2025

COMPUTER NETWORK

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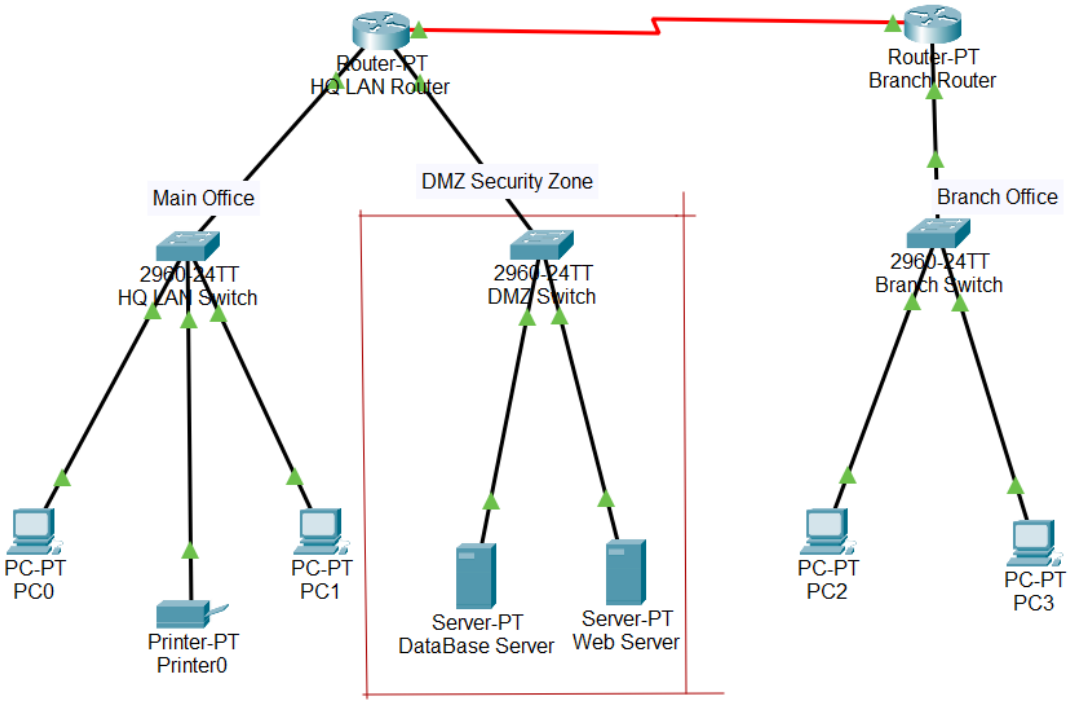
SAP 64281

