Packet Tracer - Determine the DR and BDR

Addressing Table

Device	Interface	IP Address	Subnet Mask
RA	G0/0	192.168.1.1	255.255.255.0
	Lo0	192.168.31.11	255.255.255.255
RB	G0/0	192.168.1.2	255.255.255.0
	Lo0	192.168.31.22	255.255.255.255
RC	G0/0	192.168.1.3	255.255.255.0
	Lo0	192.168.31.33	255.255.255.255

Objectives

Part 1: Examine DR and BDR Changing Roles

Part 2: Modify OSPF Priority and Force Elections

Scenario

In this activity, you will examine DR and BDR roles and watch the roles change when there is a change in the network. You will then modify the priority to control the roles and force a new election. Finally, you will verify routers are filling the desired roles.

Instructions

Part 1: Examine DR and BDR Changing Roles

Step 1: Wait until the amber link lights turn green.

When you first open the file in Packet Tracer, you may notice that the link lights for the switch are amber. These link lights will stay amber for 50 seconds while the STP protocol on the switch makes sure that one of the routers is not another switch. Alternatively, you can click **Fast Forward Time** to bypass this process.

Step 2: Verify the current OSPF neighbor states.

Use the appropriate command on each router to examine the current DR and BDR. If a router shows FULL/DROTHER it means that the router is not a DR or a BDR.

```
RA# show ip ospf neighbor


Neighbor ID     Pri   State          Dead Time   Address         Interface
192.168.31.33    2   FULL/DR        00:00:35    192.168.1.3     GigabitEthernet0/0
192.168.31.22    1   FULL/BDR       00:00:35    192.168.1.2     GigabitEthernet0/0


RB# show ip ospf neighbor
```

```
Neighbor ID     Pri   State         Dead Time    Address       Interface
192.168.31.11   1    FULL/DROTHER   00:00:36     192.168.1.1   GigabitEthernet0/0
192.168.31.33   2    FULL/DR        00:00:36     192.168.1.3   GigabitEthernet0/0

RC# show ip ospf neighbor

Neighbor ID     Pri   State         Dead Time    Address       Interface
192.168.31.11   1    FULL/DROTHER   00:00:39     192.168.1.1   GigabitEthernet0/0
192.168.31.22   1    FULL/BDR       00:00:38     192.168.1.2   GigabitEthernet0/0
```

Which router is the DR?

RC

Which router is the BDR?

RB

What is the OSPF state of router RA?

DROTHER

Step 3: Turn on IP OSPF adjacency debugging.

You can monitor the DR and BDR election process with a **debug** command. On **RA** and **RB**, enter the following command.

```
RA# debug ip ospf adj
RB# debug ip ospf adj
```

Step 4: Disable the Gigabit Ethernet 0/0 interface on RC.

a. Use the **shutdown** command to disable the link between **RC** and the switch to cause roles to change.

b. Wait about 30 seconds for the dead timers to expire on **RA** and **RB**.

    According to the debug output, which router was elected DR and which router was elected BDR?

    RB will be DR and RA will be BDR.

Step 5: Restore the Gigabit Ethernet 0/0 interface on RC.

a. Re-enable the link between **RC** and the switch.

b. Wait for the new DR/BDR elections to occur.

    Did DR and BDR roles change? Explain.

    No, because OSPF does not update the DR/BDR when the existing ones are active.

c. Verify the DR and BDR assignments using the **show ip ospf neighbor** command on router **RC**.

```
RC# show ip ospf neighbor

Neighbor ID     Pri   State      Dead Time    Address       Interface
192.168.31.22   1    FULL/DR     00:00:34     192.168.1.2   GigabitEthernet0/0
192.168.31.11   1    FULL/BDR    00:00:34     192.168.1.1   GigabitEthernet0/0
```

Note: if the **show ip ospf neighbor** command does not return RB as the DR and RA as the BDR, turn off debugging on RA and RB with the **undebug all** command and retry steps 4 and 5.

Step 6: Disable the GigabitEthernet0/0 interface on RB.

a. Disable the link between **RB** and the switch to cause roles to change.

b. Wait about 30 seconds for the holddown timers to expire on **RA** and **RC**.

According to the debug output on **RA**, which router was elected DR and which router was elected BDR?

RA is now the DR, while RC is the new BDR. When the DR failed (RB), the BDR (RA), took over as the DR.

Step 7: Restore the GigabitEthernet0/0 interface on RB.

a. Re-enable the link between **RB** and the switch.

Wait for the new DR/BDR elections to occur. Did DR and BDR roles change? Explain.

No, roles did not change because the current DR and BDR are still active. When a router with a higher router ID comes online, it won't take over the BDR role until the BDR fails.

b. Use the **show ip ospf interface** command on router RC.

What is the status of router RC now?

BDR.

Enter the command **undebug all** on **RA** and **RB** to disable debugging.

Part 2: Modify OSPF Priority and Force Elections

Step 1: Configure OSPF priorities on each router.

a. To change the DR and BDR, use the **ip ospf priority** command to configure the GigabitEthernet 0/0 port of each router with the following OSPF interface priorities:

- **RA**: 200
- **RB**: 100
- **RC**: 1 (This is the default priority)

```
RA(config)# interface g0/0
RA(config-if)# ip ospf priority 200
```

b. Set the priority on router **RB** and **RC**.

RB(config)# interface g0/0

RB(config-if)# ip ospf priority 100

RC(config)# interface g0/0

RC(config-if)# ip ospf priority 1

Step 2: Force an election by resetting the OSPF process on the routers.

Starting with router **RA**, issue the **clear ip ospf process** on each router to reset the OSPF process.

Step 3: Verify DR and BDR elections were successful.

Wait long enough for OSPF to converge and for the DR/BDR election to occur. This should take a few minutes. You can click **Fast Forward Time** to speed up the process.

According to output from the **show ip ospf neighbor** command on the routers, which router is now DR and which router is now BDR?

RA is now DR and RB is now BDR.

Note: If the routers do not elect the correct DR and BDR after setting the OSPF priorities try restarting Packet Tracer.