts/sec analyzed  
trace file elapsed time: 0:02:12.417514  
TCP connection info:

1: bb121-7-0-2.singnet.com.sg:40998 - bb121-7-192-2.singnet.com.sg:80 (a2b) 2892>  
5098< (complete)

2: bb121-7-0-2.singnet.com.sg:41005 - bb121-7-192-2.singnet.com.sg:80 (c2d) 18>  
16< (reset)

3: bb121-7-0-2.singnet.com.sg:41006 - bb121-7-192-2.singnet.com.sg:80 (e2f) 30>  
32< (complete)

4: bb121-7-0-2.singnet.com.sg:41007 - bb121-7-192-2.singnet.com.sg:80 (g2h) 18>  
16< (reset)

5: bb121-7-0-2.singnet.com.sg:41008 - bb121-7-192-2.singnet.com.sg:80 (i2j) 31>  
32< (complete)

6: bb121-7-0-2.singnet.com.sg:41011 - bb121-7-192-2.singnet.com.sg:80 (k2l) 12>  
10< (reset)



7: bb121-7-0-2.singnet.com.sg:41012 - bb121-7-192-2.singnet.com.sg:80 (m2n) 11>  
9< (reset)  
8: bb121-7-0-2.singnet.com.sg:41014 - bb121-7-192-2.singnet.com.sg:80 (o2p) 29>  
31< (complete)  
9: bb121-7-0-2.singnet.com.sg:41022 - bb121-7-192-2.singnet.com.sg:80 (q2r) 29>  
31< (complete)  
10: bb121-7-0-2.singnet.com.sg:41025 - bb121-7-192-2.singnet.com.sg:80 (s2t) 29>  
32< (complete)  
11: bb121-7-0-2.singnet.com.sg:41027 - bb121-7-192-2.singnet.com.sg:80 (u2v) 9>  
7< (reset)  
12: bb121-7-0-2.singnet.com.sg:41028 - bb121-7-192-2.singnet.com.sg:80 (w2x) 9>  
7< (reset)  
13: bb121-7-0-2.singnet.com.sg:41033 - bb121-7-192-2.singnet.com.sg:80 (y2z) 31>  
32< (complete)  
14: bb121-7-0-2.singnet.com.sg:41037 - bb121-7-192-2.singnet.com.sg:80 (aa2ab) 29>  
31< (complete)  
15: bb121-7-0-2.singnet.com.sg:41039 - bb121-7-192-2.singnet.com.sg:80 (ac2ad) 28>  
32< (complete)  
16: bb121-7-0-2.singnet.com.sg:41042 - bb121-7-192-2.singnet.com.sg:80 (ae2af) 31>  
33< (complete)  
17: bb121-7-0-2.singnet.com.sg:41044 - bb121-7-192-2.singnet.com.sg:80 (ag2ah) 9>  
7< (reset)  
18: bb121-7-0-2.singnet.com.sg:41045 - bb121-7-192-2.singnet.com.sg:80 (ai2aj) 9>  
7< (reset)  
19: bb121-7-0-2.singnet.com.sg:41051 - bb121-7-192-2.singnet.com.sg:80 (ak2al) 30>  
31< (complete)  
20: bb121-7-0-2.singnet.com.sg:41054 - bb121-7-192-2.singnet.com.sg:80 (am2an) 30>  
31< (complete)  
21: bb121-7-0-2.singnet.com.sg:41057 - bb121-7-192-2.singnet.com.sg:80 (ao2ap) 32>  
33< (complete)  
22: bb121-7-0-2.singnet.com.sg:41060 - bb121-7-192-2.singnet.com.sg:80 (aq2ar) 31>  
33< (complete)  
23: bb121-7-0-2.singnet.com.sg:41065 - bb121-7-192-2.singnet.com.sg:80 (as2at) 30>  
31< (complete)  
24: bb121-7-0-2.singnet.com.sg:41067 - bb121-7-192-2.singnet.com.sg:80 (au2av) 9>  
7< (reset)  
25: bb121-7-0-2.singnet.com.sg:41068 - bb121-7-192-2.singnet.com.sg:80 (aw2ax) 30>  
31< (complete)  
26: bb121-7-0-2.singnet.com.sg:41069 - bb121-7-192-2.singnet.com.sg:80 (ay2az) 7>  
7< (reset)  
27: bb121-7-0-2.singnet.com.sg:41076 - bb121-7-192-2.singnet.com.sg:80 (ba2bb) 30>  
32< (complete)  
28: bb121-7-0-2.singnet.com.sg:41088 - bb121-7-192-2.singnet.com.sg:80 (bc2bd) 29>  
31< (complete)  
29: bb121-7-0-2.singnet.com.sg:41091 - bb121-7-192-2.singnet.com.sg:80 (be2bf) 9>  
7< (reset)

30: bb121-7-0-2.singnet.com.sg:41092 - bb121-7-192-2.singnet.com.sg:80 (bg2bh) 8>  
7< (reset)  
31: bb121-7-0-2.singnet.com.sg:41093 - bb121-7-192-2.singnet.com.sg:80 (bi2bj) 30>  
31< (complete)  
32: bb121-7-0-2.singnet.com.sg:41099 - bb121-7-192-2.singnet.com.sg:80 (bk2bl) 32>  
32< (complete)  
33: bb121-7-0-2.singnet.com.sg:41102 - bb121-7-192-2.singnet.com.sg:80 (bm2bn) 29>  
31< (complete)  
34: bb121-7-0-2.singnet.com.sg:41105 - bb121-7-192-2.singnet.com.sg:80 (bo2bp) 30>  
31< (complete)  
35: bb121-7-0-2.singnet.com.sg:41108 - bb121-7-192-2.singnet.com.sg:80 (bq2br) 31>  
32< (complete)  
36: bb121-7-0-2.singnet.com.sg:41112 - bb121-7-192-2.singnet.com.sg:80 (bs2bt) 31>  
33< (complete)  
37: bb121-7-0-2.singnet.com.sg:41116 - bb121-7-192-2.singnet.com.sg:80 (bu2bv) 29>  
31< (complete)  
38: bb121-7-0-2.singnet.com.sg:41119 - bb121-7-192-2.singnet.com.sg:80 (bw2bx) 30>  
31< (complete)  
39: bb121-7-0-2.singnet.com.sg:41121 - bb121-7-192-2.singnet.com.sg:80 (by2bz) 9>  
7< (reset)  
40: bb121-7-0-2.singnet.com.sg:41122 - bb121-7-192-2.singnet.com.sg:80 (ca2cb) 11>  
9< (reset)  
41: bb121-7-0-2.singnet.com.sg:41124 - bb121-7-192-2.singnet.com.sg:80 (cc2cd) 29>  
32< (complete)  
42: bb121-7-0-2.singnet.com.sg:41130 - bb121-7-192-2.singnet.com.sg:80 (ce2cf) 31>  
32< (complete)  
43: bb121-7-0-2.singnet.com.sg:41133 - bb121-7-192-2.singnet.com.sg:80 (cg2ch) 28>  
32< (complete)  
44: bb121-7-0-2.singnet.com.sg:41136 - bb121-7-192-2.singnet.com.sg:80 (ci2cj) 31>  
32< (complete)

4. Now use **tcptrace** to compute the **average** throughput given to a short flow. Similarly, compute the average throughput achieved by a long flow. What values do you get?

Average Throughput of Long Flow at C: 351322Bps  
Average Throughput of Long Flow at D: 332422Bps  
Average Throughput of Long Flow at E: 332514Bps  
Average Throughput of Long Flow: 338756Bps

Average Throughput of Short Flow at C: 81421Bps  
Average Throughput of Short Flow at D: 86378Bps  
Average Throughput of Short Flow at E: 103425Bps  
Average Throughput of Short Flow: 90408Bps

5. **Are these two values different? Would you have expected them to be different? If the values turn out to be different, proceed to the next step. Otherwise stop here.**

These values come out to be different. These values must be different because the long flow packets occupy the queues at router most of the time and short flows would be penalized more often in case of congestion as they would have to back off and reduce their window size.

6. **Include the time-sequence plot (see the tcptrace manual for this) for one short flow from machine C. Name the file C.tcp\_fair.short.time-seq.eps. Include a time-sequence plot for the long flow from machine C. Name the file C.tcp\_fair.long.time-seq.eps. Do these two files give you an idea why you saw a throughput difference in step 4? Explain.**

7. **Is TCP fair to short flows?**

TCP is not fair to short flows when there is a single queue for both long and short flows at the router. Long flows have more packets than short flows and their packets occupy most of space in router buffers. Short flow packets find the queues full and their packets get dropped resulting in reduction of window size at the source resulting in throughput degradation. When long flow packets get dropped due to buffer overflow, their sources reduce their rate of packet transmission allowing for congestion level to reduce but then again new packets from the long flows occupy the buffers and the situation does not get better for long flows.

## Part B

1. **What commands did you use to enable RED on the Cisco?**

At interface Ethernet0 of Router B:

```
random-detect
```

2. **Compress the traces from each of C, D, and E and include them in your submission. These traces must be name C.tcp\_fair\_red.trace.gz, D.tcp\_fair\_red.trace.gz etc.**
3. **Include three summaries of these traces (i.e run tcptrace -b on them). These files must be text files and must be named: C.tcp\_fair\_red.summary, D.tcp\_fair\_red.summary etc.**

C.tcp\_fair\_red.summary

1 arg remaining, starting with 'C.tcp\_fair\_red.trace'

Ostermann's tcptrace -- version 6.6.7 -- Thu Nov 4, 2004

11106 packets seen, 11100 TCP packets traced

elapsed wallclock time: 0:00:00.498093, 22297 pkts/sec analyzed

trace file elapsed time: 0:00:57.018190

TCP connection info:

1: bb121-7-0-2.singnet.com.sg:42285 - bb121-7-64-2.singnet.com.sg:80 (a2b) 3302> 5121<  
(complete)

2: bb121-7-0-2.singnet.com.sg:42288 - bb121-7-64-2.singnet.com.sg:80 (c2d) 31> 34<  
(complete)

3: bb121-7-0-2.singnet.com.sg:42289 - bb121-7-64-2.singnet.com.sg:80 (e2f) 6> 8<  
(reset)

4: bb121-7-0-2.singnet.com.sg:42290 - bb121-7-64-2.singnet.com.sg:80 (g2h) 6> 8<  
(reset)

5: bb121-7-0-2.singnet.com.sg:42299 - bb121-7-64-2.singnet.com.sg:80 (i2j) 29> 31<  
(complete)

6: bb121-7-0-2.singnet.com.sg:42302 - bb121-7-64-2.singnet.com.sg:80 (k2l) 9> 7<  
(reset)

7: bb121-7-0-2.singnet.com.sg:42303 - bb121-7-64-2.singnet.com.sg:80 (m2n) 9> 7<  
(reset)

8: bb121-7-0-2.singnet.com.sg:42308 - bb121-7-64-2.singnet.com.sg:80 (o2p) 31> 32<  
(complete)

9: bb121-7-0-2.singnet.com.sg:42310 - bb121-7-64-2.singnet.com.sg:80 (q2r) 31> 32<  
(complete)

10: bb121-7-0-2.singnet.com.sg:42312 - bb121-7-64-2.singnet.com.sg:80 (s2t) 31> 32<  
(complete)

11: bb121-7-0-2.singnet.com.sg:42316 - bb121-7-64-2.singnet.com.sg:80 (u2v) 29> 31<  
(complete)

12: bb121-7-0-2.singnet.com.sg:42318 - bb121-7-64-2.singnet.com.sg:80 (w2x) 9> 7<  
(reset)

13: bb121-7-0-2.singnet.com.sg:42319 - bb121-7-64-2.singnet.com.sg:80 (y2z) 7> 7<  
(reset)

14: bb121-7-0-2.singnet.com.sg:42323 - bb121-7-64-2.singnet.com.sg:80 (aa2ab) 31> 33<  
(complete)

15: bb121-7-0-2.singnet.com.sg:42328 - bb121-7-64-2.singnet.com.sg:80 (ac2ad) 31> 32<  
(complete)

16: bb121-7-0-2.singnet.com.sg:42331 - bb121-7-64-2.singnet.com.sg:80 (ae2af) 29> 31<  
(complete)

17: bb121-7-0-2.singnet.com.sg:42334 - bb121-7-64-2.singnet.com.sg:80 (ag2ah) 29> 31<  
(complete)

18: bb121-7-0-2.singnet.com.sg:42340 - bb121-7-64-2.singnet.com.sg:80 (ai2aj) 10> 8<  
(reset)

19: bb121-7-0-2.singnet.com.sg:42341 - bb121-7-64-2.singnet.com.sg:80 (ak2al) 8> 7<  
(reset)

20: bb121-7-0-2.singnet.com.sg:42342 - bb121-7-64-2.singnet.com.sg:80 (am2an) 29> 31<  
(complete)

21: bb121-7-0-2.singnet.com.sg:42347 - bb121-7-64-2.singnet.com.sg:80 (ao2ap) 30> 31<  
(complete)

22: bb121-7-0-2.singnet.com.sg:42351 - bb121-7-64-2.singnet.com.sg:80 (aq2ar) 29> 31<  
(complete)

23: bb121-7-0-2.singnet.com.sg:42355 - bb121-7-64-2.singnet.com.sg:80 (as2at) 29> 31<  
(complete)

24: bb121-7-0-2.singnet.com.sg:42359 - bb121-7-64-2.singnet.com.sg:80 (au2av) 29> 31<  
(complete)

25: bb121-7-0-2.singnet.com.sg:42363 - bb121-7-64-2.singnet.com.sg:80 (aw2ax) 29> 31<  
(complete)

26: bb121-7-0-2.singnet.com.sg:42367 - bb121-7-64-2.singnet.com.sg:80 (ay2az) 31> 32<  
(complete)

27: bb121-7-0-2.singnet.com.sg:42371 - bb121-7-64-2.singnet.com.sg:80 (ba2bb) 8> 6<  
(reset)

28: bb121-7-0-2.singnet.com.sg:42372 - bb121-7-64-2.singnet.com.sg:80 (bc2bd) 8> 6<  
(reset)

29: bb121-7-0-2.singnet.com.sg:42376 - bb121-7-64-2.singnet.com.sg:80 (be2bf) 31> 32<  
(complete)

30: bb121-7-0-2.singnet.com.sg:42380 - bb121-7-64-2.singnet.com.sg:80 (bg2bh) 32> 32<  
(complete)

31: bb121-7-0-2.singnet.com.sg:42384 - bb121-7-64-2.singnet.com.sg:80 (bi2bj) 29> 31<  
(complete)

32: bb121-7-0-2.singnet.com.sg:42388 - bb121-7-64-2.singnet.com.sg:80 (bk2bl) 31> 32<  
(complete)

33: bb121-7-0-2.singnet.com.sg:42392 - bb121-7-64-2.singnet.com.sg:80 (bm2bn) 29> 31<  
(complete)

34: bb121-7-0-2.singnet.com.sg:42395 - bb121-7-64-2.singnet.com.sg:80 (bo2bp) 31> 32<  
(complete)

35: bb121-7-0-2.singnet.com.sg:42399 - bb121-7-64-2.singnet.com.sg:80 (bq2br) 32> 32<  
(complete)

36: bb121-7-0-2.singnet.com.sg:42403 - bb121-7-64-2.singnet.com.sg:80 (bs2bt) 32> 32<  
(complete)

37: bb121-7-0-2.singnet.com.sg:42407 - bb121-7-64-2.singnet.com.sg:80 (bu2bv) 8> 7<  
(reset)

38: bb121-7-0-2.singnet.com.sg:42408 - bb121-7-64-2.singnet.com.sg:80 (bw2bx) 9> 7<  
(reset)

39: bb121-7-0-2.singnet.com.sg:42412 - bb121-7-64-2.singnet.com.sg:80 (by2bz) 29> 31<  
(complete)

40: bb121-7-0-2.singnet.com.sg:42416 - bb121-7-64-2.singnet.com.sg:80 (ca2cb) 31> 32<  
(complete)

41: bb121-7-0-2.singnet.com.sg:42420 - bb121-7-64-2.singnet.com.sg:80 (cc2cd) 29> 31<  
(complete)

42: bb121-7-0-2.singnet.com.sg:42424 - bb121-7-64-2.singnet.com.sg:80 (ce2cf) 29> 31<  
(complete)

43: bb121-7-0-2.singnet.com.sg:42428 - bb121-7-64-2.singnet.com.sg:80 (cg2ch) 31> 33<  
(complete)

44: bb121-7-0-2.singnet.com.sg:42432 - bb121-7-64-2.singnet.com.sg:80 (ci2cj) 29> 31<  
(complete)

45: bb121-7-0-2.singnet.com.sg:42435 - bb121-7-64-2.singnet.com.sg:80 (ck2cl) 29> 31<  
(complete)

46: bb121-7-0-2.singnet.com.sg:42439 - bb121-7-64-2.singnet.com.sg:80 (cm2cn) 31> 32<  
(complete)

47: bb121-7-0-2.singnet.com.sg:42442 - bb121-7-64-2.singnet.com.sg:80 (co2cp) 29> 31<  
(complete)

48: bb121-7-0-2.singnet.com.sg:42448 - bb121-7-64-2.singnet.com.sg:80 (cq2cr) 9> 7<  
(reset)

49: bb121-7-0-2.singnet.com.sg:42449 - bb121-7-64-2.singnet.com.sg:80 (cs2ct) 9> 7<  
(reset)

50: bb121-7-0-2.singnet.com.sg:42450 - bb121-7-64-2.singnet.com.sg:80 (cu2cv) 31> 33<  
(complete)

51: bb121-7-0-2.singnet.com.sg:42455 - bb121-7-64-2.singnet.com.sg:80 (cw2cx) 29> 31<  
(complete)

52: bb121-7-0-2.singnet.com.sg:42459 - bb121-7-64-2.singnet.com.sg:80 (cy2cz) 29> 31<  
(complete)

53: bb121-7-0-2.singnet.com.sg:42463 - bb121-7-64-2.singnet.com.sg:80 (da2db) 31> 32<  
(complete)

54: bb121-7-0-2.singnet.com.sg:42469 - bb121-7-64-2.singnet.com.sg:80 (dc2dd) 29> 31<  
(complete)

55: bb121-7-0-2.singnet.com.sg:42472 - bb121-7-64-2.singnet.com.sg:80 (de2df) 29> 31<  
(complete)

#### **D.tcp\_fair\_red.summary**

1 arg remaining, starting with 'D.tcp\_fair\_red.trace'

Ostermann's tcptrace -- version 6.6.7 -- Thu Nov 4, 2004

10650 packets seen, 10646 TCP packets traced

elapsed wallclock time: 0:00:00.337501, 31555 pkts/sec analyzed

trace file elapsed time: 0:00:30.020409

TCP connection info:

1: bb121-7-0-2.singnet.com.sg:43684 - bb121-7-128-2.singnet.com.sg:80 (a2b) 3269> 5104<  
(complete)

2: bb121-7-0-2.singnet.com.sg:43689 - bb121-7-128-2.singnet.com.sg:80 (c2d) 31> 37<  
(complete)

3: bb121-7-0-2.singnet.com.sg:43690 - bb121-7-128-2.singnet.com.sg:80 (e2f) 8> 6<  
(reset)

4: bb121-7-0-2.singnet.com.sg:43691 - bb121-7-128-2.singnet.com.sg:80 (g2h) 6> 6<  
(reset)

5: bb121-7-0-2.singnet.com.sg:43695 - bb121-7-128-2.singnet.com.sg:80 (i2j) 28> 32<  
(complete)

6: bb121-7-0-2.singnet.com.sg:43698 - bb121-7-128-2.singnet.com.sg:80 (k2l) 11> 9<  
(reset)

7: bb121-7-0-2.singnet.com.sg:43699 - bb121-7-128-2.singnet.com.sg:80 (m2n) 9> 7<  
(reset)

8: bb121-7-0-2.singnet.com.sg:43702 - bb121-7-128-2.singnet.com.sg:80 (o2p) 9> 8<  
(reset)

9: bb121-7-0-2.singnet.com.sg:43713 - bb121-7-128-2.singnet.com.sg:80 (q2r) 9> 7<  
(reset)

10: bb121-7-0-2.singnet.com.sg:43715 - bb121-7-128-2.singnet.com.sg:80 (s2t) 10> 9<  
(reset)

11: bb121-7-0-2.singnet.com.sg:43728 - bb121-7-128-2.singnet.com.sg:80 (u2v) 33> 33<  
(complete)

12: bb121-7-0-2.singnet.com.sg:43733 - bb121-7-128-2.singnet.com.sg:80 (w2x) 32> 35<  
(complete)

13: bb121-7-0-2.singnet.com.sg:43735 - bb121-7-128-2.singnet.com.sg:80 (y2z) 9> 7<  
(reset)



14: bb121-7-0-2.singnet.com.sg:43736 - bb121-7-128-2.singnet.com.sg:80 (aa2ab) 13> 11<  
(reset)

15: bb121-7-0-2.singnet.com.sg:43742 - bb121-7-128-2.singnet.com.sg:80 (ac2ad) 31> 34<  
(complete)

16: bb121-7-0-2.singnet.com.sg:43746 - bb121-7-128-2.singnet.com.sg:80 (ae2af) 33> 33<  
(complete)

17: bb121-7-0-2.singnet.com.sg:43750 - bb121-7-128-2.singnet.com.sg:80 (ag2ah) 31> 32<  
(complete)

18: bb121-7-0-2.singnet.com.sg:43754 - bb121-7-128-2.singnet.com.sg:80 (ai2aj) 31> 32<  
(complete)

19: bb121-7-0-2.singnet.com.sg:43758 - bb121-7-128-2.singnet.com.sg:80 (ak2al) 29> 32<  
(complete)

20: bb121-7-0-2.singnet.com.sg:43762 - bb121-7-128-2.singnet.com.sg:80 (am2an) 32> 33<  
(complete)

21: bb121-7-0-2.singnet.com.sg:43766 - bb121-7-128-2.singnet.com.sg:80 (ao2ap) 9> 7<  
(reset)

22: bb121-7-0-2.singnet.com.sg:43767 - bb121-7-128-2.singnet.com.sg:80 (aq2ar) 12> 11<  
(reset)

23: bb121-7-0-2.singnet.com.sg:43768 - bb121-7-128-2.singnet.com.sg:80 (as2at) 31> 32<  
(complete)

24: bb121-7-0-2.singnet.com.sg:43775 - bb121-7-128-2.singnet.com.sg:80 (au2av) 29> 31<  
(complete)

25: bb121-7-0-2.singnet.com.sg:43779 - bb121-7-128-2.singnet.com.sg:80 (aw2ax) 31> 32<  
(complete)

26: bb121-7-0-2.singnet.com.sg:43783 - bb121-7-128-2.singnet.com.sg:80 (ay2az) 31> 32<  
(complete)

27: bb121-7-0-2.singnet.com.sg:43787 - bb121-7-128-2.singnet.com.sg:80 (ba2bb) 29> 31<  
(complete)

28: bb121-7-0-2.singnet.com.sg:43791 - bb121-7-128-2.singnet.com.sg:80 (bc2bd) 31> 32<  
(complete)

29: bb121-7-0-2.singnet.com.sg:43794 - bb121-7-128-2.singnet.com.sg:80 (be2bf) 29> 31<  
(complete)

30: bb121-7-0-2.singnet.com.sg:43798 - bb121-7-128-2.singnet.com.sg:80 (bg2bh) 31> 32<  
(complete)

31: bb121-7-0-2.singnet.com.sg:43802 - bb121-7-128-2.singnet.com.sg:80 (bi2bj) 32> 33<  
(complete)

32: bb121-7-0-2.singnet.com.sg:43803 - bb121-7-128-2.singnet.com.sg:80 (bk2bl) 9> 7<  
(reset)

33: bb121-7-0-2.singnet.com.sg:43804 - bb121-7-128-2.singnet.com.sg:80 (bm2bn) 9> 7<  
(reset)

34: bb121-7-0-2.singnet.com.sg:43811 - bb121-7-128-2.singnet.com.sg:80 (bo2bp) 29> 31<  
(complete)

35: bb121-7-0-2.singnet.com.sg:43815 - bb121-7-128-2.singnet.com.sg:80 (bq2br) 31> 32<  
(complete)

36: bb121-7-0-2.singnet.com.sg:43819 - bb121-7-128-2.singnet.com.sg:80 (bs2bt) 29> 31<  
(complete)

37: bb121-7-0-2.singnet.com.sg:43823 - bb121-7-128-2.singnet.com.sg:80 (bu2bv) 29> 31<  
(complete)

38: bb121-7-0-2.singnet.com.sg:43827 - bb121-7-128-2.singnet.com.sg:80 (bw2bx) 7> 8<  
(reset)

39: bb121-7-0-2.singnet.com.sg:43834 - bb121-7-128-2.singnet.com.sg:80 (by2bz) 32> 32<  
(complete)

40: bb121-7-0-2.singnet.com.sg:43838 - bb121-7-128-2.singnet.com.sg:80 (ca2cb) 31> 32<  
(complete)

41: bb121-7-0-2.singnet.com.sg:43841 - bb121-7-128-2.singnet.com.sg:80 (cc2cd) 31> 33<  
(complete)

42: bb121-7-0-2.singnet.com.sg:43844 - bb121-7-128-2.singnet.com.sg:80 (ce2cf) 9> 7<  
(reset)

43: bb121-7-0-2.singnet.com.sg:43845 - bb121-7-128-2.singnet.com.sg:80 (cg2ch) 9> 7<  
(reset)

44: bb121-7-0-2.singnet.com.sg:43850 - bb121-7-128-2.singnet.com.sg:80 (ci2cj) 29> 31<  
(complete)

45: bb121-7-0-2.singnet.com.sg:43854 - bb121-7-128-2.singnet.com.sg:80 (ck2cl) 30> 31<  
(complete)

46: bb121-7-0-2.singnet.com.sg:43858 - bb121-7-128-2.singnet.com.sg:80 (cm2cn) 29> 31<  
(complete)

47: bb121-7-0-2.singnet.com.sg:43862 - bb121-7-128-2.singnet.com.sg:80 (co2cp) 29> 31<  
(complete)

48: bb121-7-0-2.singnet.com.sg:43864 - bb121-7-128-2.singnet.com.sg:80 (cq2cr) 30> 32<  
(complete)

49: bb121-7-0-2.singnet.com.sg:43871 - bb121-7-128-2.singnet.com.sg:80 (cs2ct) 29> 31<  
(complete)

### **E.tcp\_fair\_red.summary**

1 arg remaining, starting with 'D.tcp\_fair\_red.trace'  
Ostermann's tcptrace -- version 6.6.7 -- Thu Nov 4, 2004

10650 packets seen, 10646 TCP packets traced  
elapsed wallclock time: 0:00:00.337501, 31555 pkts/sec analyzed  
trace file elapsed time: 0:00:30.020409

TCP connection info:

1: bb121-7-0-2.singnet.com.sg:43684 - bb121-7-128-2.singnet.com.sg:80 (a2b) 3269> 5104<  
(complete)

2: bb121-7-0-2.singnet.com.sg:43689 - bb121-7-128-2.singnet.com.sg:80 (c2d) 31> 37<  
(complete)

3: bb121-7-0-2.singnet.com.sg:43690 - bb121-7-128-2.singnet.com.sg:80 (e2f) 8> 6<  
(reset)

4: bb121-7-0-2.singnet.com.sg:43691 - bb121-7-128-2.singnet.com.sg:80 (g2h) 6> 6<  
(reset)

5: bb121-7-0-2.singnet.com.sg:43695 - bb121-7-128-2.singnet.com.sg:80 (i2j) 28> 32<  
(complete)

6: bb121-7-0-2.singnet.com.sg:43698 - bb121-7-128-2.singnet.com.sg:80 (k2l) 11> 9<  
(reset)

7: bb121-7-0-2.singnet.com.sg:43699 - bb121-7-128-2.singnet.com.sg:80 (m2n) 9> 7<  
(reset)

8: bb121-7-0-2.singnet.com.sg:43702 - bb121-7-128-2.singnet.com.sg:80 (o2p) 9> 8<  
(reset)

9: bb121-7-0-2.singnet.com.sg:43713 - bb121-7-128-2.singnet.com.sg:80 (q2r) 9> 7<  
(reset)

10: bb121-7-0-2.singnet.com.sg:43715 - bb121-7-128-2.singnet.com.sg:80 (s2t) 10> 9<  
(reset)  
11: bb121-7-0-2.singnet.com.sg:43728 - bb121-7-128-2.singnet.com.sg:80 (u2v) 33> 33<  
(complete)  
12: bb121-7-0-2.singnet.com.sg:43733 - bb121-7-128-2.singnet.com.sg:80 (w2x) 32> 35<  
(complete)  
13: bb121-7-0-2.singnet.com.sg:43735 - bb121-7-128-2.singnet.com.sg:80 (y2z) 9> 7<  
(reset)  
14: bb121-7-0-2.singnet.com.sg:43736 - bb121-7-128-2.singnet.com.sg:80 (aa2ab) 13> 11<  
(reset)  
15: bb121-7-0-2.singnet.com.sg:43742 - bb121-7-128-2.singnet.com.sg:80 (ac2ad) 31> 34<  
(complete)  
16: bb121-7-0-2.singnet.com.sg:43746 - bb121-7-128-2.singnet.com.sg:80 (ae2af) 33> 33<  
(complete)  
17: bb121-7-0-2.singnet.com.sg:43750 - bb121-7-128-2.singnet.com.sg:80 (ag2ah) 31> 32<  
(complete)  
18: bb121-7-0-2.singnet.com.sg:43754 - bb121-7-128-2.singnet.com.sg:80 (ai2aj) 31> 32<  
(complete)  
19: bb121-7-0-2.singnet.com.sg:43758 - bb121-7-128-2.singnet.com.sg:80 (ak2al) 29> 32<  
(complete)  
20: bb121-7-0-2.singnet.com.sg:43762 - bb121-7-128-2.singnet.com.sg:80 (am2an) 32> 33<  
(complete)  
21: bb121-7-0-2.singnet.com.sg:43766 - bb121-7-128-2.singnet.com.sg:80 (ao2ap) 9> 7<  
(reset)  
22: bb121-7-0-2.singnet.com.sg:43767 - bb121-7-128-2.singnet.com.sg:80 (aq2ar) 12> 11<  
(reset)  
23: bb121-7-0-2.singnet.com.sg:43768 - bb121-7-128-2.singnet.com.sg:80 (as2at) 31> 32<  
(complete)  
24: bb121-7-0-2.singnet.com.sg:43775 - bb121-7-128-2.singnet.com.sg:80 (au2av) 29> 31<  
(complete)  
25: bb121-7-0-2.singnet.com.sg:43779 - bb121-7-128-2.singnet.com.sg:80 (aw2ax) 31> 32<  
(complete)  
26: bb121-7-0-2.singnet.com.sg:43783 - bb121-7-128-2.singnet.com.sg:80 (ay2az) 31> 32<  
(complete)  
27: bb121-7-0-2.singnet.com.sg:43787 - bb121-7-128-2.singnet.com.sg:80 (ba2bb) 29> 31<  
(complete)  
28: bb121-7-0-2.singnet.com.sg:43791 - bb121-7-128-2.singnet.com.sg:80 (bc2bd) 31> 32<  
(complete)  
29: bb121-7-0-2.singnet.com.sg:43794 - bb121-7-128-2.singnet.com.sg:80 (be2bf) 29> 31<  
(complete)  
30: bb121-7-0-2.singnet.com.sg:43798 - bb121-7-128-2.singnet.com.sg:80 (bg2bh) 31> 32<  
(complete)  
31: bb121-7-0-2.singnet.com.sg:43802 - bb121-7-128-2.singnet.com.sg:80 (bi2bj) 32> 33<  
(complete)  
32: bb121-7-0-2.singnet.com.sg:43803 - bb121-7-128-2.singnet.com.sg:80 (bk2bl) 9> 7<  
(reset)

33: bb121-7-0-2.singnet.com.sg:43804 - bb121-7-128-2.singnet.com.sg:80 (bm2bn) 9> 7<  
(reset)  
34: bb121-7-0-2.singnet.com.sg:43811 - bb121-7-128-2.singnet.com.sg:80 (bo2bp) 29> 31<  
(complete)  
35: bb121-7-0-2.singnet.com.sg:43815 - bb121-7-128-2.singnet.com.sg:80 (bq2br) 31> 32<  
(complete)  
36: bb121-7-0-2.singnet.com.sg:43819 - bb121-7-128-2.singnet.com.sg:80 (bs2bt) 29> 31<  
(complete)  
37: bb121-7-0-2.singnet.com.sg:43823 - bb121-7-128-2.singnet.com.sg:80 (bu2bv) 29> 31<  
(complete)  
38: bb121-7-0-2.singnet.com.sg:43827 - bb121-7-128-2.singnet.com.sg:80 (bw2bx) 7> 8<  
(reset)  
39: bb121-7-0-2.singnet.com.sg:43834 - bb121-7-128-2.singnet.com.sg:80 (by2bz) 32> 32<  
(complete)  
40: bb121-7-0-2.singnet.com.sg:43838 - bb121-7-128-2.singnet.com.sg:80 (ca2cb) 31> 32<  
(complete)  
41: bb121-7-0-2.singnet.com.sg:43841 - bb121-7-128-2.singnet.com.sg:80 (cc2cd) 31> 33<  
(complete)  
42: bb121-7-0-2.singnet.com.sg:43844 - bb121-7-128-2.singnet.com.sg:80 (ce2cf) 9> 7<  
(reset)  
43: bb121-7-0-2.singnet.com.sg:43845 - bb121-7-128-2.singnet.com.sg:80 (cg2ch) 9> 7<  
(reset)  
44: bb121-7-0-2.singnet.com.sg:43850 - bb121-7-128-2.singnet.com.sg:80 (ci2cj) 29> 31<  
(complete)  
45: bb121-7-0-2.singnet.com.sg:43854 - bb121-7-128-2.singnet.com.sg:80 (ck2cl) 30> 31<  
(complete)  
46: bb121-7-0-2.singnet.com.sg:43858 - bb121-7-128-2.singnet.com.sg:80 (cm2cn) 29> 31<  
(complete)  
47: bb121-7-0-2.singnet.com.sg:43862 - bb121-7-128-2.singnet.com.sg:80 (co2cp) 29> 31<  
(complete)  
48: bb121-7-0-2.singnet.com.sg:43864 - bb121-7-128-2.singnet.com.sg:80 (cq2cr) 30> 32<  
(complete)  
49: bb121-7-0-2.singnet.com.sg:43871 - bb121-7-128-2.singnet.com.sg:80 (cs2ct) 29> 31<  
(complete)

4. Now use `tcptrace` to compute the average throughput given to a short flow.  
Similarly, compute the average throughput achieved by a long flow. What values do you get?

