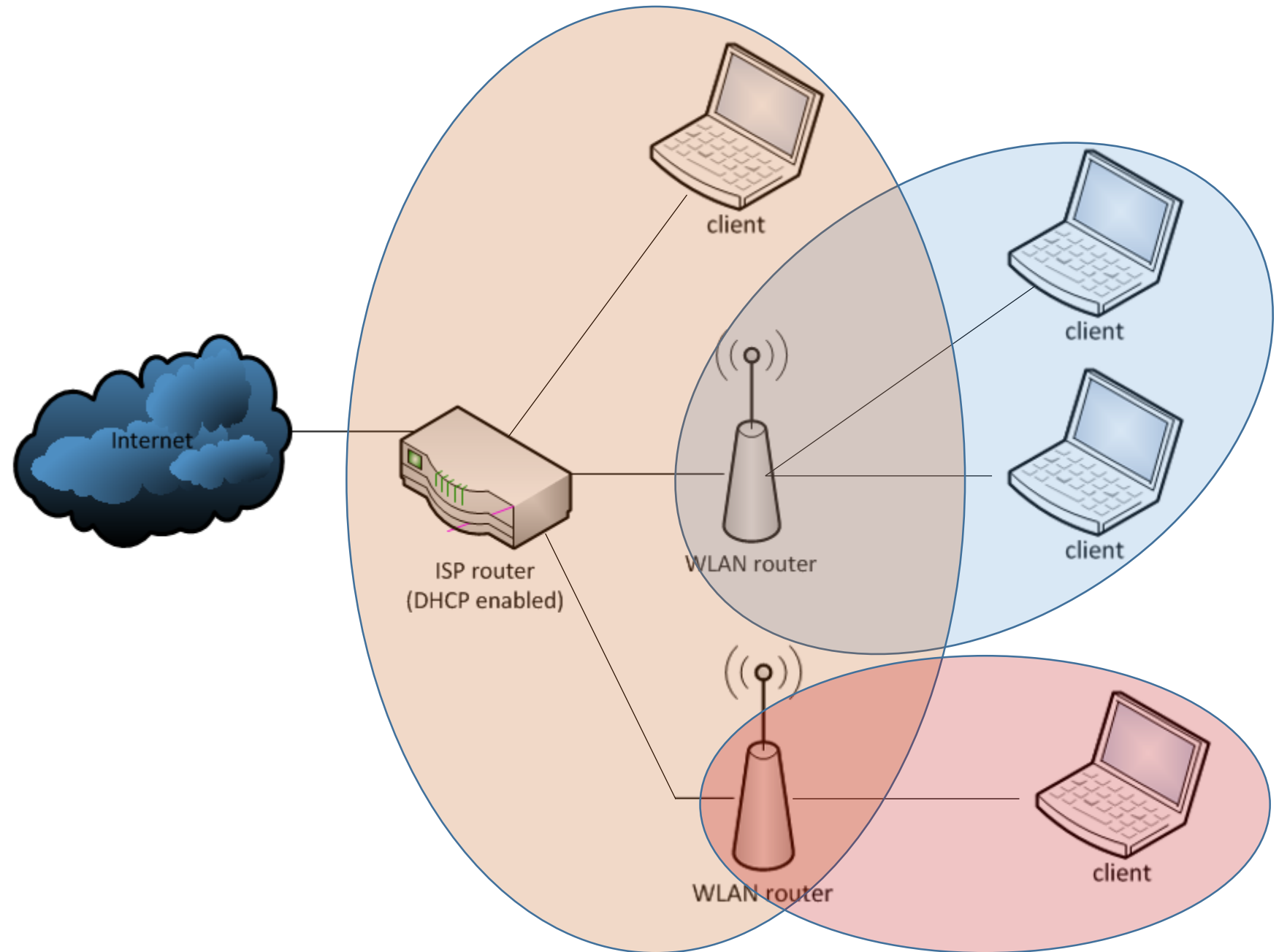


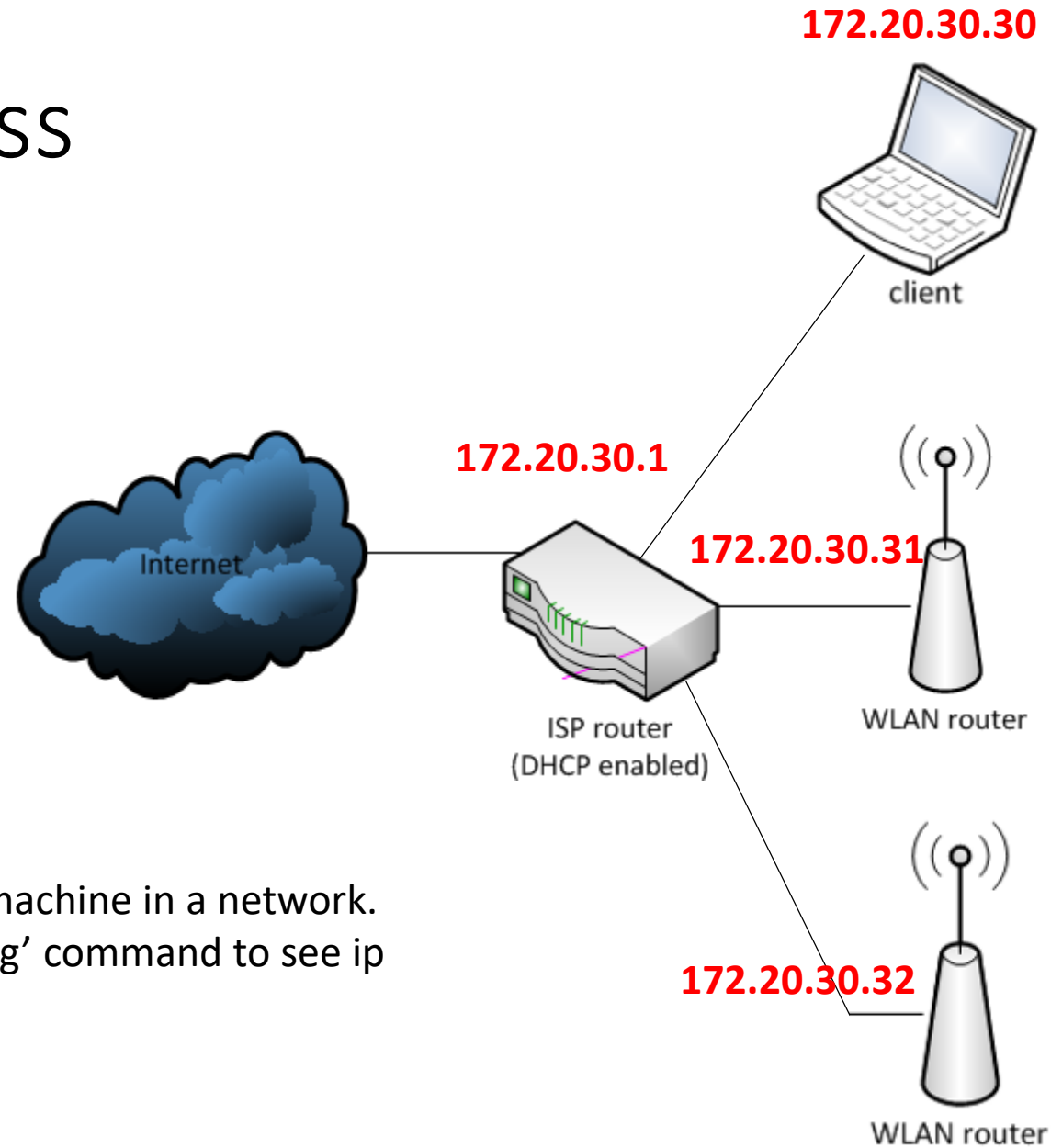
# Introduction to Socket Programming

