

RAW RESULTS

BANDWIDTH AGGREGATION

1. USING TWO LINKS WITH REORDERING ENABLED

```
Retrieving speedtest.net configuration...
Testing from Linode (45.33.83.64)...
Retrieving speedtest.net server list...
Selecting best server based on ping...
Hosted by Optimum Online (New York City, NY) [14.26 km]: 31.356 ms
Testing download
speed.....
.....
Download: 7.99 Mbit/s
Testing upload
speed.....
.....
Upload: 4.20 Mbit/s
```

```
--2018-04-04 22:27:18-- http://ipv4.download.thinkbroadband.com/20MB.zip
Resolving ipv4.download.thinkbroadband.com
(ipv4.download.thinkbroadband.com)... 80.249.99.148
Connecting to ipv4.download.thinkbroadband.com
(ipv4.download.thinkbroadband.com)|80.249.99.148|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 20971520 (20M) [application/zip]
Saving to: ?20MB.zip.17?
20MB.zip.44      100%[=====>]  20.00M   992KB/s   in 21s
2018-04-04 23:50:56 (995 KB/s) - ?20MB.zip.44? Saved [20971520/20971520]
```

2. USING TWO LINKS WITHOUT REORDERING ENABLED

```
cole@mpb13l:~$ speedtest
Retrieving speedtest.net configuration...
Testing from Linode (45.33.83.64)...
Retrieving speedtest.net server list...
Selecting best server based Retrieving speedtest.net configuration...
Testing from Linode (45.33.83.64)...
Retrieving speedtest.net server list...
Selecting best server based on ping...
Hosted by Sprint (Harrison, NJ) [1.34 km]: 27.234 ms
Testing download
speed.....
.....
Download: 3.93 Mbit/s
Testing upload
speed.....
.....
Upload: 3.14 Mbit/s
```

```
--2018-04-04 21:26:29-- http://ipv4.download.thinkbroadband.com/20MB.zip
Resolving ipv4.download.thinkbroadband.com
(ipv4.download.thinkbroadband.com)... 80.249.99.148
Connecting to ipv4.download.thinkbroadband.com
(ipv4.download.thinkbroadband.com)|80.249.99.148|:80... connected.
```

```
HTTP request sent, awaiting response... 200 OK
Length: 20971520 (20M) [application/zip]
Saving to: ?20MB.zip?
20MB.zip      100%[=====>]  20.00M   541KB/s   in 42s
2018-04-04 21:27:11 (488 KB/s) - ?20MB.zip? Saved [20971520/20971520]
```

3. USING ONLY LINK ONE

```
--2018-04-04 21:32:16-- http://ipv4.download.thinkbroadband.com/20MB.zip
Resolving ipv4.download.thinkbroadband.com
(ipv4.download.thinkbroadband.com)... 80.249.99.148
Connecting to ipv4.download.thinkbroadband.com
(ipv4.download.thinkbroadband.com)|80.249.99.148|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 20971520 (20M) [application/zip]
Saving to: ?20MB.zip.4?
20MB.zip.4    100%[=====>]  20.00M   1.24MB/s   in 20s
2018-04-04 21:32:36 (1.01 MB/s) - ?20MB.zip.4? Saved [20971520/20971520]
```

```
Retrieving speedtest.net configuration...
Testing from Linode (45.33.83.64)...
Retrieving speedtest.net server list...
Selecting best server based on ping...
Hosted by AT&T (New York City, NY) [14.26 km]: 30.413 ms
Testing download
speed.....
.....
Download: 6.21 Mbit/s
Testing upload
speed.....
.....
Upload: 1.86 Mbit/s
```

4. USING ONLY LINK TWO

```
--2018-04-04 21:34:37-- http://ipv4.download.thinkbroadband.com/20MB.zip
Resolving ipv4.download.thinkbroadband.com
(ipv4.download.thinkbroadband.com)... 80.249.99.148
Connecting to ipv4.download.thinkbroadband.com
(ipv4.download.thinkbroadband.com)|80.249.99.148|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 20971520 (20M) [application/zip]
Saving to: ?20MB.zip.5?
20MB.zip.5    100%[=====>]  20.00M   414KB/s   in 52s
2018-04-04 21:35:29 (397 KB/s) - ?20MB.zip.5? Saved [20971520/20971520]
```

```
Retrieving speedtest.net configuration...
Testing from Linode (45.33.83.64)...
Retrieving speedtest.net server list...
Selecting best server based on ping...
Hosted by Speedtest.net (New York City, NY) [14.26 km]: 25.442 ms
Testing download
speed.....
.....
Download: 3.35 Mbit/s
Testing upload
speed.....
.....
```

Upload: 2.31 Mbit/s

QOS RESULTS - SPEED

NOTE:another download is running that can saturate link

1. WITH DOWNLOAD PRIORITY 1

```
cole@mpb13l:~$ wget http://80.249.99.148/20MB.zip
--2018-04-04 22:59:57-- http://80.249.99.148/20MB.zip
Connecting to 80.249.99.148:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 20971520 (20M) [application/zip]
Saving to: ?20MB.zip.32?
20MB.zip.32      100%[=====>]  20.00M   356KB/s   in 62s
2018-04-04 23:01:00 (328 KB/s) - ?20MB.zip.32? Saved [20971520/20971520]
```

