Socket- It is one endpoint of a two-way communication link b/w two programs running on the network.

- Socket system provides bidirectional **FIFO** communication over the network.
- Each socket has a specific address(composed of port number and IP)
- A socket is uniquely identified by-
    1. IP
    2. End to End protocol
    3. Port number

Types of (TCP/IP) Sockets –

- Datagram socket (UDP)- connection less and data not in order
- Stream socket (TCP)- Reliable byte- stream service and data in order(send/received)

Port Numbers- They have decimal value ranging 0-65535.

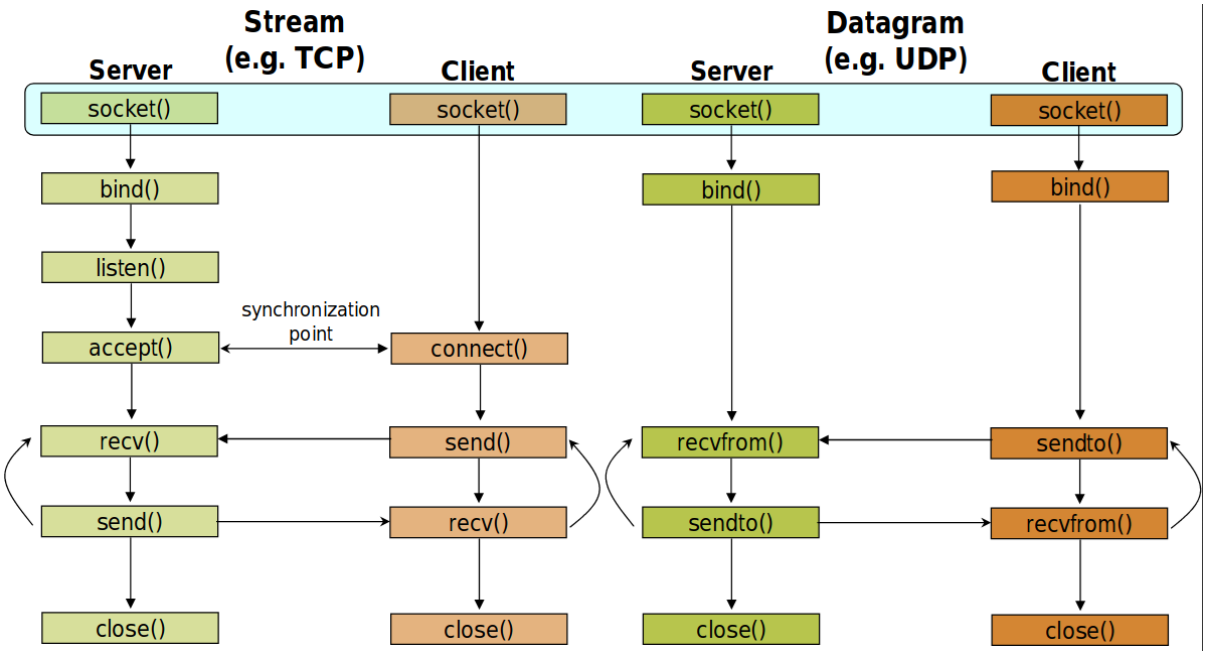
#further grouping-

1. 0 – 1023 (Well Known Ports)-
   These are allocated to server services with IANA (Internet Assigned Number Authority)
   Eg- Web server normally used port 80

2. 1024 – 49151(Registered ports)-
   Can be registered for services with IANA.
   These are semi reserved
   User written program should not use these ports.

3. 49152 – 65535(Ephemeral ports)-
   These are used by client programs.
   Eg- When web browser connects to a webserver, the browser allocates itself a port in this range.

Server – Client Model -



Some basics-

- **Socket()** – Create a socket.
- **Bind()** – Assign address to socket
  (It's a socket identification like telephone number to a contact)
- **Listen()-** Ready to receive connection
- **Connect()-** Ready to act as a sender(client connect with server using this)
- **Accept()-** Server gets a socket for an incoming client connection.

- **File Descriptor** – A file descriptor is a number uniquely identifies an open file in a computer's operating system. It describes a data resource and how that resource may be accessed.
  (Usually It's 0 – successful, -1 – failure)

About various functions and statement used in program-

- **htons()-** stands for host to network short.
  Used to provide the port number because in
  // object.sin_port = 54000 – we can't do that because of endianness. So, we use this function.
- **INADDR_ANY -** This allowed your program to work without knowing the IP address of the machine it was running on. When receiving, a socket bound to this address receives packets from *all* interfaces. When sending, a socket bound with INADDR_ANY binds to the default IP address, which is that of the lowest-numbered interface.
- **inet_aton() -** returns non-zero if the address is a valid one, and it returns zero if the address is invalid.