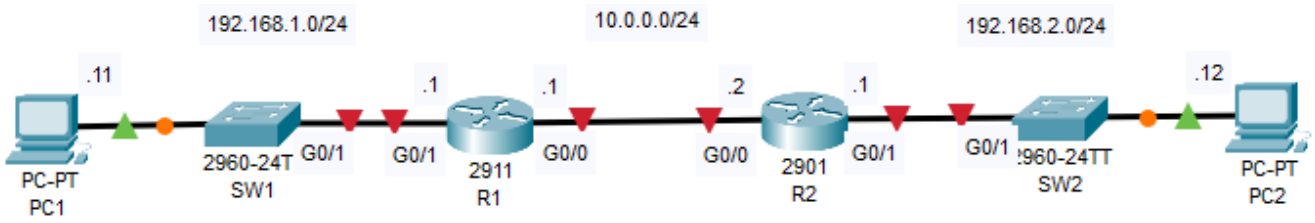
ACTIVITY 24 : Static Routing (Part 1)



1. Configure the G0/0 and G0/1 interfaces of R1 and R2 according to the network diagram, and enable the interfaces.

```
R1(config)#interface g0/1
R1(config-if)#ip address 192.168.1.1 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#interface g0/0
R1(config-if)#ip address 10.0.0.1 255.255.255.0
R1(config-if)#no shutdown

R2(config)#interface g0/0
R2(config-if)#ip address 10.0.0.2 255.255.255.0
R2(config-if)#no shutdown
R2(config-if)#interface g0/1
R2(config-if)#ip address 192.168.2.1 255.255.255.0
R2(config-if)#no shutdown
```

2. From PC1 ping R1's G0/1 interface, R1's G0/0 interface, R2's G0/0 interface, R2's G0/1 interface, then PC2. Which pings succeed? Which pings fail?

On PC1, the ping works with R1's G0/1 and G0/0 interface, but doen't work for the rest.

3. Similarly, ping from PC2 to R2's G0/1 interface, then progressively ping toward PC1. Which pings succeed? Which pings fail?

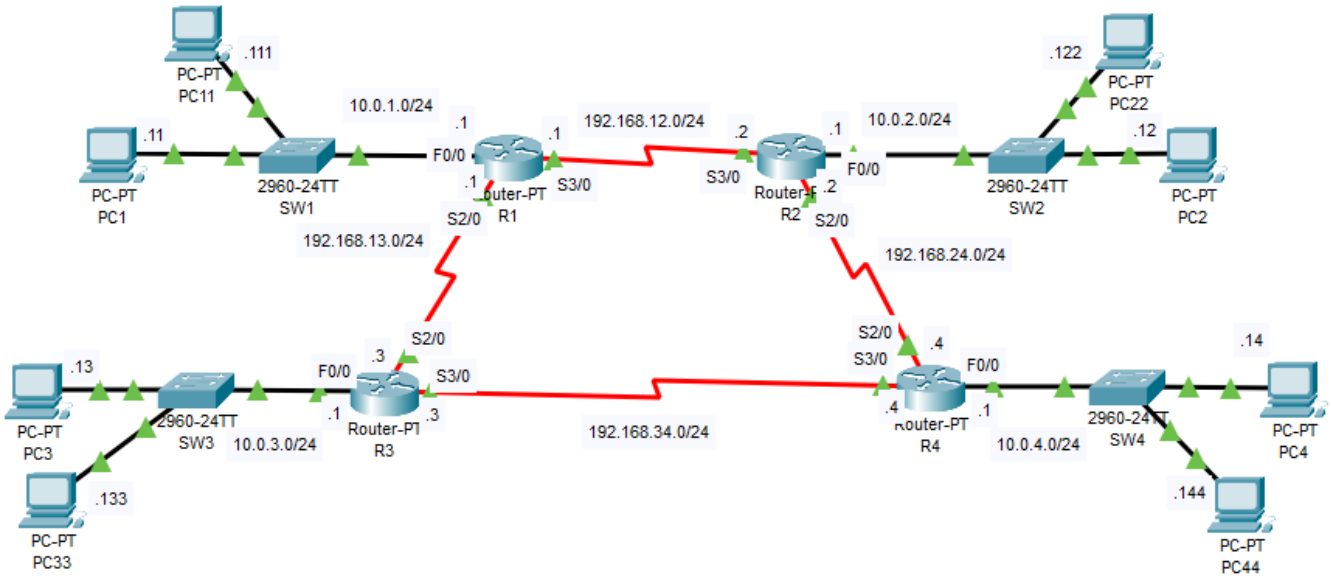
On PC2, the ping works with R2's G0/1 and G0/0 interface, but doen't work for the rest.

