

ABSTRACT

A Study of the Feasibility and Efficiency of Voice/Data Integration using a Modern PBX.

Glendon B. Redway

This thesis is a study of the usefulness of a digital private branch exchange (PBX) to integrate voice and data. Integration, in this study, signifies that both voice and data share the same communication facilities provided by the PBX. Two computer models of voice/data traffic and loading on digital PBX's were done.

In the first model, the digital PBX operated in a circuit switch mode and both traffic types were time division multiplexed. In the second model, voice was time division multiplexed and data was packet switched.

The digital PBX in the first model was considered feasible and efficient if at least eighty percent of the calls generated were connected by means of the PBX. The results indicate that it is feasible for this PBX to integrate voice and data when the mean voice/data call generation rate is at most 13.2 calls per minute, and the mean holding times of voice and

data calls are ten minutes and fifteen and a half minutes respectively. When the mean holding times of voice and data calls are ten minutes and thirty minutes respectively, the digital PBX is also feasible in handling voice and data traffic when the mean call generation rate is up to 9.4 calls per minute.

The results obtained from the second model show that the digital PBX in this model is feasible and reliable in handling voice and data traffic types, when the mean generation rate of the Poisson distributed data packets is 0.3 packets per row, and at most five rows are reserved for voice transmission. (A row is a section of the time division multiplexed frame produced by the synchronous generator of the PBX.)