

IPv4/IPv6 Performance Measurement

1 GATHERING THE DATA

To obtain the results used in this report, I created a simple unix script, which takes the .csv file of the top one million websites, downloaded onto the local machine, and strips it down to the top 100, and takes out all columns that aren't the url. It then goes through each row, and does an ipv4 and an ipv6 ping on each website, each ping command takes an average of five pings. "www_". Is appended to the start of each url as this increases that the amount of pings that are successful.

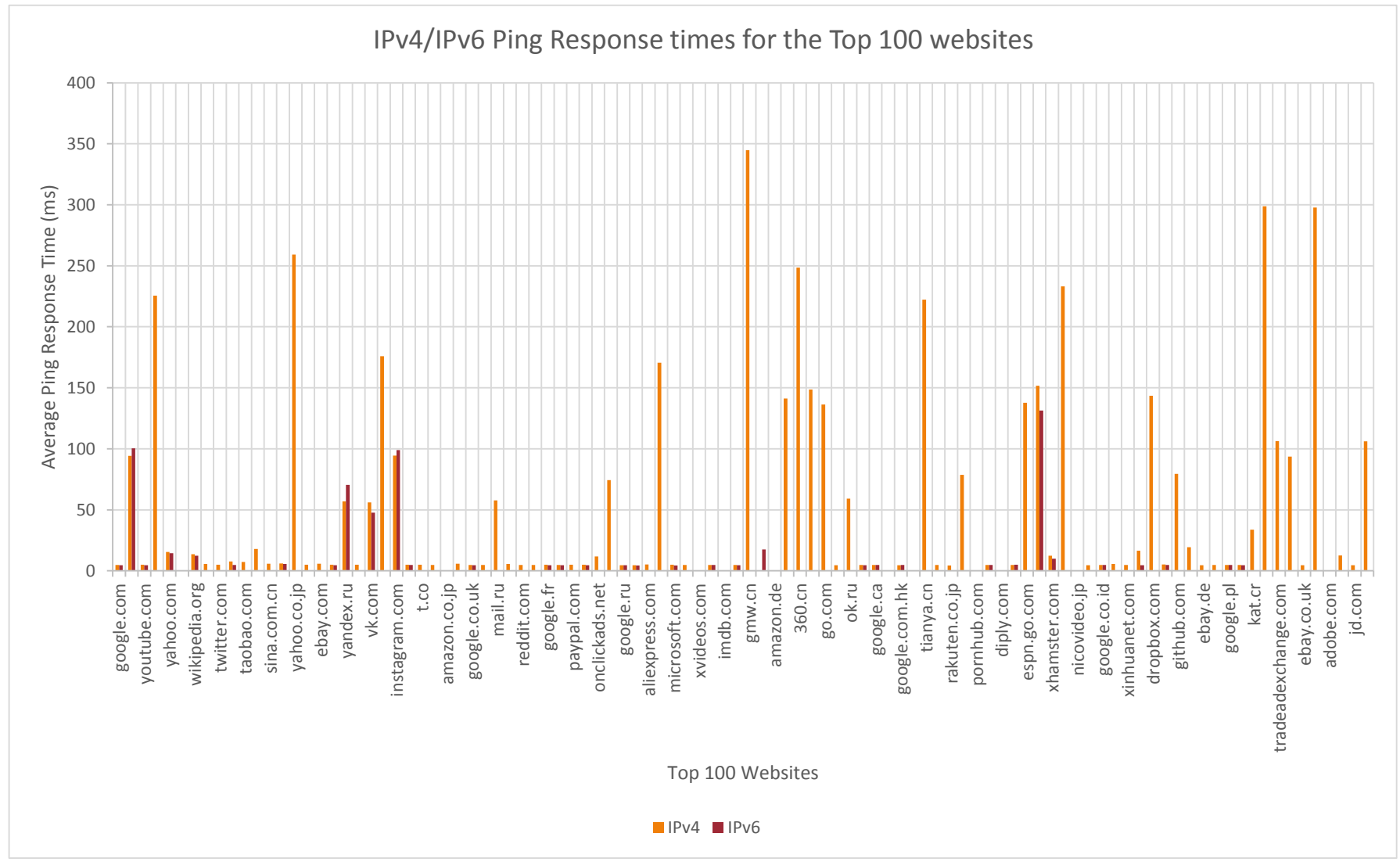
Sites without IPv6 are reported as an empty result within the .csv file.

The results of this saved saved in .csv format to a file.

The script is as follows:

```
head -100 top-1m.csv | awk -F "\"*,\"" '{print $2}' |
while read line; do
    ipv4=$(ping -c 5 "www.$line" | tail -1 | awk -F '/' '{print $5}');
    ipv6=$(ping6 -c 5 "www.$line" | tail -1 | awk -F '/' '{print $5}');
    echo "$line,$ipv4,$ipv6"
done > newresults.csv
```

2 MEASUREMENT RESULT



3 DISCUSSION

The results show, that mostly the difference in performance between ipv4 and ipv6 for websites that support both, is relatively negligible. There are a few instances where ipv6 has a slightly better performance than ipv4, but there are also a similar amount of sites where the opposite is true.

For the sites that have a large response time, where a difference would be easier to observe, they do not have ipv6 support, so no comparison can be made.

This conclusion may be largely due to the reliability of the results, which are probably relatively unreliable, given how dynamic and varied network performance can be across different systems and different infrastructures. To try and increase reliability of a performance test like this, one would have to repeat the test on multiple machines, from different networks, and at different times of day, and take an average, all in order to try and get a more accurate picture of network performance to a specific site. These reliability increasing methods were done here, due to time and resource constraints; however, I do think my results are accurate enough for them to be useful to a certain degree.

The negligible performance difference between the two protocols may be due to the websites who support Ipv6, not delegating as much of their server infrastructure to IPv6 services, therefore it has worse network performance compared to their Ipv4 service, which has more network power assigned to it.