CIS 527
COMPUTER NETWORKS
UNIVERSITY OF MICHIGAN - DEARBORN
P-3

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ABSTRACT:

This experiment looks into packet losses, round-trip times, and routing stability in the Internet using the network diagnostic tools traceroute and ping. Five destination hosts—www.google.com, www.youtube.com, www.africau.com, www.hulu.com, and www.atos.com—are being watched for the study. In addition to analyzing loss rates and round-trip times, the objectives are to evaluate the stability of Internet routes to these hosts and derive insights into their performance characteristics.

INTRODUCTION:

The peculiarities of network routing and packet round-trip times can be better understood thanks to developments in network diagnostic tools like traceroute and ping. Using these instruments to collect information on specific destination hosts, this experiment aims to investigate the routing stability, losses, and delays in the Internet. The objectives of the research are to comprehend routing path dynamics, track any alterations over time, and assess the chosen targets' performance attributes.

METHODOLOGY:

GOOGLE

The following parameters were used to perform traceroute measurements for the designated target:

Target:www.google.com

OBSERVATIONS:

There was a consistent routing path seen within each measurement. Typically, a single traceroute followed the same hop sequence.There were differences in the routing paths across various measurements. Differentiated routes were noted, suggesting that the network routing system is dynamically adjusted.Measurements taken to "WWW.GOOGLE.COM" showed several different routing routes. This implies that routes may be dynamically adjusted by the network in response to various factors, including traffic patterns and routing protocol choices.In order to

evaluate stability, the paths' consistency over several measurements was examined. Although the paths between measurements varied, the stability is still dependent on the dynamics of the network and any modifications made during the measurement period.

YOUTUBE

The following parameters were used to perform traceroute measurements for the designated target:

Target:www.youtube.com

OBSERVATIONS:

There was a consistent routing path seen within each measurement. Typically, a single traceroute followed the same hop sequence.There were differences in the routing paths across various measurements. Differentiated routes were noted, suggesting that the network routing system is dynamically adjusted.Measurements taken to "WWW.YOUTUBE.COM" showed several different routing routes. This implies that routes may be dynamically adjusted by the network in response to various factors, including traffic patterns and routing protocol choices.In order to evaluate stability, the paths' consistency over several measurements was examined. Although the paths between measurements varied, the stability is still dependent on the dynamics of the network and any modifications made during the measurement period.

HULU

The following parameters were used to perform traceroute measurements for the designated target:

Target:www.hulu.com

OBSERVATIONS:

There was a consistent routing path seen within each measurement. Typically, a single traceroute followed the same hop sequence.There were almost the same in the routing paths across various measurements. Similar routes were noted, but different network protocols.Measurements taken to "WWW.HULU.COM" showed several same routing routes.but small difference in traffic patterns and routing protocol choices.In order to evaluate stability, the paths' consistency over several measurements was examined.

ATOS

The following parameters were used to perform traceroute measurements for the designated target:

Target:www.atos.com

OBSERVATIONS:

There was a consistent routing path seen within each measurement. Typically, a single traceroute followed the same hop sequence.There were almost the same in the routing paths across various measurements. Similar routes were noted, but different network protocols.Measurements taken to "WWW.ATOS.COM" showed several same routing routes.but small difference in traffic patterns and routing protocol choices.In order to evaluate stability, the paths' consistency over several measurements was examined.

AFRICAU

The following parameters were used to perform traceroute measurements for the designated target:

Target:www.aftrica.edu

OBSERVATIONS:

There was a consistent routing path seen within each measurement. Typically, a single traceroute followed the same hop sequence.There were differences in the routing paths across various measurements. Differentiated routes were noted, suggesting that the network routing system is dynamically adjusted.Measurements taken to "WWW.AFRICAU.COM" showed several different routing routes. This implies that routes may be dynamically adjusted by the network in response to various factors, including traffic patterns and routing protocol choices.In order to evaluate stability, the paths' consistency over several measurements was examined. Although the paths between measurements varied, the stability is still dependent on the dynamics of the network and any modifications made during the measurement period.

RESULTS:

Ping Analysis Report

1. Loss Classification:

Target: www.google.com

- Loss Free: 0% packet loss
- Classification: Loss Free

Target: www.youtube.com

- Loss Free: 0% packet loss
- Classification: Loss Free

Target: www.hulu.com

- Loss Free: 0% packet loss
- Classification: Loss Free

Target: www.africau.edu

- Loss Free: 0% packet loss
- Classification: Loss Free

Target: www.atos.com

- Loss Free: 0% packet loss
- Classification: Loss Free

Weekly Overview:

All measured domains consistently exhibit no packet loss throughout the week.

2. RTT Analysis:

Target: www.google.com

First:a1

- Minimum RTT: 19.950ms
- Maximum RTT: 53.280ms
- Mean RTT: 28.649ms

Second:a2

- Minimum RTT: 19.119ms
- Maximum RTT: 386.555ms
- Mean RTT: 41.474ms

Target: www.youtube.com

a1:

- Minimum RTT: 19.213 ms
- Maximum RTT: 190.989 ms
- Mean RTT: 24.276 ms

a2:

- Minimum RTT: 19.676 ms
- Maximum RTT: 79.109 ms
- Mean RTT: 24.234 ms

Target: www.hulu.com

a1:

- Minimum RTT: 15.660ms
- Maximum RTT: 95.146ms
- Mean RTT: 21.454 ms

a2:

- Minimum RTT: 15.490ms
- Maximum RTT: 397.834ms
- Mean RTT: 41.252 ms

Target: www.africau.edu

a1:

- Minimum RTT: 42.865ms
- Maximum RTT: 137.946ms
- Mean RTT: 50.003 ms

a2:

- Minimum RTT: 43.389ms
- Maximum RTT: 640.167ms
- Mean RTT: 76.161 ms

Target:www.atos.com

a1:

- Minimum RTT: 15.765 ms
- Maximum RTT: 319.681 ms
- Mean RTT: 26.818 ms

a2:

- Minimum RTT: 14.544 ms
- Maximum RTT: 208.428 ms
- Mean RTT: 34.125ms

The above results are only from day1.The remaining days outputs are attached in data file

3. Loss Rate and RTT Trends Over Time:

Observation:

For any of the measured domains, no discernible variations in loss rate or RTTs are seen in relation to the various times of day or week.

FINAL CONCLUSION:

The experiment offers insightful information about the performance characteristics of chosen targets, including www.google.com, www.youtube.com, www.africau.com, www.hulu.com, and www.atos.com, as well as the stability of Internet routes. Traceroute and ping measurement observations shed light on round-trip time patterns, loss rate variations, and routing path dynamics. The organization of targets according to their rate of loss facilitates comprehension of the dependability of various locations.

What Did We Learn?

This experiment taught us that routing paths on the Internet can be both stable and variable. There are targets that always travel the same path, and targets that change over time. The classification aids in evaluating the dependability of the targets because round-trip times and loss rates differ amongst them. A deeper comprehension of the subtleties and complexity of Internet behavior is made possible through the examination of routing and performance data.