MACsec-over-Layer 3

Implementing high-performance encryption over layer 3

What:

- Previous work at chair focused on encryption of layer 2 frames via MACsec
  → use/modify tunneling protocol to securely transmit MACsec-protected frames over layer 3
- Focus on performance (use DPDK or netmap or ...)
- Protocol on how to secure frames was already proposed in previous thesis

Skillset:

- c/c++
- Linux kernel would be nice
- DPDK or netmap or ... would also be nice

Module:

- Bachelor/Master/Großer Beleg/Diplom

Talk to: Tim Lackorzynski <tim.lackorzynski@tu-dresden.de>

Secure Software Engineering
Analyze/Classify/Summarize Best Practices

What:
- Software engineering approaches, that focus on producing secure (a.k.a. as few bugs as possible) code/software
- Especially important for safety- and security-critical applications (industrial, automotive, avionics...)
- Analyze state of the art (practical guides, certification standards, general approaches, supporting tools)
- Find invariants and recommend tools/general approaches
- Generate guide with absolute baseline techniques/tools/approaches for students

Skillset:
- Experience in commercial programming (a.k.a. programmed for food in a company in the past)

Module:
- SHK/WHK
- Analyse eines Forschungsthemas

Talk to: Tim Lackorzynski <tim.lackorzynski@tu-dresden.de>

Methods for Assessing Software Complexities
Analyze State-of-the-Art/Identify Open Questions

What:
- „Complexity is the worst enemy of security“ – Bruce Schneier
  → Trust simplicity more/complexity less
- Question: How to quantify software complexity?
- Analyze state of the art (theoretic methods, practices and available tools)
- Also look at methods concerning binary files
- Identify open questions/lacking tools...

Skillset:
- Experience in programming would be nice (esp. c/c++)
- Abstract thinking

Module:
- Analyse eines Forschungsthemas

Talk to: Tim Lackorzynski <tim.lackorzynski@tu-dresden.de>

Scraping of News Sources
Create tool for analyzing news trends

What:
- The world changes/certain topics become more/less relevant
- Hard to tell, when trends start to shift, what problems become prevalent
- Create framework for scraping archives of news sites for search terms
- Also create statistics over results (e.g. occurrence over time)

Skillset:
- Python?
- Some knowledge how the web works maybe...

Module:
- Inf-PM-FPA

Talk to: Tim Lackorzynski <tim.lackorzynski@tu-dresden.de>