

Final Project

Problem Statement

Modern enterprise networks must support multiple locations, scalable routing, and reliable external connectivity.

Traditional flat network designs suffer from poor scalability, high routing overhead, and difficult management as the network grows. In addition, relying solely on distributed routing protocols limits flexibility and centralized control.

To address these challenges, hierarchical routing using **OSPF multi-area**, policy-based inter-domain routing using **BGP**, and centralized control through **Software Defined Networking (SDN)** can be combined within a single enterprise network design.

This project focuses on designing and implementing a **medium-scale enterprise network** that integrates **OSPF multi-area routing for internal communication**, **BGP for external connectivity**, and a **basic SDN segment** to demonstrate centralized network control, **(Bonus) Data Center using EVE-NG**.

Project Requirements

1. The network must be divided into multiple OSPF areas, including a backbone area (Area 0).
2. Internal routing between enterprise routers must be implemented using **OSPF multi-area**.
3. External connectivity must be provided using **BGP** between the enterprise network and an ISP network.
4. At least one network segment must be controlled using an **SDN controller** and OpenFlow-based switches.
5. End-to-end connectivity must be verified across all network segments.
6. The network must correctly handle basic link or node failures.

Note that:

- **The deadline 29/12/2025 11:00 PM**
- **The team must be 3-4 students**
- **It must be submitted in classroom**
- **The discussion will be on Tuesday and Wednesday.**