Chair of Network Architectures and Services
School of Computation, Information and Technology
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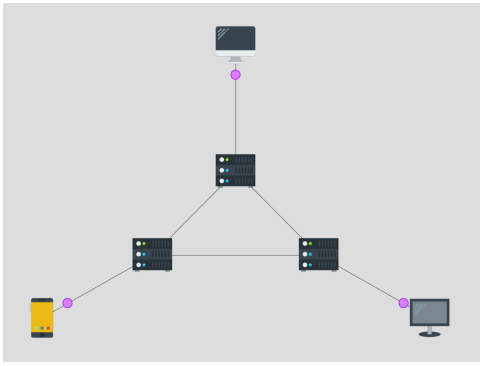
IDP

Advancing a Network Simulator for Cybersecurity Education

Motivation



Teaching fundamental networking concepts and security principles is essential for raising awareness and introducing learners early to the field of cybersecurity. One of the tools used for this purpose is netsim [1], which has already been translated and extended with an additional level [2]. The simulator is actively used in teaching environments [3].
It covers core networking concepts and introduces various attack scenarios, such as spoofing and denial-of-service attacks. However, it currently lacks technical depth in certain areas. Additionally, the presentation of information could be improved, and further scenarios could be introduced to enhance the learning experience.

Your Task

Your task is to extend the existing codebase by adding new functionality and developing additional scenarios. Possible starting points include:

- Improved differentiation between IP addresses and domain names
- Enhanced traceability and visualization of network packets
- Improved usability for instructors, e.g., a status page with progress tracking

Further extensions could include support for additional protocols, new attack scenarios, or the introduction of advanced network concepts such as Content Delivery Networks (CDNs), demilitarized zones (DMZs), or carrier-grade NAT (CGNAT).

References

- [1] https://github.com/errorinn/netsim
- [2] https://github.com/timbetzer/netsim
- [3] https://teacher1.css.net.in.tum.de/

Requirements

A basic understanding of networking concepts and JavaScript is required. Fluency in German is also necessary. Please submit your application via email, including a brief summary of the additional scenarios you would be interested in implementing in the tool.

Contact

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