Dynamic Host Configuration Protocol (DHCP) **10/20/2023**

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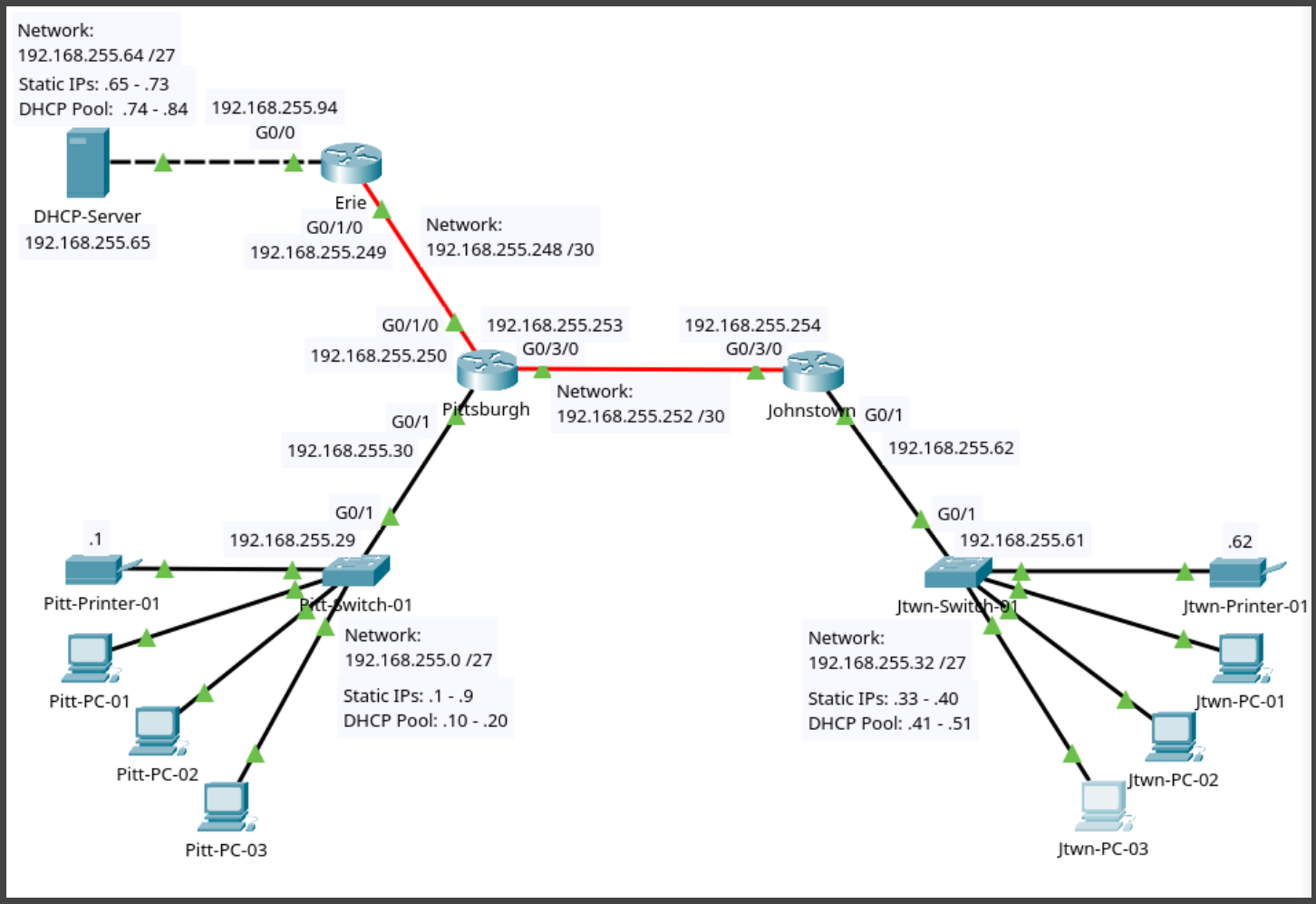

In this lab we will configure Dynamic Host Configuration Protocol:

- Add routers, servers, and PCs to the network.
- Router configuration.
- IP routing.
- Configure server to act as a DHCP server.
- Configure routers with DHCP commands.
- Verify DHCP
- Verify Telnet username/password login.

