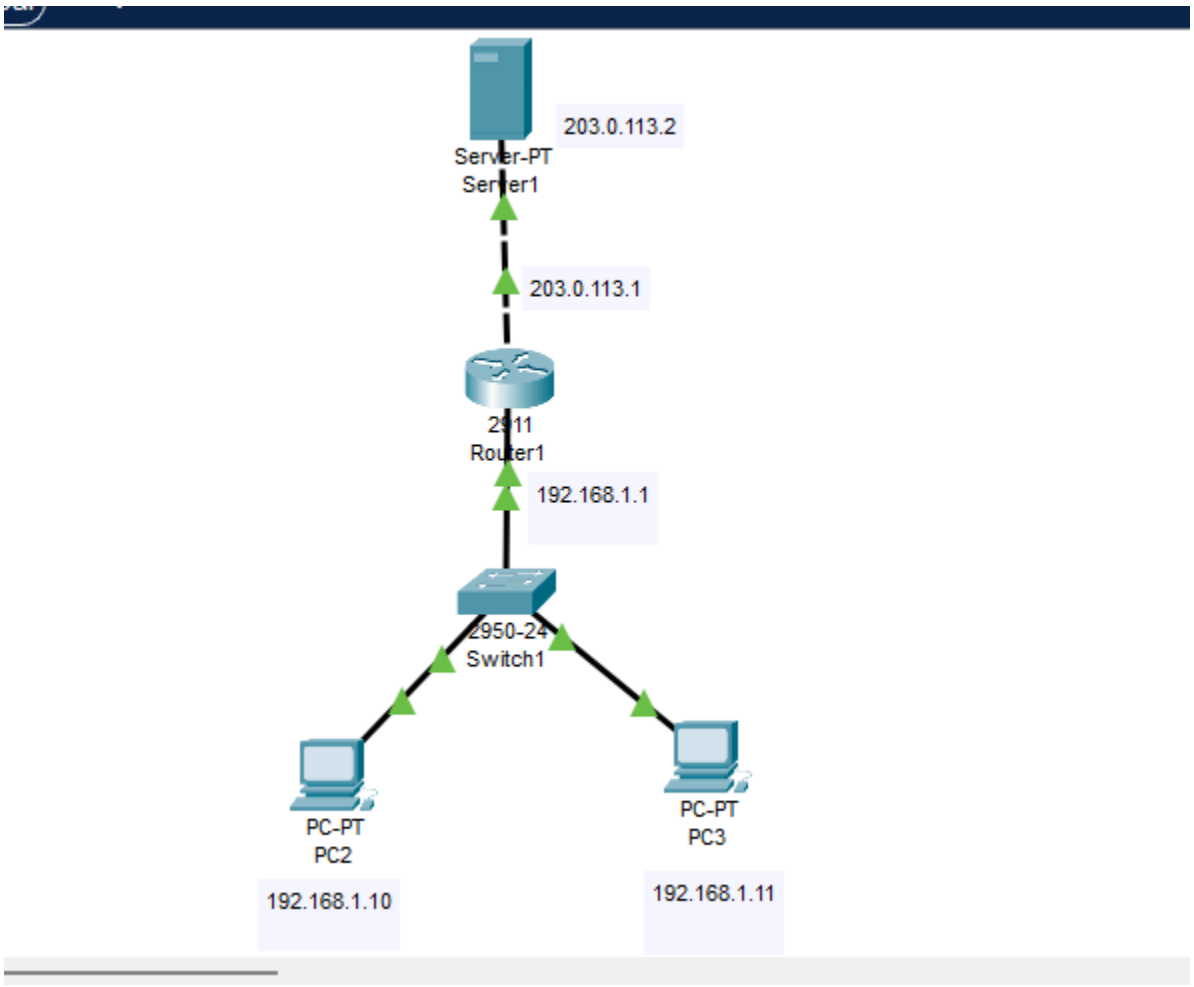
Network :
A basic network is developed to run Static NAT, Dynamic NAT and PAT



