

# ACM SIGCOMM 2022 TUTORIAL

# COSMOS

## Mininet-Optical

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# Outline

2:30PM Introduction to Mininet-Optical

3:00PM Mininet-Optical Experiment

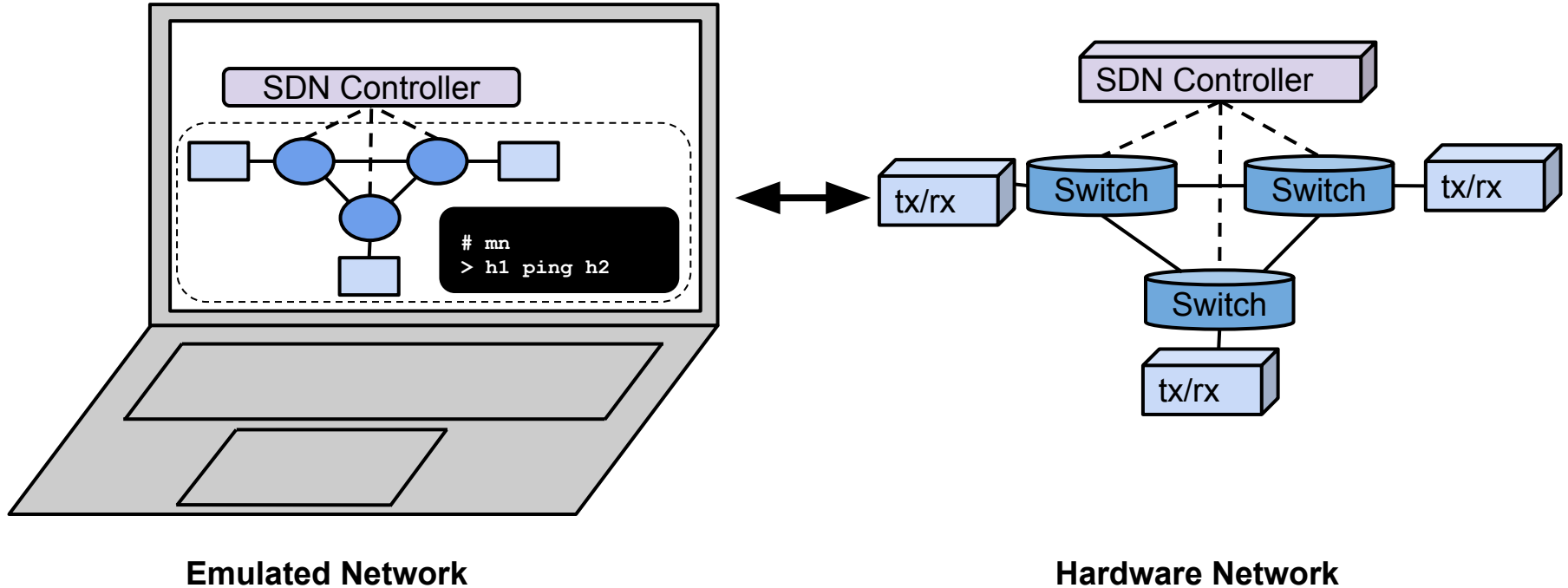
(<https://wiki.cosmos-lab.org/wiki/Workshops/SigComm2022/MininetOptical>)

