

~ ABSTRACT ~

FDDI Performance Model

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A communications revolution is taking place as institutions around the world install computer based Local Area Networks (LANs). Computer networks offer immediate cost benefits by allowing many computers to access the same expensive peripherals and software. Furthermore, computer networks make efficient communication possible through electronic mail and file transfers.

The Fibre Distributed Data Interface (FDDI) protocol was the protocol of choice for high speed LANs in recent years. For example, the University of the West Indies (UWI) installed its FDDI backbone in 1993. With the ever increasing traffic on a backbone, particularly with the heightened use of multimedia based software on LANs, it is becoming increasingly important to understand the behaviour of an FDDI based backbone under a variety of load conditions, identify the limitations of the FDDI protocol, and suggest a means to optimise the network. This is the subject of this thesis. By designing an event driven model which simulates the parallel nature the FDDI protocol, a performance model is developed and analysed.

Critical operating parameters are identified and optimised under a variety of simulation scenarios. In addition, simulation results will be presented to show the operating characteristics of the network model. These will include the fairness of the protocol, and its token access delay characteristics. Finally, the performance of the FDDI based network model will be investigated under extreme load conditions.