Average Throughput of Long Flow at C: 283751Bps  
Average Throughput of Long Flow at D: 286037Bps  
Average Throughput of Long Flow at E: 292375Bps  
Average Throughput of Long Flow: 287388Bps

Average Throughput of Short Flow at C: 94140Bps  
Average Throughput of Short Flow at D: 101258Bps

Average Throughput of Short Flow at E: 119235Bps  
Average Throughput of Short Flow: 104877Bps

**5. Are these two values different? Would you have expected them to be different?**

The values come out to be different.

**6. How do these values compare with the throughputs obtained using FIFO (the default queueing behavior)?**

The average throughput of Long Flows has decreased as RED penalizes long flows more than short flows. As the number of packets of long flows are more as compared to in the queue, the packets of long flows would be dropped more to inform about congestion and hence the long flows would decrease their window size more often resulting in lower throughput than the previous case. The throughput of short flows has increased from the previous case as the short flows will be dropped less often.

## Isolation

**1. Include the shell script along with your submission. Name the file tcp\_iso.sh.**

```
#!/bin/bash

ttcp -l 1460 -u -s -r -n 10000 &
x2=$!
ssh 121.7.64.2 'ttcp -u -l 1460 -s -t 121.7.0.2 -n 10000' &
x1=$!

cd /C
wget http://121.7.64.2/tcpexpt/xorp-1.0.tar.gz &
l1=$!

cd /D
wget http://121.7.128.2/tcpexpt/xorp-1.0.tar.gz &
l2=$!

cd /E
wget http://121.7.192.2/tcpexpt/xorp-1.0.tar.gz &
l3=$!

cd /C
wget http://121.7.64.2/tcpexpt/XEmacs.htm &
s1=$!

wget http://121.7.64.2/tcpexpt/XEmacs.htm &
s2=$!
```

```
wget http://121.7.64.2/tcpexpt/XEmacs.htm &
s3=$!

cd /D
wget http://121.7.128.2/tcpexpt/XEmacs.htm &
s4=$!

wget http://121.7.128.2/tcpexpt/XEmacs.htm &
s5=$!

wget http://121.7.128.2/tcpexpt/XEmacs.htm &
s6=$!

cd /E
wget http://121.7.192.2/tcpexpt/XEmacs.htm &
s7=$!

wget http://121.7.192.2/tcpexpt/XEmacs.htm &
s8=$!

wget http://121.7.192.2/tcpexpt/XEmacs.htm &
s9=$!

while true
do

var1=`ps ax | grep $s1 | grep -v grep -c`
if [ $var1 -eq 0 ]
then
cd /C
wget http://121.7.64.2/tcpexpt/XEmacs.htm &
s1=$!
fi

var2=`ps ax | grep $s2 | grep -v grep -c`
if [ $var2 -eq 0 ]
then
cd /C
wget http://121.7.64.2/tcpexpt/XEmacs.htm &
s2=$!
fi

var3=`ps ax | grep $s3 | grep -v grep -c`
if [ $var3 -eq 0 ]
then
cd /C
wget http://121.7.64.2/tcpexpt/XEmacs.htm &
s3=$!
fi

var4=`ps ax | grep $s4 | grep -v grep -c`
if [ $var4 -eq 0 ]
```

```
then
cd /D
wget http://121.7.128.2/tcpexpt/XEmacs.htm &
s4=$!
fi

var5=`ps ax | grep $s5 | grep -v grep -c`
if [ $var5 -eq 0 ]
then
cd /D
wget http://121.7.128.2/tcpexpt/XEmacs.htm &
s5=$!
fi

var6=`ps ax | grep $s6 | grep -v grep -c`
if [ $var6 -eq 0 ]
then
cd /D
wget http://121.7.128.2/tcpexpt/XEmacs.htm &
s6=$!
fi

var7=`ps ax | grep $s7 | grep -v grep -c`
if [ $var7 -eq 0 ]
then
cd /E
wget http://121.7.192.2/tcpexpt/XEmacs.htm & ttcp -l 1460 -u -s -r -n
1000000000 &
x1=$!
s7=$!
fi

var8=`ps ax | grep $s8 | grep -v grep -c`cd /C
if [ $var8 -eq 0 ]
then
cd /E
wget http://121.7.192.2/tcpexpt/XEmacs.htm &
s8=$!
fi

var9=`ps ax | grep $s9 | grep -v grep -c`
if [ $var9 -eq 0 ]
then
cd /E
wget http://121.7.192.2/tcpexpt/XEmacs.htm &
s9=$!
fi

var10=`ps ax | grep $l1 | grep -v grep -c`
var11=`ps ax | grep $l2 | grep -v grep -c`
var12=`ps ax | grep $l3 | grep -v grep -c`
if [ $var10 -eq 0 ] && [ $var11 -eq 0 ] && [ $var12 -eq 0 ]
then
kill $s1
kill $s2
```



```
kill $s3
kill $s4
kill $s5
kill $s6
kill $s7
kill $s8
kill $s9
kill $x1
kill $x2
exit 0
fi
done
```

2. **Compress the traces from each of C, D, and E and include them in your submission. These traces must be named C.tcp\_iso.trace.gz, D.tcp\_iso.trace.gz etc.**
3. **Include three summaries of these traces (i.e run tcptrace -b on them). These files must be text files and must be named: C.tcp\_iso.summary, D.tcp\_iso.summary etc.**

#### **C.tcp\_iso.summary**

1 arg remaining, starting with 'C.tcp\_iso\_fair.trace'

Ostermann's tcptrace -- version 6.6.7 -- Thu Nov 4, 2004

623841 packets seen, 10670 TCP packets traced

elapsed wallclock time: 0:00:01.275538, 489080 pkts/sec analyzed

trace file elapsed time: 0:14:38.602986

TCP connection info:

1: bb121-7-0-2.singnet.com.sg:36859 - bb121-7-64-2.singnet.com.sg:pcanywherestat  
(a2b) 23> 21< (reset)

2: bb121-7-0-2.singnet.com.sg:36717 - bb121-7-64-2.singnet.com.sg:80 (c2d)  
10> 13< (reset)

3: bb121-7-0-2.singnet.com.sg:36720 - bb121-7-64-2.singnet.com.sg:80 (e2f)  
27> 31< (complete)

4: bb121-7-0-2.singnet.com.sg:36721 - bb121-7-64-2.singnet.com.sg:80 (g2h)  
10> 10< (reset)

- 5: bb121-7-0-2.singnet.com.sg:36722 - bb121-7-64-2.singnet.com.sg:80 (i2j)  
13> 16< (reset)
- 6: bb121-7-0-2.singnet.com.sg:36730 - bb121-7-64-2.singnet.com.sg:80 (k2l)  
10> 13< (reset)
- 7: bb121-7-0-2.singnet.com.sg:36739 - bb121-7-64-2.singnet.com.sg:80 (m2n)  
28> 36< (complete)
- 8: bb121-7-0-2.singnet.com.sg:36753 - bb121-7-64-2.singnet.com.sg:80 (o2p)  
3> 7< (reset)
- 9: bb121-7-0-2.singnet.com.sg:36762 - bb121-7-64-2.singnet.com.sg:80 (q2r)  
27> 43< (complete)
- 10: bb121-7-0-2.singnet.com.sg:36780 - bb121-7-64-2.singnet.com.sg:80 (s2t)  
3150> 5240< (complete)
- 11: bb121-7-0-2.singnet.com.sg:36797 - bb121-7-64-2.singnet.com.sg:80 (u2v)  
6> 7< (reset)
- 12: bb121-7-0-2.singnet.com.sg:36800 - bb121-7-64-2.singnet.com.sg:80 (w2x)  
23> 31< (complete)
- 13: bb121-7-0-2.singnet.com.sg:36798 - bb121-7-64-2.singnet.com.sg:80 (y2z)  
11> 12< (reset)
- 14: bb121-7-0-2.singnet.com.sg:36804 - bb121-7-64-2.singnet.com.sg:80 (aa2ab)  
9> 9< (reset)
- 15: bb121-7-0-2.singnet.com.sg:36806 - bb121-7-64-2.singnet.com.sg:80 (ac2ad)  
23> 31< (complete) (reset)
- 16: bb121-7-0-2.singnet.com.sg:36809 - bb121-7-64-2.singnet.com.sg:80 (ae2af)  
24> 32< (complete) (reset)
- 17: bb121-7-0-2.singnet.com.sg:36811 - bb121-7-64-2.singnet.com.sg:80 (ag2ah)  
28> 35< (complete)
- 18: bb121-7-0-2.singnet.com.sg:36813 - bb121-7-64-2.singnet.com.sg:80 (ai2aj)  
9> 9< (reset)
- 19: bb121-7-0-2.singnet.com.sg:37672 - bb121-7-64-2.singnet.com.sg:80 (ak2al)  
27> 36< (complete)

20: bb121-7-0-2.singnet.com.sg:37670 - bb121-7-64-2.singnet.com.sg:80 (am2an)  
9> 13< (reset)

21: bb121-7-0-2.singnet.com.sg:37684 - bb121-7-64-2.singnet.com.sg:80 (ao2ap)  
32> 42< (complete) (reset)

22: bb121-7-0-2.singnet.com.sg:37701 - bb121-7-64-2.singnet.com.sg:80 (aq2ar)  
31> 40< (complete)

23: bb121-7-0-2.singnet.com.sg:37764 - bb121-7-64-2.singnet.com.sg:80 (as2at)  
27> 35< (complete)

24: bb121-7-0-2.singnet.com.sg:37778 - bb121-7-64-2.singnet.com.sg:80 (au2av)  
28> 37< (complete)

25: bb121-7-0-2.singnet.com.sg:37791 - bb121-7-64-2.singnet.com.sg:80 (aw2ax)  
25> 35< (complete)

26: bb121-7-0-2.singnet.com.sg:37798 - bb121-7-64-2.singnet.com.sg:80 (ay2az)  
28> 37< (complete)

27: bb121-7-0-2.singnet.com.sg:37809 - bb121-7-64-2.singnet.com.sg:80 (ba2bb)  
27> 38< (complete)

28: bb121-7-0-2.singnet.com.sg:37828 - bb121-7-64-2.singnet.com.sg:80 (bc2bd)  
26> 36< (complete)

29: bb121-7-0-2.singnet.com.sg:37832 - bb121-7-64-2.singnet.com.sg:80 (be2bf)  
11> 11< (reset)

30: bb121-7-0-2.singnet.com.sg:37837 - bb121-7-64-2.singnet.com.sg:80 (bg2bh)  
24> 35< (complete)

31: bb121-7-0-2.singnet.com.sg:37842 - bb121-7-64-2.singnet.com.sg:80 (bi2bj)  
11> 12< (reset)

32: bb121-7-0-2.singnet.com.sg:37843 - bb121-7-64-2.singnet.com.sg:80 (bk2bl)  
27> 37< (complete)

33: bb121-7-0-2.singnet.com.sg:37853 - bb121-7-64-2.singnet.com.sg:80 (bm2bn)  
7> 9< (reset)

34: bb121-7-0-2.singnet.com.sg:37855 - bb121-7-64-2.singnet.com.sg:80 (bo2bp)  
25> 33< (complete)

35: bb121-7-0-2.singnet.com.sg:37860 - bb121-7-64-2.singnet.com.sg:80 (bq2br)  
10> 14< (reset)

36: bb121-7-0-2.singnet.com.sg:37861 - bb121-7-64-2.singnet.com.sg:80 (bs2bt)  
27> 41<

37: bb121-7-0-2.singnet.com.sg:55725 - bb121-7-64-2.singnet.com.sg:80 (bu2bv)  
22> 34<

38: bb121-7-0-2.singnet.com.sg:55729 - bb121-7-64-2.singnet.com.sg:80 (bw2bx)  
30> 41< (reset)

39: bb121-7-0-2.singnet.com.sg:55731 - bb121-7-64-2.singnet.com.sg:80 (by2bz)  
28> 34< (complete)

40: bb121-7-0-2.singnet.com.sg:55734 - bb121-7-64-2.singnet.com.sg:80 (ca2cb)  
26> 38< (complete)

41: bb121-7-0-2.singnet.com.sg:55747 - bb121-7-64-2.singnet.com.sg:80 (cc2cd)  
28> 35< (complete)

42: bb121-7-0-2.singnet.com.sg:55751 - bb121-7-64-2.singnet.com.sg:80 (ce2cf)  
26> 33< (complete)

43: bb121-7-0-2.singnet.com.sg:55754 - bb121-7-64-2.singnet.com.sg:80 (cg2ch)  
27> 41< (complete)

44: bb121-7-0-2.singnet.com.sg:55790 - bb121-7-64-2.singnet.com.sg:80 (ci2cj)  
26> 38<

45: bb121-7-0-2.singnet.com.sg:55795 - bb121-7-64-2.singnet.com.sg:80 (ck2cl)  
24> 37< (complete)

46: bb121-7-0-2.singnet.com.sg:37818 - bb121-7-64-2.singnet.com.sg:80 (cm2cn)  
27> 35< (complete)

47: bb121-7-0-2.singnet.com.sg:37829 - bb121-7-64-2.singnet.com.sg:80 (co2cp)  
29> 35< (complete)

48: bb121-7-0-2.singnet.com.sg:37835 - bb121-7-64-2.singnet.com.sg:80 (cq2cr)  
1> 2<

#### **D.tcp\_iso.summary**

1 arg remaining, starting with 'D.tcp\_iso\_fair.trace'

Ostermann's tcptrace -- version 6.6.7 -- Thu Nov 4, 2004

30271 packets seen, 30209 TCP packets traced

elapsed wallclock time: 0:00:00.131431, 230318 pkts/sec analyzed

trace file elapsed time: 0:14:20.544493

TCP connection info:

1: bb121-7-0-2.singnet.com.sg:52138 - bb121-7-128-2.singnet.com.sg:80 (a2b) 4977>  
7060< (complete)

2: bb121-7-0-2.singnet.com.sg:52143 - bb121-7-128-2.singnet.com.sg:80 (c2d) 31>  
40< (complete)

3: bb121-7-0-2.singnet.com.sg:52144 - bb121-7-128-2.singnet.com.sg:80 (e2f) 10>  
11< (reset)

4: bb121-7-0-2.singnet.com.sg:52145 - bb121-7-128-2.singnet.com.sg:80 (g2h) 7>  
8< (reset)

5: bb121-7-0-2.singnet.com.sg:52149 - bb121-7-128-2.singnet.com.sg:80 (i2j) 31>  
41< (complete)

6: bb121-7-0-2.singnet.com.sg:52151 - bb121-7-128-2.singnet.com.sg:80 (k2l) 8>  
10< (reset)

7: bb121-7-0-2.singnet.com.sg:52153 - bb121-7-128-2.singnet.com.sg:80 (m2n) 9>  
10< (reset)

8: bb121-7-0-2.singnet.com.sg:52154 - bb121-7-128-2.singnet.com.sg:80 (o2p) 31>  
53< (complete)

9: bb121-7-0-2.singnet.com.sg:52156 - bb121-7-128-2.singnet.com.sg:80 (q2r) 32>  
50< (complete)

10: bb121-7-0-2.singnet.com.sg:52157 - bb121-7-128-2.singnet.com.sg:80 (s2t) 8>  
9< (reset)

11: bb121-7-0-2.singnet.com.sg:52161 - bb121-7-128-2.singnet.com.sg:80 (u2v) 31>  
48< (complete)

12: bb121-7-0-2.singnet.com.sg:52162 - bb121-7-128-2.singnet.com.sg:80 (w2x) 7>  
10< (reset)

13: bb121-7-0-2.singnet.com.sg:52163 - bb121-7-128-2.singnet.com.sg:80 (y2z) 8>  
12< (reset)

14: bb121-7-0-2.singnet.com.sg:52165 - bb121-7-128-2.singnet.com.sg:80 (aa2ab) 31>  
52< (complete)

15: bb121-7-0-2.singnet.com.sg:52166 - bb121-7-128-2.singnet.com.sg:80 (ac2ad) 35>  
44< (complete)

16: bb121-7-0-2.singnet.com.sg:52167 - bb121-7-128-2.singnet.com.sg:80 (ae2af) 31>  
48< (complete)

17: bb121-7-0-2.singnet.com.sg:52168 - bb121-7-128-2.singnet.com.sg:80 (ag2ah) 32>  
42< (complete)

18: bb121-7-0-2.singnet.com.sg:52170 - bb121-7-128-2.singnet.com.sg:80 (ai2aj) 7>  
9< (reset)

19: bb121-7-0-2.singnet.com.sg:52171 - bb121-7-128-2.singnet.com.sg:80 (ak2al) 31>  
49< (complete)

20: bb121-7-0-2.singnet.com.sg:52172 - bb121-7-128-2.singnet.com.sg:80 (am2an) 8>  
14< (reset)

21: bb121-7-0-2.singnet.com.sg:52175 - bb121-7-128-2.singnet.com.sg:80 (ao2ap) 31>  
38< (complete)

22: bb121-7-0-2.singnet.com.sg:52176 - bb121-7-128-2.singnet.com.sg:80 (aq2ar) 31>  
47< (complete)

23: bb121-7-0-2.singnet.com.sg:52177 - bb121-7-128-2.singnet.com.sg:80 (as2at) 31>  
41< (complete)

24: bb121-7-0-2.singnet.com.sg:52179 - bb121-7-128-2.singnet.com.sg:80 (au2av) 31>  
51< (complete)

25: bb121-7-0-2.singnet.com.sg:52180 - bb121-7-128-2.singnet.com.sg:80 (aw2ax) 31>  
45< (complete)

26: bb121-7-0-2.singnet.com.sg:52181 - bb121-7-128-2.singnet.com.sg:80 (ay2az) 10>  
8< (reset)

27: bb121-7-0-2.singnet.com.sg:52183 - bb121-7-128-2.singnet.com.sg:80 (ba2bb) 31>  
39< (complete)

28: bb121-7-0-2.singnet.com.sg:52184 - bb121-7-128-2.singnet.com.sg:80 (bc2bd) 31>  
44< (complete)

29: bb121-7-0-2.singnet.com.sg:52185 - bb121-7-128-2.singnet.com.sg:80 (be2bf) 14>  
13< (reset)

30: bb121-7-0-2.singnet.com.sg:52186 - bb121-7-128-2.singnet.com.sg:80 (bg2bh) 7>  
8< (reset)

31: bb121-7-0-2.singnet.com.sg:52187 - bb121-7-128-2.singnet.com.sg:80 (bi2bj) 7>  
10< (reset)

32: bb121-7-0-2.singnet.com.sg:52188 - bb121-7-128-2.singnet.com.sg:80 (bk2bl) 31>  
47< (complete)

33: bb121-7-0-2.singnet.com.sg:52189 - bb121-7-128-2.singnet.com.sg:80 (bm2bn) 9>  
9< (reset)

34: bb121-7-0-2.singnet.com.sg:52190 - bb121-7-128-2.singnet.com.sg:80 (bo2bp) 31>  
47< (complete)

35: bb121-7-0-2.singnet.com.sg:52191 - bb121-7-128-2.singnet.com.sg:80 (bq2br) 33>  
49< (complete)

36: bb121-7-0-2.singnet.com.sg:52192 - bb121-7-128-2.singnet.com.sg:80 (bs2bt) 31>  
54< (complete)

37: bb121-7-0-2.singnet.com.sg:52193 - bb121-7-128-2.singnet.com.sg:80 (bu2bv) 31>  
36< (complete)

38: bb121-7-0-2.singnet.com.sg:52194 - bb121-7-128-2.singnet.com.sg:80 (bw2bx)  
31> 48< (complete)

39: bb121-7-0-2.singnet.com.sg:52195 - bb121-7-128-2.singnet.com.sg:80 (by2bz) 7>  
8< (reset)

40: bb121-7-0-2.singnet.com.sg:52196 - bb121-7-128-2.singnet.com.sg:80 (ca2cb) 31>  
46< (complete)

41: bb121-7-0-2.singnet.com.sg:52197 - bb121-7-128-2.singnet.com.sg:80 (cc2cd) 31>  
55< (complete)

42: bb121-7-0-2.singnet.com.sg:52198 - bb121-7-128-2.singnet.com.sg:80 (ce2cf) 7>  
10< (reset)

43: bb121-7-0-2.singnet.com.sg:52199 - bb121-7-128-2.singnet.com.sg:80 (cg2ch) 9>  
12< (reset)

44: bb121-7-0-2.singnet.com.sg:52201 - bb121-7-128-2.singnet.com.sg:80 (ci2cj) 31>  
40< (complete)

45: bb121-7-0-2.singnet.com.sg:52202 - bb121-7-128-2.singnet.com.sg:80 (ck2cl) 31>  
42< (complete)

46: bb121-7-0-2.singnet.com.sg:52203 - bb121-7-128-2.singnet.com.sg:80 (cm2cn) 8>  
10< (reset)

47: bb121-7-0-2.singnet.com.sg:52204 - bb121-7-128-2.singnet.com.sg:80 (co2cp) 31>  
55< (complete)

48: bb121-7-0-2.singnet.com.sg:52205 - bb121-7-128-2.singnet.com.sg:80 (cq2cr) 8>  
7< (reset)

49: bb121-7-0-2.singnet.com.sg:52206 - bb121-7-128-2.singnet.com.sg:80 (cs2ct) 31>  
39< (complete)

50: bb121-7-0-2.singnet.com.sg:52207 - bb121-7-128-2.singnet.com.sg:80 (cu2cv) 31>  
48< (complete)

51: bb121-7-0-2.singnet.com.sg:52208 - bb121-7-128-2.singnet.com.sg:80 (cw2cx) 11>  
9< (reset)

52: bb121-7-0-2.singnet.com.sg:52209 - bb121-7-128-2.singnet.com.sg:80 (cy2cz) 31>  
42< (complete)

53: bb121-7-0-2.singnet.com.sg:52210 - bb121-7-128-2.singnet.com.sg:80 (da2db) 7>  
8< (reset)

54: bb121-7-0-2.singnet.com.sg:52211 - bb121-7-128-2.singnet.com.sg:80 (dc2dd) 8>  
11< (reset)

55: bb121-7-0-2.singnet.com.sg:52212 - bb121-7-128-2.singnet.com.sg:80 (de2df) 31>  
45< (complete)

56: bb121-7-0-2.singnet.com.sg:52213 - bb121-7-128-2.singnet.com.sg:80 (dg2dh) 11>  
9< (reset)



57: bb121-7-0-2.singnet.com.sg:52214 - bb121-7-128-2.singnet.com.sg:80 (di2dj) 31>  
49< (complete)

58: bb121-7-0-2.singnet.com.sg:52215 - bb121-7-128-2.singnet.com.sg:80 (dk2dl) 31>  
44< (complete)

59: bb121-7-0-2.singnet.com.sg:52216 - bb121-7-128-2.singnet.com.sg:80 (dm2dn) 7>  
8< (reset)

60: bb121-7-0-2.singnet.com.sg:52219 - bb121-7-128-2.singnet.com.sg:80 (do2dp) 31>  
40< (complete)

61: bb121-7-0-2.singnet.com.sg:52221 - bb121-7-128-2.singnet.com.sg:80 (dq2dr) 31>  
40< (complete)

62: bb121-7-0-2.singnet.com.sg:52222 - bb121-7-128-2.singnet.com.sg:80 (ds2dt) 13>  
12< (reset)

63: bb121-7-0-2.singnet.com.sg:52223 - bb121-7-128-2.singnet.com.sg:80 (du2dv) 7>  
8< (reset)

64: bb121-7-0-2.singnet.com.sg:52225 - bb121-7-128-2.singnet.com.sg:80 (dw2dx) 31>  
50< (complete)

65: bb121-7-0-2.singnet.com.sg:52227 - bb121-7-128-2.singnet.com.sg:80 (dy2dz) 7>  
8< (reset)

66: bb121-7-0-2.singnet.com.sg:52228 - bb121-7-128-2.singnet.com.sg:80 (ea2eb) 31>  
42< (complete)

67: bb121-7-0-2.singnet.com.sg:52230 - bb121-7-128-2.singnet.com.sg:80 (ec2ed) 5>  
9< (reset)

68: bb121-7-0-2.singnet.com.sg:52232 - bb121-7-128-2.singnet.com.sg:80 (ee2ef) 31>  
41< (complete)

69: bb121-7-0-2.singnet.com.sg:55554 - bb121-7-128-2.singnet.com.sg:80 (eg2eh) 7>  
8< (reset)

70: bb121-7-0-2.singnet.com.sg:55555 - bb121-7-128-2.singnet.com.sg:80 (ei2ej) 8>  
10< (reset)

71: bb121-7-0-2.singnet.com.sg:55556 - bb121-7-128-2.singnet.com.sg:80 (ek2el) 10>  
9< (reset)

72: bb121-7-0-2.singnet.com.sg:55558 - bb121-7-128-2.singnet.com.sg:80 (em2en) 31> 48< (complete)

73: bb121-7-0-2.singnet.com.sg:55560 - bb121-7-128-2.singnet.com.sg:80 (eo2ep) 8> 10< (reset)

74: bb121-7-0-2.singnet.com.sg:55562 - bb121-7-128-2.singnet.com.sg:80 (eq2er) 31> 41< (complete)

75: bb121-7-0-2.singnet.com.sg:55565 - bb121-7-128-2.singnet.com.sg:80 (es2et) 31> 43< (complete)

76: bb121-7-0-2.singnet.com.sg:55566 - bb121-7-128-2.singnet.com.sg:80 (eu2ev) 9> 7< (reset)

77: bb121-7-0-2.singnet.com.sg:55567 - bb121-7-128-2.singnet.com.sg:80 (ew2ex) 5> 11< (reset)

78: bb121-7-0-2.singnet.com.sg:55568 - bb121-7-128-2.singnet.com.sg:80 (ey2ez) 33> 50< (complete)

79: bb121-7-0-2.singnet.com.sg:55570 - bb121-7-128-2.singnet.com.sg:80 (fa2fb) 31> 40< (complete)

80: bb121-7-0-2.singnet.com.sg:55571 - bb121-7-128-2.singnet.com.sg:80 (fc2fd) 31> 45< (complete)

81: bb121-7-0-2.singnet.com.sg:55572 - bb121-7-128-2.singnet.com.sg:80 (fe2ff) 5> 11< (reset)

82: bb121-7-0-2.singnet.com.sg:55574 - bb121-7-128-2.singnet.com.sg:80 (fg2fh) 31> 37< (complete)

83: bb121-7-0-2.singnet.com.sg:55575 - bb121-7-128-2.singnet.com.sg:80 (fi2fj) 31> 54< (complete)

84: bb121-7-0-2.singnet.com.sg:55576 - bb121-7-128-2.singnet.com.sg:80 (fk2fl) 10> 11< (reset)

85: bb121-7-0-2.singnet.com.sg:55578 - bb121-7-128-2.singnet.com.sg:80 (fm2fn) 10> 8< (reset)

86: bb121-7-0-2.singnet.com.sg:55581 - bb121-7-128-2.singnet.com.sg:80 (fo2fp) 31> 41< (complete)

87: bb121-7-0-2.singnet.com.sg:55582 - bb121-7-128-2.singnet.com.sg:80 (fq2fr) 31>  
50< (complete)

88: bb121-7-0-2.singnet.com.sg:55583 - bb121-7-128-2.singnet.com.sg:80 (fs2ft) 32>  
45< (complete)

89: bb121-7-0-2.singnet.com.sg:55584 - bb121-7-128-2.singnet.com.sg:80 (fu2fv) 10>  
9< (reset)

90: bb121-7-0-2.singnet.com.sg:55586 - bb121-7-128-2.singnet.com.sg:80 (fw2fx) 31>  
43< (complete)

91: bb121-7-0-2.singnet.com.sg:55588 - bb121-7-128-2.singnet.com.sg:80 (fy2fz) 32>  
47< (complete)

92: bb121-7-0-2.singnet.com.sg:55589 - bb121-7-128-2.singnet.com.sg:80 (ga2gb) 9>  
10< (reset)

93: bb121-7-0-2.singnet.com.sg:55591 - bb121-7-128-2.singnet.com.sg:80 (gc2gd) 8>  
9< (reset)

94: bb121-7-0-2.singnet.com.sg:55592 - bb121-7-128-2.singnet.com.sg:80 (ge2gf) 6>  
10< (reset)

95: bb121-7-0-2.singnet.com.sg:55593 - bb121-7-128-2.singnet.com.sg:80 (gg2gh) 31>  
40< (complete)

96: bb121-7-0-2.singnet.com.sg:55595 - bb121-7-128-2.singnet.com.sg:80 (gi2gj) 32>  
51< (complete)

97: bb121-7-0-2.singnet.com.sg:55596 - bb121-7-128-2.singnet.com.sg:80 (gk2gl) 7>  
11< (reset)

98: bb121-7-0-2.singnet.com.sg:55598 - bb121-7-128-2.singnet.com.sg:80 (gm2gn)  
31> 35< (complete)

99: bb121-7-0-2.singnet.com.sg:55599 - bb121-7-128-2.singnet.com.sg:80 (go2gp) 32>  
53< (complete)

100: bb121-7-0-2.singnet.com.sg:55600 - bb121-7-128-2.singnet.com.sg:80 (gq2gr) 5>  
8< (reset)

101: bb121-7-0-2.singnet.com.sg:55601 - bb121-7-128-2.singnet.com.sg:80 (gs2gt) 31>  
36< (complete)

102: bb121-7-0-2.singnet.com.sg:55603 - bb121-7-128-2.singnet.com.sg:80 (gu2gv)  
31> 42< (complete)

103: bb121-7-0-2.singnet.com.sg:55606 - bb121-7-128-2.singnet.com.sg:80 (gw2gx)  
33> 40< (complete)

104: bb121-7-0-2.singnet.com.sg:55607 - bb121-7-128-2.singnet.com.sg:80 (gy2gz)  
32> 46< (complete)

105: bb121-7-0-2.singnet.com.sg:55609 - bb121-7-128-2.singnet.com.sg:80 (ha2hb) 5>  
9< (reset)

106: bb121-7-0-2.singnet.com.sg:55610 - bb121-7-128-2.singnet.com.sg:80 (hc2hd)  
32> 38< (complete)

107: bb121-7-0-2.singnet.com.sg:55611 - bb121-7-128-2.singnet.com.sg:80 (he2hf) 7>  
11< (reset)

108: bb121-7-0-2.singnet.com.sg:55613 - bb121-7-128-2.singnet.com.sg:80 (hg2hh) 9>  
8< (reset)

109: bb121-7-0-2.singnet.com.sg:55614 - bb121-7-128-2.singnet.com.sg:80 (hi2hj) 31>  
42< (complete)

110: bb121-7-0-2.singnet.com.sg:55615 - bb121-7-128-2.singnet.com.sg:80 (hk2hl) 31>  
52< (complete)

111: bb121-7-0-2.singnet.com.sg:55616 - bb121-7-128-2.singnet.com.sg:80 (hm2hn)  
9> 9< (reset)

112: bb121-7-0-2.singnet.com.sg:55617 - bb121-7-128-2.singnet.com.sg:80 (ho2hp)  
31> 40< (complete)

113: bb121-7-0-2.singnet.com.sg:55618 - bb121-7-128-2.singnet.com.sg:80 (hq2hr) 32>  
37< (complete)

114: bb121-7-0-2.singnet.com.sg:55619 - bb121-7-128-2.singnet.com.sg:80 (hs2ht) 31>  
51< (complete)

115: bb121-7-0-2.singnet.com.sg:55620 - bb121-7-128-2.singnet.com.sg:80 (hu2hv) 8>  
9< (reset)

116: bb121-7-0-2.singnet.com.sg:55621 - bb121-7-128-2.singnet.com.sg:80 (hw2hx)  
31> 37< (complete)

