DNS resolver comparison

5 websites were sampled from the top 25 websites listed on the suggested link at https://www.similarweb.com/top-websites/.
Websites: ['google.com', 'twitter.com', 'amazon.com', 'netflix.com', 'reddit.com']

Methodology

- The average resolution time was recorded for each website over ten iterations in each of the experiments below using the same machine.
- For experiment 1, the custom dig implementation (mydig) was used to resolve the addresses. Since wolfienet-secure does not allow us to connect to root servers, I used wolfienet-guest for this experiment.
- For experiment 2 and 3, dnspython dns.resolver.resolve() was used with nameservers as specified.
- Results are plotted using matplotlib.pyplot bar graphs.

Experiments

Experiment 1: Custom DNS resolver (mydig resolver)
Corresponding resolution times (in millisec) are [48.54, 97.46, 92.17, 60.97, 62.4].

Experiment 2: Local DNS resolver (using wolfienet-secure the local DNS resolver address is 130.245.255.4)
Corresponding resolution times (in millisec) are [4.13, 4.12, 5.16, 6.01, 4.06].

Experiment 3: Google public DNS resolver (IP 8.8.8.8).
Corresponding resolution times (in millisec) are [15.47, 8.54, 9.83, 15.8, 10.02].

Results and observations

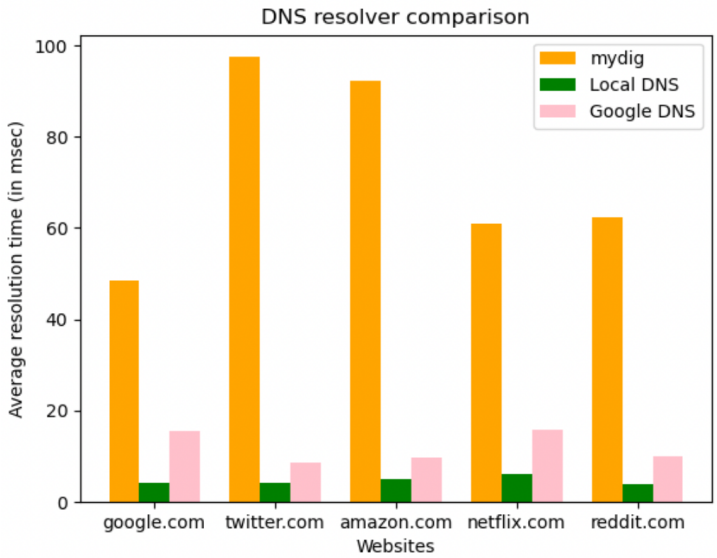

Figure 1: Average resolution time (in ms) for different resolvers

1. Overall we observe that Local DNS and Google public DNS perform much better than the custom implementation (mydig) by approximately 50-60 ms. This can mainly be attributed to the lack of a caching mechanism in the design of mydig resolver.
2. Adding caching to mydig could improve performance since the performance of other resolvers improves as we increase the number of iterations.
3. Local DNS and Google DNS performance is comparable but local DNS has the lowest resolution times. This could again be attributed to caching differences.