Chương 6
Open Shortest Path First

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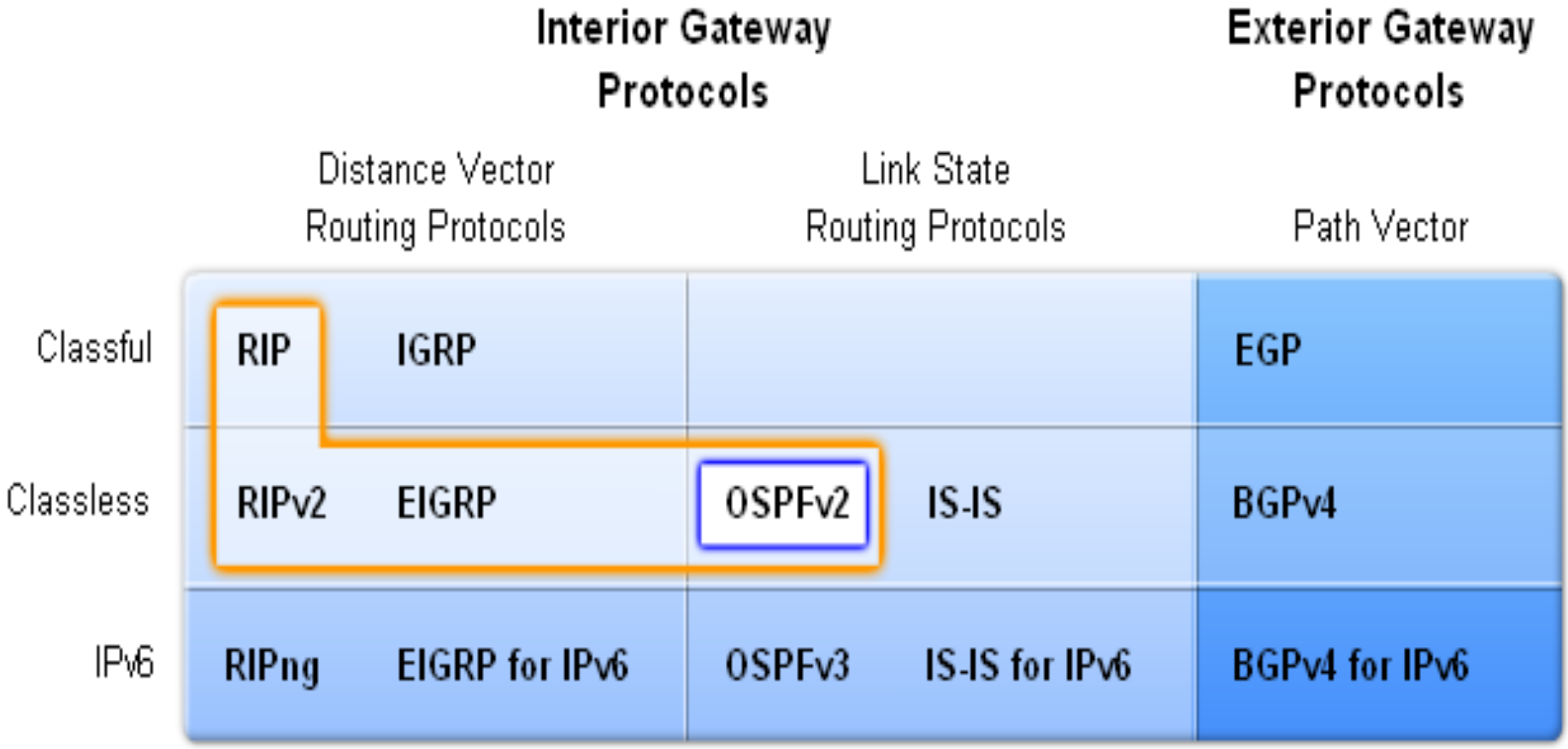
Nội Dung

