Module 2 Project

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Executive Summary

I designed and implemented a routed network using the address block 192.168.0.0/24, subdivided into purpose-built subnets for a PCs LAN, a servers LAN, and a /30 oint-to-point link between two routers. Instrafstructure devices (routers and servers) use static IPs; client PCs use addresses via a DHCP server with Router 1 acting as a DHCP relay. The routing is provided by RIPv2 with no auto-summary. Verification shows a successful DHCP leases, dynamic routing between subnets, DNS name resolution, and end-to-end connectivity across the network.

1- Typology Overview:

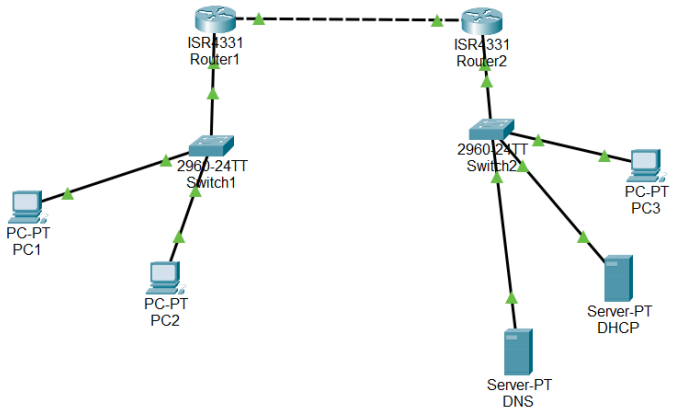
Devices used: 2 routers (Router 1, Router2), 2 switches (Switch 1, Switch 2), 2 servers (DHCP, DNS) and PCs (PC1, PC2, PC3)

Physical Layout:

Left: PC1/PC2→Switch1→Router1

Right: Router2→Switch2→DHCP Server (192.168.0.2), DNS Server (192.1168.0.3)→PC3

Router1↔Router2 connected by a /30 link.

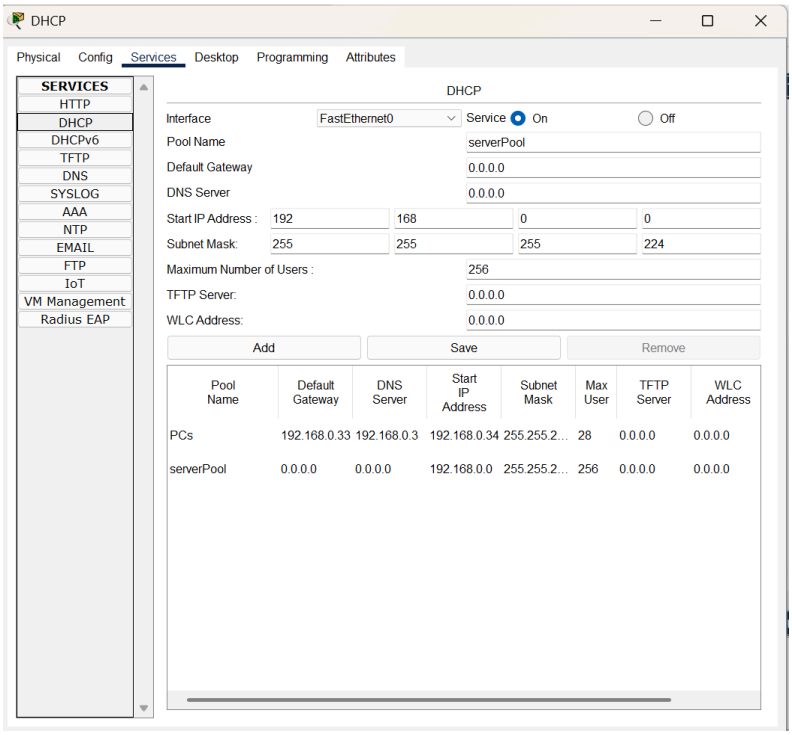


2-IP Subnetting Plan (all carved from 192.168.0.0/24)