Md. Tareq Mahmood

# Network

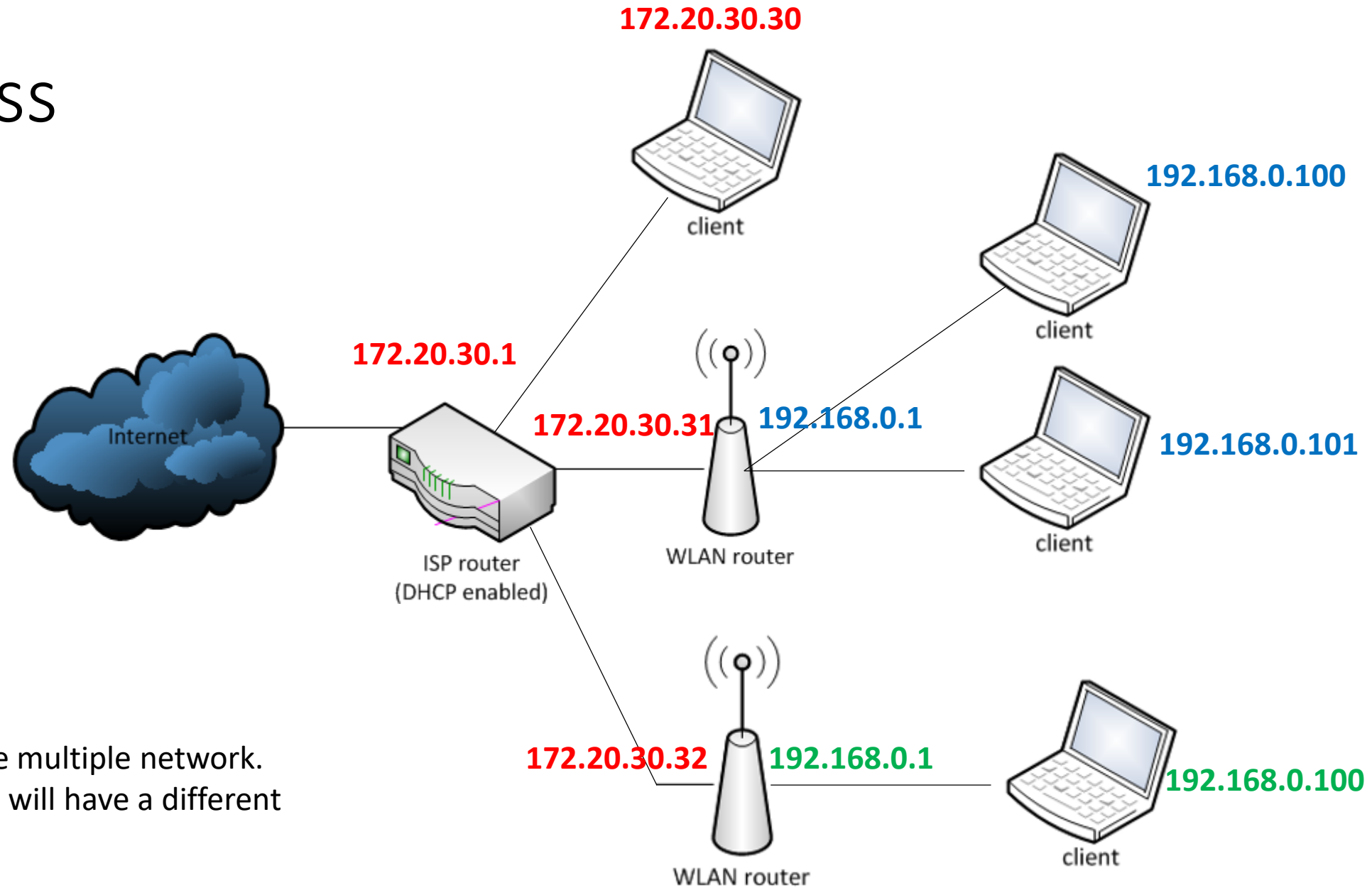


# IP Address



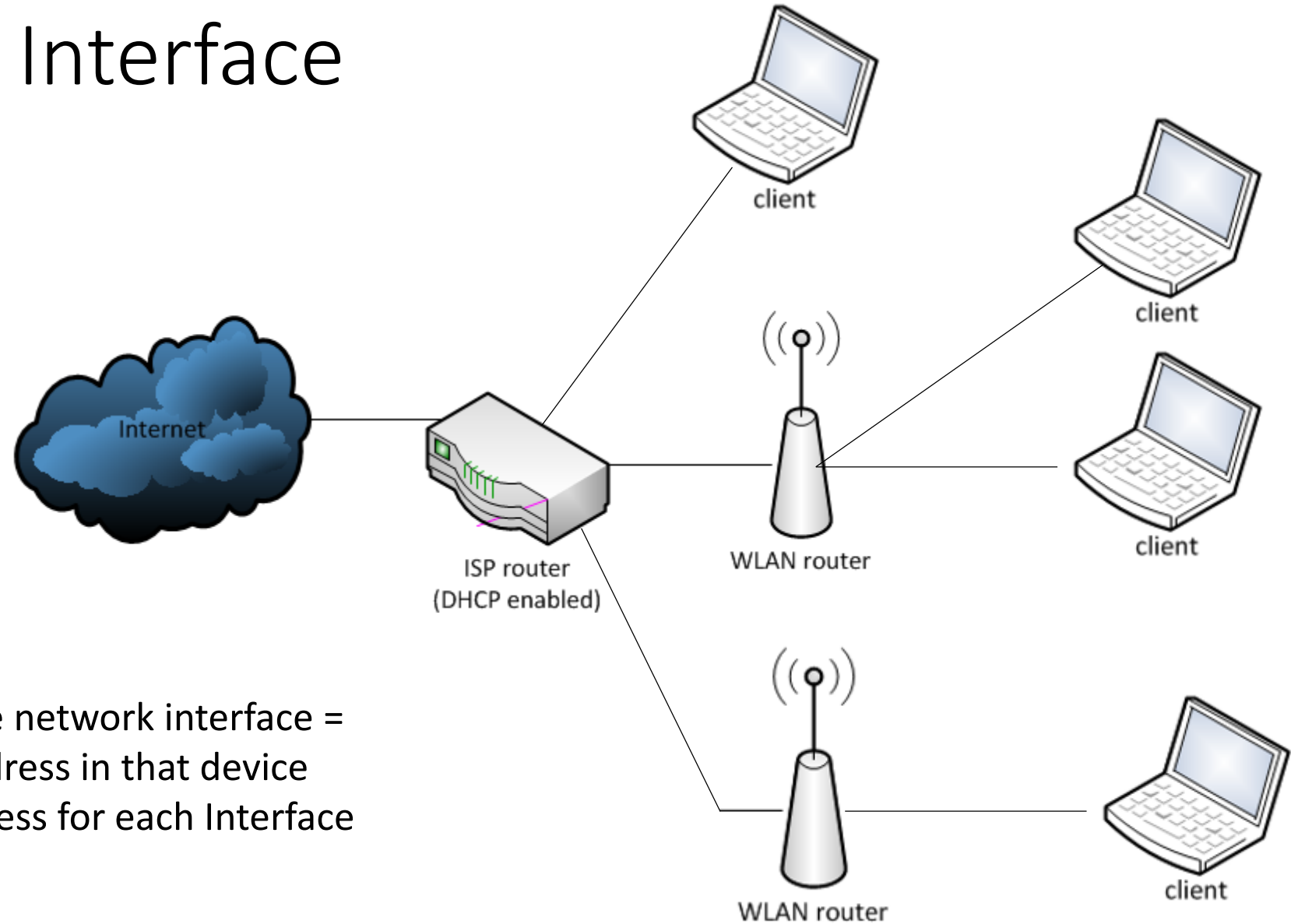
- Identification of a machine in a network.
- 'ipconfig' or 'ifconfig' command to see ip address.

