

Packet Tracer Project

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CYB-210: Computer Networking

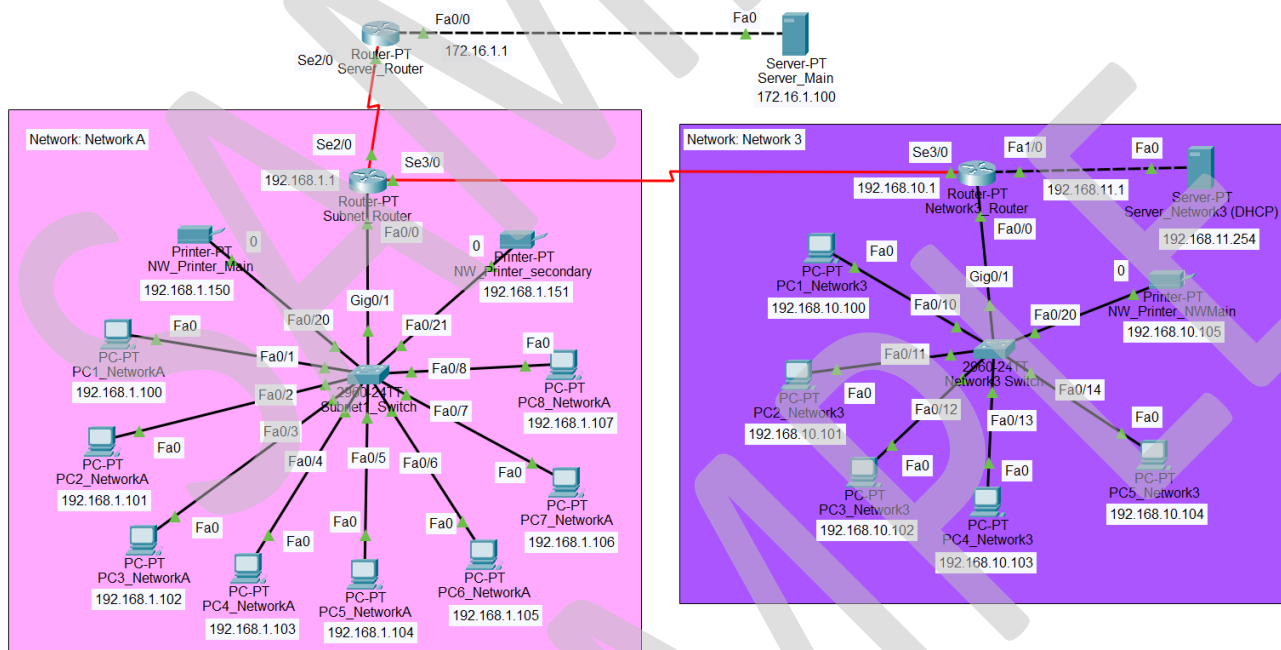
June 21, 2026

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Network Diagram

The following screenshot shows the final annotated network design. The new design qualifies as Class C by meeting the following conditions (Powell, 2025):

- Best for smaller networks with LANs.
- IP addresses range from 192.0.0.0 to 223.255.255.255.
- Usable host addresses range from 0 to 255, or 254 total.



IP Networking & Subnet Masks

The original networks (subnet 1 and subnet 2) were merged into Network A, and connected through routers to Network 3. IP addresses, default gateways, and subnets masks were updated as necessary throughout the Network A and Network 3. Network 3 also required an addition of a router (Network3_Router).

