

ABSTRACT

Asynchronous Transfer Mode (ATM) is considered to be the foundation on which B-ISDN is to be built. It is the new generation of communication protocol that being deployed throughout the telecommunication industry. An important component of this communication networks is the ATM switch whose basic functions are to direct cells from input port to output port and to buffer cell destined to the same output port from different input port. Understanding an ATM switch before building it, is a challenging task as one must consider the design of switching architecture and cell buffering at the same time.

As the switching architecture is important, this project focuses on the development of an object-oriented simulator for simulation and prototyping of ATM switching architecture. It also focuses on the identification of functional requirements of the switch fabric at ATM layer, i.e. develops an improved architecture which considers QoS at the switch fabric, and ensures the correctness and fairness of routing within the switch fabric for ATM applications. As such, the implemented switching architecture is Banyan switching architecture. The design of switching element used in Banyan Switch includes a 2x2 crossbar switch and first-in-first-out buffers at each input controller.

Finally, object-oriented approach is proven to be the most suitable approach for the development of network simulator. Multithreading has been applied to closely simulate the real ATM switch. The results of this project clearly stated that this simulator is platform independent and can be placed into the World Wide Web easily.