Chair of Network Architectures and Services
Department of Informatics
Technical University of Munich

Thesis M.Sc.

Structural Analysis of the Great Firewall of China

Motivation

The Chinese Internet is controlled by one of the largest-scale censorship machanisms in existence, commonly referred to as the ”Great Firewall of China” (GFW). It is being monitored and studied by different research [1-3], but its exact structure is still largely unknown. One of its main functions is to inject false information into DNS queries for censored domains. Our IPv6 Internet Measurement team has (accidentally) been collecting great amounts of data on these injections for multiple years and could already identify some of the GFW's structure. Some of the effects visible in our data remain unsolved, however. These include: In exactly which subnets do injections happen? Can different injector nodes be identified and located? Can unusual behavior be mapped to different subnets? The main goal of this thesis is to improve our understanding of the GFW for both IPv6 and IPv4. This will be done by analysis of existing data and, if necessary by collection of new data with through our scanning infrastructure.

Your Task

- Familiarize yourself with our DNS dataset and the structure of the GFW
- Identify the cause of the anomalies in our datasets
- Implement Internet scans and conduct them with us if necessary
- Transfer your findings from the IPv6 data to IPv4

References

[1] https://gfw.report/
[2] https://en.greatfire.org/
[3] https://www.usenix.org/system/files/foci20-paper-anonymous_0.pdf

Requirements

Good network programming skills, preferably in Python. Good understanding of Internet routing, Autonomous Systems, prefixes, protocols, optimally also of DNS.

Contact

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