

One of the principal phases in the design process of the information systems is the performance evaluation of these systems. Queueing networks and Markov chains are commonly used for the performance and reliability evaluation of computer, communication, and manufacturing systems. In the context of this work, this phase of analysis is based on a mathematical modeling and resolution in term of Markov chains. Several high level formalisms were developed to address the problem arising from the size, potentially very large, of these chains. In this paper, we are interested in the generation of computer and telecommunication networks will use the Asynchronous Transfer Mode (ATM). ATM networks use small fixed size cells to transmit information. This allows them to share the same network for voice, video, and data at a wide range of distances. Most computer and telecommunication companies are working on ATM products and services.

In this thesis we made simulation to the performance of the network by using Markov Model, and we used two models of Markov Chain. First model, shows the simulation network error between two colleges of science first one in Beirut, and second in Tripoli. Second model, shows the delay of ATM cell in variant modules. The implementations of these models were by using Matlab program.