# IP Address



A machine may have multiple network.  
For each network, it will have a different  
IP address.

# Network Interface



- Number of active network interface = number of ip address in that device
- Different IP Address for each Interface

# Port

- Endpoint/channel for communication for different programs
  - $2^{16}$  ports, some are reserved
  - A computer process must acquire a port for network communication
  - A logical construct
- 
- 'netstat' command to see ports in use

# Connection Establishment

- You need (IP address, Port) to establish a connection to remote PC
- A program must be running to that PC to accept your connection
- Some program must be running on that port
  
- Example: buet.ac.bd:443
- Error for, buet.ac.bd:120

# Socket

- Represents a single connection between two network applications
- Number of connection = number of sockets
- A socket must have these informations to communicate
  - Remote IP
  - Remote Port
  - Local Port
- A socket need these bufferes to operate
  - Input buffer
  - Output buffer

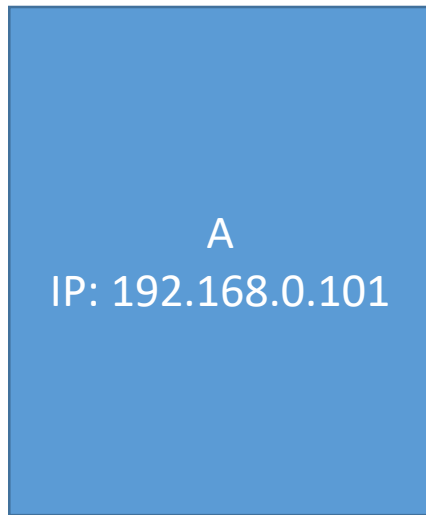


# Socket vs Port

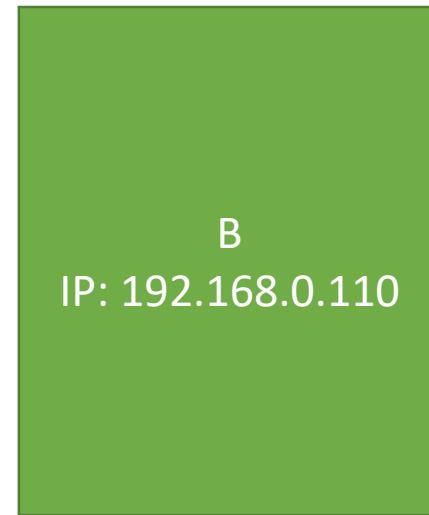
- Multiple sockets can be using same ports
- But a port must be acquired by only one program

