7. OSPF

ICT폴리텍대학

강 상 희

7. OSPF

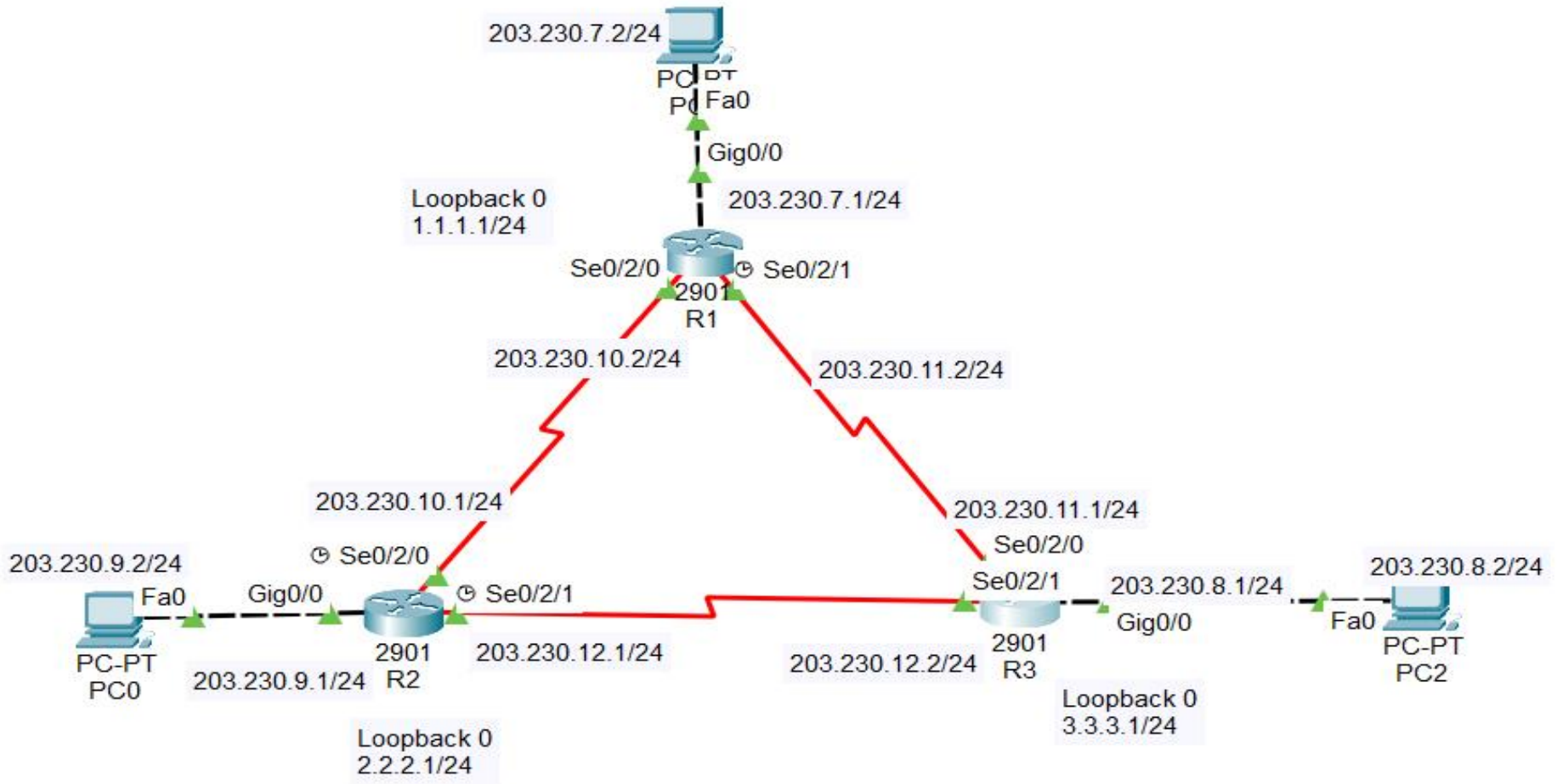
목 차

- OSPF

OSPF(Open Shortest Path First)

- **RIP, EIGRP** 보다 복잡하나 계층화된 라우팅 동작 수행
- 중/대규모 네트워크에서 가장 많이 사용
- **224.0.0.5, 224.0.0.6** 멀티캐스트 주소과 **89 Port** 사용
- 목적지까지의 비용이 가장 적게 소요되는 경로 설정
- 최단 경로 우선 알고리즘 사용