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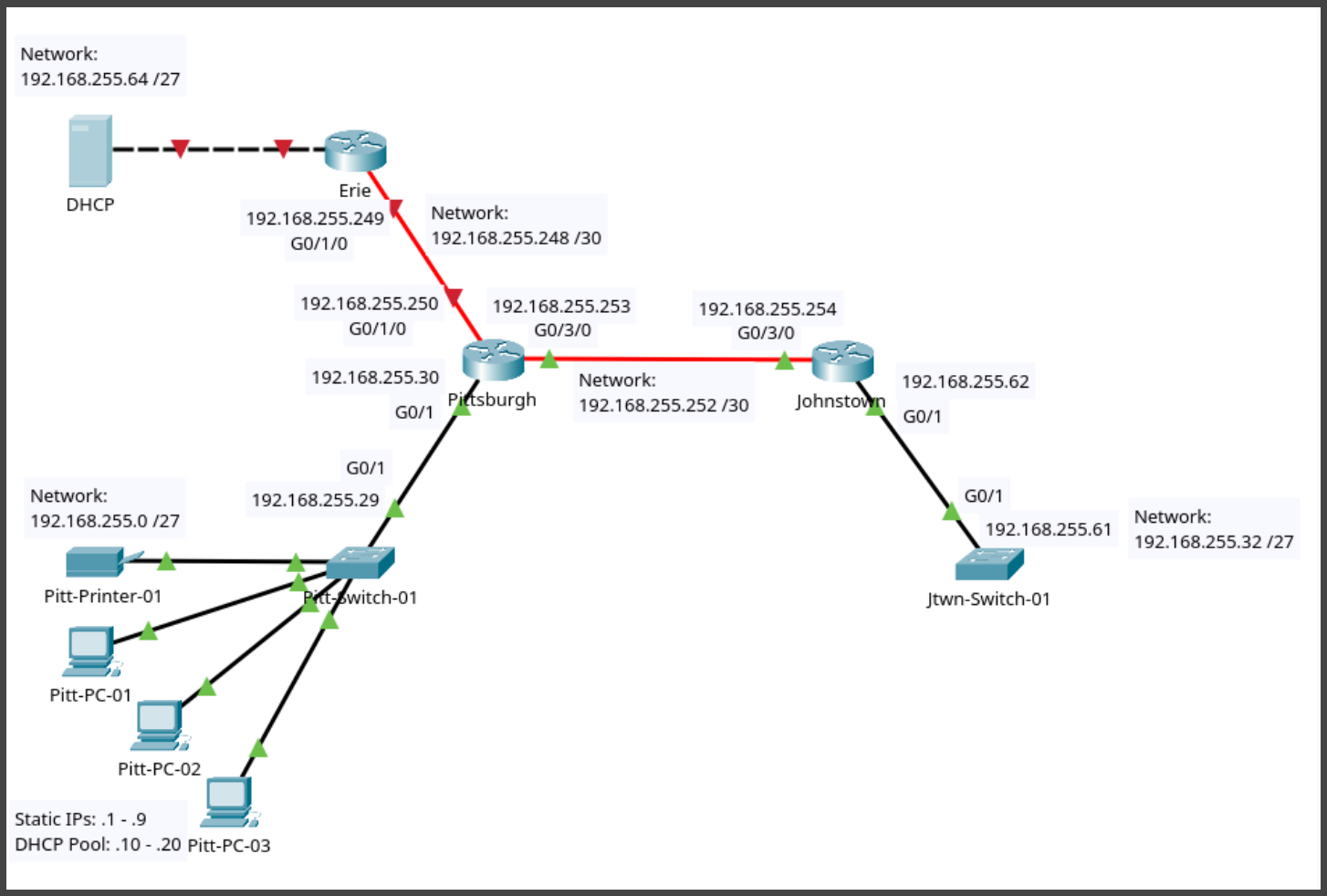
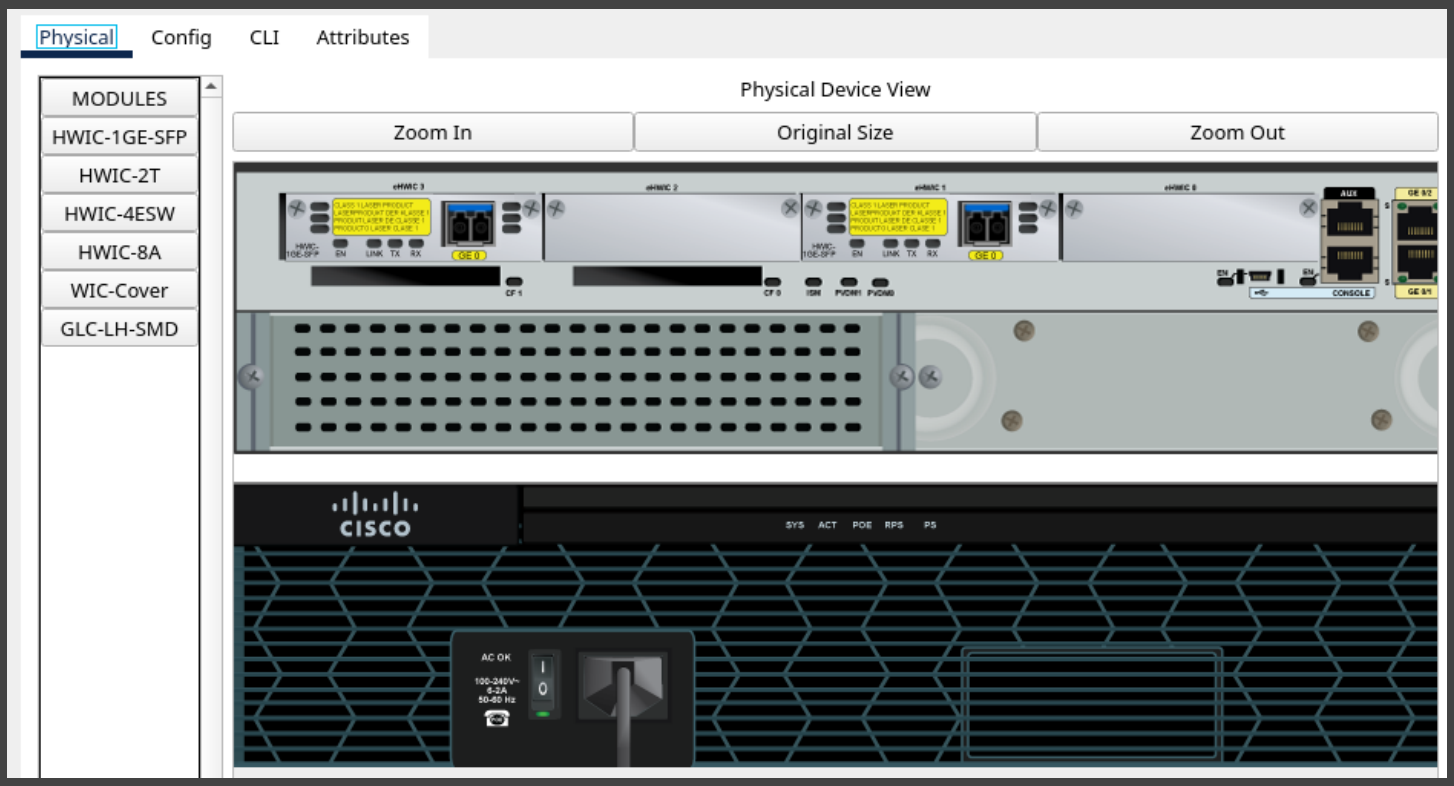
1. Select and delete the console cable from the admin laptop. Move the admin laptop to the side for a later date.
2. Select End Devices and drag and drop 3 PCs and one Printer to the canvas. Connect each device to Pitt-Switch-01 and rename them on the topology.
    a. Connections:
        i. Printer - Fa0/24
        ii. PC-01 - Fa0/1
        iii. PC-02 - Fa0/7
        iv. PC-03 - Fa0/13
3. Notate the IPs you want to save for end devices that will need static IPs (e.g. printers, servers) and the pool of IPs for end devices that can learn their IP dynamically (e.g. PCs, laptops, smart phones).



