

Telecommunications @ Crossroads: The Transition from a Voice-Centric to a Data-Centric Communication Network

by
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Abstract

Packet based, e.g., Internet, traffic will soon surpass conventional forms of wired communication, e.g., circuit-switched voice traffic. Moreover, the growth in packet traffic is so pronounced that by 2007, telephony may constitute only 10% of overall backbone traffic. In this thesis, I investigate this transition of the communication network from a "voice-centric" to a "data-centric" model. In particular, I examine the speed with which data traffic will eclipse voice traffic, and the significance of the shift's suddenness to the final outcome. While a prediction concerning the precise timing of the circuit-to-packet crossover is of some interest, this thesis' focus is on addressing the fundamental issues relevant to the rapid evolution of a data dominated communication network. To aid in understanding the shift, I present and characterize a traffic transition model. Based on this model, I determine that the window in which data traffic increases to contribute 90% of overall backbone traffic is 10 years from today, and find that the crossover (50%) point occurs in 1998. I argue that the suddenness of the change, as opposed to the change itself, will be a key issue in determining the post "crossover" telecommunication industry structure, and discuss the implications of this finding for ISPs, RBOCs, switch equipment vendors, Internet telephony, and Universal Access. In the appendix, this model is extended to investigate the revenue crossover that accompanies the traffic crossover and the relationship between the two events is characterized.

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