- Familiarise yourself with Mininet-Optical through an example

3:30PM Coffee Break with Educational Toolkit Presentation

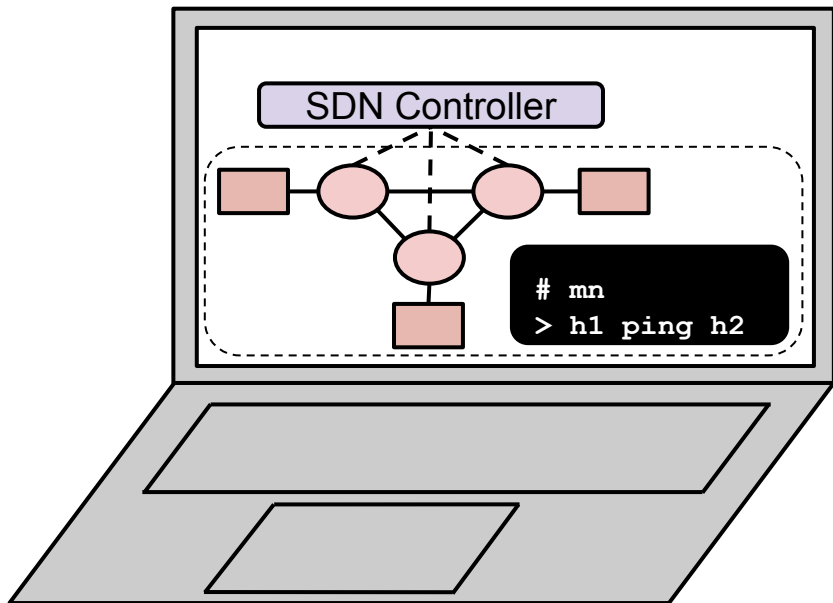
# Mininet

A virtual emulated packet network for prototyping Software-Defined Networking (SDN) systems.