11/23/2025

Topology According to Given Scenario



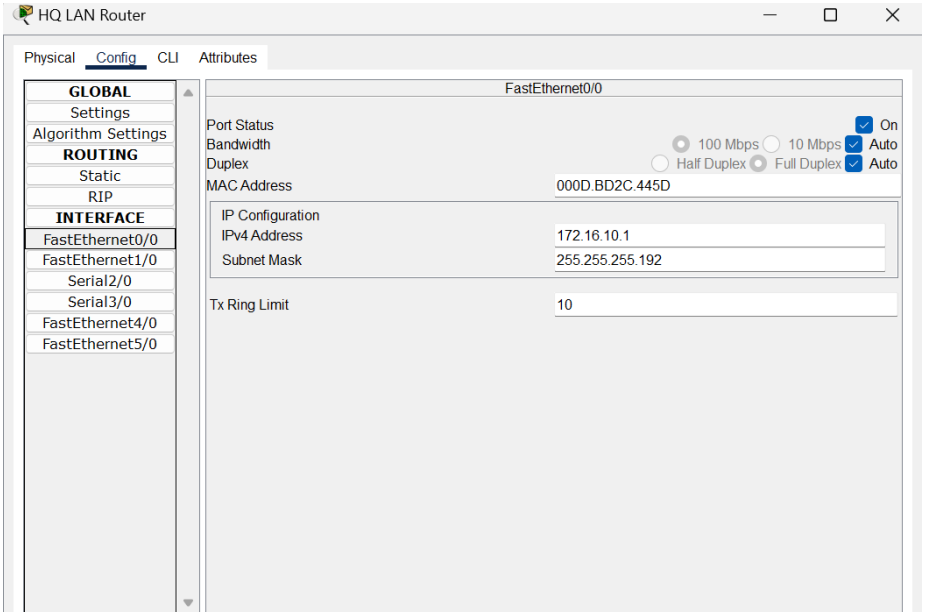
Deliverables Checklist

1. VLSM Table Completed Task 1 table showing all calculations.

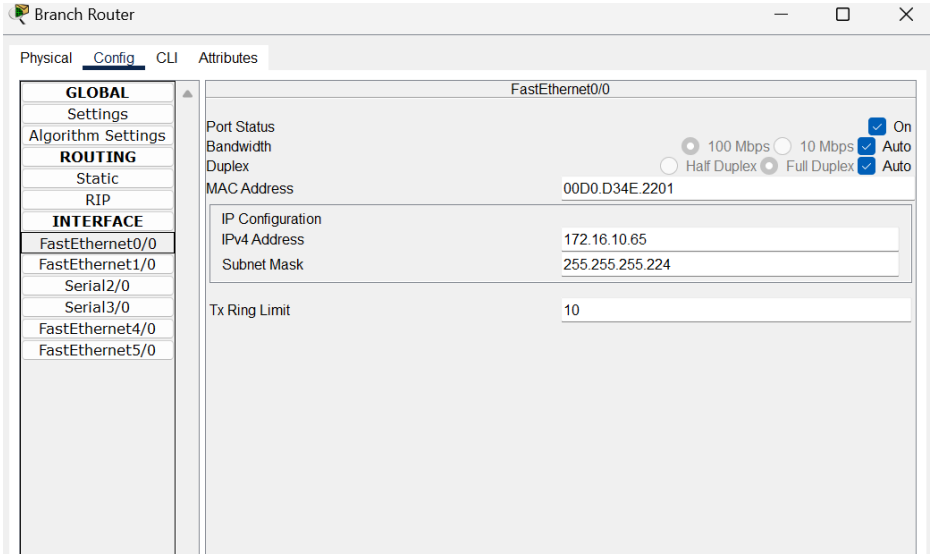
Segment Name	Required Hosts	Subnet Address	New Subnet Mask	Usable Range (First & Last Host)
1. Main Office LAN	60	**172.16.10.0/26**	255.255.255.192 (/26)	**172.16.10.1 – 172.16.10.62**
2. Branch Office LAN	28	**172.16.10.64/27**	255.255.255.224 (/27)	**172.16.10.65 – 172.16.10.94**
3. DMZ (Servers)	14	**172.16.10.96/28**	255.255.255.240 (/28)	**172.16.10.97 – 172.16.10.110**
4. WAN Link (R1–R2)	2	**172.16.10.112/30**	255.255.255.252 (/30)	**172.16.10.113 – 172.16.10.114**

Notes (for documentation)

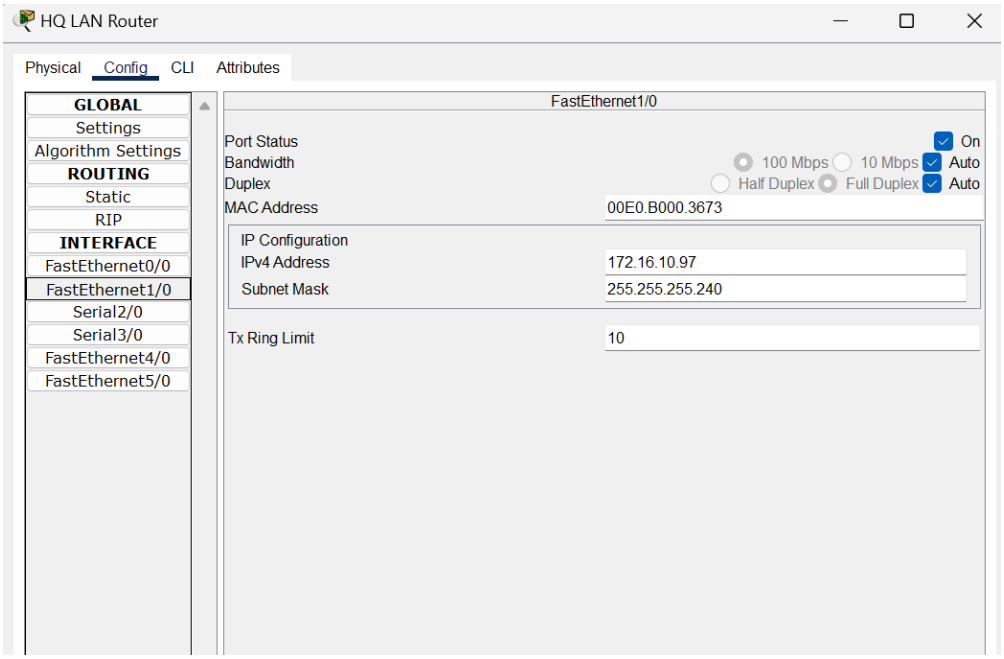
- Router/Gateway assignments used in the configuration:
  - R1 (HQ) Fa0/0 = **172.16.10.1** (Main LAN gateway)



