LAB COMPLETED REMOTELY

PC1

Physical | Config | Desktop | Programming | Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration

- ○ DHCP
- ● Static

IPv4 Address	192.168.10.2
Subnet Mask	255.255.255.0
Default Gateway	192.168.10.1
DNS Server	0.0.0.0

IPv6 Configuration

- ○ Automatic
- ● Static

IPv6 Address	/
Link Local Address	FE80::290:21FF:FE12:8C18
Default Gateway	
DNS Server	

802.1X

☐ Use 802.1X Security

Authentication	MD5
Username	
Password	

☐ Top

PC8

Physical | Config | Desktop | Programming | Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration

- ○ DHCP
- ● Static

IPv4 Address	192.168.30.2
Subnet Mask	255.255.255.0
Default Gateway	192.168.30.1
DNS Server	0.0.0.0

IPv6 Configuration

- ○ Automatic
- ● Static

IPv6 Address	/
Link Local Address	FE80::210:11FF:FE2E:753D
Default Gateway	
DNS Server	

802.1X

☐ Use 802.1X Security

Authentication	MD5
Username	
Password	

☐ Top

Router0

Physical | Config | CLI | Attributes

IOS Command Line Interface

```
%LINK-3-UPDOWN: Interface Serial0/3/0, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/3/0, changed state to down

%LINK-5-CHANGED: Interface Serial0/3/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/3/0, changed state to up


Router>show ip interface brief
Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0     unassigned      YES unset  administratively down down
GigabitEthernet0/1     unassigned      YES unset  up                    down
GigabitEthernet0/1.10  192.168.10.1    YES manual up                    down
GigabitEthernet0/1.20  192.168.20.1    YES manual up                    down
GigabitEthernet0/1.110 192.168.110.1   YES manual up                    down
GigabitEthernet0/1.120 192.168.120.1   YES manual up                    down
GigabitEthernet0/1.130 192.168.130.1   YES manual up                    down
Serial0/3/0            10.10.10.1      YES manual up                    up
Serial0/3/1            unassigned      YES unset  administratively down down
Vlan1                  unassigned      YES unset  administratively down down
Router>show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

     10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       10.10.10.0/30 is directly connected, Serial0/3/0
L       10.10.10.1/32 is directly connected, Serial0/3/0
S    192.168.30.0/24 [1/0] via 10.10.10.2
S    192.168.40.0/24 [1/0] via 10.10.10.2

Router>
```

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☐ Top

Multilayer Switch0

Physical | Config | CLI | Attributes

IOS Command Line Interface

```
%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/5, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to up


Switch>show vlan brief

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/13, Fa0/14, Fa0/15, Fa0/16
                                                Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                                Fa0/21, Fa0/22, Fa0/23, Fa0/24
                                                Gig0/1, Gig0/2
10   zone10                           active
20   zone20                           active    Fa0/7, Fa0/8
30   VLAN30                           active    Fa0/1, Fa0/2, Fa0/3, Fa0/9
                                                Fa0/10, Fa0/11, Fa0/12
40   VLAN40                           active    Fa0/4, Fa0/5, Fa0/6
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active
Switch>
```

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☐ Top

Multilayer Switch1

Physical | Config | CLI | Attributes

IOS Command Line Interface

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/5, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to up


Switch>show vlan brief

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/13, Fa0/14, Fa0/15, Fa0/16
                                                Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                                Fa0/21, Fa0/22, Fa0/23, Fa0/24
                                                Gig0/1, Gig0/2
10   VLAN10                           active    Fa0/1, Fa0/2, Fa0/3
20   VLAN20                           active    Fa0/4, Fa0/5, Fa0/6
110  zone110                          active
120  zone120                          active    Fa0/7, Fa0/8
130  zone130                          active    Fa0/9, Fa0/10, Fa0/11, Fa0/12
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active
Switch>show interfaces trunk