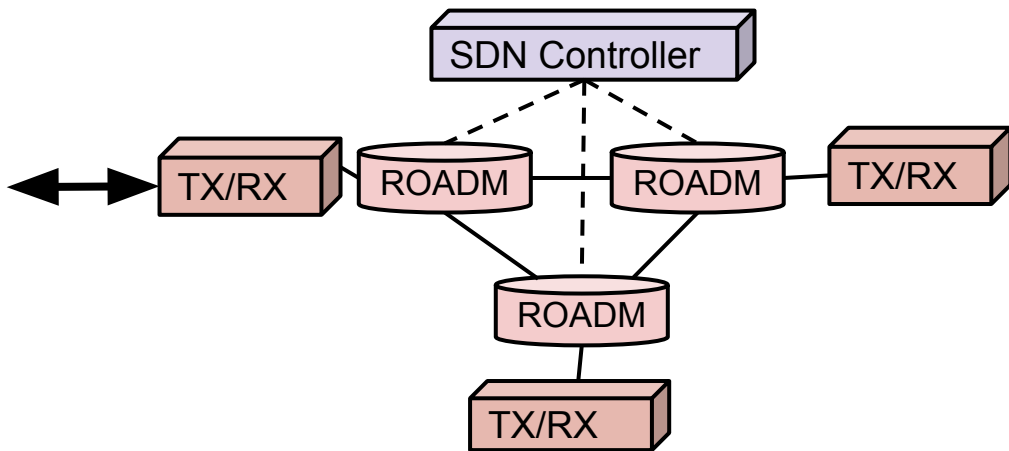


# Mininet-Optical

A virtual emulated optical packet network



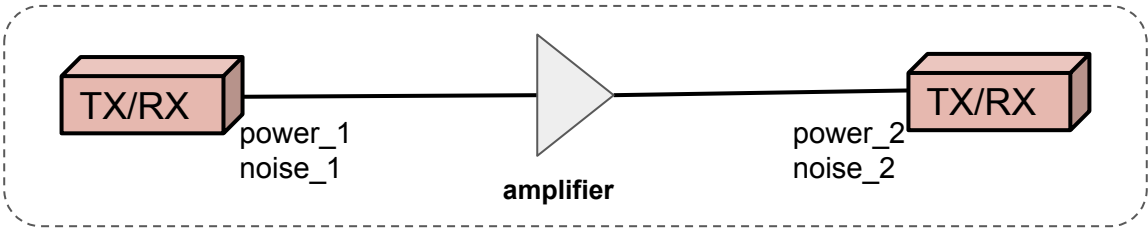
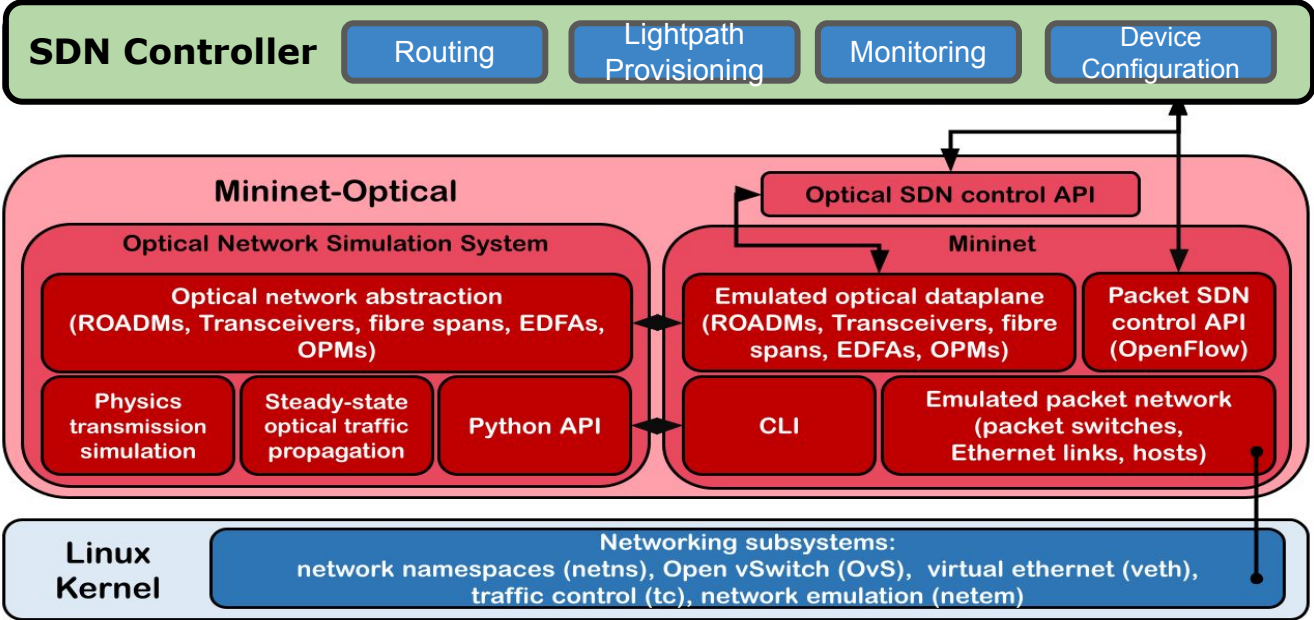
**Emulated Network**



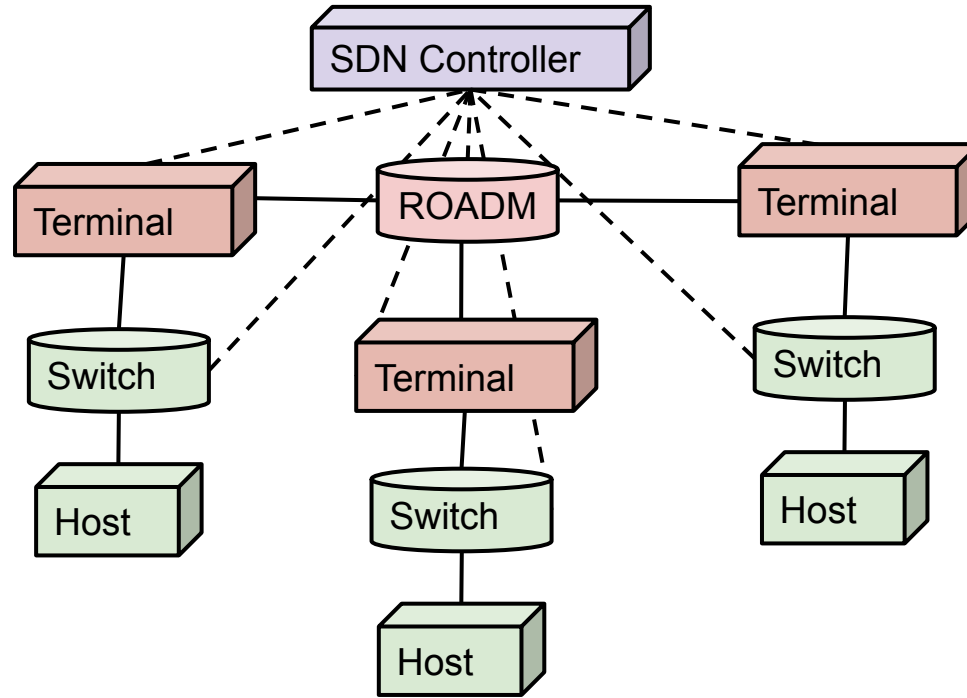
**Hardware Network**

# Mininet-Optical architecture

Mininet-Optical extends Mininet with optical network components and a simulation of the transmission physics



