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Internetworking

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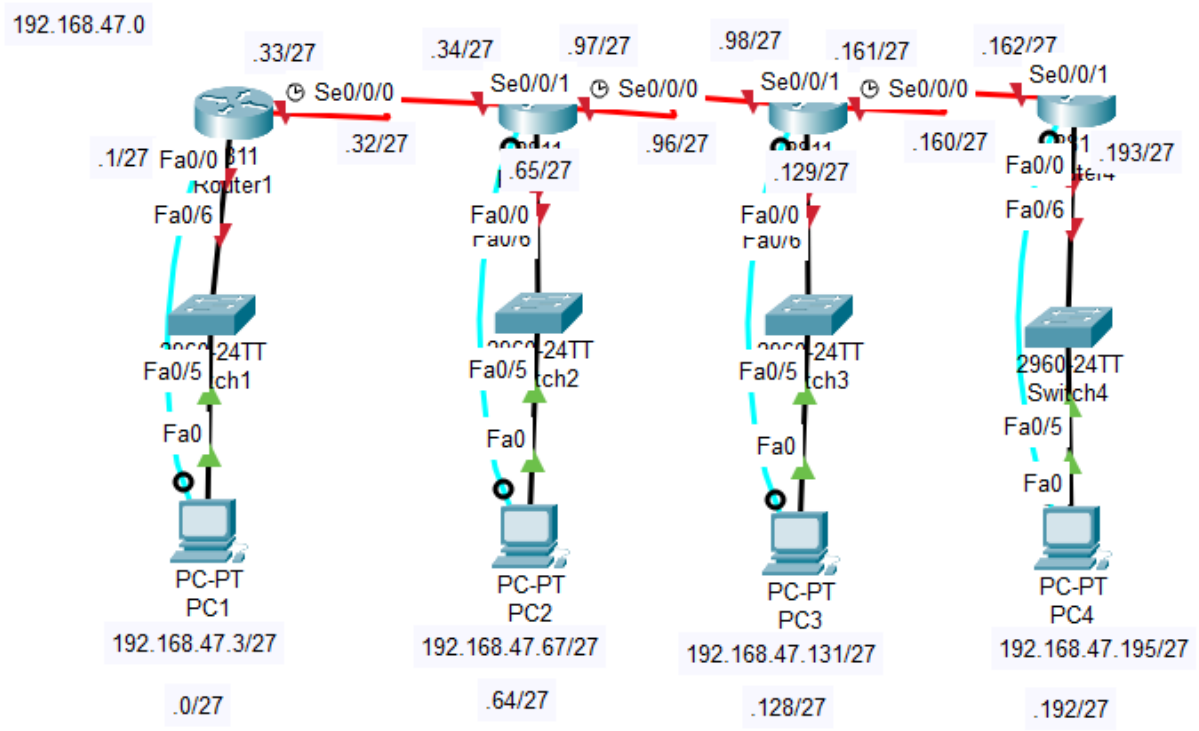
Lab 4

Description: In this lab, I created an internetwork of 7 networks that contained 4 stub networks. I configured static routing to make it functional.

Topology/Diagram:



Syntax:

CLI	Command	Description	Mode
Cisco IOS	clock rate xxxx	Sets the clock rate for a Serial DCE interface on the female end	Interface Config
Cisco IOS	ip route <destination> <subnetMask> <nextHop>	Creates a static route in the routing table	Global Config
Cisco IOS	show ip route | exclude L	Shows the routing table but excludes local links	Privilege Mode
CMD	netsh interface ipv4 set address name=”INT NAME” static <ip><subnetMask><gateway>	Sets the interface parameters through cmd instead of the NCPA control panel GUI	Administrator Prompt
Cisco IOS	show ip route	Shows the device’s routing table	User Exec Mode
Cisco IOS	no ip route <destination> <subnetMask><nextHop>	Removes a static route	Global Config
Cisco IOS	interface sx/x/x	Interface config for serial port	Global Config
CMD	tracert <ip>	Traces the route to the destination host and returns information	Prompt

Verification:

Verify the PCs can reach their default gateways.