- Giới thiệu OSPF
- Cấu hình OSPF
- OSPF Metric

Nội Dung

- **Giới thiệu OSPF**
- Cấu hình OSPF
- OSPF Metric

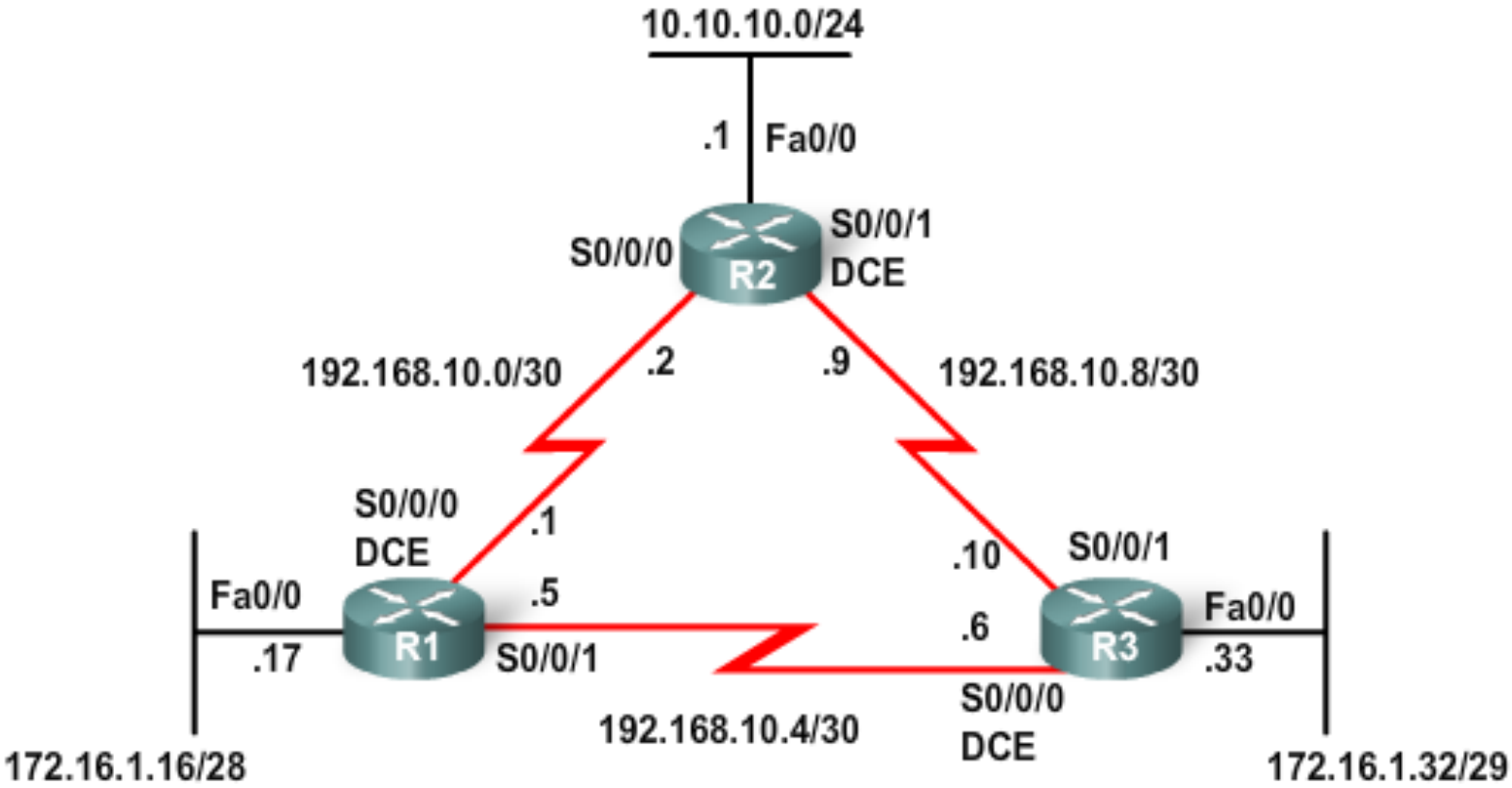
Giới thiệu OSPF



Nội Dung

- Giới thiệu OSPF
- **Cấu hình OSPF**
- OSPF Metric

Network Topology



IP Address

Device	Interface	IP Address	Subnet Mask
R1	Fa0/0	172.16.1.17	255.255.255.240
	S0/0/0	192.168.10.1	255.255.255.252
	S0/0/1	192.168.10.5	255.255.255.252
R2	Fa0/0	10.10.10.1	255.255.255.0
	S0/0/0	192.168.10.2	255.255.255.252
	S0/0/1	192.168.10.9	255.255.255.252
R3	Fa0/0	172.16.1.33	255.255.255.248
	S0/0/0	192.168.10.6	255.255.255.252
	S0/0/1	192.168.10.10	255.255.255.252

OSPF Command

- router ospf ***process-id***
  - Process-id : có ý nghĩa tương tự AS
  - Có giá trị : 1 - 65535

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

```
R2(config)#router ospf 1
R2(config-router)#
```

```
R3(config)#router ospf 1
R3(config-router)#
```

