EXPERIMENT 7

7. Session Configuration of ARP and Static Routing using Cisco network switch and verify the connectivity.

To configure ARP and static routing on Cisco switches, especially with a setup involving two switches and multiple PCs across VLANs, follow these steps. This setup will ensure that ARP entries are correctly created and that static routing is correctly configured to enable communication between VLANs.

Scenario

- **Switch 1** (Cisco 3560) with VLAN 10
- **Switch 2** (Cisco 3560) with VLAN 20
- **PCs**:
  - **VLAN 10**: PC A1, PC A2
  - **VLAN 20**: PC B1, PC B2

Network Topology

1. **Switch 1 (VLAN 10)**:
   - **PC A1**: 192.168.10.2
   - **PC A2**: 192.168.10.3
   - **VLAN 10 IP**: 192.168.10.1
2. **Switch 2 (VLAN 20)**:
   - **PC B1**: 192.168.20.2
   - **PC B2**: 192.168.20.3
   - **VLAN 20 IP**: 192.168.20.1
3. **Trunk Link** between Switch 1 and Switch 2

Step 1: Configure VLANs and Assign IP Addresses

On Switch 1:

1. **Enter global configuration mode:**

```
enable
configure terminal
```

2. **Create VLAN 10 and assign it to ports:**

```
vlan 10
name Network_A
```

```
exit

interface range fastethernet 0/1 - 2
switchport mode access
switchport access vlan 10
no shutdown
exit
```

3. **Configure the VLAN 10 interface with an IP address:**

```
interface vlan 10
ip address 192.168.10.1 255.255.255.0
no shutdown
exit
```

4. **Configure trunk port to Switch 2:**

```
interface fastethernet 0/24
switchport mode trunk
switchport trunk allowed vlan 10,20
no shutdown
exit
```

On Switch 2:

1. **Enter global configuration mode:**

```
enable
configure terminal
```

2. **Create VLAN 20 and assign it to ports:**

```
vlan 20
name Network_B
exit

interface range fastethernet 0/1 - 2
switchport mode access
switchport access vlan 20
no shutdown
exit
```

3. **Configure the VLAN 20 interface with an IP address:**

```
interface vlan 20
ip address 192.168.20.1 255.255.255.0
no shutdown
exit
```

4. **Configure trunk port to Switch 1:**

```
interface fastethernet 0/24
```

```
switchport mode trunk
switchport trunk allowed vlan 10,20
no shutdown
exit
```

Step 2: Enable IP Routing

1. **Enable IP routing on both switches:**

   On Switch 1 and Switch 2:

   ```
   ip routing
   ```

Step 3: Configure Static Routing (if necessary)

For this scenario, routing between VLANs on the same Layer 3 switch is handled internally, so static routes aren't necessary unless you need to route traffic to an external network. However, if you are configuring routing to another network or router, you would add static routes like this:

```
ip route [destination_network] [subnet_mask] [next_hop_address]
```

Step 4: Configure ARP

ARP (Address Resolution Protocol) is used to map IP addresses to MAC addresses. Cisco switches handle ARP automatically. However, you can manually add ARP entries if needed:

1. **Add ARP entry:**

   On Switch 1:

   ```
   arp 192.168.20.2 00:11:22:33:44:55
   ```

   On Switch 2:

   ```
   arp 192.168.10.2 00:66:77:88:99:AA
   ```

   - Replace `00:11:22:33:44:55` and `00:66:77:88:99:AA` with the actual MAC addresses of the corresponding devices.

Step 5: Configure IP Addresses on the PCs

1. **On PC A1:**
   - **IP Address:** 192.168.10.2
   - **Subnet Mask:** 255.255.255.0
   - **Default Gateway:** 192.168.10.1
2. **On PC A2:**
   - **IP Address:** 192.168.10.3

- **Subnet Mask:** 255.255.255.0
- **Default Gateway:** 192.168.10.1

3. **On PC B1:**
   - **IP Address:** 192.168.20.2
   - **Subnet Mask:** 255.255.255.0
   - **Default Gateway:** 192.168.20.1
4. **On PC B2:**
   - **IP Address:** 192.168.20.3
   - **Subnet Mask:** 255.255.255.0
   - **Default Gateway:** 192.168.20.1

Step 6: Verify Configuration and Connectivity

1. **Ping from PC A1 to PC B1:**

   ```
   ping 192.168.20.2
   ```

2. **Check ARP Table on Switches:**

   ```
   show ip arp
   ```

3. **Check Routing Table on Switches:**

   ```
   show ip route
   ```