Network Simulation Lab Report – GNS3

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Objective

The purpose of this lab was to understand basic network simulation using GNS3 in a virtual environment, create simple switch-based topologies, test connectivity, and document the results using GitHub for submission.

Tools & Environment

Operating System: Ubuntu

Simulation Software: GNS3 (GUI + Local server)

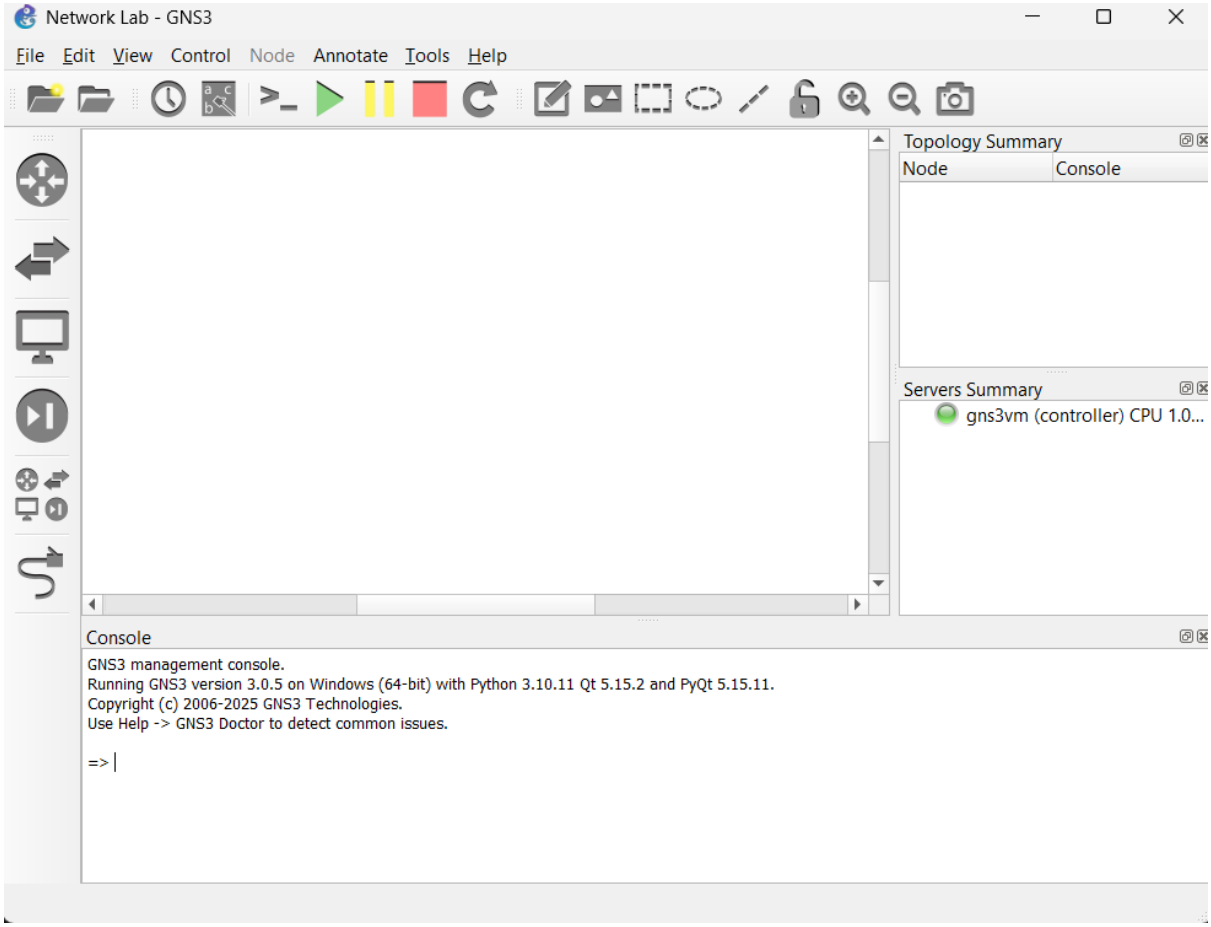
Devices Used: VPCS (virtual PCs), Ethernet switches