OSPF Network Command

- **network address**
- **wildcard mask**
- **area-id**
- Example: Router(config-router)#**network** network-address wildcard-ask **area** area-id

```
R1(config)#router ospf 1
R1(config-router)#network 172.16.1.16 0.0.0.15 area 0
R1(config-router)#network 192.168.10.0 0.0.0.3 area 0
R1(config-router)#network 192.168.10.4 0.0.0.3 area 0
```

```
R2(config)#router ospf 1
R2(config-router)#network 10.10.10.0 0.0.0.255 area 0
R2(config-router)#network 192.168.10.0 0.0.0.3 area 0
R2(config-router)#network 192.168.10.8 0.0.0.3 area 0
```

```
R3(config)#router ospf 1
R3(config-router)#network 172.16.1.32 0.0.0.7 area 0
R3(config-router)#network 192.168.10.4 0.0.0.3 area 0
R3(config-router)#network 192.168.10.8 0.0.0.3 area 0
```

Nội Dung

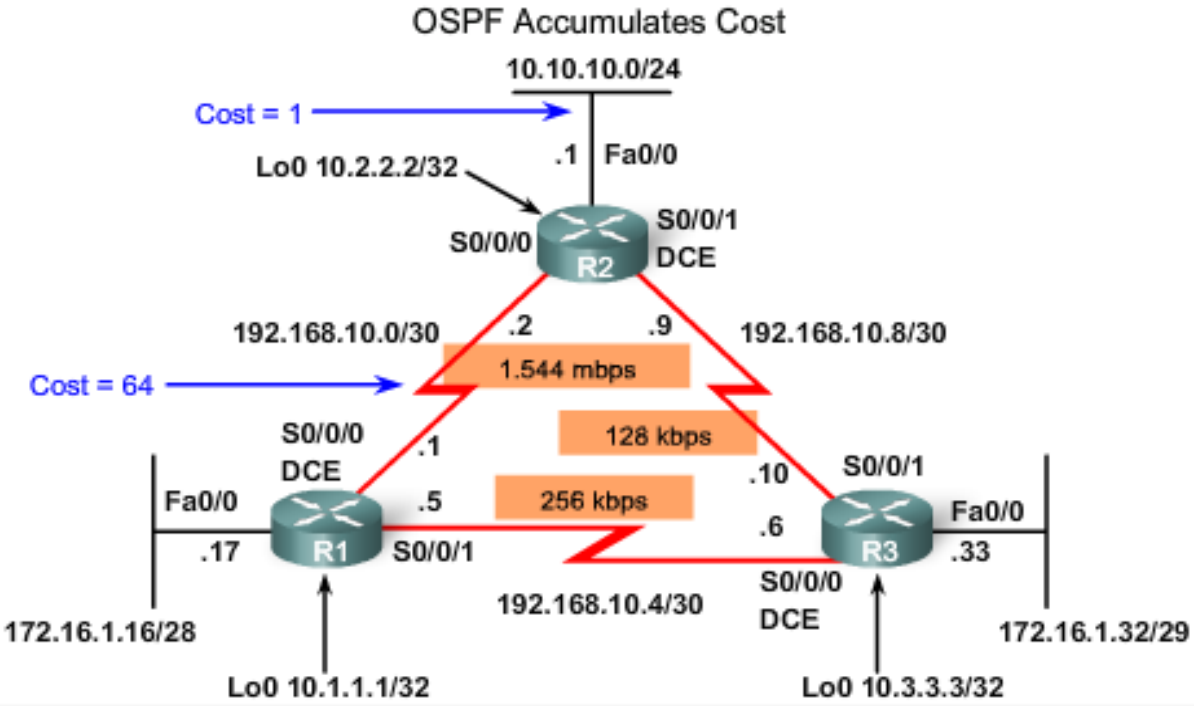
- Giới thiệu OSPF
- Cấu hình OSPF
- **OSPF Metric**

OSPF Metric

- Cisco sử dụng mặc định Bandwidth để tính OSPF Metric
  - Metric = **10^8/bandwidth**

Interface Type	10^8/bps = Cost
Fast Ethernet and faster	10^8/100,000,000 bps = 1
Ethernet	10^8/10,000,000 bps = 10
E1	10^8/2,048,000 bps = 48
T1	10^8/1,544,000 bps = 64
128 kbps	10^8/128,000 bps = 781
64 kbps	10^8/64,000 bps = 1562
56 kbps	10^8/56,000 bps = 1785

OSPF Metric




```
R1#show ip route
Codes: <some code output omitted>
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

***output omitted***
O       10.10.10.0/24 [110/65] via 192.168.10.2, 14:27:57, Serial0/0/0
```