# A simple packet-optical network



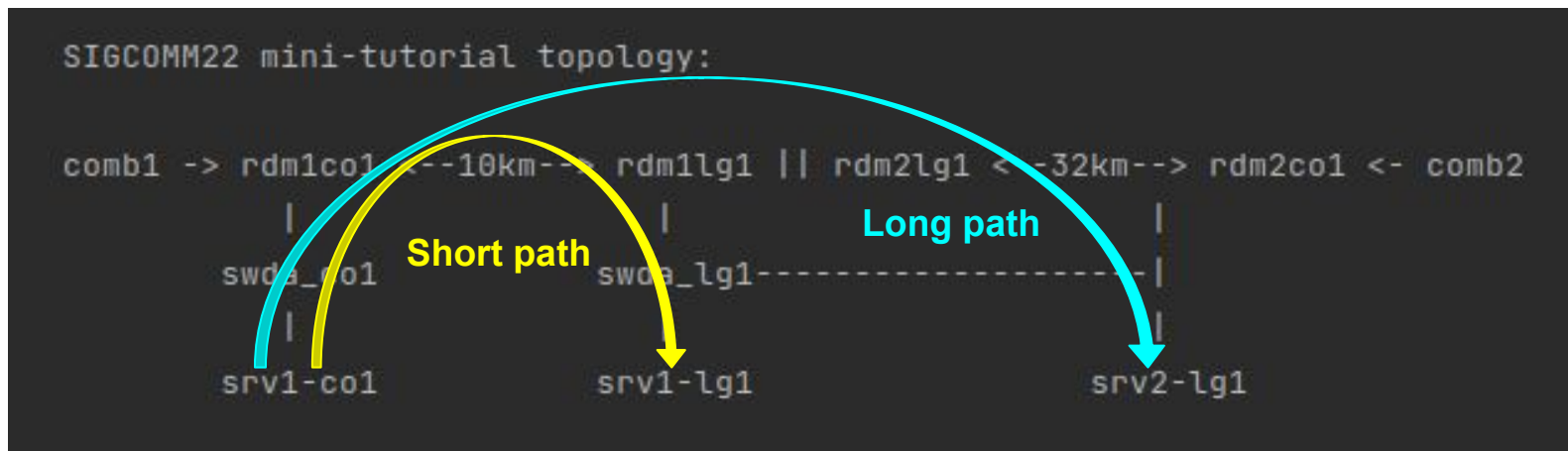
# Mininet-Optical vision

- Emulate any network, easy to scale
- Being a digital twin
- Model and emulate the same SDN-controlled network experiments that we run on the hardware optical network testbeds, ideally using the same SDN controller software
- For COSMOS users, being able to emulate the COSMOS testbed and develop, test and debug COSMOS experiments and SDN control applications, even without accessing the hardware itself [1].