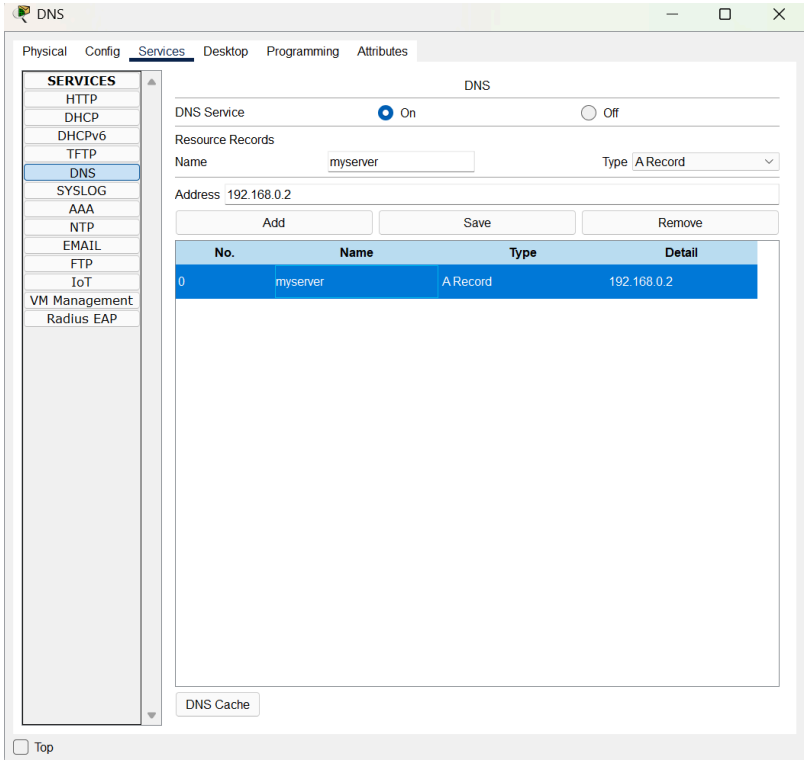
Purpose	Network	Prefix/Mask	Usable Host Range	Gateway
Servers LAN	192.168.0.0	/27 (255.255.255.224)	192.168.0.1-192.168.0.30	192.168.0.1 (Router2 g0/0/1)
PCs LAN	192.168.0.3.2	/27 (255.255.255.224)	192.168.0.33-192.168.0.62	192.168.0.33 (Router1 g0/0/0)
Router↔Router	192.168.0.8.0	/30 (255.255.255.252)	192.168.0.81-192.168.0.82	

Router 1: g0/0/0 192.168.0.33/27, g0/0/1 192.168.0.82/30
Rouer 2: g0/0/1 192.168.0.1/27, g0/0/0 192.168.0.1
DHCP Server: 192.168.0.2/27, gateway 192.168.0.1
DNS Server: 192.168.0.3.27, gateway 192.168.0.1

