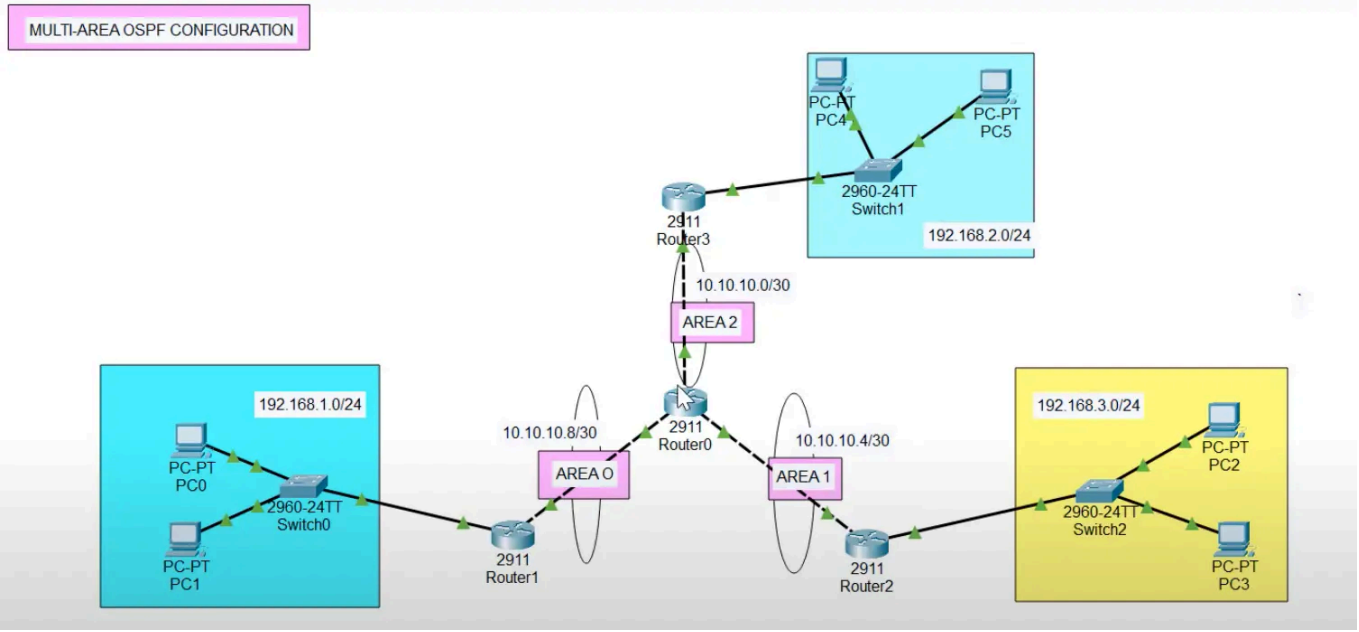
Multi-Area OSPF



To implement the topology shown in the image for Multi-Area OSPF, follow the step-by-step configuration guide below:

Step 1: Build the Topology in Packet Tracer

1. **Devices**:
    - **Routers**: 4 routers (2911 models)
    - **Switches**: 3 switches (2960-24TT models)
    - **End Devices**: 6 PCs
2. **Connections**:
    - Connect the routers and switches as shown.
    - Connect the PCs to the switches.
    - Ensure correct cabling between devices (automatic cable selection will work for the basic setup).

Step 2: Assign IP Addresses

1. **Subnets and Interface Assignments**:
    - **Router0** (Area 0):
        - Interface connecting to Router1: `10.10.10.8/30`
        - Interface connecting to Router2: `10.10.10.4/30`
        - Interface connecting to Router3: `10.10.10.0/30`
    - **Router1** (Area 0):
        - Interface connecting to Router0: `10.10.10.9/30`
        - LAN interface: `192.168.1.1/24`
    - **Router2** (Area 1):
        - Interface connecting to Router0: `10.10.10.5/30`
        - LAN interface: `192.168.3.1/24`
    - **Router3** (Area 2):
        - Interface connecting to Router0: `10.10.10.1/30`
        - LAN interface: `192.168.2.1/24`
2. **Configure IP addresses on the PCs**:
    - **PC0 and PC1** (in Area 0): Use IPs in the `192.168.1.0/24` network (e.g., `192.168.1.2/24`, `192.168.1.3/24`).
    - **PC2 and PC3** (in Area 1): Use IPs in the `192.168.3.0/24` network (e.g., `192.168.3.2/24`, `192.168.3.3/24`).
    - **PC4 and PC5** (in Area 2): Use IPs in the `192.168.2.0/24` network (e.g., `192.168.2.2/24`, `192.168.2.3/24`).

Step 3: Configure OSPF on Routers

1. **Router0 Configuration** (Backbone Router, Area 0):

```
enable
configure terminal
router ospf 1
router-id 1.1.1.1
network 10.10.10.8 0.0.0.3 area 0
network 10.10.10.4 0.0.0.3 area 0
network 10.10.10.0 0.0.0.3 area 0
end
```

2. **Router1 Configuration** (Area 0):

```
enable
configure terminal
router ospf 1
router-id 1.1.1.2
network 10.10.10.8 0.0.0.3 area 0
network 192.168.1.0 0.0.0.255 area 0
end
```

3. **Router2 Configuration** (Area 1):

```
enable
configure terminal
router ospf 1
router-id 2.2.2.1
network 10.10.10.4 0.0.0.3 area 0
network 192.168.3.0 0.0.0.255 area 1
end
```

4. **Router3 Configuration** (Area 2):

```
enable
configure terminal
router ospf 1
router-id 3.3.3.1
network 10.10.10.0 0.0.0.3 area 0
```

```
network 192.168.2.0 0.0.0.255 area 2
end
```

Step 4: Verifying the OSPF Configuration

1. **Check OSPF Neighbor Relationships**:
   On each router, use the following command to verify OSPF neighbors:

   ```
   show ip ospf neighbor
   ```

   This will show if the routers have formed OSPF adjacencies with their neighbors.
2. **Check OSPF Routing Table**:
   On each router, verify the OSPF routes by using:

   ```
   show ip route ospf
   ```

   This should display routes learned via OSPF, including routes from other areas.
3. **Ping Across the Network**:
   - Test connectivity between PCs in different areas to verify that OSPF is correctly routing traffic.
   - For example, ping from a PC in Area 0 to a PC in Area 2.

Step 5: Saving the Configuration

After verifying that everything is working as expected, save the configuration on each router using:

```
write memory
```

This setup should successfully implement Multi-Area OSPF in your Packet Tracer topology. If you encounter any issues, let me know, and I can assist with troubleshooting.