4. Time to create a DHCP server. Configure a new router and configure it as we did in the first lab.
    a. Power off. Insert HWIC-1GE-SFP, GLC-LH-SMD, and WIC-COVER. Power on.
    b. Connect and notate hostname and IP addresses on the new router..
    c. Note. You'll have to add a second HWIC module to the Pittsburgh router.
    d. Drag and Drop a Server from the end devices to the canvas.
        i. Rename it on the topology.
        ii. Connect it to the new router with crossover cable.



Notice we have two modules now.

5. Configure the Pittsburgh's interface facing the new router.

```
User Access Verification

Username: Nathan
Password:

Pittsburgh>enable
Pittsburgh#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Pittsburgh(config)#interface g0/1/0
Pittsburgh(config-if)#ip address 192.168.255.250 255.255.255.252
Pittsburgh(config-if)#no shutdown
Pittsburgh(config-if)#exit
```

6. Configure hostname, interfaces, and username/password for the new router.

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname Erie
Erie(config)#interface g0/1/0
Erie(config-if)#ip address 192.168.255.249 255.255.255.252
Erie(config-if)#no shutdown

Erie(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1/0, changed state to up
exit
Erie(config)#interface g0/0
Erie(config-if)#ip address 192.168.255.94 255.255.255.224
Erie(config-if)#no shutdown
```

```
Erie(config)#service password-encryption
Erie(config)#username Nathan secret Cisco
Erie(config)#
Erie(config)#line console 0
Erie(config-line)#login local
Erie(config-line)#exit
Erie(config)#line aux 0
Erie(config-line)#login local
Erie(config-line)#exit
Erie(config)#line vty 0 15
Erie(config-line)#login local
Erie(config-line)#exit
```

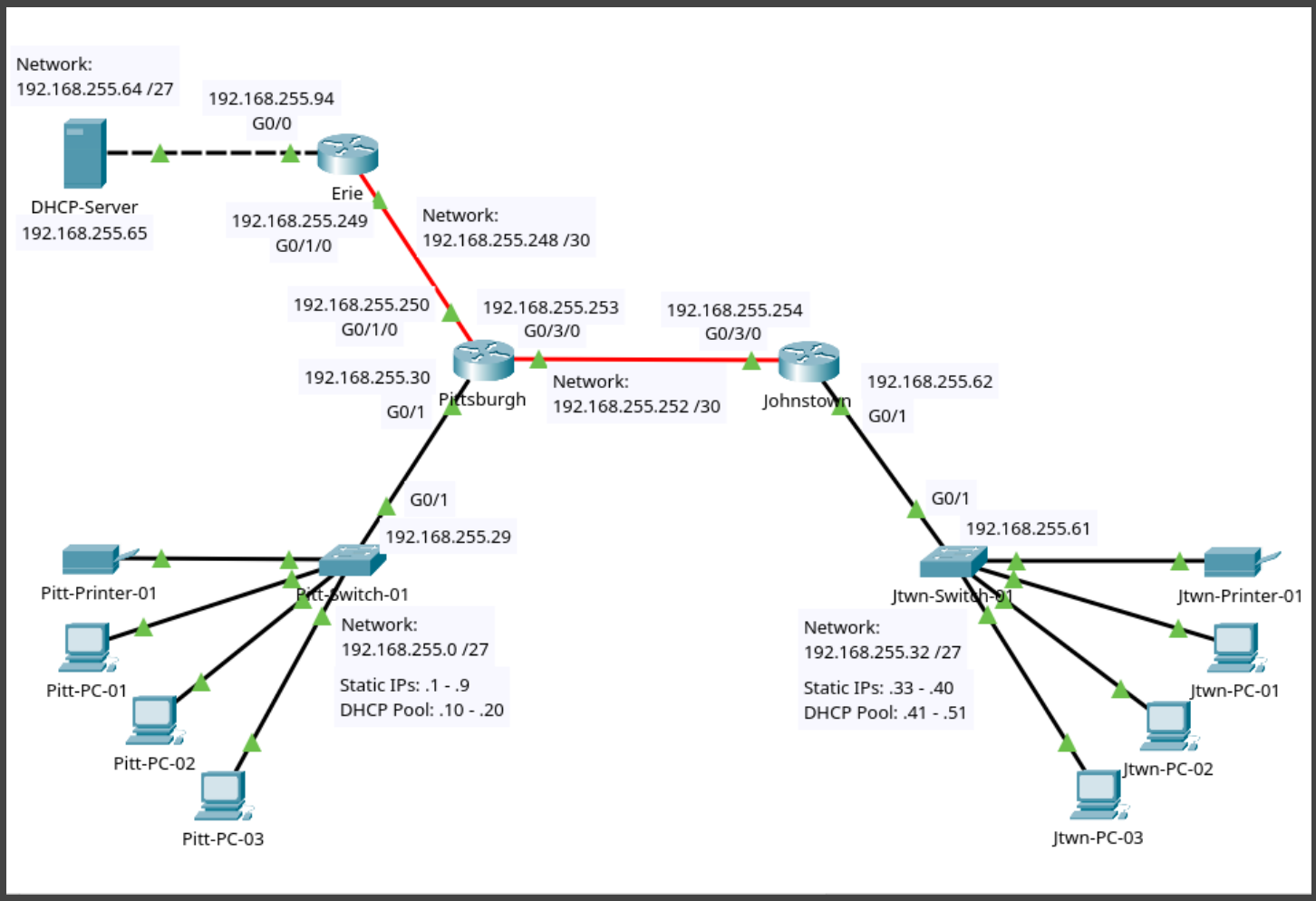
7. We need to configure multiple ip routes for the network to work with the new set up. Below are all the ip routes I have configured on all routers.