117: bb121-7-0-2.singnet.com.sg:55622 - bb121-7-128-2.singnet.com.sg:80 (hy2hz) 31> 45< (complete)

118: bb121-7-0-2.singnet.com.sg:55623 - bb121-7-128-2.singnet.com.sg:80 (ia2ib) 32> 44< (complete)

119: bb121-7-0-2.singnet.com.sg:55625 - bb121-7-128-2.singnet.com.sg:80 (ic2id) 8> 10< (reset)

120: bb121-7-0-2.singnet.com.sg:55626 - bb121-7-128-2.singnet.com.sg:80 (ie2if) 30> 35< (complete)

121: bb121-7-0-2.singnet.com.sg:55627 - bb121-7-128-2.singnet.com.sg:80 (ig2ih) 31> 40< (complete)

122: bb121-7-0-2.singnet.com.sg:55629 - bb121-7-128-2.singnet.com.sg:80 (ii2ij) 31> 43< (complete)

123: bb121-7-0-2.singnet.com.sg:55630 - bb121-7-128-2.singnet.com.sg:80 (ik2il) 31> 57< (complete)

124: bb121-7-0-2.singnet.com.sg:55632 - bb121-7-128-2.singnet.com.sg:80 (im2in) 32> 37< (complete)

125: bb121-7-0-2.singnet.com.sg:55634 - bb121-7-128-2.singnet.com.sg:80 (io2ip) 31> 41< (complete)

126: bb121-7-0-2.singnet.com.sg:55635 - bb121-7-128-2.singnet.com.sg:80 (iq2ir) 7> 8< (reset)

127: bb121-7-0-2.singnet.com.sg:55636 - bb121-7-128-2.singnet.com.sg:80 (is2it) 31> 44< (complete)

128: bb121-7-0-2.singnet.com.sg:55637 - bb121-7-128-2.singnet.com.sg:80 (iu2iv) 7> 9< (reset)

129: bb121-7-0-2.singnet.com.sg:55638 - bb121-7-128-2.singnet.com.sg:80 (iw2ix) 31> 47< (complete)

130: bb121-7-0-2.singnet.com.sg:55639 - bb121-7-128-2.singnet.com.sg:80 (iy2iz) 32> 47< (complete)

131: bb121-7-0-2.singnet.com.sg:55640 - bb121-7-128-2.singnet.com.sg:80 (ja2jb) 33> 44< (complete)

132: bb121-7-0-2.singnet.com.sg:55641 - bb121-7-128-2.singnet.com.sg:80 (jc2jd) 6>  
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133: bb121-7-0-2.singnet.com.sg:55643 - bb121-7-128-2.singnet.com.sg:80 (je2jf) 8>  
9< (reset)

134: bb121-7-0-2.singnet.com.sg:55644 - bb121-7-128-2.singnet.com.sg:80 (jg2jh) 31>  
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135: bb121-7-0-2.singnet.com.sg:55645 - bb121-7-128-2.singnet.com.sg:80 (ji2jj) 7>  
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137: bb121-7-0-2.singnet.com.sg:55648 - bb121-7-128-2.singnet.com.sg:80 (jm2jn) 31>  
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138: bb121-7-0-2.singnet.com.sg:55649 - bb121-7-128-2.singnet.com.sg:80 (jo2jp) 9>  
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139: bb121-7-0-2.singnet.com.sg:55651 - bb121-7-128-2.singnet.com.sg:80 (jq2jr) 32>  
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143: bb121-7-0-2.singnet.com.sg:55657 - bb121-7-128-2.singnet.com.sg:80 (jy2jz) 5>  
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31> 39< (complete)

146: bb121-7-0-2.singnet.com.sg:55660 - bb121-7-128-2.singnet.com.sg:80 (ke2kf) 8>  
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151: bb121-7-0-2.singnet.com.sg:55665 - bb121-7-128-2.singnet.com.sg:80 (ko2kp) 6> 9< (reset)

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163: bb121-7-0-2.singnet.com.sg:55681 - bb121-7-128-2.singnet.com.sg:80 (lm2ln) 32>  
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164: bb121-7-0-2.singnet.com.sg:55682 - bb121-7-128-2.singnet.com.sg:80 (lo2lp) 31>  
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169: bb121-7-0-2.singnet.com.sg:55690 - bb121-7-128-2.singnet.com.sg:80 (ly2lz) 31>  
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170: bb121-7-0-2.singnet.com.sg:55692 - bb121-7-128-2.singnet.com.sg:80 (ma2mb)  
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171: bb121-7-0-2.singnet.com.sg:55693 - bb121-7-128-2.singnet.com.sg:80 (mc2md)  
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172: bb121-7-0-2.singnet.com.sg:55694 - bb121-7-128-2.singnet.com.sg:80 (me2mf)  
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173: bb121-7-0-2.singnet.com.sg:55696 - bb121-7-128-2.singnet.com.sg:80 (mg2mh)  
32> 38< (complete)

174: bb121-7-0-2.singnet.com.sg:55697 - bb121-7-128-2.singnet.com.sg:80 (mi2mj) 7>  
8< (reset)

175: bb121-7-0-2.singnet.com.sg:55699 - bb121-7-128-2.singnet.com.sg:80 (mk2ml)  
8> 10< (reset)

176: bb121-7-0-2.singnet.com.sg:55700 - bb121-7-128-2.singnet.com.sg:80 (mm2mn)  
31> 42< (complete)



177: bb121-7-0-2.singnet.com.sg:55701 - bb121-7-128-2.singnet.com.sg:80 (mo2mp)  
33> 47< (complete)

178: bb121-7-0-2.singnet.com.sg:55703 - bb121-7-128-2.singnet.com.sg:80 (mq2mr)  
8> 9< (reset)

179: bb121-7-0-2.singnet.com.sg:55704 - bb121-7-128-2.singnet.com.sg:80 (ms2mt)  
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180: bb121-7-0-2.singnet.com.sg:55705 - bb121-7-128-2.singnet.com.sg:80 (mu2mv)  
31> 39< (complete)

181: bb121-7-0-2.singnet.com.sg:55706 - bb121-7-128-2.singnet.com.sg:80 (mw2mx)  
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182: bb121-7-0-2.singnet.com.sg:55707 - bb121-7-128-2.singnet.com.sg:80 (my2mz)  
6> 11< (reset)

183: bb121-7-0-2.singnet.com.sg:55708 - bb121-7-128-2.singnet.com.sg:80 (na2nb)  
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184: bb121-7-0-2.singnet.com.sg:55709 - bb121-7-128-2.singnet.com.sg:80 (nc2nd) 7>  
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189: bb121-7-0-2.singnet.com.sg:55715 - bb121-7-128-2.singnet.com.sg:80 (nm2nn)  
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- 192: bb121-7-0-2.singnet.com.sg:55722 - bb121-7-128-2.singnet.com.sg:80 (ns2nt) 31>  
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- 193: bb121-7-0-2.singnet.com.sg:55723 - bb121-7-128-2.singnet.com.sg:80 (nu2nv)  
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- 194: bb121-7-0-2.singnet.com.sg:55724 - bb121-7-128-2.singnet.com.sg:80 (nw2nx)  
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- 195: bb121-7-0-2.singnet.com.sg:55727 - bb121-7-128-2.singnet.com.sg:80 (ny2nz)  
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- 196: bb121-7-0-2.singnet.com.sg:55728 - bb121-7-128-2.singnet.com.sg:80 (oa2ob)  
31> 46< (complete)
- 197: bb121-7-0-2.singnet.com.sg:55729 - bb121-7-128-2.singnet.com.sg:80 (oc2od) 8>  
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- 198: bb121-7-0-2.singnet.com.sg:55733 - bb121-7-128-2.singnet.com.sg:80 (oe2of) 31>  
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- 199: bb121-7-0-2.singnet.com.sg:55734 - bb121-7-128-2.singnet.com.sg:80 (og2oh)  
32> 54< (complete)
- 200: bb121-7-0-2.singnet.com.sg:55737 - bb121-7-128-2.singnet.com.sg:80 (oi2oj) 32>  
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- 201: bb121-7-0-2.singnet.com.sg:55738 - bb121-7-128-2.singnet.com.sg:80 (ok2ol) 8>  
12< (reset)
- 202: bb121-7-0-2.singnet.com.sg:55739 - bb121-7-128-2.singnet.com.sg:80 (om2on)  
8> 10< (reset)
- 203: bb121-7-0-2.singnet.com.sg:55740 - bb121-7-128-2.singnet.com.sg:80 (oo2op)  
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- 204: bb121-7-0-2.singnet.com.sg:55741 - bb121-7-128-2.singnet.com.sg:80 (oq2or) 31>  
42< (complete)
- 205: bb121-7-0-2.singnet.com.sg:55743 - bb121-7-128-2.singnet.com.sg:80 (os2ot) 31>  
53< (complete)
- 206: bb121-7-0-2.singnet.com.sg:55745 - bb121-7-128-2.singnet.com.sg:80 (ou2ov) 8>  
10< (reset)

207: bb121-7-0-2.singnet.com.sg:55746 - bb121-7-128-2.singnet.com.sg:80 (ow2ox)  
7> 8< (reset)

208: bb121-7-0-2.singnet.com.sg:55747 - bb121-7-128-2.singnet.com.sg:80 (oy2oz)  
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209: bb121-7-0-2.singnet.com.sg:55748 - bb121-7-128-2.singnet.com.sg:80 (pa2pb)  
13> 13< (reset)

210: bb121-7-0-2.singnet.com.sg:55752 - bb121-7-128-2.singnet.com.sg:80 (pc2pd)  
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215: bb121-7-0-2.singnet.com.sg:48567 - bb121-7-128-2.singnet.com.sg:80 (pm2pn)  
7> 7< (reset)

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217: bb121-7-0-2.singnet.com.sg:48570 - bb121-7-128-2.singnet.com.sg:80 (pq2pr) 31>  
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223: bb121-7-0-2.singnet.com.sg:48578 - bb121-7-128-2.singnet.com.sg:80 (qc2qd)  
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224: bb121-7-0-2.singnet.com.sg:48581 - bb121-7-128-2.singnet.com.sg:80 (qe2qf) 7>  
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225: bb121-7-0-2.singnet.com.sg:48582 - bb121-7-128-2.singnet.com.sg:80 (qg2qh)  
32> 36< (complete)

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228: bb121-7-0-2.singnet.com.sg:48585 - bb121-7-128-2.singnet.com.sg:80 (qm2qn)  
7> 8< (reset)

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32> 47< (complete)

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231: bb121-7-0-2.singnet.com.sg:48590 - bb121-7-128-2.singnet.com.sg:80 (qs2qt) 7>  
9< (reset)

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31> 48< (complete)

233: bb121-7-0-2.singnet.com.sg:48592 - bb121-7-128-2.singnet.com.sg:80 (qw2qx)  
31> 43< (complete)

234: bb121-7-0-2.singnet.com.sg:48594 - bb121-7-128-2.singnet.com.sg:80 (qy2qz)  
31> 44< (complete)

235: bb121-7-0-2.singnet.com.sg:48595 - bb121-7-128-2.singnet.com.sg:80 (ra2rb) 31>  
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236: bb121-7-0-2.singnet.com.sg:48597 - bb121-7-128-2.singnet.com.sg:80 (rc2rd) 32>  
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- 237: bb121-7-0-2.singnet.com.sg:48598 - bb121-7-128-2.singnet.com.sg:80 (re2rf) 10>  
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- 238: bb121-7-0-2.singnet.com.sg:48601 - bb121-7-128-2.singnet.com.sg:80 (rg2rh) 10>  
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- 239: bb121-7-0-2.singnet.com.sg:48602 - bb121-7-128-2.singnet.com.sg:80 (ri2rj) 31>  
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- 240: bb121-7-0-2.singnet.com.sg:48603 - bb121-7-128-2.singnet.com.sg:80 (rk2rl) 31>  
46< (complete)
- 241: bb121-7-0-2.singnet.com.sg:48604 - bb121-7-128-2.singnet.com.sg:80 (rm2rn) 8>  
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- 242: bb121-7-0-2.singnet.com.sg:48605 - bb121-7-128-2.singnet.com.sg:80 (ro2rp) 6>  
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- 243: bb121-7-0-2.singnet.com.sg:48608 - bb121-7-128-2.singnet.com.sg:80 (rq2rr) 5>  
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- 244: bb121-7-0-2.singnet.com.sg:48611 - bb121-7-128-2.singnet.com.sg:80 (rs2rt) 31>  
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- 245: bb121-7-0-2.singnet.com.sg:48612 - bb121-7-128-2.singnet.com.sg:80 (ru2rv) 5>  
8< (reset)
- 246: bb121-7-0-2.singnet.com.sg:48613 - bb121-7-128-2.singnet.com.sg:80 (rw2rx)  
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- 247: bb121-7-0-2.singnet.com.sg:48614 - bb121-7-128-2.singnet.com.sg:80 (ry2rz) 7>  
11< (reset)
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- 249: bb121-7-0-2.singnet.com.sg:48616 - bb121-7-128-2.singnet.com.sg:80 (sc2sd) 15>  
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15< (reset)

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31> 48< (complete)

260: bb121-7-0-2.singnet.com.sg:48634 - bb121-7-128-2.singnet.com.sg:80 (sy2sz) 31>  
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261: bb121-7-0-2.singnet.com.sg:48638 - bb121-7-128-2.singnet.com.sg:80 (ta2tb) 30>  
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262: bb121-7-0-2.singnet.com.sg:48639 - bb121-7-128-2.singnet.com.sg:80 (tc2td) 31>  
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263: bb121-7-0-2.singnet.com.sg:48641 - bb121-7-128-2.singnet.com.sg:80 (te2tf) 35>  
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264: bb121-7-0-2.singnet.com.sg:48642 - bb121-7-128-2.singnet.com.sg:80 (tg2th) 8>  
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265: bb121-7-0-2.singnet.com.sg:48644 - bb121-7-128-2.singnet.com.sg:80 (ti2tj) 32>  
46< (complete)

266: bb121-7-0-2.singnet.com.sg:48646 - bb121-7-128-2.singnet.com.sg:80 (tk2tl) 8>  
13< (reset)

- 267: bb121-7-0-2.singnet.com.sg:48647 - bb121-7-128-2.singnet.com.sg:80 (tm2tn) 5>  
8< (reset)
- 268: bb121-7-0-2.singnet.com.sg:48650 - bb121-7-128-2.singnet.com.sg:80 (to2tp) 31>  
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- 269: bb121-7-0-2.singnet.com.sg:48654 - bb121-7-128-2.singnet.com.sg:80 (tq2tr) 7>  
10< (reset)
- 270: bb121-7-0-2.singnet.com.sg:48655 - bb121-7-128-2.singnet.com.sg:80 (ts2tt) 33>  
48< (complete)
- 271: bb121-7-0-2.singnet.com.sg:48657 - bb121-7-128-2.singnet.com.sg:80 (tu2tv) 33>  
52< (complete)
- 272: bb121-7-0-2.singnet.com.sg:48658 - bb121-7-128-2.singnet.com.sg:80 (tw2tx) 12>  
12< (reset)
- 273: bb121-7-0-2.singnet.com.sg:48664 - bb121-7-128-2.singnet.com.sg:80 (ty2tz) 31>  
49< (complete)
- 274: bb121-7-0-2.singnet.com.sg:48666 - bb121-7-128-2.singnet.com.sg:80 (ua2ub)  
31> 56< (complete)
- 275: bb121-7-0-2.singnet.com.sg:48667 - bb121-7-128-2.singnet.com.sg:80 (uc2ud)  
34> 43< (complete)
- 276: bb121-7-0-2.singnet.com.sg:48669 - bb121-7-128-2.singnet.com.sg:80 (ue2uf) 33>  
42< (complete)
- 277: bb121-7-0-2.singnet.com.sg:48670 - bb121-7-128-2.singnet.com.sg:80 (ug2uh)  
31> 46< (complete)
- 278: bb121-7-0-2.singnet.com.sg:48672 - bb121-7-128-2.singnet.com.sg:80 (ui2uj) 31>  
47< (complete)
- 279: bb121-7-0-2.singnet.com.sg:48673 - bb121-7-128-2.singnet.com.sg:80 (uk2ul) 31>  
43< (complete)
- 280: bb121-7-0-2.singnet.com.sg:48674 - bb121-7-128-2.singnet.com.sg:80 (um2un)  
33> 45< (complete) (reset)
- 281: bb121-7-0-2.singnet.com.sg:48676 - bb121-7-128-2.singnet.com.sg:80 (uo2up) 7>  
10< (reset)

282: bb121-7-0-2.singnet.com.sg:48677 - bb121-7-128-2.singnet.com.sg:80 (uq2ur) 34>  
43< (complete) (reset)

283: bb121-7-0-2.singnet.com.sg:48678 - bb121-7-128-2.singnet.com.sg:80 (us2ut) 31>  
51< (complete)

284: bb121-7-0-2.singnet.com.sg:48681 - bb121-7-128-2.singnet.com.sg:80 (uu2uv) 8>  
7< (reset)

285: bb121-7-0-2.singnet.com.sg:48682 - bb121-7-128-2.singnet.com.sg:80 (uw2ux)  
33> 47< (complete) (reset)

286: bb121-7-0-2.singnet.com.sg:48684 - bb121-7-128-2.singnet.com.sg:80 (uy2uz)  
31> 57< (complete)

287: bb121-7-0-2.singnet.com.sg:48685 - bb121-7-128-2.singnet.com.sg:80 (va2vb)  
31> 40< (complete)

288: bb121-7-0-2.singnet.com.sg:48686 - bb121-7-128-2.singnet.com.sg:80 (vc2vd)  
31> 46< (complete)

289: bb121-7-0-2.singnet.com.sg:48687 - bb121-7-128-2.singnet.com.sg:80 (ve2vf) 31>  
52< (complete)

290: bb121-7-0-2.singnet.com.sg:48689 - bb121-7-128-2.singnet.com.sg:80 (vg2vh)  
31> 50< (complete)

291: bb121-7-0-2.singnet.com.sg:48691 - bb121-7-128-2.singnet.com.sg:80 (vi2vj) 31>  
45< (complete)

292: bb121-7-0-2.singnet.com.sg:48693 - bb121-7-128-2.singnet.com.sg:80 (vk2vl) 31>  
46< (complete)

293: bb121-7-0-2.singnet.com.sg:48694 - bb121-7-128-2.singnet.com.sg:80 (vm2vn)  
34> 45< (complete)

294: bb121-7-0-2.singnet.com.sg:48698 - bb121-7-128-2.singnet.com.sg:80 (vo2vp) 7>  
13< (reset)

295: bb121-7-0-2.singnet.com.sg:48701 - bb121-7-128-2.singnet.com.sg:80 (vq2vr) 9>  
15< (reset)

296: bb121-7-0-2.singnet.com.sg:48704 - bb121-7-128-2.singnet.com.sg:80 (vs2vt) 32>  
54< (complete)



297: bb121-7-0-2.singnet.com.sg:48706 - bb121-7-128-2.singnet.com.sg:80 (vu2vv)  
10> 9< (reset)

298: bb121-7-0-2.singnet.com.sg:48708 - bb121-7-128-2.singnet.com.sg:80 (vw2vx)  
31> 47< (complete)

299: bb121-7-0-2.singnet.com.sg:48709 - bb121-7-128-2.singnet.com.sg:80 (vy2vz)  
31> 50< (complete)

300: bb121-7-0-2.singnet.com.sg:48711 - bb121-7-128-2.singnet.com.sg:80 (wa2wb)  
31> 50< (complete)

301: bb121-7-0-2.singnet.com.sg:48712 - bb121-7-128-2.singnet.com.sg:80 (wc2wd)  
11> 10< (reset)

302: bb121-7-0-2.singnet.com.sg:48713 - bb121-7-128-2.singnet.com.sg:80 (we2wf)  
31> 48< (complete)

303: bb121-7-0-2.singnet.com.sg:48714 - bb121-7-128-2.singnet.com.sg:80 (wg2wh)  
10> 9< (reset)

304: bb121-7-0-2.singnet.com.sg:48715 - bb121-7-128-2.singnet.com.sg:80 (wi2wj)  
31> 38< (complete)

305: bb121-7-0-2.singnet.com.sg:45776 - bb121-7-128-2.singnet.com.sg:80 (wk2wl)  
31> 44< (complete)

306: bb121-7-0-2.singnet.com.sg:45778 - bb121-7-128-2.singnet.com.sg:80 (wm2wn)  
7> 10< (reset)

307: bb121-7-0-2.singnet.com.sg:45779 - bb121-7-128-2.singnet.com.sg:80 (wo2wp)  
31> 47< (complete)

308: bb121-7-0-2.singnet.com.sg:45782 - bb121-7-128-2.singnet.com.sg:80 (wq2wr)  
33> 41< (complete)

309: bb121-7-0-2.singnet.com.sg:45783 - bb121-7-128-2.singnet.com.sg:80 (ws2wt) 7>  
7< (reset)

310: bb121-7-0-2.singnet.com.sg:45784 - bb121-7-128-2.singnet.com.sg:80 (wu2wv)  
31> 36< (complete)

311: bb121-7-0-2.singnet.com.sg:45785 - bb121-7-128-2.singnet.com.sg:80 (ww2wx)  
9> 7< (reset)

312: bb121-7-0-2.singnet.com.sg:45786 - bb121-7-128-2.singnet.com.sg:80 (wy2wz)  
8> 9< (reset)

313: bb121-7-0-2.singnet.com.sg:45787 - bb121-7-128-2.singnet.com.sg:80 (xa2xb)  
31> 50< (complete)

314: bb121-7-0-2.singnet.com.sg:45790 - bb121-7-128-2.singnet.com.sg:80 (xc2xd)  
33> 51< (complete)

315: bb121-7-0-2.singnet.com.sg:45791 - bb121-7-128-2.singnet.com.sg:80 (xe2xf) 32>  
44< (complete)

316: bb121-7-0-2.singnet.com.sg:45793 - bb121-7-128-2.singnet.com.sg:80 (xg2xh) 7>  
8< (reset)

317: bb121-7-0-2.singnet.com.sg:45794 - bb121-7-128-2.singnet.com.sg:80 (xi2xj) 33>  
39< (complete)

318: bb121-7-0-2.singnet.com.sg:45795 - bb121-7-128-2.singnet.com.sg:80 (xk2xl) 31>  
37< (complete)

319: bb121-7-0-2.singnet.com.sg:45796 - bb121-7-128-2.singnet.com.sg:80 (xm2xn)  
7> 9< (reset)

320: bb121-7-0-2.singnet.com.sg:45797 - bb121-7-128-2.singnet.com.sg:80 (xo2xp)  
31> 45< (complete)

321: bb121-7-0-2.singnet.com.sg:45798 - bb121-7-128-2.singnet.com.sg:80 (xq2xr) 9>  
7< (reset)

322: bb121-7-0-2.singnet.com.sg:45799 - bb121-7-128-2.singnet.com.sg:80 (xs2xt) 31>  
56< (complete)

323: bb121-7-0-2.singnet.com.sg:45801 - bb121-7-128-2.singnet.com.sg:80 (xu2xv) 7>  
8< (reset)

324: bb121-7-0-2.singnet.com.sg:45802 - bb121-7-128-2.singnet.com.sg:80 (xw2xx)  
31> 51< (complete)

325: bb121-7-0-2.singnet.com.sg:45804 - bb121-7-128-2.singnet.com.sg:80 (xy2xz)  
31> 45< (complete)

326: bb121-7-0-2.singnet.com.sg:45807 - bb121-7-128-2.singnet.com.sg:80 (ya2yb)  
31> 48< (complete)

327: bb121-7-0-2.singnet.com.sg:45808 - bb121-7-128-2.singnet.com.sg:80 (yc2yd)  
11> 10< (reset)

328: bb121-7-0-2.singnet.com.sg:45810 - bb121-7-128-2.singnet.com.sg:80 (ye2yf) 31>  
46< (complete)

329: bb121-7-0-2.singnet.com.sg:45811 - bb121-7-128-2.singnet.com.sg:80 (yg2yh)  
26> 37<

### **E.tcp\_iso.summary**

1 arg remaining, starting with 'E.tcp\_iso\_fair.trace'

Ostermann's tcptrace -- version 6.6.7 -- Thu Nov 4, 2004

20718 packets seen, 20654 TCP packets traced

elapsed wallclock time: 0:00:00.403677, 51323 pkts/sec analyzed

trace file elapsed time: 0:14:22.627147

TCP connection info:

1: bb121-7-0-2.singnet.com.sg:35007 - bb121-7-192-2.singnet.com.sg:80 (a2b) 4970>  
7110< (complete)

2: bb121-7-0-2.singnet.com.sg:35014 - bb121-7-192-2.singnet.com.sg:80 (c2d) 8>  
11< (reset)

3: bb121-7-0-2.singnet.com.sg:35015 - bb121-7-192-2.singnet.com.sg:80 (e2f) 31>  
56< (complete)

4: bb121-7-0-2.singnet.com.sg:35016 - bb121-7-192-2.singnet.com.sg:80 (g2h) 7>  
10< (reset)

5: bb121-7-0-2.singnet.com.sg:35020 - bb121-7-192-2.singnet.com.sg:80 (i2j) 31>  
46< (complete)

6: bb121-7-0-2.singnet.com.sg:35023 - bb121-7-192-2.singnet.com.sg:80 (k2l) 34>  
44< (complete)

7: bb121-7-0-2.singnet.com.sg:35026 - bb121-7-192-2.singnet.com.sg:80 (m2n) 8>  
13< (reset)

8: bb121-7-0-2.singnet.com.sg:35028 - bb121-7-192-2.singnet.com.sg:80 (o2p) 31>  
48< (complete)

9: bb121-7-0-2.singnet.com.sg:35032 - bb121-7-192-2.singnet.com.sg:80 (q2r) 32>  
46< (complete)

10: bb121-7-0-2.singnet.com.sg:35037 - bb121-7-192-2.singnet.com.sg:80 (s2t) 32>  
48< (complete)

11: bb121-7-0-2.singnet.com.sg:35042 - bb121-7-192-2.singnet.com.sg:80 (u2v) 32>  
40< (complete)

12: bb121-7-0-2.singnet.com.sg:35046 - bb121-7-192-2.singnet.com.sg:80 (w2x) 32>  
49< (complete)

13: bb121-7-0-2.singnet.com.sg:57883 - bb121-7-192-2.singnet.com.sg:80 (y2z) 30>  
34< (complete)

14: bb121-7-0-2.singnet.com.sg:57887 - bb121-7-192-2.singnet.com.sg:80 (aa2ab) 31>  
48< (complete)

15: bb121-7-0-2.singnet.com.sg:57893 - bb121-7-192-2.singnet.com.sg:80 (ac2ad) 31>  
40< (complete)

16: bb121-7-0-2.singnet.com.sg:57894 - bb121-7-192-2.singnet.com.sg:80 (ae2af) 32>  
48< (complete)

17: bb121-7-0-2.singnet.com.sg:57899 - bb121-7-192-2.singnet.com.sg:80 (ag2ah) 31>  
54< (complete)

18: bb121-7-0-2.singnet.com.sg:57907 - bb121-7-192-2.singnet.com.sg:80 (ai2aj) 32>  
41< (complete)

19: bb121-7-0-2.singnet.com.sg:57909 - bb121-7-192-2.singnet.com.sg:80 (ak2al) 31>  
47< (complete)

20: bb121-7-0-2.singnet.com.sg:57910 - bb121-7-192-2.singnet.com.sg:80 (am2an)  
31> 48< (complete)

21: bb121-7-0-2.singnet.com.sg:57915 - bb121-7-192-2.singnet.com.sg:80 (ao2ap) 31>  
42< (complete)

22: bb121-7-0-2.singnet.com.sg:57917 - bb121-7-192-2.singnet.com.sg:80 (aq2ar) 32>  
54< (complete)

23: bb121-7-0-2.singnet.com.sg:57924 - bb121-7-192-2.singnet.com.sg:80 (as2at) 31>  
57< (complete)

24: bb121-7-0-2.singnet.com.sg:57927 - bb121-7-192-2.singnet.com.sg:80 (au2av) 31>  
46< (complete)

25: bb121-7-0-2.singnet.com.sg:57932 - bb121-7-192-2.singnet.com.sg:80 (aw2ax) 31>  
41< (complete)

26: bb121-7-0-2.singnet.com.sg:57934 - bb121-7-192-2.singnet.com.sg:80 (ay2az) 31>  
39< (complete)

27: bb121-7-0-2.singnet.com.sg:57935 - bb121-7-192-2.singnet.com.sg:80 (ba2bb) 33>  
42< (complete)

28: bb121-7-0-2.singnet.com.sg:57938 - bb121-7-192-2.singnet.com.sg:80 (bc2bd) 31>  
48< (complete)

29: bb121-7-0-2.singnet.com.sg:57942 - bb121-7-192-2.singnet.com.sg:80 (be2bf) 33>  
52< (complete)

30: bb121-7-0-2.singnet.com.sg:57954 - bb121-7-192-2.singnet.com.sg:80 (bg2bh) 31>  
45< (complete)

31: bb121-7-0-2.singnet.com.sg:57958 - bb121-7-192-2.singnet.com.sg:80 (bi2bj) 33>  
48< (complete)

32: bb121-7-0-2.singnet.com.sg:57961 - bb121-7-192-2.singnet.com.sg:80 (bk2bl) 31>  
46< (complete)

33: bb121-7-0-2.singnet.com.sg:57963 - bb121-7-192-2.singnet.com.sg:80 (bm2bn)  
32> 44< (complete)

34: bb121-7-0-2.singnet.com.sg:57972 - bb121-7-192-2.singnet.com.sg:80 (bo2bp) 31>  
50< (complete)

35: bb121-7-0-2.singnet.com.sg:57977 - bb121-7-192-2.singnet.com.sg:80 (bq2br) 32>  
49< (complete)

36: bb121-7-0-2.singnet.com.sg:57980 - bb121-7-192-2.singnet.com.sg:80 (bs2bt) 32>  
44< (complete)

37: bb121-7-0-2.singnet.com.sg:57985 - bb121-7-192-2.singnet.com.sg:80 (bu2bv) 32>  
52< (complete)

38: bb121-7-0-2.singnet.com.sg:57996 - bb121-7-192-2.singnet.com.sg:80 (bw2bx) 35> 51< (complete)

39: bb121-7-0-2.singnet.com.sg:58005 - bb121-7-192-2.singnet.com.sg:80 (by2bz) 31> 50< (complete)

40: bb121-7-0-2.singnet.com.sg:58015 - bb121-7-192-2.singnet.com.sg:80 (ca2cb) 32> 47< (complete)

41: bb121-7-0-2.singnet.com.sg:58019 - bb121-7-192-2.singnet.com.sg:80 (cc2cd) 32> 47< (complete)

42: bb121-7-0-2.singnet.com.sg:58021 - bb121-7-192-2.singnet.com.sg:80 (ce2cf) 31> 48< (complete)

43: bb121-7-0-2.singnet.com.sg:58025 - bb121-7-192-2.singnet.com.sg:80 (cg2ch) 33> 45< (complete)

44: bb121-7-0-2.singnet.com.sg:58032 - bb121-7-192-2.singnet.com.sg:80 (ci2cj) 34> 67< (complete)

45: bb121-7-0-2.singnet.com.sg:58044 - bb121-7-192-2.singnet.com.sg:80 (ck2cl) 31> 41< (complete)

46: bb121-7-0-2.singnet.com.sg:58048 - bb121-7-192-2.singnet.com.sg:80 (cm2cn) 33> 45< (complete)

47: bb121-7-0-2.singnet.com.sg:58050 - bb121-7-192-2.singnet.com.sg:80 (co2cp) 31> 52< (complete)

48: bb121-7-0-2.singnet.com.sg:58055 - bb121-7-192-2.singnet.com.sg:80 (cq2cr) 32> 63< (complete)

49: bb121-7-0-2.singnet.com.sg:58060 - bb121-7-192-2.singnet.com.sg:80 (cs2ct) 33> 41< (complete)

50: bb121-7-0-2.singnet.com.sg:58065 - bb121-7-192-2.singnet.com.sg:80 (cu2cv) 31> 42< (complete)

51: bb121-7-0-2.singnet.com.sg:58066 - bb121-7-192-2.singnet.com.sg:80 (cw2cx) 32> 59< (complete)

52: bb121-7-0-2.singnet.com.sg:58081 - bb121-7-192-2.singnet.com.sg:80 (cy2cz) 31> 42< (complete)

53: bb121-7-0-2.singnet.com.sg:58085 - bb121-7-192-2.singnet.com.sg:80 (da2db) 32>  
44< (complete)

54: bb121-7-0-2.singnet.com.sg:58087 - bb121-7-192-2.singnet.com.sg:80 (dc2dd) 32>  
42< (complete)

55: bb121-7-0-2.singnet.com.sg:55273 - bb121-7-192-2.singnet.com.sg:80 (de2df) 31>  
43< (complete)

56: bb121-7-0-2.singnet.com.sg:55276 - bb121-7-192-2.singnet.com.sg:80 (dg2dh) 31>  
55< (complete)

57: bb121-7-0-2.singnet.com.sg:55281 - bb121-7-192-2.singnet.com.sg:80 (di2dj) 32>  
49< (complete)