OSPF(Open Shortest Path First)



OSPF(Open Shortest Path First)

라우터 R1의 설정 스크립트

1. Router(config)#hostname R1
2. R1(config)#int loopback 0
3. R1(config-if)#ip add 1.1.1.1 255.255.255.0
4. R1(config)#int gi0/0
5. R1(config-if)#ip address 203.230.7.1 255.255.255.0
6. R1(config-if)#no shut
7. R1(config-if)#int s0/2/0
8. R1(config-if)#ip address 203.230.10.2 255.255.255.0
9. R1(config-if)#no shut
10. R1(config-if)#int s0/2/1
11. R1(config-if)#ip address 203.230.11.2 255.255.255.0
12. R1(config-if)#clock rate 64000
13. R1(config-if)#no shutdown
14. R1(config-if)#exit

OSPF(Open Shortest Path First)

라우터 R2의 설정 스크립트

1. Router(config)#hostname R2
2. R2(config)#int loopback 0
3. R2(config-if)#ip add 2.2.2.1 255.255.255.0
4. R2(config)#int gi0/0
5. R2(config-if)#ip address 203.230.9.1 255.255.255.0
6. R2(config-if)#no shut
7. R2(config-if)#int s0/2/0
8. R2(config-if)#ip address 203.230.10.1 255.255.255.0
9. R2(config-if)#clock rate 64000
10. R2(config-if)#no shut
11. R2(config-if)#int s0/2/1
12. R2(config-if)#ip address 203.230.12.1 255.255.255.0
13. R2(config-if)#clock rate 64000
14. R2(config-if)#no shutdown
15. R2(config-if)#exit

OSPF(Open Shortest Path First)

라우터 R3의 설정 스크립트

1. Router(config)#hostname R3
2. R3(config)#int loopback 0
3. R3(config-if)#ip add 3.3.3.1 255.255.255.0
4. R3(config)#int gi0/0
5. R3(config-if)#ip address 203.230.8.1 255.255.255.0
6. R3(config-if)#no shut
7. R3(config-if)#int s0/2/0
8. R3(config-if)#ip address 203.230.11.1 255.255.255.0
9. R3(config-if)#no shut
10. R3(config-if)#int s0/2/1
11. R3(config-if)#ip address 203.230.12.2 255.255.255.0
12. R3(config-if)#no shutdown
13. R3(config-if)#exit

OSPF(Open Shortest Path First)

OSPF 라우팅 프로토콜 선언

R1(config)#router ospf Process-ID
R1(config-router)#router-id OSPF router-ID
R1(config-router)#network network-address wildcard-mask area area-id

- **OSPF : Process-ID 는 1~65535사이 숫자,**
  동일한 Process-ID 사용 안해도 됨
- **EIGRP : 라우팅 정보를 주고받을 경우 동일한 Process-ID 사용**
- **wildcard-mask : 서브넷 마스크와 반대 개념**

OSPF(Open Shortest Path First)

/* Process-ID는 7, Area-ID는 단일영역 OSPF로 구성 */

1. R1(config)#do show ip int brief
2. R1(config)#router ospf 7
3. R1(config-router)#network 203.230.7.1 0.0.0.0 area 0
4. R1(config-router)#network 203.230.10.2 0.0.0.0 area 0
5. R1(config-router)#network 203.230.11.2 0.0.0.0 area 0
6. R1(config-router)#network 1.1.1.1 0.0.0.0 area 0

OSPF(Open Shortest Path First)

1. R2(config)#do show ip int brief
2. R2(config)#router ospf 7
3. R2(config-router)#network 203.230.9.1 0.0.0.0 area 0
4. R2(config-router)#network 203.230.10.1 0.0.0.0 area 0
5. R2(config-router)#network 203.230.12.1 0.0.0.0 area 0
6. R2(config-router)#network 2.2.2.1 0.0.0.0 area 0

7. R3(config)#do show ip int brief
8. R3(config)#router ospf 7
9. R3(config-router)#network 203.230.8.1 0.0.0.0 area 0
10. R3(config-router)#network 203.230.11.1 0.0.0.0 area 0
11. R3(config-router)#network 203.230.12.2 0.0.0.0 area 0
12. R3(config-router)#network 3.3.3.1 0.0.0.0 area 0