# Connect Two PC

1. A listens for connection in a port (6666) using a Server Socket



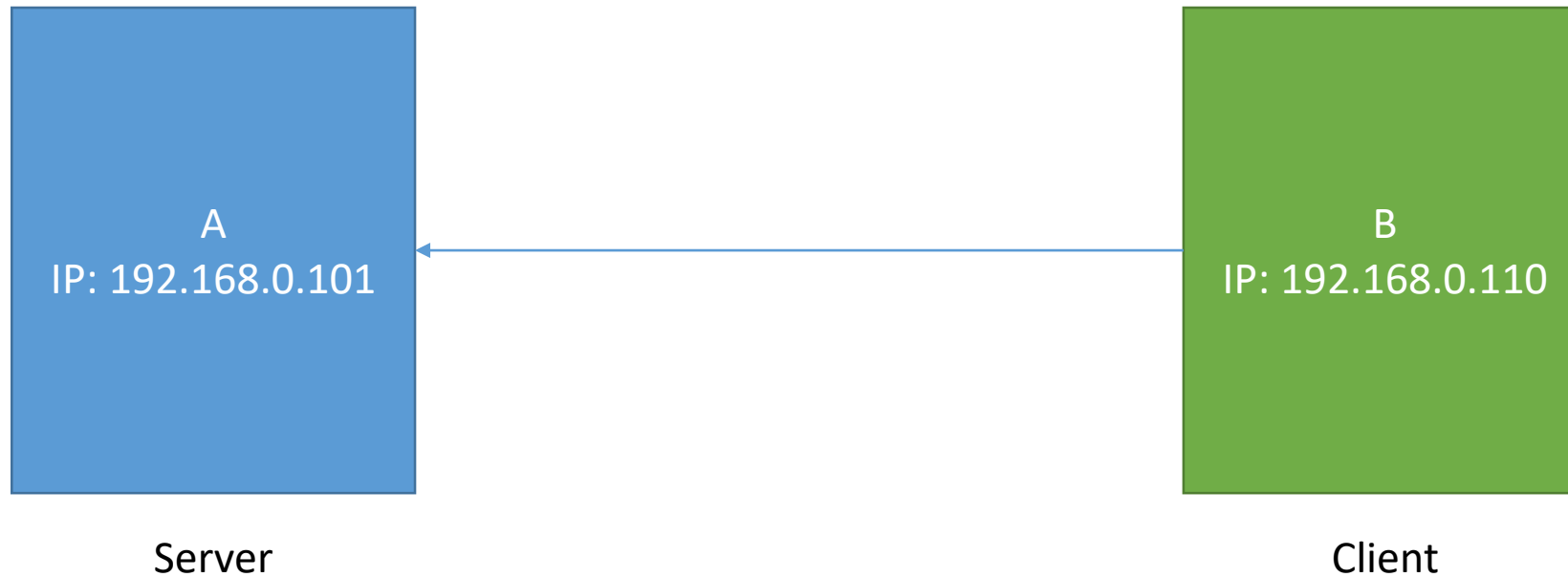
Server



Client

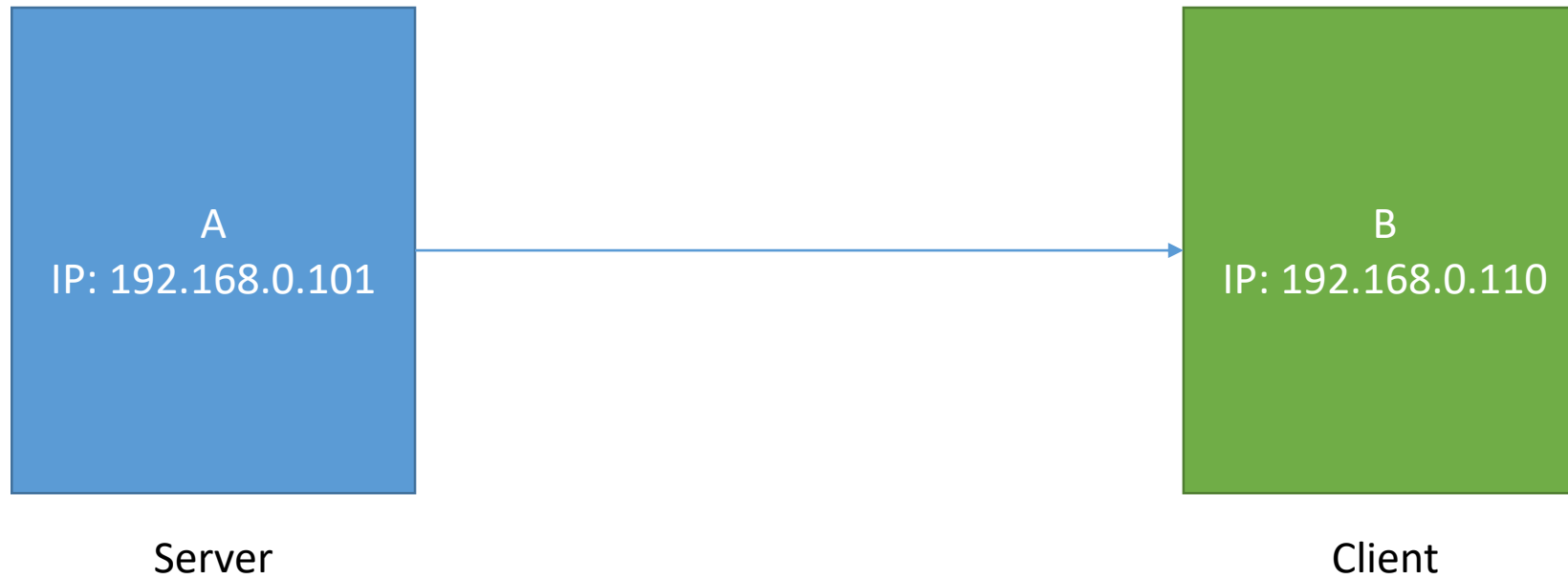