```
Pittsburgh#show run | include ip route
ip route 192.168.255.32 255.255.255.224 192.168.255.254
ip route 192.168.255.64 255.255.255.224 192.168.255.249
```

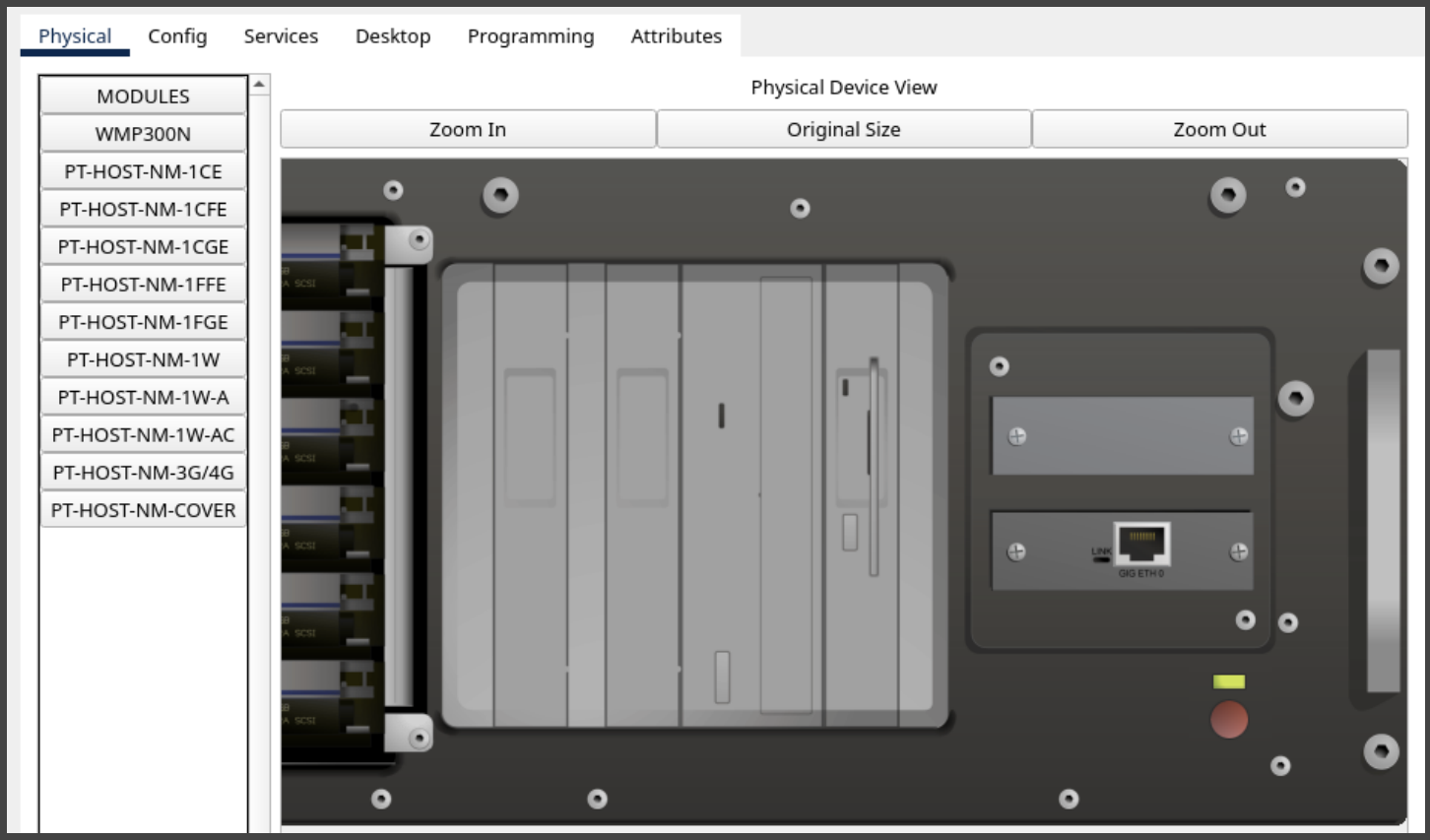
```
Johnstown#show run | include ip route
ip route 192.168.255.0 255.255.255.224 192.168.255.253
ip route 192.168.255.64 255.255.255.224 192.168.255.253
ip route 192.168.255.248 255.255.255.252 192.168.255.253
```

