INTRODUCTION

IP address means Internet Protocol Address is a numerical type of is a numerical label assigned to each device connected to a computer network that uses the internet protocol for communication. It carries 2 main functions: host/network identification & location addressing. There are 2 types of IP address. IPv4 that contains 32 bits & IPv6 contains 128 bits.

IPv4 Classes: IPv4 is categorized as 5 classes. Class A to Class E

Class A: In a Class A network, the first eight bits, or the first dotted decimal, is the network part of the address, with the remaining part of the address being the host part of the address. There are 128 possible Class A networks : 0.0.0.0 to 127.0.0.0
Class A IP address format is 0NNNNNNN.HHHHHHHH.HHHHHHHH.HHHHHHHH

Class B: In a Class B network, the first 16 bits are the network part of the address. All Class B networks have their first bit set to 1 and the second bit set to 0. In dotted decimal notation, that makes 128.0.0.0 to 191.255.0.0 as Class B networks. There are 16,384 possible Class B networks.
Class B IP address format is: 10NNNNNN.NNNNNNNN.HHHHHHHH.HHHHHHHH

Class C: In a Class C network, the first two bits are set to 1, and the third bit is set to 0. That makes the first 24 bits of the address the network address and the remainder as the host address. Class C network addresses range from 192.0.0.0 to 223.255.255.0. There are over 2 million possible Class C networks.
Class C IP address format is: 110NNNNN.NNNNNNNN.NNNNNNNN.HHHHHHHH

Class D: Class D addresses are used for multicasting applications. Class D is not used for basic networking operations. Class D addresses have their first three bits set to “1” and their fourth bit set to “0”. Class D addresses are within the range of 224.0.0.0 – 239.255.255.255 are used to identify multicast groups. There are no host addresses within the Class D address space, since all the hosts within a group share the group’s IP address for receiver purposes.

Class E: This IP Class is reserved for experimental purposes only for R&D or Study. IP addresses in this class range from 240.0.0.0 to 255.255.255.254. Like Class D, this class too is not equipped with any subnet mask.

* Here H means hosts & N means Networks

In our Experiment we will Use C class IP for among all the devices of a local area network (LAN) & class A IP for Static routing between two or more different LANs’

Size of Networks: Class A 8 bits, Class B 16 bits, Class C 24 bits
Size of Rest: Class A 24 bits, Class B 16 bits, Class C 8 bits

Number of Addresses per Network: Class A 2^24 = 16777216, Class B 2^16 = 65536 & Class C 2^8 = 256
Number of Network: Class A 2^7 = 128, Class B = 2^14 = 16384 & Class C 2^21 = 2097152

EXPERIMENT TITLE

We want to set up the environment of Static Routing & then we want to transfer data between two local area networks.

