# Finding unknown routing protocol deviations in routers

Abstract:

Routing protocols such as OSPF and BGP have open standards (published in RFCs), however commercial routers (e.g. Juniper and Cisco) that implement those protocols may deviate from those standards (deliberately or inadvertently). Such deviation are important to identify from a security point of view as they may be a pose a security vulnerability. We would like to discover those deviations. The problem is that commercial routers are closed-source so it is difficult to directly analyze the router's implementation.
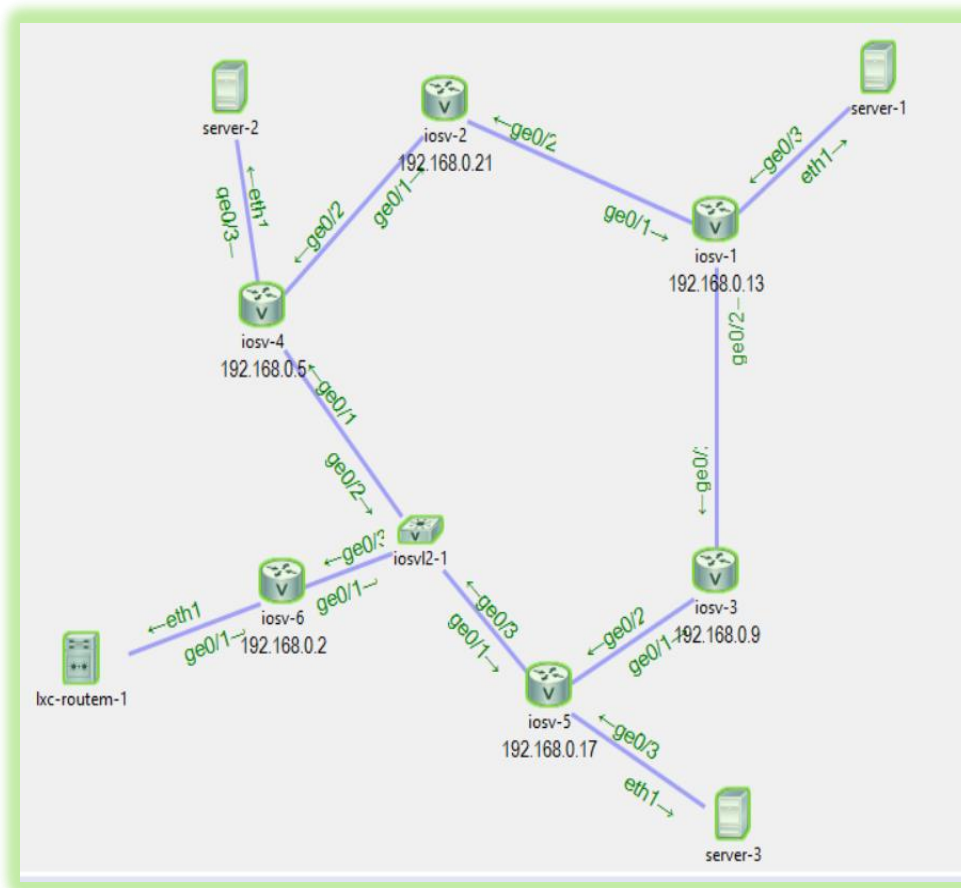
Goals:

- Run the BGP reference model that was build last semester and obtain the test results output.
- Using VIRL simulation tool - Build similar topology with Cisco IoS virtual images and run same tests as on the BGP model.
- Compare the VIRL tests output vs the model output. Any failed test is identified as protocol deviation.
- Perform the same test with Juniper virtual image router (vMx).
- The goal of the project is to discover unknown vulnerabilities in BGP protocol and report them to Cisco and Juniper.

Requirements:

Internet Networking Course, Formal verification (preferably).

Programming Languages:

C, Python

Guided by:

 Dr. Adi Sosnovich, Dr. Gabi Nakibly