```
Erie#show run | include ip route
ip route 192.168.255.0 255.255.255.224 192.168.255.250
ip route 192.168.255.252 255.255.255.252 192.168.255.250
ip route 192.168.255.32 255.255.255.224 192.168.255.250
```

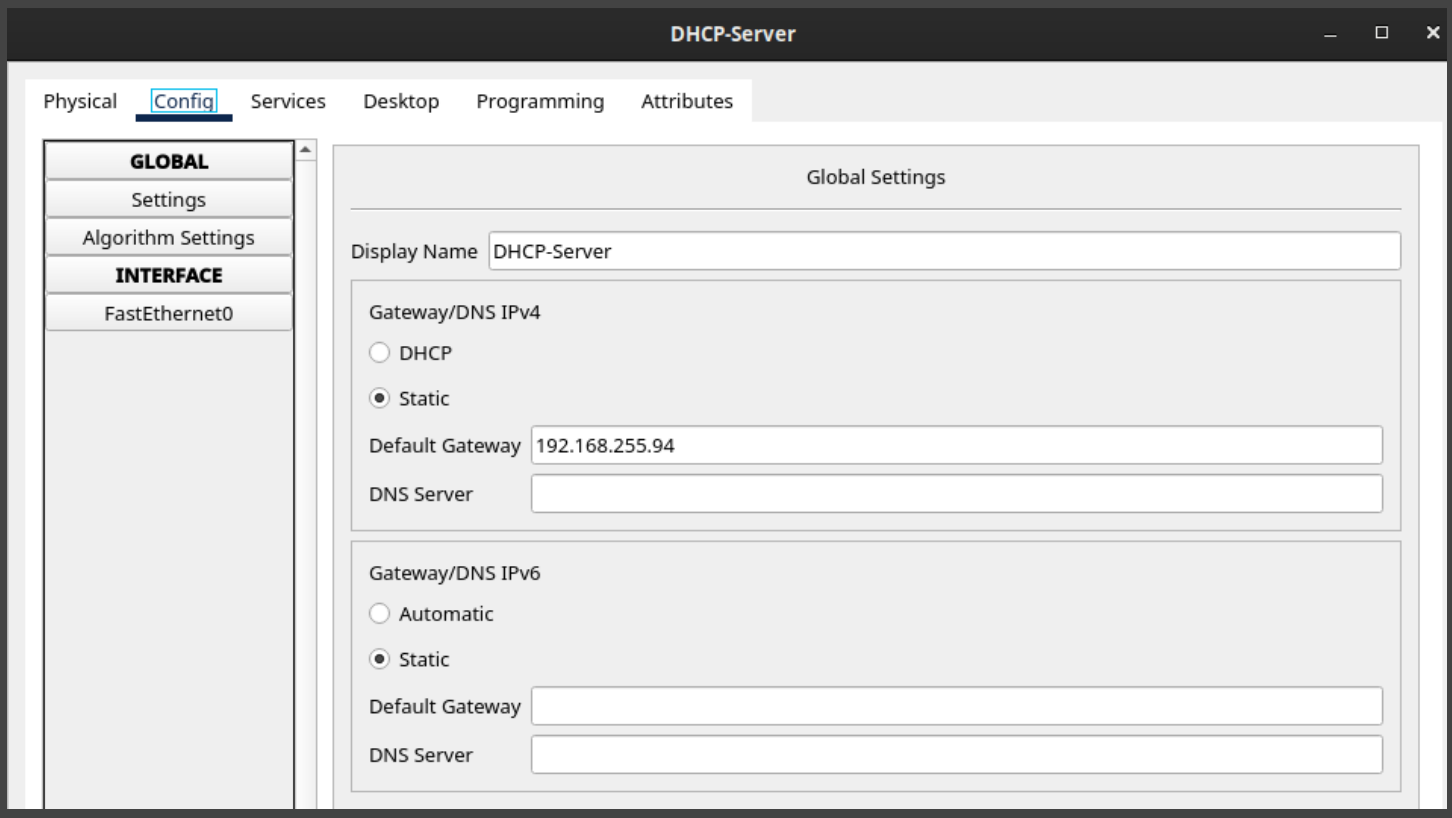
8. Set up and mirror PC's and Printers set up on the Jtwn Switch.



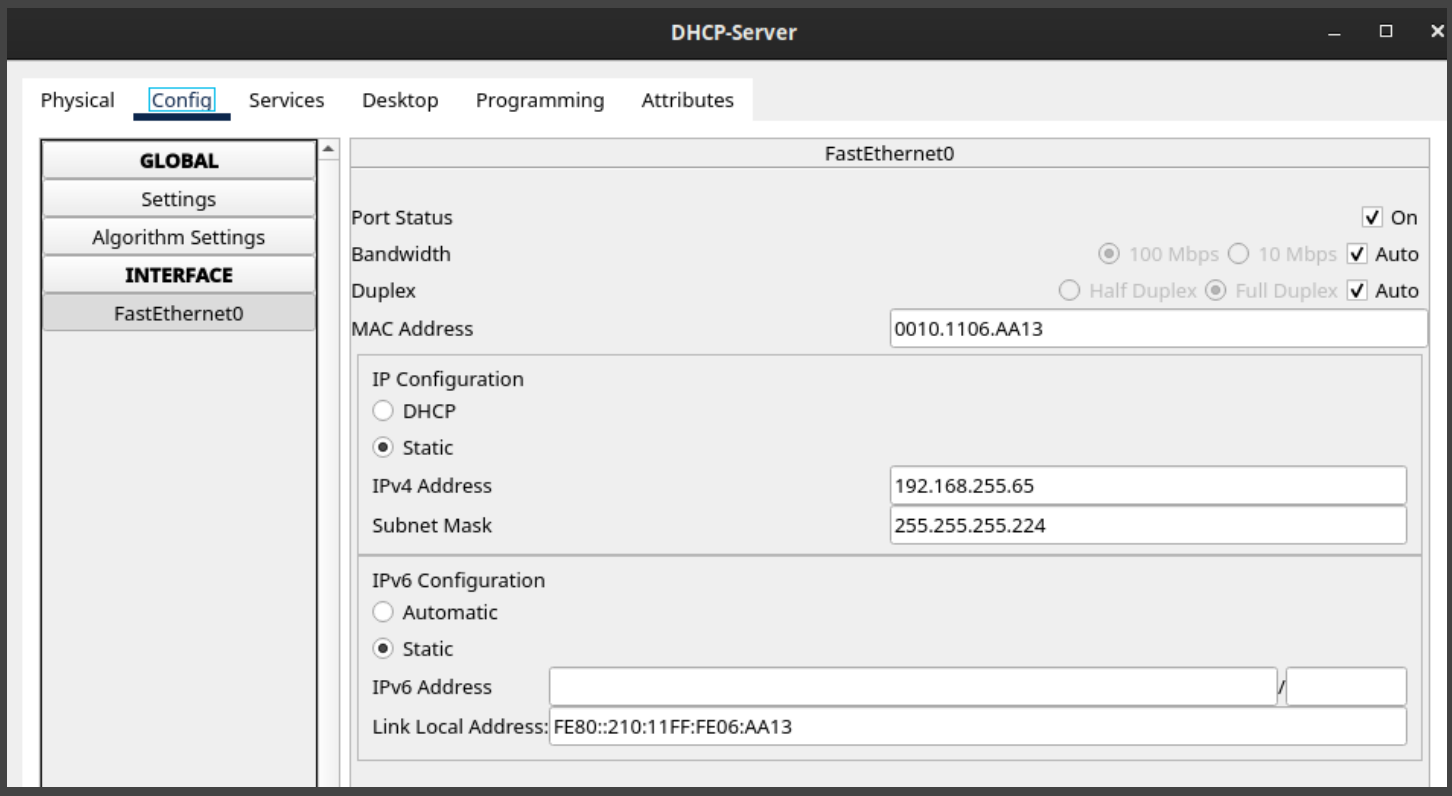
9. Left Click on the server icon. Remove the ethernet module currently installed and replace it with PT-HOST-NM-1CGE module. Cover the vacant slot.



10. Configure Default Gateway in the config GUI.

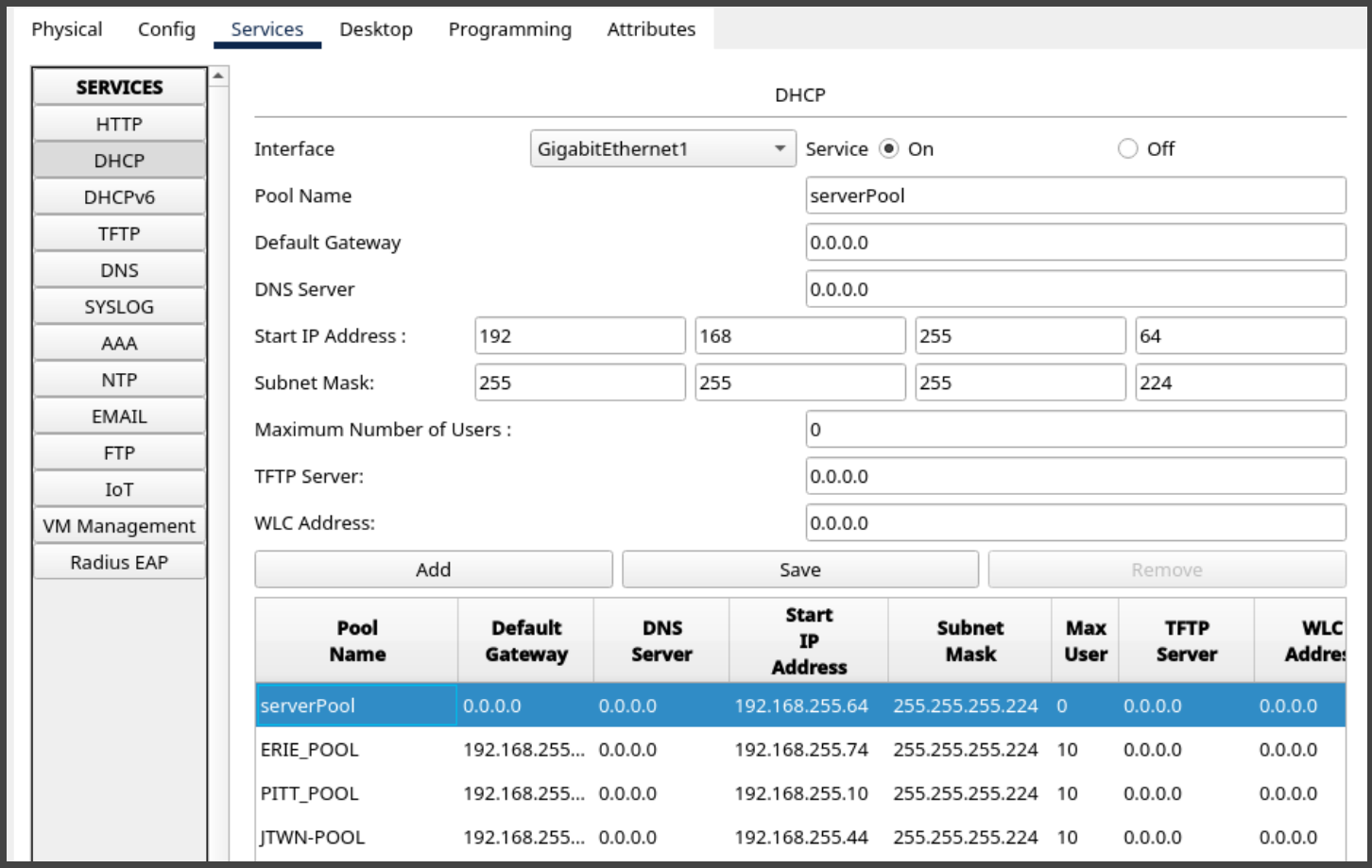


11. Configure the IP address and subnet mask in the Config GUI.



12. In the services tab, disable all other services, including: HTTP, HTTPS, DHCPv6, TFTP, DNS, SYSLOG, AAA, NTP, EMAIL, FTP, IoT, VM Management, Radius EAP.

13. Enable DHCP on the server.
14. Configure the DHCP in the GUI:
    a. Pool Name
    b. Start IP Address (Important to remember we designated DHCP pools on the topology)
    c. Maximum users (10 for our designated pools)



15. Configure ***ALL*** active router interfaces with dhcp command. This lets the router know where to send dhcp requests.
    a. Interface [***INTERFACE***]
    b. IP helper-address [***IP OF DHCP SERVER***]