EQUIPMENTS/SOFTWARE

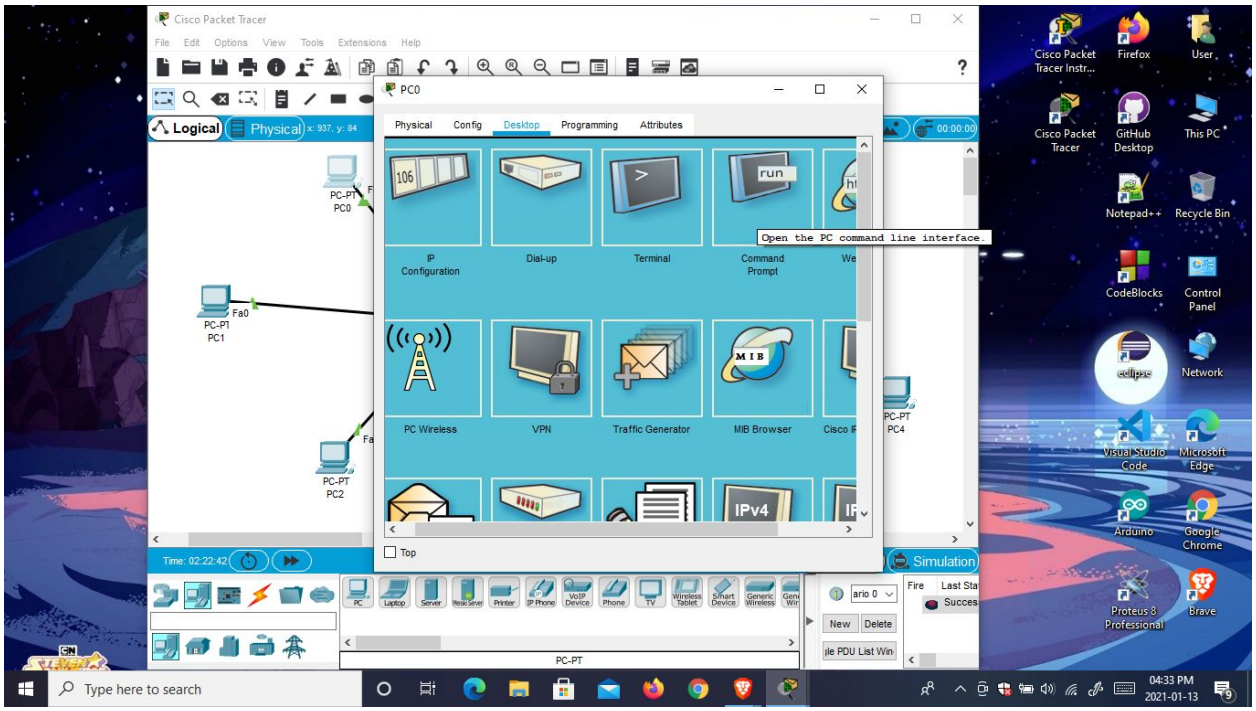
Cisco Packet Tracer

PROCEDURES

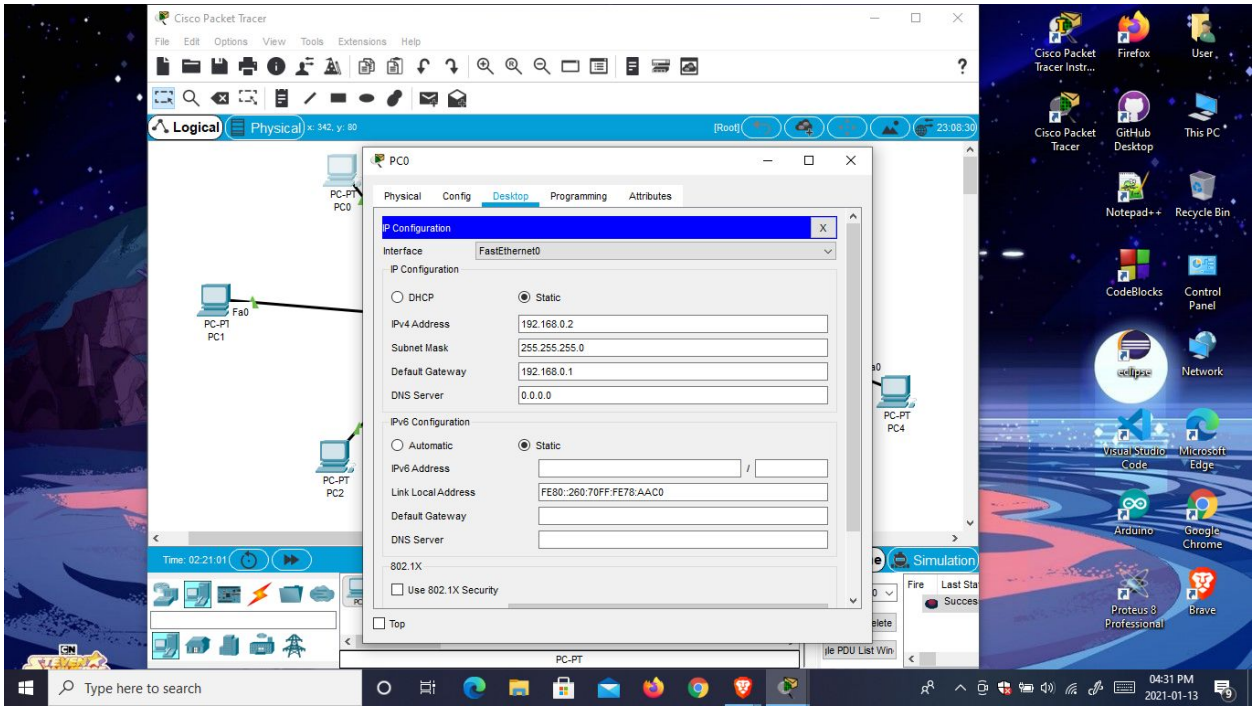
1. First of all I've opened Cisco packet tracer & logged in.

