TCP／IP網路通訊協定組合模擬器 A Network Simulator of TCP/IP Protocol Suite

Today computer network system has become more and more important. Most network architectures developed by major international standards organizations in the world are roganized as a series of layers. The purpose of each protocol layer is to offer certain services to higher protocol layers. Moreover, the stacking of several protocol layers creates a full and independent computer network architecture serving a set of specific objectives. This paper impelments a computer network simulator. This software simulates DARPA's (Defense Advanced Research Projects Agency) TCP/IP protocol stack with IEEE's 802 standards) for the local area networks. In specific, we simulate five protocol layers including an application layer, the transprot layer of TCP protocol, the network layer of IP protocol, IEEE's 802.2 logical link control sublayer protocol and IEEE's 802.3 medium access control sublayer protocol. We had used the discrete-event simulation techniques to construct our computer network simulator. It simulates data transfer between different machines in the different or same networks. This requires implementation of the following mechanism: establishing logical connection, closing logical connection, flow control, retransmission of duplicated and lost packets, routing, fragmentation and reassembling packets, physical medium transfer control, display of data flow in between protocol layers and collection of simulation results. We believe this simulator can be used to analyze the efficiency of transmission between protocol layers and between two different machines in an user defined network topology. In addition, with the ability of monitoring the network packet traffic, this simulator can also be used as an excellent education tool for computer network relative courses.