```
Pittsburgh>enable
Pittsburgh#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Pittsburgh(config)#interface range g0/1, g0/1/0, g0/3/0
Pittsburgh(config-if-range)#ip helper-address 192.168.255.65
Pittsburgh(config-if-range)#do wr
Building configuration...
[OK]
```

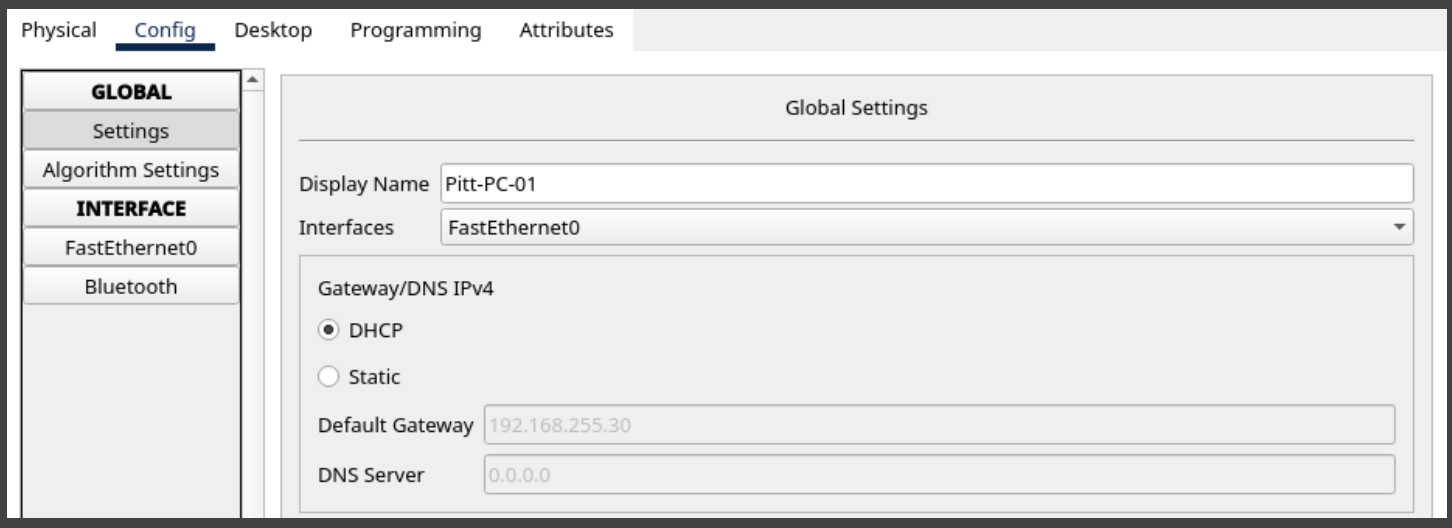
16. Run the ipconfig command on Pitt-PC-01 to view it's IP Address and Default Gateway before the DHCP configuration.

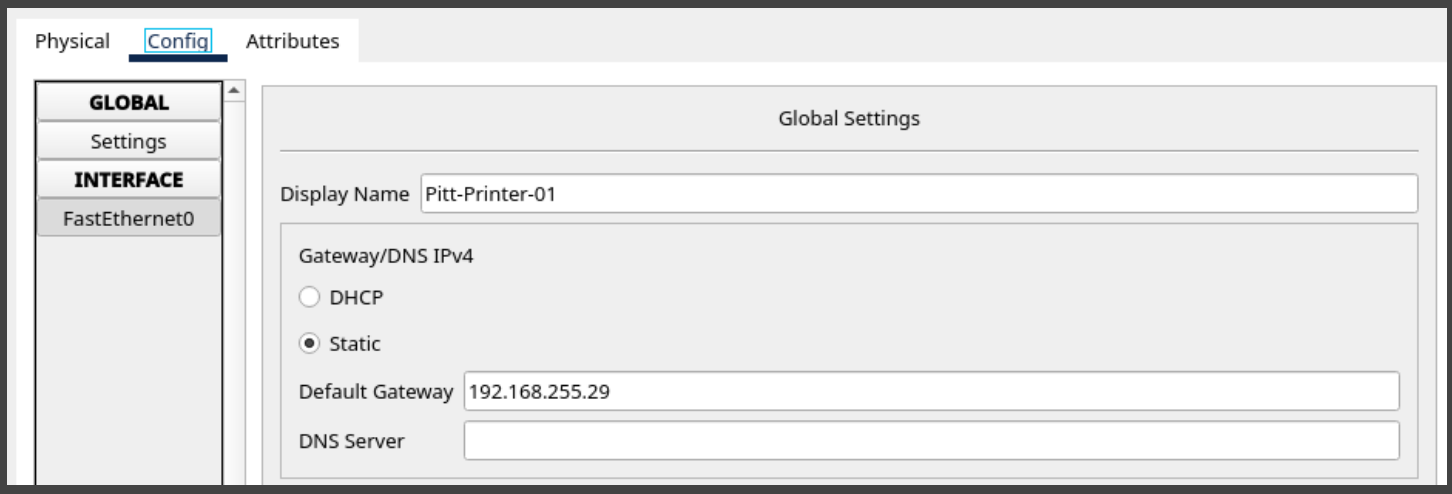
```
C:\>ipconfig