  - R2 (Branch) Fa0/0 = **172.16.10.65** (Branch gateway)

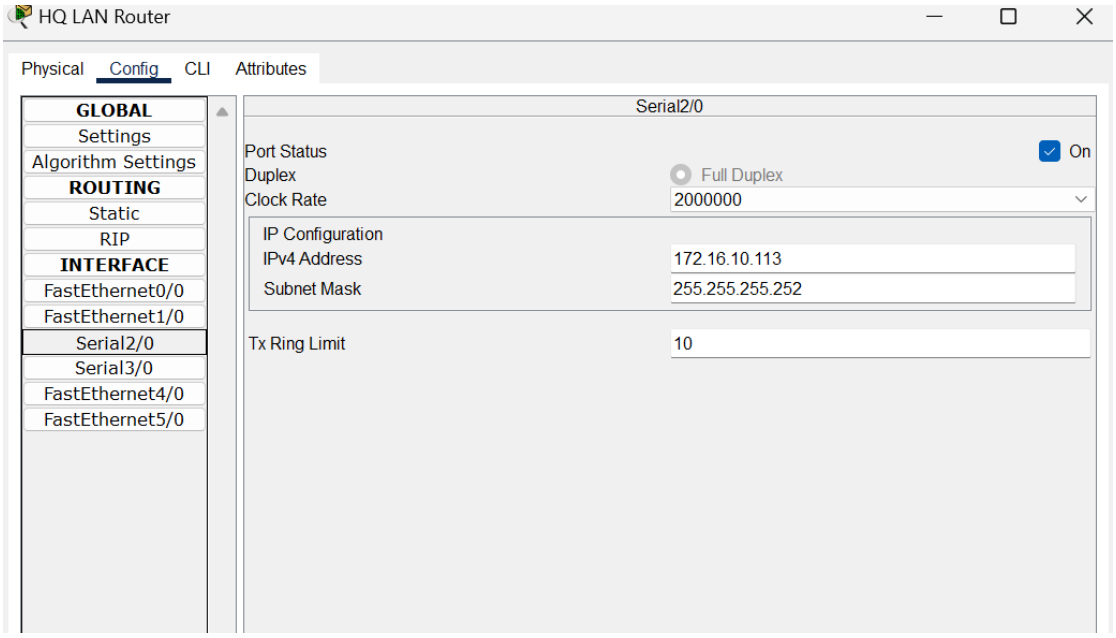


- R1 (DMZ) Fa0/1 = **172.16.10.97** (DMZ gateway)

