**Design Philosophy of the DARPA internet protocols**

What I’ve learned from the paper can be listed for Objectives, Services, Implementations, Importance of TCP and Datagrams, and Discussion. Firstly, the Internet is built on the two main concept of “datagram” and “connectionless”. “Datagrams” means the concept of the information package unit which can be delivered. The word “connectionless” means that the IP has no need to store the information from any datagram, which means the datagram can be transported in other routers without the order of original information structure. These two concepts lead to the objectives, which mainly consists of survivability of networks, multiple services provided by networks, and varieties of networks. Although there are orders of the above three objectives, in my opinion, it is mostly determined by the service we want to provide with by network. Take the online speech service for example, we may lose some words from the speaker, but we definitely can’t lose the real-time stream service. In this case, real-time is the primary goal instead of the 100% survivability of the audio message transmission.

If network is mostly built on the service we want to provide, then the flexibility is way more important. However, if we want to achieve all the services in different network implementations, it will be difficult to manage and to interact between different services. As a result, we need a general protocol of the network implementation and maintain the flexibility at the same time. This is the main idea of TCP. Based on TCP, we can achieve flexibility on network, and get close to the goal we want. Nonetheless, the TCP is faced with many challenges such as implementation of host and gateways, including the bandwidth, tradeoff between efficiency and reliability, execution on different operating system and so on.

Discussion: We solved many problems that is proposed in this paper nowadays, such as the maintenance for the order of the packets, transmission efficiency achieved by Time to Live (TTL), IPv4 to IPv6 and so on. We already built an evolutionary network instead of the original one. Nevertheless, these evolutions mostly come from the initial ideas of “service of network”. By reading the paper, we can get a more rounded viewpoint of network.

Reference:

1. Jonathan B. Postel, Carl A. Sunshine, Danny Cohen, “The ARPA Internet Protocol”
2. Richard Stevens, “TCP/IP Illustrated”