Communication

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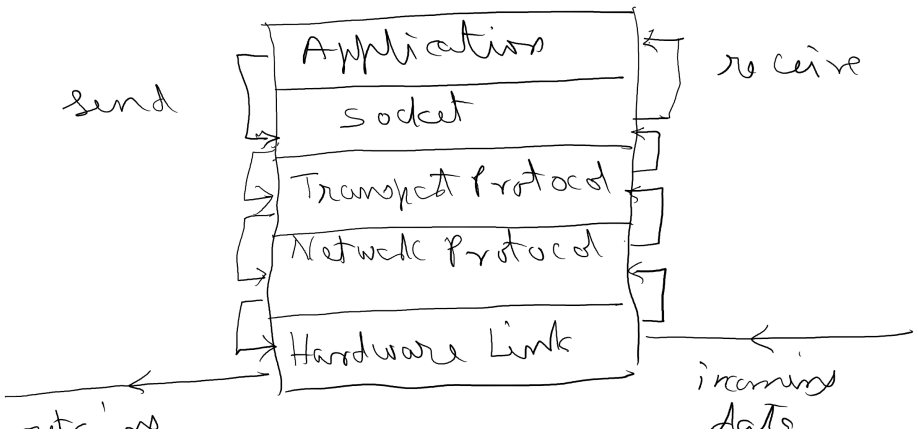
Network Communication: It is a mechanism that enables a program executing on one machine to exchange data with another program executing on a remote machine provided these machines are linked together through some networking hardware.
In order to support network communication between application processes, an operating system provides implementations for

1. **Network Protocol** - It is hardware link type (WiFi, 4G) independent interface for identifying machines known as *hosts* on the network and for handling transmission of data between such hosts. The *internet(work) protocol* (IP v4/6) is a popular network protocol which identifies each host using a unique (32/128-bit) integer known as its *IP address* and handles transmission of data using structured data-blocks (each with maximum size of 65535 bytes) known as *IP packets*.
2. **Transport Protocol** - It is a network protocol based interface for identifying communicating processes known as *peers* executing on different hosts and for handling transmission of data between such peers. *Transmission control protocol* (TCP) and *user datagram protocol* (UDP) are popular IP based transport protocols which identify each peer using a unique *endpoint* consisting of a 16-bit integer known as its *port address* along with the IP address of its host. While TCP is a *connection-oriented* protocol which offers a reliable mode for point-to-point communication, UDP is a *connectionless* protocol which offers a lightweight mode for communication with support for multicasting (one point to multiple points).
3. **Socket** - It is a logical interface enabling an application to consume the implementation of a transport protocol provided by the system. While a *stream socket* is built on top of connection oriented protocol (such as TCP) to send/receive data as sequence of bytes, a *datagram socket* is built on top or connectionless protocol (such as UDP) to send/receive data in form of fixed-size messages (65507 bytes in case of UDP).



Distributed System: It is a software whose different parts are executed as separate processes on different machines across a network and which interact with each other using network communication. It is commonly supported using one or more *server* processes which publish their operations on well-known endpoints so that they can consumed *by client* processes from random endpoints within their network.
A distributed system is generally implemented for centralization (decentralization) of resources over a network. Centralization (decentralization) of large-scale resources over the internet is called *cloud* (*grid*) *computing*.