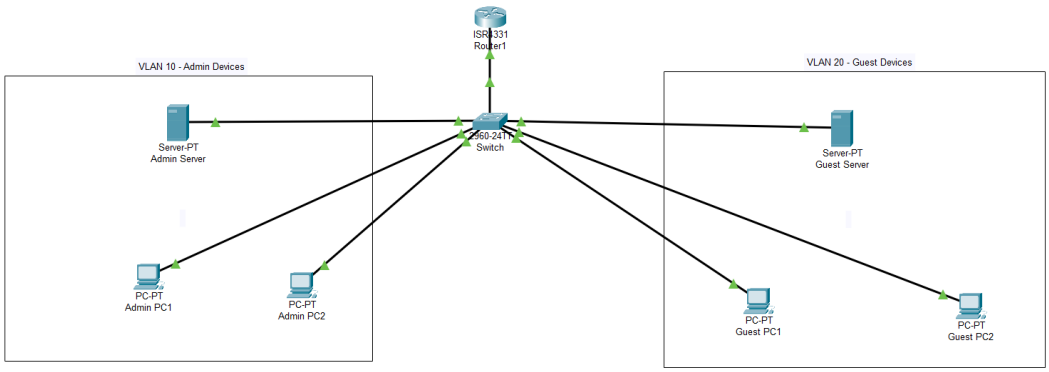
Networking Foundations Lab: VLAN & IP Address Configuration

1. Objective

To design and implement a segmented virtual network using VLANs and IP addressing to enhance network security, organization, and performance.

Network Design Overview

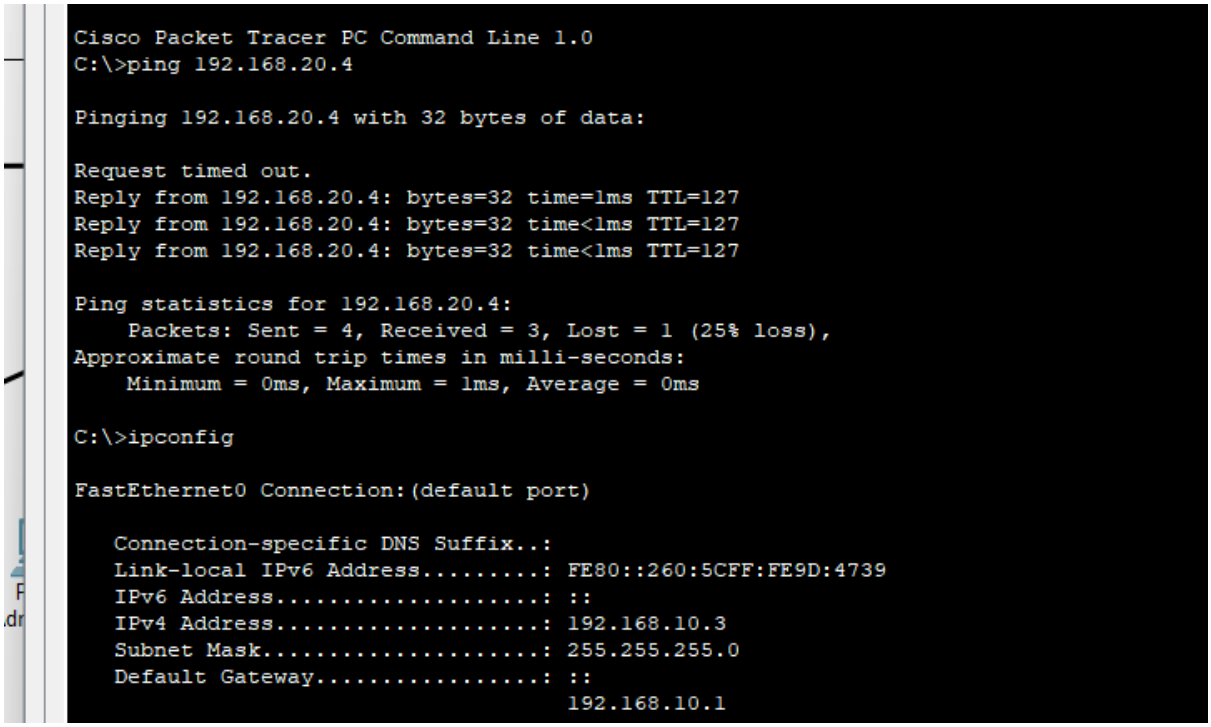
VLAN	Purpose	Subnet
VLAN 10	Administrative Traffic	192.168.10.0/24
VLAN 20	Guest Traffic	192.168.20.0/24



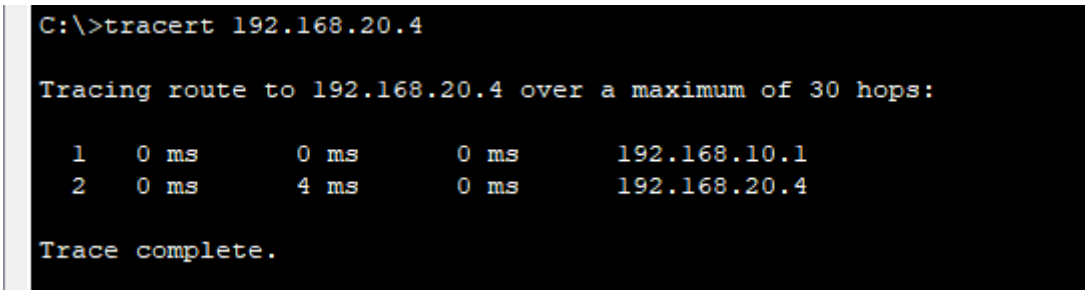
Network Topology

```
C:\>ping 192.168.10.2

Pinging 192.168.10.2 with 32 bytes of data:

Reply from 192.168.10.2: bytes=32 time<1ms TTL=128
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Intra-VLAN Ping (Same VLAN communication)



Inter-VLAN Ping (Cross VLAN communication)



TraceRoute Output

Brief Summary

In this lab, VLAN segmentation and Inter-VLAN Routing were successfully implemented using Cisco Packet Tracer. VLAN 10 (Admin) and VLAN 20 (Guest) were configured to isolate traffic, and a Router-on-a-Stick setup enabled secure communication between VLANs.

This project demonstrates:

- ✔ Practical network segmentation for traffic isolation
- ✔ Efficient Inter-VLAN Routing to maintain controlled communication
- ✔ Foundational understanding of VLANs, IP management, and routing