Switch>
```

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☐ Top

Router1

Physical | Config | CLI | Attributes

IOS Command Line Interface

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/2/0, changed state to up

%LINK-3-UPDOWN: Interface Serial0/2/0, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/2/0, changed state to down

%LINK-5-CHANGED: Interface Serial0/2/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/2/0, changed state to up


Router>show ip interface brief
Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0     unassigned      YES unset  up                    up
GigabitEthernet0/1     unassigned      YES unset  up                    down
GigabitEthernet0/1.10  192.168.10.1    YES manual up                    down
GigabitEthernet0/1.20  192.168.20.1    YES manual up                    down
GigabitEthernet0/1.30  192.168.30.1    YES manual up                    down
GigabitEthernet0/1.40  192.168.40.1    YES manual up                    down
Serial0/2/0            10.10.10.2      YES manual up                    up
Serial0/2/1            unassigned      YES unset  down                  down
Vlan1                  unassigned      YES unset  up                    down
Router>show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

     10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       10.10.10.0/30 is directly connected, Serial0/2/0
L       10.10.10.2/32 is directly connected, Serial0/2/0
S    192.168.10.0/24 [1/0] via 10.10.10.1
S    192.168.20.0/24 [1/0] via 10.10.10.1

Router>
```
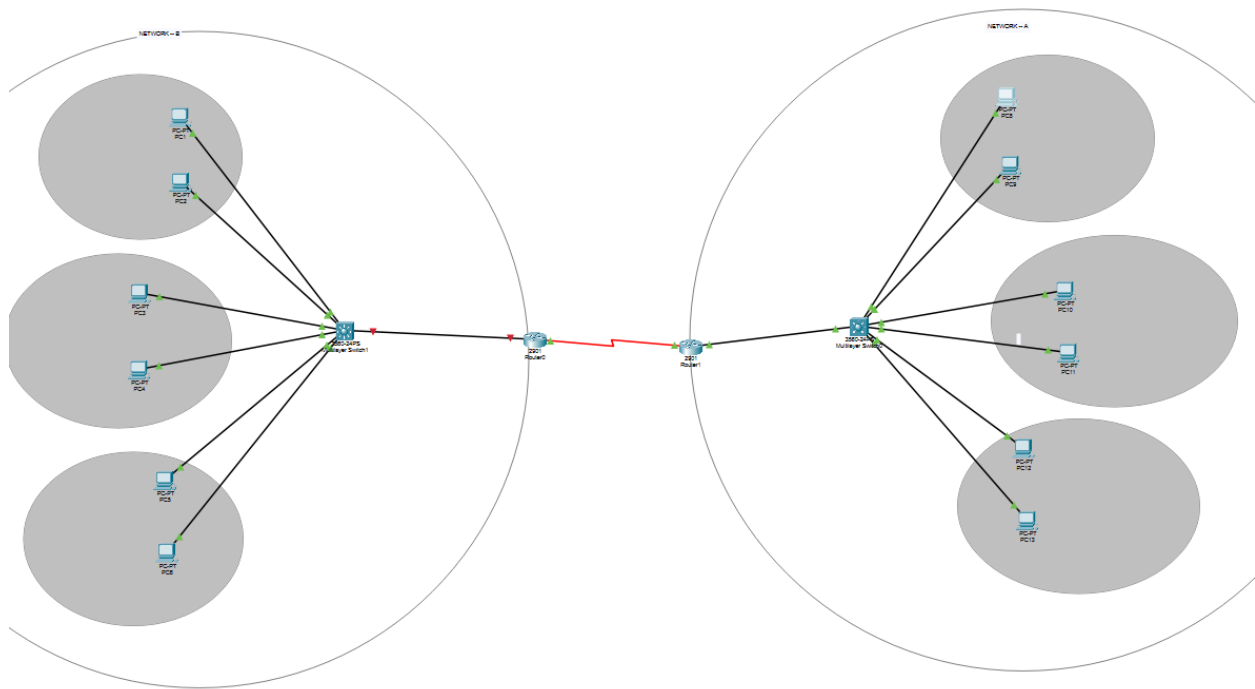
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☐ Top

LAB 6 questions:

1. What does TCP/IP stand for?

TCP/IP stands for **Transmission Control Protocol/Internet Protocol**. It is a suite of communication protocols used to interconnect network devices on the internet and private networks.

- **TCP**: Ensures reliable, ordered, and error-checked delivery of data.

- **IP**: Handles addressing and routing of data packets.

2. What does UDP stand for?

UDP stands for **User Datagram Protocol**. It is a lightweight, connectionless transport-layer protocol that prioritizes speed over reliability.

- **Key difference from TCP**: No error recovery, sequencing, or flow control.

3. How does TCP differ from UDP?

TCP is reliable and connection-oriented, ensuring error-free data delivery for applications like web browsing. UDP is connectionless and faster, prioritizing speed over reliability for real-time services like video calls. TCP verifies data arrival; UDP does not.

    a. How are these protocols similar?

Similarities

a. Similarities:

- Both are Transport Layer (Layer 4) protocols
- Both use port numbers for application identification
- Both support process-to-process communication
- Both can operate over IP

b. List some characteristics of both.

TCP:

- Connection-oriented (3-way handshake)
- Reliable with acknowledgments
- Error checking and correction
- Flow and congestion control
- Guaranteed delivery (retransmits lost packets)
- Slower due to overhead
- Used for: Web (HTTP), email (SMTP), file transfer (FTP)

UDP:

- Connectionless (no handshake)
- Unreliable (no delivery guarantees)
- Minimal error checking
- No flow/congestion control

- No retransmission of lost packets
- Faster with lower overhead
- Used for: Video streaming, VoIP, DNS queries

4. Explain the use of 0.0.0.0 in setting the static routes in this assignment. (use complete sentences)

In this assignment, 0.0.0.0 is used as a default route in static routing configurations. This special address represents all possible network destinations not explicitly listed in the routing table. When configured with a subnet mask of 0.0.0.0 (written as 0.0.0.0/0), it creates a catch-all route that directs any traffic for unknown networks to a specified gateway. In our lab, we used this to configure routers to send all non-local traffic through the serial interface connecting the two networks (e.g., "ip route 0.0.0.0 0.0.0.0 10.10.10.2"). This ensures that packets destined for networks not directly connected to the router will be forwarded appropriately rather than being dropped.

5. What does the statement "Gateway of last resort is not set" mean?

This statement indicates that the router does not have a default route (0.0.0.0/0) configured in its routing table.

a. Why would this matter when sending packets outside a network?

This matters significantly when sending packets outside the local network because without a default gateway, the router has no instructions for where to send traffic destined for networks not explicitly listed in its routing table. In our lab scenario, this would prevent communication between Network A and Network B through the serial connection, as the router would simply drop any packets for the remote network rather than forwarding them to the appropriate interface. The gateway of last resort serves as the "exit door" for all traffic going to external networks, so its absence breaks inter-network communication while still allowing local network traffic to function normally.