Version Control & Submission: GitHub (public repository)

Part A – Installation

✓ Installed GNS3 on Ubuntu

✓ Verified GNS3 Local Server (green status)

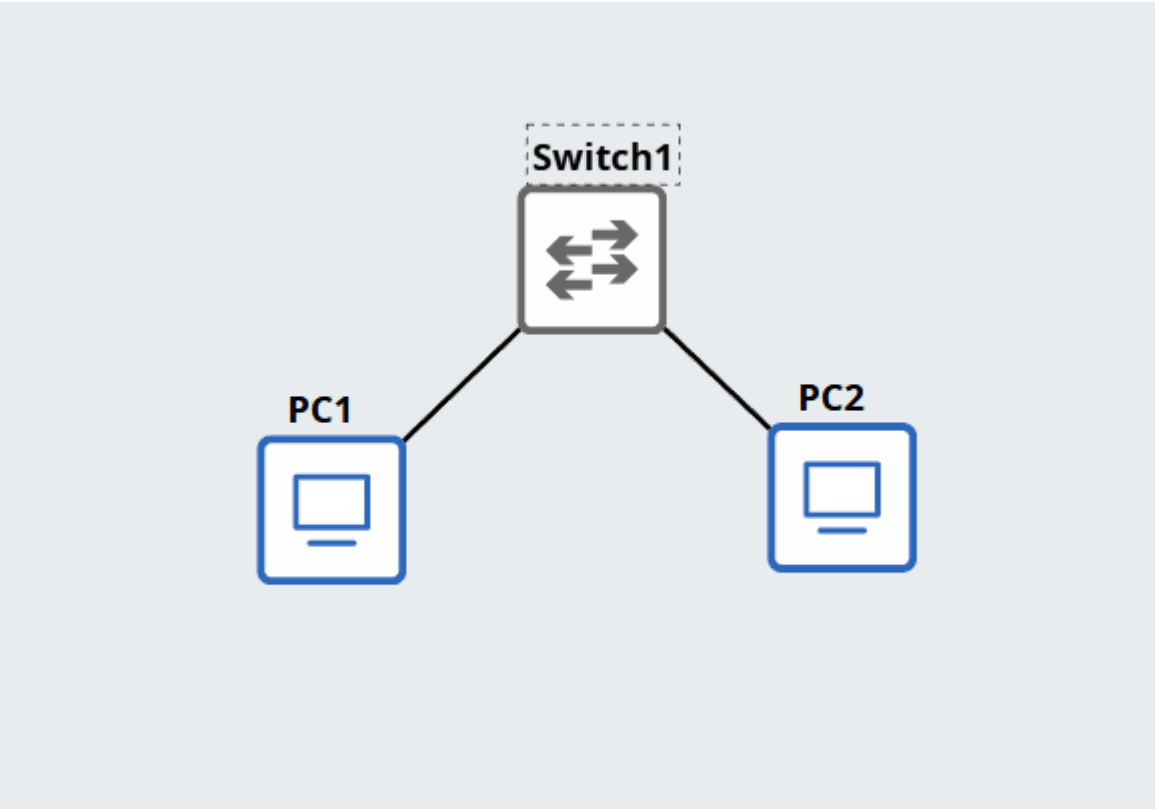


Part B – Network Topologies

1. Topology 1 – Simple LAN

   2 PCs, 1 Switch

   Connected PCs through switch



Assigned IP addresses (same subnet)