58: bb121-7-0-2.singnet.com.sg:55283 - bb121-7-192-2.singnet.com.sg:80 (dk2dl) 31>  
42< (complete)

59: bb121-7-0-2.singnet.com.sg:55284 - bb121-7-192-2.singnet.com.sg:80 (dm2dn)  
31> 60< (complete)

60: bb121-7-0-2.singnet.com.sg:55291 - bb121-7-192-2.singnet.com.sg:80 (do2dp) 31>  
42< (complete)

61: bb121-7-0-2.singnet.com.sg:55293 - bb121-7-192-2.singnet.com.sg:80 (dq2dr) 32>  
58< (complete)

62: bb121-7-0-2.singnet.com.sg:55297 - bb121-7-192-2.singnet.com.sg:80 (ds2dt) 33>  
44< (complete)

63: bb121-7-0-2.singnet.com.sg:55300 - bb121-7-192-2.singnet.com.sg:80 (du2dv) 35>  
52< (complete) (reset)

64: bb121-7-0-2.singnet.com.sg:55303 - bb121-7-192-2.singnet.com.sg:80 (dw2dx)  
31> 39< (complete)

65: bb121-7-0-2.singnet.com.sg:55304 - bb121-7-192-2.singnet.com.sg:80 (dy2dz) 31>  
53< (complete)

66: bb121-7-0-2.singnet.com.sg:55310 - bb121-7-192-2.singnet.com.sg:80 (ea2eb) 35>  
42< (complete) (reset)

67: bb121-7-0-2.singnet.com.sg:55311 - bb121-7-192-2.singnet.com.sg:80 (ec2ed) 32>  
47< (complete)

68: bb121-7-0-2.singnet.com.sg:55313 - bb121-7-192-2.singnet.com.sg:80 (ee2ef) 32>  
48< (complete)

69: bb121-7-0-2.singnet.com.sg:55314 - bb121-7-192-2.singnet.com.sg:80 (eg2eh) 32>  
53< (complete)

70: bb121-7-0-2.singnet.com.sg:55327 - bb121-7-192-2.singnet.com.sg:80 (ei2ej) 32>  
45< (complete)

71: bb121-7-0-2.singnet.com.sg:55332 - bb121-7-192-2.singnet.com.sg:80 (ek2el) 33>  
47< (complete)

72: bb121-7-0-2.singnet.com.sg:55333 - bb121-7-192-2.singnet.com.sg:80 (em2en)  
33> 51< (complete)

73: bb121-7-0-2.singnet.com.sg:55336 - bb121-7-192-2.singnet.com.sg:80 (eo2ep) 31>  
43< (complete)

74: bb121-7-0-2.singnet.com.sg:55339 - bb121-7-192-2.singnet.com.sg:80 (eq2er) 31>  
41< (complete)

75: bb121-7-0-2.singnet.com.sg:55341 - bb121-7-192-2.singnet.com.sg:80 (es2et) 31>  
47< (complete)

76: bb121-7-0-2.singnet.com.sg:55344 - bb121-7-192-2.singnet.com.sg:80 (eu2ev) 32>  
46< (complete)

77: bb121-7-0-2.singnet.com.sg:55347 - bb121-7-192-2.singnet.com.sg:80 (ew2ex) 31>  
44< (complete)

78: bb121-7-0-2.singnet.com.sg:55349 - bb121-7-192-2.singnet.com.sg:80 (ey2ez) 32>  
44< (complete)

79: bb121-7-0-2.singnet.com.sg:55352 - bb121-7-192-2.singnet.com.sg:80 (fa2fb) 31>  
44< (complete)

80: bb121-7-0-2.singnet.com.sg:55355 - bb121-7-192-2.singnet.com.sg:80 (fc2fd) 33>  
41< (complete)

81: bb121-7-0-2.singnet.com.sg:55356 - bb121-7-192-2.singnet.com.sg:80 (fe2ff) 31>  
60< (complete)

82: bb121-7-0-2.singnet.com.sg:55363 - bb121-7-192-2.singnet.com.sg:80 (fg2fh) 31>  
50< (complete)



83: bb121-7-0-2.singnet.com.sg:55364 - bb121-7-192-2.singnet.com.sg:80 (fi2fj) 33>  
41< (complete)

84: bb121-7-0-2.singnet.com.sg:55365 - bb121-7-192-2.singnet.com.sg:80 (fk2fl) 31>  
49< (complete)

85: bb121-7-0-2.singnet.com.sg:55366 - bb121-7-192-2.singnet.com.sg:80 (fm2fn) 31>  
43< (complete)

86: bb121-7-0-2.singnet.com.sg:55367 - bb121-7-192-2.singnet.com.sg:80 (fo2fp) 31>  
47< (complete)

87: bb121-7-0-2.singnet.com.sg:55369 - bb121-7-192-2.singnet.com.sg:80 (fq2fr) 32>  
49< (complete)

88: bb121-7-0-2.singnet.com.sg:55372 - bb121-7-192-2.singnet.com.sg:80 (fs2ft) 31>  
50< (complete)

89: bb121-7-0-2.singnet.com.sg:55375 - bb121-7-192-2.singnet.com.sg:80 (fu2fv) 34>  
58< (complete)

90: bb121-7-0-2.singnet.com.sg:55379 - bb121-7-192-2.singnet.com.sg:80 (fw2fx) 31>  
46< (complete)

91: bb121-7-0-2.singnet.com.sg:55383 - bb121-7-192-2.singnet.com.sg:80 (fy2fz) 33>  
38< (complete)

92: bb121-7-0-2.singnet.com.sg:55384 - bb121-7-192-2.singnet.com.sg:80 (ga2gb) 31>  
45< (complete)

93: bb121-7-0-2.singnet.com.sg:55387 - bb121-7-192-2.singnet.com.sg:80 (gc2gd) 31>  
56< (complete)

94: bb121-7-0-2.singnet.com.sg:55392 - bb121-7-192-2.singnet.com.sg:80 (ge2gf) 31>  
42< (complete)

95: bb121-7-0-2.singnet.com.sg:55394 - bb121-7-192-2.singnet.com.sg:80 (gg2gh) 31>  
49< (complete)

96: bb121-7-0-2.singnet.com.sg:55399 - bb121-7-192-2.singnet.com.sg:80 (gi2gj) 33>  
39< (complete)

97: bb121-7-0-2.singnet.com.sg:55400 - bb121-7-192-2.singnet.com.sg:80 (gk2gl) 32>  
45< (complete)

98: bb121-7-0-2.singnet.com.sg:55403 - bb121-7-192-2.singnet.com.sg:80 (gm2gn) 31> 49< (complete)

99: bb121-7-0-2.singnet.com.sg:55404 - bb121-7-192-2.singnet.com.sg:80 (go2gp) 32> 48< (complete)

100: bb121-7-0-2.singnet.com.sg:55406 - bb121-7-192-2.singnet.com.sg:80 (gq2gr) 31> 39< (complete)

101: bb121-7-0-2.singnet.com.sg:55407 - bb121-7-192-2.singnet.com.sg:80 (gs2gt) 31> 45< (complete)

102: bb121-7-0-2.singnet.com.sg:55409 - bb121-7-192-2.singnet.com.sg:80 (gu2gv) 31> 48< (complete)

103: bb121-7-0-2.singnet.com.sg:55411 - bb121-7-192-2.singnet.com.sg:80 (gw2gx) 32> 40< (complete)

104: bb121-7-0-2.singnet.com.sg:55414 - bb121-7-192-2.singnet.com.sg:80 (gy2gz) 33> 52< (complete)

105: bb121-7-0-2.singnet.com.sg:50154 - bb121-7-192-2.singnet.com.sg:80 (ha2hb) 32> 50< (complete)

106: bb121-7-0-2.singnet.com.sg:50157 - bb121-7-192-2.singnet.com.sg:80 (hc2hd) 34> 39< (complete)

107: bb121-7-0-2.singnet.com.sg:50158 - bb121-7-192-2.singnet.com.sg:80 (he2hf) 32> 49< (complete)

108: bb121-7-0-2.singnet.com.sg:50165 - bb121-7-192-2.singnet.com.sg:80 (hg2hh) 31> 49< (complete)

109: bb121-7-0-2.singnet.com.sg:50169 - bb121-7-192-2.singnet.com.sg:80 (hi2hj) 31> 58< (complete)

110: bb121-7-0-2.singnet.com.sg:50180 - bb121-7-192-2.singnet.com.sg:80 (hk2hl) 31> 40< (complete)

111: bb121-7-0-2.singnet.com.sg:50182 - bb121-7-192-2.singnet.com.sg:80 (hm2hn) 31> 45< (complete)

112: bb121-7-0-2.singnet.com.sg:50186 - bb121-7-192-2.singnet.com.sg:80 (ho2hp) 32> 46< (complete)

4. Now use **tcptrace** to compute the average throughput given to a short flow. Similarly, compute the average throughput achieved by a long flow. What values do you get?

Average Throughput of Long Flow at C: 36018Bps  
Average Throughput of Long Flow at D: 12041Bps  
Average Throughput of Long Flow at E: 9479Bps  
Average Throughput of Long Flow:19179Bps

Average Throughput of Short Flow at C: 3214Bps  
Average Throughput of Short Flow at D: 11363Bps  
Average Throughput of Short Flow at E: 9172Bps  
Average Throughput of Short Flow:7916Bps

5. Is each of these throughputs different from the corresponding throughput numbers obtained in Part A of the "Mice and Elephants" experiment? If they are explain what you think is happening, using one of the types of plots that **tcptrace** generates, for one of the flows (we don't tell you which plot will provide the most graphic explanation for what is happening; this is something for you to decide). Name this file **iso\_plot.eps**.

The throughput values for both short and long flows are very low as compared to part A of "Mice and Elephants" experiment because UDP is persistent in sending packets and UDP sources do not reduce their rate in case of congestion. Therefore when router buffer fills up, only both short and long TCP flows reduce their transmission rate, but UDP source keeps on sending packets persistently and the throughput of TCP flows degrades.

## Part B

1. Compress the traces from each of C, D, and E and include them in your submission. These traces must be named **C.tcp\_iso\_red.trace.gz**, **D.tcp\_iso\_red.trace.gz** etc.
2. Include three summaries of these traces (i.e run **tcptrace -b** on them). These files must be text files and must be named: **C.tcp\_iso\_red.summary**, **D.tcp\_iso\_red.summary** etc.

**C.tcp\_iso\_red.summary**

1 arg remaining, starting with 'C.tcp\_iso\_red.trace'

Ostermann's tcptrace -- version 6.6.7 -- Thu Nov 4, 2004

338271 packets seen, 15560 TCP packets traced

elapsed wallclock time: 0:00:00.757422, 446608 pkts/sec analyzed

trace file elapsed time: 0:09:01.027807

TCP connection info:

1: bb121-7-0-2.singnet.com.sg:59199 - bb121-7-64-2.singnet.com.sg:pcanywherestat  
(a2b) 26> 20<

2: bb121-7-0-2.singnet.com.sg:57919 - bb121-7-64-2.singnet.com.sg:80 (c2d)  
7> 6< (reset)

3: bb121-7-0-2.singnet.com.sg:57922 - bb121-7-64-2.singnet.com.sg:80 (e2f)  
9> 8< (reset)

4: bb121-7-0-2.singnet.com.sg:57923 - bb121-7-64-2.singnet.com.sg:80 (g2h)  
28> 35< (complete)

5: bb121-7-0-2.singnet.com.sg:57924 - bb121-7-64-2.singnet.com.sg:80 (i2j)  
7> 6< (reset)

6: bb121-7-0-2.singnet.com.sg:57934 - bb121-7-64-2.singnet.com.sg:80 (k2l)  
3445> 5373< (complete)

7: bb121-7-0-2.singnet.com.sg:57937 - bb121-7-64-2.singnet.com.sg:80 (m2n)  
28> 36< (complete)

8: bb121-7-0-2.singnet.com.sg:57939 - bb121-7-64-2.singnet.com.sg:80 (o2p)  
9> 10< (reset)

9: bb121-7-0-2.singnet.com.sg:57936 - bb121-7-64-2.singnet.com.sg:80 (q2r)  
9> 8< (reset)

10: bb121-7-0-2.singnet.com.sg:57945 - bb121-7-64-2.singnet.com.sg:80 (s2t)  
27> 36< (complete)

11: bb121-7-0-2.singnet.com.sg:57953 - bb121-7-64-2.singnet.com.sg:80 (u2v)  
26> 33< (complete)

12: bb121-7-0-2.singnet.com.sg:57954 - bb121-7-64-2.singnet.com.sg:80 (w2x)  
25> 32< (complete)

13: bb121-7-0-2.singnet.com.sg:57961 - bb121-7-64-2.singnet.com.sg:80 (y2z)  
31> 35< (complete)

14: bb121-7-0-2.singnet.com.sg:57964 - bb121-7-64-2.singnet.com.sg:80 (aa2ab)  
26> 35< (complete)

15: bb121-7-0-2.singnet.com.sg:57973 - bb121-7-64-2.singnet.com.sg:80 (ac2ad)  
27> 32< (complete)

16: bb121-7-0-2.singnet.com.sg:57974 - bb121-7-64-2.singnet.com.sg:80 (ae2af)  
29> 32< (complete)

17: bb121-7-0-2.singnet.com.sg:57977 - bb121-7-64-2.singnet.com.sg:80 (ag2ah)  
27> 39< (complete)

18: bb121-7-0-2.singnet.com.sg:57972 - bb121-7-64-2.singnet.com.sg:80 (ai2aj)  
9> 8< (reset)

19: bb121-7-0-2.singnet.com.sg:57980 - bb121-7-64-2.singnet.com.sg:80 (ak2al)  
27> 31< (complete)

20: bb121-7-0-2.singnet.com.sg:57985 - bb121-7-64-2.singnet.com.sg:80 (am2an)  
26> 36< (complete)

21: bb121-7-0-2.singnet.com.sg:57988 - bb121-7-64-2.singnet.com.sg:80 (ao2ap)  
30> 37< (complete)

22: bb121-7-0-2.singnet.com.sg:57989 - bb121-7-64-2.singnet.com.sg:80 (aq2ar)  
9> 8< (reset)

23: bb121-7-0-2.singnet.com.sg:57993 - bb121-7-64-2.singnet.com.sg:80 (as2at)  
5> 9< (reset)

24: bb121-7-0-2.singnet.com.sg:57996 - bb121-7-64-2.singnet.com.sg:80 (au2av)  
27> 41< (complete)

25: bb121-7-0-2.singnet.com.sg:58001 - bb121-7-64-2.singnet.com.sg:80 (aw2ax)  
25> 33< (complete)

26: bb121-7-0-2.singnet.com.sg:58005 - bb121-7-64-2.singnet.com.sg:80 (ay2az)  
27> 36< (complete)

27: bb121-7-0-2.singnet.com.sg:58006 - bb121-7-64-2.singnet.com.sg:80 (ba2bb)  
7> 8< (reset)

28: bb121-7-0-2.singnet.com.sg:58011 - bb121-7-64-2.singnet.com.sg:80 (bc2bd)  
26> 36< (complete)

29: bb121-7-0-2.singnet.com.sg:58019 - bb121-7-64-2.singnet.com.sg:80 (be2bf)  
26> 32< (complete)

30: bb121-7-0-2.singnet.com.sg:58015 - bb121-7-64-2.singnet.com.sg:80 (bg2bh)  
8> 7< (reset)

31: bb121-7-0-2.singnet.com.sg:58032 - bb121-7-64-2.singnet.com.sg:80 (bi2bj)  
6> 6< (reset)

32: bb121-7-0-2.singnet.com.sg:58027 - bb121-7-64-2.singnet.com.sg:80 (bk2bl)  
31> 34< (complete)

33: bb121-7-0-2.singnet.com.sg:58038 - bb121-7-64-2.singnet.com.sg:80 (bm2bn)  
29> 39< (complete)

34: bb121-7-0-2.singnet.com.sg:58035 - bb121-7-64-2.singnet.com.sg:80 (bo2bp)  
4> 5< (reset)

35: bb121-7-0-2.singnet.com.sg:58025 - bb121-7-64-2.singnet.com.sg:80 (bq2br)  
9> 8< (reset)

36: bb121-7-0-2.singnet.com.sg:58048 - bb121-7-64-2.singnet.com.sg:80 (bs2bt)  
12> 11< (reset)

37: bb121-7-0-2.singnet.com.sg:58043 - bb121-7-64-2.singnet.com.sg:80 (bu2bv)  
27> 38< (complete)

38: bb121-7-0-2.singnet.com.sg:58050 - bb121-7-64-2.singnet.com.sg:80 (bw2bx)  
26> 33< (complete)

39: bb121-7-0-2.singnet.com.sg:58054 - bb121-7-64-2.singnet.com.sg:80 (by2bz)  
29> 39< (complete)

40: bb121-7-0-2.singnet.com.sg:58069 - bb121-7-64-2.singnet.com.sg:80 (ca2cb)  
9> 9< (reset)

41: bb121-7-0-2.singnet.com.sg:58071 - bb121-7-64-2.singnet.com.sg:80 (cc2cd)  
24> 31< (complete)

42: bb121-7-0-2.singnet.com.sg:58073 - bb121-7-64-2.singnet.com.sg:80 (ce2cf)  
5> 8< (reset)

43: bb121-7-0-2.singnet.com.sg:58076 - bb121-7-64-2.singnet.com.sg:80 (cg2ch)  
28> 34< (complete) (reset)

44: bb121-7-0-2.singnet.com.sg:58080 - bb121-7-64-2.singnet.com.sg:80 (ci2cj)  
28> 32< (complete)

45: bb121-7-0-2.singnet.com.sg:58082 - bb121-7-64-2.singnet.com.sg:80 (ck2cl)  
24> 31< (complete)

46: bb121-7-0-2.singnet.com.sg:58084 - bb121-7-64-2.singnet.com.sg:80 (cm2cn)  
29> 32< (complete)

47: bb121-7-0-2.singnet.com.sg:58087 - bb121-7-64-2.singnet.com.sg:80 (co2cp)  
10> 8< (reset)

48: bb121-7-0-2.singnet.com.sg:58088 - bb121-7-64-2.singnet.com.sg:80 (cq2cr)  
29> 42< (complete)

49: bb121-7-0-2.singnet.com.sg:58095 - bb121-7-64-2.singnet.com.sg:80 (cs2ct)  
29> 40< (complete)

50: bb121-7-0-2.singnet.com.sg:58111 - bb121-7-64-2.singnet.com.sg:80 (cu2cv)  
21> 33< (complete)

51: bb121-7-0-2.singnet.com.sg:58114 - bb121-7-64-2.singnet.com.sg:80 (cw2cx)  
29> 38< (complete)

52: bb121-7-0-2.singnet.com.sg:58135 - bb121-7-64-2.singnet.com.sg:80 (cy2cz)  
25> 31< (complete)

53: bb121-7-0-2.singnet.com.sg:58138 - bb121-7-64-2.singnet.com.sg:80 (da2db)  
27> 34< (complete)

54: bb121-7-0-2.singnet.com.sg:58151 - bb121-7-64-2.singnet.com.sg:80 (dc2dd)  
5> 8< (reset)

55: bb121-7-0-2.singnet.com.sg:58153 - bb121-7-64-2.singnet.com.sg:80 (de2df)  
27> 38< (complete)

56: bb121-7-0-2.singnet.com.sg:58169 - bb121-7-64-2.singnet.com.sg:80 (dg2dh)  
11> 9< (reset)

57: bb121-7-0-2.singnet.com.sg:58181 - bb121-7-64-2.singnet.com.sg:80 (di2dj)  
29> 34< (complete)

58: bb121-7-0-2.singnet.com.sg:58193 - bb121-7-64-2.singnet.com.sg:80 (dk2dl)  
30> 34< (complete) (reset)

59: bb121-7-0-2.singnet.com.sg:58196 - bb121-7-64-2.singnet.com.sg:80 (dm2dn)  
29> 37< (complete)

60: bb121-7-0-2.singnet.com.sg:58201 - bb121-7-64-2.singnet.com.sg:80 (do2dp)  
27> 42< (complete)

61: bb121-7-0-2.singnet.com.sg:58248 - bb121-7-64-2.singnet.com.sg:80 (dq2dr)  
29> 31< (complete)

62: bb121-7-0-2.singnet.com.sg:58251 - bb121-7-64-2.singnet.com.sg:80 (ds2dt)  
25> 34< (complete) (reset)

63: bb121-7-0-2.singnet.com.sg:58258 - bb121-7-64-2.singnet.com.sg:80 (du2dv)  
29> 36< (complete)

64: bb121-7-0-2.singnet.com.sg:58261 - bb121-7-64-2.singnet.com.sg:80 (dw2dx)  
10> 8< (reset)

65: bb121-7-0-2.singnet.com.sg:58268 - bb121-7-64-2.singnet.com.sg:80 (dy2dz)  
24> 35< (complete)

66: bb121-7-0-2.singnet.com.sg:58270 - bb121-7-64-2.singnet.com.sg:80 (ea2eb)  
26> 33< (complete)

67: bb121-7-0-2.singnet.com.sg:58278 - bb121-7-64-2.singnet.com.sg:80 (ec2ed)  
29> 33< (complete)

68: bb121-7-0-2.singnet.com.sg:58281 - bb121-7-64-2.singnet.com.sg:80 (ee2ef)  
8> 8< (reset)

69: bb121-7-0-2.singnet.com.sg:58289 - bb121-7-64-2.singnet.com.sg:80 (eg2eh)  
27> 33< (complete)

70: bb121-7-0-2.singnet.com.sg:58295 - bb121-7-64-2.singnet.com.sg:80 (ei2ej)  
26> 33< (complete)

71: bb121-7-0-2.singnet.com.sg:58292 - bb121-7-64-2.singnet.com.sg:80 (ek2el)  
9> 7< (reset)

72: bb121-7-0-2.singnet.com.sg:58301 - bb121-7-64-2.singnet.com.sg:80 (em2en)  
30> 35< (complete)

73: bb121-7-0-2.singnet.com.sg:46445 - bb121-7-64-2.singnet.com.sg:80 (eo2ep)  
27> 37< (complete)

74: bb121-7-0-2.singnet.com.sg:46453 - bb121-7-64-2.singnet.com.sg:80 (eq2er)  
22> 32< (complete)



75: bb121-7-0-2.singnet.com.sg:46463 - bb121-7-64-2.singnet.com.sg:80 (es2et)  
24> 37< (complete)

76: bb121-7-0-2.singnet.com.sg:46478 - bb121-7-64-2.singnet.com.sg:80 (eu2ev)  
28> 34< (complete)

77: bb121-7-0-2.singnet.com.sg:46480 - bb121-7-64-2.singnet.com.sg:80 (ew2ex)  
10> 9< (reset)

78: bb121-7-0-2.singnet.com.sg:46485 - bb121-7-64-2.singnet.com.sg:80 (ey2ez)  
29> 35< (complete) (reset)

79: bb121-7-0-2.singnet.com.sg:46488 - bb121-7-64-2.singnet.com.sg:80 (fa2fb)  
28> 32< (complete)

80: bb121-7-0-2.singnet.com.sg:46495 - bb121-7-64-2.singnet.com.sg:80 (fc2fd)  
25> 35< (complete)

81: bb121-7-0-2.singnet.com.sg:46501 - bb121-7-64-2.singnet.com.sg:80 (fe2ff)  
27> 32< (complete)

82: bb121-7-0-2.singnet.com.sg:46502 - bb121-7-64-2.singnet.com.sg:80 (fg2fh)  
10> 9< (reset)

83: bb121-7-0-2.singnet.com.sg:46496 - bb121-7-64-2.singnet.com.sg:80 (fi2fj)  
9> 9< (reset)

84: bb121-7-0-2.singnet.com.sg:46506 - bb121-7-64-2.singnet.com.sg:80 (fk2fl)  
27> 31< (complete)

85: bb121-7-0-2.singnet.com.sg:46510 - bb121-7-64-2.singnet.com.sg:80 (fm2fn)  
5> 7< (reset)

86: bb121-7-0-2.singnet.com.sg:46519 - bb121-7-64-2.singnet.com.sg:80 (fo2fp)  
30> 35< (complete) (reset)

87: bb121-7-0-2.singnet.com.sg:46511 - bb121-7-64-2.singnet.com.sg:80 (fq2fr)  
9> 7< (reset)

88: bb121-7-0-2.singnet.com.sg:46525 - bb121-7-64-2.singnet.com.sg:80 (fs2ft)  
28> 32< (complete)

89: bb121-7-0-2.singnet.com.sg:46518 - bb121-7-64-2.singnet.com.sg:80 (fu2fv)  
9> 7< (reset)

90: bb121-7-0-2.singnet.com.sg:46530 - bb121-7-64-2.singnet.com.sg:80 (fw2fx)  
30> 33< (complete)

91: bb121-7-0-2.singnet.com.sg:46531 - bb121-7-64-2.singnet.com.sg:80 (fy2fz)  
9> 7< (reset)

92: bb121-7-0-2.singnet.com.sg:46532 - bb121-7-64-2.singnet.com.sg:80 (ga2gb)  
24> 32< (complete)

93: bb121-7-0-2.singnet.com.sg:46535 - bb121-7-64-2.singnet.com.sg:80 (gc2gd)  
9> 8< (reset)

94: bb121-7-0-2.singnet.com.sg:46536 - bb121-7-64-2.singnet.com.sg:80 (ge2gf)  
9> 8< (reset)

95: bb121-7-0-2.singnet.com.sg:46585 - bb121-7-64-2.singnet.com.sg:80 (gg2gh)  
28> 35< (complete)

96: bb121-7-0-2.singnet.com.sg:46587 - bb121-7-64-2.singnet.com.sg:80 (gi2gj)  
10> 8< (reset)

97: bb121-7-0-2.singnet.com.sg:46595 - bb121-7-64-2.singnet.com.sg:80 (gk2gl)  
27> 33< (complete)

98: bb121-7-0-2.singnet.com.sg:46597 - bb121-7-64-2.singnet.com.sg:80 (gm2gn)  
7> 7< (reset)

99: bb121-7-0-2.singnet.com.sg:46605 - bb121-7-64-2.singnet.com.sg:80 (go2gp)  
26> 32< (complete)

100: bb121-7-0-2.singnet.com.sg:46596 - bb121-7-64-2.singnet.com.sg:80 (gq2gr)  
11> 9< (reset)

101: bb121-7-0-2.singnet.com.sg:46603 - bb121-7-64-2.singnet.com.sg:80 (gs2gt)  
9> 7< (reset)

102: bb121-7-0-2.singnet.com.sg:46614 - bb121-7-64-2.singnet.com.sg:80 (gu2gv)  
26> 32< (complete)

103: bb121-7-0-2.singnet.com.sg:46609 - bb121-7-64-2.singnet.com.sg:80 (gw2gx)  
7> 7< (reset)

104: bb121-7-0-2.singnet.com.sg:46615 - bb121-7-64-2.singnet.com.sg:80 (gy2gz)  
9> 9< (reset)

105: bb121-7-0-2.singnet.com.sg:46617 - bb121-7-64-2.singnet.com.sg:80 (ha2hb)  
27> 34< (complete)

106: bb121-7-0-2.singnet.com.sg:46625 - bb121-7-64-2.singnet.com.sg:80 (hc2hd)  
6> 5< (reset)

107: bb121-7-0-2.singnet.com.sg:46622 - bb121-7-64-2.singnet.com.sg:80 (he2hf)  
8> 7< (reset)

108: bb121-7-0-2.singnet.com.sg:46631 - bb121-7-64-2.singnet.com.sg:80 (hg2hh)  
7> 8< (reset)

109: bb121-7-0-2.singnet.com.sg:46633 - bb121-7-64-2.singnet.com.sg:80 (hi2hj)  
28> 32< (complete)

110: bb121-7-0-2.singnet.com.sg:46637 - bb121-7-64-2.singnet.com.sg:80 (hk2hl)  
23> 31< (complete)

111: bb121-7-0-2.singnet.com.sg:46642 - bb121-7-64-2.singnet.com.sg:80 (hm2hn)  
8> 7< (reset)

112: bb121-7-0-2.singnet.com.sg:46645 - bb121-7-64-2.singnet.com.sg:80 (ho2hp)  
10> 9< (reset)

113: bb121-7-0-2.singnet.com.sg:46647 - bb121-7-64-2.singnet.com.sg:80 (hq2hr)  
25> 33< (complete)

114: bb121-7-0-2.singnet.com.sg:46651 - bb121-7-64-2.singnet.com.sg:80 (hs2ht)  
8> 7< (reset)

115: bb121-7-0-2.singnet.com.sg:46654 - bb121-7-64-2.singnet.com.sg:80 (hu2hv)  
29> 35< (complete)

116: bb121-7-0-2.singnet.com.sg:46657 - bb121-7-64-2.singnet.com.sg:80 (hw2hx)  
9> 10< (reset)

117: bb121-7-0-2.singnet.com.sg:46662 - bb121-7-64-2.singnet.com.sg:80 (hy2hz)  
8> 7< (reset)

118: bb121-7-0-2.singnet.com.sg:46664 - bb121-7-64-2.singnet.com.sg:80 (ia2ib)  
28> 32< (complete)

119: bb121-7-0-2.singnet.com.sg:46671 - bb121-7-64-2.singnet.com.sg:80 (ic2id)  
28> 37< (complete)

120: bb121-7-0-2.singnet.com.sg:46674 - bb121-7-64-2.singnet.com.sg:80 (ie2if)  
9> 7< (reset)

121: bb121-7-0-2.singnet.com.sg:46677 - bb121-7-64-2.singnet.com.sg:80 (ig2ih)  
9> 8< (reset)

122: bb121-7-0-2.singnet.com.sg:46681 - bb121-7-64-2.singnet.com.sg:80 (ii2ij)  
26> 32< (complete)

123: bb121-7-0-2.singnet.com.sg:46683 - bb121-7-64-2.singnet.com.sg:80 (ik2il)  
9> 10< (reset)

124: bb121-7-0-2.singnet.com.sg:46698 - bb121-7-64-2.singnet.com.sg:80 (im2in)  
26> 32< (complete)

125: bb121-7-0-2.singnet.com.sg:46704 - bb121-7-64-2.singnet.com.sg:80 (io2ip)  
24> 31< (complete)

126: bb121-7-0-2.singnet.com.sg:46690 - bb121-7-64-2.singnet.com.sg:80 (iq2ir)  
7> 8< (reset)

127: bb121-7-0-2.singnet.com.sg:46712 - bb121-7-64-2.singnet.com.sg:80 (is2it)  
27> 35< (complete)

128: bb121-7-0-2.singnet.com.sg:46713 - bb121-7-64-2.singnet.com.sg:80 (iu2iv)  
11> 9< (reset)

129: bb121-7-0-2.singnet.com.sg:46723 - bb121-7-64-2.singnet.com.sg:80 (iw2ix)  
28> 31< (complete)

130: bb121-7-0-2.singnet.com.sg:46726 - bb121-7-64-2.singnet.com.sg:80 (iy2iz)  
7> 9< (reset)

131: bb121-7-0-2.singnet.com.sg:46727 - bb121-7-64-2.singnet.com.sg:80 (ja2jb)  
30> 34< (complete)

132: bb121-7-0-2.singnet.com.sg:46733 - bb121-7-64-2.singnet.com.sg:80 (jc2jd)  
7> 7< (reset)

133: bb121-7-0-2.singnet.com.sg:46742 - bb121-7-64-2.singnet.com.sg:80 (je2jf)  
8> 10< (reset)

134: bb121-7-0-2.singnet.com.sg:46749 - bb121-7-64-2.singnet.com.sg:80 (jg2jh)  
28> 35< (complete)

135: bb121-7-0-2.singnet.com.sg:46754 - bb121-7-64-2.singnet.com.sg:80 (ji2jj)  
27> 34< (complete)

136: bb121-7-0-2.singnet.com.sg:46755 - bb121-7-64-2.singnet.com.sg:80 (jk2jl)  
9> 7< (reset)

137: bb121-7-0-2.singnet.com.sg:46758 - bb121-7-64-2.singnet.com.sg:80 (jm2jn)  
26> 31< (complete)

138: bb121-7-0-2.singnet.com.sg:46772 - bb121-7-64-2.singnet.com.sg:80 (jo2jp)  
25> 31< (complete)

139: bb121-7-0-2.singnet.com.sg:46765 - bb121-7-64-2.singnet.com.sg:80 (jq2jr)  
8> 7< (reset)

140: bb121-7-0-2.singnet.com.sg:46775 - bb121-7-64-2.singnet.com.sg:80 (js2jt)  
25> 39< (complete)

141: bb121-7-0-2.singnet.com.sg:46778 - bb121-7-64-2.singnet.com.sg:80 (ju2jv)  
9> 9< (reset)

142: bb121-7-0-2.singnet.com.sg:46785 - bb121-7-64-2.singnet.com.sg:80 (jw2jx)  
30> 32< (complete)

143: bb121-7-0-2.singnet.com.sg:46794 - bb121-7-64-2.singnet.com.sg:80 (jy2jz)  
9> 9< (reset)

144: bb121-7-0-2.singnet.com.sg:46788 - bb121-7-64-2.singnet.com.sg:80 (ka2kb)  
28> 31< (complete)