Accumulated Cost = 65

OSPF Metric

- Cấu hình **Bandwidth** cho Interface :
  - Router(config-if)#bandwidth ***bandwidth-kbps***

```
R1(config)#inter serial 0/0/0
R1(config-if)#bandwidth 64
R1(config-if)#inter serial 0/0/1
R1(config-if)#bandwidth 256
R1(config-if)#end
R1#show ip ospf interface serial 0/0/0
Serial0/0 is up, line protocol is up
  Internet Address 192.168.10.1/30, Area 0
  Process ID 1, Router ID 10.1.1.1, Network Type POINT_TO_POINT, Cost: 1562
  Transmit Delay is 1 sec, State POINT_TO_POINT,
  <output omitted>
```

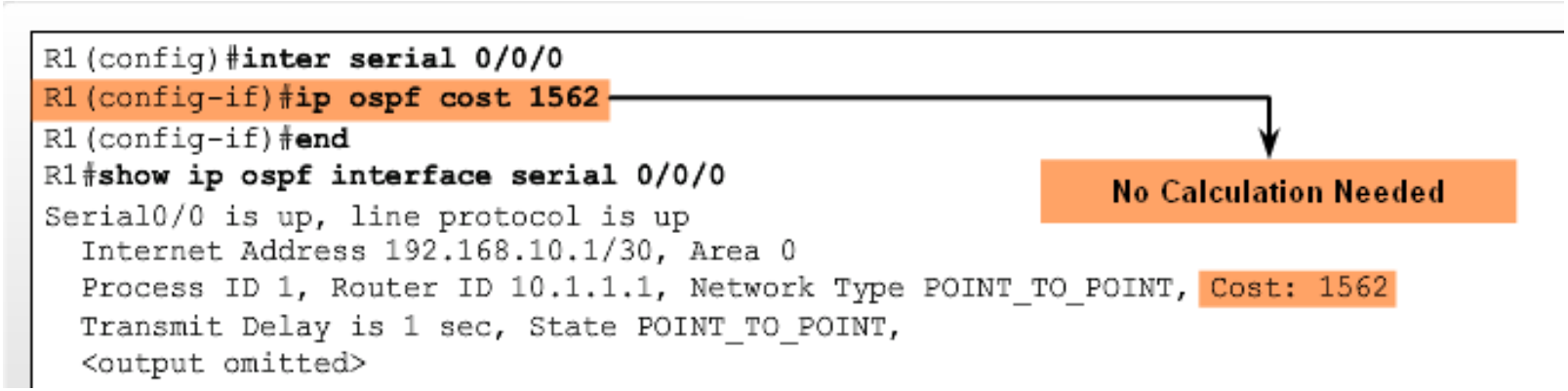
$10^8 / 64{,}000 \text{ bps} = 1562$

```
R2(config)#inter serial 0/0/0
R2(config-if)#bandwidth 64
R2(config-if)#inter serial 0/0/1
R2(config-if)#bandwidth 128
```

```
R3(config)#inter serial 0/0/0
R3(config-if)#bandwidth 256
R3(config-if)#inter serial 0/0/1
R3(config-if)#bandwidth 128
```

OSPF Metric

- Cấu hình **Cost** cho Interface :
  - R1(config)#interface serial 0/0/0
  - R1(config-if)#ip ospf cost **1562**



Bandwidth và Cost

bandwidth Commands		ip ospf cost Commands
Router R1 R1(config)#**interface serial 0/0/0** R1(config-if)#**bandwidth 64**	=	**Router R1** R1(config)#**interface serial 0/0/0** R1(config-if)#**ip ospf cost 1562**
R1(config)#**interface serial 0/0/1** R1(config-if)#**bandwidth 256**	=	R1(config)#**interface serial 0/0/1** R1(config-if)#**ip ospf cost 390**
Router R2 R2(config)#**interface serial 0/0/0** R2(config-if)#**bandwidth 64**	=	**Router R2** R2(config)#**interface serial 0/0/0** R2(config-if)#**ip ospf cost 1562**
R2(config)#**interface serial 0/0/1** R2(config-if)#**bandwidth 128**	=	R2(config)#**interface serial 0/0/1** R2(config-if)#**ip ospf cost 781**
Router R3 R3(config)#**interface serial 0/0/0** R3(config-if)#**bandwidth 256**	=	**Router R3** R3(config)#**interface serial 0/0/0** R3(config-if)#**ip ospf cost 390**
R3(config)#**interface serial 0/0/1** R3(config-if)#**bandwidth 128**	=	R3(config)#**interface serial 0/0/0** R3(config-if)#**ip ospf cost 781**

Câu hỏi ôn tập

1) Những đặc điểm của OSPF ?
2) Metric của OSPF dựa vào những thông số nào ?
3) Cách tính Metric cho OSPF