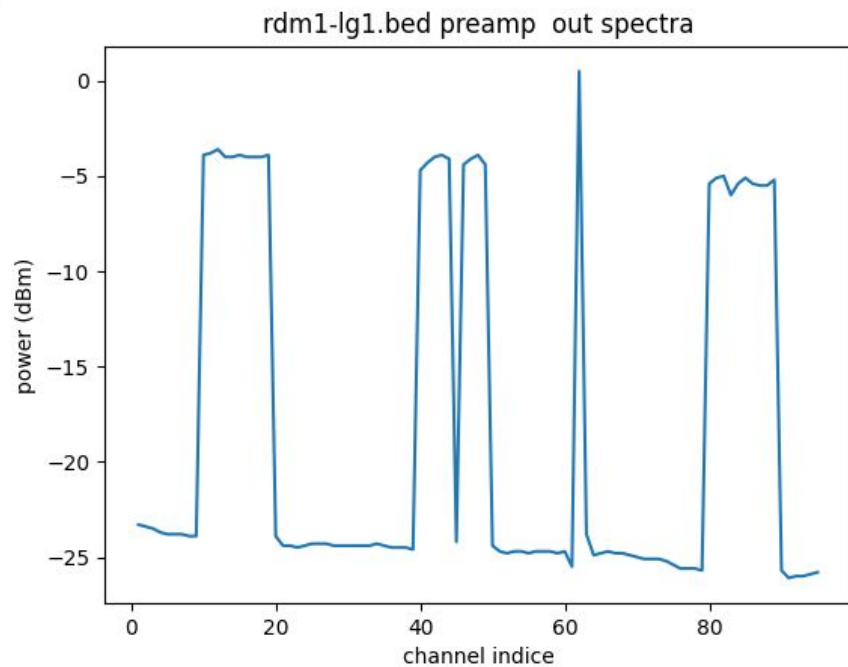
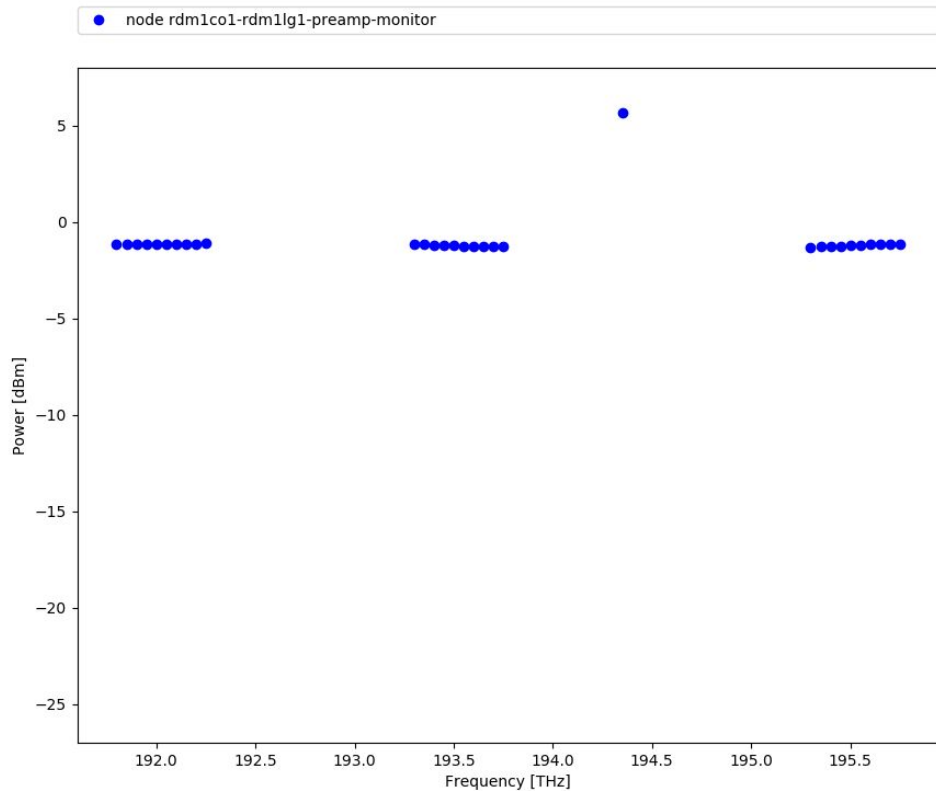


# COSMOS tutorial in Mininet-Optical: experiment



This experiment demonstrates optical switching between the short (1-hop) path, between `srv1-co1` and `srv1-lg1`, and the long (2-hop) path, between `srv1-co1` and `srv2-lg1`. It represents changing of the light path in C-RAN when a "Client" wants to dynamically change its baseband processing location between a nearby "Edge Cloud" and a further away "Central Cloud".

# Software/Hardware comparison



# Tutorial explanation

-> <https://wiki.cosmos-lab.org/wiki/Workshops/SigComm2022/MininetOptical>

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## References:

- Mininet-Optical Tutorial 1 network script: <https://github.com/Mininet-Optical/mininet-optical/blob/cosmos-tutorial/mnoptical/examples/sigcommtutorial.py>
- Mininet-Optical Tutorial 1 configuration script: <https://github.com/Mininet-Optical/mininet-optical/blob/cosmos-tutorial/mnoptical/examples/config-sigcommtutorial.sh>
- Mininet-Optical documentation: <https://mininet-optical.org/>
- Mininet-Optical code: <https://github.com/mininet-optical/mininet-optical>
- (Packet) Mininet web site: <https://mininet.org>