TraceRoute 2.0

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ABSTRACT

A network diagnostic tool called **Traceroute** is used to monitor in real-time the path an IP packet takes from source to destination while reporting the IP addresses of all the routers it pings along the way. Traceroute also keeps track of the duration of each hop a packet takes to get to its final destination. We intend to develop over this existing tool, discover its limitations and provide an upgrade inorder to provide much intuitive output data such as the average RTT, Standard deviations and also the path which offers the quickest packet delivery at a given point in time.

TRACEROUTE 2.0 - Introduction

With countless applications, including identifying routing flaws and diagnosing network outages, Traceroute is widely regarded as the go-to tool for troubleshooting networks. Previous studies have looked closely at the potential dangers and weaknesses that could lead to inaccurate or insufficient measurements while utilizing this technology. The round-trip times of the packets received from each subsequent host (remote node) along the route (path) serve as a record of the route's history; the sum of these mean times serves as an indicator of the entire amount of time required to establish the connection.Traceroute continues until all (often three) sent packets are lost more than twice; at that point, the connection is lost and it is impossible to determine the route. In contrast, Ping only determines the final round-trip timings from the destination point.

Working

The user invokes the traceroute or tracert command and specifies a target host. If the host is specified in the form of a domain name, traceroute will attempt to resolve it. Traceroute sends a data packet towards the target with the TTL value set to 1. The first router in the path will decrement the value by 1, which should trigger a TTL exceeded message that gets sent back to the host on which the traceroute program is running. With details of the first hop in hand, traceroute will increase the TTL value to 2. That first router in the path will still decrement the value by 1, but because the TTL will no longer drop to zero right out of the gate the packet can live on for one more hop.

Features

Tracing the IP route inside an IP network from a source to a destination is the core function of a traceroute, as its name suggests. With the use of a network traceroute, a user can see not only the routers but also the round-trip latency from the source to each router.

ANALYSIS AND PROJECT OVERVIEW

Contrasting between Traditional Traceroute and TraceRoute 2.0:

It is well known that the standard traceroute displays the route the packet follows, including the IP addresses of the routers it goes through, as well as the RTT to return to the source IP address. It pings packets from the source computer to the destination IP address. Along with some other tasks like calculating the average RTT, showing the standard deviation, contrasting the time difference between several pings to a certain IP, showing missed packets, etc. TraceRoute 2.0 also carries out comparable capabilities.

Traditional Traceroute, its limitations and an effort to make it better.

We came to the conclusion that showing the Average RTT, standard deviation, and the opportunity to play around with the parameters of the traceroute algorithm would provide the user a much better knowledge of the method after extensive brainstorming sessions and survey analysis. Additionally, it would show the user the fastest route a packet might take at a certain moment.We have given users the ability to specify their own settings, such as the amount of packets they would want to ping, the time interval at which they would like to send packets, the number of hops, etc., in order to make it more interactive and experimental for the user.

For the special features of the program like calculating round trip averages and standard deviations, the application automates this process by keeping track of every hop`s round trip during a given traceroute of the program and then gets the average of all those round trips and outputs this as one final average RTT for that traceroute.The program also logs the time of day that the user pinged a certain destination host, and this allows for comparison between different runs of the program as their average RTT is logged as well as their standard deviation. Another cool feature is World Trace, where the program shows an interactive map with the locations of each individual hop during a traceroute.

CONCLUSION

To learn more about the network and its condition, it is crucial to trace Internet paths.To this aim, Traceroute is frequently utilized by researchers and network administrators. This de facto standard technology is also known to be impacted by a number of problems, such as anonymous or hidden routers that result in erroneous and incomplete data collection. In this project, we built and examined the traceroute tool's existing capability and also succeeded in enhancing it by adding a number of new features that offer end users valuable data. We were successful in developing a highly experimental tool that allows the user to explore with its features, quickly gather important information, educate themselves, or have this tool assist them in the experiments they conduct. We have also made this tool as an executable so it would be easier to run it on any machine without any issues.

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