2. Then, I took 3 on-end devices (PC) & connected them with a Switch to create a Local Area Network

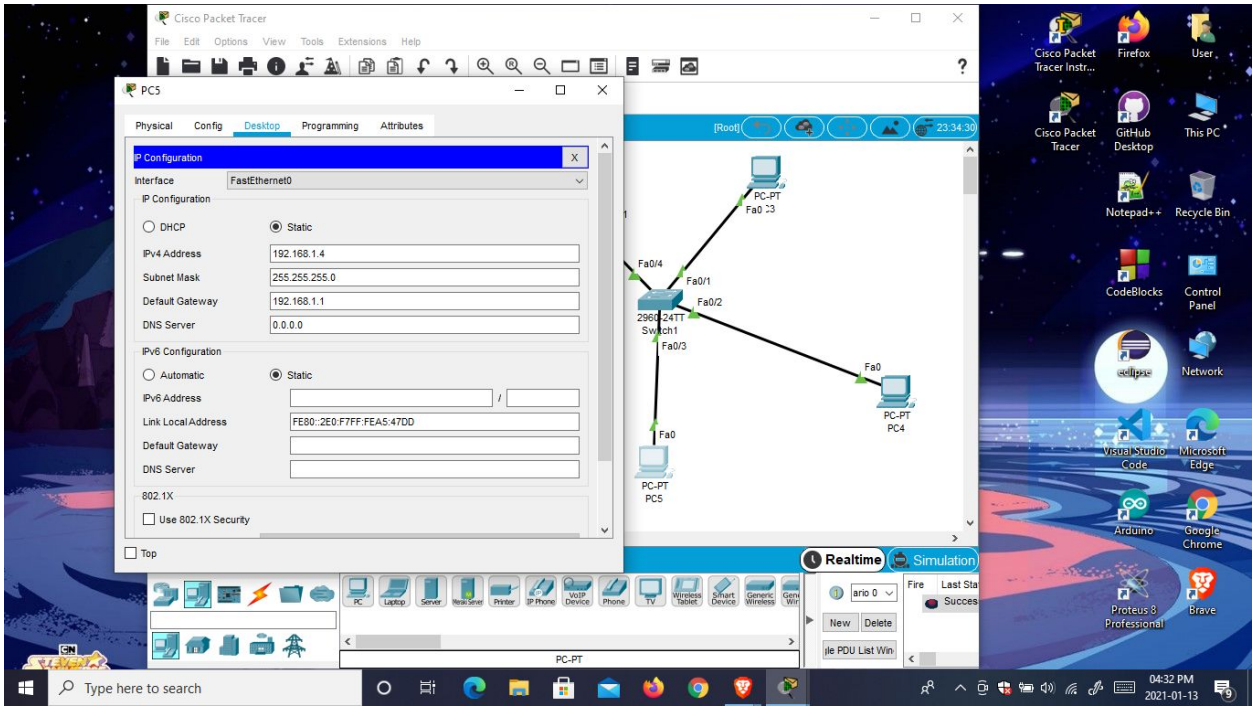
3. After that, I right clicked on the PC & after this tab appeared I clicked the IP configuration section.



