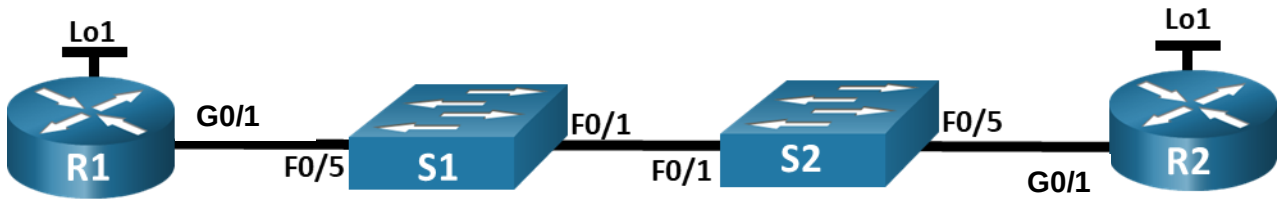
Lab 10 - Configure Single-Area OSPFv2 using Cisco Hardware

Topology



Addressing Table

Device	Interface	IP Address	Subnet Mask
R1	G0/1	10.53.0.1	255.255.255.0
	Loopback1	172.16.1.1	255.255.255.0
R2	G0/1	10.53.0.2	255.255.255.0
	Loopback1	192.168.1.1	255.255.255.0

Objectives

Part 1: Build the Network and Configure Basic Device Settings

Part 2: Configure and Verify Single-Area OSPFv2 for basic operation

Part 3: Optimize and Verify the Single-Area OSPFv2 configuration

Background / Scenario

You have been tasked with configuring a small company's network using OSPFv2. R1 will be hosting an internet connection (simulated by interface Loopback 1) and sharing the default route information to R2. After the initial configuration, the organization has asked for the configuration to be optimized to reduce protocol traffic and ensure that R1 remains in control of routing.

Instructions

Part 1: Build the Network and Configure Basic Device Settings.

Step 1: Cable the network as shown in the topology.

Attach the devices as shown in the topology diagram, and cable as necessary.

Step 2: Configure basic settings for each router.

a. Assign a device name to each router.

b. Disable DNS lookup to prevent the router from attempting to translate incorrectly entered commands as though they were host names.

c. Configure interface addresses on each router as shown in the Addressing Table above.

d. Loopback interfaces are virtual interfaces, there is no cable connected to them. Please configure the loopback interfaces in the same way as G0/1.

e. Verify your connected interfaces using R1#**show ip route connected**

Please go to Moodle and answer questions 1-3 and keep the quiz open as you move on to Part 2.

Part 2: Configure and Verify Single-Area OSPFv2 for basic operation.

Step 1: Configure interface addresses and basic OSPFv2 on each router.

a. Enter OSPF router configuration mode using process ID 56.

b. Configure a static router ID for each router (1.1.1.1 for R1, 2.2.2.2 for R2).

c. Configure a network statement for the network between R1 and R2 placing it in area 0.

Answer Q4 on Moodle: What command did you use for step c.?

d. On R2 only, add the configuration necessary to advertise the Loopback 1 network into OSPF area 0.

e. Verify OSPFv2 is operational between the routers. Issue **the command** to verify R1 and R2 have formed an adjacency. You can use slide 8 from Lecture 11 to help you.

Answer Q5 on Moodle – What command did you use for step 1 part (e) above.

f. **Q6** Which router is identified as the DR?

g. **Q7** Which router is the BDR?

h. **Q8** Why was this router elected as the DR?

i. On R1, issue the **show ip route ospf** command to verify that the R2 Loopback1 network is present in the routing table. Notice the default behavior of OSPF is to advertise a loopback interface as a host route using a 32 bit mask.

j. Ping the R2 Loopback 1 interface address from R1. The ping should succeed.

Part 3: Optimize the Single-Area OSPFv2 configuration

Step 1: Implement various optimizations on each router. Please use the lecture slides to help with the syntax. Lecture 11 from slide 10.

a. On R1, configure the interface G0/1 OSPF priority to 50 to ensure R1 is the Designated Router.

b. Configure the OSPF timers on the G0/1 of each router for a **hello timer** of 30 seconds and **dead timer** as 120.

c. On R1, configure a default static route that uses interface Loopback 1 as the exit interface. Then, propagate the default route into OSPF. Note the console message after setting the default route.

d. On R2 only, add the configuration necessary to **prevent** OSPF advertisements from being sent to the Loopback 1 network (passive interfaces).

Step 2: Verify OSPFv2 optimizations are in place.

a. Issue the **show ip ospf interface g0/1** command on R1 and verify that the interface priority has been set to 50 and that the time intervals are Hello 30, Dead 120, and the default Network Type is Broadcast.

b. On R1, issue the **show ip route ospf** command to verify that the R2 Loopback1 network is present in the routing table.

c. On R2, issue the **show ip route ospf** command. The only OSPF route information should be the default route R1 is propagating.

d. Ping the R1 Loopback 1 interface address from R2. The ping should succeed.

Show the outputs of the show commands above to your lecturer and receive a completion code for Q9 on Moodle.