

Thesis
B.Sc.

Thesis
M.Sc.

Transformation and Evaluation of TLS Behavior Graphs

Motivation

During the TLS handshake, servers react to the properties offered by the client in sent Client Hellos (CHs). The server behavior can be actively derived sending multiple CHs offering different properties. This behavior allows to differentiate servers, e.g., as used within JARM [1].

The goal of this thesis is to transform this behavior into graphs and allow the application of Graph Neural Networks (GNN). Each graph is supposed to represent the behavior of individual servers. Nodes and edges will represent individual properties of the server in relation to CHs triggering the behavior.

A framework to create different graph representations has to be developed and graphs need to be compared. Afterwards, a selection of promising representations will be used to train GNNs with the goal to classify servers (e.g., CDN deployments).

Your Task

- Transform TLS data into graphs
- Describe different graph representations
- Analyze different representations in respect to graph features
- Train a GNN with the different graphs

Requirements

- Basic programming knowledge in Python
- Basic knowledge regarding graphs and AI
- Familiarity with GIYF-Based work approaches

Bibliography

[1] <https://github.com/salesforce/jarm>

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