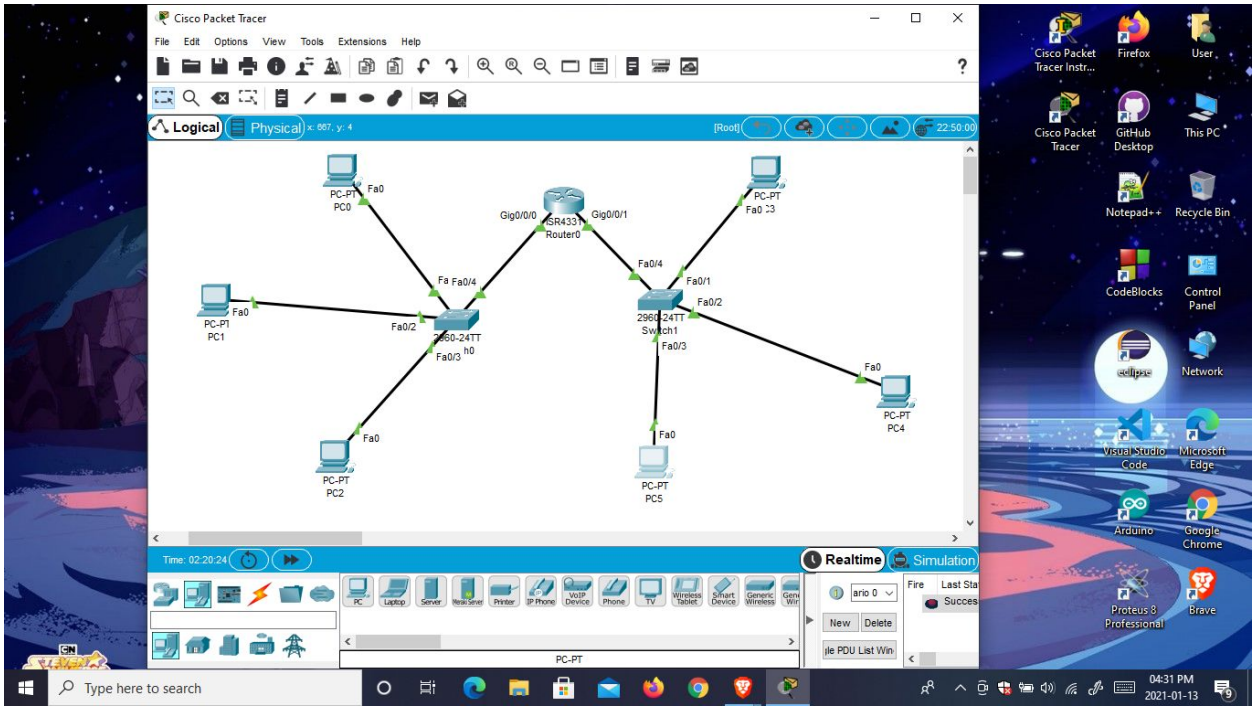
4. Then I set the IP address, Subnet Mask for each PC. The IP address of any network under a LAN will be C class IP. Subnet mask was generated automatically by the packet tracer. Default gateway was selected for this LAN, the same as router IP. Here IP of PC 0 was 192.168.0.2, Subnet Mask was 255.255.255.0, Default gateway was here 192.168.0.1



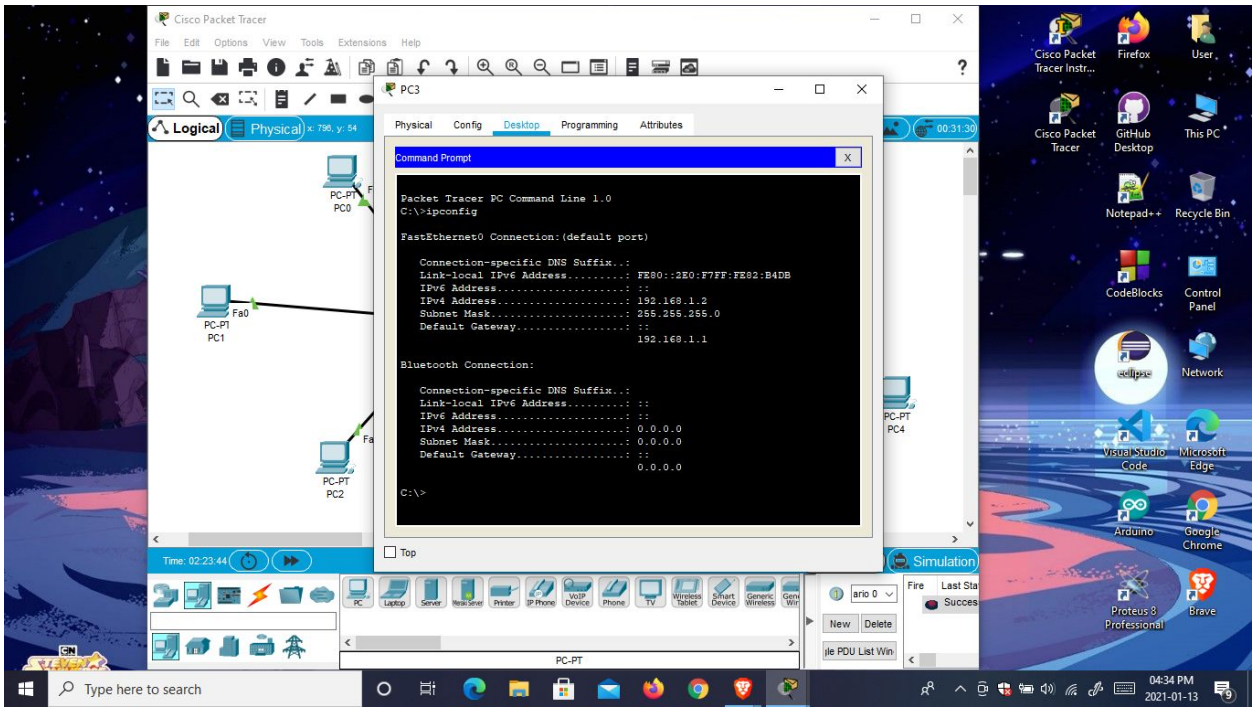
5. Next, I followed the same process 3-4 for all PCs' of left side network
6. Then I connected all the PCs' cables with a Switch for a LAN. Thus my left side's LAN connection was fulfilled.
7. Again I repeated these 3-5 terms for another LAN but this time, Default gateway will be the opposite LAN's network. Like, here for PC 3 IP address was 192.168.1.4, Subnet mask was 255.255.255.0 & default gateway was 192.168.1.1 which was this network's router path address.



