# DNS Resolution Analysis Report

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Here we measured the performance of our DNS resolver (without DNSSEC support) for resolving A records for top 25 Websites from alexa.com. Each website was resolved 10 times and the average resolution time was measured (milliSeconds).

Similarly, we collected data by repeating the experiment with local DNS resolver and another experiment with a Public DNS Resolver (@8.8.8.8). All the measurements were noted and plotted as shown below.

The first plot shows the results of time taken in resolution of top 24 Alexa websites:
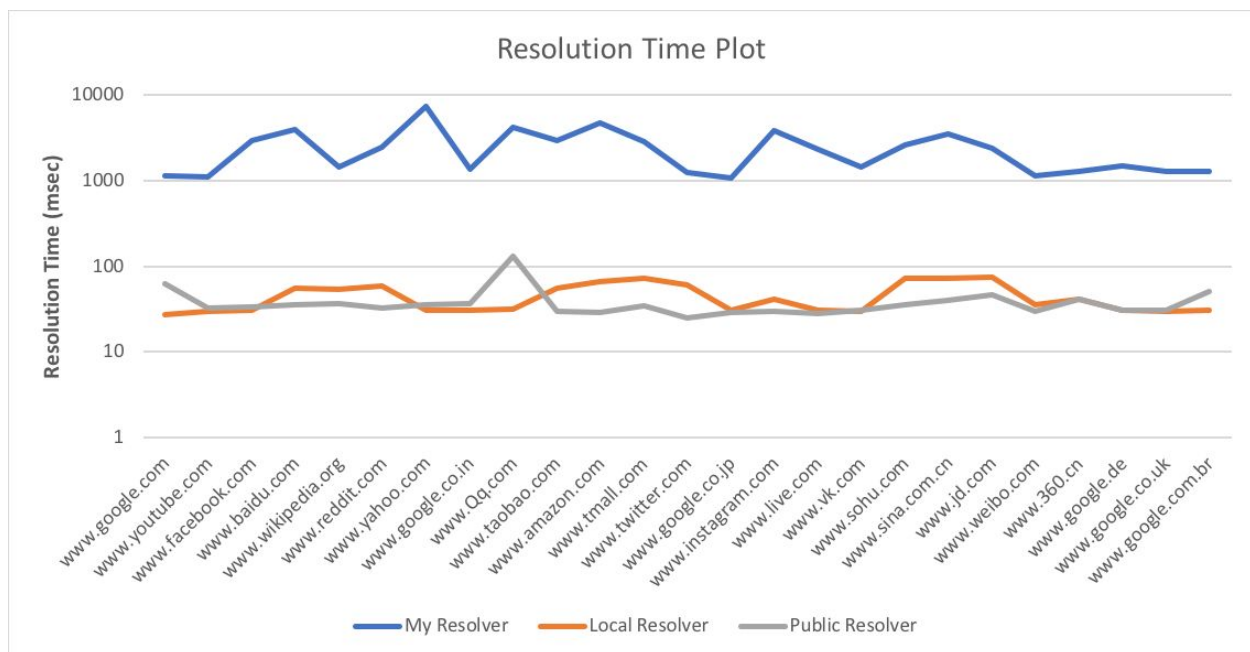
As seen from the plot, our own resolver takes more time to resolve IPs than the local and Public DNS resolvers. This is due to the fact that the local resolver doesn't maintain a DNS cache and each time, a query is fetched, it contacts the root servers to get the TLD address all the way down to the Authoritative name server for the query's zone. Our resolver also queries the servers in a round robin fashion and ignores any effect of geological presence of servers or request origin to select the next nearest server for query. We see that websites, such as Qq.com take higher resolution time than more common google.com. This could again be attributed to lesser number of cached responses of Qq as compared to google.com which seems to have a local hike in the resolution time. We can also see a

trend a resolution time from sohu.com - weibo.com which is shown to have a local peak across all 3 resolvers, showing that these domains in general had more resolution time than others.

The Second Plot shows the Cumulative Distribution Frequency Plot for the Resolution time across the 3 resolvers used to collect data:
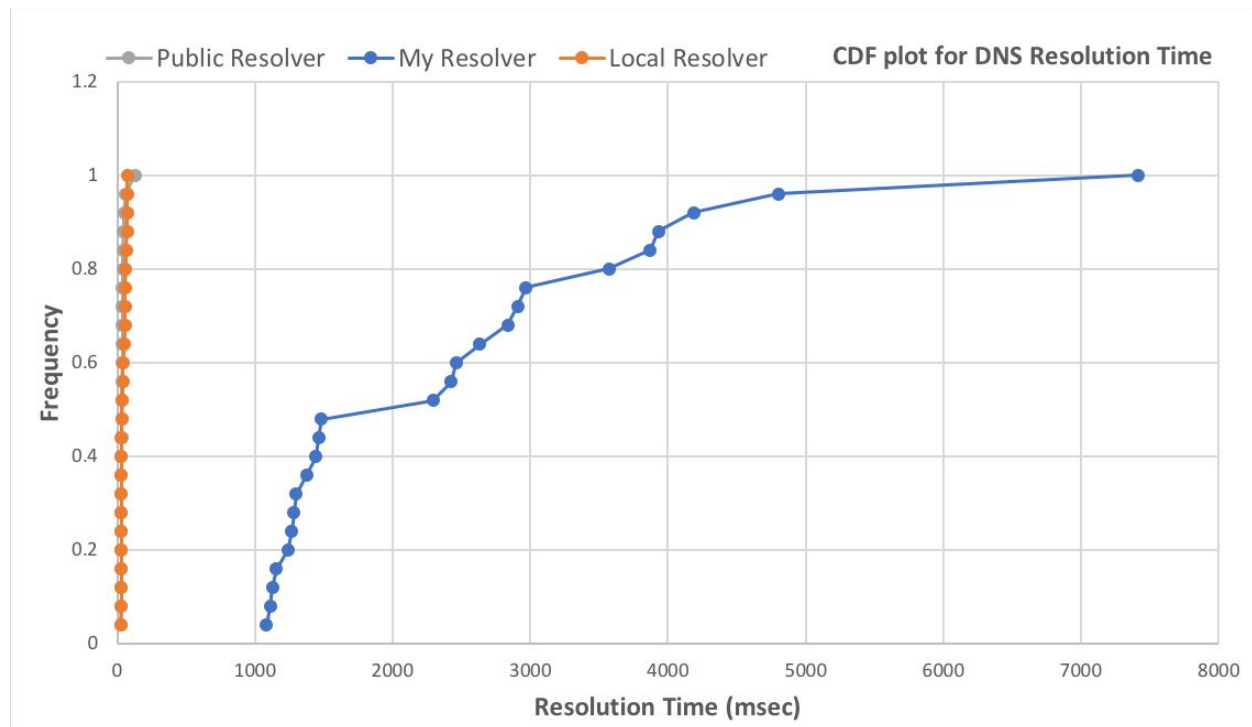
The Plot majorly highlights the larger resolution time of our own resolver as compared to the local and public resolvers. As discussed, this is majorly attributed to the caching of DNS responses, and which in prohibits the queries to be resolved from all the way in root servers to the Authoritative Servers of queries which holds the IPs of the queried servers. The DNS responses of the public and local servers collected were majorly the cached responses from an intermediate resolver and thus the response time of these resolvers were seen to be low. Further as discussed, the public and local resolver often followed the lowest hop path to the request origin, whereas our resolver simply chose the servers in a round robin fashion ignoring any effect of request origin and current load on the query resolver.