Technische Universität München, Department of Informatics

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Thesis M.Sc.

IPv6 Scanning - Smart address selection and comparison to legacy IP

Motivation

Internet-wide network scans provide valuable information about the state of the Internet. With tools like `zmap` or `masscan` it is feasible to scan the complete IPv4 Internet fast and accurately. IPv6, however, features 128 bit long addresses, which makes the bruteforce scanning approach impractical. The goal of this thesis is to scan *relevant* parts of the IPv6 Internet by making use of smart address selection techniques. These techniques should reduce the vast IPv6 address space to a scannable size and maximize the number of found hosts/services. Previous work on used IPv6 addresses [3, 4] and estimations derived from passive measurements [2] should provide a starting point. For the selected addresses we will then perform TLS scans as well as delay measurements. The results from the IPv6 scans will then be evaluated to discover differenced to previously performed IPv4 measurements.

Figure 2: IPv6[1]

Your Task

- Devise a method for IPv6 address selection to allow for efficient scanning while maximizing the hit-rate
- Extend existing scanner for IPv6 support or program a new one
- Conduct TLS and delay (RTT) scans on IPv6 addresses
- Collect results and compare with previous IPv4 scanning results

Bibliography

References

[1] Wikimedia Commons. World ipv6 day (internet society), 2012. CC-BY 3.0.

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[3] Elliott Karpilovsky, Alexandre Gerber, Dan Pei, Jennifer Rexford, and Aman Shaikh. Quantifying the extent of ipv6 deployment. In *Passive and Active Network Measurement*, pages 13–22. Springer, 2009.

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