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EDI: First/Second Lab Report

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Abstract— This report presents two analyses of network performance with regards to ProtonVPN servers and DNS servers. The first analysis evaluates the performance of various ProtonVPN servers and investigates the impact of server location on network performance. To accomplish this, measurements of latency, packet loss, and network bandwidth were taken using tools such as Speedtest-cli, Ping, and MTR. The second analysis focuses on DNS performance, beginning with an overview of DNS functionality and studying the contents of DNS queries and responses, followed by an evaluation of the performance of different DNS servers and protocols.
During the investigation, the latency, packet loss, and DNS query resolution time of different DNS servers was measured. The results provide insights into optimal server selection to maximize performance, privacy and security of the user.

Keywords— VPN • Performance • Speedtest • Ping • MTR • DNS • dig • dnseval • DNSSEC • DoT • DoH

CONTENTS

1. WEB TECHNOLOGIES

Analyze and discuss the impacts of the number of parallel connections set inside the browser on the Page Load Times of commercial/institutional websites. Did you notice any expected or unexpected behavior?

Analyze and discuss the impacts of caching policies implemented by different commercial/institutional websites on the Page Load Times. Consider websites that support HTTP/1.1, HTTP/2 and HTTP/3 (possibly with unsecure and secure connections). Did you notice any expected or unexpected behavior?

Analyze and discuss the performance of different commercial/institutional websites obtained under different conditions using the ab – Apache HTTP server benchmarking tool. Did you notice any expected or unexpected behavior?

Analyze and discuss the performance of different commercial/institutional websites obtained under different conditions using the nghttp and h2load tools. In the experiments with h2load analyze the role of the warm-up time. Did you notice any expected or unexpected behavior?

2. CONCLUSIONS