

## Laboratory Activity Sheet

### Module: 6 – OSPF (Open Shortest Path First)

Activity Title: Understanding OSPF Through Real-Life Scenarios

#### Learning Objectives

- Understand the difference between static and dynamic routing.
- Identify how OSPF chooses the best path.
- Practice converting subnet masks to wildcard masks.
- Explain OSPF's importance in real networks.

#### Activity

##### Scenario 1 – Static vs Dynamic Routing

A school has 2 routers. The IT staff manually sets the routes. Later, the school expands to 15 routers.

1. Which routing method is easier for 2 routers? **Because the routes may be manually defined with little effort, static routing is simpler.**
2. Which routing method is better for 15 routers? Why? **Compared to manually setting up several static routes, dynamic routing, like OSPF, is superior because it automatically refreshes and updates routes, saving time and minimizing errors.**

##### Scenario 2 – Hop Count vs Cost

The city sets up two paths: - Path A: 3 routers (slower links, 10 Mbps each) - Path B: 1 direct router (faster link, 1 Gbps)

1. Which path would RIP (hop count) choose? **Since RIP only considers hop count, it would select Path A, which has three hops as compared to Path B's one.**
2. Which path would OSPF (cost) choose? Why? **Given that OSPF bases its cost calculation on bandwidth and that the 1 Gbps link is significantly less expensive than the 10 Mbps lines in Path A, it would select Path B as the most cost-effective option.**

##### Scenario 3 – Wildcard Mask

The network uses 192.168.1.0/24.

1. What is the wildcard mask of 255.255.255.0? **0.0.0.255.**
2. Why does OSPF use wildcard masks? **OSPF uses wildcard masks to define which IP addresses in a network or subnet should be included when forming OSPF adjacencies and advertising routes.**

## Scenario 4 – Link Failure

A company has 3 branches: Quezon City, Makati, Cavite. The Quezon City–Cavite link goes down.

1. What will OSPF do? ***In order to maintain connectivity in the event that the Quezon City–Cavite link fails, OSPF will automatically recalculate the best possible path and, if practical, divert traffic through Makati.***
- 2.
3. If static routing was used, what would the IT staff need to do? ***In order to reestablish connectivity between the branches, the IT team would have to manually modify or create new routes on each router that was impacted if static routing had been employed.***

## Output

Answer the questions in complete sentences.