MASTER‘S THESIS ASSIGNMENT

I. Personal and study details

Student's name: **Forst Lukáš** Personal ID number: **465806**

Faculty / Institute: **Faculty of Electrical Engineering**

Department / Institute: **Department of Computer Science**

Study program: **Open Informatics**

Specialisation: **Cyber Security**

II. Master’s thesis details

Master’s thesis title in English:

Trust Model for Global Peer-To-Peer Intrusion Prevention System

Master’s thesis title in Czech:

Model důvěry pro globální peer-to-peer IDS/IPS

Guidelines:

The goal is to design and implement a trust model for distributed multi-agent environments of intrusion prevention systems (IPS). One IPS is the Stratosphere Linux IPS (Slips)[6] which will have a globally distributed peer-to-peer system. With this capability and the fact that peer-to-peer systems are permission-less, Slips determines how much can trust the data from other peers. We aim to solve this challenge and design and implement a trust model as a Slips module. The trust model should be able to evaluate the behavior of other Slips agents (which can also be acting as malicious actors) in a global peer-to-peer data sharing network and compute a trust value. The question that we want to answer is “how much can the local system trust the data coming from the said global peer?”.
The student will analyze different trust models and options to attack them. A new trust model that uses data from Slips will be proposed, and its performance will be evaluated. Finally, the model will be implemented as a module inside Slips and will enable sharing said network data with other nodes running Slips.

Bibliography / sources:

[1] Eleni Koutrouli, Aphrodite Tsalgatidou: Taxonomy of attacks and defense mechanisms in P2P reputation systems - Lessons for reputation system designers, 2010
[2] Jingpei Wang, Jie Liu: The Comparison of Distributed P2P Trust Models Based on Quantitative Parameters in the File Downloading Scenarios, 2016
[3] Tigist Abera, Ferdinand Brasser, Lachlan J. Gunn, David Koisser, Ahmad-Reza Sadegh: SADAN: Scalable Adversary Detection in Autonomous Networks, 2017
[4] Nicolas Falliere: Sality: Story of a Peer-to-Peer Viral Network, 2011
[5] Emmanouil Vasilomanolakis, Jan Helge Wolf, Leon Böck, Shankar Karuppayah, Max Mühlhäuser: I Trust my Zombies: A Trust-enabled Botnet, 2017
[6] SLIPS: Stratosphere labs intrusion prevention system, https://github.com/stratosphereips/StratosphereLinuxIPS/

Name and workplace of master’s thesis supervisor:

Ing. Sebastián García, Ph.D. Artificial Intelligence Center FEE

Name and workplace of second master’s thesis supervisor or consultant:

Date of master’s thesis assignment: **22.02.2022** Deadline for master's thesis submission: **20.05.2022**

Assignment valid until: **19.02.2024**

Ing. Sebastián García, Ph.D. Supervisor’s signature	Head of department’s signature	prof. Mgr. Petr Páta, Ph.D. Dean’s signature

III. Assignment receipt

The student acknowledges that the master's thesis is an individual work. The student must produce his thesis without the assistance of others, with the exception of provided consultations. Within the master's thesis, the author must state the names of consultants and include a list of references.

. _____ Date of assignment receipt

_____ Student's signature