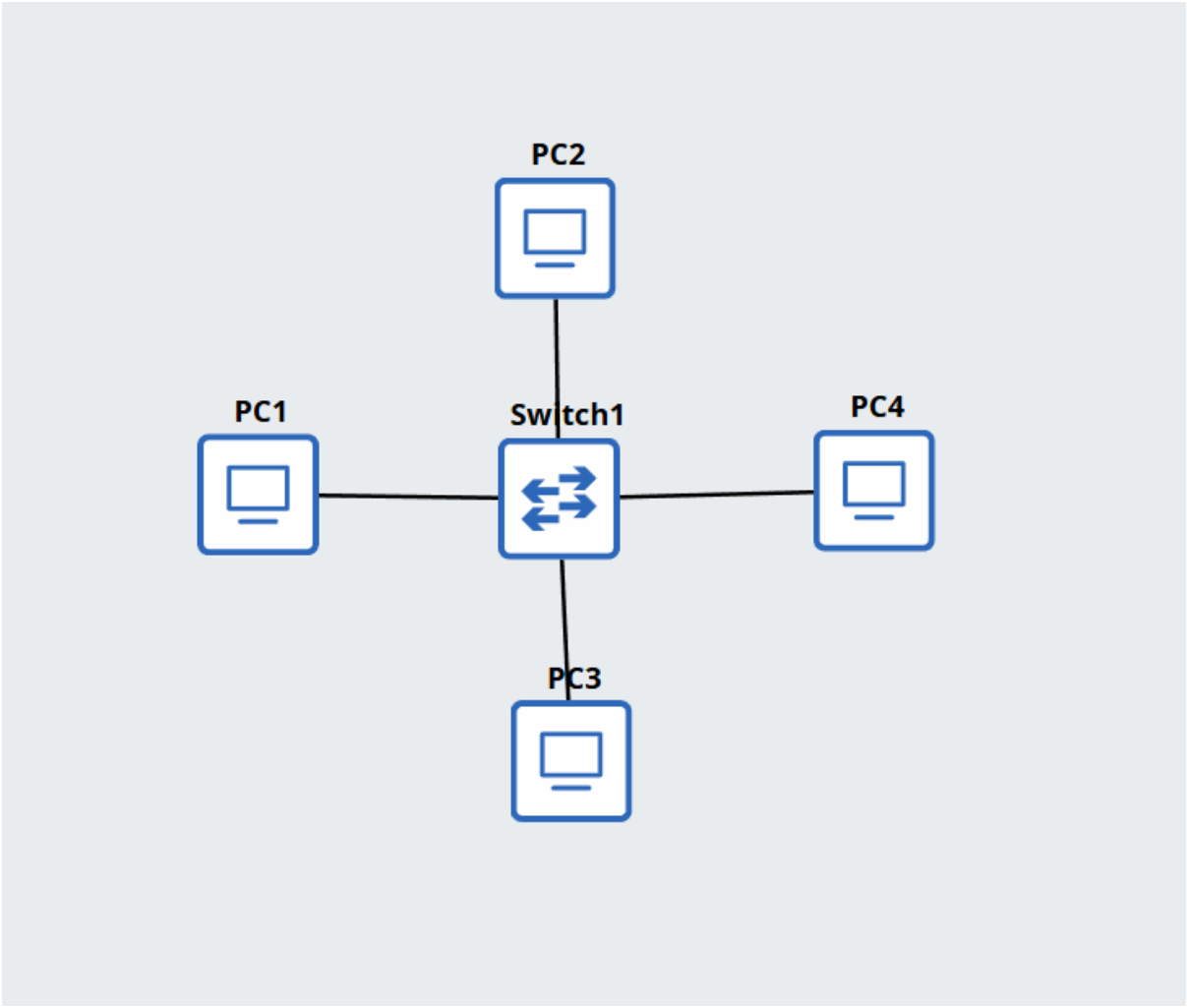
```
PC1> ip 10.1.1.1 255.255.255.0
Checking for duplicate address...
PC1 : 10.1.1.1 255.255.255.0
```

```
PC2> ip 10.1.1.2 255.255.255.0
Checking for duplicate address...
PC2 : 10.1.1.2 255.255.255.0
```