OSPF(Open Shortest Path First)

Protocol 확인 (ospf 7 확인)

1. **R1(config-router)#do show ip protocols**

1. **R2(config-router)#do show ip protocols**

1. **R3(config-router)#do show ip protocols**

10초 간격으로 핼로 패킷 받음

1. **R3#debug ip ospf events**

OSPF(Open Shortest Path First)

현재 네이버를 맺고 있는 라우터 확인

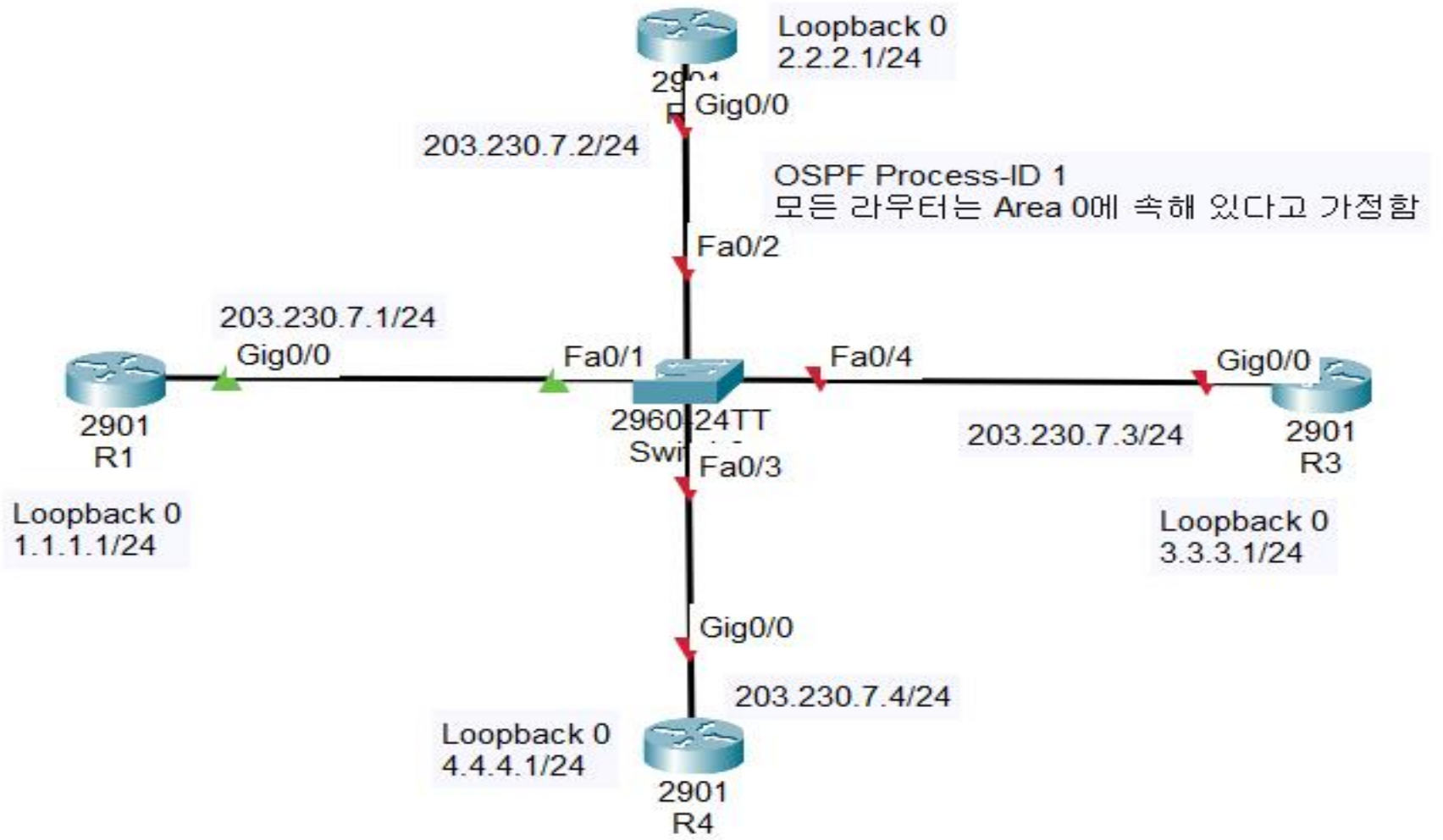
1. **R1#show ip ospf neighbor**
2. **R2#show ip ospf neighbor**
3. **R3#show ip ospf neighbor**

