Antimony

Virtual Network Topology Builder

Graduate

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Einleitung: Containerlab is a powerful framework for container-based network emulation but lacks a user-friendly graphical interface and fine-grained access management. This makes it less accessible to users unfamiliar with CLI-based workflows and less suitable for usage in large-scale lab environments. Our thesis presents the completion of Antimony, a tool that addresses these very problems by providing a server that communicates with the Containerlab tool chain and a user-friendly interface for designing, deploying and maintaining network topologies.

Ziel der Arbeit: The goal of this thesis is to develop a platform that simplifies the integration of Containerlab into educational lab environments. A user-interface makes it easier for students and teachers to understand networking concepts and design networks through visual topology management.

Building on our previous thesis, whose goal was to develop an initial frontend prototype, this work focuses on finalizing that prototype and designing a robust server that acts as the binding between the interface and Containelab. By developing our own server, we are able to implement features such as log streaming and fine-grained access management.

Ergebnis: The resulting product is a user-friendly platform that can be deployed locally for personal testing, as well as in large-scale educational environments. Our flexible authentication scheme allows for seamless integration with existing university infrastructure such as Azure AD or other OpenID providers.

Antimony is open source and designed for use here at OST as well as by the broader Containerlab community. It aims to make network emulation more approachable by offering a graphical interface, supporting students, educators, and any users working with container-based network topologies.
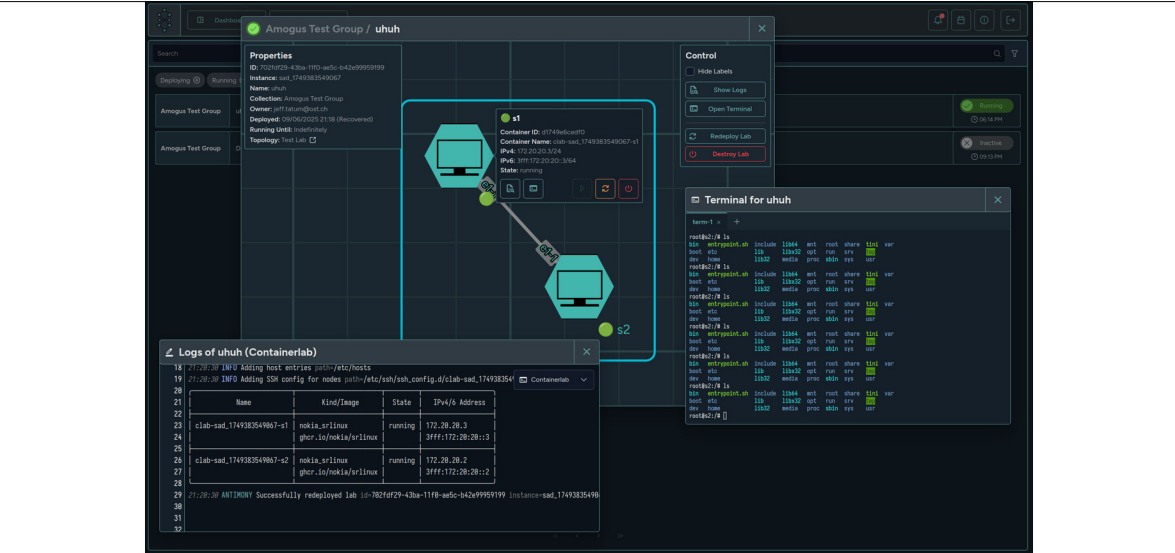
Antimony's lab dashboard showing current state of all deployed network topologies.
Own presentment
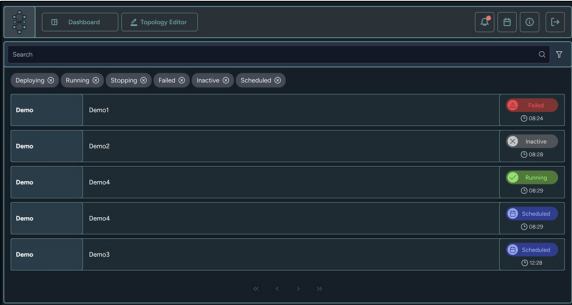
The graphical topology editor, with an integrated YAML and graph editor for editing Containerlab topologies.
Own presentment
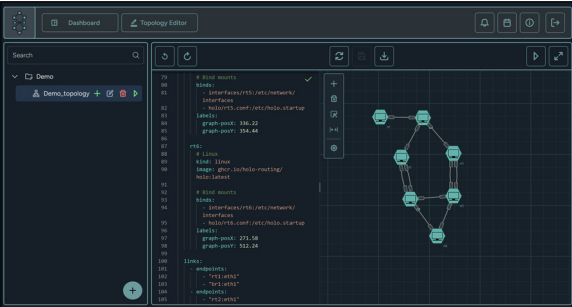
The dashboard's lab view, showing lab properties, live node metadata, real-time logs, and the interactive web terminal.
Own presentment

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Subject Area
Frontend Engineering, Network and Cloud Infrastructure, Software, Software Engineering