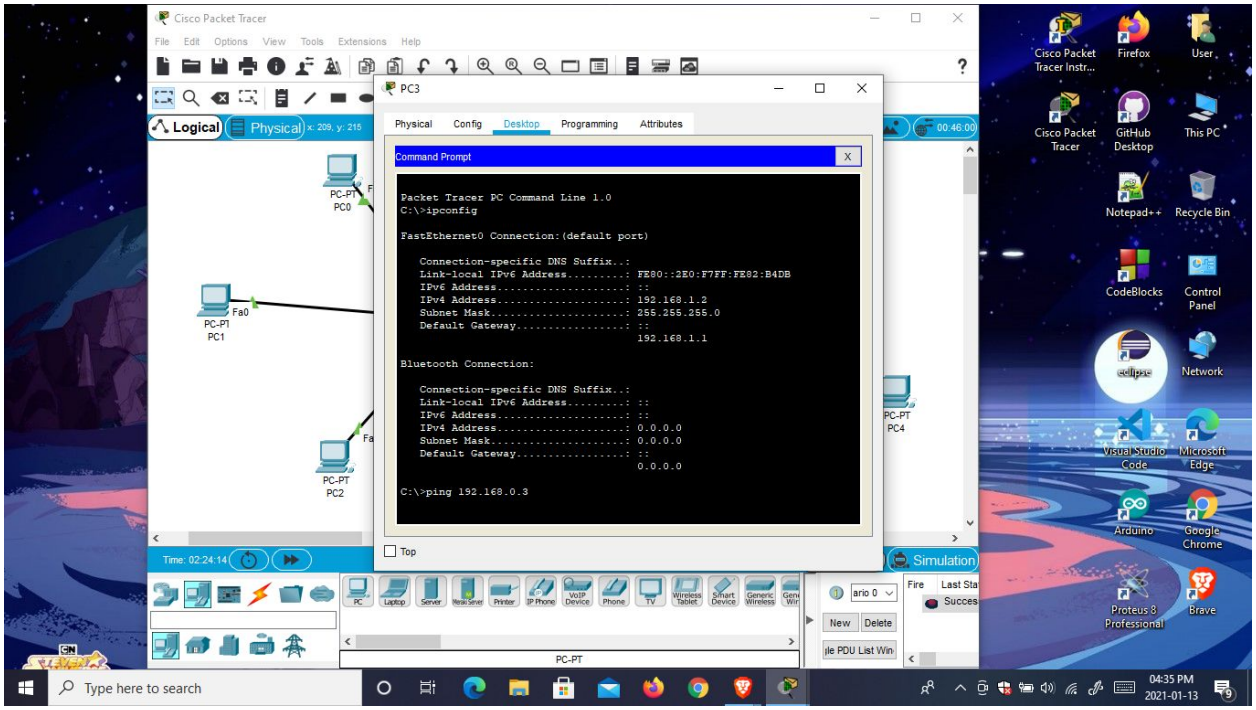
8. After that, I chose a Router-PT & connected with these two LANs' through cables. Here First I hover up the cables & find that the left side network is connected with Fa 0/0. So, I put the router's Fast Ethernet 0/0 ports IP as 192.168.0.1. The other side is connected with Fa0/1 so, I put in Fast Ethernet port 0/1's IP as 192.168.1.1 Then I turned on both side's port status,



9. Now, for packet/data passing I clicked on the Real Time process & selected a PC (Here PC 3). I clicked on the Pc & opened its command prompt & typed command ipconfig to check the IP address & all other network info's of that PC.

