

บทที่ 20

Lab Dynamic Route-OSPF

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Open Shortest Path First (OSPF) เป็น Routing Protocol แบบ Link State และเป็น Routing ที่นิยมใช้กันอย่างแพร่หลายมากที่สุดในระบบ Network เป็น Routing ที่มีการรับรู้ถึงความเปลี่ยนแปลงใน Topology หรือเส้นทางของ Network ได้อย่างรวดเร็ว และมีความสามารถในการรองรับการขยายของระบบ (Scalable) ได้เป็นอย่างดีเยี่ยม

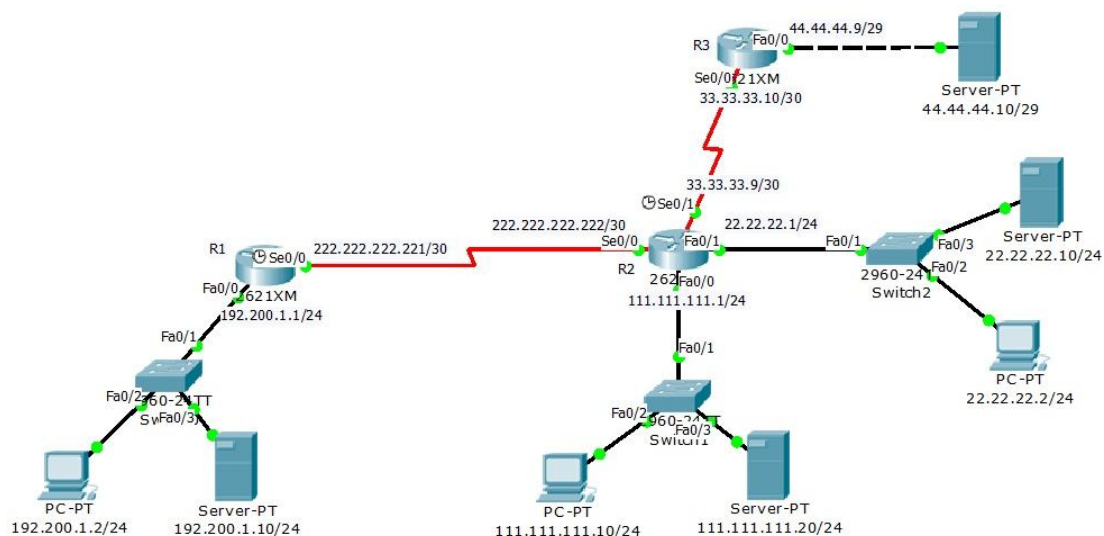
Lab 1. ให้ Config Routing ด้วย OSPF โดยใช้ค่า Process ID = 200 , Area ID = 0 บน Router R1,R2 และ R3 เครื่อง Client ทุกเครื่องต้องสามารถติดต่อกันได้

รูปแบบ Config OSPF

Router(config)#router ospf Process ID

Router(config-router)#network Network-IP wildcard-mask area Area ID

ให้วาดภาพดังนี้



ให้ Set IP Address ตามรูปภาพ และ Config WAN ให้ Up และติดต่อกัน ได้ภายในNetwork เดียวกัน เช่น

R1#show interfaces s0/0

Serial0/0 is up, line protocol is up (connected)

Hardware is HD64570

Internet address is 222.222.222.221/30

R1#ping 222.222.222.222

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 222.222.222.222, timeout is 2 seconds:

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 3/20/40 ms

เฉลย LAB Config OSPF

R1(config)#router ospf 200

R1(config-router)#network 192.200.1.0 0.0.0.255 area 0

R1(config-router)#network 222.222.222.220 0.0.0.3 area 0

R2(config)#router ospf 200

R2(config-router)#network 222.222.222.220 0.0.0.3 area 0

R2(config-router)#network 111.111.111.0 0.0.0.255 area 0

R2(config-router)#network 22.22.22.0 0.0.0.255 area 0

R2(config-router)#network 33.33.33.8 0.0.0.3 area 0

R3(config)#router ospf 200

R3(config-router)#network 33.33.33.8 0.0.0.3 area 0

R3(config-router)#network 44.44.44.8 0.0.0.7 area 0

R1#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

22.0.0.0/24 is subnetted, 1 subnets

O 22.22.22.0 [110/65] via 222.222.222.222, 00:10:05, Serial0/0

33.0.0.0/30 is subnetted, 1 subnets

O 33.33.33.8 [110/128] via 222.222.222.222, 00:09:55, Serial0/0

44.0.0.0/29 is subnetted, 1 subnets

O 44.44.44.8 [110/129] via 222.222.222.222, 00:03:05, Serial0/0

111.0.0.0/24 is subnetted, 1 subnets

O 111.111.111.0 [110/65] via 222.222.222.222, 00:10:15, Serial0/0

C 192.200.1.0/24 is directly connected, FastEthernet0/0

222.222.222.0/30 is subnetted, 1 subnets

C 222.222.222.220 is directly connected, Serial0/0

R2#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

22.0.0.0/24 is subnetted, 1 subnets

C 22.22.22.0 is directly connected, FastEthernet0/1

33.0.0.0/30 is subnetted, 1 subnets

C 33.33.33.8 is directly connected, Serial0/1

44.0.0.0/29 is subnetted, 1 subnets

O 44.44.44.8 [110/65] via 33.33.33.10, 00:08:14, Serial0/1

111.0.0.0/24 is subnetted, 1 subnets

C 111.111.111.0 is directly connected, FastEthernet0/0

O 192.200.1.0/24 [110/65] via 222.222.222.221, 00:17:33, Serial0/0

222.222.222.0/30 is subnetted, 1 subnets

C 222.222.222.220 is directly connected, Serial0/0

R3#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

22.0.0.0/24 is subnetted, 1 subnets

O 22.22.22.0 [110/65] via 33.33.33.9, 00:12:25, Serial0/0

33.0.0.0/30 is subnetted, 1 subnets

C 33.33.33.8 is directly connected, Serial0/0

44.0.0.0/29 is subnetted, 1 subnets

C 44.44.44.8 is directly connected, FastEthernet0/0

111.0.0.0/24 is subnetted, 1 subnets

O 111.111.111.0 [110/65] via 33.33.33.9, 00:12:25, Serial0/0

O 192.200.1.0/24 [110/129] via 33.33.33.9, 00:12:25, Serial0/0

222.222.222.0/30 is subnetted, 1 subnets

O 222.222.222.220 [110/128] via 33.33.33.9, 00:12:25, Serial0/0

ตัวอย่างผลการ ping จาก เครื่อง Client ที่อยู่ใน LAN ของ Router R1 ping ไปยัง Server ที่อยู่ใน LAN ของ Router R2 ตามรูปด้านล่าง

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PC>ipconfig
IP Address.....: 192.200.1.2
Subnet Mask.....: 255.255.255.0
Default Gateway.....: 192.200.1.1

PC>ping 44.44.44.10

Pinging 44.44.44.10 with 32 bytes of data:

Reply from 44.44.44.10: bytes=32 time=109ms TTL=125
Reply from 44.44.44.10: bytes=32 time=156ms TTL=125
Reply from 44.44.44.10: bytes=32 time=135ms TTL=125
Reply from 44.44.44.10: bytes=32 time=100ms TTL=125

Ping statistics for 44.44.44.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 100ms, Maximum = 156ms, Average = 125ms

PC>
```

ตัวอย่าง command ที่ใช้ตรวจสอบ Routing OSPF

R1#show ip ospf ?

<1-65535> Process ID number
border-routers Border and Boundary Router Information
database Database summary
interface Interface information
neighbor Neighbor list
virtual-links Virtual link information
<cr>

R1#show ip ospf

Routing Process "ospf 200" with ID **222.222.222.221**
Supports only single TOS(TOS0) routes
Supports opaque LSA
SPF schedule delay 5 secs, Hold time between two SPFs 10 secs
Minimum LSA interval 5 secs. Minimum LSA arrival 1 secs
Number of external LSA 0. Checksum Sum 0x000000
Number of opaque AS LSA 0. Checksum Sum 0x000000
Number of DCbitless external and opaque AS LSA 0
Number of DoNotAge external and opaque AS LSA 0
Number of areas in this router is 1. 1 normal 0 stub 0 nssa
External flood list length 0
Area BACKBONE(0)
Number of interfaces in this area is 2
Area has no authentication
SPF algorithm executed 11 times
Area ranges are
Number of LSA 3. Checksum Sum 0x01a789
Number of opaque link LSA 0. Checksum Sum 0x000000
Number of DCbitless LSA 0
Number of indication LSA 0
Number of DoNotAge LSA 0
Flood list length 0

R1#show ip ospf interface

FastEthernet0/0 is up, line protocol is up

Internet address is 192.200.1.1/24, Area 0

Process ID 200, Router ID 222.222.222.221, Network Type BROADCAST, Cost: 1

Transmit Delay is 1 sec, State DR, Priority 1

Designated Router (ID) 222.222.222.221, Interface address 192.200.1.1

No backup designated router on this network

Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5

Hello due in 00:00:05

Index 1/1, flood queue length 0

Next 0x0(0)/0x0(0)

Last flood scan length is 1, maximum is 1

Last flood scan time is 0 msec, maximum is 0 msec

Neighbor Count is 0, Adjacent neighbor count is 0

Suppress hello for 0 neighbor(s)

Serial0/0 is up, line protocol is up

Internet address is 222.222.222.221/30, Area 0

Process ID 200, Router ID 222.222.222.221, Network Type POINT-TO-POINT, Cost: 64

Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0

No designated router on this network

No backup designated router on this network

Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5

Hello due in 00:00:05

Index 2/2, flood queue length 0

Next 0x0(0)/0x0(0)

Last flood scan length is 1, maximum is 1

Last flood scan time is 0 msec, maximum is 0 msec

Neighbor Count is 1, Adjacent neighbor count is 1

Adjacent with neighbor 222.222.222.222

Suppress hello for 0 neighbor(s)

หวังว่าบทความนี้ คงจะก่อให้เกิดประโยชน์ไม่มากนักก็น้อยสำหรับผู้ทำงานอยู่กับอุปกรณ์isco นะครับ

สนับสนุนโดย <http://www.jodoi.com>