

Bachelor/Master Thesis in IT Security

Modeling Fraud Scenarios in Trigger Nets (TN1)

THESESUS is a highly visible lighthouse project that is publicly funded by the BMWi with 90 Mio EUR. The THESESUS use case TEXO investigates the full life cycle of tradable services. The services are implemented using Web Service standard. When offering tradable services that are handling valuable goods or information and that users are billed for, security is a key non-functional requirement.

Services with low security standards may not be able to prevent their users from exploiting the overall composite business process (of which the service is a component) to realize a fraud scheme. The clients of services may consider security standards as an important criterion for service selection. Detected fraud schemes in a service are considered an indicator of low security standards. This research activity employs specifications (*domain expert knowledge*) of known fraud scenarios (*detection model*) and in order to detect runtime behavior that matches these scenarios.

Thesis Work Description

- Define reference fraud scenarios (in collaboration with industry partners) that are representative and should cover all detection requirements in practice.
- Investigate if Meier's semantics model is complete or too expressive wrt. to the requirements of modeling fraud scenarios. If necessary adapt the semantics model.
- Investigate the expressiveness of Trigger Nets as a vehicle to specify fraud scenarios.
- Validate the modeling framework by using Meier's (adapted) semantics model as a benchmark. Provide constructive proof of concept by giving working constructions for each semantic concept of the (adapted) semantics model in the Trigger Nets.
- As use case example translate the reference fraud scenarios into Trigger Nets.
- Explore available editors for Trigger Nets.
- If no editors are available, design and implement according extensions to Oryx.
- Investigate and survey analysis tooling available in Oryx.

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Key Requirements

- Bachelor awarded from a University (of Applied Sciences) with major Computer Science.
- Very good Java programming under Eclipse, familiarity with Web Services programming
- Ability to thoroughly understand and analyze technical specifications and standards.
- Enthusiasm for innovative applications and technologies.
- The preferable language of the thesis is English.

Contact

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