145: bb121-7-0-2.singnet.com.sg:46789 - bb121-7-64-2.singnet.com.sg:80 (kc2kd)  
8> 9< (reset)

146: bb121-7-0-2.singnet.com.sg:46800 - bb121-7-64-2.singnet.com.sg:80 (ke2kf)  
28> 35< (complete)

147: bb121-7-0-2.singnet.com.sg:46805 - bb121-7-64-2.singnet.com.sg:80 (kg2kh)  
8> 9< (reset)

148: bb121-7-0-2.singnet.com.sg:46808 - bb121-7-64-2.singnet.com.sg:80 (ki2kj)  
27> 39< (complete)

149: bb121-7-0-2.singnet.com.sg:46816 - bb121-7-64-2.singnet.com.sg:80 (kk2kl)  
22> 31< (complete)

150: bb121-7-0-2.singnet.com.sg:46824 - bb121-7-64-2.singnet.com.sg:80 (km2kn)  
23> 31< (complete)

151: bb121-7-0-2.singnet.com.sg:46825 - bb121-7-64-2.singnet.com.sg:80 (ko2kp)  
9> 7< (reset)

152: bb121-7-0-2.singnet.com.sg:46832 - bb121-7-64-2.singnet.com.sg:80 (kq2kr)  
22> 31< (complete)

153: bb121-7-0-2.singnet.com.sg:46833 - bb121-7-64-2.singnet.com.sg:80 (ks2kt)  
27> 34< (complete)

154: bb121-7-0-2.singnet.com.sg:46831 - bb121-7-64-2.singnet.com.sg:80 (ku2kv)  
9> 8< (reset)

155: bb121-7-0-2.singnet.com.sg:46842 - bb121-7-64-2.singnet.com.sg:80 (kw2kx)  
30> 31< (complete)

156: bb121-7-0-2.singnet.com.sg:46847 - bb121-7-64-2.singnet.com.sg:80 (ky2kz)  
29> 34< (complete)

157: bb121-7-0-2.singnet.com.sg:46848 - bb121-7-64-2.singnet.com.sg:80 (la2lb)  
8> 10< (reset)

#### **D.tcp\_iso\_red.summary**

1 arg remaining, starting with 'D.tcp\_iso\_red.trace'  
Ostermann's tcptrace -- version 6.6.7 -- Thu Nov 4, 2004

31874 packets seen, 31832 TCP packets traced  
elapsed wallclock time: 0:00:00.521504, 61119 pkts/sec analyzed  
trace file elapsed time: 0:09:09.434410

TCP connection info:

1: bb121-7-0-2.singnet.com.sg:41406 - bb121-7-128-2.singnet.com.sg:80 (a2b)  
4791> 5773< (complete)  
2: bb121-7-0-2.singnet.com.sg:41411 - bb121-7-128-2.singnet.com.sg:80 (c2d) 8>  
9< (reset)  
3: bb121-7-0-2.singnet.com.sg:41412 - bb121-7-128-2.singnet.com.sg:80 (e2f) 31>  
36< (complete)  
4: bb121-7-0-2.singnet.com.sg:41413 - bb121-7-128-2.singnet.com.sg:80 (g2h) 8>  
8< (reset)  
5: bb121-7-0-2.singnet.com.sg:41417 - bb121-7-128-2.singnet.com.sg:80 (i2j) 31>  
38< (complete)  
6: bb121-7-0-2.singnet.com.sg:41418 - bb121-7-128-2.singnet.com.sg:80 (k2l) 8>  
7< (reset)

7: bb121-7-0-2.singnet.com.sg:41421 - bb121-7-128-2.singnet.com.sg:80 (m2n) 7>  
9< (reset)  
8: bb121-7-0-2.singnet.com.sg:41426 - bb121-7-128-2.singnet.com.sg:80 (o2p) 34>  
35< (complete)  
9: bb121-7-0-2.singnet.com.sg:41427 - bb121-7-128-2.singnet.com.sg:80 (q2r) 9>  
8< (reset)  
10: bb121-7-0-2.singnet.com.sg:41428 - bb121-7-128-2.singnet.com.sg:80 (s2t) 31>  
36< (complete)  
11: bb121-7-0-2.singnet.com.sg:41429 - bb121-7-128-2.singnet.com.sg:80 (u2v) 9>  
7< (reset)  
12: bb121-7-0-2.singnet.com.sg:41432 - bb121-7-128-2.singnet.com.sg:80 (w2x)  
31> 36< (complete)  
13: bb121-7-0-2.singnet.com.sg:41434 - bb121-7-128-2.singnet.com.sg:80 (y2z) 8>  
6< (reset)  
14: bb121-7-0-2.singnet.com.sg:41435 - bb121-7-128-2.singnet.com.sg:80 (aa2ab)  
10> 8< (reset)  
15: bb121-7-0-2.singnet.com.sg:41436 - bb121-7-128-2.singnet.com.sg:80 (ac2ad)  
32> 34< (complete)  
16: bb121-7-0-2.singnet.com.sg:41437 - bb121-7-128-2.singnet.com.sg:80 (ae2af)  
32> 36< (complete)  
17: bb121-7-0-2.singnet.com.sg:41442 - bb121-7-128-2.singnet.com.sg:80 (ag2ah)  
31> 38< (complete)  
18: bb121-7-0-2.singnet.com.sg:41443 - bb121-7-128-2.singnet.com.sg:80 (ai2aj) 10>  
9< (reset)  
19: bb121-7-0-2.singnet.com.sg:41444 - bb121-7-128-2.singnet.com.sg:80 (ak2al)  
11> 9< (reset)  
20: bb121-7-0-2.singnet.com.sg:41446 - bb121-7-128-2.singnet.com.sg:80 (am2an)  
32> 33< (complete)  
21: bb121-7-0-2.singnet.com.sg:41448 - bb121-7-128-2.singnet.com.sg:80 (ao2ap)  
31> 36< (complete)  
22: bb121-7-0-2.singnet.com.sg:41451 - bb121-7-128-2.singnet.com.sg:80 (aq2ar)  
30> 34< (complete)  
23: bb121-7-0-2.singnet.com.sg:41453 - bb121-7-128-2.singnet.com.sg:80 (as2at) 33>  
42< (complete)  
24: bb121-7-0-2.singnet.com.sg:41455 - bb121-7-128-2.singnet.com.sg:80 (au2av)  
10> 9< (reset)  
25: bb121-7-0-2.singnet.com.sg:41456 - bb121-7-128-2.singnet.com.sg:80 (aw2ax)  
32> 36< (complete)  
26: bb121-7-0-2.singnet.com.sg:41457 - bb121-7-128-2.singnet.com.sg:80 (ay2az) 7>  
7< (reset)  
27: bb121-7-0-2.singnet.com.sg:41461 - bb121-7-128-2.singnet.com.sg:80 (ba2bb)  
30> 32< (complete)  
28: bb121-7-0-2.singnet.com.sg:41462 - bb121-7-128-2.singnet.com.sg:80 (bc2bd)  
31> 35< (complete)  
29: bb121-7-0-2.singnet.com.sg:41464 - bb121-7-128-2.singnet.com.sg:80 (be2bf)  
32> 35< (complete)

30: bb121-7-0-2.singnet.com.sg:41467 - bb121-7-128-2.singnet.com.sg:80 (bg2bh)  
32> 37< (complete)  
31: bb121-7-0-2.singnet.com.sg:41469 - bb121-7-128-2.singnet.com.sg:80 (bi2bj) 8>  
7< (reset)  
32: bb121-7-0-2.singnet.com.sg:41470 - bb121-7-128-2.singnet.com.sg:80 (bk2bl) 7>  
6< (reset)  
33: bb121-7-0-2.singnet.com.sg:41477 - bb121-7-128-2.singnet.com.sg:80 (bm2bn)  
32> 36< (complete)  
34: bb121-7-0-2.singnet.com.sg:41480 - bb121-7-128-2.singnet.com.sg:80 (bo2bp)  
32> 35< (complete)  
35: bb121-7-0-2.singnet.com.sg:41483 - bb121-7-128-2.singnet.com.sg:80 (bq2br)  
30> 31< (complete)  
36: bb121-7-0-2.singnet.com.sg:41484 - bb121-7-128-2.singnet.com.sg:80 (bs2bt) 6>  
8< (reset)  
37: bb121-7-0-2.singnet.com.sg:41485 - bb121-7-128-2.singnet.com.sg:80 (bu2bv)  
9> 8< (reset)  
38: bb121-7-0-2.singnet.com.sg:41486 - bb121-7-128-2.singnet.com.sg:80 (bw2bx)  
31> 36< (complete)  
39: bb121-7-0-2.singnet.com.sg:41488 - bb121-7-128-2.singnet.com.sg:80 (by2bz)  
31> 34< (complete)  
40: bb121-7-0-2.singnet.com.sg:41490 - bb121-7-128-2.singnet.com.sg:80 (ca2cb)  
33> 36< (complete)  
41: bb121-7-0-2.singnet.com.sg:41494 - bb121-7-128-2.singnet.com.sg:80 (cc2cd)  
31> 35< (complete)  
42: bb121-7-0-2.singnet.com.sg:41495 - bb121-7-128-2.singnet.com.sg:80 (ce2cf)  
33> 34< (complete)  
43: bb121-7-0-2.singnet.com.sg:41498 - bb121-7-128-2.singnet.com.sg:80 (cg2ch)  
8> 7< (reset)  
44: bb121-7-0-2.singnet.com.sg:41499 - bb121-7-128-2.singnet.com.sg:80 (ci2cj) 10>  
9< (reset)  
45: bb121-7-0-2.singnet.com.sg:41503 - bb121-7-128-2.singnet.com.sg:80 (ck2cl)  
31> 35< (complete)  
46: bb121-7-0-2.singnet.com.sg:41506 - bb121-7-128-2.singnet.com.sg:80 (cm2cn)  
31> 34< (complete)  
47: bb121-7-0-2.singnet.com.sg:41508 - bb121-7-128-2.singnet.com.sg:80 (co2cp)  
32> 33< (complete)  
48: bb121-7-0-2.singnet.com.sg:41509 - bb121-7-128-2.singnet.com.sg:80 (cq2cr)  
31> 37< (complete)  
49: bb121-7-0-2.singnet.com.sg:41515 - bb121-7-128-2.singnet.com.sg:80 (cs2ct) 31>  
32< (complete)  
50: bb121-7-0-2.singnet.com.sg:41517 - bb121-7-128-2.singnet.com.sg:80 (cu2cv)  
10> 8< (reset)  
51: bb121-7-0-2.singnet.com.sg:41519 - bb121-7-128-2.singnet.com.sg:80 (cw2cx)  
32> 37< (complete)  
52: bb121-7-0-2.singnet.com.sg:41520 - bb121-7-128-2.singnet.com.sg:80 (cy2cz)  
31> 37< (complete)



53: bb121-7-0-2.singnet.com.sg:41522 - bb121-7-128-2.singnet.com.sg:80 (da2db)  
9> 7< (reset)  
54: bb121-7-0-2.singnet.com.sg:41523 - bb121-7-128-2.singnet.com.sg:80 (dc2dd)  
32> 36< (complete)  
55: bb121-7-0-2.singnet.com.sg:41526 - bb121-7-128-2.singnet.com.sg:80 (de2df)  
31> 33< (complete)  
56: bb121-7-0-2.singnet.com.sg:41528 - bb121-7-128-2.singnet.com.sg:80 (dg2dh)  
32> 35< (complete)  
57: bb121-7-0-2.singnet.com.sg:41531 - bb121-7-128-2.singnet.com.sg:80 (di2dj) 32>  
36< (complete)  
58: bb121-7-0-2.singnet.com.sg:41533 - bb121-7-128-2.singnet.com.sg:80 (dk2dl)  
32> 35< (complete)  
59: bb121-7-0-2.singnet.com.sg:41535 - bb121-7-128-2.singnet.com.sg:80 (dm2dn)  
7> 8< (reset)  
60: bb121-7-0-2.singnet.com.sg:41538 - bb121-7-128-2.singnet.com.sg:80 (do2dp)  
9> 7< (reset)  
61: bb121-7-0-2.singnet.com.sg:41541 - bb121-7-128-2.singnet.com.sg:80 (dq2dr)  
32> 37< (complete)  
62: bb121-7-0-2.singnet.com.sg:41543 - bb121-7-128-2.singnet.com.sg:80 (ds2dt)  
31> 35< (complete)  
63: bb121-7-0-2.singnet.com.sg:41545 - bb121-7-128-2.singnet.com.sg:80 (du2dv)  
32> 36< (complete)  
64: bb121-7-0-2.singnet.com.sg:41546 - bb121-7-128-2.singnet.com.sg:80 (dw2dx)  
32> 39< (complete)  
65: bb121-7-0-2.singnet.com.sg:41549 - bb121-7-128-2.singnet.com.sg:80 (dy2dz)  
32> 37< (complete)  
66: bb121-7-0-2.singnet.com.sg:41550 - bb121-7-128-2.singnet.com.sg:80 (ea2eb) 8>  
6< (reset)  
67: bb121-7-0-2.singnet.com.sg:41552 - bb121-7-128-2.singnet.com.sg:80 (ec2ed)  
32> 35< (complete)  
68: bb121-7-0-2.singnet.com.sg:41553 - bb121-7-128-2.singnet.com.sg:80 (ee2ef)  
31> 34< (complete)  
69: bb121-7-0-2.singnet.com.sg:41554 - bb121-7-128-2.singnet.com.sg:80 (eg2eh)  
10> 8< (reset)  
70: bb121-7-0-2.singnet.com.sg:41556 - bb121-7-128-2.singnet.com.sg:80 (ei2ej) 32>  
40< (complete)  
71: bb121-7-0-2.singnet.com.sg:41561 - bb121-7-128-2.singnet.com.sg:80 (ek2el)  
31> 32< (complete)  
72: bb121-7-0-2.singnet.com.sg:41563 - bb121-7-128-2.singnet.com.sg:80 (em2en)  
31> 35< (complete)  
73: bb121-7-0-2.singnet.com.sg:41564 - bb121-7-128-2.singnet.com.sg:80 (eo2ep)  
9> 7< (reset)  
74: bb121-7-0-2.singnet.com.sg:41565 - bb121-7-128-2.singnet.com.sg:80 (eq2er)  
31> 37< (complete)  
75: bb121-7-0-2.singnet.com.sg:41569 - bb121-7-128-2.singnet.com.sg:80 (es2et) 32>  
36< (complete)

76: bb121-7-0-2.singnet.com.sg:41571 - bb121-7-128-2.singnet.com.sg:80 (eu2ev)  
33> 37< (complete)  
77: bb121-7-0-2.singnet.com.sg:41576 - bb121-7-128-2.singnet.com.sg:80 (ew2ex)  
8> 8< (reset)  
78: bb121-7-0-2.singnet.com.sg:41579 - bb121-7-128-2.singnet.com.sg:80 (ey2ez)  
32> 37< (complete)  
79: bb121-7-0-2.singnet.com.sg:41582 - bb121-7-128-2.singnet.com.sg:80 (fa2fb) 9>  
7< (reset)  
80: bb121-7-0-2.singnet.com.sg:41585 - bb121-7-128-2.singnet.com.sg:80 (fc2fd) 32>  
37< (complete)  
81: bb121-7-0-2.singnet.com.sg:41588 - bb121-7-128-2.singnet.com.sg:80 (fe2ff) 9>  
8< (reset)  
82: bb121-7-0-2.singnet.com.sg:41589 - bb121-7-128-2.singnet.com.sg:80 (fg2fh)  
32> 33< (complete)  
83: bb121-7-0-2.singnet.com.sg:41590 - bb121-7-128-2.singnet.com.sg:80 (fi2fj) 32>  
39< (complete)  
84: bb121-7-0-2.singnet.com.sg:41593 - bb121-7-128-2.singnet.com.sg:80 (fk2fl) 32>  
36< (complete)  
85: bb121-7-0-2.singnet.com.sg:41594 - bb121-7-128-2.singnet.com.sg:80 (fm2fn)  
10> 8< (reset)  
86: bb121-7-0-2.singnet.com.sg:41595 - bb121-7-128-2.singnet.com.sg:80 (fo2fp)  
32> 36< (complete)  
87: bb121-7-0-2.singnet.com.sg:41596 - bb121-7-128-2.singnet.com.sg:80 (fq2fr) 31>  
36< (complete)  
88: bb121-7-0-2.singnet.com.sg:41599 - bb121-7-128-2.singnet.com.sg:80 (fs2ft) 32>  
36< (complete)  
89: bb121-7-0-2.singnet.com.sg:41601 - bb121-7-128-2.singnet.com.sg:80 (fu2fv)  
31> 34< (complete)  
90: bb121-7-0-2.singnet.com.sg:41604 - bb121-7-128-2.singnet.com.sg:80 (fw2fx)  
32> 34< (complete)  
91: bb121-7-0-2.singnet.com.sg:41605 - bb121-7-128-2.singnet.com.sg:80 (fy2fz) 32>  
35< (complete)  
92: bb121-7-0-2.singnet.com.sg:41606 - bb121-7-128-2.singnet.com.sg:80 (ga2gb)  
32> 37< (complete)  
93: bb121-7-0-2.singnet.com.sg:41607 - bb121-7-128-2.singnet.com.sg:80 (gc2gd)  
9> 7< (reset)  
94: bb121-7-0-2.singnet.com.sg:41608 - bb121-7-128-2.singnet.com.sg:80 (ge2gf)  
32> 38< (complete)  
95: bb121-7-0-2.singnet.com.sg:41611 - bb121-7-128-2.singnet.com.sg:80 (gg2gh)  
32> 35< (complete)  
96: bb121-7-0-2.singnet.com.sg:41613 - bb121-7-128-2.singnet.com.sg:80 (gi2gj) 8>  
7< (reset)  
97: bb121-7-0-2.singnet.com.sg:41616 - bb121-7-128-2.singnet.com.sg:80 (gk2gl)  
33> 36< (complete)  
98: bb121-7-0-2.singnet.com.sg:41618 - bb121-7-128-2.singnet.com.sg:80 (gm2gn)  
33> 44< (complete)

99: bb121-7-0-2.singnet.com.sg:41620 - bb121-7-128-2.singnet.com.sg:80 (go2gp)  
9> 8< (reset)  
100: bb121-7-0-2.singnet.com.sg:41625 - bb121-7-128-2.singnet.com.sg:80 (gq2gr)  
9> 7< (reset)  
101: bb121-7-0-2.singnet.com.sg:41626 - bb121-7-128-2.singnet.com.sg:80 (gs2gt)  
31> 35< (complete)  
102: bb121-7-0-2.singnet.com.sg:41628 - bb121-7-128-2.singnet.com.sg:80 (gu2gv)  
31> 38< (complete)  
103: bb121-7-0-2.singnet.com.sg:41630 - bb121-7-128-2.singnet.com.sg:80 (gw2gx)  
31> 40< (complete)  
104: bb121-7-0-2.singnet.com.sg:41631 - bb121-7-128-2.singnet.com.sg:80 (gy2gz)  
32> 41< (complete)  
105: bb121-7-0-2.singnet.com.sg:41632 - bb121-7-128-2.singnet.com.sg:80 (ha2hb)  
8> 7< (reset)  
106: bb121-7-0-2.singnet.com.sg:41634 - bb121-7-128-2.singnet.com.sg:80 (hc2hd)  
32> 37< (complete)  
107: bb121-7-0-2.singnet.com.sg:41638 - bb121-7-128-2.singnet.com.sg:80 (he2hf)  
9> 7< (reset)  
108: bb121-7-0-2.singnet.com.sg:41642 - bb121-7-128-2.singnet.com.sg:80 (hg2hh)  
31> 37< (complete)  
109: bb121-7-0-2.singnet.com.sg:41645 - bb121-7-128-2.singnet.com.sg:80 (hi2hj)  
31> 35< (complete)  
110: bb121-7-0-2.singnet.com.sg:41646 - bb121-7-128-2.singnet.com.sg:80 (hk2hl)  
32> 38< (complete)  
111: bb121-7-0-2.singnet.com.sg:41648 - bb121-7-128-2.singnet.com.sg:80 (hm2hn)  
9> 8< (reset)  
112: bb121-7-0-2.singnet.com.sg:41649 - bb121-7-128-2.singnet.com.sg:80 (ho2hp)  
29> 31< (complete)  
113: bb121-7-0-2.singnet.com.sg:41651 - bb121-7-128-2.singnet.com.sg:80 (hq2hr)  
31> 36< (complete)  
114: bb121-7-0-2.singnet.com.sg:41652 - bb121-7-128-2.singnet.com.sg:80 (hs2ht)  
31> 34< (complete)  
115: bb121-7-0-2.singnet.com.sg:41653 - bb121-7-128-2.singnet.com.sg:80 (hu2hv)  
31> 33< (complete)  
116: bb121-7-0-2.singnet.com.sg:41654 - bb121-7-128-2.singnet.com.sg:80 (hw2hx)  
9> 9< (reset)  
117: bb121-7-0-2.singnet.com.sg:41656 - bb121-7-128-2.singnet.com.sg:80 (hy2hz)  
31> 38< (complete)  
118: bb121-7-0-2.singnet.com.sg:41658 - bb121-7-128-2.singnet.com.sg:80 (ia2ib)  
33> 35< (complete)  
119: bb121-7-0-2.singnet.com.sg:41660 - bb121-7-128-2.singnet.com.sg:80 (ic2id) 9>  
9< (reset)  
120: bb121-7-0-2.singnet.com.sg:41661 - bb121-7-128-2.singnet.com.sg:80 (ie2if) 31>  
36< (complete)  
121: bb121-7-0-2.singnet.com.sg:41662 - bb121-7-128-2.singnet.com.sg:80 (ig2ih)  
32> 34< (complete)

122: bb121-7-0-2.singnet.com.sg:41663 - bb121-7-128-2.singnet.com.sg:80 (ii2ij) 31>  
38< (complete)  
123: bb121-7-0-2.singnet.com.sg:41665 - bb121-7-128-2.singnet.com.sg:80 (ik2il) 31>  
35< (complete)  
124: bb121-7-0-2.singnet.com.sg:41666 - bb121-7-128-2.singnet.com.sg:80 (im2in)  
32> 33< (complete)  
125: bb121-7-0-2.singnet.com.sg:41668 - bb121-7-128-2.singnet.com.sg:80 (io2ip)  
31> 41< (complete)  
126: bb121-7-0-2.singnet.com.sg:41669 - bb121-7-128-2.singnet.com.sg:80 (iq2ir) 8>  
7< (reset)  
127: bb121-7-0-2.singnet.com.sg:41671 - bb121-7-128-2.singnet.com.sg:80 (is2it) 31>  
41< (complete)  
128: bb121-7-0-2.singnet.com.sg:41673 - bb121-7-128-2.singnet.com.sg:80 (iu2iv)  
31> 34< (complete)  
129: bb121-7-0-2.singnet.com.sg:41675 - bb121-7-128-2.singnet.com.sg:80 (iw2ix)  
9> 8< (reset)  
130: bb121-7-0-2.singnet.com.sg:41676 - bb121-7-128-2.singnet.com.sg:80 (iy2iz)  
10> 9< (reset)  
131: bb121-7-0-2.singnet.com.sg:41677 - bb121-7-128-2.singnet.com.sg:80 (ja2jb)  
32> 40< (complete)  
132: bb121-7-0-2.singnet.com.sg:41680 - bb121-7-128-2.singnet.com.sg:80 (jc2jd)  
31> 34< (complete)  
133: bb121-7-0-2.singnet.com.sg:41683 - bb121-7-128-2.singnet.com.sg:80 (je2jf) 32>  
34< (complete)  
134: bb121-7-0-2.singnet.com.sg:41684 - bb121-7-128-2.singnet.com.sg:80 (jg2jh) 8>  
7< (reset)  
135: bb121-7-0-2.singnet.com.sg:41685 - bb121-7-128-2.singnet.com.sg:80 (ji2jj) 8>  
7< (reset)  
136: bb121-7-0-2.singnet.com.sg:41688 - bb121-7-128-2.singnet.com.sg:80 (jk2jl) 32>  
37< (complete)  
137: bb121-7-0-2.singnet.com.sg:41689 - bb121-7-128-2.singnet.com.sg:80 (jm2jn)  
9> 7< (reset)  
138: bb121-7-0-2.singnet.com.sg:41691 - bb121-7-128-2.singnet.com.sg:80 (jo2jp)  
32> 38< (complete)  
139: bb121-7-0-2.singnet.com.sg:41692 - bb121-7-128-2.singnet.com.sg:80 (jq2jr) 9>  
7< (reset)  
140: bb121-7-0-2.singnet.com.sg:41694 - bb121-7-128-2.singnet.com.sg:80 (js2jt) 9>  
9< (reset)  
141: bb121-7-0-2.singnet.com.sg:41695 - bb121-7-128-2.singnet.com.sg:80 (ju2jv)  
31> 32< (complete)  
142: bb121-7-0-2.singnet.com.sg:41696 - bb121-7-128-2.singnet.com.sg:80 (jw2jx)  
31> 35< (complete)  
143: bb121-7-0-2.singnet.com.sg:41697 - bb121-7-128-2.singnet.com.sg:80 (jy2jz) 7>  
7< (reset)  
144: bb121-7-0-2.singnet.com.sg:41699 - bb121-7-128-2.singnet.com.sg:80 (ka2kb)  
32> 38< (complete)

145: bb121-7-0-2.singnet.com.sg:41700 - bb121-7-128-2.singnet.com.sg:80 (kc2kd)  
32> 35< (complete)  
146: bb121-7-0-2.singnet.com.sg:41702 - bb121-7-128-2.singnet.com.sg:80 (ke2kf)  
31> 33< (complete)  
147: bb121-7-0-2.singnet.com.sg:41704 - bb121-7-128-2.singnet.com.sg:80 (kg2kh)  
9> 7< (reset)  
148: bb121-7-0-2.singnet.com.sg:41705 - bb121-7-128-2.singnet.com.sg:80 (ki2kj)  
31> 32< (complete)  
149: bb121-7-0-2.singnet.com.sg:41706 - bb121-7-128-2.singnet.com.sg:80 (kk2kl)  
10> 8< (reset)  
150: bb121-7-0-2.singnet.com.sg:41707 - bb121-7-128-2.singnet.com.sg:80 (km2kn)  
31> 33< (complete)  
151: bb121-7-0-2.singnet.com.sg:41708 - bb121-7-128-2.singnet.com.sg:80 (ko2kp)  
32> 34< (complete)  
152: bb121-7-0-2.singnet.com.sg:41709 - bb121-7-128-2.singnet.com.sg:80 (kq2kr)  
32> 34< (complete)  
153: bb121-7-0-2.singnet.com.sg:41710 - bb121-7-128-2.singnet.com.sg:80 (ks2kt)  
32> 33< (complete)  
154: bb121-7-0-2.singnet.com.sg:41712 - bb121-7-128-2.singnet.com.sg:80 (ku2kv)  
11> 10< (reset)  
155: bb121-7-0-2.singnet.com.sg:41713 - bb121-7-128-2.singnet.com.sg:80 (kw2kx)  
29> 31< (complete)  
156: bb121-7-0-2.singnet.com.sg:41715 - bb121-7-128-2.singnet.com.sg:80 (ky2kz)  
8> 7< (reset)  
157: bb121-7-0-2.singnet.com.sg:41716 - bb121-7-128-2.singnet.com.sg:80 (la2lb)  
31> 34< (complete)  
158: bb121-7-0-2.singnet.com.sg:41718 - bb121-7-128-2.singnet.com.sg:80 (lc2ld)  
29> 31< (complete)  
159: bb121-7-0-2.singnet.com.sg:41720 - bb121-7-128-2.singnet.com.sg:80 (le2lf) 33>  
36< (complete)  
160: bb121-7-0-2.singnet.com.sg:41726 - bb121-7-128-2.singnet.com.sg:80 (lg2lh) 9>  
7< (reset)  
161: bb121-7-0-2.singnet.com.sg:41728 - bb121-7-128-2.singnet.com.sg:80 (li2lj) 30>  
32< (complete)  
162: bb121-7-0-2.singnet.com.sg:41729 - bb121-7-128-2.singnet.com.sg:80 (lk2ll) 31>  
33< (complete)  
163: bb121-7-0-2.singnet.com.sg:41730 - bb121-7-128-2.singnet.com.sg:80 (lm2ln)  
33> 37< (complete)  
164: bb121-7-0-2.singnet.com.sg:41731 - bb121-7-128-2.singnet.com.sg:80 (lo2lp)  
31> 33< (complete)  
165: bb121-7-0-2.singnet.com.sg:41733 - bb121-7-128-2.singnet.com.sg:80 (lq2lr)  
29> 31< (complete)  
166: bb121-7-0-2.singnet.com.sg:41735 - bb121-7-128-2.singnet.com.sg:80 (ls2lt) 32>  
36< (complete)  
167: bb121-7-0-2.singnet.com.sg:41738 - bb121-7-128-2.singnet.com.sg:80 (lu2lv)  
31> 33< (complete)

168: bb121-7-0-2.singnet.com.sg:41740 - bb121-7-128-2.singnet.com.sg:80 (lw2lx)  
31> 32< (complete)  
169: bb121-7-0-2.singnet.com.sg:41742 - bb121-7-128-2.singnet.com.sg:80 (ly2lz) 9>  
7< (reset)  
170: bb121-7-0-2.singnet.com.sg:41743 - bb121-7-128-2.singnet.com.sg:80 (ma2mb)  
9> 7< (reset)  
171: bb121-7-0-2.singnet.com.sg:41745 - bb121-7-128-2.singnet.com.sg:80 (mc2md)  
32> 34< (complete)  
172: bb121-7-0-2.singnet.com.sg:41746 - bb121-7-128-2.singnet.com.sg:80 (me2mf)  
31> 32< (complete)  
173: bb121-7-0-2.singnet.com.sg:41749 - bb121-7-128-2.singnet.com.sg:80 (mg2mh)  
31> 32< (complete)  
174: bb121-7-0-2.singnet.com.sg:41751 - bb121-7-128-2.singnet.com.sg:80 (mi2mj)  
30> 33< (complete)  
175: bb121-7-0-2.singnet.com.sg:41753 - bb121-7-128-2.singnet.com.sg:80 (mk2ml)  
32> 34< (complete)  
176: bb121-7-0-2.singnet.com.sg:41755 - bb121-7-128-2.singnet.com.sg:80 (mm2mn)  
31> 33< (complete)  
177: bb121-7-0-2.singnet.com.sg:41757 - bb121-7-128-2.singnet.com.sg:80 (mo2mp)  
31> 33< (complete)  
178: bb121-7-0-2.singnet.com.sg:41758 - bb121-7-128-2.singnet.com.sg:80 (mq2mr)  
8> 6< (reset)  
179: bb121-7-0-2.singnet.com.sg:41759 - bb121-7-128-2.singnet.com.sg:80 (ms2mt)  
32> 36< (complete)  
180: bb121-7-0-2.singnet.com.sg:41762 - bb121-7-128-2.singnet.com.sg:80 (mu2mv)  
8> 6< (reset)  
181: bb121-7-0-2.singnet.com.sg:41763 - bb121-7-128-2.singnet.com.sg:80 (mw2mx)  
31> 34< (complete)  
182: bb121-7-0-2.singnet.com.sg:41765 - bb121-7-128-2.singnet.com.sg:80 (my2mz)  
29> 31< (complete)  
183: bb121-7-0-2.singnet.com.sg:41766 - bb121-7-128-2.singnet.com.sg:80 (na2nb)  
31> 32< (complete)  
184: bb121-7-0-2.singnet.com.sg:41768 - bb121-7-128-2.singnet.com.sg:80 (nc2nd)  
33> 34< (complete)  
185: bb121-7-0-2.singnet.com.sg:41770 - bb121-7-128-2.singnet.com.sg:80 (ne2nf)  
31> 32< (complete)  
186: bb121-7-0-2.singnet.com.sg:41772 - bb121-7-128-2.singnet.com.sg:80 (ng2nh)  
32> 33< (complete)  
187: bb121-7-0-2.singnet.com.sg:41773 - bb121-7-128-2.singnet.com.sg:80 (ni2nj) 7>  
9< (reset)  
188: bb121-7-0-2.singnet.com.sg:41774 - bb121-7-128-2.singnet.com.sg:80 (nk2nl)  
32> 34< (complete)  
189: bb121-7-0-2.singnet.com.sg:41776 - bb121-7-128-2.singnet.com.sg:80 (nm2nn)  
29> 31< (complete)  
190: bb121-7-0-2.singnet.com.sg:41777 - bb121-7-128-2.singnet.com.sg:80 (no2np)  
31> 37< (complete)

