

Abstract

Asynchronous Transfer Mode (ATM) provides the required flexibility for the support of heterogeneous services for Broadband Integrated Services Digital Networks (B-ISDN) environment. ATM has proven to be efficient and flexible in handling a wide range of integrated service traffic. The most outstanding feature of ATM is that it provides the Quality of Service (QoS) guarantees between connections. In a network environment, congestion control is an important factor to consider as to guarantee the negotiated QoS. To study, observe and develop the congestion control mechanism in an ATM network, simulation modelling provides the ideal domain.

The aim of this project is to develop object-oriented components for an ATM network simulator that emphasises on congestion control mechanism. The link and buffer management technique is implemented in the congestion control mechanism.

In this project, ATM congestion control system makes use of Early Packet Discard (EPD) mechanism together with Fair Buffer Allocation (FBA) technique. In addition, ABR rate control feedback mechanism has also been referred to. The object-oriented approach is used as the construction method for this simulator. By this approach, the simulator is made easily extensible with any addition of program methods. Furthermore, this technique provides for reusability, portability, maintainability as well as extensibility in the simulator.

The results of the project clearly show the suitability of using the object-oriented approach in network simulation. The components are fully object-oriented and can be easily ported to be World Wide Web. This simulator is also capable of multithreaded operations as well as platform independent.