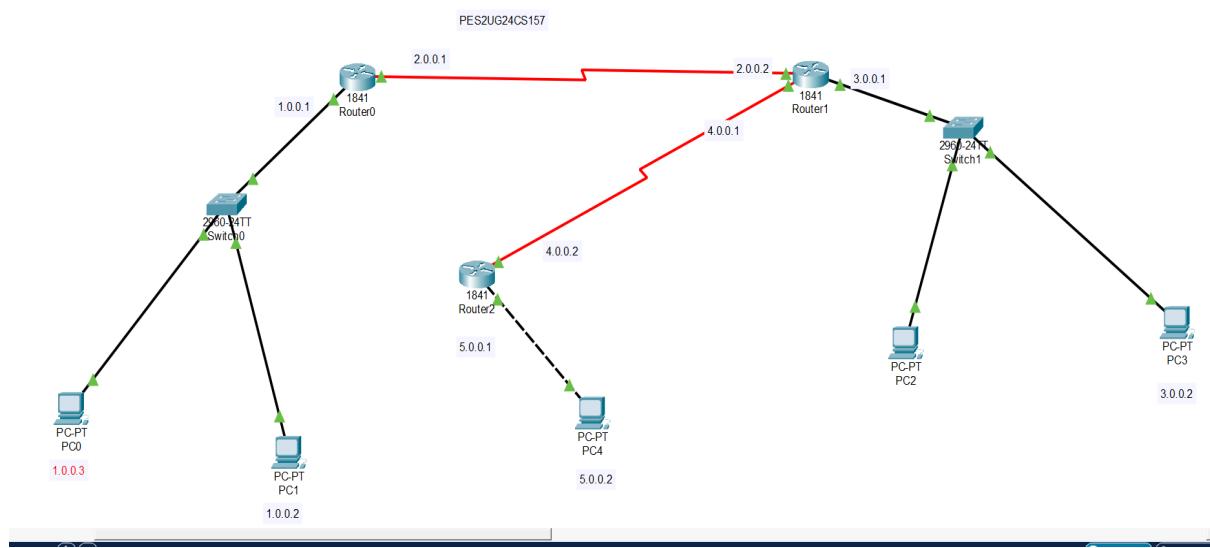


COMPUTER NETWORKS - UE24CS252B Lab 1: Designing and Simulation of Network Topology using Cisco Packet Tracer

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Task 2a:



DU List Window											
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete	
●	Successful	PC0	PC2	ICMP	■	0.000	N	0	(edit)		
●	Successful	PC0	PC3	ICMP	■	0.000	N	1	(edit)		
●	Successful	PC1	PC4	ICMP	■	0.000	N	2	(edit)		
●	Successful	PC4	PC2	ICMP	■	0.000	N	3	(edit)		

3.What is your observation and understanding of this concept that you have implemented?

1. Each end device (PC/host) in the network is assigned a unique IP address, subnet mask, and a default gateway, where the gateway corresponds to the IP address of the router interface connected to that LAN. The DNS server Field is optional in this topology and remains 0.0.0.0 since no name resolution is required for basic connectivity and testing.

2. A switch is used to connect multiple end devices within the same local area network. The switch operates at Layer 2 and forwards frames based on MAC addresses, allowing multiple hosts to communicate with the other router through a single router interface.

3. A router is used to interconnect different networks and enable communication between multiple LANs. Each router interface represents a separate network and therefore must be configured with a unique IP address and subnet. Routers typically have FastEthernet interfaces by default, and additional connectivity between routers can be achieved using serial interfaces, which must be present and properly configured on both routers.

4. Each network segment (LAN or serial link) is assigned a distinct subnet, such as 1.0.0.0/24 for LANs and /30 subnets for point-to-point serial links. All devices connected to a particular segment must have IP addresses derived from the same subnet.

