

SUMMARY REPORT – GNS3 NETWORK SIMULATION LAB

The purpose of this lab exercise was to install and configure GNS3 on an Ubuntu machine, design basic switch-based network topologies, assign IP addresses to devices, verify connectivity using ping, and finally publish the completed work to a public GitHub repository.

Part A – System Setup

GNS3 was successfully installed and launched on the Ubuntu environment. The Local Server/GNS3 VM indicators displayed green status lights, confirming proper functionality. A screenshot of the GNS3 dashboard was taken to document the successful installation and setup.

Part B – Network Topology Designs

1. Basic LAN Topology

The first network design featured two PCs connected to a single switch. Both devices were configured with IP addresses within the same subnet (e.g., 192.168.10.x). After configuration, a ping test confirmed that the two PCs could communicate with each other, demonstrating correct Layer 2 connectivity.

2. Star Topology

The second design implemented a star layout with one central switch linked to four individual PCs. Each PC was assigned an IP address from the same network range (e.g., 10.1.1.x).

Connectivity tests—such as PC1 pinging PC2, PC3, and PC4—were all successful, verifying that the star topology was functioning as intended.

3. Multi-Switch Mesh Topology

The final topology involved three switches connected in a circular mesh: SW1–SW2, SW2–SW3, and SW3–SW1. One PC was attached to each switch and configured with addresses from the same subnet (e.g., 10.1.1.1–10.1.1.3). Ping tests showed full reachability across all end devices, confirming proper communication through the interconnected switches.

Conclusion

This lab provided hands-on experience with GNS3 and strengthened understanding of fundamental networking concepts. Through installing the software, creating various topologies (LAN, Star, and Multi-Switch Mesh), configuring IP addresses, and validating connectivity, the exercise offered practical insight into Layer 2 network behavior and demonstrated GNS3's usefulness for simulating real-world network environments.