# Connect Two PC

2. B tries connect to A using (192.168.0.101, 6666)



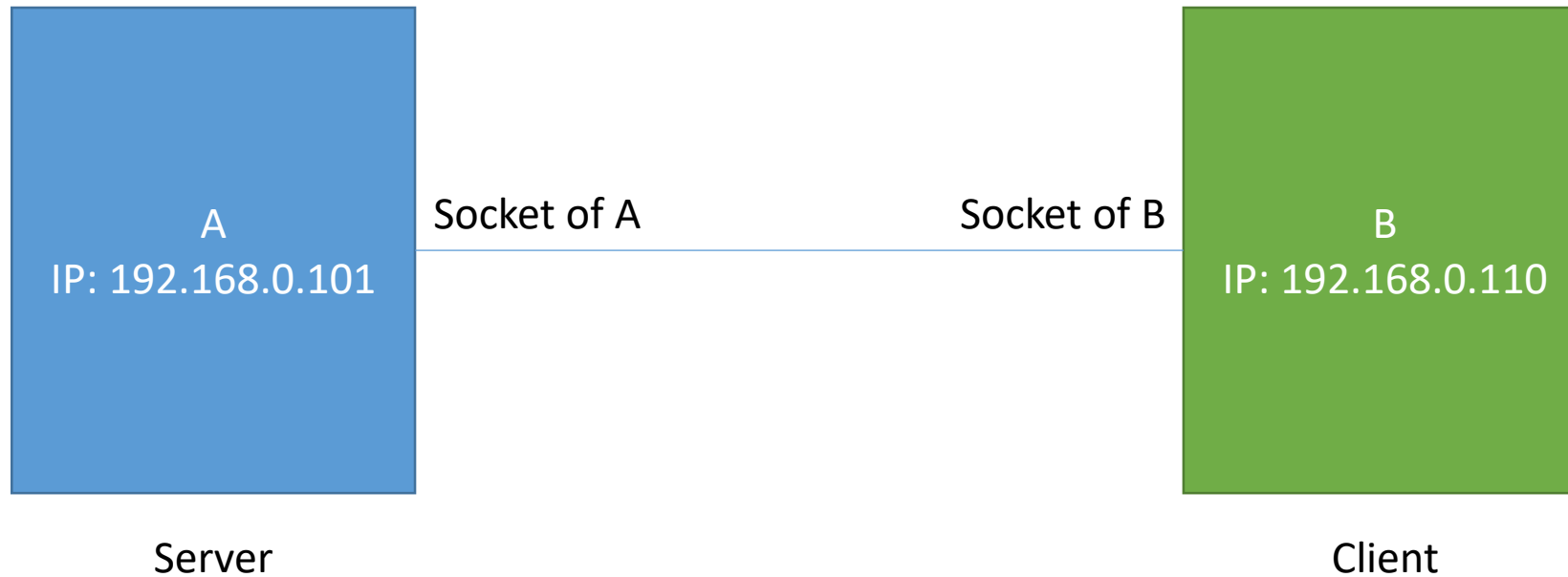
# Connect Two PC

3. A accepts B's connection



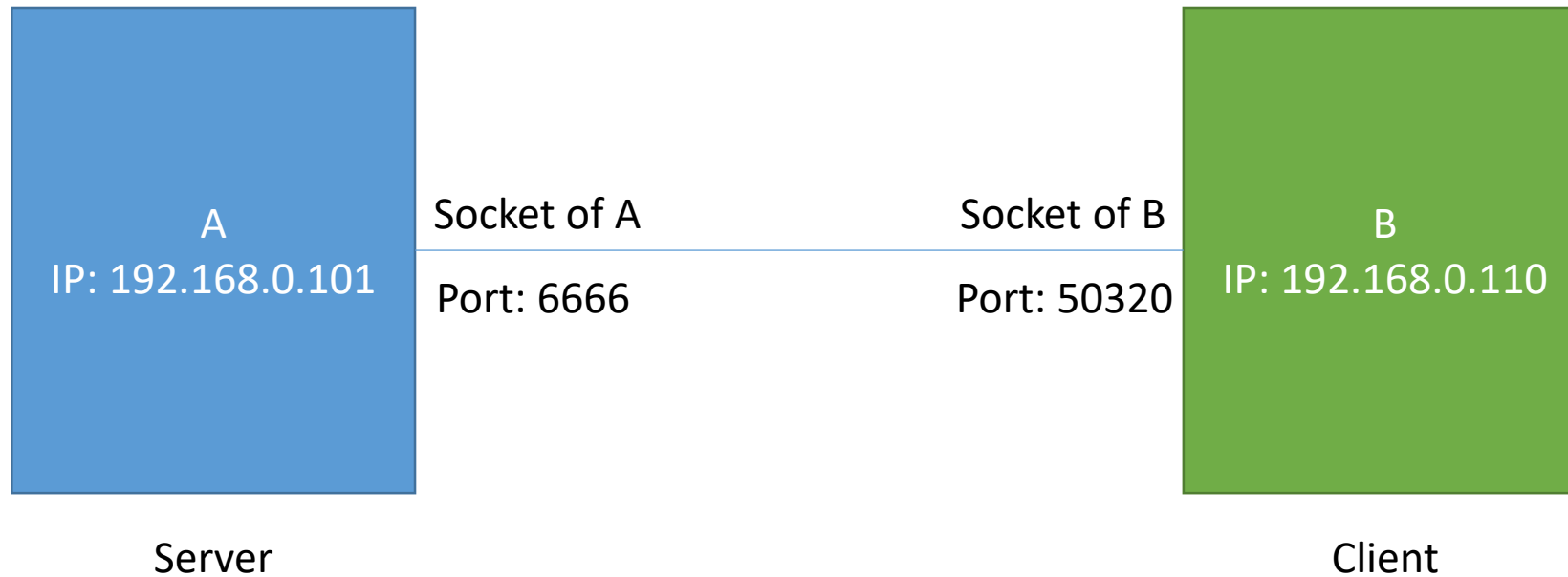
