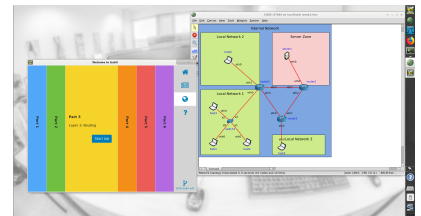


Extending the virtual iLab isle

Motivation

Teaching in lab environments always has the physical bottleneck of lab equipment. Therefore we have created a lightweight virtualization of our lab room - the *vLab* [1]. The *vLab* makes it possible to perform networking experiments in an easy to use environment on your home computer. This also enables large scale teaching of practical courses as demonstrated in the *iLabX* massive open online course [2]. It is actively used by hundreds of students every semester.

In this thesis we want to improve and extend the *vLab* by several features. Amongst them are new mechanisms to provide automated support, receive feedback or developing an efficient checkpointing mechanism for virtual machines. Further we want to extend the capabilities of the used network emulator CORE [3] to allow even more experiments. Another open task is the improvement of the resulting image with regards to efficiency to support even more platforms, e.g. Raspberry Pi.



Your Task

- Extend the *vLab* to improve the experience for teaching and studying networking
- Implement different new features e.g.:
 - checkpointing
 - an easy maintainable CI/CD pipeline
 - an evaluation frame-work to evaluate the usability of the machines
 - new ways for providing user support
- Port the current system to low-resource devices like Raspberry-Pi

Requirements

- Knowledge in Python and JavaScript
- Ability to write easy maintainable code

Sources

- [1] The *vLab*, <https://ilabxp.com/vlab-the-virtual-internet-laboratory/>
- [2] *iLabX*, <https://www.edx.org/course/ilabx-the-internet-masterclass>
- [3] Common Open Research Emulator (CORE), <https://www.nrl.navy.mil/itd/ncs/products/core>

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