4. Configure static routes on R1 and R2 to allow PC1 to reach PC2, and vice versa. Configure the routes to the subnets the PCs are part of, not directly to the PCs. Test by using ping or tracert from each PC.

Now all the pings work. Here PC1 can ping PC2.

```
C:\>ping 192.168.2.12

Pinging 192.168.2.12 with 32 bytes of data:

Request timed out.
Reply from 192.168.2.12: bytes=32 time=1ms TTL=126
Reply from 192.168.2.12: bytes=32 time=1ms TTL=126
Reply from 192.168.2.12: bytes=32 time<1ms TTL=126

Ping statistics for 192.168.2.12:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

ACTIVITY 25 : Static Routing (Part 2)



All IP addresses are preconfigured. Configure static routes on each router to allow full connectivity throughout the entire network. You have successfully completed the lab when each PC can ping any other point in the network.

R1(config)#ip route 10.0.3.0 255.255.255.0 192.168.13.3
R1(config)#ip route 192.168.34.0 255.255.255.0 192.168.13.3
R1(config)#ip route 10.0.2.0 255.255.255.0 192.168.12.2
R1(config)#ip route 192.168.24.0 255.255.255.0 192.168.12.2
R1(config)#ip route 10.0.4.0 255.255.255.0 192.168.12.2

R2(config)#ip route 10.0.1.0 255.255.255.0 192.168.12.1
R2(config)#ip route 192.168.13.0 255.255.255.0 192.168.12.1
R2(config)#ip route 10.0.3.0 255.255.255.0 192.168.12.1
R2(config)#ip route 10.0.4.0 255.255.255.0 192.168.24.4
R2(config)#ip route 192.168.34.0 255.255.255.0 192.168.24.4

R3(config)#ip route 10.0.1.0 255.255.255.0 192.168.13.1
R3(config)#ip route 192.168.12.0 255.255.255.0 192.168.13.1
R3(config)#ip route 10.0.2.0 255.255.255.0 192.168.13.1
R3(config)#ip route 10.0.4.0 255.255.255.0 192.168.34.4
R3(config)#ip route 192.168.24.0 255.255.255.0 192.168.34.4

R4(config)#ip route 10.0.2.0 255.255.255.0 192.168.24.2
R4(config)#ip route 192.168.12.0 255.255.255.0 192.168.24.2
R4(config)#ip route 10.0.1.0 255.255.255.0 192.168.24.2
R4(config)#ip route 10.0.3.0 255.255.255.0 192.168.34.3
R4(config)#ip route 192.168.13.0 255.255.255.0 192.168.34.3

From PCs at 10.0.1.0/24

```
C:\>ping 10.0.2.122

Pinging 10.0.2.122 with 32 bytes of data:

Request timed out.
Reply from 10.0.2.122: bytes=32 time=2ms TTL=126
Reply from 10.0.2.122: bytes=32 time=2ms TTL=126
Reply from 10.0.2.122: bytes=32 time=1ms TTL=126

Ping statistics for 10.0.2.122:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 2ms, Average = 1ms

C:\>ping 10.0.3.13

Pinging 10.0.3.13 with 32 bytes of data:

Request timed out.
Reply from 10.0.3.13: bytes=32 time=1ms TTL=126
Reply from 10.0.3.13: bytes=32 time=1ms TTL=126

Ping statistics for 10.0.3.13:
    Packets: Sent = 3, Received = 2, Lost = 1 (34% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

Control-C
^C
C:\>ping 10.0.4.144

Pinging 10.0.4.144 with 32 bytes of data:

Request timed out.
Reply from 10.0.4.144: bytes=32 time=2ms TTL=125
Reply from 10.0.4.144: bytes=32 time=3ms TTL=125
```

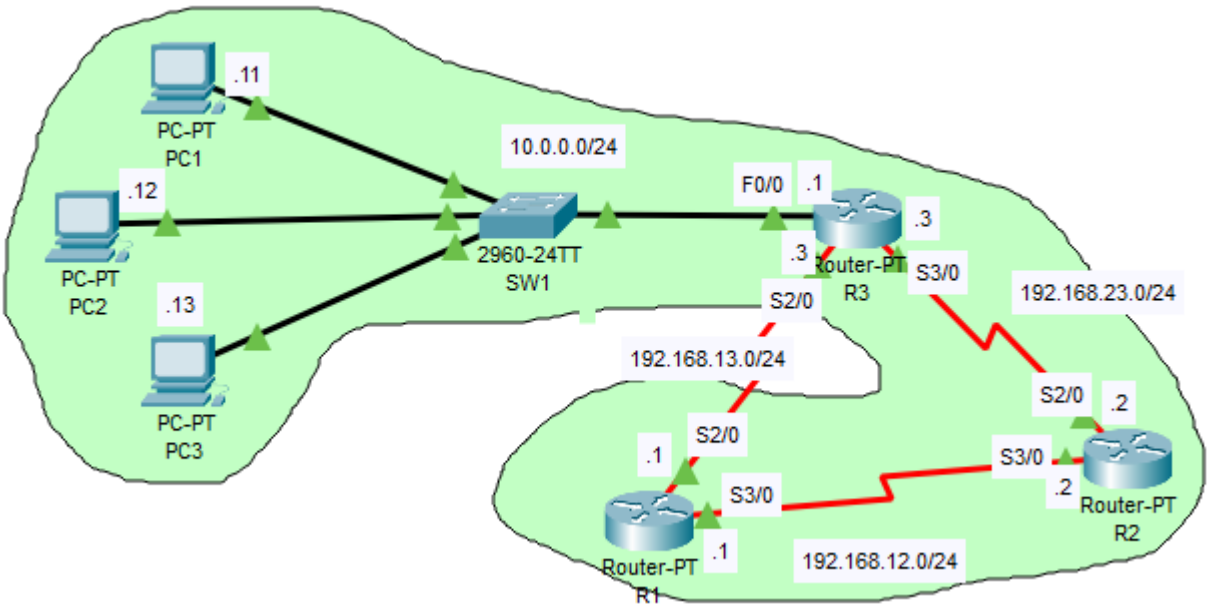
From PCs at 10.0.2.0/24

```
C:\>ping 10.0.3.13

Pinging 10.0.3.13 with 32 bytes of data:

Reply from 10.0.3.13: bytes=32 time=18ms TTL=125
Reply from 10.0.3.13: bytes=32 time=2ms TTL=125

Ping statistics for 10.0.3.13:
    Packets: Sent = 2, Received = 2, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 18ms, Average = 10ms

Control-C
^C
C:\>ping 10.0.4.144

Pinging 10.0.4.144 with 32 bytes of data:

Reply from 10.0.4.144: bytes=32 time=11ms TTL=126
Reply from 10.0.4.144: bytes=32 time=1ms TTL=126
```

From PCs at 10.0.3.0/24

```
C:\>ping 10.0.4.14

Pinging 10.0.4.14 with 32 bytes of data:

Request timed out.
Reply from 10.0.4.14: bytes=32 time=2ms TTL=126
Reply from 10.0.4.14: bytes=32 time=1ms TTL=126

Ping statistics for 10.0.4.14:
    Packets: Sent = 3, Received = 2, Lost = 1 (34% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 2ms, Average = 1ms

Control-C
```

ACTIVITY 26 : Static Routing (Part 3)



(RIP is configured on all router interfaces except between R1 and R3). R1 receives its route to 10.0.0.0/24 via RIP on its S3/0 interface. Configure a floating static route on R1 to allow it to reach the 10.0.0.0/24 network via it's S2/0 interface in the event the connection to R2 fails.

Result of show ip route

```
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

     10.0.0.0/24 is subnetted, 1 subnets
R       10.0.0.0 [120/2] via 192.168.12.2, 00:00:21, Serial3/0
C    192.168.12.0/24 is directly connected, Serial3/0
C    192.168.13.0/24 is directly connected, Serial2/0
R    192.168.23.0/24 [120/1] via 192.168.12.2, 00:00:21, Serial3/0
```

To create a floating static route via R3 in case R2 fails, we will increment by 1 the distance metric. So it becomes 120+1=121.
R1(config)#ip route 10.0.0.0 255.255.255.0 192.168.13.3 121

The route table is still the same as above become it will take 120 before 121. But let's try it if the port S3/0 of R2 is shutdown. The route table becomes like this :

```
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

     10.0.0.0/24 is subnetted, 1 subnets
S       10.0.0.0 [121/0] via 192.168.13.3
C    192.168.13.0/24 is directly connected, Serial2/0
```