Bachelor's Thesis Assignment

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Institut:	Department of Intelligent Systems (UITS)
Student:	**Do Hung**
Programme:	Information Technology
Specialization:	Information Technology
Title:	**Implement Rubber Duckies on Available USB Devices and Make a Practical Test**
Category:	Security
Academic year:	2022/23

Assignment:

1. Study how the Universal Serial Bus (USB) works and describe it. Next, study and describe how BadUSB and RubberDucky attacks work.
2. Implement RubberDucky on a Raspberry Pico platform working on platforms Microsoft Windows 10 and later and GNU/Linux with kernel 5.15 and later:
    1. The device will behave like a keyboard and execute a desired command in command line (execute reverse shell, blue screen / kernel panic, otherwise specified command executable in the command line).
    2. The device will behave as a virtual USB Hub with a virtual USB memory and a virtual Rubber Ducky device with the above specification.
3. Study and find ways to defend against RubberDucky attacks on Microsoft Windows and GNU/Linux operating systems.
4. Test the functionality of these techniques using your RubberDucky implementation.
5. Evaluate acquired results.

Literature:

- van Woudenberg, J., & O'Flynn, C. (2021). The Hardware Hacking Handbook: Breaking Embedded Security with Hardware Attacks
- USB Specification 2.0, Dostupné z: https://www.usb.org/document-library/usb-20-specification
- USBCaptchaIn: Preventing (un)conventional attacks from promiscuously used USB devices in industrial control systems
- Hou, Hao-Hsun ; 2018, Method for Preventing BadUSB Attack
- NEUNER, Sebastian, Artemios G. VOYIATZIS, Spiros FOTOPOULOS, Collin MULLINER a Edgar R. WEIPPL. USBlock: Blocking USB-Based Keypress Injection Attacks. In: *Data and Applications Security and Privacy XXXII* [online]. Cham: Springer International Publishing, 2018, s. 278-295 [cit. 2022-10-20]. ISBN 9783319957289. ISSN 0302-9743. Dostupné z: doi:10.1007/978-3-319-95729-6_18

Requirements for the semestral defence:
1-2.

Detailed formal requirements can be found at https://www.fit.vut.cz/study/theses/

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