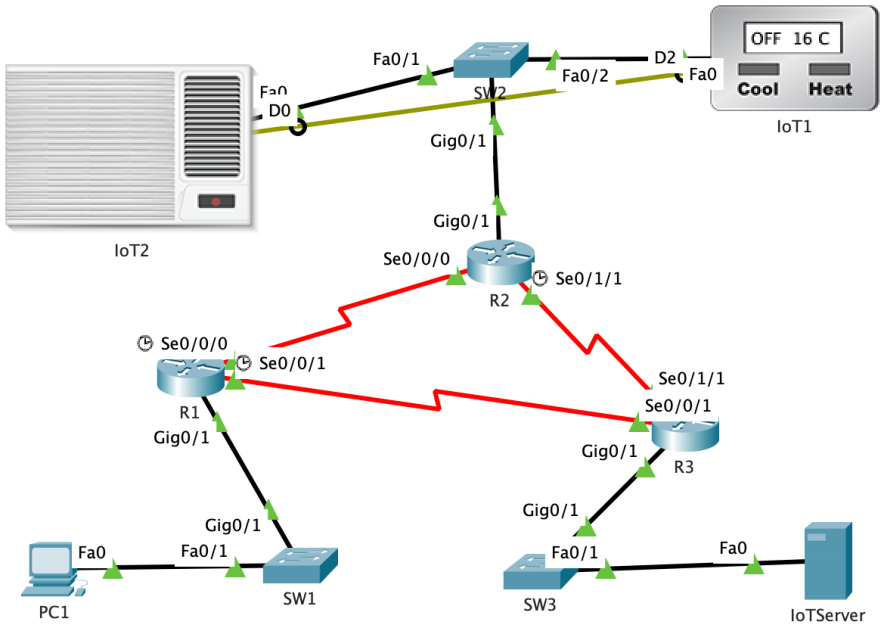
CST337 – Network Configurations and Protocols
Lab 3
Duration: 2 hours

Topology



Required Resources

- 3 Router (Cisco 1941)
- 3 Switches (Cisco 2960)
- 1 PC
- 1 Server
- 2 IoT devices
- Console cables to configure the Cisco IOS devices via the console ports.
- Ethernet cables as shown in the topology.

Addressing Table

Device	Interface	Network	Subnet Mask
R1	G0/1	192.168.1.0/24	255.255.255.0
	S0/0/0 (DCE)	192.168.12.0/30	255.255.255.252
	S0/0/1 (DCE)	192.168.13.0/30	255.255.255.252
R2	G0/1	192.168.2.0/24	255.255.255.0
	S0/0/0	192.168.12.0/30	255.255.255.252
	S0/1/1 (DCE)	192.168.23.0/30	255.255.255.252
R3	G0/1	192.168.3.0/24	255.255.255.0
	S0/0/1	192.168.13.0/30	255.255.255.252
	S0/1/1	192.168.23.0/30	255.255.255.252
PC1	NIC	192.168.1.0/24	255.255.255.0
IoTServer	NIC	192.168.3.0/24	255.255.255.0
IoT2	NIC	192.168.2.0/24	255.255.255.0
IoT3	NIC	192.168.2.0/24	255.255.255.0

Step 1: Set Up the Topology and Initialize Devices

a. Attach the devices as shown in the topology diagram, and cable as necessary.
b. Power on all the devices in the topology.
c. Initialize and reload the devices.

Step 2: Configure IP addressing.

a. Configure the interfaces in routers, PC, IoTServer and IoT devices with the IP addresses given in the Addressing Table.

Step 3: Configure OSPF on R1

a. Use the router ospf command in global configuration mode to enable OSPF on R1.
```
R1(config)# router ospf 20
```
b. Assign the OSPFv2 router-id to R1.
```
R1(config-router)# router-id 1.1.1.1
```
c. Configure the network statements for the networks on R1. Use an area ID of 0.
```
R1(config-router)# network 192.168.1.0 0.0.0.255 area 0
R1(config-router)# network 192.168.12.0 0.0.0.3 area 0
R1(config-router)# network 192.168.13.0 0.0.0.3 area 0
```

Step 4: Configure OSPF on R2 and R2.

a. Use the router ospf command and add the network statements for the networks on R2 and R3. Neighbour adjacency messages display on R1 when OSPF routing is configured on R2 and R3. Assign the OSPFv2 router-id of 2.2.2 to R2 and a router ID of 3.3.3.3 to R3.

Step 5: Configure passive interface.

a. Issue the passive-interface command to change the G0/1 interface on R1, R2 and R3 to passive.

```
R1(config)# router ospf 20
R1(config-router)# passive-interface g0/1
```

b. Issue the **`show ip ospf interface g0/1`** command to verify that G0/1 is now passive.

Step 6: Verify OSPF neighbours and routing information.

a. Issue the **`show ip ospf neighbor`** command to verify that each router lists the other routers in the network as neighbours.
b. Issue the **`show ip route`** command to verify that all networks display in the routing table on the routers.

Step 7: Verify OSPF neighbours and routing information.

a. Issue the **`show ip ospf neighbor`** command to verify that each router lists the other routers in the network as neighbours.
b. Issue the **`show ip route`** command to verify that all networks display in the routing table on the routers.

Step 8: Verify OSPF protocol settings.

a. Issue the **`show ip protocols`** command to verify vital OSPF configuration information such as OSPF process ID, the router ID, networks the router is advertising, the neighbours the router is receiving updates from, and the default administrative distance.

Step 9: Verify OSPF process information.

a. Use the **`show ip ospf`** command to examine the OSPF process ID and router ID. This command displays the OSPF area information, as well as the last time the SPF algorithm was calculated.

Step 10: Verify network connectivity.

LAB INSTRUCTIONS:

1. You are required to complete the configuration based on the instruction.
2. Marks will be given only after you complete the configuration, and each end device can ping the other end devices in the topology.