FastEthernet0 Connection:(default port)

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.....: FE80::260:2FFF:FE5E:31E2
   IPv6 Address.....: ::
   IPv4 Address.....: 0.0.0.0
   Subnet Mask.....: 0.0.0.0
   Default Gateway.....: ::
                                 0.0.0.0
```

17. Configure DHCP on Pitt-PC-01 through the Config GUI.
    a. Click DHCP on Settings tab. This will automatically check DHCP on the FastEthernet0 tab as well. You can view to confirm.





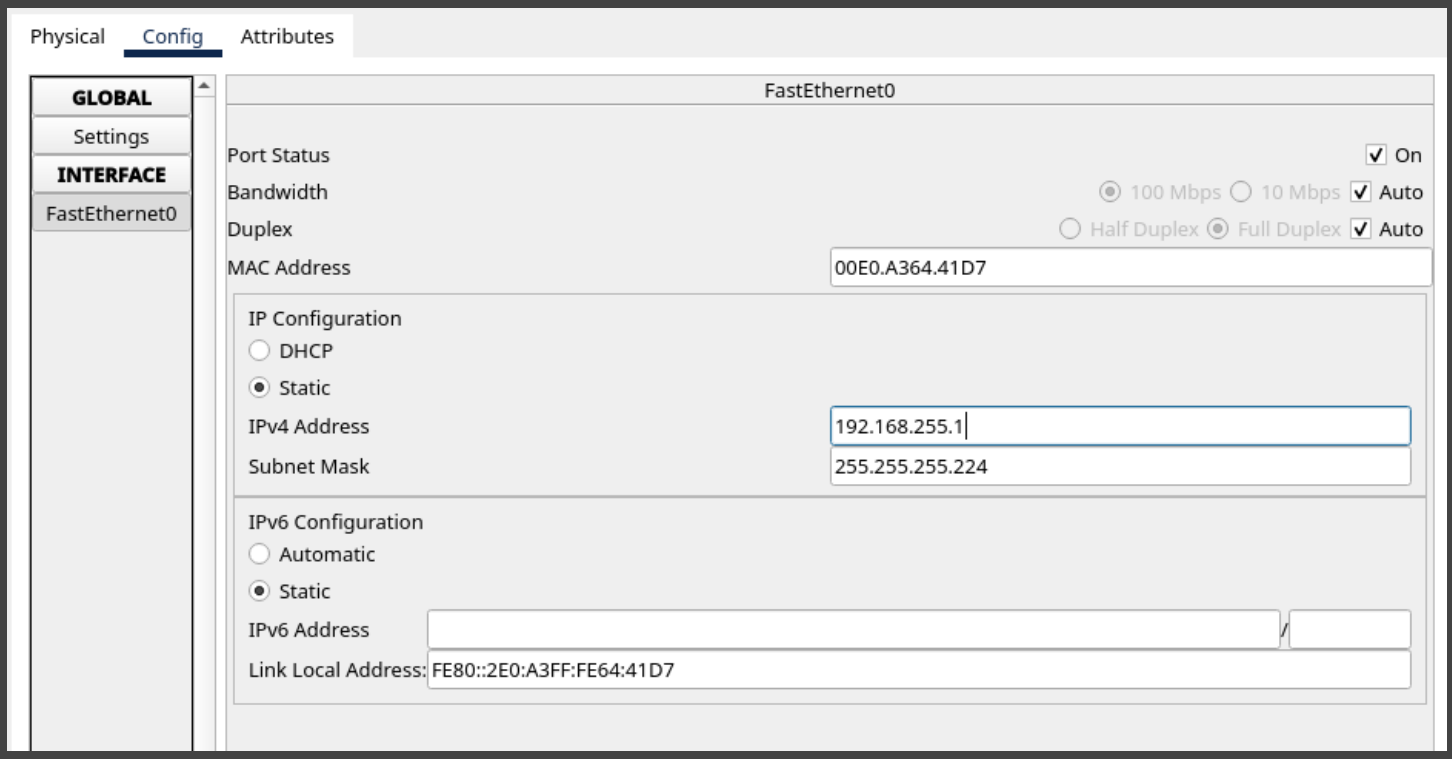
18. Confirm DHCP has resulted in an IP address for the PC.
    a. Enter the ipconfig into the PC's command prompt.

```
C:\>ipconfig

FastEthernet0 Connection:(default port)

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.....: FE80::260:2FFF:FE5E:31E2
   IPv6 Address.....: ::
   IPv4 Address.....: 192.168.255.10
   Subnet Mask.....: 255.255.255.224
   Default Gateway.....: ::
                                 192.168.255.30
```

19. Manually configure the printers with static IPs in the config GUI.



20. Ping from a Pitt-PC to a Jtwn-PC to confirm connectivity still exists.

```
C:\>ping 192.168.255.12

Pinging 192.168.255.12 with 32 bytes of data:

Request timed out.
Reply from 192.168.255.12: bytes=32 time<1ms TTL=126
Reply from 192.168.255.12: bytes=32 time<1ms TTL=126
Reply from 192.168.255.12: bytes=32 time<1ms TTL=126

Ping statistics for 192.168.255.12:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

21. Now that we have our IP addresses set up, let's call back to the last lab and attempt to connect with a VTY line. It should ask us for a log in if we configured it correctly.
    a. Telnet into Pitt-Switch-01 from a PC's terminal.
        i. Terminal, Click OK.
        ii. Telnet 192.168.255.30
        iii. Log in.

```
C:\>
C:\>telnet 192.168.255.30
Trying 192.168.255.30 ...Open


User Access Verification

Username: Nathan
Password:
Pittsburgh>
```

22. Go through all network devices and write the configurations to the startup-config.