2. Topology 2 – Star Topology

   4 PCs, 1 Switch

   Central switch connected to all PCs



Assigned IP addresses

```
PC2> ip 10.1.1.2 255.255.255.0
Checking for duplicate address...
PC2 : 10.1.1.2 255.255.255.0
```

```
PC1> ip 10.1.1.1 255.255.255.0
Checking for duplicate address...
PC1 : 10.1.1.1 255.255.255.0

PC3> ip 10.1.1.4 255.255.255.0
Checking for duplicate address...
PC3 : 10.1.1.4 255.255.255.0

PC4> ip 10.1.1.3 255.255.255.0
Checking for duplicate address...
PC4 : 10.1.1.3 255.255.255.0
```

All devices successfully pinged

```
PC3> ping 10.1.1.1

84 bytes from 10.1.1.1 icmp_seq=1 ttl=64 time=0.299 ms
84 bytes from 10.1.1.1 icmp_seq=2 ttl=64 time=0.272 ms
84 bytes from 10.1.1.1 icmp_seq=3 ttl=64 time=0.373 ms
84 bytes from 10.1.1.1 icmp_seq=4 ttl=64 time=0.259 ms
84 bytes from 10.1.1.1 icmp_seq=5 ttl=64 time=0.250 ms
```

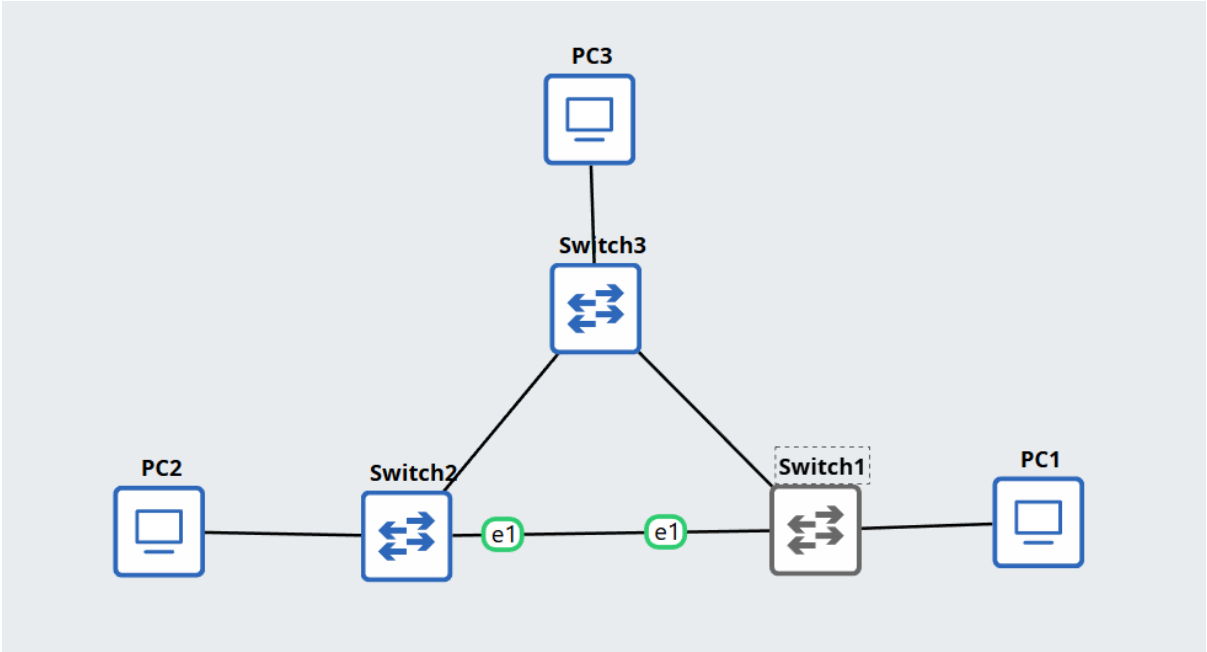
```
PC2> ping 10.1.1.1

84 bytes from 10.1.1.1 icmp_seq=1 ttl=64 time=0.979 ms
84 bytes from 10.1.1.1 icmp_seq=2 ttl=64 time=0.268 ms
84 bytes from 10.1.1.1 icmp_seq=3 ttl=64 time=0.266 ms
84 bytes from 10.1.1.1 icmp_seq=4 ttl=64 time=0.408 ms
84 bytes from 10.1.1.1 icmp_seq=5 ttl=64 time=0.437 ms
```