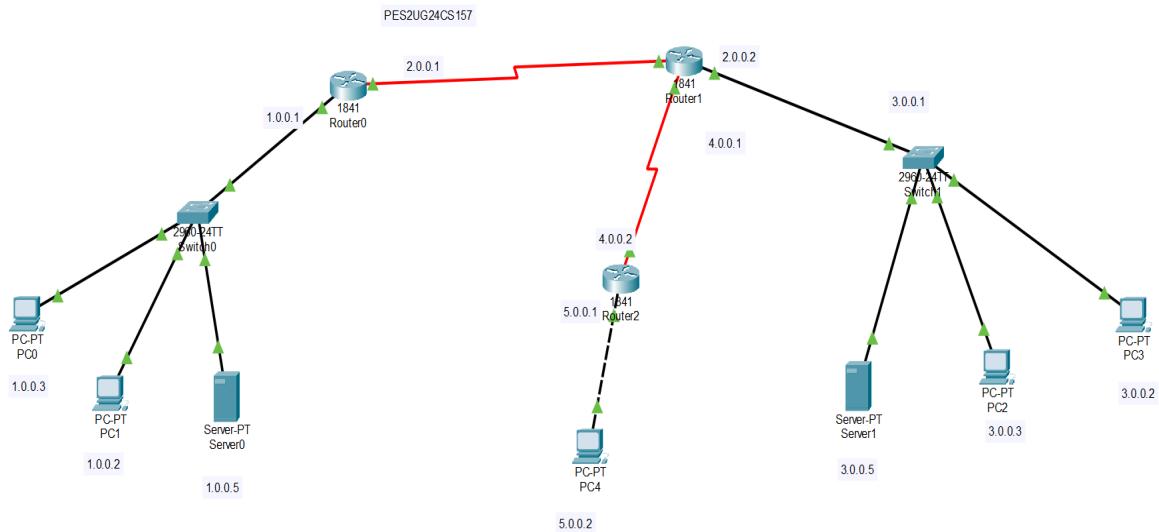
4. Why is it necessary to assign an IP address to the newly added interface?

A. It is necessary to assign an IP address to a newly added interface because an interface without an IP address cannot participate in network communication. The IP address uniquely identifies the interface on a specific subnet and allows the router to send, receive, and route packets through that interface. Without a valid IP address and subnet mask, the interface remains unusable for data transmission.

5. What is a routing table and why is it important?

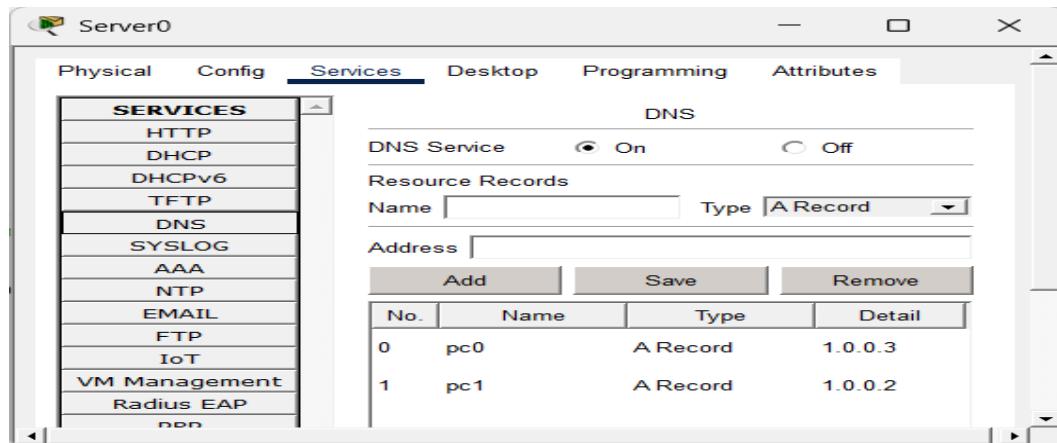
A routing table is a data structure maintained by a router that contains information about destination networks, their subnet masks and the next-hop address or outgoing interface used to reach them. It is important because the router uses the routing table to determine the best path for forwarding packets to networks that are not directly connected. Without a routing table, a router would not know where to send packets beyond its local networks.

