High-speed Networks, Cybersecurity, and Software-defined Networking Workshop

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Overview SDN Lab Series
SDN Lab Series

The labs provide learning experiences on essential SDN topics

- Mininet
- Legacy networks, Border Gateway Protocol (BGP)
- FRR routing, an open routing implementation
- MPLS networks – early efforts toward SDN
- SDN fundamentals – controllers, switches
  - ONOS controller
  - Open Virtual Switch (OVS)
- Traffic isolation with VXLAN
- OpenFlow
- Interconnection between SDN and legacy Networks
Lab experiments

Lab 1: Introduction to Mininet
Lab 2: Legacy Networks: BGP Example as a Distributed System and Autonomous Forwarding Decisions
Lab 3: Early efforts of SDN: MPLS example of a control plane that establishes semi-static forwarding paths
Lab 4: Introduction to SDN
Lab 5: Configuring VXLAN to Provide Network Traffic Isolation
Lab 6: Introduction to OpenFlow
Lab 7: Interconnection between legacy networks and SDN networks
The goal of the SDN Lab Series is to provide a practical experience to students and IT practitioners.

The labs provide background information which is reinforced with hands-on activities.

A good book on SDN network (which matches the SDN Lab Series) is “Software Defined Networking, A Comprehensive Approach.”
Organization of Lab Manuals

Each lab starts with a section *Overview*
- Objectives
- Lab settings: passwords, device names
- Roadmap: organization of the lab

*Section 1*
- Background information of the topic being covered (e.g., fundamentals of TCP congestion control)
- Section 1 is optional (i.e., the reader can skip this section and move to lab directions)

*Section 2… n*
- Step-by-step directions
Examples

Legacy networks

BGP scenario

MPLS scenario
Examples

SDN networks
Examples

Interconnection of SDN and legacy networks