191: bb121-7-0-2.singnet.com.sg:41779 - bb121-7-128-2.singnet.com.sg:80 (nq2nr)  
31> 34< (complete)  
192: bb121-7-0-2.singnet.com.sg:41782 - bb121-7-128-2.singnet.com.sg:80 (ns2nt)  
32> 33< (complete)  
193: bb121-7-0-2.singnet.com.sg:41783 - bb121-7-128-2.singnet.com.sg:80 (nu2nv)  
9> 7< (reset)  
194: bb121-7-0-2.singnet.com.sg:45785 - bb121-7-128-2.singnet.com.sg:80 (nw2nx)  
29> 31< (complete)  
195: bb121-7-0-2.singnet.com.sg:45788 - bb121-7-128-2.singnet.com.sg:80 (ny2nz)  
10> 8< (reset)  
196: bb121-7-0-2.singnet.com.sg:45789 - bb121-7-128-2.singnet.com.sg:80 (oa2ob)  
31> 34< (complete)  
197: bb121-7-0-2.singnet.com.sg:45792 - bb121-7-128-2.singnet.com.sg:80 (oc2od)  
32> 34< (complete)  
198: bb121-7-0-2.singnet.com.sg:45794 - bb121-7-128-2.singnet.com.sg:80 (oe2of)  
31> 32< (complete)  
199: bb121-7-0-2.singnet.com.sg:45796 - bb121-7-128-2.singnet.com.sg:80 (og2oh)  
29> 31< (complete)  
200: bb121-7-0-2.singnet.com.sg:45798 - bb121-7-128-2.singnet.com.sg:80 (oi2oj)  
31> 35< (complete)  
201: bb121-7-0-2.singnet.com.sg:45800 - bb121-7-128-2.singnet.com.sg:80 (ok2ol)  
31> 32< (complete)  
202: bb121-7-0-2.singnet.com.sg:45801 - bb121-7-128-2.singnet.com.sg:80 (om2on)  
9> 7< (reset)  
203: bb121-7-0-2.singnet.com.sg:45803 - bb121-7-128-2.singnet.com.sg:80 (oo2op)  
33> 35< (complete)  
204: bb121-7-0-2.singnet.com.sg:45806 - bb121-7-128-2.singnet.com.sg:80 (oq2or)  
31> 33< (complete)  
205: bb121-7-0-2.singnet.com.sg:45808 - bb121-7-128-2.singnet.com.sg:80 (os2ot)  
31> 32< (complete)  
206: bb121-7-0-2.singnet.com.sg:45810 - bb121-7-128-2.singnet.com.sg:80 (ou2ov)  
31> 33< (complete)  
207: bb121-7-0-2.singnet.com.sg:45812 - bb121-7-128-2.singnet.com.sg:80 (ow2ox)  
9> 7< (reset)  
208: bb121-7-0-2.singnet.com.sg:45813 - bb121-7-128-2.singnet.com.sg:80 (oy2oz)  
31> 36< (complete)  
209: bb121-7-0-2.singnet.com.sg:45815 - bb121-7-128-2.singnet.com.sg:80 (pa2pb)  
31> 36< (complete)  
210: bb121-7-0-2.singnet.com.sg:45817 - bb121-7-128-2.singnet.com.sg:80 (pc2pd)  
31> 34< (complete)  
211: bb121-7-0-2.singnet.com.sg:45818 - bb121-7-128-2.singnet.com.sg:80 (pe2pf)  
31> 33< (complete)  
212: bb121-7-0-2.singnet.com.sg:45819 - bb121-7-128-2.singnet.com.sg:80 (pg2ph)  
31> 32< (complete)  
213: bb121-7-0-2.singnet.com.sg:45821 - bb121-7-128-2.singnet.com.sg:80 (pi2pj)  
32> 33< (complete)

214: bb121-7-0-2.singnet.com.sg:45823 - bb121-7-128-2.singnet.com.sg:80 (pk2pl)  
32> 38< (complete)  
215: bb121-7-0-2.singnet.com.sg:45824 - bb121-7-128-2.singnet.com.sg:80 (pm2pn)  
9> 7< (reset)  
216: bb121-7-0-2.singnet.com.sg:45828 - bb121-7-128-2.singnet.com.sg:80 (po2pp)  
33> 35< (complete)  
217: bb121-7-0-2.singnet.com.sg:45831 - bb121-7-128-2.singnet.com.sg:80 (pq2pr)  
31> 32< (complete)  
218: bb121-7-0-2.singnet.com.sg:45833 - bb121-7-128-2.singnet.com.sg:80 (ps2pt)  
29> 31< (complete)  
219: bb121-7-0-2.singnet.com.sg:45834 - bb121-7-128-2.singnet.com.sg:80 (pu2pv)  
33> 36< (complete)  
220: bb121-7-0-2.singnet.com.sg:45835 - bb121-7-128-2.singnet.com.sg:80 (pw2px)  
9> 7< (reset)  
221: bb121-7-0-2.singnet.com.sg:45839 - bb121-7-128-2.singnet.com.sg:80 (py2pz)  
32> 36< (complete)  
222: bb121-7-0-2.singnet.com.sg:45841 - bb121-7-128-2.singnet.com.sg:80 (qa2qb)  
31> 32< (complete)  
223: bb121-7-0-2.singnet.com.sg:45845 - bb121-7-128-2.singnet.com.sg:80 (qc2qd)  
32> 34< (complete)  
224: bb121-7-0-2.singnet.com.sg:45847 - bb121-7-128-2.singnet.com.sg:80 (qe2qf)  
31> 37< (complete)  
225: bb121-7-0-2.singnet.com.sg:45850 - bb121-7-128-2.singnet.com.sg:80 (qg2qh)  
31> 34< (complete)  
226: bb121-7-0-2.singnet.com.sg:45855 - bb121-7-128-2.singnet.com.sg:80 (qi2qj) 8>  
6< (reset)  
227: bb121-7-0-2.singnet.com.sg:45856 - bb121-7-128-2.singnet.com.sg:80 (qk2ql)  
31> 34< (complete)  
228: bb121-7-0-2.singnet.com.sg:45858 - bb121-7-128-2.singnet.com.sg:80 (qm2qn)  
31> 33< (complete)  
229: bb121-7-0-2.singnet.com.sg:45862 - bb121-7-128-2.singnet.com.sg:80 (qo2qp)  
29> 31< (complete)  
230: bb121-7-0-2.singnet.com.sg:45864 - bb121-7-128-2.singnet.com.sg:80 (qq2qr)  
31> 32< (complete)  
231: bb121-7-0-2.singnet.com.sg:45865 - bb121-7-128-2.singnet.com.sg:80 (qs2qt)  
31> 33< (complete)  
232: bb121-7-0-2.singnet.com.sg:45866 - bb121-7-128-2.singnet.com.sg:80 (qu2qv)  
9> 7< (reset)  
233: bb121-7-0-2.singnet.com.sg:45868 - bb121-7-128-2.singnet.com.sg:80 (qw2qx)  
31> 34< (complete)  
234: bb121-7-0-2.singnet.com.sg:45870 - bb121-7-128-2.singnet.com.sg:80 (qy2qz)  
32> 38< (complete)  
235: bb121-7-0-2.singnet.com.sg:45879 - bb121-7-128-2.singnet.com.sg:80 (ra2rb)  
29> 31< (complete)  
236: bb121-7-0-2.singnet.com.sg:45880 - bb121-7-128-2.singnet.com.sg:80 (rc2rd) 9>  
7< (reset)



237: bb121-7-0-2.singnet.com.sg:45881 - bb121-7-128-2.singnet.com.sg:80 (re2rf)  
31> 33< (complete)  
238: bb121-7-0-2.singnet.com.sg:45882 - bb121-7-128-2.singnet.com.sg:80 (rg2rh)  
31> 32< (complete)  
239: bb121-7-0-2.singnet.com.sg:45884 - bb121-7-128-2.singnet.com.sg:80 (ri2rj) 31>  
33< (complete)  
240: bb121-7-0-2.singnet.com.sg:45886 - bb121-7-128-2.singnet.com.sg:80 (rk2rl)  
30> 32< (complete)  
241: bb121-7-0-2.singnet.com.sg:45888 - bb121-7-128-2.singnet.com.sg:80 (rm2rn)  
9> 8< (reset)  
242: bb121-7-0-2.singnet.com.sg:45889 - bb121-7-128-2.singnet.com.sg:80 (ro2rp)  
31> 35< (complete)  
243: bb121-7-0-2.singnet.com.sg:45892 - bb121-7-128-2.singnet.com.sg:80 (rq2rr)  
31> 32< (complete)  
244: bb121-7-0-2.singnet.com.sg:45894 - bb121-7-128-2.singnet.com.sg:80 (rs2rt) 30>  
32< (complete)  
245: bb121-7-0-2.singnet.com.sg:45897 - bb121-7-128-2.singnet.com.sg:80 (ru2rv)  
32> 34< (complete)  
246: bb121-7-0-2.singnet.com.sg:45898 - bb121-7-128-2.singnet.com.sg:80 (rw2rx)  
9> 7< (reset)  
247: bb121-7-0-2.singnet.com.sg:45899 - bb121-7-128-2.singnet.com.sg:80 (ry2rz)  
32> 36< (complete)  
248: bb121-7-0-2.singnet.com.sg:45901 - bb121-7-128-2.singnet.com.sg:80 (sa2sb)  
31> 32< (complete)  
249: bb121-7-0-2.singnet.com.sg:45903 - bb121-7-128-2.singnet.com.sg:80 (sc2sd)  
31> 33< (complete)  
250: bb121-7-0-2.singnet.com.sg:45905 - bb121-7-128-2.singnet.com.sg:80 (se2sf)  
33> 34< (complete)  
251: bb121-7-0-2.singnet.com.sg:45906 - bb121-7-128-2.singnet.com.sg:80 (sg2sh)  
9> 7< (reset)  
252: bb121-7-0-2.singnet.com.sg:45908 - bb121-7-128-2.singnet.com.sg:80 (si2sj) 32>  
35< (complete)  
253: bb121-7-0-2.singnet.com.sg:45910 - bb121-7-128-2.singnet.com.sg:80 (sk2sl)  
31> 37< (complete)  
254: bb121-7-0-2.singnet.com.sg:45912 - bb121-7-128-2.singnet.com.sg:80 (sm2sn)  
31> 33< (complete)  
255: bb121-7-0-2.singnet.com.sg:45913 - bb121-7-128-2.singnet.com.sg:80 (so2sp)  
9> 7< (reset)  
256: bb121-7-0-2.singnet.com.sg:45915 - bb121-7-128-2.singnet.com.sg:80 (sq2sr)  
32> 34< (complete)  
257: bb121-7-0-2.singnet.com.sg:45916 - bb121-7-128-2.singnet.com.sg:80 (ss2st)  
31> 32< (complete)  
258: bb121-7-0-2.singnet.com.sg:45917 - bb121-7-128-2.singnet.com.sg:80 (su2sv)  
31> 34< (complete)  
259: bb121-7-0-2.singnet.com.sg:45918 - bb121-7-128-2.singnet.com.sg:80 (sw2sx)  
29> 31< (complete)

260: bb121-7-0-2.singnet.com.sg:45919 - bb121-7-128-2.singnet.com.sg:80 (sy2sz)  
31> 34< (complete)  
261: bb121-7-0-2.singnet.com.sg:45921 - bb121-7-128-2.singnet.com.sg:80 (ta2tb) 9>  
7< (reset)  
262: bb121-7-0-2.singnet.com.sg:45922 - bb121-7-128-2.singnet.com.sg:80 (tc2td)  
29> 31< (complete)  
263: bb121-7-0-2.singnet.com.sg:45923 - bb121-7-128-2.singnet.com.sg:80 (te2tf) 31>  
33< (complete)  
264: bb121-7-0-2.singnet.com.sg:45924 - bb121-7-128-2.singnet.com.sg:80 (tg2th)  
31> 37< (complete)  
265: bb121-7-0-2.singnet.com.sg:45925 - bb121-7-128-2.singnet.com.sg:80 (ti2tj) 32>  
34< (complete)  
266: bb121-7-0-2.singnet.com.sg:45926 - bb121-7-128-2.singnet.com.sg:80 (tk2tl) 32>  
33< (complete)  
267: bb121-7-0-2.singnet.com.sg:45928 - bb121-7-128-2.singnet.com.sg:80 (tm2tn)  
31> 35< (complete)  
268: bb121-7-0-2.singnet.com.sg:45931 - bb121-7-128-2.singnet.com.sg:80 (to2tp)  
32> 34< (complete)  
269: bb121-7-0-2.singnet.com.sg:48605 - bb121-7-128-2.singnet.com.sg:80 (tq2tr) 1>  
1< (reset)  
270: bb121-7-0-2.singnet.com.sg:45933 - bb121-7-128-2.singnet.com.sg:80 (ts2tt) 9>  
8< (reset)  
271: bb121-7-0-2.singnet.com.sg:45934 - bb121-7-128-2.singnet.com.sg:80 (tu2tv)  
31> 33< (complete)  
272: bb121-7-0-2.singnet.com.sg:45935 - bb121-7-128-2.singnet.com.sg:80 (tw2tx)  
31> 32< (complete)  
273: bb121-7-0-2.singnet.com.sg:45940 - bb121-7-128-2.singnet.com.sg:80 (ty2tz)  
33> 35< (complete)  
274: bb121-7-0-2.singnet.com.sg:45942 - bb121-7-128-2.singnet.com.sg:80 (ua2ub)  
30> 32< (complete)  
275: bb121-7-0-2.singnet.com.sg:45944 - bb121-7-128-2.singnet.com.sg:80 (uc2ud)  
32> 36< (complete)  
276: bb121-7-0-2.singnet.com.sg:45948 - bb121-7-128-2.singnet.com.sg:80 (ue2uf)  
32> 33< (complete)  
277: bb121-7-0-2.singnet.com.sg:45949 - bb121-7-128-2.singnet.com.sg:80 (ug2uh)  
9> 8< (reset)  
278: bb121-7-0-2.singnet.com.sg:45950 - bb121-7-128-2.singnet.com.sg:80 (ui2uj)  
32> 36< (complete) (reset)  
279: bb121-7-0-2.singnet.com.sg:45952 - bb121-7-128-2.singnet.com.sg:80 (uk2ul)  
32> 32< (complete)  
280: bb121-7-0-2.singnet.com.sg:45953 - bb121-7-128-2.singnet.com.sg:80 (um2un)  
31> 39< (complete)  
281: bb121-7-0-2.singnet.com.sg:45955 - bb121-7-128-2.singnet.com.sg:80 (uo2up)  
32> 34< (complete)  
282: bb121-7-0-2.singnet.com.sg:45958 - bb121-7-128-2.singnet.com.sg:80 (uq2ur)  
32> 34< (complete)

283: bb121-7-0-2.singnet.com.sg:45960 - bb121-7-128-2.singnet.com.sg:80 (us2ut)  
9> 7< (reset)  
284: bb121-7-0-2.singnet.com.sg:45961 - bb121-7-128-2.singnet.com.sg:80 (uu2uv)  
31> 35< (complete)  
285: bb121-7-0-2.singnet.com.sg:45965 - bb121-7-128-2.singnet.com.sg:80 (uw2ux)  
33> 34< (complete)  
286: bb121-7-0-2.singnet.com.sg:45970 - bb121-7-128-2.singnet.com.sg:80 (uy2uz)  
9> 7< (reset)  
287: bb121-7-0-2.singnet.com.sg:45971 - bb121-7-128-2.singnet.com.sg:80 (va2vb)  
29> 31< (complete)  
288: bb121-7-0-2.singnet.com.sg:45972 - bb121-7-128-2.singnet.com.sg:80 (vc2vd)  
31> 37< (complete)  
289: bb121-7-0-2.singnet.com.sg:45976 - bb121-7-128-2.singnet.com.sg:80 (ve2vf)  
31> 32< (complete)  
290: bb121-7-0-2.singnet.com.sg:45977 - bb121-7-128-2.singnet.com.sg:80 (vg2vh)  
29> 31< (complete)  
291: bb121-7-0-2.singnet.com.sg:45980 - bb121-7-128-2.singnet.com.sg:80 (vi2vj)  
31> 33< (complete)  
292: bb121-7-0-2.singnet.com.sg:45982 - bb121-7-128-2.singnet.com.sg:80 (vk2vl)  
31> 34< (complete)  
293: bb121-7-0-2.singnet.com.sg:45985 - bb121-7-128-2.singnet.com.sg:80 (vm2vn)  
9> 7< (reset)  
294: bb121-7-0-2.singnet.com.sg:45988 - bb121-7-128-2.singnet.com.sg:80 (vo2vp)  
31> 34< (complete)  
295: bb121-7-0-2.singnet.com.sg:45991 - bb121-7-128-2.singnet.com.sg:80 (vq2vr)  
29> 31< (complete)  
296: bb121-7-0-2.singnet.com.sg:45992 - bb121-7-128-2.singnet.com.sg:80 (vs2vt)  
31> 32< (complete)  
297: bb121-7-0-2.singnet.com.sg:45994 - bb121-7-128-2.singnet.com.sg:80 (vu2vv)  
31> 32< (complete)  
298: bb121-7-0-2.singnet.com.sg:45995 - bb121-7-128-2.singnet.com.sg:80 (vw2vx)  
9> 7< (reset)  
299: bb121-7-0-2.singnet.com.sg:45997 - bb121-7-128-2.singnet.com.sg:80 (vy2vz)  
29> 31< (complete)  
300: bb121-7-0-2.singnet.com.sg:45998 - bb121-7-128-2.singnet.com.sg:80 (wa2wb)  
32> 33< (complete)  
301: bb121-7-0-2.singnet.com.sg:46007 - bb121-7-128-2.singnet.com.sg:80 (wc2wd)  
32> 34< (complete)  
302: bb121-7-0-2.singnet.com.sg:46009 - bb121-7-128-2.singnet.com.sg:80 (we2wf)  
9> 7< (reset)  
303: bb121-7-0-2.singnet.com.sg:46010 - bb121-7-128-2.singnet.com.sg:80 (wg2wh)  
32> 36< (complete)  
304: bb121-7-0-2.singnet.com.sg:46011 - bb121-7-128-2.singnet.com.sg:80 (wi2wj)  
32> 34< (complete)  
305: bb121-7-0-2.singnet.com.sg:46014 - bb121-7-128-2.singnet.com.sg:80 (wk2wl)  
31> 33< (complete)

306: bb121-7-0-2.singnet.com.sg:46015 - bb121-7-128-2.singnet.com.sg:80 (wm2wn)  
9> 7< (reset)  
307: bb121-7-0-2.singnet.com.sg:46017 - bb121-7-128-2.singnet.com.sg:80 (wo2wp)  
31> 37< (complete)  
308: bb121-7-0-2.singnet.com.sg:46018 - bb121-7-128-2.singnet.com.sg:80 (wq2wr)  
9> 7< (reset)  
309: bb121-7-0-2.singnet.com.sg:46020 - bb121-7-128-2.singnet.com.sg:80 (ws2wt)  
31> 33< (complete)  
310: bb121-7-0-2.singnet.com.sg:46021 - bb121-7-128-2.singnet.com.sg:80 (wu2wv)  
9> 7< (reset)  
311: bb121-7-0-2.singnet.com.sg:46022 - bb121-7-128-2.singnet.com.sg:80 (ww2wx)  
31> 33< (complete)  
312: bb121-7-0-2.singnet.com.sg:46026 - bb121-7-128-2.singnet.com.sg:80 (wy2wz)  
31> 32< (complete)  
313: bb121-7-0-2.singnet.com.sg:46028 - bb121-7-128-2.singnet.com.sg:80 (xa2xb)  
32> 36< (complete)  
314: bb121-7-0-2.singnet.com.sg:46029 - bb121-7-128-2.singnet.com.sg:80 (xc2xd)  
8> 7< (reset)  
315: bb121-7-0-2.singnet.com.sg:46031 - bb121-7-128-2.singnet.com.sg:80 (xe2xf)  
8> 7< (reset)  
316: bb121-7-0-2.singnet.com.sg:46033 - bb121-7-128-2.singnet.com.sg:80 (xg2xh)  
32> 35< (complete)  
317: bb121-7-0-2.singnet.com.sg:46035 - bb121-7-128-2.singnet.com.sg:80 (xi2xj)  
10> 8< (reset)  
318: bb121-7-0-2.singnet.com.sg:46036 - bb121-7-128-2.singnet.com.sg:80 (xk2xl)  
33> 34< (complete)  
319: bb121-7-0-2.singnet.com.sg:46038 - bb121-7-128-2.singnet.com.sg:80 (xm2xn)  
31> 35< (complete)  
320: bb121-7-0-2.singnet.com.sg:46041 - bb121-7-128-2.singnet.com.sg:80 (xo2xp)  
31> 33< (complete)  
321: bb121-7-0-2.singnet.com.sg:46043 - bb121-7-128-2.singnet.com.sg:80 (xq2xr)  
31> 34< (complete)  
322: bb121-7-0-2.singnet.com.sg:46044 - bb121-7-128-2.singnet.com.sg:80 (xs2xt)  
32> 34< (complete)  
323: bb121-7-0-2.singnet.com.sg:46047 - bb121-7-128-2.singnet.com.sg:80 (xu2xv)  
31> 32< (complete)  
324: bb121-7-0-2.singnet.com.sg:46048 - bb121-7-128-2.singnet.com.sg:80 (xw2xx)  
7> 7< (reset)  
325: bb121-7-0-2.singnet.com.sg:46050 - bb121-7-128-2.singnet.com.sg:80 (xy2xz)  
8> 7< (reset)  
326: bb121-7-0-2.singnet.com.sg:46051 - bb121-7-128-2.singnet.com.sg:80 (ya2yb)  
31> 32< (complete)  
327: bb121-7-0-2.singnet.com.sg:46052 - bb121-7-128-2.singnet.com.sg:80 (yc2yd)  
31> 35< (complete)  
328: bb121-7-0-2.singnet.com.sg:46056 - bb121-7-128-2.singnet.com.sg:80 (ye2yf)  
31> 35< (complete)

329: bb121-7-0-2.singnet.com.sg:46057 - bb121-7-128-2.singnet.com.sg:80 (yg2yh)  
8> 7< (reset)  
330: bb121-7-0-2.singnet.com.sg:46059 - bb121-7-128-2.singnet.com.sg:80 (yi2yj)  
31> 33< (complete)  
331: bb121-7-0-2.singnet.com.sg:46060 - bb121-7-128-2.singnet.com.sg:80 (yk2yl)  
8> 6< (reset)  
332: bb121-7-0-2.singnet.com.sg:46062 - bb121-7-128-2.singnet.com.sg:80 (ym2yn)  
31> 32< (complete)  
333: bb121-7-0-2.singnet.com.sg:46063 - bb121-7-128-2.singnet.com.sg:80 (yo2yp)  
9> 7< (reset)  
334: bb121-7-0-2.singnet.com.sg:46066 - bb121-7-128-2.singnet.com.sg:80 (yq2yr)  
33> 36< (complete)  
335: bb121-7-0-2.singnet.com.sg:46070 - bb121-7-128-2.singnet.com.sg:80 (ys2yt)  
9> 7< (reset)  
336: bb121-7-0-2.singnet.com.sg:46071 - bb121-7-128-2.singnet.com.sg:80 (yu2yv)  
8> 7< (reset)  
337: bb121-7-0-2.singnet.com.sg:46072 - bb121-7-128-2.singnet.com.sg:80 (yw2yx)  
31> 32< (complete)  
338: bb121-7-0-2.singnet.com.sg:46074 - bb121-7-128-2.singnet.com.sg:80 (yy2yz)  
31> 34< (complete)  
339: bb121-7-0-2.singnet.com.sg:46076 - bb121-7-128-2.singnet.com.sg:80 (za2zb)  
32> 35< (complete)  
340: bb121-7-0-2.singnet.com.sg:46077 - bb121-7-128-2.singnet.com.sg:80 (zc2zd)  
8> 6< (reset)  
341: bb121-7-0-2.singnet.com.sg:46078 - bb121-7-128-2.singnet.com.sg:80 (ze2zf)  
32> 36< (complete) (reset)  
342: bb121-7-0-2.singnet.com.sg:46080 - bb121-7-128-2.singnet.com.sg:80 (zg2zh)  
31> 35< (complete)  
343: bb121-7-0-2.singnet.com.sg:46082 - bb121-7-128-2.singnet.com.sg:80 (zi2zj)  
31> 36< (complete)  
344: bb121-7-0-2.singnet.com.sg:46085 - bb121-7-128-2.singnet.com.sg:80 (zk2zl)  
32> 33< (complete)  
345: bb121-7-0-2.singnet.com.sg:46087 - bb121-7-128-2.singnet.com.sg:80 (zm2zn)  
11> 9< (reset)  
346: bb121-7-0-2.singnet.com.sg:46088 - bb121-7-128-2.singnet.com.sg:80 (zo2zp)  
10> 8< (reset)  
347: bb121-7-0-2.singnet.com.sg:46089 - bb121-7-128-2.singnet.com.sg:80 (zq2zr)  
31> 33< (complete)  
348: bb121-7-0-2.singnet.com.sg:46092 - bb121-7-128-2.singnet.com.sg:80 (zs2zt)  
31> 34< (complete)  
349: bb121-7-0-2.singnet.com.sg:46093 - bb121-7-128-2.singnet.com.sg:80 (zu2zv)  
31> 34< (complete)  
350: bb121-7-0-2.singnet.com.sg:46095 - bb121-7-128-2.singnet.com.sg:80 (zw2zx)  
32> 38< (complete)  
351: bb121-7-0-2.singnet.com.sg:46098 - bb121-7-128-2.singnet.com.sg:80 (zy2zz)  
9> 7< (reset)

352: bb121-7-0-2.singnet.com.sg:46101 - bb121-7-128-2.singnet.com.sg:80 (aaa2aab)  
32> 33< (complete)  
353: bb121-7-0-2.singnet.com.sg:46103 - bb121-7-128-2.singnet.com.sg:80 (aac2aad)  
10> 8< (reset)  
354: bb121-7-0-2.singnet.com.sg:46104 - bb121-7-128-2.singnet.com.sg:80 (aae2aaf)  
31> 32< (complete)  
355: bb121-7-0-2.singnet.com.sg:46106 - bb121-7-128-2.singnet.com.sg:80 (aag2aah)  
31> 33< (complete)  
356: bb121-7-0-2.singnet.com.sg:46108 - bb121-7-128-2.singnet.com.sg:80 (aai2aaj)  
32> 33< (complete)  
357: bb121-7-0-2.singnet.com.sg:46109 - bb121-7-128-2.singnet.com.sg:80 (aak2aal)  
29> 33< (complete)  
358: bb121-7-0-2.singnet.com.sg:46110 - bb121-7-128-2.singnet.com.sg:80 (aam2aan)  
10> 8< (reset)  
359: bb121-7-0-2.singnet.com.sg:46111 - bb121-7-128-2.singnet.com.sg:80 (aao2aap)  
31> 34< (complete)  
360: bb121-7-0-2.singnet.com.sg:46113 - bb121-7-128-2.singnet.com.sg:80 (aaq2aar)  
32> 33< (complete)  
361: bb121-7-0-2.singnet.com.sg:46115 - bb121-7-128-2.singnet.com.sg:80 (aas2aat)  
31> 36< (complete)  
362: bb121-7-0-2.singnet.com.sg:46118 - bb121-7-128-2.singnet.com.sg:80 (aau2aav)  
33> 34< (complete)  
363: bb121-7-0-2.singnet.com.sg:46121 - bb121-7-128-2.singnet.com.sg:80 (aaw2aax)  
32> 33< (complete)  
364: bb121-7-0-2.singnet.com.sg:46123 - bb121-7-128-2.singnet.com.sg:80 (aay2aaz)  
31> 32< (complete)  
365: bb121-7-0-2.singnet.com.sg:46125 - bb121-7-128-2.singnet.com.sg:80 (aba2abb)  
9> 7< (reset)  
366: bb121-7-0-2.singnet.com.sg:46126 - bb121-7-128-2.singnet.com.sg:80 (abc2abd)  
29> 32< (complete)  
367: bb121-7-0-2.singnet.com.sg:46128 - bb121-7-128-2.singnet.com.sg:80 (abe2abf)  
32> 33< (complete)  
368: bb121-7-0-2.singnet.com.sg:46129 - bb121-7-128-2.singnet.com.sg:80 (abg2abh)  
30> 31< (complete)  
369: bb121-7-0-2.singnet.com.sg:46132 - bb121-7-128-2.singnet.com.sg:80 (abi2abj)  
33> 34< (complete)  
370: bb121-7-0-2.singnet.com.sg:46135 - bb121-7-128-2.singnet.com.sg:80 (abk2abl)  
9> 7< (reset)  
371: bb121-7-0-2.singnet.com.sg:46140 - bb121-7-128-2.singnet.com.sg:80 (abm2abn)  
31> 32< (complete)  
372: bb121-7-0-2.singnet.com.sg:46141 - bb121-7-128-2.singnet.com.sg:80 (abo2abp)  
31> 34< (complete)  
373: bb121-7-0-2.singnet.com.sg:46143 - bb121-7-128-2.singnet.com.sg:80 (abq2abr)  
29> 31< (complete)  
374: bb121-7-0-2.singnet.com.sg:46144 - bb121-7-128-2.singnet.com.sg:80 (abs2abt)  
31> 32< (complete)

375: bb121-7-0-2.singnet.com.sg:46145 - bb121-7-128-2.singnet.com.sg:80 (abu2abv)  
29> 31< (complete)  
376: bb121-7-0-2.singnet.com.sg:46146 - bb121-7-128-2.singnet.com.sg:80 (abw2abx)  
31> 36< (complete)  
377: bb121-7-0-2.singnet.com.sg:46148 - bb121-7-128-2.singnet.com.sg:80 (aby2abz)  
8> 7< (reset)  
378: bb121-7-0-2.singnet.com.sg:46152 - bb121-7-128-2.singnet.com.sg:80 (aca2acb)  
31> 35< (complete)  
379: bb121-7-0-2.singnet.com.sg:46153 - bb121-7-128-2.singnet.com.sg:80 (acc2acd)  
9> 7< (reset)  
380: bb121-7-0-2.singnet.com.sg:46155 - bb121-7-128-2.singnet.com.sg:80 (ace2acf)  
32> 33< (complete)  
381: bb121-7-0-2.singnet.com.sg:46157 - bb121-7-128-2.singnet.com.sg:80 (acg2ach)  
31> 35< (complete)  
382: bb121-7-0-2.singnet.com.sg:46160 - bb121-7-128-2.singnet.com.sg:80 (aci2acj)  
31> 35< (complete)  
383: bb121-7-0-2.singnet.com.sg:46162 - bb121-7-128-2.singnet.com.sg:80 (ack2acl)  
32> 34< (complete)  
384: bb121-7-0-2.singnet.com.sg:46170 - bb121-7-128-2.singnet.com.sg:80 (acm2acn)  
8> 7< (reset)  
385: bb121-7-0-2.singnet.com.sg:46172 - bb121-7-128-2.singnet.com.sg:80 (aco2acp)  
9> 7< (reset)  
386: bb121-7-0-2.singnet.com.sg:46176 - bb121-7-128-2.singnet.com.sg:80 (acq2acr)  
29> 31< (complete)  
387: bb121-7-0-2.singnet.com.sg:46177 - bb121-7-128-2.singnet.com.sg:80 (acs2act)  
30> 31< (complete)  
388: bb121-7-0-2.singnet.com.sg:46178 - bb121-7-128-2.singnet.com.sg:80 (acu2acv)  
29> 31< (complete)  
389: bb121-7-0-2.singnet.com.sg:46179 - bb121-7-128-2.singnet.com.sg:80 (acw2acx)  
9> 7< (reset)  
390: bb121-7-0-2.singnet.com.sg:46180 - bb121-7-128-2.singnet.com.sg:80 (acy2acz)  
31> 35< (complete)  
391: bb121-7-0-2.singnet.com.sg:46181 - bb121-7-128-2.singnet.com.sg:80 (ada2adb)  
31> 32< (complete)  
392: bb121-7-0-2.singnet.com.sg:46182 - bb121-7-128-2.singnet.com.sg:80 (adc2add)  
29> 31< (complete)  
393: bb121-7-0-2.singnet.com.sg:46183 - bb121-7-128-2.singnet.com.sg:80 (ade2adf)  
31> 32< (complete)  
394: bb121-7-0-2.singnet.com.sg:46185 - bb121-7-128-2.singnet.com.sg:80 (adg2adh)  
29> 31< (complete)  
395: bb121-7-0-2.singnet.com.sg:46186 - bb121-7-128-2.singnet.com.sg:80 (adi2adj)  
32> 34< (complete)  
396: bb121-7-0-2.singnet.com.sg:46187 - bb121-7-128-2.singnet.com.sg:80 (adk2adl)  
29> 31< (complete)  
397: bb121-7-0-2.singnet.com.sg:46188 - bb121-7-128-2.singnet.com.sg:80 (adm2adn)  
32> 33< (complete)

```
398: bb121-7-0-2.singnet.com.sg:46191 - bb121-7-128-2.singnet.com.sg:80 (ado2adp)
9> 7< (reset)
399: bb121-7-0-2.singnet.com.sg:46192 - bb121-7-128-2.singnet.com.sg:80 (adq2adr)
31> 32< (complete)
400: bb121-7-0-2.singnet.com.sg:46193 - bb121-7-128-2.singnet.com.sg:80 (ads2adt)
29> 31< (complete)
401: bb121-7-0-2.singnet.com.sg:46194 - bb121-7-128-2.singnet.com.sg:80 (adu2adv)
31> 32< (complete)
402: bb121-7-0-2.singnet.com.sg:46195 - bb121-7-128-2.singnet.com.sg:80 (adw2adx)
29> 31< (complete)
403: bb121-7-0-2.singnet.com.sg:46196 - bb121-7-128-2.singnet.com.sg:80 (ady2adz)
31> 33< (complete)
404: bb121-7-0-2.singnet.com.sg:46197 - bb121-7-128-2.singnet.com.sg:80 (aea2aeb)
32> 32< (complete)
405: bb121-7-0-2.singnet.com.sg:46198 - bb121-7-128-2.singnet.com.sg:80 (aec2aed)
32> 34< (complete)
406: bb121-7-0-2.singnet.com.sg:46200 - bb121-7-128-2.singnet.com.sg:80 (aee2aef)
28> 30< (reset)
```