Task2b:



Pc0, Pc1 and Pc4 have the same dns server 1.0.0.5

Server 0:



From PC4:

```
C:\>ping pc1
Pinging 1.0.0.2 with 32 bytes of data:

Reply from 1.0.0.2: bytes=32 time=9ms TTL=125
Reply from 1.0.0.2: bytes=32 time=19ms TTL=125
Reply from 1.0.0.2: bytes=32 time=2ms TTL=125
Reply from 1.0.0.2: bytes=32 time=10ms TTL=125

Ping statistics for 1.0.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 19ms, Average = 10ms

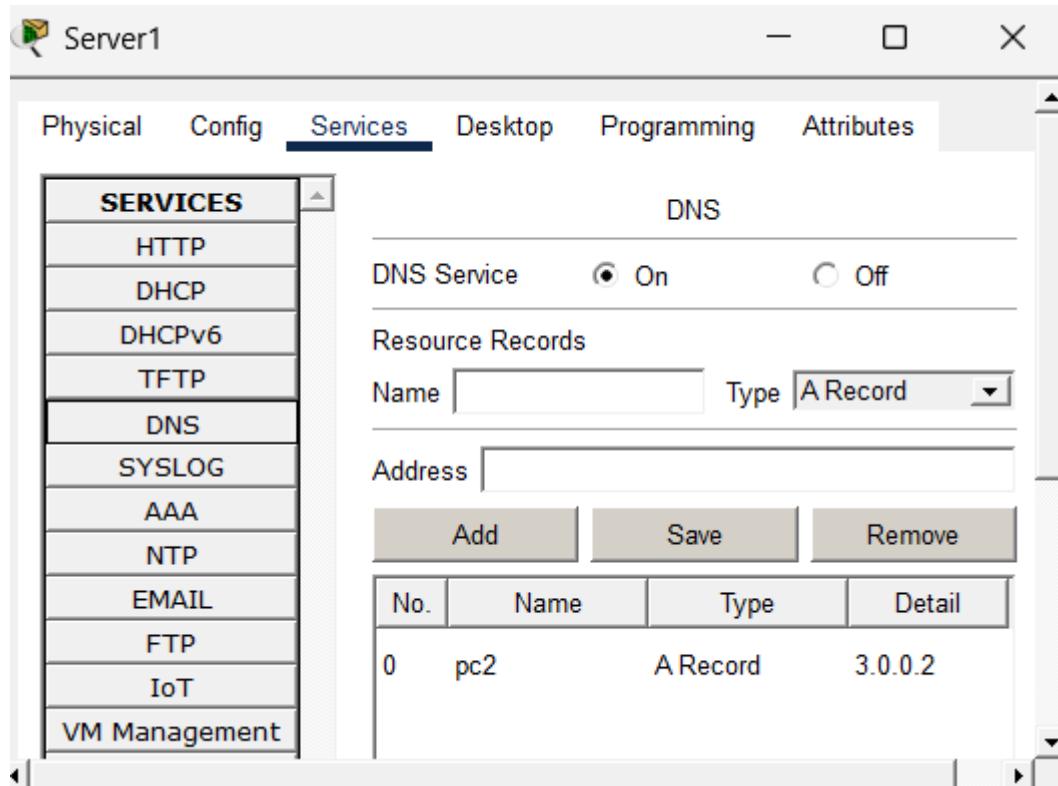
C:\>ping pc0
Pinging 1.0.0.3 with 32 bytes of data:

Request timed out.
Reply from 1.0.0.3: bytes=32 time=2ms TTL=125
Reply from 1.0.0.3: bytes=32 time=14ms TTL=125
Reply from 1.0.0.3: bytes=32 time=10ms TTL=125

Ping statistics for 1.0.0.3:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 14ms, Average = 8ms
```

