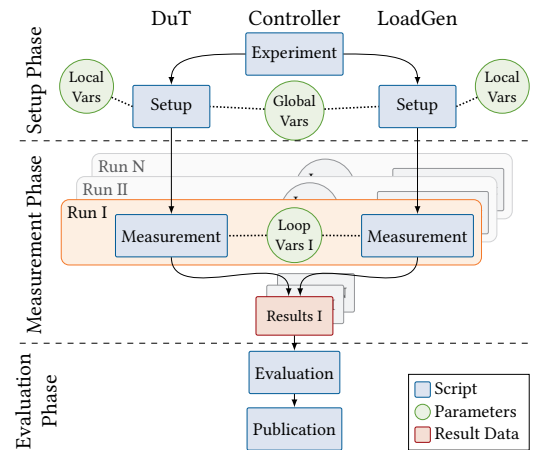Thesis
M.Sc.

Portable pos:
A Portable Reproducible Testbed Orchestrator

Motivation

The plain orchestrating service (pos) is a testbed controller that is developed at the Chair of Network Architectures and Services. pos is designed to create fully-automated distributed experiments. pos' experiment workflow ensures the creation of reproducible experiments and simplifies the publication of experiment results at the same time. There are different scientific testbeds available that also allow the execution of experiments. However, each of these testbeds feature their own API, run their own controller, and support their own experiment workflow. While these testbeds allow the creation of reproducible experiment workflows, the researchers must create them manually. None of the available testbeds, at least to the best of our knowledge, support the highly convenient reproducibility-by-design features of pos. Therefore, we want to create a portable version of pos that is able to run on top of the APIs of existing testbeds, allowing the execution of experiments according to the pos experiment workflow.

Your Task

- Familiarize yourself with other testbeds and controllers:
    - https://www.cloudlab.us/
    - https://www.chameleoncloud.org/
    - https://www.fed4fire.eu/
- Select one of the investigated testbeds as your implementation target
- Create a portable pos controller to execute pos experiments in the selected testbed
- Analyze and compare measurements between the original pos and the portable testbed environment

References

- Sebastian Gallenmüller*, Dominik Scholz*, Henning Stubbe, Georg Carle, "The pos Framework: A Methodology and Toolchain for Reproducible Network Experiments," in The 17th International Conference on emerging Networking EXperiments and Technologies (CoNEXT '21), Munich, Germany (Virtual Event), Dec. 2021, https://dl.acm.org/doi/10.1145/3485983.3494841.

Contact

Sebastian Gallenmüller   gallenmu@net.in.tum.de
Henning Stubbe   stubbe@net.in.tum.de
Manuel Simon   simonm@net.in.tum.de