Static routes were set on the Network3_Router through the following CLI commands:

```
Router>en
```

```
Router#conf t
```

```
Router(config)#ip route 192.168.1.0 255.255.255.0 20.0.0.1
```

```
Router(config)#exit
```

“ip route” to add a static route

And static routes were set on the Subnet_Router through the following CLI commands:

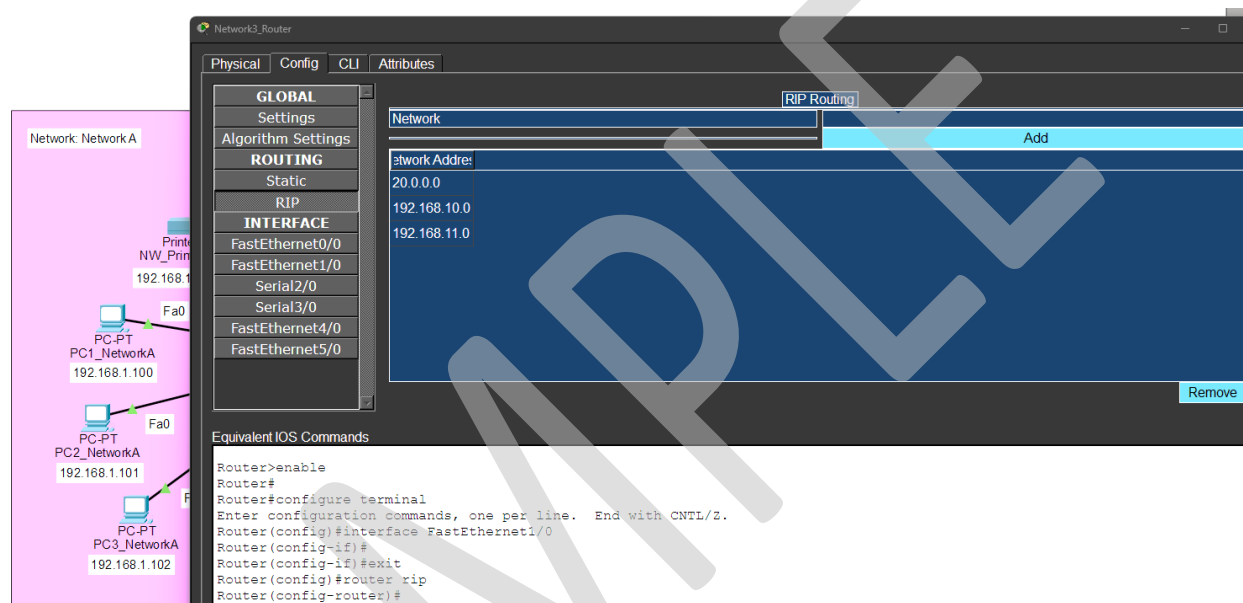
```
router1>en
```

```
router1#conf t
```

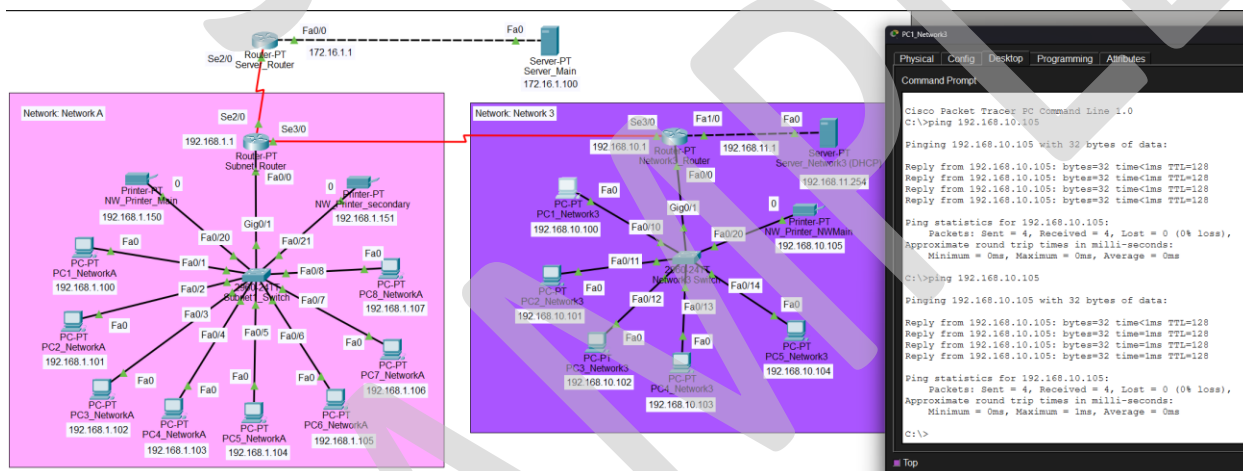
```
router1(config)#ip route 192.168.10.0 255.255.255.0 20.0.0.2
```

```
router1(config)#exit
```