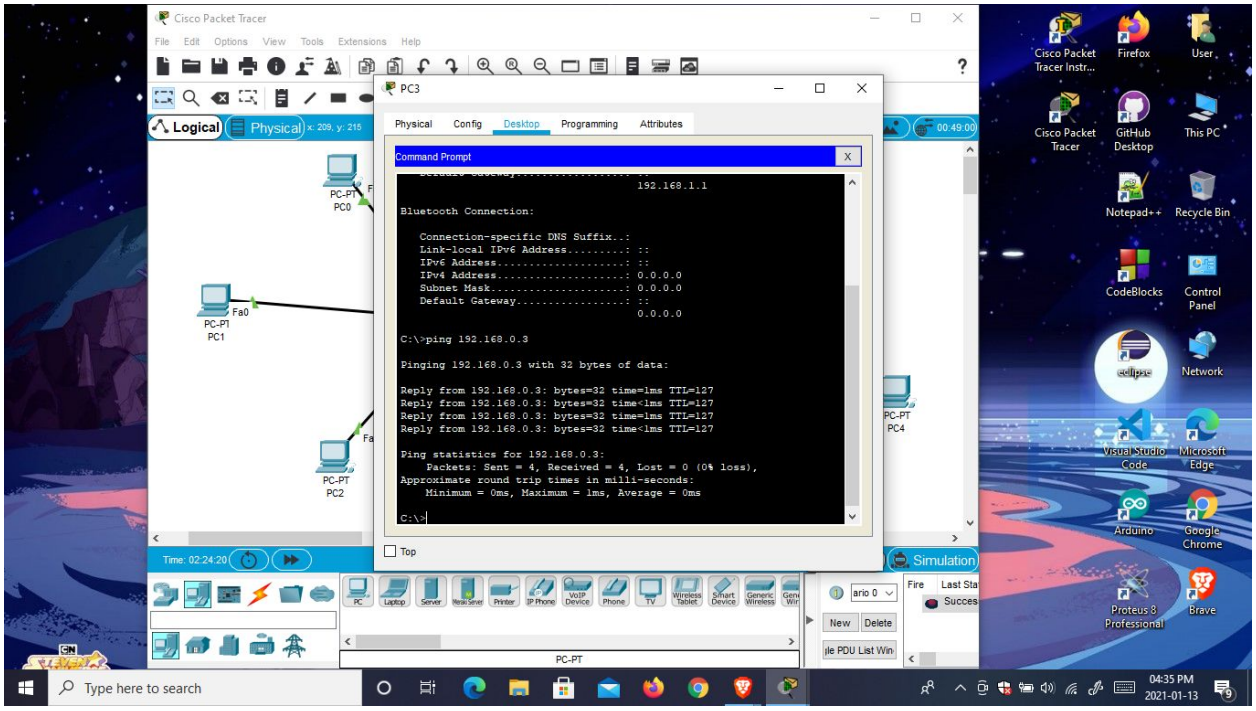


10. After that I typed command ping ip_address of receiver Here I typed ping & then PC 2's IP 192.168.0.3 because i want to transmit my data from PC3 to PC2



11. After transmitting the data it generated a command like this.

Ping statistics for ip address:
Sent:_ ; Received:_ : Loss:_ As this is the confirmation messages for this experiment, So I finished my experiment successfully



RESULT

Left Side Network

PC No	IP Address	Subnet Mask	Default Gateway
PC 0	192.168.0.2	255.255.255.0	192.168.0.1
PC 1	192.168.0.3	255.255.255.0	192.168.0.1
PC 2	192.168.0.4	255.255.255.0	192.168.0.1

Right Side Network

PC No	IP Address	Subnet Mask	Default Gateway
PC 3	192.168.1.2	255.255.255.0	192.168.1.1
PC 4	192.168.1.3	255.255.255.0	192.168.1.1
PC 5	192.168.1.4	255.255.255.0	192.168.1.1

Router

Fast Ethernet	IP Address
Fa 0/0	192.168.0.1
Fa 0/1	192.168.1.1

CONCLUSION

After this experiment we can now make a static routing protocol
We also learned different types of IP classes of IPv4 & their basic use
We also learned about the network connections, end devices, port devices.