/* 대역에 따른 비용 확인 */

1. **R1#show ip ospf interface S0/2/0**
   /* cost : 1562…. 64kbps, F,G/Ethernet : 1, 128Kbps(781)

1. **R2#show ip ospf neighbor**
2. **R3#show ip ospf neighbor**

OSPF(Open Shortest Path First)



OSPF(Open Shortest Path First)

라우터 **R1**의 설정 스크립트

1. **Router(config)#hostname R1**
2. **R1(config)#int loopback 0**
3. **R1(config-if)#ip add 1.1.1.1 255.255.255.0**
4. **R1(config)#int gi0/0**
5. **R1(config-if)#ip address 203.230.7.1 255.255.255.0**
6. **R1(config-if)#no shut**
7. **R1(config-if)#do show ip int brief**
8. **----------(확인)**
9. **R1(config-if)#router ospf 1**
10. **R1(config-router)#network 203.230.7.1 0.0.0.0 area 0**
11. **R1(config-router)#network 1.1.1.1 0.0.0.0 area 0**
12. **R1(config-router)#do show ip ospf neighbor** /* 결과 없음 */

OSPF(Open Shortest Path First)

라우터 R2의 설정 스크립트

1. Router(config)#hostname R2
2. R2(config)#int lo 0
3. R2(config-if)#ip add 2.2.2.1 255.255.255.0
4. R2(config)#int gi0/0
5. R2(config-if)#ip address 203.230.7.2 255.255.255.0
6. R2(config-if)#no shut
7. R2(config-if)#do show ip int brief
8. ----------(확인)
9. R2(config-if)#router ospf 1
10. R2(config-router)#network 203.230.7.2 0.0.0.0 area 0
11. R2(config-router)#network 2.2.2.1 0.0.0.0 area 0
12. R2(config-router)#do show ip ospf neighbor

OSPF(Open Shortest Path First)

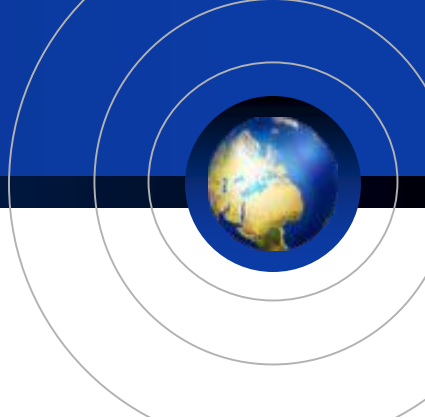
라우터 R3의 설정 스크립트

1. Router(config)#hostname R3
2. R3(config)#int lo 0
3. R3(config-if)#ip add 3.3.3.1 255.255.255.0
4. R3(config)#int gi0/0
5. R3(config-if)#ip address 203.230.7.3 255.255.255.0
6. R3(config-if)#no shut
7. R3(config-if)#do show ip int brief
8. ----------(확인)
9. R3(config-if)#router ospf 1
10. R3(config-router)#network 203.230.7.3 0.0.0.0 area 0
11. R3(config-router)#network 3.3.3.1 0.0.0.0 area 0
12. R3(config-router)#do show ip ospf neighbor

OSPF(Open Shortest Path First)

라우터 **R4**의 설정 스크립트

1. **Router(config)#hostname R4**
2. **R4(config)#int lo 0**
3. **R4(config-if)#ip add 4.4.4.1 255.255.255.0**
4. **R4(config)#int gi0/0**
5. **R4(config-if)#ip address 203.230.7.4 255.255.255.0**
6. **R4(config-if)#no shut**
7. **R4(config-if)#do show ip int brief**
8. **----------(확인)**
9. **R4(config-if)#router ospf 1**
10. **R4(config-router)#network 203.230.7.4 0.0.0.0 area 0**
11. **R4(config-router)#network 4.4.4.1 0.0.0.0 area 0**
12. **R4(config-router)#do show ip ospf neighbor**



Q & A

감 사 합 니 다`