### **E.tcp\_iso\_red.summary**

1 arg remaining, starting with 'E.tcp\_iso\_red.trace'

Ostermann's tcptrace -- version 6.6.7 -- Thu Nov 4, 2004

26167 packets seen, 26127 TCP packets traced

elapsed wallclock time: 0:00:00.330955, 79065 pkts/sec analyzed

trace file elapsed time: 0:08:43.365649

TCP connection info:

1: bb121-7-0-2.singnet.com.sg:56028 - bb121-7-192-2.singnet.com.sg:80 (a2b) 4824>  
5785< (complete)

2: bb121-7-0-2.singnet.com.sg:56035 - bb121-7-192-2.singnet.com.sg:80 (c2d) 31>  
42< (complete)

3: bb121-7-0-2.singnet.com.sg:56036 - bb121-7-192-2.singnet.com.sg:80 (e2f) 6>  
6< (reset)

4: bb121-7-0-2.singnet.com.sg:56037 - bb121-7-192-2.singnet.com.sg:80 (g2h) 9>  
8< (reset)



5: bb121-7-0-2.singnet.com.sg:56040 - bb121-7-192-2.singnet.com.sg:80 (i2j) 31>  
34< (complete)

6: bb121-7-0-2.singnet.com.sg:56045 - bb121-7-192-2.singnet.com.sg:80 (k2l) 31>  
34< (complete)

7: bb121-7-0-2.singnet.com.sg:56051 - bb121-7-192-2.singnet.com.sg:80 (m2n) 31>  
38< (complete)

8: bb121-7-0-2.singnet.com.sg:56054 - bb121-7-192-2.singnet.com.sg:80 (o2p) 31>  
38< (complete)

9: bb121-7-0-2.singnet.com.sg:56059 - bb121-7-192-2.singnet.com.sg:80 (q2r) 31>  
37< (complete)

10: bb121-7-0-2.singnet.com.sg:56062 - bb121-7-192-2.singnet.com.sg:80 (s2t) 32>  
36< (complete)

11: bb121-7-0-2.singnet.com.sg:56066 - bb121-7-192-2.singnet.com.sg:80 (u2v) 31>  
37< (complete)

12: bb121-7-0-2.singnet.com.sg:56070 - bb121-7-192-2.singnet.com.sg:80 (w2x) 30>  
33< (complete)

13: bb121-7-0-2.singnet.com.sg:56073 - bb121-7-192-2.singnet.com.sg:80 (y2z) 33>  
34< (complete)

14: bb121-7-0-2.singnet.com.sg:56075 - bb121-7-192-2.singnet.com.sg:80 (aa2ab) 33>  
39< (complete)

15: bb121-7-0-2.singnet.com.sg:56086 - bb121-7-192-2.singnet.com.sg:80 (ac2ad) 31>  
36< (complete)

16: bb121-7-0-2.singnet.com.sg:56089 - bb121-7-192-2.singnet.com.sg:80 (ae2af) 31>  
34< (complete)

17: bb121-7-0-2.singnet.com.sg:56093 - bb121-7-192-2.singnet.com.sg:80 (ag2ah) 29>  
31< (complete)

18: bb121-7-0-2.singnet.com.sg:56094 - bb121-7-192-2.singnet.com.sg:80 (ai2aj) 31>  
36< (complete)

19: bb121-7-0-2.singnet.com.sg:56097 - bb121-7-192-2.singnet.com.sg:80 (ak2al) 31>  
33< (complete)

20: bb121-7-0-2.singnet.com.sg:56099 - bb121-7-192-2.singnet.com.sg:80 (am2an)  
32> 35< (complete)

21: bb121-7-0-2.singnet.com.sg:56102 - bb121-7-192-2.singnet.com.sg:80 (ao2ap) 34>  
37< (complete)

22: bb121-7-0-2.singnet.com.sg:56110 - bb121-7-192-2.singnet.com.sg:80 (aq2ar) 31>  
35< (complete)

23: bb121-7-0-2.singnet.com.sg:56114 - bb121-7-192-2.singnet.com.sg:80 (as2at) 34>  
41< (complete)

24: bb121-7-0-2.singnet.com.sg:56117 - bb121-7-192-2.singnet.com.sg:80 (au2av) 31>  
35< (complete)

25: bb121-7-0-2.singnet.com.sg:56121 - bb121-7-192-2.singnet.com.sg:80 (aw2ax) 31>  
35< (complete)

26: bb121-7-0-2.singnet.com.sg:56123 - bb121-7-192-2.singnet.com.sg:80 (ay2az) 31>  
36< (complete)

27: bb121-7-0-2.singnet.com.sg:56125 - bb121-7-192-2.singnet.com.sg:80 (ba2bb) 31>  
37< (complete)

28: bb121-7-0-2.singnet.com.sg:56128 - bb121-7-192-2.singnet.com.sg:80 (bc2bd) 32>  
33< (complete)

29: bb121-7-0-2.singnet.com.sg:56131 - bb121-7-192-2.singnet.com.sg:80 (be2bf) 32>  
34< (complete)

30: bb121-7-0-2.singnet.com.sg:56133 - bb121-7-192-2.singnet.com.sg:80 (bg2bh) 31>  
32< (complete)

31: bb121-7-0-2.singnet.com.sg:56135 - bb121-7-192-2.singnet.com.sg:80 (bi2bj) 31>  
35< (complete)

32: bb121-7-0-2.singnet.com.sg:56137 - bb121-7-192-2.singnet.com.sg:80 (bk2bl) 34>  
40< (complete)

33: bb121-7-0-2.singnet.com.sg:56146 - bb121-7-192-2.singnet.com.sg:80 (bm2bn)  
32> 35< (complete)

34: bb121-7-0-2.singnet.com.sg:56148 - bb121-7-192-2.singnet.com.sg:80 (bo2bp) 31>  
35< (complete)

35: bb121-7-0-2.singnet.com.sg:56151 - bb121-7-192-2.singnet.com.sg:80 (bq2br) 31>  
34< (complete)

36: bb121-7-0-2.singnet.com.sg:56153 - bb121-7-192-2.singnet.com.sg:80 (bs2bt) 32>  
41< (complete)

37: bb121-7-0-2.singnet.com.sg:56158 - bb121-7-192-2.singnet.com.sg:80 (bu2bv) 31>  
37< (complete)

38: bb121-7-0-2.singnet.com.sg:56160 - bb121-7-192-2.singnet.com.sg:80 (bw2bx)  
31> 36< (complete)

39: bb121-7-0-2.singnet.com.sg:56163 - bb121-7-192-2.singnet.com.sg:80 (by2bz) 31>  
36< (complete)

40: bb121-7-0-2.singnet.com.sg:56165 - bb121-7-192-2.singnet.com.sg:80 (ca2cb) 31>  
36< (complete)

41: bb121-7-0-2.singnet.com.sg:56168 - bb121-7-192-2.singnet.com.sg:80 (cc2cd) 32>  
34< (complete)

42: bb121-7-0-2.singnet.com.sg:56169 - bb121-7-192-2.singnet.com.sg:80 (ce2cf) 32>  
36< (complete)

43: bb121-7-0-2.singnet.com.sg:56172 - bb121-7-192-2.singnet.com.sg:80 (cg2ch) 33>  
36< (complete)

44: bb121-7-0-2.singnet.com.sg:56179 - bb121-7-192-2.singnet.com.sg:80 (ci2cj) 31>  
34< (complete)

45: bb121-7-0-2.singnet.com.sg:56181 - bb121-7-192-2.singnet.com.sg:80 (ck2cl) 34>  
42< (complete)

46: bb121-7-0-2.singnet.com.sg:56188 - bb121-7-192-2.singnet.com.sg:80 (cm2cn)  
31> 41< (complete)

47: bb121-7-0-2.singnet.com.sg:56193 - bb121-7-192-2.singnet.com.sg:80 (co2cp) 31>  
34< (complete)

48: bb121-7-0-2.singnet.com.sg:56196 - bb121-7-192-2.singnet.com.sg:80 (cq2cr) 31>  
34< (complete)

49: bb121-7-0-2.singnet.com.sg:56198 - bb121-7-192-2.singnet.com.sg:80 (cs2ct) 33>  
37< (complete)

50: bb121-7-0-2.singnet.com.sg:56199 - bb121-7-192-2.singnet.com.sg:80 (cu2cv) 32>  
36< (complete)

51: bb121-7-0-2.singnet.com.sg:56201 - bb121-7-192-2.singnet.com.sg:80 (cw2cx) 31>  
38< (complete)

52: bb121-7-0-2.singnet.com.sg:56204 - bb121-7-192-2.singnet.com.sg:80 (cy2cz) 32>  
32< (complete)

53: bb121-7-0-2.singnet.com.sg:56205 - bb121-7-192-2.singnet.com.sg:80 (da2db) 31>  
36< (complete)

54: bb121-7-0-2.singnet.com.sg:56207 - bb121-7-192-2.singnet.com.sg:80 (dc2dd) 31>  
34< (complete)

55: bb121-7-0-2.singnet.com.sg:56208 - bb121-7-192-2.singnet.com.sg:80 (de2df) 33>  
37< (complete)

56: bb121-7-0-2.singnet.com.sg:56212 - bb121-7-192-2.singnet.com.sg:80 (dg2dh) 32>  
33< (complete)

57: bb121-7-0-2.singnet.com.sg:56213 - bb121-7-192-2.singnet.com.sg:80 (di2dj) 32>  
37< (complete)

58: bb121-7-0-2.singnet.com.sg:56219 - bb121-7-192-2.singnet.com.sg:80 (dk2dl) 31>  
40< (complete)

59: bb121-7-0-2.singnet.com.sg:56223 - bb121-7-192-2.singnet.com.sg:80 (dm2dn)  
31> 36< (complete)

60: bb121-7-0-2.singnet.com.sg:56224 - bb121-7-192-2.singnet.com.sg:80 (do2dp) 31>  
37< (complete)

61: bb121-7-0-2.singnet.com.sg:56230 - bb121-7-192-2.singnet.com.sg:80 (dq2dr) 32>  
34< (complete)

62: bb121-7-0-2.singnet.com.sg:56231 - bb121-7-192-2.singnet.com.sg:80 (ds2dt) 31>  
34< (complete)

63: bb121-7-0-2.singnet.com.sg:56233 - bb121-7-192-2.singnet.com.sg:80 (du2dv) 31>  
34< (complete)

64: bb121-7-0-2.singnet.com.sg:56235 - bb121-7-192-2.singnet.com.sg:80 (dw2dx)  
31> 34< (complete)

65: bb121-7-0-2.singnet.com.sg:56236 - bb121-7-192-2.singnet.com.sg:80 (dy2dz) 31>  
32< (complete)

66: bb121-7-0-2.singnet.com.sg:56238 - bb121-7-192-2.singnet.com.sg:80 (ea2eb) 31>  
36< (complete)

67: bb121-7-0-2.singnet.com.sg:56240 - bb121-7-192-2.singnet.com.sg:80 (ec2ed) 31>  
42< (complete)

68: bb121-7-0-2.singnet.com.sg:56243 - bb121-7-192-2.singnet.com.sg:80 (ee2ef) 31>  
34< (complete)

69: bb121-7-0-2.singnet.com.sg:56244 - bb121-7-192-2.singnet.com.sg:80 (eg2eh) 32>  
36< (complete)

70: bb121-7-0-2.singnet.com.sg:56248 - bb121-7-192-2.singnet.com.sg:80 (ei2ej) 32>  
36< (complete)

71: bb121-7-0-2.singnet.com.sg:56250 - bb121-7-192-2.singnet.com.sg:80 (ek2el) 32>  
34< (complete)

72: bb121-7-0-2.singnet.com.sg:56254 - bb121-7-192-2.singnet.com.sg:80 (em2en) 31>  
38< (complete)

73: bb121-7-0-2.singnet.com.sg:56256 - bb121-7-192-2.singnet.com.sg:80 (eo2ep) 31>  
33< (complete)

74: bb121-7-0-2.singnet.com.sg:56257 - bb121-7-192-2.singnet.com.sg:80 (eq2er) 32>  
34< (complete)

75: bb121-7-0-2.singnet.com.sg:56261 - bb121-7-192-2.singnet.com.sg:80 (es2et) 31>  
36< (complete)

76: bb121-7-0-2.singnet.com.sg:56262 - bb121-7-192-2.singnet.com.sg:80 (eu2ev) 32>  
34< (complete)

77: bb121-7-0-2.singnet.com.sg:56264 - bb121-7-192-2.singnet.com.sg:80 (ew2ex) 31>  
34< (complete)

78: bb121-7-0-2.singnet.com.sg:56265 - bb121-7-192-2.singnet.com.sg:80 (ey2ez) 31>  
37< (complete)

79: bb121-7-0-2.singnet.com.sg:56268 - bb121-7-192-2.singnet.com.sg:80 (fa2fb) 31>  
37< (complete)

80: bb121-7-0-2.singnet.com.sg:56271 - bb121-7-192-2.singnet.com.sg:80 (fc2fd) 32>  
40< (complete)

81: bb121-7-0-2.singnet.com.sg:56278 - bb121-7-192-2.singnet.com.sg:80 (fe2ff) 32>  
38< (complete)

82: bb121-7-0-2.singnet.com.sg:56280 - bb121-7-192-2.singnet.com.sg:80 (fg2fh) 33>  
35< (complete)

83: bb121-7-0-2.singnet.com.sg:56285 - bb121-7-192-2.singnet.com.sg:80 (fi2fj) 32>  
37< (complete)

84: bb121-7-0-2.singnet.com.sg:56291 - bb121-7-192-2.singnet.com.sg:80 (fk2fl) 33>  
34< (complete) (reset)

85: bb121-7-0-2.singnet.com.sg:56293 - bb121-7-192-2.singnet.com.sg:80 (fm2fn) 31>  
38< (complete)

86: bb121-7-0-2.singnet.com.sg:56295 - bb121-7-192-2.singnet.com.sg:80 (fo2fp) 31>  
34< (complete)

87: bb121-7-0-2.singnet.com.sg:56299 - bb121-7-192-2.singnet.com.sg:80 (fq2fr) 32>  
45< (complete)

88: bb121-7-0-2.singnet.com.sg:56302 - bb121-7-192-2.singnet.com.sg:80 (fs2ft) 31>  
37< (complete)

89: bb121-7-0-2.singnet.com.sg:56307 - bb121-7-192-2.singnet.com.sg:80 (fu2fv) 31>  
35< (complete)

90: bb121-7-0-2.singnet.com.sg:56311 - bb121-7-192-2.singnet.com.sg:80 (fw2fx) 32>  
35< (complete)

91: bb121-7-0-2.singnet.com.sg:56314 - bb121-7-192-2.singnet.com.sg:80 (fy2fz) 31>  
39< (complete)

92: bb121-7-0-2.singnet.com.sg:56319 - bb121-7-192-2.singnet.com.sg:80 (ga2gb) 32>  
40< (complete)

93: bb121-7-0-2.singnet.com.sg:56322 - bb121-7-192-2.singnet.com.sg:80 (gc2gd) 30>  
31< (complete)

94: bb121-7-0-2.singnet.com.sg:56324 - bb121-7-192-2.singnet.com.sg:80 (ge2gf) 31>  
33< (complete)

95: bb121-7-0-2.singnet.com.sg:56332 - bb121-7-192-2.singnet.com.sg:80 (gg2gh) 31>  
34< (complete)

96: bb121-7-0-2.singnet.com.sg:56335 - bb121-7-192-2.singnet.com.sg:80 (gi2gj) 31>  
34< (complete)

97: bb121-7-0-2.singnet.com.sg:56338 - bb121-7-192-2.singnet.com.sg:80 (gk2gl) 31>  
34< (complete)

98: bb121-7-0-2.singnet.com.sg:56340 - bb121-7-192-2.singnet.com.sg:80 (gm2gn)  
29> 31< (complete)

99: bb121-7-0-2.singnet.com.sg:56342 - bb121-7-192-2.singnet.com.sg:80 (go2gp) 29>  
31< (complete)

100: bb121-7-0-2.singnet.com.sg:56343 - bb121-7-192-2.singnet.com.sg:80 (gq2gr) 29>  
31< (complete)

101: bb121-7-0-2.singnet.com.sg:56344 - bb121-7-192-2.singnet.com.sg:80 (gs2gt) 31>  
34< (complete)

102: bb121-7-0-2.singnet.com.sg:56345 - bb121-7-192-2.singnet.com.sg:80 (gu2gv)  
31> 33< (complete)

103: bb121-7-0-2.singnet.com.sg:56346 - bb121-7-192-2.singnet.com.sg:80 (gw2gx)  
32> 35< (complete)

104: bb121-7-0-2.singnet.com.sg:56348 - bb121-7-192-2.singnet.com.sg:80 (gy2gz)  
33> 33< (complete)

105: bb121-7-0-2.singnet.com.sg:56353 - bb121-7-192-2.singnet.com.sg:80 (ha2hb)  
33> 34< (complete)

106: bb121-7-0-2.singnet.com.sg:56357 - bb121-7-192-2.singnet.com.sg:80 (hc2hd)  
31> 34< (complete)

107: bb121-7-0-2.singnet.com.sg:56360 - bb121-7-192-2.singnet.com.sg:80 (he2hf) 32>  
34< (complete)

108: bb121-7-0-2.singnet.com.sg:56362 - bb121-7-192-2.singnet.com.sg:80 (hg2hh)  
31> 36< (complete)

109: bb121-7-0-2.singnet.com.sg:56369 - bb121-7-192-2.singnet.com.sg:80 (hi2hj) 29>  
31< (complete)

110: bb121-7-0-2.singnet.com.sg:56371 - bb121-7-192-2.singnet.com.sg:80 (hk2hl) 32>  
34< (complete)

111: bb121-7-0-2.singnet.com.sg:56373 - bb121-7-192-2.singnet.com.sg:80 (hm2hn)  
31> 32< (complete)

112: bb121-7-0-2.singnet.com.sg:56381 - bb121-7-192-2.singnet.com.sg:80 (ho2hp)  
29> 31< (complete)

113: bb121-7-0-2.singnet.com.sg:56382 - bb121-7-192-2.singnet.com.sg:80 (hq2hr) 32>  
33< (complete)

114: bb121-7-0-2.singnet.com.sg:56390 - bb121-7-192-2.singnet.com.sg:80 (hs2ht) 32>  
36< (complete)

115: bb121-7-0-2.singnet.com.sg:56392 - bb121-7-192-2.singnet.com.sg:80 (hu2hv)  
32> 33< (complete)

116: bb121-7-0-2.singnet.com.sg:56401 - bb121-7-192-2.singnet.com.sg:80 (hw2hx)  
31> 34< (complete)

117: bb121-7-0-2.singnet.com.sg:56405 - bb121-7-192-2.singnet.com.sg:80 (hy2hz)  
32> 37< (complete)

118: bb121-7-0-2.singnet.com.sg:56406 - bb121-7-192-2.singnet.com.sg:80 (ia2ib) 29>  
31< (complete)

119: bb121-7-0-2.singnet.com.sg:56407 - bb121-7-192-2.singnet.com.sg:80 (ic2id) 31>  
32< (complete)

120: bb121-7-0-2.singnet.com.sg:56409 - bb121-7-192-2.singnet.com.sg:80 (ie2if) 29>  
31< (complete)

121: bb121-7-0-2.singnet.com.sg:49651 - bb121-7-192-2.singnet.com.sg:80 (ig2ih) 31>  
32< (complete)

122: bb121-7-0-2.singnet.com.sg:49655 - bb121-7-192-2.singnet.com.sg:80 (ii2ij) 31>  
33< (complete)

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124: bb121-7-0-2.singnet.com.sg:49658 - bb121-7-192-2.singnet.com.sg:80 (im2in) 31>  
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- 125: bb121-7-0-2.singnet.com.sg:49662 - bb121-7-192-2.singnet.com.sg:80 (io2ip) 31>  
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- 126: bb121-7-0-2.singnet.com.sg:49664 - bb121-7-192-2.singnet.com.sg:80 (iq2ir) 31>  
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- 127: bb121-7-0-2.singnet.com.sg:49667 - bb121-7-192-2.singnet.com.sg:80 (is2it) 31>  
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- 130: bb121-7-0-2.singnet.com.sg:49674 - bb121-7-192-2.singnet.com.sg:80 (iy2iz) 32>  
34< (complete)
- 131: bb121-7-0-2.singnet.com.sg:49676 - bb121-7-192-2.singnet.com.sg:80 (ja2jb) 31>  
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- 132: bb121-7-0-2.singnet.com.sg:49679 - bb121-7-192-2.singnet.com.sg:80 (jc2jd) 31>  
34< (complete)
- 133: bb121-7-0-2.singnet.com.sg:49681 - bb121-7-192-2.singnet.com.sg:80 (je2jf) 30>  
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- 134: bb121-7-0-2.singnet.com.sg:49690 - bb121-7-192-2.singnet.com.sg:80 (jg2jh) 32>  
32< (complete)
- 135: bb121-7-0-2.singnet.com.sg:49691 - bb121-7-192-2.singnet.com.sg:80 (ji2jj) 32>  
35< (complete)
- 136: bb121-7-0-2.singnet.com.sg:49694 - bb121-7-192-2.singnet.com.sg:80 (jk2jl) 32>  
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- 137: bb121-7-0-2.singnet.com.sg:49697 - bb121-7-192-2.singnet.com.sg:80 (jm2jn) 31>  
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- 138: bb121-7-0-2.singnet.com.sg:49701 - bb121-7-192-2.singnet.com.sg:80 (jo2jp) 31>  
36< (complete)
- 139: bb121-7-0-2.singnet.com.sg:49705 - bb121-7-192-2.singnet.com.sg:80 (jq2jr) 29>  
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140: bb121-7-0-2.singnet.com.sg:49707 - bb121-7-192-2.singnet.com.sg:80 (js2jt) 31>  
35< (complete)

141: bb121-7-0-2.singnet.com.sg:49711 - bb121-7-192-2.singnet.com.sg:80 (ju2jv) 31>  
34< (complete)

142: bb121-7-0-2.singnet.com.sg:49714 - bb121-7-192-2.singnet.com.sg:80 (jw2jx) 31>  
32< (complete)

143: bb121-7-0-2.singnet.com.sg:49716 - bb121-7-192-2.singnet.com.sg:80 (jy2jz) 32>  
33< (complete)

144: bb121-7-0-2.singnet.com.sg:49719 - bb121-7-192-2.singnet.com.sg:80 (ka2kb)  
32> 35< (complete)

145: bb121-7-0-2.singnet.com.sg:49722 - bb121-7-192-2.singnet.com.sg:80 (kc2kd)  
30> 32< (complete)

146: bb121-7-0-2.singnet.com.sg:49724 - bb121-7-192-2.singnet.com.sg:80 (ke2kf) 31>  
36< (complete)

147: bb121-7-0-2.singnet.com.sg:49728 - bb121-7-192-2.singnet.com.sg:80 (kg2kh)  
32> 37< (complete)

148: bb121-7-0-2.singnet.com.sg:49734 - bb121-7-192-2.singnet.com.sg:80 (ki2kj) 32>  
34< (complete)

149: bb121-7-0-2.singnet.com.sg:49736 - bb121-7-192-2.singnet.com.sg:80 (kk2kl) 31>  
36< (complete)

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30> 32< (complete)

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37< (complete)

153: bb121-7-0-2.singnet.com.sg:49750 - bb121-7-192-2.singnet.com.sg:80 (ks2kt) 31>  
33< (complete)

154: bb121-7-0-2.singnet.com.sg:49752 - bb121-7-192-2.singnet.com.sg:80 (ku2kv)  
32> 37< (complete)

155: bb121-7-0-2.singnet.com.sg:49755 - bb121-7-192-2.singnet.com.sg:80 (kw2kx) 32> 32< (complete)

156: bb121-7-0-2.singnet.com.sg:49756 - bb121-7-192-2.singnet.com.sg:80 (ky2kz) 31> 32< (complete)

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158: bb121-7-0-2.singnet.com.sg:49760 - bb121-7-192-2.singnet.com.sg:80 (lc2ld) 31> 33< (complete)

159: bb121-7-0-2.singnet.com.sg:49761 - bb121-7-192-2.singnet.com.sg:80 (le2lf) 32> 35< (complete)

160: bb121-7-0-2.singnet.com.sg:49765 - bb121-7-192-2.singnet.com.sg:80 (lg2lh) 31> 32< (complete)

161: bb121-7-0-2.singnet.com.sg:49767 - bb121-7-192-2.singnet.com.sg:80 (li2lj) 32> 34< (complete)

162: bb121-7-0-2.singnet.com.sg:49769 - bb121-7-192-2.singnet.com.sg:80 (lk2ll) 33> 33< (complete)

163: bb121-7-0-2.singnet.com.sg:49772 - bb121-7-192-2.singnet.com.sg:80 (lm2ln) 31> 33< (complete)

164: bb121-7-0-2.singnet.com.sg:49774 - bb121-7-192-2.singnet.com.sg:80 (lo2lp) 31> 33< (complete)

165: bb121-7-0-2.singnet.com.sg:49776 - bb121-7-192-2.singnet.com.sg:80 (lq2lr) 32> 37< (complete)

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169: bb121-7-0-2.singnet.com.sg:49797 - bb121-7-192-2.singnet.com.sg:80 (ly2lz) 31> 32< (complete)

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31> 36< (complete)

171: bb121-7-0-2.singnet.com.sg:49806 - bb121-7-192-2.singnet.com.sg:80 (mc2md)  
31> 33< (complete)

172: bb121-7-0-2.singnet.com.sg:49808 - bb121-7-192-2.singnet.com.sg:80 (me2mf)  
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173: bb121-7-0-2.singnet.com.sg:49811 - bb121-7-192-2.singnet.com.sg:80 (mg2mh)  
30> 32< (complete)

174: bb121-7-0-2.singnet.com.sg:49819 - bb121-7-192-2.singnet.com.sg:80 (mi2mj)  
32> 33< (complete)

175: bb121-7-0-2.singnet.com.sg:49827 - bb121-7-192-2.singnet.com.sg:80 (mk2ml)  
32> 33< (complete)

176: bb121-7-0-2.singnet.com.sg:49828 - bb121-7-192-2.singnet.com.sg:80 (mm2mn)  
31> 32< (complete)

177: bb121-7-0-2.singnet.com.sg:49831 - bb121-7-192-2.singnet.com.sg:80 (mo2mp)  
29> 31< (complete)

178: bb121-7-0-2.singnet.com.sg:49833 - bb121-7-192-2.singnet.com.sg:80 (mq2mr)  
31> 33< (complete)

179: bb121-7-0-2.singnet.com.sg:49834 - bb121-7-192-2.singnet.com.sg:80 (ms2mt)  
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180: bb121-7-0-2.singnet.com.sg:49839 - bb121-7-192-2.singnet.com.sg:80 (mu2mv)  
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181: bb121-7-0-2.singnet.com.sg:49843 - bb121-7-192-2.singnet.com.sg:80 (mw2mx)  
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182: bb121-7-0-2.singnet.com.sg:49846 - bb121-7-192-2.singnet.com.sg:80 (my2mz)  
32> 34< (complete)

183: bb121-7-0-2.singnet.com.sg:49848 - bb121-7-192-2.singnet.com.sg:80 (na2nb)  
33> 35< (complete)

184: bb121-7-0-2.singnet.com.sg:49851 - bb121-7-192-2.singnet.com.sg:80 (nc2nd)  
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185: bb121-7-0-2.singnet.com.sg:49855 - bb121-7-192-2.singnet.com.sg:80 (ne2nf) 33>  
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186: bb121-7-0-2.singnet.com.sg:49865 - bb121-7-192-2.singnet.com.sg:80 (ng2nh)  
32> 34< (complete)

187: bb121-7-0-2.singnet.com.sg:49866 - bb121-7-192-2.singnet.com.sg:80 (ni2nj) 30>  
31< (complete)

188: bb121-7-0-2.singnet.com.sg:49867 - bb121-7-192-2.singnet.com.sg:80 (nk2nl) 29>  
31< (complete)

189: bb121-7-0-2.singnet.com.sg:49868 - bb121-7-192-2.singnet.com.sg:80 (nm2nn)  
31> 36< (complete)

190: bb121-7-0-2.singnet.com.sg:49870 - bb121-7-192-2.singnet.com.sg:80 (no2np)  
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192: bb121-7-0-2.singnet.com.sg:49877 - bb121-7-192-2.singnet.com.sg:80 (ns2nt) 32>  
36< (complete)

193: bb121-7-0-2.singnet.com.sg:49889 - bb121-7-192-2.singnet.com.sg:80 (nu2nv)  
31> 33< (complete)

194: bb121-7-0-2.singnet.com.sg:49892 - bb121-7-192-2.singnet.com.sg:80 (nw2nx)  
31> 33< (complete)

195: bb121-7-0-2.singnet.com.sg:49895 - bb121-7-192-2.singnet.com.sg:80 (ny2nz)  
33> 34< (complete)

196: bb121-7-0-2.singnet.com.sg:49899 - bb121-7-192-2.singnet.com.sg:80 (oa2ob)  
32> 33< (complete)

197: bb121-7-0-2.singnet.com.sg:49902 - bb121-7-192-2.singnet.com.sg:80 (oc2od)  
32> 33< (complete)

198: bb121-7-0-2.singnet.com.sg:49904 - bb121-7-192-2.singnet.com.sg:80 (oe2of) 32>  
36< (complete)

199: bb121-7-0-2.singnet.com.sg:49907 - bb121-7-192-2.singnet.com.sg:80 (og2oh)  
32> 35< (complete)

- 200: bb121-7-0-2.singnet.com.sg:49910 - bb121-7-192-2.singnet.com.sg:80 (oi2oj) 30>  
32< (complete)
- 201: bb121-7-0-2.singnet.com.sg:49914 - bb121-7-192-2.singnet.com.sg:80 (ok2ol) 32>  
35< (complete)
- 202: bb121-7-0-2.singnet.com.sg:49918 - bb121-7-192-2.singnet.com.sg:80 (om2on)  
31> 35< (complete)
- 203: bb121-7-0-2.singnet.com.sg:49923 - bb121-7-192-2.singnet.com.sg:80 (oo2op)  
30> 33< (complete)
- 204: bb121-7-0-2.singnet.com.sg:49926 - bb121-7-192-2.singnet.com.sg:80 (oq2or) 31>  
34< (complete)
- 205: bb121-7-0-2.singnet.com.sg:49929 - bb121-7-192-2.singnet.com.sg:80 (os2ot) 31>  
33< (complete)
- 206: bb121-7-0-2.singnet.com.sg:49932 - bb121-7-192-2.singnet.com.sg:80 (ou2ov)  
32> 32< (complete)
- 207: bb121-7-0-2.singnet.com.sg:49938 - bb121-7-192-2.singnet.com.sg:80 (ow2ox)  
32> 33< (complete)
- 208: bb121-7-0-2.singnet.com.sg:49944 - bb121-7-192-2.singnet.com.sg:80 (oy2oz)  
32> 34< (complete)
- 209: bb121-7-0-2.singnet.com.sg:49946 - bb121-7-192-2.singnet.com.sg:80 (pa2pb)  
29> 32< (complete)
- 210: bb121-7-0-2.singnet.com.sg:49948 - bb121-7-192-2.singnet.com.sg:80 (pc2pd)  
31> 34< (complete)
- 211: bb121-7-0-2.singnet.com.sg:49951 - bb121-7-192-2.singnet.com.sg:80 (pe2pf) 32>  
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- 212: bb121-7-0-2.singnet.com.sg:49955 - bb121-7-192-2.singnet.com.sg:80 (pg2ph)  
31> 34< (complete)
- 213: bb121-7-0-2.singnet.com.sg:49959 - bb121-7-192-2.singnet.com.sg:80 (pi2pj) 33>  
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- 214: bb121-7-0-2.singnet.com.sg:49964 - bb121-7-192-2.singnet.com.sg:80 (pk2pl) 31>  
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- 215: bb121-7-0-2.singnet.com.sg:49967 - bb121-7-192-2.singnet.com.sg:80 (pm2pn)  
31> 32< (complete)
- 216: bb121-7-0-2.singnet.com.sg:49970 - bb121-7-192-2.singnet.com.sg:80 (po2pp)  
30> 32< (complete)
- 217: bb121-7-0-2.singnet.com.sg:49977 - bb121-7-192-2.singnet.com.sg:80 (pq2pr) 31>  
36< (complete)
- 218: bb121-7-0-2.singnet.com.sg:49981 - bb121-7-192-2.singnet.com.sg:80 (ps2pt) 31>  
34< (complete)
- 219: bb121-7-0-2.singnet.com.sg:49984 - bb121-7-192-2.singnet.com.sg:80 (pu2pv)  
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- 220: bb121-7-0-2.singnet.com.sg:49987 - bb121-7-192-2.singnet.com.sg:80 (pw2px)  
33> 35< (complete)
- 221: bb121-7-0-2.singnet.com.sg:49989 - bb121-7-192-2.singnet.com.sg:80 (py2pz)  
34> 34< (complete)
- 222: bb121-7-0-2.singnet.com.sg:49998 - bb121-7-192-2.singnet.com.sg:80 (qa2qb)  
32> 32< (complete)
- 223: bb121-7-0-2.singnet.com.sg:49999 - bb121-7-192-2.singnet.com.sg:80 (qc2qd)  
31> 34< (complete)
- 224: bb121-7-0-2.singnet.com.sg:50002 - bb121-7-192-2.singnet.com.sg:80 (qe2qf) 29>  
31< (complete)
- 225: bb121-7-0-2.singnet.com.sg:50003 - bb121-7-192-2.singnet.com.sg:80 (qg2qh)  
31> 33< (complete)
- 226: bb121-7-0-2.singnet.com.sg:50004 - bb121-7-192-2.singnet.com.sg:80 (qi2qj) 32>  
37< (complete)
- 227: bb121-7-0-2.singnet.com.sg:50014 - bb121-7-192-2.singnet.com.sg:80 (qk2ql) 31>  
33< (complete)
- 228: bb121-7-0-2.singnet.com.sg:50016 - bb121-7-192-2.singnet.com.sg:80 (qm2qn)  
31> 37< (complete)
- 229: bb121-7-0-2.singnet.com.sg:50019 - bb121-7-192-2.singnet.com.sg:80 (qo2qp)  
31> 32< (complete)

230: bb121-7-0-2.singnet.com.sg:50021 - bb121-7-192-2.singnet.com.sg:80 (qq2qr) 32>  
36< (complete)

231: bb121-7-0-2.singnet.com.sg:50024 - bb121-7-192-2.singnet.com.sg:80 (qs2qt) 31>  
35< (complete)

232: bb121-7-0-2.singnet.com.sg:50026 - bb121-7-192-2.singnet.com.sg:80 (qu2qv)  
31> 34< (complete)

233: bb121-7-0-2.singnet.com.sg:50028 - bb121-7-192-2.singnet.com.sg:80 (qw2qx)  
29> 31< (complete)

234: bb121-7-0-2.singnet.com.sg:50029 - bb121-7-192-2.singnet.com.sg:80 (qy2qz)  
29> 31< (complete)

235: bb121-7-0-2.singnet.com.sg:50030 - bb121-7-192-2.singnet.com.sg:80 (ra2rb) 31>  
33< (complete)

236: bb121-7-0-2.singnet.com.sg:50033 - bb121-7-192-2.singnet.com.sg:80 (rc2rd) 31>  
32< (complete)

237: bb121-7-0-2.singnet.com.sg:50034 - bb121-7-192-2.singnet.com.sg:80 (re2rf) 31>  
34< (complete)

238: bb121-7-0-2.singnet.com.sg:50036 - bb121-7-192-2.singnet.com.sg:80 (rg2rh) 31>  
32< (complete)

239: bb121-7-0-2.singnet.com.sg:50066 - bb121-7-192-2.singnet.com.sg:80 (ri2rj) 10>  
8< (reset)

3. **Now use tcptrace to compute the average throughput given to a short flow. Similarly, compute the average throughput achieved by a long flow. What values do you get?**

Average Throughput of Long Flow at C: 18075Bps  
Average Throughput of Long Flow at D: 43173Bps  
Average Throughput of Long Flow at E: 42395Bps  
Average Throughput of Long Flow: 34548Bps

Average Throughput of Long Flow at C: 8181Bps  
Average Throughput of Long Flow at D: 47892Bps  
Average Throughput of Long Flow at E: 43581Bps  
Average Throughput of Long Flow: 33218Bps

4. **Is each of these throughputs different from the corresponding throughput numbers obtained in Part B of the "Mice and Elephants" experiment? If they are explain**



**what you think is happening, using one of the types of plots that tcptrace generates, for one of the flows (we don't tell you which plot will provide the most graphic explanation for what is happening; this is something for you to decide). Name this file iso\_red\_plot.eps.**

Both the throughput values are very low as compared to part B of “Mice and Elephants” Experiment. The reason is that UDP flow does not reduce its rate even when its packets are dropped probabilistically before the occurrence of congestion whereas both the long and short TCP flows go into slow start phase, reducing their window size, when their packets are dropped. They are therefore penalized more than UDP flow and their throughput drops drastically due to this phenomenon. Even though the throughput is better than Tail Drop case with UDP source, but still RED does not help much in improving throughput because the UDP flow does not change its rate.

