Lab 9 - Single-Area OSPFv2

Addressing Table

Device	Interface	IP Address	Subnet Mask
R1	G0/0/0	192.168.10.1	/24
	S0/1/0	10.1.1.1	/30
	S0/1/1	10.1.1.5	/30
R2	G0/0/0	192.168.20.1	/24
	S0/1/0	10.1.1.2	/30
	S0/1/1	10.1.1.9	/30
R3	G0/0/0	192.168.30.1	/24
	S0/1/0	10.1.1.10	/30
	S0/1/1	10.1.1.6	/30
PC1	NIC	192.168.10.10	/24
PC2	NIC	192.168.20.10	/24
PC3	NIC	192.168.30.10	/24

Objectives

Part 1: Configure Router IDs.

Part 2: Configure Networks for OSPF Routing.

Part 3: Configure Passive Interfaces.

Part 4: Verify OSPF configuration.

Background

In this activity, you will activate OSPF routing using network statements and wildcard masks and by using network statements quad-zero masks. In addition, you will configure explicit router IDs and passive interfaces.

Instructions

Part 1: Configure router IDs.

a. Start the OSPF routing process on all three routers. Use process ID **10**.

    Router(config)# **router ospf** *process-id*

b. Use the router-id command to set the OSPF IDs of the three routers as follows

- R1: **1.1.1.1**
- R2: **2.2.2.2**
- R3: **3.3.3.3**

Use the following command:

```
Router(config-router)# router-id rid
```

QUESTION 1: What is the main purpose of configuring the router IDs?

Before proceeding, go to the "Lab 9 - Single-Area OSPFv2 - QUESTIONS" quiz on the Moodle page and enter your answer for question 1. Leave the quiz open while you complete the rest of the lab sheet.

Part 2: Configure Networks for OSPF Routing

Step 1: Configure networks for OSPF routing using network commands and wildcard masks.

QUESTION 2: How many statements are required to configure OSPF to route all the networks attached to router R1? In other words, how many networks is R1 <u>directly</u> connected to?

QUESTION 3: The LAN attached to router R1 has a /24 mask. What is the equivalent of this mask in dotted decimal representation?

QUESTION 4: The **wildcard mask** can be calculated by subtracting the dotted decimal subnet mask from 255.255.255.255. What is the result from doing this?

QUESTION 5: What is the dotted decimal equivalent of the /30 subnet mask?

QUESTION 6: What is the **wildcard mask** for the /30 subnet mask?

Before proceeding, return to the quiz on the Moodle page and enter your answers for question 2-6. Leave the quiz open while you complete the rest of the lab sheet.

a. Configure the routing process on R1 with the network statements and wildcard masks that are required to activate OSPF routing for all the attached networks. The network statement values should be the network or subnet addresses of the configured networks.

```
Router(config-router)# network network-address wildcard-mask area area-id
```

b. Verify that OSPF has been configured properly by the displaying the running configuration. If you find an error, delete the network statement using the **no** command and reconfigure it.

Step 2: Configure networks for OSPF routing using interface IP addresses and quad-zero masks.

On router R2, configure OSPF using network commands with the IP addresses of the interfaces and quad-zero masks. The syntax of the network command is the same as was used above.

Note: See page 31 of this week's lecture (lecture 10) is unsure how to do this.

Step 3: Configure OSPF routing on R3.

Configure OSPF on R3. Use the **network addresses for the two networks connected via serial links** and the **IP address of the interfaces (with quad-zero mask) for the LAN**.

Part 3: Configure Passive Interfaces

Configure the OSPF process on the LAN interface of each of the three routers with the **passive-interface** command.

```
Router(config-router)# passive-interface interface
```

QUESTION 7: Why do we configure certain interfaces as passive?

Before proceeding, return to the quiz on the Moodle page and enter your answer for question 7. Leave the quiz open while you complete the rest of the lab sheet.

Part 4: Verify OSPF Configuration

Use **show** commands to verify the network and passive interface configuration of the OSPF process on each router.

If you have correctly configured all parts of the lab your activity score should now be showing as 100%. If so, click on "check results" in the activity window. Return to the Moodle quiz one last time and enter the code into the appropriate question box (Q8) of the quiz.

You have completed the lab – please submit the Moodle quiz.