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Assignment 4: Router Configuration
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1. Now that the routers have been "physically" connected, they must be tested to see if the serial connection is running successfully. On the privileged console for R1 and R2, try the following and fill the table below with the results:

	Router 1	**Success ?**	**Router 2**	**Success ?**
1	R1# ping 192.168.102.1	N	R2# ping 192.168.101.1	N
2	R1# ping 192.168.100.2	Y	R2# ping 192.168.100.1	Y
3	R1# ping 192.168.101.1	Y	R2# ping 192.168.102.1	Y

```
R1#ping 192.168.102.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.102.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
R1#ping 192.168.100.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.100.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 60/62/64 ms
R1#ping 192.168.101.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.101.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/3/4 ms
```

```
R2#ping 192.168.101.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.101.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
R2#ping 192.168.100.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.100.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 60/60/60 ms
R2#ping 192.168.102.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.102.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms
```

2. Discuss why some pings are successful, but others are not.

   The first ping command for R1 and R2 didn't work because it is trying to ping to an address in network that it does not belong to. The second and third pings for R1 and R2 worked because it was pings to ip addresses belonging to the same network as the router.

3. Type "show ip route" on R1 and R2 and explain the resultsin your own words.

   The "show ip route" command shows the IPv4 routing table of that router. It shows that both routers have 2 routes that it is connected to which are the Serial1/0 and FastEthernet0/0 interfaces. When a new route is created it will be added to this table and with a corresponding code to tell us what kind of route it is.

```
R1#show ip route
Codes: C - connected, S - static, 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
       i - IS-IS, su - IS-IS summary, 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

     192.168.100.0/30 is subnetted, 1 subnets
C       192.168.100.0 is directly connected, Serial1/0
C    192.168.101.0/24 is directly connected, FastEthernet0/0
R1#
```

```
R2#show ip route
Codes: C - connected, S - static, 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
       i - IS-IS, su - IS-IS summary, 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

C    192.168.102.0/24 is directly connected, FastEthernet0/0
     192.168.100.0/30 is subnetted, 1 subnets
C       192.168.100.0 is directly connected, Serial1/0
R2#
```

4. From PC1 try to ping PC2? Do you getsuccessful ping results? If no, what do you need to do in order to make the ping work?

   I did not get successful ping result on my first attempt.

```
PC1> ping 192.168.102.2
*192.168.101.1 icmp_seq=1 ttl=255 time=30.566 ms (ICMP type:3, code:1, Destination host unreachable)
*192.168.101.1 icmp_seq=2 ttl=255 time=15.603 ms (ICMP type:3, code:1, Destination host unreachable)
*192.168.101.1 icmp_seq=3 ttl=255 time=15.342 ms (ICMP type:3, code:1, Destination host unreachable)
*192.168.101.1 icmp_seq=4 ttl=255 time=15.303 ms (ICMP type:3, code:1, Destination host unreachable)
*192.168.101.1 icmp_seq=5 ttl=255 time=16.056 ms (ICMP type:3, code:1, Destination host unreachable)
```

```
PC2> ping 192.168.101.2
*192.168.102.1 icmp_seq=1 ttl=255 time=16.351 ms (ICMP type:3, code:1, Destination host unreachable)
*192.168.102.1 icmp_seq=2 ttl=255 time=15.760 ms (ICMP type:3, code:1, Destination host unreachable)
*192.168.102.1 icmp_seq=3 ttl=255 time=16.612 ms (ICMP type:3, code:1, Destination host unreachable)
*192.168.102.1 icmp_seq=4 ttl=255 time=16.453 ms (ICMP type:3, code:1, Destination host unreachable)
*192.168.102.1 icmp_seq=5 ttl=255 time=16.211 ms (ICMP type:3, code:1, Destination host unreachable)
```

To make the ping work you need to set the gateway address for PC1 to the router R1's IP address and do the same for PC2 and R2. Once the gateway is set, you need to use the ip route command in the R1 console to establish the path to travel across multiple networks to get to PC2 from PC1.The ip route command must be created in R2 as well for the ping to be successful both ways.

```
PC1> ping 192.168.102.2
84 bytes from 192.168.102.2 icmp_seq=1 ttl=62 time=62.160 ms
84 bytes from 192.168.102.2 icmp_seq=2 ttl=62 time=62.917 ms
84 bytes from 192.168.102.2 icmp_seq=3 ttl=62 time=60.883 ms
84 bytes from 192.168.102.2 icmp_seq=4 ttl=62 time=62.716 ms
84 bytes from 192.168.102.2 icmp_seq=5 ttl=62 time=62.956 ms
```

```
PC2> ping 192.168.101.2
84 bytes from 192.168.101.2 icmp_seq=1 ttl=62 time=61.739 ms
84 bytes from 192.168.101.2 icmp_seq=2 ttl=62 time=62.289 ms
84 bytes from 192.168.101.2 icmp_seq=3 ttl=62 time=62.631 ms
84 bytes from 192.168.101.2 icmp_seq=4 ttl=62 time=62.713 ms
84 bytes from 192.168.101.2 icmp_seq=5 ttl=62 time=62.133 ms
```