Pc2, pc3, pc4 have the same dns server 3.0.0.5

Server1:



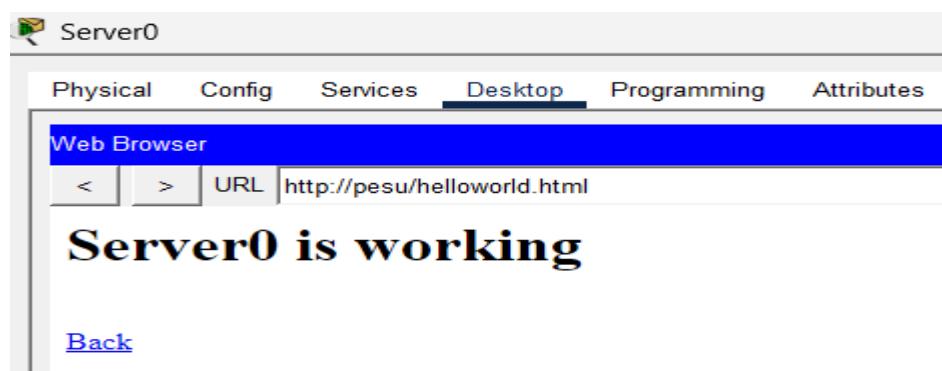
From pc4:

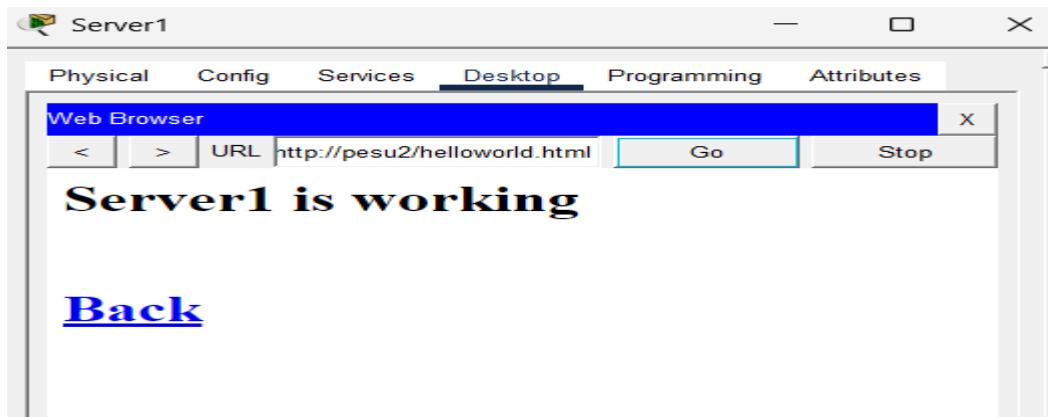
```
C:\>ping pc2

Pinging 3.0.0.2 with 32 bytes of data:

Reply from 3.0.0.2: bytes=32 time=10ms TTL=126
Reply from 3.0.0.2: bytes=32 time=3ms TTL=126
Reply from 3.0.0.2: bytes=32 time=1ms TTL=126
Reply from 3.0.0.2: bytes=32 time=3ms TTL=126

Ping statistics for 3.0.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 10ms, Average = 4ms
```





What is your observation and understanding of this concept that you have implemented?

The DNS server enables hosts to access network resources using domain names instead of IP addresses. It works alongside routing and IP addressing to provide user-friendly communication in a multi-network environment.

Why must each PC be configured with the DNS server's IP address?

Each PC must know the DNS server's IP address so it can send name-resolution queries when a domain name is entered. Without it, the PC cannot translate domain names into IP addresses.

What is the role of a DNS server in a network?

A DNS server resolves domain names into corresponding IP addresses. This allows users and applications to access network services without memorizing IP addresses.