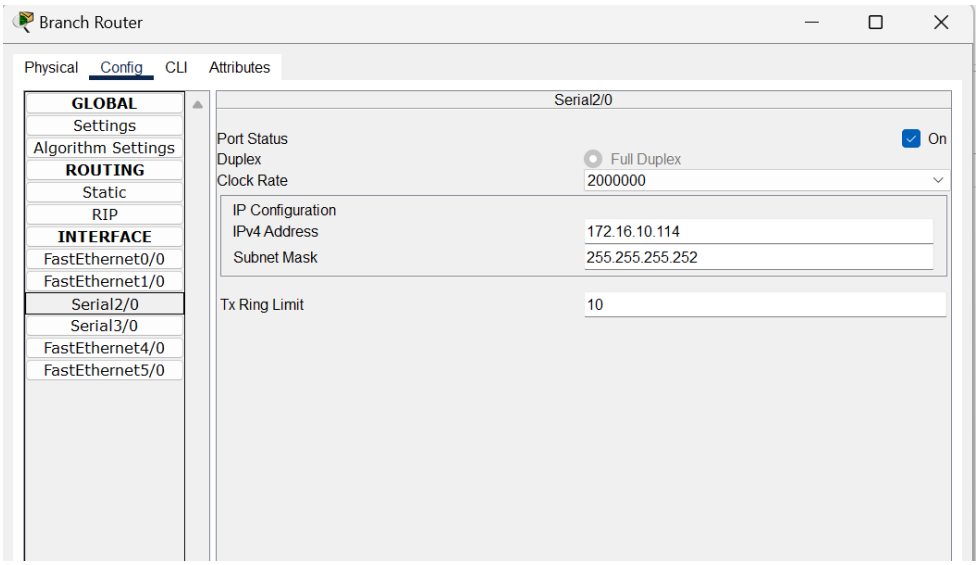


- R1 Serial = **172.16.10.113**, R2 Serial = **172.16.10.114** (WAN)

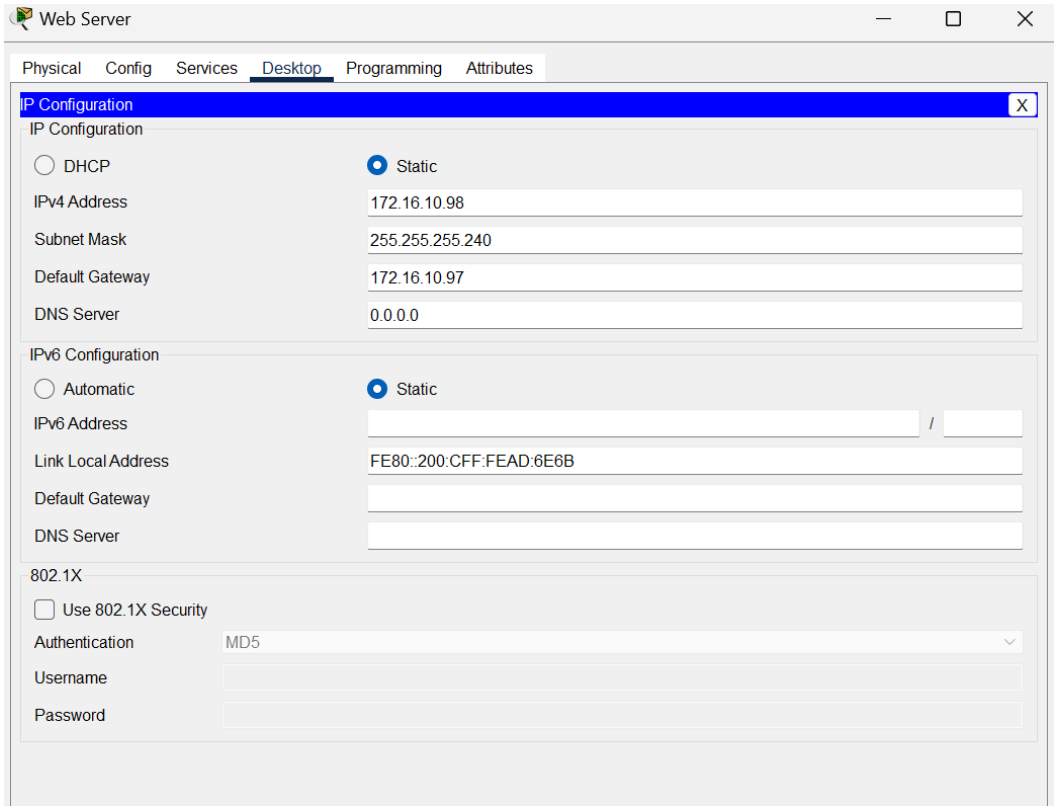
R1 Serial2/0:



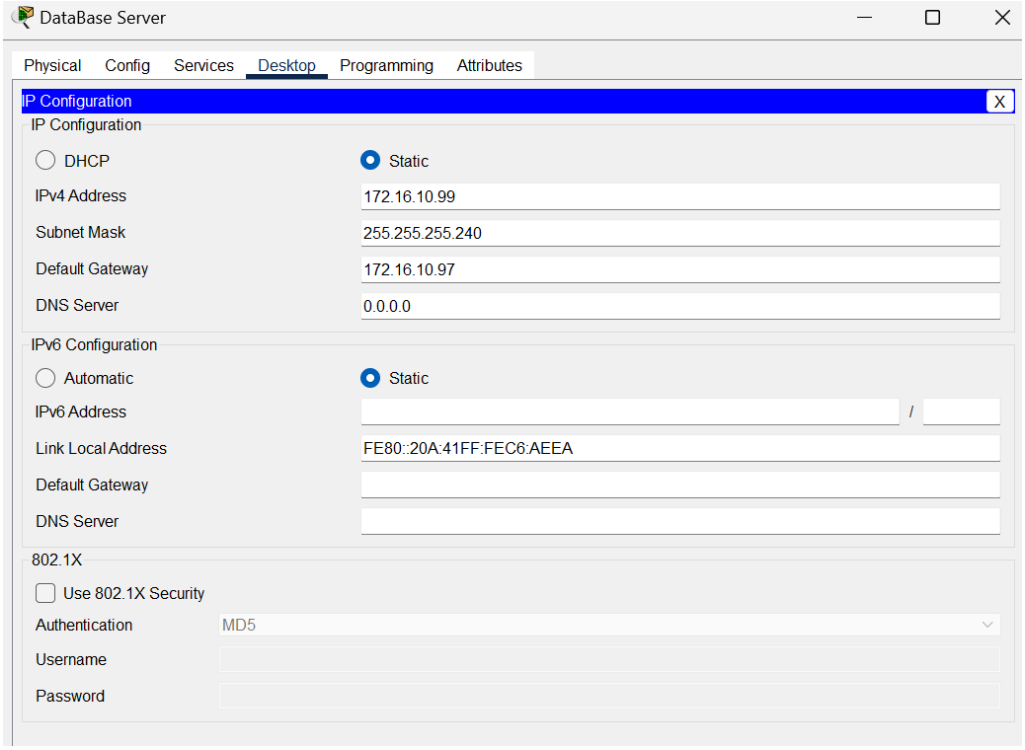
R2 Serial2/0:



- Server static IPs (per plan):
  - Web Server = **172.16.10.98**



- Database Server = **172.16.10.99**

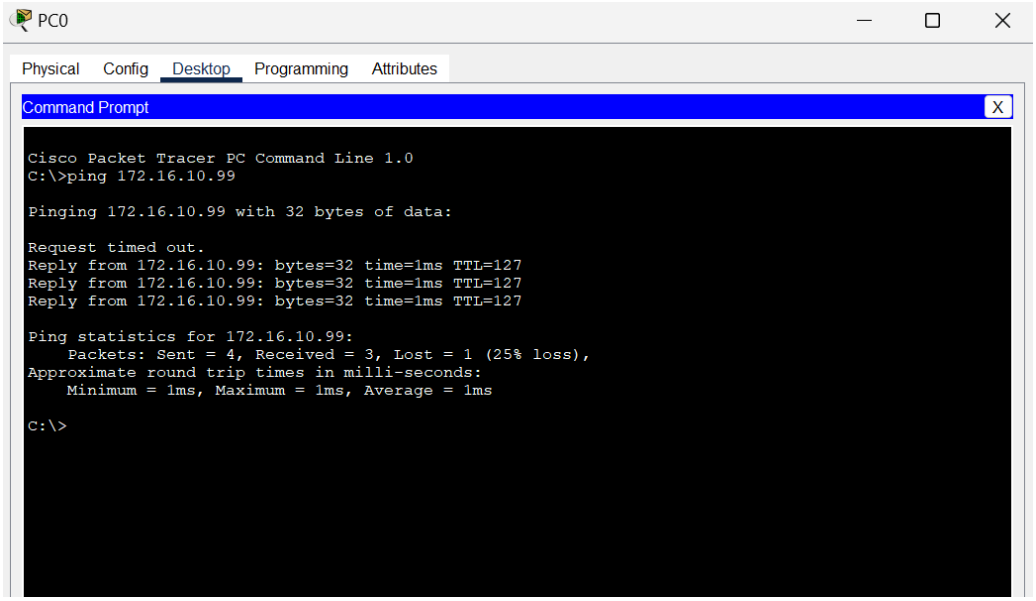


- DHCP pool on R1 covers **172.16.10.0/26** with excluded addresses 172.16.10.1–172.16.10.6 (first usable DHCP will be 172.16.10.7).

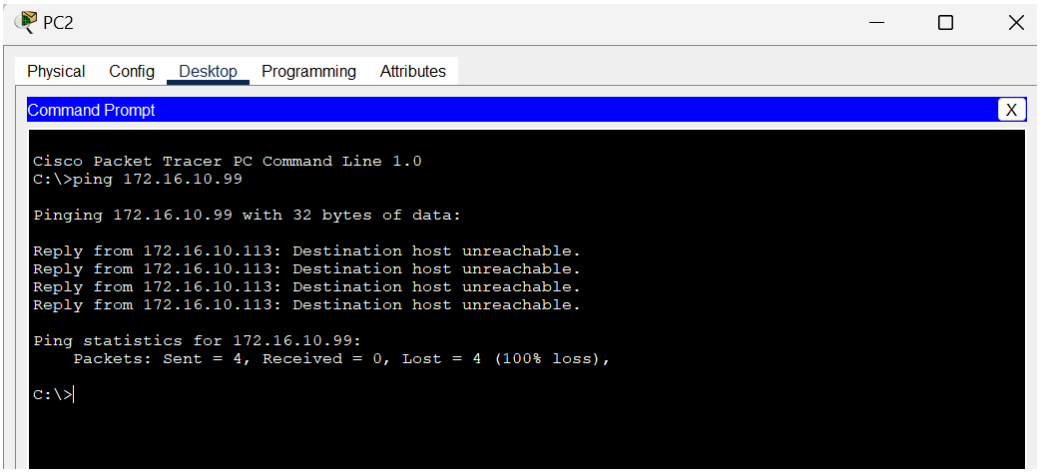
```
R1(config-router)#hostname R1
R1(config)#
R1(config)#! ---------------------- DHCP ----------------------
R1(config)#ip dhcp excluded-address 172.16.10.1 172.16.10.6
R1(config)#ip dhcp pool MAIN_LAN
R1(dhcp-config)# network 172.16.10.0 255.255.255.192
R1(dhcp-config)# default-router 172.16.10.1
R1(dhcp-config)# dns-server 8.8.8.8
```

2. Verification Screenshots

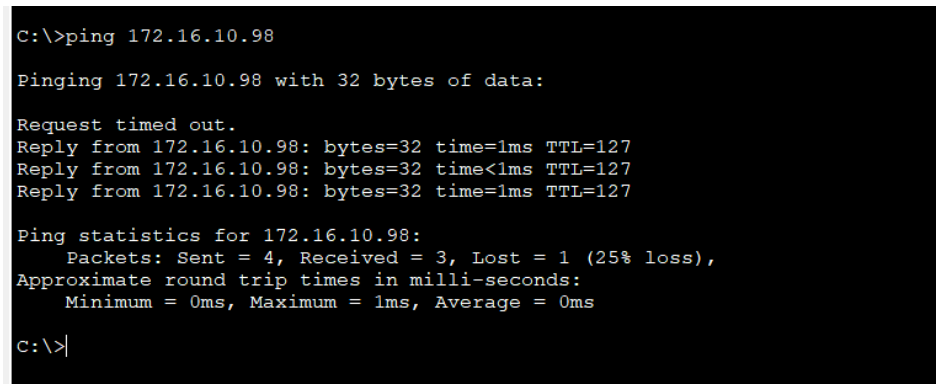
a. Successful ping from HQ PC to Database Server.