2. WITH NO DOWNLOAD PRIORITY

```
cole@mpb13l:~$ wget http://80.249.99.148/20MB.zip
--2018-04-04 22:51:56-- http://80.249.99.148/20MB.zip
Connecting to 80.249.99.148:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 20971520 (20M) [application/zip]
Saving to: ?20MB.zip.27?
20MB.zip.27      100%[=====>]  20.00M   208KB/s   in 1m
54s
2018-04-04 22:53:51 (179 KB/s) - ?20MB.zip.27? Saved [20971520/20971520]
```

QOS RESULTS - LATENCY

1. WITH NO PRIORITIZATION

```
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_seq=1 ttl=60 time=12.2 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=60 time=12.9 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=60 time=51.6 ms
64 bytes from 8.8.8.8: icmp_seq=4 ttl=60 time=14.6 ms
64 bytes from 8.8.8.8: icmp_seq=5 ttl=60 time=26.4 ms
64 bytes from 8.8.8.8: icmp_seq=6 ttl=60 time=21.1 ms
64 bytes from 8.8.8.8: icmp_seq=7 ttl=60 time=23.4 ms
64 bytes from 8.8.8.8: icmp_seq=8 ttl=60 time=17.4 ms
64 bytes from 8.8.8.8: icmp_seq=9 ttl=60 time=39.5 ms
64 bytes from 8.8.8.8: icmp_seq=10 ttl=60 time=16.2 ms
64 bytes from 8.8.8.8: icmp_seq=11 ttl=60 time=13.4 ms
64 bytes from 8.8.8.8: icmp_seq=12 ttl=60 time=108 ms
64 bytes from 8.8.8.8: icmp_seq=13 ttl=60 time=11.0 ms
64 bytes from 8.8.8.8: icmp_seq=14 ttl=60 time=15.0 ms
64 bytes from 8.8.8.8: icmp_seq=15 ttl=60 time=12.6 ms
64 bytes from 8.8.8.8: icmp_seq=16 ttl=60 time=21.6 ms
64 bytes from 8.8.8.8: icmp_seq=17 ttl=60 time=12.0 ms
64 bytes from 8.8.8.8: icmp_seq=18 ttl=60 time=13.2 ms
64 bytes from 8.8.8.8: icmp_seq=19 ttl=60 time=20.5 ms
64 bytes from 8.8.8.8: icmp_seq=20 ttl=60 time=19.6 ms
64 bytes from 8.8.8.8: icmp_seq=21 ttl=60 time=12.4 ms
q64 bytes from 8.8.8.8: icmp_seq=22 ttl=60 time=12.4 ms
64 bytes from 8.8.8.8: icmp_seq=23 ttl=60 time=21.7 ms
^C
--- 8.8.8.8 ping statistics ---
23 packets transmitted, 23 received, 0% packet loss, time 22031ms
rtt min/avg/max/mdev = 11.027/23.033/108.075/20.403 ms
```

2. WITH LOW LATENCY PRIORITY

```
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.  
64 bytes from 8.8.8.8: icmp_seq=1 ttl=60 time=12.0 ms  
64 bytes from 8.8.8.8: icmp_seq=2 ttl=60 time=11.4 ms  
64 bytes from 8.8.8.8: icmp_seq=3 ttl=60 time=11.5 ms  
64 bytes from 8.8.8.8: icmp_seq=4 ttl=60 time=10.5 ms  
64 bytes from 8.8.8.8: icmp_seq=5 ttl=60 time=12.8 ms  
64 bytes from 8.8.8.8: icmp_seq=6 ttl=60 time=12.0 ms  
64 bytes from 8.8.8.8: icmp_seq=7 ttl=60 time=12.0 ms  
64 bytes from 8.8.8.8: icmp_seq=8 ttl=60 time=10.9 ms  
64 bytes from 8.8.8.8: icmp_seq=9 ttl=60 time=11.4 ms  
64 bytes from 8.8.8.8: icmp_seq=10 ttl=60 time=11.8 ms  
64 bytes from 8.8.8.8: icmp_seq=11 ttl=60 time=11.9 ms  
64 bytes from 8.8.8.8: icmp_seq=12 ttl=60 time=12.0 ms  
64 bytes from 8.8.8.8: icmp_seq=13 ttl=60 time=11.8 ms  
64 bytes from 8.8.8.8: icmp_seq=14 ttl=60 time=11.5 ms  
64 bytes from 8.8.8.8: icmp_seq=15 ttl=60 time=11.9 ms  
64 bytes from 8.8.8.8: icmp_seq=16 ttl=60 time=11.5 ms  
64 bytes from 8.8.8.8: icmp_seq=17 ttl=60 time=11.7 ms  
64 bytes from 8.8.8.8: icmp_seq=18 ttl=60 time=11.6 ms  
64 bytes from 8.8.8.8: icmp_seq=19 ttl=60 time=11.9 ms  
64 bytes from 8.8.8.8: icmp_seq=20 ttl=60 time=11.6 ms  
^C  
--- 8.8.8.8 ping statistics ---  
20 packets transmitted, 20 received, 0% packet loss, time 19025ms  
rtt min/avg/max/mdev = 10.529/11.739/12.802/0.471 ms
```