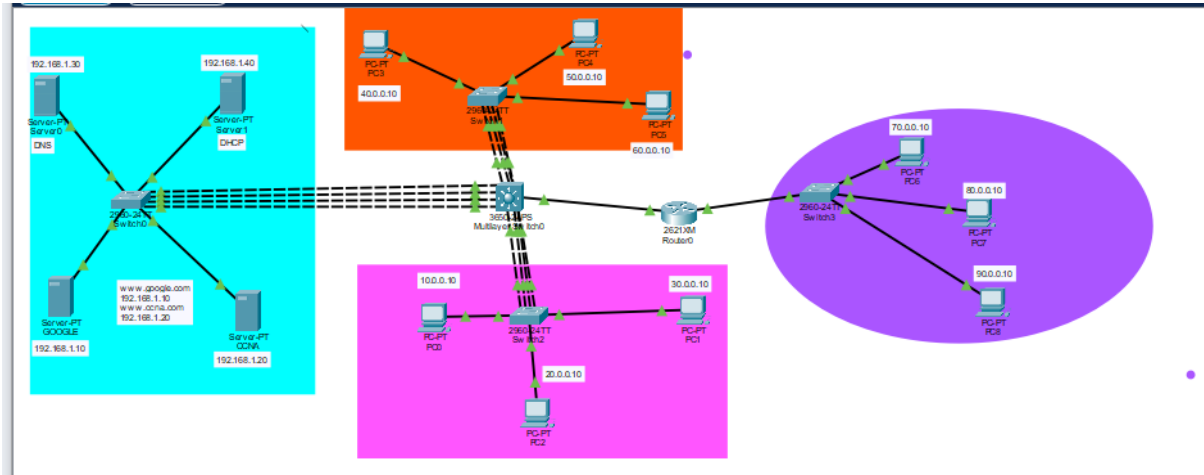


1)CCNA PROJECT

SWITCHING:



1. Routing Protocol

- **Static Routing or Dynamic Routing (e.g., RIP, OSPF, or EIGRP)**
The central router is connecting multiple networks (e.g., 10.0.0.0, 20.0.0.0, 30.0.0.0, etc.), so a routing protocol is needed for communication between these networks.

2. Switching Protocol

- **Ethernet / IEEE 802.3**
All switches are likely using Ethernet as the data link layer protocol.

3. Addressing and Internetworking Protocols

- **IP (Internet Protocol)**
Clearly used for assigning IP addresses to PCs, servers, and interfaces (e.g., 192.168.1.x, 40.0.0.x, etc.).
- **ARP (Address Resolution Protocol)**
Used to map IP addresses to MAC addresses within local networks.

4. Transport Protocols

- **TCP/UDP**
Used by end devices to ensure communication (e.g., file transfer, DNS queries).
-

5. Application Layer Protocols

- **DNS (Domain Name System)**
One of your servers is marked as a DNS server (192.168.1.10). It resolves domain names like `www.google.com`.
 - **HTTP/HTTPS**
Likely used for web-based services hosted on the server.
 - **FTP (File Transfer Protocol)**
Possibly in use if file sharing is enabled between server and clients.
-

6. ICMP (Internet Control Message Protocol)

- Used for **ping** and **traceroute** operations to test connectivity.
-

Optional / Advanced Protocols (Depending on Configuration):

- **DHCP**: If any of the IP addresses are being dynamically assigned.
 - **NAT**: If this project is simulating internet access.
 - **ACL (Access Control Lists)**: For traffic filtering or security.
 - **VLANs**: If switch segments are configured to separate broadcast domains.
-

The screenshot displays a network simulation interface with two command prompts and a network diagram.