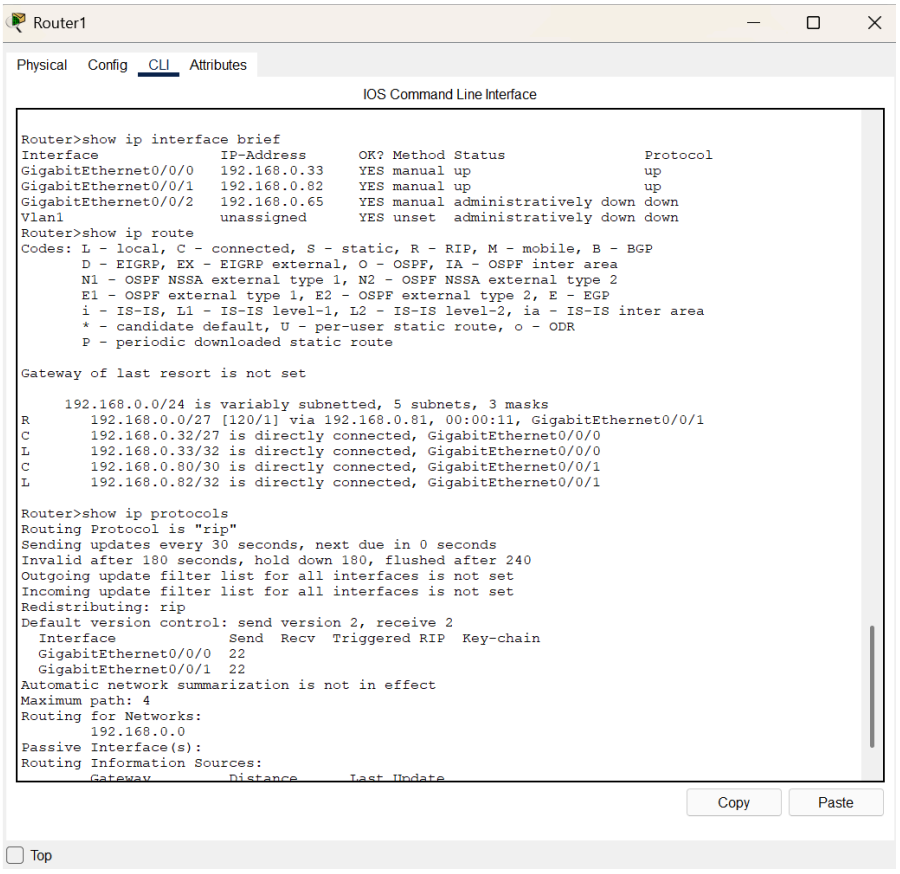
3- Services Configuration:
DHCP (on server 192.168.0.2)
Service: on
Pool “PCs”:
    Default Gateway: 192.168.0.33
    DNS Server: 192.168.0.34
    Subnet Mask: 255.255.255.224
    Max users: 28
NIC on server: 192.168.0.2/27, GW 192.168.0.1



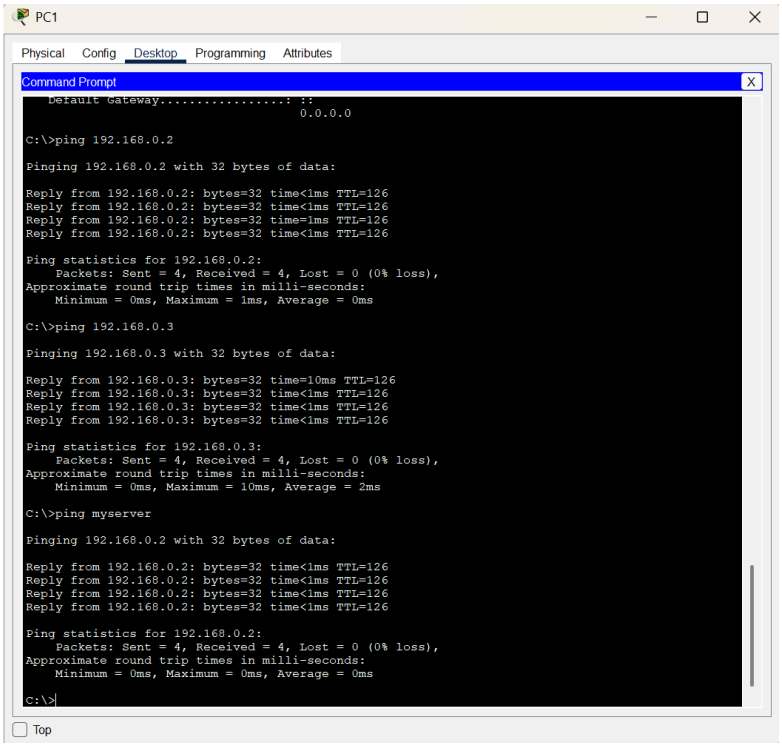
DNS (On server 192.168.0.3)
Service: On
Record(s): myserver a 192.168.0.2 (resolves the DHCP server's hostname)



4-Routing (RIPv2)



5-Verification and Test Results



6- Troubleshooting Notes (What I fixed)

- Router Interface naming: used 3 part names (g0/0/0, g0/0/1, g0/0/2)
- Line Protocol up/down: ensured router uplinks connect to switch Gi ports and ports are no shutdown
- DHCP not reaching PCs: added ip helper-address 192.168.0.2 on Router1 g0/0/0 and set server NIC GW to 192.168.0.1.
- DNS not resolving: enabled DNS service and added myserver → 192.168.0.2