3. **Topology 3 – Multi-Switch Mesh**

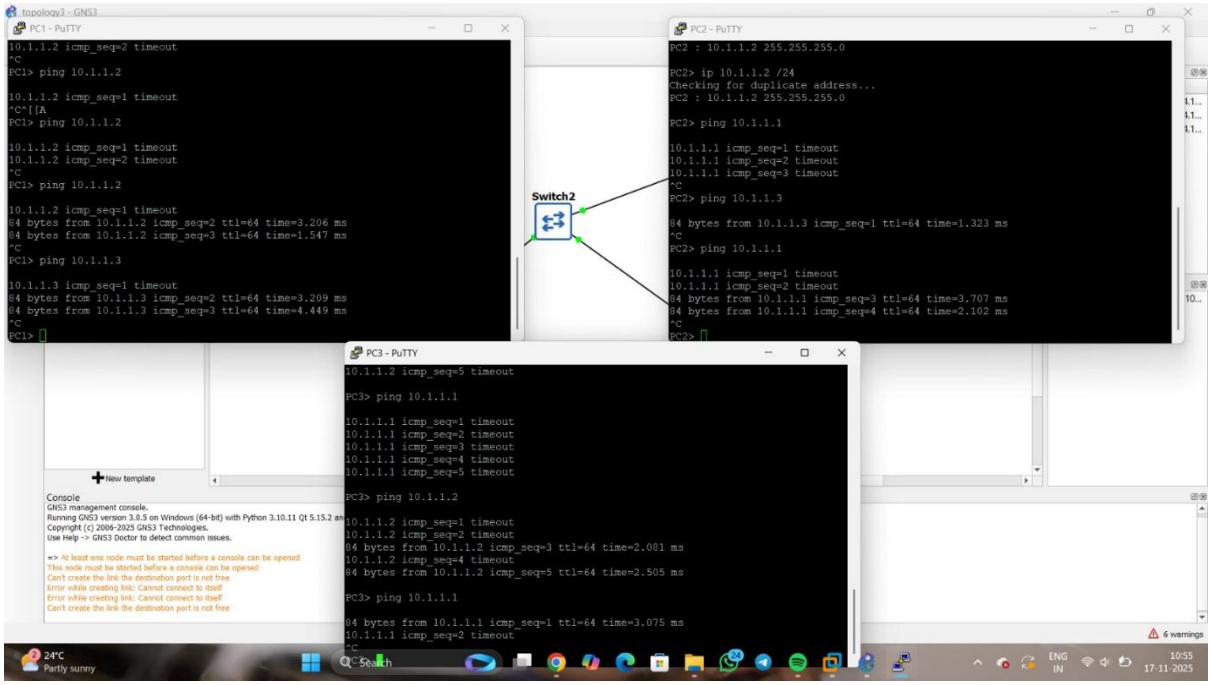
   3 switches interconnected in loop

   1 PC per switch



All PCs assigned IPs in same subnet

Verified full end-to-end connectivity



Part D – GitHub Submission

Created a public repository named:

NetworkSimLab-Muhammed Sinan M

GitHub URL submitted in ICTAK Paatshala:
https://github.com/sinanmanu/NetwotkSimLab-Muhammed-Sinan-M