Top Command Prompt (PC1):

```

C:\>ping 80.0.0.10 with 32 bytes of data:

Reply from 80.0.0.10: bytes=32 time=10ms TTL=123
Reply from 80.0.0.10: bytes=32 time=40ms TTL=123
Reply from 80.0.0.10: bytes=32 time=30ms TTL=123
Reply from 80.0.0.10: bytes=32 time=47ms TTL=123

Ping statistics for 80.0.0.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 10ms, Maximum = 47ms, Average = 31ms

C:\>ping 70.0.0.10 with 32 bytes of data:

Reply from 70.0.0.10: bytes=32 time=10ms TTL=123
Reply from 70.0.0.10: bytes=32 time=12ms TTL=123
Reply from 70.0.0.10: bytes=32 time=44ms TTL=123
Reply from 70.0.0.10: bytes=32 time=61ms TTL=123

Ping statistics for 70.0.0.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 10ms, Maximum = 61ms, Average = 32ms

C:\>ping 80.0.0.20 with 32 bytes of data:

Reply from 80.0.0.20: bytes=32 time=3ms TTL=123
Reply from 80.0.0.20: bytes=32 time=6ms TTL=123
Reply from 80.0.0.20: bytes=32 time=57ms TTL=123

```

Bottom Command Prompt (PC2):

```

C:\>ping 172.16.0.20 with 32 bytes of data:

Reply from 172.16.0.20: bytes=32 time=30ms TTL=126
Reply from 172.16.0.20: bytes=32 time=43ms TTL=126
Reply from 172.16.0.20: bytes=32 time=37ms TTL=126
Reply from 172.16.0.20: bytes=32 time=25ms TTL=126

Ping statistics for 172.16.0.20:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 20ms, Maximum = 43ms, Average = 31ms

C:\>tracert 172.16.0.10 over a maximum of
30 hops:
  0  1 ms    1 ms    0 ms    10.0.0.1
  1  17 ms   28 ms   16 ms   1.1.1.2
  2  29 ms   43 ms   31 ms   172.16.0.10

```

Network Diagram:

The network diagram illustrates a multi-protocol network topology. It includes several routers and switches connected in a complex manner. Key components include:

- OSPF Area 0:** A central area containing routers R1, R2, R3, R4, R5, and R6. R1 and R2 are connected to R3, which is connected to R4 and R5. R4 and R5 are connected to R6. R6 is connected to R1 and R2.
- EIGRP:** A network of routers including R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14, R15, R16, R17, R18, R19, R20, R21, R22, R23, R24, R25, R26, R27, R28, R29, R30, R31, R32, R33, R34, R35, R36, R37, R38, R39, R40, R41, R42, R43, R44, R45, R46, R47, R48, R49, R50, R51, R52, R53, R54, R55, R56, R57, R58, R59, R60, R61, R62, R63, R64, R65, R66, R67, R68, R69, R70, R71, R72, R73, R74, R75, R76, R77, R78, R79, R80, R81, R82, R83, R84, R85, R86, R87, R88, R89, R90, R91, R92, R93, R94, R95, R96, R97, R98, R99, R100, R101, R102, R103, R104, R105, R106, R107, R108, R109, R110, R111, R112, R113, R114, R115, R116, R117, R118, R119, R120, R121, R122, R123, R124, R125, R126, R127, R128, R129, R130, R131, R132, R133, R134, R135, R136, R137, R138, R139, R140, R141, R142, R143, R144, R145, R146, R147, R148, R149, R150, R151, R152, R153, R154, R155, R156, R157, R158, R159, R160, R161, R162, R163, R164, R165, R166, R167, R168, R169, R170, R171, R172, R173, R174, R175, R176, R177, R178, R179, R180, R181, R182, R183, R184, R185, R186, R187, R188, R189, R190, R191, R192, R193, R194, R195, R196, R197, R198, R199, R200, R201, R202, R203, R204, R205, R206, R207, R208, R209, R210, R211, R212, R213, R214, R215, R216, R217, R218, R219, R220, R221, R222, R223, R224, R225, R226, R227, R228, R229, R230, R231, R232, R233, R234, R235, R236, R237, R238, R239, R240, R241, R242, R243, R244, R245, R246, R247, R248, R249, R250, R251, R252, R253, R254, R255, R256, R257, R258, R259, R260, R261, R262, R263, R264, R265, R266, R267, R268, R269, R270, R271, R272, R273, R274, R275, R276, R277, R278, R279, R280, R281, R282, R283, R284, R285, R286, R287, R288, R289, R290, R291, R292, R293, R294, R295, R296, R297, R298, R299, R300, R301, R302, R303, R304, R305, R306, R307, R308, R309, R310, R311, R312, R313, R314, R315, R316, R317, R318, R319, R320, R321, R322, R323, R324, R325, R326, R327, R328, R329, R330, R331, R332, R333, R334, R335, R336, R337, R338, R339, R340, R341, R342, R343, R344, R345, R346, R347, R348, R349, R350, R351, R352, R353, R354, R355, R356, R357, R358, R359, R360, R361, R362, R363, R364, R365, R366, R367, R368, R369, R370, R371, R372, R373, R374, R375, R376, R377, R378, R379, R380, R381, R382, R383, R384, R385, R386, R387, R388, R389, R390, R391, R392, R393, R394, R395, R396, R397, R398, R399, R400, R401, R402, R403, R404, R405, R406, R407, R408, R409, R410, R411, R412, R413, R414, R415, R416, R417, R418, R419, R420, R421, R422, R423, R424, R425, R426, R427, R428, R429, R430, R431, R432, R433, R434, R435, R436, R437, R438, R439, R440, R441, R442, R443, R444, R445, R446, R447, R448, R449, R450, R451, R452, R453, R454, R455, R456, R457, R458, R459, R460, R461, R462, R463, R464, R465, R466, R467, R468, R469, R470, R471, R472, R473, R474, R475, R476, R477, R478, R479, R480, R481, R482, R483, R484, R485, R486, R487, R488, R489, R490, R491, R492, R493, R494, R495, R496, R497, R498, R499, R500, R501, R502, R503, R504, R505, R506, R507, R508, R509, R510, R511, R512, R513, R514, R515, R516, R517, R518, R519, R520, R521, R522, R523, R524, R525, R526, R527, R528, R529, R530, R531, R532, R533, R534, R535, R536, R537, R538, R539, R540, R541, R542, R543, R544, R545, R546, R547, R548, R549, R550, R551, R552, R553, R554, R555, R556, R557, R558, R559, R560, R561, R562, R563, R564, R565, R566, R567, R568, R569, R570, R571, R572, R573, R574, R575, R576, R577, R578, R579, R580, R581, R582, R583, R584, R585, R586, R587, R588, R589, R590, R591, R592, R593, R594, R595, R596, R597, R598, R599, R600, R601, R602, R603, R604, R605, R606, R

- **Purpose:** Allows devices with private IP addresses to access public networks (e.g., internet).
- **Type Used:** Likely **PAT (Port Address Translation)** for internet access, and **Static NAT** for public servers (like `www.google.com`, `www.cnn.com`).
- **Protocols Involved:**
 - **NAT** – IP address translation
 - **TCP/UDP** – Data transport
 - **ICMP** – For ping and diagnostics

◆ 2. VPN (Virtual Private Network)

- **Purpose:** Secures communication between different branch routers over an ISP network.
- **Type Used:** Likely **GRE over IPSec VPN** between branch routers.
- **Protocols Involved:**
 - **IPSec** – Data encryption and security
 - **GRE** – Encapsulation of routed traffic
 - **ISAKMP/IKE** – Key exchange for IPSec

◆ 3. Supporting Protocols

- **ICMP** – Used for testing connectivity (ping)
 - **DNS** – Resolves domain names (used in Server config)
 - **HTTP** – Web traffic (access to websites)
 - **Static Routing / Dynamic Routing (optional)** – For network path selection
-