Additionally, all three routers (Server_Router, Subnet_Router, and Network3_Router) had their RIP settings updated to remove the unnecessary network address (192.168.5.0) and add correct ones (192.168.1.0, 192.168.10.0, 192.168.11.0, etc.). The following screenshot is an example of Network3_Router's RIP settings.



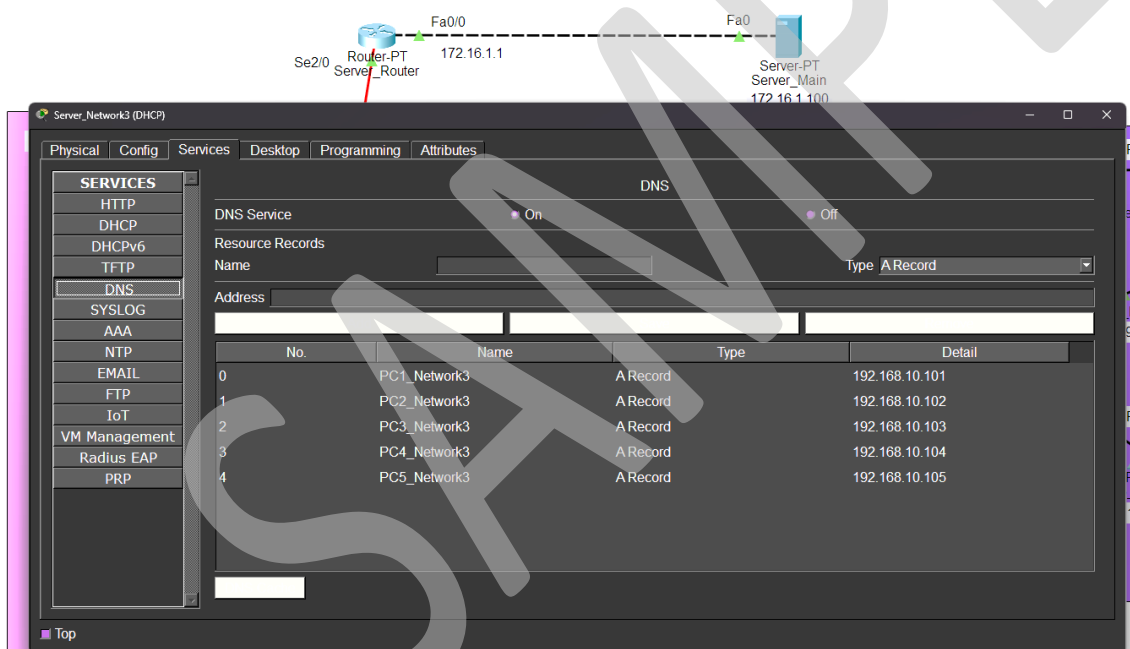
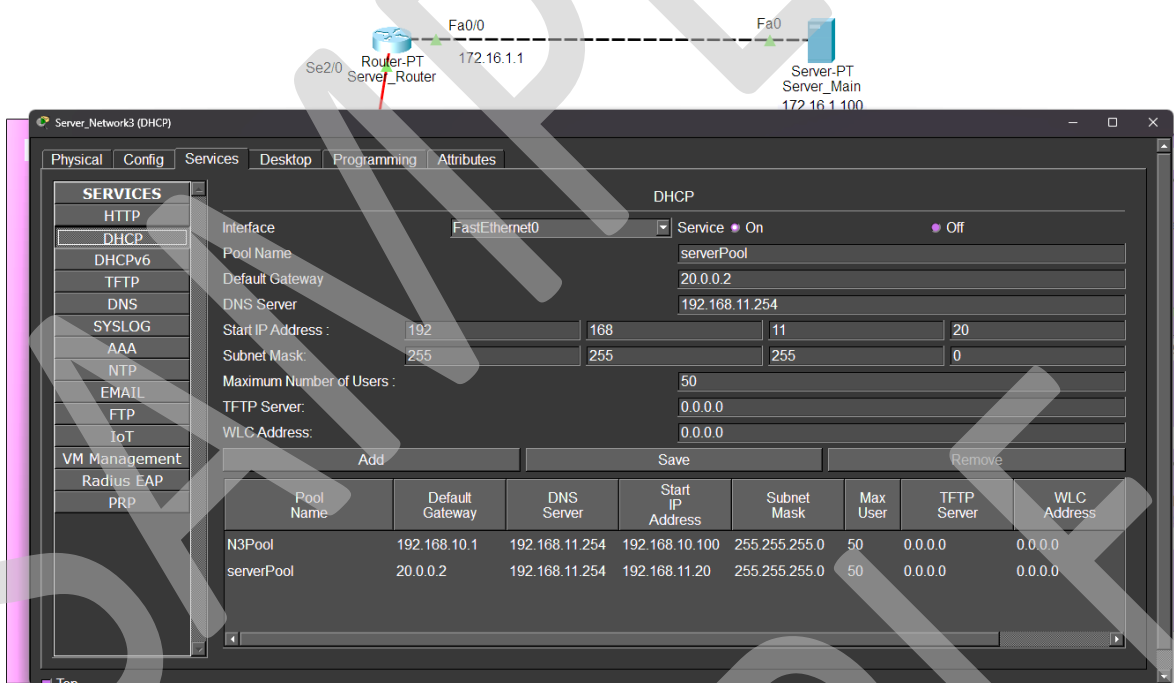
After the DHCP settings were updated on all devices in Network 3, the “Add Simple PDU” button was used to check PC-to-PC communication between networks. Then ping tests were performed to ensure communication within Network 3 and also to Network A, and to their respective printers. The following is an example of PCs_Network3’s ping tests.