# Connect Two PC

4. Both of them has a socket of their own



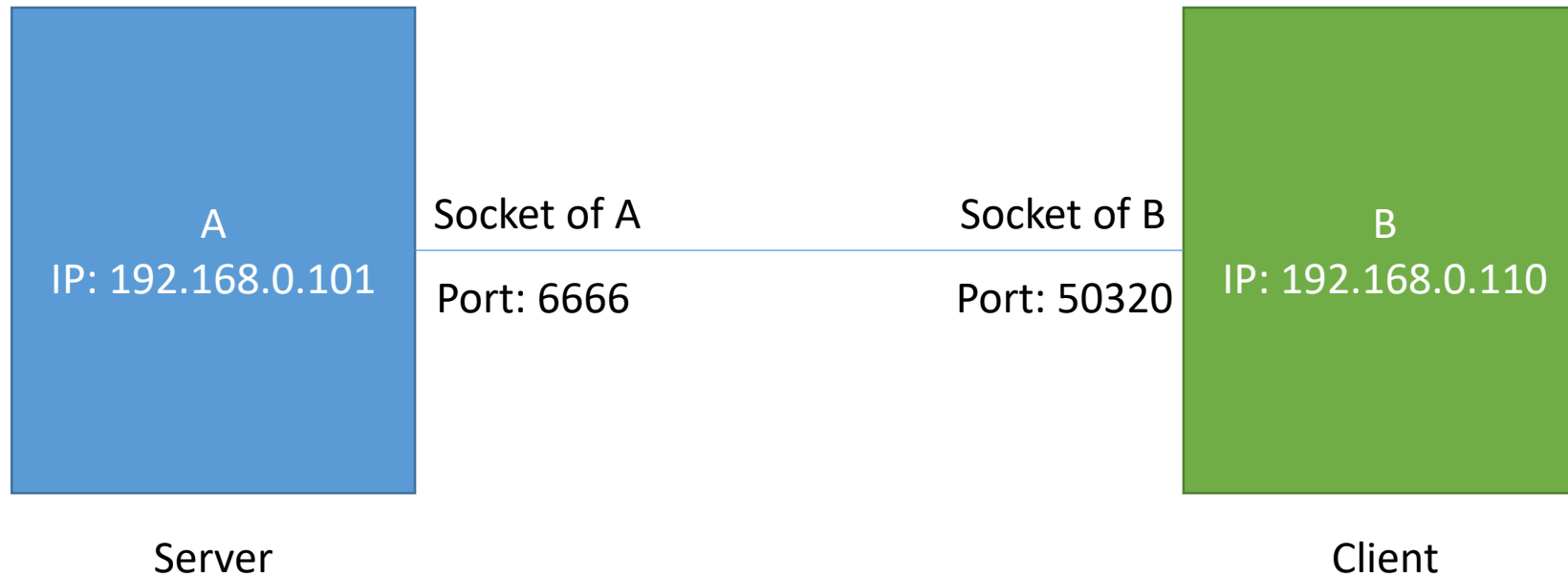
# Connect Two PC

5. Both of them knows each other's IP address and Port



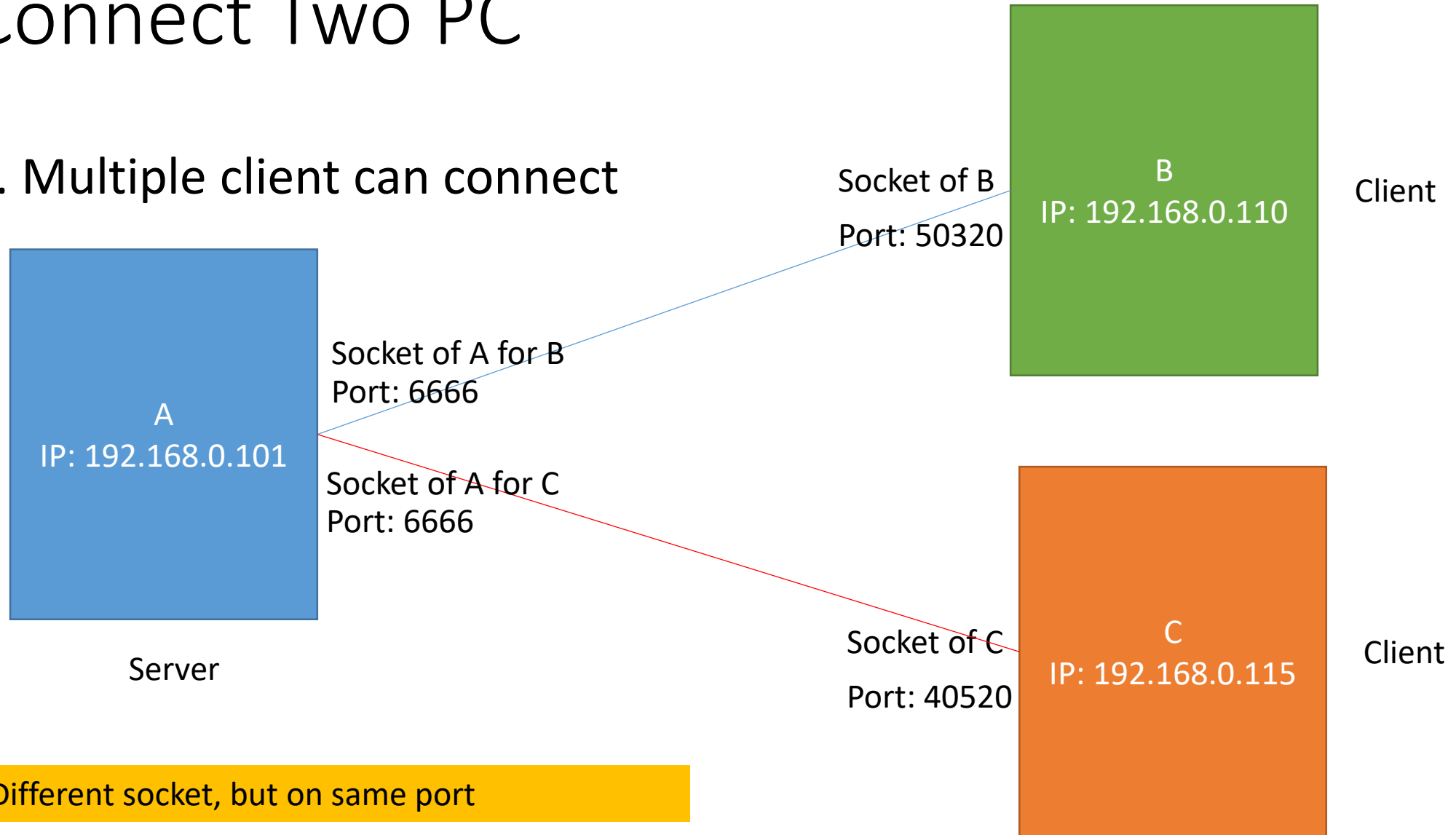
# Connect Two PC

6. Server keeps listening on same port for new connection



# Connect Two PC

## 7. Multiple client can connect





# TCP

- This whole thing is done using Transmission Control Protocol