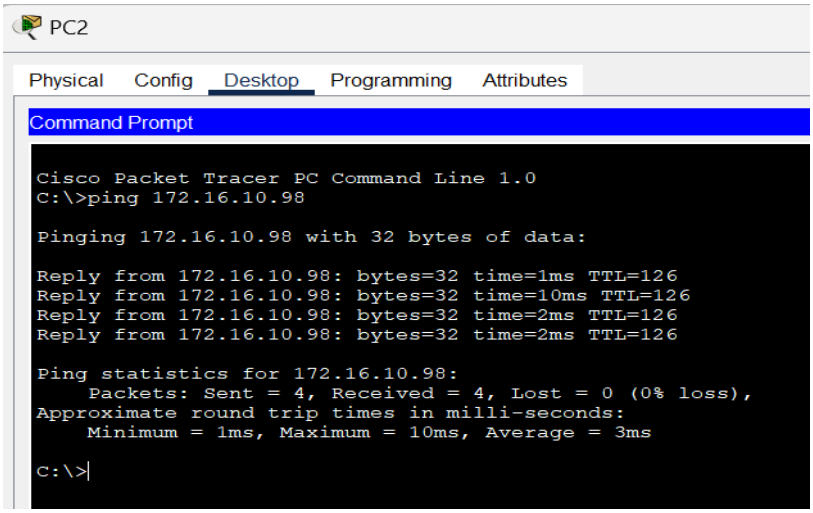
b. Failed ping from Branch PC to Database Server.



c. Successful ping from HQ PC to web Server.



d. Successful ping from branch PC to web Server.



e. Output of show ip route from R1 and R2.

R1:

```
R1(dhcp-config)#! ----------------------- RIP v2 -----------------------
R1(dhcp-config)#router rip
R1(config-router)# version 2
R1(config-router)# no auto-summary
R1(config-router)# network 172.16.10.0
R1(config-router)# network 172.16.10.64
R1(config-router)# network 172.16.10.112
R1(config-router)#
R1(config-router)#! ----------------------- Static Route to DMZ -----------------------
R1(config-router)#ip route 172.16.10.96 255.255.255.240 172.16.10.97
%Invalid next hop address (it's this router)
```

R2:

```
R2(config)#hostname R2
R2(config)#
R2(config)#! ----------------------- RIP v2 -----------------------
R2(config)#router rip
R2(config-router)# version 2
R2(config-router)# no auto-summary
R2(config-router)# network 172.16.10.64
R2(config-router)# network 172.16.10.112
R2(config-router)#
R2(config-router)#! ----------------------- Default Route -----------------------
R2(config-router)#ip route 0.0.0.0 0.0.0.0 172.16.10.113
R2(config)#
```

F. Output of show access-lists from R1.

```
R1(config)#
R1(config)#! ----------------------- ACL Rules -----------------------
R1(config)#ip access-list extended SECURE_DMZ
R1(config-ext-nacl)# permit tcp any host 172.16.10.98 eq 80
R1(config-ext-nacl)# permit tcp any host 172.16.10.98 eq 443
R1(config-ext-nacl)# permit ip 172.16.10.0 0.0.0.63 host 172.16.10.99
R1(config-ext-nacl)# deny ip 172.16.10.64 0.0.0.31 host 172.16.10.99
R1(config-ext-nacl)# permit ip any any
R1(config-ext-nacl)#
R1(config-ext-nacl)#! ----------------------- Apply ACL -----------------------
R1(config-ext-nacl)#interface Serial2/0
R1(config-if)# ip access-group SECURE_DMZin
% Incomplete command.
R1(config-if)#
R1(config-if)#end
R1#write
```

4. Routing Explanation Briefly explain why you chose RIP for one segment and a Static

Route for the DMZ (50 words max).

RIP v2 was used for the HQ and Branch LANs because these networks need automatic route exchange and easy scalability. The DMZ uses a static route because it is a small, security-sensitive network that should not be dynamically advertised. This ensures controlled access and reduces unnecessary routing updates.

THE END