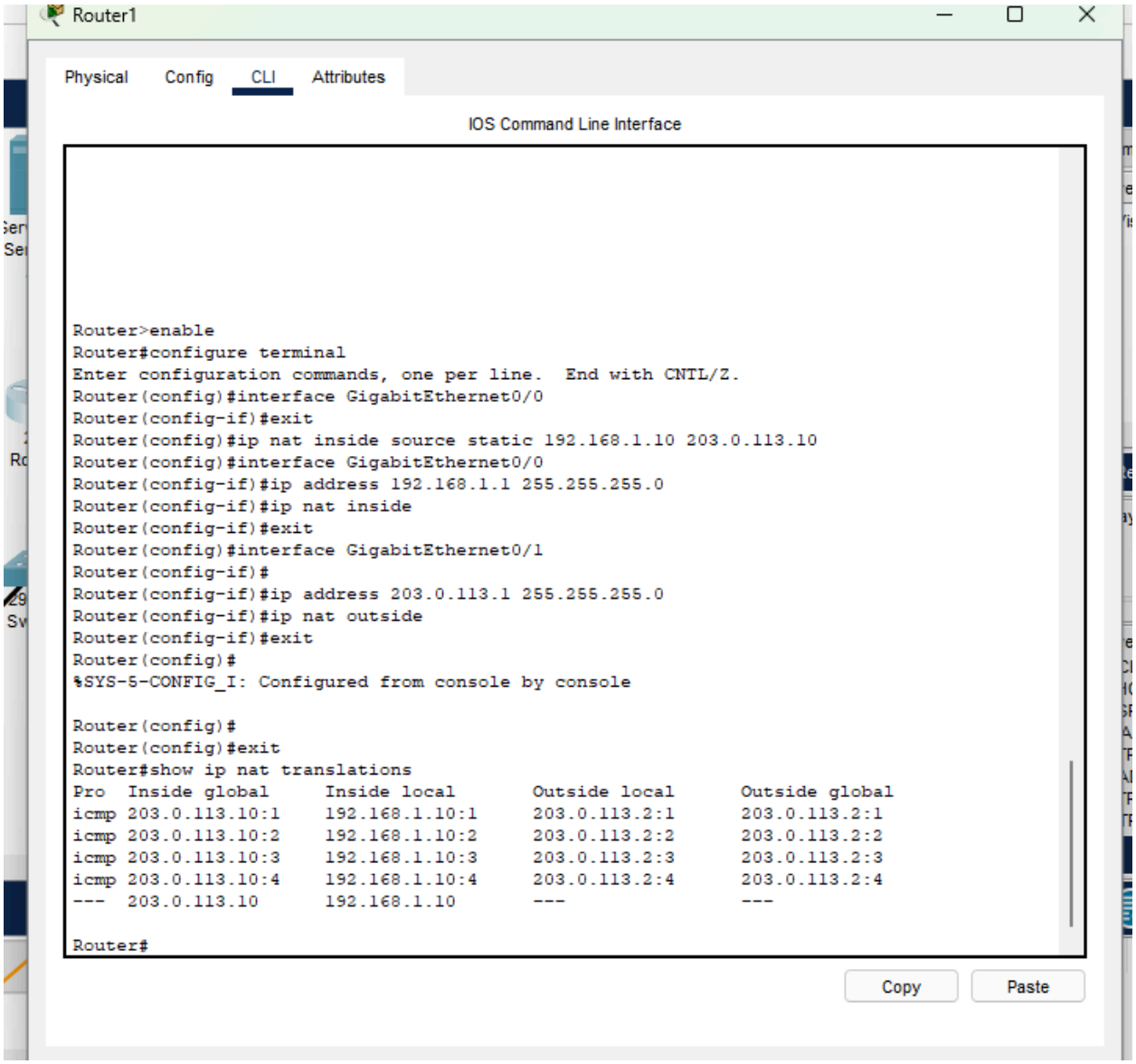
Static NAT

Static NAT maps a specific private IP address to a specific public IP address (one-to-one mapping).
Here , PC0's private IP (192.168.1.10) is translated to a public IP (203.0.113.10) in outside network

ip nat inside source static 192.168.1.10 203.0.113.10

Command passed in router statically

Once server is reached by PC2, ping used to check the connectivity
Then



In the ip nat translations we can verify the translation occurred outside the router

Dynamic NAT

Dynamic NAT maps private IP addresses to a pool of public IP addresses on a first-come, first-served basis (one-to-one mapping, but temporary).

ip nat pool MY_POOL 203.0.113.10 203.0.113.15 netmask 255.255.255.0

Command to define NAT Pool

```
Router(config)#
Router(config)#exit
Router#show ip nat translations
Pro  Inside global     Inside local       Outside local      Outside global
icmp 203.0.113.10:5    192.168.1.10:5     203.0.113.2:5      203.0.113.2:5
icmp 203.0.113.10:6    192.168.1.10:6     203.0.113.2:6      203.0.113.2:6
icmp 203.0.113.10:7    192.168.1.10:7     203.0.113.2:7      203.0.113.2:7
icmp 203.0.113.10:8    192.168.1.10:8     203.0.113.2:8      203.0.113.2:8

Router#
```

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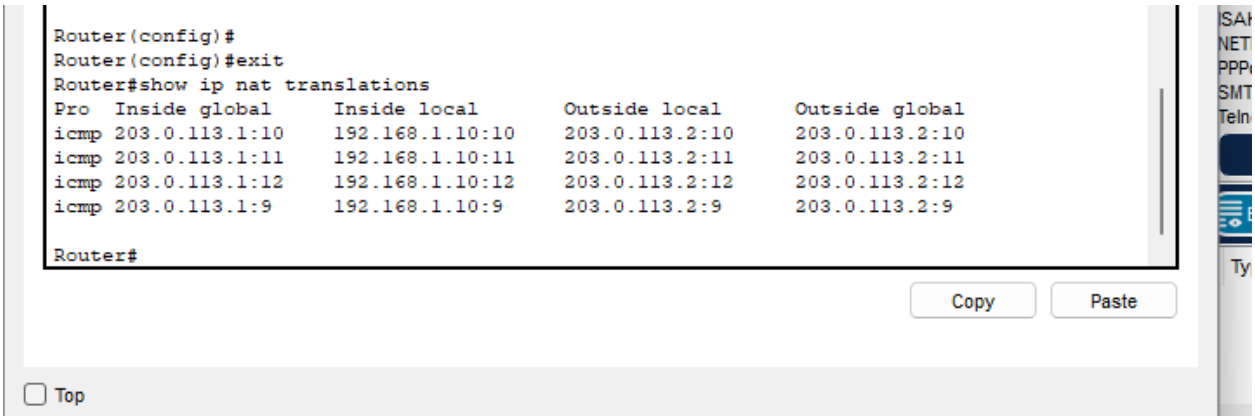
PAT (Port Address Translation)

PAT (also called NAT overload) maps multiple private IPs to a single public IP by using different port numbers (many-to-one mapping). This is the most common form of NAT.

ip nat inside source list 1 interface GigabitEthernet0/1 overload

Using the overload keyword , PAT is enabled



PAT uses the single public IP (203.0.113.1) for all internal devices but differentiates traffic using unique port numbers.
This allows many devices to share one public IP, making it highly efficient for home or small office networks.