TCP/IP

1. Network, packets and protocols
2. Address
3. Name
4. Client/server
5. Socket

Network, packets and protocols

Network uses hosts and routers. Routers relay/forward infos from hosts to hosts

Hosts runs programs

Packets is information sent between routers, hosts. It has packets` destinations

Protocols = rules of packets (structures, how it is sent)

Structure of TCP/IP network

IP: Internet Protocol

TCP:Transmission Control protocol

UDP: User datagram protocol

Network layer: IP- using datagram services, which sends informations between hosts

Transport layer: transfer information to programs inside hosts (TCP & UDP)

TCP: require connection between 2 programs, ensure no losses,

Addresss

Consists of Internet address (used by IP), port number (used by TCP/UDP)

IPv4 (IP version 4) consists of decimal number seperated by period, 32 bits long. E.g 10.1.2.3

IPv6 (IP version 6) consists of hexadecimal number, seperated by colon (:), 128 bits long E.g 2000:fdb8:0000:0000:0001:00ab:853c:39a1

Internet interface: underlying communication channel

A host can have many internet interfaces but a internet interface only be used by 1 host only

Special address:

+loopback (127.0.0.1 for IPv4; 0:0:0:0:0:0:0:1 for IPv6)

+for private: IPv4 starts with 10 or 192.168 or 172.(between 16 and 31). None for IPv6. NAT (network address translation) sends pairs of private address and port number of 1 interface to another pairs in another interface

+link-local: IPv4 starts with 169.254, IPv6 having first 16 bits starts with FE8

+multi-cast:addresses refering to a single destination

Names:

Easier for usage, and insulates users from IP address changes

Information of IP address can gathered from names by 2 primary sources: (name-resolution services)

DNS (domain name system):distributed database that maps domain names such as Internet addresses and other information

Local configuration database: generally OS-specifific mechanisms for local name-to-Internet address mappings.

Clients and servers

Clients == host

Clients use name-resolution services to find server

API (Application Programming Interface) Sockets

An abstract definition of how programs send and receive data from transport layer

2 types for TCP/IP network:

Stream sockets: TCP uses it

Datagram sockets: UDP uses it for delivering information as fast as its possibly can