### Service Differentiation

1. **List the commands you used to configure the router B and machine E.**

At Machine E:

```
iptables -t mangle -A OUTPUT -o eth1 -p tcp -s 121.7.192.2/32 -d  
121.7.0.2/32 -j DSCP --set-dscp 32
```

At Router B:

At Ethernet0

Random-detect

2. **Compress the traces from each of C, D, and E and include them in your submission. These traces must be named C.tcp\_diff.trace.gz, D.tcp\_diff.trace.gz etc.**
3. **Include three summaries of these traces (i.e run tcptrace -b on them). These files must be text files and must be named: C.tcp\_diff.summary, D.tcp\_diff.summary etc.**

**C.tcp\_diff.summary**

1 arg remaining, starting with 'C.tcp\_diff.trace'

Ostermann's tcptrace -- version 6.6.7 -- Thu Nov 4, 2004

10303 packets seen, 10295 TCP packets traced

elapsed wallclock time: 0:00:00.881534, 11687 pkts/sec analyzed

trace file elapsed time: 0:01:34.122665

TCP connection info:

1: bb121-7-0-2.singnet.com.sg:44501 - bb121-7-64-2.singnet.com.sg:80 (a2b) 3069>  
5091< (complete)

2: bb121-7-0-2.singnet.com.sg:44504 - bb121-7-64-2.singnet.com.sg:80 (c2d) 30>  
33< (complete)

3: bb121-7-0-2.singnet.com.sg:44505 - bb121-7-64-2.singnet.com.sg:80 (e2f) 8>  
6< (reset)

4: bb121-7-0-2.singnet.com.sg:44506 - bb121-7-64-2.singnet.com.sg:80 (g2h) 10>  
8< (reset)

5: bb121-7-0-2.singnet.com.sg:44513 - bb121-7-64-2.singnet.com.sg:80 (i2j) 31>  
33< (complete)

6: bb121-7-0-2.singnet.com.sg:44515 - bb121-7-64-2.singnet.com.sg:80 (k2l) 9>  
7< (reset)

7: bb121-7-0-2.singnet.com.sg:44516 - bb121-7-64-2.singnet.com.sg:80 (m2n) 9>  
7< (reset)

8: bb121-7-0-2.singnet.com.sg:44519 - bb121-7-64-2.singnet.com.sg:80 (o2p) 33>  
35< (complete)

9: bb121-7-0-2.singnet.com.sg:44526 - bb121-7-64-2.singnet.com.sg:80 (q2r) 33>  
35< (complete)

10: bb121-7-0-2.singnet.com.sg:44529 - bb121-7-64-2.singnet.com.sg:80 (s2t) 33>  
33< (complete)

11: bb121-7-0-2.singnet.com.sg:44532 - bb121-7-64-2.singnet.com.sg:80 (u2v) 31>  
33< (complete)

12: bb121-7-0-2.singnet.com.sg:44533 - bb121-7-64-2.singnet.com.sg:80 (w2x) 9>  
7< (reset)

13: bb121-7-0-2.singnet.com.sg:44535 - bb121-7-64-2.singnet.com.sg:80 (y2z) 9>  
7< (reset)

14: bb121-7-0-2.singnet.com.sg:44542 - bb121-7-64-2.singnet.com.sg:80 (aa2ab) 30>  
31< (complete)

15: bb121-7-0-2.singnet.com.sg:44545 - bb121-7-64-2.singnet.com.sg:80 (ac2ad) 32>  
34< (complete)

16: bb121-7-0-2.singnet.com.sg:44549 - bb121-7-64-2.singnet.com.sg:80 (ae2af) 31>  
32< (complete)

17: bb121-7-0-2.singnet.com.sg:44552 - bb121-7-64-2.singnet.com.sg:80 (ag2ah) 10>  
8< (reset)

18: bb121-7-0-2.singnet.com.sg:44553 - bb121-7-64-2.singnet.com.sg:80 (ai2aj) 11>  
9< (reset)

19: bb121-7-0-2.singnet.com.sg:44559 - bb121-7-64-2.singnet.com.sg:80 (ak2al) 29>  
31< (complete)

20: bb121-7-0-2.singnet.com.sg:44562 - bb121-7-64-2.singnet.com.sg:80 (am2an) 29>  
33< (complete)

21: bb121-7-0-2.singnet.com.sg:44567 - bb121-7-64-2.singnet.com.sg:80 (ao2ap) 31>  
34< (complete)

22: bb121-7-0-2.singnet.com.sg:44571 - bb121-7-64-2.singnet.com.sg:80 (aq2ar) 30>  
31< (complete)

23: bb121-7-0-2.singnet.com.sg:44574 - bb121-7-64-2.singnet.com.sg:80 (as2at) 31>  
32< (complete)

24: bb121-7-0-2.singnet.com.sg:44575 - bb121-7-64-2.singnet.com.sg:80 (au2av) 9>  
7< (reset)

25: bb121-7-0-2.singnet.com.sg:44581 - bb121-7-64-2.singnet.com.sg:80 (aw2ax) 33>  
33< (complete)

26: bb121-7-0-2.singnet.com.sg:44593 - bb121-7-64-2.singnet.com.sg:80 (ay2az) 9>  
7< (reset)

27: bb121-7-0-2.singnet.com.sg:44598 - bb121-7-64-2.singnet.com.sg:80 (ba2bb) 29>  
31< (complete)

28: bb121-7-0-2.singnet.com.sg:44601 - bb121-7-64-2.singnet.com.sg:80 (bc2bd) 29>  
31< (complete)

29: bb121-7-0-2.singnet.com.sg:44604 - bb121-7-64-2.singnet.com.sg:80 (be2bf) 9>  
7< (reset)

30: bb121-7-0-2.singnet.com.sg:44606 - bb121-7-64-2.singnet.com.sg:80 (bg2bh) 29>  
31< (complete)

31: bb121-7-0-2.singnet.com.sg:44611 - bb121-7-64-2.singnet.com.sg:80 (bi2bj) 29>  
31< (complete)

32: bb121-7-0-2.singnet.com.sg:44614 - bb121-7-64-2.singnet.com.sg:80 (bk2bl) 30>  
31< (complete)

33: bb121-7-0-2.singnet.com.sg:44618 - bb121-7-64-2.singnet.com.sg:80 (bm2bn) 29>  
31< (complete)

34: bb121-7-0-2.singnet.com.sg:44620 - bb121-7-64-2.singnet.com.sg:80 (bo2bp) 30>  
32< (complete)

35: bb121-7-0-2.singnet.com.sg:44623 - bb121-7-64-2.singnet.com.sg:80 (bq2br) 9>  
7< (reset)

36: bb121-7-0-2.singnet.com.sg:44626 - bb121-7-64-2.singnet.com.sg:80 (bs2bt) 29>  
31< (complete)

37: bb121-7-0-2.singnet.com.sg:44629 - bb121-7-64-2.singnet.com.sg:80 (bu2bv) 28>  
31< (complete)

38: bb121-7-0-2.singnet.com.sg:44632 - bb121-7-64-2.singnet.com.sg:80 (bw2bx) 28>  
31< (complete)

39: bb121-7-0-2.singnet.com.sg:44635 - bb121-7-64-2.singnet.com.sg:80 (by2bz) 29>  
31< (complete)

40: bb121-7-0-2.singnet.com.sg:44638 - bb121-7-64-2.singnet.com.sg:80 (ca2cb) 29>  
31< (complete)

41: bb121-7-0-2.singnet.com.sg:44641 - bb121-7-64-2.singnet.com.sg:80 (cc2cd) 9>  
7< (reset)

42: bb121-7-0-2.singnet.com.sg:44642 - bb121-7-64-2.singnet.com.sg:80 (ce2cf) 29>  
31< (complete)

43: bb121-7-0-2.singnet.com.sg:44648 - bb121-7-64-2.singnet.com.sg:80 (cg2ch) 29>  
31< (complete)

44: bb121-7-0-2.singnet.com.sg:44651 - bb121-7-64-2.singnet.com.sg:80 (ci2cj) 29>  
31< (complete)

45: bb121-7-0-2.singnet.com.sg:44655 - bb121-7-64-2.singnet.com.sg:80 (ck2cl) 29>  
31< (complete)

#### **D.tcp\_diff.summary**

1 arg remaining, starting with 'D.tcp\_diff.trace'

Ostermann's tcptrace -- version 6.6.7 -- Thu Nov 4, 2004

10641 packets seen, 10633 TCP packets traced

elapsed wallclock time: 0:00:00.275562, 38615 pkts/sec analyzed

trace file elapsed time: 0:01:34.180819

TCP connection info:

1: bb121-7-0-2.singnet.com.sg:52300 - bb121-7-128-2.singnet.com.sg:80 (a2b) 16>  
14< (reset)

2: bb121-7-0-2.singnet.com.sg:52305 - bb121-7-128-2.singnet.com.sg:80 (c2d) 29>  
31< (complete)

3: bb121-7-0-2.singnet.com.sg:52306 - bb121-7-128-2.singnet.com.sg:80 (e2f) 10>  
8< (reset)

4: bb121-7-0-2.singnet.com.sg:52307 - bb121-7-128-2.singnet.com.sg:80 (g2h) 10>  
8< (reset)

5: bb121-7-0-2.singnet.com.sg:52312 - bb121-7-128-2.singnet.com.sg:80 (i2j) 29>  
32< (complete)

6: bb121-7-0-2.singnet.com.sg:52318 - bb121-7-128-2.singnet.com.sg:80 (k2l) 2904>  
5060< (complete)

7: bb121-7-0-2.singnet.com.sg:52319 - bb121-7-128-2.singnet.com.sg:80 (m2n) 11>  
9< (reset)

8: bb121-7-0-2.singnet.com.sg:52320 - bb121-7-128-2.singnet.com.sg:80 (o2p) 9>  
7< (reset)

9: bb121-7-0-2.singnet.com.sg:52321 - bb121-7-128-2.singnet.com.sg:80 (q2r) 33>  
33< (complete)

- 10: bb121-7-0-2.singnet.com.sg:52325 - bb121-7-128-2.singnet.com.sg:80 (s2t) 33>  
36< (complete)
- 11: bb121-7-0-2.singnet.com.sg:52332 - bb121-7-128-2.singnet.com.sg:80 (u2v) 28>  
32< (complete)
- 12: bb121-7-0-2.singnet.com.sg:52336 - bb121-7-128-2.singnet.com.sg:80 (w2x) 9>  
7< (reset)
- 13: bb121-7-0-2.singnet.com.sg:52337 - bb121-7-128-2.singnet.com.sg:80 (y2z) 8>  
9< (reset)
- 14: bb121-7-0-2.singnet.com.sg:52338 - bb121-7-128-2.singnet.com.sg:80 (aa2ab) 27>  
32< (complete)
- 15: bb121-7-0-2.singnet.com.sg:52341 - bb121-7-128-2.singnet.com.sg:80 (ac2ad) 32>  
33< (complete)
- 16: bb121-7-0-2.singnet.com.sg:52344 - bb121-7-128-2.singnet.com.sg:80 (ae2af) 31>  
33< (complete)
- 17: bb121-7-0-2.singnet.com.sg:52348 - bb121-7-128-2.singnet.com.sg:80 (ag2ah) 29>  
31< (complete)
- 18: bb121-7-0-2.singnet.com.sg:52352 - bb121-7-128-2.singnet.com.sg:80 (ai2aj) 32>  
33< (complete)
- 19: bb121-7-0-2.singnet.com.sg:52355 - bb121-7-128-2.singnet.com.sg:80 (ak2al) 9>  
7< (reset)
- 20: bb121-7-0-2.singnet.com.sg:52356 - bb121-7-128-2.singnet.com.sg:80 (am2an) 8>  
7< (reset)
- 21: bb121-7-0-2.singnet.com.sg:52358 - bb121-7-128-2.singnet.com.sg:80 (ao2ap) 32>  
32< (complete)
- 22: bb121-7-0-2.singnet.com.sg:52361 - bb121-7-128-2.singnet.com.sg:80 (aq2ar) 29>  
31< (complete)
- 23: bb121-7-0-2.singnet.com.sg:52362 - bb121-7-128-2.singnet.com.sg:80 (as2at) 32>  
33< (complete)
- 24: bb121-7-0-2.singnet.com.sg:52367 - bb121-7-128-2.singnet.com.sg:80 (au2av) 31>  
34< (complete)

25: bb121-7-0-2.singnet.com.sg:52370 - bb121-7-128-2.singnet.com.sg:80 (aw2ax) 31>  
33< (complete)

26: bb121-7-0-2.singnet.com.sg:52374 - bb121-7-128-2.singnet.com.sg:80 (ay2az) 31>  
33< (complete)

27: bb121-7-0-2.singnet.com.sg:52377 - bb121-7-128-2.singnet.com.sg:80 (ba2bb) 9>  
7< (reset)

28: bb121-7-0-2.singnet.com.sg:52378 - bb121-7-128-2.singnet.com.sg:80 (bc2bd) 9>  
7< (reset)

29: bb121-7-0-2.singnet.com.sg:52380 - bb121-7-128-2.singnet.com.sg:80 (be2bf) 29>  
31< (complete)

30: bb121-7-0-2.singnet.com.sg:52382 - bb121-7-128-2.singnet.com.sg:80 (bg2bh) 29>  
31< (complete)

31: bb121-7-0-2.singnet.com.sg:52384 - bb121-7-128-2.singnet.com.sg:80 (bi2bj) 28>  
31< (complete)

32: bb121-7-0-2.singnet.com.sg:52387 - bb121-7-128-2.singnet.com.sg:80 (bk2bl) 29>  
31< (complete)

33: bb121-7-0-2.singnet.com.sg:52389 - bb121-7-128-2.singnet.com.sg:80 (bm2bn)  
31> 32< (complete)

34: bb121-7-0-2.singnet.com.sg:52392 - bb121-7-128-2.singnet.com.sg:80 (bo2bp) 29>  
31< (complete)

35: bb121-7-0-2.singnet.com.sg:52394 - bb121-7-128-2.singnet.com.sg:80 (bq2br) 29>  
31< (complete)

36: bb121-7-0-2.singnet.com.sg:52397 - bb121-7-128-2.singnet.com.sg:80 (bs2bt) 29>  
31< (complete)

37: bb121-7-0-2.singnet.com.sg:52400 - bb121-7-128-2.singnet.com.sg:80 (bu2bv) 29>  
31< (complete)

38: bb121-7-0-2.singnet.com.sg:52405 - bb121-7-128-2.singnet.com.sg:80 (bw2bx)  
29> 31< (complete)

39: bb121-7-0-2.singnet.com.sg:52406 - bb121-7-128-2.singnet.com.sg:80 (by2bz) 9>  
7< (reset)

40: bb121-7-0-2.singnet.com.sg:52407 - bb121-7-128-2.singnet.com.sg:80 (ca2cb) 11>  
9< (reset)

41: bb121-7-0-2.singnet.com.sg:52410 - bb121-7-128-2.singnet.com.sg:80 (cc2cd) 29>  
31< (complete)

42: bb121-7-0-2.singnet.com.sg:52413 - bb121-7-128-2.singnet.com.sg:80 (ce2cf) 29>  
32< (complete)

43: bb121-7-0-2.singnet.com.sg:52419 - bb121-7-128-2.singnet.com.sg:80 (cg2ch) 29>  
31< (complete)

44: bb121-7-0-2.singnet.com.sg:52422 - bb121-7-128-2.singnet.com.sg:80 (ci2cj) 30>  
31< (complete)

45: bb121-7-0-2.singnet.com.sg:52425 - bb121-7-128-2.singnet.com.sg:80 (ck2cl) 29>  
31< (complete)

46: bb121-7-0-2.singnet.com.sg:52428 - bb121-7-128-2.singnet.com.sg:80 (cm2cn)  
29> 31< (complete)

47: bb121-7-0-2.singnet.com.sg:52431 - bb121-7-128-2.singnet.com.sg:80 (co2cp) 31>  
34< (complete)

48: bb121-7-0-2.singnet.com.sg:52434 - bb121-7-128-2.singnet.com.sg:80 (cq2cr) 29>  
31< (complete)

49: bb121-7-0-2.singnet.com.sg:52437 - bb121-7-128-2.singnet.com.sg:80 (cs2ct) 29>  
31< (complete)

50: bb121-7-0-2.singnet.com.sg:52442 - bb121-7-128-2.singnet.com.sg:80 (cu2cv) 9>  
7< (reset)

51: bb121-7-0-2.singnet.com.sg:52443 - bb121-7-128-2.singnet.com.sg:80 (cw2cx) 9>  
7< (reset)

52: bb121-7-0-2.singnet.com.sg:52444 - bb121-7-128-2.singnet.com.sg:80 (cy2cz) 29>  
31< (complete)

53: bb121-7-0-2.singnet.com.sg:52447 - bb121-7-128-2.singnet.com.sg:80 (da2db) 29>  
31< (complete)

54: bb121-7-0-2.singnet.com.sg:52450 - bb121-7-128-2.singnet.com.sg:80 (dc2dd) 29>  
31< (complete)



55: bb121-7-0-2.singnet.com.sg:52454 - bb121-7-128-2.singnet.com.sg:80 (de2df) 31>  
32< (complete)

### **E.tcp\_diff.summary**

1 arg remaining, starting with 'E.tcp\_diff.trace'

Ostermann's tcptrace -- version 6.6.7 -- Thu Nov 4, 2004

10600 packets seen, 10590 TCP packets traced

elapsed wallclock time: 0:00:00.255282, 41522 pkts/sec analyzed

trace file elapsed time: 0:01:52.081171

TCP connection info:

1: bb121-7-0-2.singnet.com.sg:41041 - bb121-7-192-2.singnet.com.sg:80 (a2b) 2808>  
5073< (complete)

2: bb121-7-0-2.singnet.com.sg:41048 - bb121-7-192-2.singnet.com.sg:80 (c2d) 32>  
41< (complete)

3: bb121-7-0-2.singnet.com.sg:41049 - bb121-7-192-2.singnet.com.sg:80 (e2f) 10>  
8< (reset)

4: bb121-7-0-2.singnet.com.sg:41050 - bb121-7-192-2.singnet.com.sg:80 (g2h) 8>  
6< (reset)

5: bb121-7-0-2.singnet.com.sg:41055 - bb121-7-192-2.singnet.com.sg:80 (i2j) 31>  
32< (complete)

6: bb121-7-0-2.singnet.com.sg:41056 - bb121-7-192-2.singnet.com.sg:80 (k2l) 10>  
8< (reset)

7: bb121-7-0-2.singnet.com.sg:41062 - bb121-7-192-2.singnet.com.sg:80 (m2n) 29>  
31< (complete)

8: bb121-7-0-2.singnet.com.sg:41063 - bb121-7-192-2.singnet.com.sg:80 (o2p) 8>  
6< (reset)

9: bb121-7-0-2.singnet.com.sg:41066 - bb121-7-192-2.singnet.com.sg:80 (q2r) 30>  
31< (complete)

10: bb121-7-0-2.singnet.com.sg:41068 - bb121-7-192-2.singnet.com.sg:80 (s2t) 29>  
31< (complete)

11: bb121-7-0-2.singnet.com.sg:41069 - bb121-7-192-2.singnet.com.sg:80 (u2v) 10>  
8< (reset)

12: bb121-7-0-2.singnet.com.sg:41074 - bb121-7-192-2.singnet.com.sg:80 (w2x) 29>  
31< (complete)

13: bb121-7-0-2.singnet.com.sg:41075 - bb121-7-192-2.singnet.com.sg:80 (y2z) 8>  
6< (reset)

14: bb121-7-0-2.singnet.com.sg:41079 - bb121-7-192-2.singnet.com.sg:80 (aa2ab) 30>  
31< (complete)

15: bb121-7-0-2.singnet.com.sg:41082 - bb121-7-192-2.singnet.com.sg:80 (ac2ad) 28>  
31< (complete)

16: bb121-7-0-2.singnet.com.sg:41085 - bb121-7-192-2.singnet.com.sg:80 (ae2af) 28>  
31< (complete)

17: bb121-7-0-2.singnet.com.sg:41086 - bb121-7-192-2.singnet.com.sg:80 (ag2ah) 8>  
6< (reset)

18: bb121-7-0-2.singnet.com.sg:41089 - bb121-7-192-2.singnet.com.sg:80 (ai2aj) 28>  
31< (complete)

19: bb121-7-0-2.singnet.com.sg:41093 - bb121-7-192-2.singnet.com.sg:80 (ak2al) 30>  
31< (complete)

20: bb121-7-0-2.singnet.com.sg:41094 - bb121-7-192-2.singnet.com.sg:80 (am2an) 9>  
7< (reset)

21: bb121-7-0-2.singnet.com.sg:41099 - bb121-7-192-2.singnet.com.sg:80 (ao2ap) 31>  
32< (complete)

22: bb121-7-0-2.singnet.com.sg:41103 - bb121-7-192-2.singnet.com.sg:80 (aq2ar) 28>  
31< (complete)

23: bb121-7-0-2.singnet.com.sg:41104 - bb121-7-192-2.singnet.com.sg:80 (as2at) 9>  
7< (reset)

24: bb121-7-0-2.singnet.com.sg:41106 - bb121-7-192-2.singnet.com.sg:80 (au2av) 30>  
31< (complete)

25: bb121-7-0-2.singnet.com.sg:41108 - bb121-7-192-2.singnet.com.sg:80 (aw2ax) 30>  
31< (complete)

26: bb121-7-0-2.singnet.com.sg:41111 - bb121-7-192-2.singnet.com.sg:80 (ay2az) 29>  
31< (complete)

27: bb121-7-0-2.singnet.com.sg:41115 - bb121-7-192-2.singnet.com.sg:80 (ba2bb) 8>  
6< (reset)

28: bb121-7-0-2.singnet.com.sg:41116 - bb121-7-192-2.singnet.com.sg:80 (bc2bd) 29>  
31< (complete)

29: bb121-7-0-2.singnet.com.sg:41121 - bb121-7-192-2.singnet.com.sg:80 (be2bf) 29>  
31< (complete)

30: bb121-7-0-2.singnet.com.sg:41123 - bb121-7-192-2.singnet.com.sg:80 (bg2bh) 29>  
31< (complete)

31: bb121-7-0-2.singnet.com.sg:41125 - bb121-7-192-2.singnet.com.sg:80 (bi2bj) 8>  
6< (reset)

32: bb121-7-0-2.singnet.com.sg:41126 - bb121-7-192-2.singnet.com.sg:80 (bk2bl) 29>  
31< (complete)

33: bb121-7-0-2.singnet.com.sg:41128 - bb121-7-192-2.singnet.com.sg:80 (bm2bn)  
29> 31< (complete)

34: bb121-7-0-2.singnet.com.sg:41130 - bb121-7-192-2.singnet.com.sg:80 (bo2bp) 29>  
31< (complete)

35: bb121-7-0-2.singnet.com.sg:41133 - bb121-7-192-2.singnet.com.sg:80 (bq2br) 29>  
31< (complete)

36: bb121-7-0-2.singnet.com.sg:41135 - bb121-7-192-2.singnet.com.sg:80 (bs2bt) 29>  
31< (complete)

37: bb121-7-0-2.singnet.com.sg:41138 - bb121-7-192-2.singnet.com.sg:80 (bu2bv) 29>  
31< (complete)

38: bb121-7-0-2.singnet.com.sg:41141 - bb121-7-192-2.singnet.com.sg:80 (bw2bx)  
28> 31< (complete)

39: bb121-7-0-2.singnet.com.sg:41143 - bb121-7-192-2.singnet.com.sg:80 (by2bz) 8>  
6< (reset)

40: bb121-7-0-2.singnet.com.sg:41148 - bb121-7-192-2.singnet.com.sg:80 (ca2cb) 29>  
31< (complete)

41: bb121-7-0-2.singnet.com.sg:41151 - bb121-7-192-2.singnet.com.sg:80 (cc2cd) 29>  
31< (complete)

42: bb121-7-0-2.singnet.com.sg:41154 - bb121-7-192-2.singnet.com.sg:80 (ce2cf) 29>  
31< (complete)

43: bb121-7-0-2.singnet.com.sg:41155 - bb121-7-192-2.singnet.com.sg:80 (cg2ch) 9>  
7< (reset)

44: bb121-7-0-2.singnet.com.sg:41157 - bb121-7-192-2.singnet.com.sg:80 (ci2cj) 29>  
31< (complete)

45: bb121-7-0-2.singnet.com.sg:41160 - bb121-7-192-2.singnet.com.sg:80 (ck2cl) 29>  
31< (complete)

46: bb121-7-0-2.singnet.com.sg:41163 - bb121-7-192-2.singnet.com.sg:80 (cm2cn)  
29> 31< (complete)

47: bb121-7-0-2.singnet.com.sg:41166 - bb121-7-192-2.singnet.com.sg:80 (co2cp) 29>  
31< (complete)

48: bb121-7-0-2.singnet.com.sg:41169 - bb121-7-192-2.singnet.com.sg:80 (cq2cr) 29>  
31< (complete)

49: bb121-7-0-2.singnet.com.sg:41172 - bb121-7-192-2.singnet.com.sg:80 (cs2ct) 29>  
31< (complete)

50: bb121-7-0-2.singnet.com.sg:41175 - bb121-7-192-2.singnet.com.sg:80 (cu2cv) 29>  
31< (complete)

51: bb121-7-0-2.singnet.com.sg:41178 - bb121-7-192-2.singnet.com.sg:80 (cw2cx) 29>  
31< (complete)

52: bb121-7-0-2.singnet.com.sg:41181 - bb121-7-192-2.singnet.com.sg:80 (cy2cz) 8>  
6< (reset)

53: bb121-7-0-2.singnet.com.sg:41185 - bb121-7-192-2.singnet.com.sg:80 (da2db) 29>  
31< (complete)

54: bb121-7-0-2.singnet.com.sg:41188 - bb121-7-192-2.singnet.com.sg:80 (dc2dd) 29>  
31< (complete)

55: bb121-7-0-2.singnet.com.sg:41191 - bb121-7-192-2.singnet.com.sg:80 (de2df) 9>  
7< (reset)

56: bb121-7-0-2.singnet.com.sg:41192 - bb121-7-192-2.singnet.com.sg:80 (dg2dh) 29>  
31< (complete)

57: bb121-7-0-2.singnet.com.sg:41195 - bb121-7-192-2.singnet.com.sg:80 (di2dj) 29>  
31< (complete)

- 4. Now use tcptrace to compute the average throughput given to a short flow through E (suppose we call this  $TS(E)$ ). Similarly, compute the average throughput achieved by the long flow through E ( $TL(E)$ ). Also compute  $TS(CD)$  (the average of short flows from C and D) and  $TL(CD)$ . What are the values of these four variables?**

Average Throughput of Long Flow at C: 316972Bps  
Average Throughput of Long Flow at D: 323604Bps  
Average Throughput of Long Flow at E: 650068Bps  
Average Throughput of Long Flow through CD: 320288Bps  
Average Throughput of Long Flow through E: 650068Bps

Average Throughput of Short Flow at C: 94313Bps  
Average Throughput of Short Flow at D: 113037Bps  
Average Throughput of Short Flow at E: 106083Bps  
Average Throughput of Short Flow through CD: 103675Bps  
Average Throughput of Short Flow through E: 106083Bps

- 5. Are  $TS(E)$  and  $TS(CD)$  the same or different? How do they compare with the average throughput of a short flow obtained in the first experiment (section "Of Mice and Elephants", Part A)?**

$TS(E)$  and  $TS(CD)$  come out to be almost same. Both these values are slightly higher than the average throughput of short flow in part A.

- 6. Are  $TL(E)$  and  $TL(CD)$  the same or different? How do they compare with the average throughput of a long flow obtained in the first experiment (section "Of Mice and Elephants", Part A)?**

$TL(E)$  is almost double as compared to  $TL(CD)$  and  $TL(CD)$  is almost same as the throughput of long flows in part A.

- 7. If you found that TCP was unfair to short flows in Section "Of Mice and Elephants" part A, does this experiment suggest a solution to that fairness problem? What solution does this experiment suggest? What are the challenges in designing this solution?**

In "Mice and Elephants" experiment, it was proved that TCP is unfair to short flows, because long flow packets would occupy more space in buffer than short flows and short

flow packets would drop more often result in decreased throughput. Here we saw that when we gave preferential treatment to packets of packets from E by giving them a separate queue, the throughput of long flow doubled whereas that of short flows remained same because short flows have to still deal with long flow packets.

One way of introducing fairness is to give short flows a separate queue so that they do not have to compete with long flows. For that at the sources, short flow packets would have to be marked properly to distinguish them from long flows at the router buffers.