PC1 and PC4’s verification:

```
C:\>ping 192.168.47.1

Pinging 192.168.47.1 with 32 bytes of data:

Reply from 192.168.47.1: bytes=32 time<1ms TTL=255
Reply from 192.168.47.1: bytes=32 time<1ms TTL=255
Reply from 192.168.47.1: bytes=32 time=29ms TTL=255
Reply from 192.168.47.1: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.47.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 29ms, Average = 7ms
```

```
C:\>ping 192.168.47.193

Pinging 192.168.47.193 with 32 bytes of data:

Reply from 192.168.47.193: bytes=32 time=22ms TTL=255
Reply from 192.168.47.193: bytes=32 time=1ms TTL=255
Reply from 192.168.47.193: bytes=32 time<1ms TTL=255
Reply from 192.168.47.193: bytes=32 time=1ms TTL=255

Ping statistics for 192.168.47.193:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 22ms, Average = 6ms
```

Verify Static Recursive Routing Implemented:

Router 2:

```
     192.168.47.0/24 is variably subnetted, 10 subnets, 2 masks
S       192.168.47.0/27 [1/0] via 192.168.47.33
C       192.168.47.32/27 is directly connected, Serial0/0/1
C       192.168.47.64/27 is directly connected, FastEthernet0/0
C       192.168.47.96/27 is directly connected, Serial0/0/0
S       192.168.47.128/27 [1/0] via 192.168.47.98
S       192.168.47.160/27 [1/0] via 192.168.47.98
S       192.168.47.192/27 [1/0] via 192.168.47.162
```

Router 4:

```
     192.168.47.0/24 is variably subnetted, 9 subnets, 2 masks
S       192.168.47.0/27 [1/0] via 192.168.47.33
S       192.168.47.32/27 [1/0] via 192.168.47.97
S       192.168.47.64/27 [1/0] via 192.168.47.97
S       192.168.47.96/27 [1/0] via 192.168.47.161
S       192.168.47.128/27 [1/0] via 192.168.47.161
C       192.168.47.160/27 is directly connected, Serial0/0/1
C       192.168.47.192/27 is directly connected, FastEthernet0/0
```

Verify Connectivity from the router:

I have full connectivity; here is router 4 to router 1 (passes through 2 and 3).

```
Router4#ping 192.168.47.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.47.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 3/28/100 ms
```

Verify Connectivity from the PC (ping and tracert)

```
C:\>ping 192.168.47.67

Pinging 192.168.47.67 with 32 bytes of data:

Reply from 192.168.47.67: bytes=32 time=26ms TTL=126
Reply from 192.168.47.67: bytes=32 time=10ms TTL=126
Reply from 192.168.47.67: bytes=32 time=2ms TTL=126
Reply from 192.168.47.67: bytes=32 time=2ms TTL=126

Ping statistics for 192.168.47.67:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 26ms, Average = 10ms

C:\>ping 192.168.47.131

Pinging 192.168.47.131 with 32 bytes of data:

Reply from 192.168.47.131: bytes=32 time=28ms TTL=125
Reply from 192.168.47.131: bytes=32 time=3ms TTL=125
Reply from 192.168.47.131: bytes=32 time=12ms TTL=125
Reply from 192.168.47.131: bytes=32 time=76ms TTL=125

Ping statistics for 192.168.47.131:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 3ms, Maximum = 76ms, Average = 29ms

C:\>ping 192.168.47.195

Pinging 192.168.47.195 with 32 bytes of data:

Reply from 192.168.47.195: bytes=32 time=37ms TTL=124
Reply from 192.168.47.195: bytes=32 time=11ms TTL=124
Reply from 192.168.47.195: bytes=32 time=54ms TTL=124
Reply from 192.168.47.195: bytes=32 time=11ms TTL=124

Ping statistics for 192.168.47.195:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 11ms, Maximum = 54ms, Average = 28ms
```

```
C:\>tracert 192.168.47.195

Tracing route to 192.168.47.195 over a maximum of 30 hops:

  1    0 ms      1 ms      0 ms      192.168.47.1
  2    0 ms      1 ms      0 ms      192.168.47.34
  3    0 ms      1 ms      1 ms      192.168.47.98
  4    2 ms      3 ms      3 ms      192.168.47.162
  5    11 ms     17 ms     1 ms      192.168.47.195

Trace complete.
```

From PC 1: We can see full connectivity as well as the path through the different networks to get to PC4.

Conclusion: In this lab, I made the mistake of not saving my configurations to startup-config. When I turned off the router to correct a mistake in adding the WIC cards, I did not realize that my configuration was no longer present. This, in turn, made setting the ip routes not work, and resulted in confusion. Luckily, I saved my config script. I also made a mistake in setting some of the default gateways, accidentally pasting 162 instead of 192.