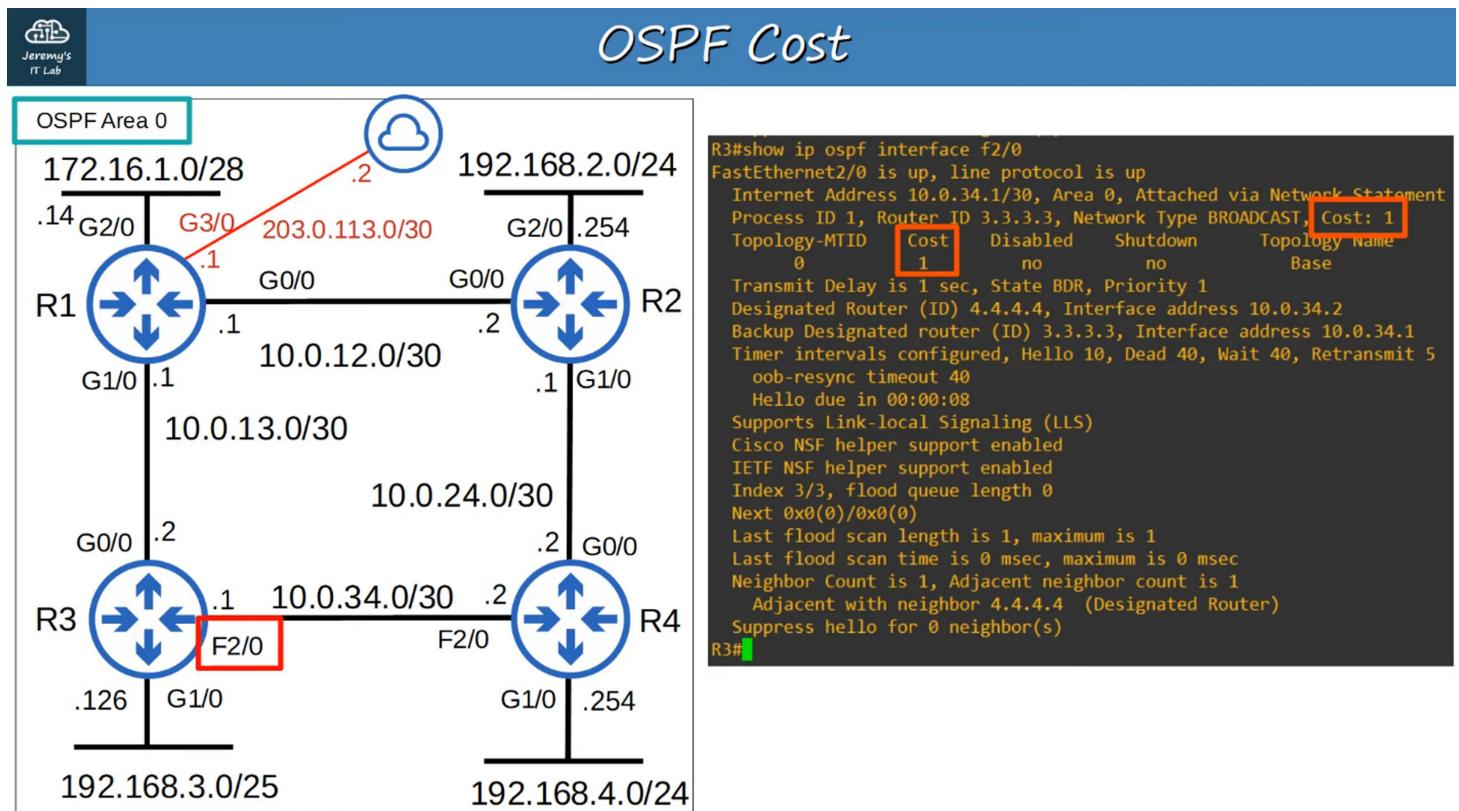


What is OSPF Cost?

- **OSPF Cost** is the **metric** used by the OSPF protocol to choose the **best path**.
 - It represents the "expense" or "preference" of sending traffic through a particular interface.
 - **Lower cost = more preferred path.**



OSPF Cost Formula

OSPF Cost = Reference Bandwidth / Interface Bandwidth

- **Default Reference Bandwidth = 100 Mbps** (100,000,000 bits/sec)
 - **Interface Bandwidth** is the actual speed of the interface (in bits/sec)

 Example:

Interface Type	Bandwidth	OSPF Cost (Default)
Ethernet	10 Mbps	10
FastEthernet	100 Mbps	1
GigabitEthernet	1000 Mbps	0.1 (rounded to 1)
10G Ethernet	10,000 Mbps	0.01 (rounded to 1)

But... OSPF can't use decimal values, so **interfaces faster than 100 Mbps will also get cost = 1**,

unless **reference bandwidth** is changed.

What is Reference Bandwidth?

- The **Reference Bandwidth** defines the **maximum link speed** used to calculate the OSPF cost.
- Default: 100 Mbps
- You must **manually change** it on all routers if you want OSPF to correctly differentiate between Gigabit, 10G, etc.

Cisco Command to Change It:

```
R1(config)# router ospf 1
```

```
R1(config-router)# auto-cost reference-bandwidth 10000
```

This sets reference bandwidth to **10,000 Mbps (10 Gbps)**.

Important:

This change must be done on **all routers** in the OSPF domain for consistent cost calculation.

Manually Setting Cost

You can also **manually override** the cost per interface:

```
R1(config)# interface g0/1
```

```
R1(config-if)# ip ospf cost 50
```

Summary Table

Concept	Value/Description
Default Ref. Bandwidth	100 Mbps (100,000,000 bps)
Formula	Cost = Reference BW / Interface BW
Lower cost	More preferred route
Manual override	ip ospf cost [value] on interface
Update Ref BW	auto-cost reference-bandwidth [value]

3. Change Interface Bandwidth (Optional)

If you want OSPF to calculate cost based on a **custom bandwidth**, you can change the interface's bandwidth value.

Command:

```
R1(config)# interface GigabitEthernet0/1
```

```
R1(config-if)# bandwidth 10000
```

 Bandwidth is in **Kbps**. So:

- 10000 = 10 Mbps
- 1000000 = 1 Gbps

- ◆ This affects routing protocols but **not actual speed**.

Clear ip ospf process