Network (DHCP) Infrastructure

The Server_Network3 was set for DHCP and had “N3Pool” added. In order for the DHCP server to function properly, the Network3_Router required adding a new IPv4 address

(192.168.11.1) for FastEthernet1/0. The previous settings would not work for Server_Network3, since it's IP is 192.168.11.254. Then all Network 3 PCs and printer were changed from static to DHCP IP addressing. The following screenshots shows the DHCP settings and DNS settings on Server_Network3.



Network Address Translation (NAT) & Port Address Translation (PAT) Protocols

Based on Cisco's Community guidance (2019), the following commands were entered into Network3_Router's CLI for NAT and PAT protocols:

```
Router#conf t
```

```
Router(config)#interface fa0/0
```

```
Router(config-if)#ip nat inside
```

```
Router(config-if)#interface serial3/0
```

```
Router(config-if)#ip nat outside
```

```
Router(config-if)#exit
```

```
Router(config)#exit
```

```
Router#conf t
```

```
Router(config)#access-list 1 permit 192.168.10.0 0.0.0.255
```

```
Router(config)#ip nat inside source list 1 interface serial3/0 overload
```

```
Router(config)#exit
```

“inside” to connect to the corporate network

“outside” to connect to the Internet

“access-list” (or Access Control List , ACL) to allow traffic from all hosts within the network

“overload” to enable NAT overload PAT

References

Cisco Community. (2019, March 1). How to Configure Static NAT with Route-Maps. Cisco.

<https://community.cisco.com/t5/networking-knowledge-base/how-to-configure-static-nat-with-route-maps/ta-p/3132855>

Powell, Adam. (2025, November 13). *What is Class C IP?* Aeanet.org.

https://www.aeanet.org/what-is-class-c-ip/#google_vignette